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NSS NEWS

American Caving Accidents

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Features

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Front Cover

The first drop inside the Friars Hole entrance to the Friars Hole System, West Virginia. Photo by Ron Simmons, Copyright © 1997 Ron Simmons.

Back Cover

Rodger Ling and Dennis Curry in Gourdneck Cave, Tennessee. Photo by Mark Wolinsky, Copyright © 1997 Mark Wolinsky.

Introduction

Bill Putnam

Welcome to the long-awaited 1994-1995 issue of American Caving Accidents. In this issue you will find 148 accident and safety incident reports. During the review process, some members of the review committee asked me why certain minor incidents were included for publication. The incidents in question were those which resulted in minor injury or inconvenience, but had no serious consequence. I would like to take a few moments to discuss the purpose of this publication, as I see it. As I do, I believe my reasons for including these minor incidents will become clear.

American Caving Accidents is not just an exercise in record keeping. It serves several purposes for the Society. Yes, it is the primary record of caving accidents in North America. That is a valuable service which the Society provides. But my discussions with cavers over 17 years of caving, and over the last year as I prepared this publication, have convinced me that this record keeping role is not the most important function of the publication.

Many cavers have said to me that ACA is the most useful publication they receive from the NSS. They feel this way because they recognize the benefits to their own caving abilities and activities to be gained from reading about the accidents, incidents, near-misses, and close calls described in these pages. They realize that this publication presents them with the opportunity to learn from the mistakes or misfortunes of their fellow cavers.

When I began caving in 1980, I was fortunate to have several good friends who acted as mentors, teaching me safe caving techniques, instructing me in the importance of cave conservation, and introducing me into the community of cavers. These cavers told me dozens of stories around the campfire, or over dinner, or on the long drives to and from the caves. In the process, they passed on to me the collective experience of many, many cavers, gained over decades of active caving. What they were doing, whether they realized it or not, was fulfilling their roles as "elders of the tribe".

You know what I mean. We may not want to admit it, but we all get older. Some of us get a little wiser in the process. Eventually, we realize that those new cavers look pretty young. Years ago, when there weren't so many of us (and of them) we knew them all and we took them into our ranks and under our wings, teaching them how to cave without hurting themselves, their friends, or the caves.

Today, the caving community is so large that we can not know everyone. My own grotto is so large that there are quite a few folks I may never cave with or get to know. Years ago I helped teach vertical training sessions. In the course of a day on the cliffs or on a training trip I would regale my captive audience with tales of close calls, nasty injuries, near misses, rescues, and fatal accidents. I wanted them to understand the consequences of rockfall in a pit, rigging the rack backwards, losing control of a rappel, or wearing a cheap hard-hat. I believed then (and I still do) that you have to have some way to take the abstract rules of safety and technique and personalize them, in order to really understand and appreciate them. You have to know the story behind or beyond the rules.

American Caving Accidents is part of what my friend Dave Hughes likes to call "the pool of archival knowledge". It is a collection of shared experiences that can help the reader connect the abstract rules and techniques found in books or imparted by teachers with the real world of caving that we all experience. When we read about the caver who dropped his only light down the pit and became stranded, or the one whose climbing helmet saved his life, we remember the stories. The phrases "three sources of light" and "cheap hard-hats are for cheap heads" have more meaning.

Almost 18 years later, I clearly remember many of the stories I was told by my mentors. Most were hair-raising tales of near-misses. Nobody got hurt, and they all laughed about it later, but they knew (and I learned) just how close they were to death or serious injury. These near-miss stories were every bit as important in my training as the stories of serious accidents. They taught me that inattention, miscommunication, and mistakes can happen to anyone – no matter how experienced. And they taught me that there is only a split second and one bad decision separating an enjoyable caving trip from tragedy.

American Caving Accidents is a teaching tool. It's a communication channel. It is a way for us to pass on to the new cavers the collective experience and wisdom of the tribe. We can't take all the new cavers out caving, or share stories around the fire with them. But we can publish our experiences for them to read. In the process, perhaps we will remind ourselves of important lessons that we have forgotten.

Eventually, I acquired responsibilities which limited my caving time. I became reluctant to devote precious caving weekends to teaching the new cavers. I wanted to spend the time that I had on fun things, like mapping and exploration, project caving, and so on. I wanted to spend that time with my old buddies, not with strangers. So I stopped leading the beginner trips and teaching the training sessions.

But I still like to tell the stories, on trips and around the campfire. I present programs to my grotto on safety and techniques. I have become involved in cave rescue work. When the opportunity arises, I try to be a good mentor to some of the new cavers that I meet.

I realize that I owe a great debt to my mentors. Steve Attaway, Ed Strausser, Buddy Lane, and many others taught me things that have kept me alive and caving. But the debt I owe is payable, not to them, but to the new generations of cavers. We all owe that debt.

Reading ACA is a great way for all cavers, not just new ones, to build knowledge and awareness of safe caving practices. But it is still up to each one of us to teach and promote safety at every meeting and on every trip.

How will you meet your responsibility as one of the elders of the caving tribe?

Overview of the 1994 and 1995 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. I have introduced one new category, "difficulty on rope", which encompasses 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 of descend. My intent is to better describe these situations, which might otherwise be lumped under "stuck", "trapped/stranded", or perhaps "equipment problem".

At first glance, it may appear that the number of 1994 incidents is alarmingly large compared to previous years. I believe that the high number is due to the long period between this issue of ACA and the previous one. The extra time for gathering reports has probably inflated the total number of incidents. The number of serious incidents (those involving fatalities, injuries, or aid) is less than in 1993, and the numbers for fatalities and incidents resulting in injury and aid are also smaller than in 1993.

For similar reasons, it is also possible that the 1995 numbers are somewhat understated. If so, I hope that additional reports for 1995 can be obtained and published in the next issue along with the 1996 and 1997 reports.

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.

Incident Results

Fatalities

There were two incidents that resulted in fatalities in 1994. The only reported caving fatality occurred in Caballo Cave, New Mexico, when a caver was killed by the collapse of a large rock slab. Another fatality occurred when a man drove into a sinkhole which had formed in a highway. It is included in the reports and treated as an "outside" incident.

In 1995 there were two fatal accidents reported. One occurred in Real Well, Tennessee, when a novice caver became stranded on rope in a wet pit and died of hypothermia. The caver was not properly equipped or clothed for wet vertical caving. The second fatality occurred when a solo caver apparently became lost and stranded in Black Cave, Arizona. His body was discovered 20 months later. Solo caving is not recommended, especially when no one knows where you are.

Injury and Aid

The number of incidents involving injury and aid has shown a slow growth in past years. It was good to see the number decline slightly after a peak in 1993. Many of the incidents were resolved by the caving parties themselves without a callout for rescue.

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. In several notable cases, however, large rescue operations were called out for experienced cavers who were stranded as a result of poor technique or poor judgment. The easy availability (via 911) of well trained and equipped cave rescue teams may have encouraged some cavers to hit the panic button when they could and probably should have performed a self-rescue.

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.

Incident Causes

Acetelyne Hazard or Explosion

There were three acetylene hazard incidents in 1994 and none in 1995. One of the three resulted in an explosion, but did not cause any injury.

Bad Air

Two of the 1994 incidents and two in 1995 involved bad air in caves. In two cases, cavers equipped with oxygen cylinders were attempting to enter a pit known to have bad air. This is extremely dangerous and should not be attempted without special equipment and training. Supplementary oxygen cylinders are no substitute for self contained breathing apparatus (SCBA) air packs. See Bill Elliot's article in this issue for an excellent discussion of bad air in caves.

Caver Fall

Caver falls remain the leading cause of accident and injury. The reported causes and contributing factors include rope failure (a manila rope), out of control rappel, poor footwear, free-climbing without belay, free-climbing with ascender safety, and climbing rope hand-over-hand. In several cases, the victims were not wearing helmets or were wearing cheap hard-hats with elastic chin-straps, resulting in head injuries. A proper caving helmet with an inelastic quick-release chin-strap is the fundamental piece of equipment for all cavers.

Drowning

There were no drowning incidents in 1994 or 1995, though there was one close call when a caver was pulled under by a waterlogged equipment bag during a swim.

Equipment Problem

This catch-all category includes bolt hanger failure, ascenders slipping on icy ropes, ascender slippage due to worn cams, light failure, sinking rafts, waterlogged packs, rope failure, and misuse or lack of equipment.

Incident Statistics 1986 – 1995

Result of Incident

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

Cause of Incident

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

Cave Diving

Fatality (one or more)	7	5	9	4	8	2	5	3	6	5
Aid, no injury	1	0	0	0	0	1	1	0	0	1
No consequence	1	2	1	1	0	5	1	0	1	0
Total Diving	9	7	10	5	8	8	7	3	7	6

NSS Membership versus Number of 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

Flooding

There was one flood entrapment in 1994 in Cueva del Brinco, Mexico, when several experienced cavers were trapped for two days. They waited it out and exited with no damage done. In contrast, the Barberry Cave, Virginia, incident in 1995 drew national media attention. Simultaneous flood entrapments in Salamander Cave and Trapdoor Cave, Indiana, also drew a large response from rescuers and the media. As in most flooding incidents, there was little choice but to wait for the water level to recede. One close call was reported in 1995 when cavers made a hasty exit from Foglepole Cave, Illinois, as a flash flood developed.

Hypothermia

Hypothermia is usually a secondary result in the reported incidents, occurring subsequent to cavers becoming injured, stranded, or trapped in a cave. In 1995 it proved fatal for a caver in Real Well, Tennessee, when he became stranded on rope in a waterfall. Hypothermia was also a factor in the 1994 rescues at Fern Cave, Alabama, and Pinnacle Cave, Nevada. Remember: hypothermia can kill.

Illness

There were two incidents involving histoplasmosis following the 1994 NSS convention in Texas. Several cavers were hospitalized as a result. One caver was on a multi-day expedition to a remote area in Lechuguilla when he became ill. He was able to exit, but was soon hospitalized. There was also one incident involving an insulin imbalance reaction in Sotano de San Augustin, Mexico. It was resolved when a doctor in the caving party provided treatment.

Lost

Most of these incidents involved untrained and ill-equipped cavers with little experience. Notable exceptions involving experienced NSS cavers include the incident at Stolen Well, Alabama, and one of the Sloans Valley Cave, Kentucky, incidents. One incident at Gage Cave, New York, also involved experienced cavers who took a wrong turn and became stranded by water.

Rockfall

Rockfall remains a major source of accidents and incidents, causing one fatality in Caballo Cave, New Mexico, in 1994 and several serious injuries. Rockfall also accounts for a large number of the "near-miss" incidents.

Stuck

Despite popular perception, getting stuck is not much of a hazard in caving. There were two minor incidents in 1994 in Snow Hole, Alaska, and Lechuguilla Cave, New Mexico, but both were quickly resolved. The 1995 incident at Owl Cave, Virginia, is interesting due to the technique used to free the hapless caver.

Trapped/Stranded

This is a new category 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 most of the reported incidents, "spelunkers" were stranded by light failure and/or poor judgment.

Exhaustion

There were four incidents in 1994 in which cavers became too exhausted to exit and required assistance. All were resolved by the caving party or with some assistance from friends, with the exception of the incident in Fern Cave, Alabama, where a large rescue operation was mounted to assist a caver stranded at the bottom of a 400-foot deep pit. The 1995 incident involved the rescue of an inexperienced caver from a pit in Kentucky.

Difficulty on Rope

There were eleven incidents in 1994 in which cavers encountered serious difficulty on rappel or ascent. One of these resulted in a fatality at Real Well, Tennessee. In most other cases the problems were resolved with some assistance from members of the caving party. One of the four incidents in 1995 involved a caver who suffered broken ribs in a fall in Lechuguilla Cave, New Mexico, and who subsequently became stranded on rope at Boulder Falls, requiring rescue.

Other

This catch-all category includes the pipe bomb found in Hush-Hush Cave, Utah, along with the chopped rope at San Augustin, a broken finger in an Arkansas cave, difficulty in swim in Aire Fresco Cave, Mexico, washed out to sea from a Hawaiian sea cave, washed into a sea cave in California, a hand injury in Hurricane Cave, Colorado, and a few other mishaps. Probable the most notable are the Safford Shafts explosion and entrapment (the victim poured gasoline into a pit and ignited it) and the caver who drove his snowmobile into a pit while looking for caves in a snow-covered lava field.

Outside Incidents

There were two outside incidents reported in 1994 and none reported in 1995. The first 1994 incident involved difficulty on rappel due to hair caught in a rappel rack at a practice cliff. In the second incident, a man was killed when he drove his car into a sinkhole that had formed in the middle of a highway in Maryland. These are not included in the regular accident totals, since they are only peripherally related to caving.

Cave Diving Incidents

Of the seven diving incidents in 1994, four involved divers trained and certified in cave diving. The Sotano de San Augustin incident involved the use of complex rebreather technology. It is unclear whether operator error, the diver's diabetes, or some other factor caused the accident. The Zacaton incident is also puzzling, with no indication of the cause of the fatality other than a reported past experience with blackout at depth. In both cases the divers were pushing the limits of technology and exploration. Sheck Exley's death in Zacaton was a shock to many in the diving community. He was widely recognized as an expert in cave diving and deep diving with SCUBA equipment.

Two other 1994 incidents involved trained cave divers who apparently ignored standard safety practices regarding air management rules and guideline use, with tragic results. Two incidents resulting in multiple fatalities were attributed to open water divers entering caves without proper training or equipment. A snorkeler became lost and disoriented in a sea cave, but was eventually able to find his way out.

The 1995 diving incidents include another snorkeler rescued from a sea cave, as well as five incidents resulting in fatalities. The incident in Thunderhole, Florida, involved a trained cave diver who apparently used the wrong mixed gas bottle on a deep dive. The others involved open water divers who entered caves without proper training and equipment.

Acknowledgments

I would like to thank all the people who have contributed reports for this issue. Several notable correspondents have contributed a large portion of the material for these reports. They include Richard Breisch, Bill Torode, Chuck Porter, Butch Feldhaus, Buddy Lane, and Scott Fee. Camille Duke helped get the mailing set up and provided much useful information, as did Tom Rea and Fred Wefer. Mark Wolinsky, Ron Simmons, Buddy Lane, and John Lyles provided photos. Mary Foster did much of the typing. Bob Hinchley helped prepare the statistical tables and summaries. Richard Blackburn was a great help with the proofreading. I would also like to thank Steve Knutson for his assistance in the preparation of this issue and for his years of service to the Society as Editor of ACA. Steve revived ACA and built it into the valuable resource that it has become. We all appreciate his efforts and contributions.

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Bad Air In Caves

William R. Elliott, Ph.D.

This article was revised from one which appeared in Cavers' Digest

Many have debated the sources of bad air in caves. Caves that flood may have O_2 depletion and CO_2 production from bacterial digestion of organic matter. In Texas there are some karst areas that commonly have bad air, but little flooding. There may be biogeological sources of CO_2 in these areas, but this hypothesis (Elliott, 1995) is unproven as yet. I have a lot of unpublished data from bad air caves in Texas, in which I measured CO_2 with a Drager tube and O_2 with an Edmont O_2 meter.

Normal atmospheric CO_2 is about 0.035% (350 ppm) and O_2 is 20.9%. In my experience most cavers can easily tolerate increased CO_2 levels of 3% (with a similar decrease of O_2 to about 18%), and may only breathe a bit heavily even after resting. At 4% most cavers will be puffing, and at 5% most are panting hard and will give up and leave. I have driven myself to breathe 5.5% CO_2 with 12.5% O_2 for a short time, but paid for it later (a hangover the next day, soreness, crankiness, etc.). Some people become very ill and vomit after coming out into the open air, a lot like the "off effects" after anesthesia. Most get violent headaches (I don't for some reason). Loss of judgment is a real problem – in one celebrated case in Texas, cavers tried to survey Marguerite Cave in very bad air. They would forget to write down data, then would say "forget it" and go on to the next station. They almost gave up getting out of the very tight entrance, and might have died if one guy had not gotten up the energy to struggle out and help the others out.

Most people will pass out at an O_2 level of 10%, but some need higher levels and there is a time factor as well. Luckily for us, the body has a CO_2 detector in the circulatory system that triggers harder breathing as dissolved CO_2 rises. This helps us to compensate for awhile, but at about 17% O_2 we cannot compensate further, so we begin to lose the battle at that point. Time to get out!

In the USA the federal Occupational Safety and Health Administration (OSHA) does not allow workers in a closed space with less than 19.5% O_2 at any time without breathing apparatus. There's a good reason for that – a worker climbing down a ladder into a tank or a rusty ship's hold may quickly go from 20.9% O_2 to a very low concentration in a short distance. So, the 19.5% limit gives a large safety margin. A similar hazard exists in bad air pit caves, where the heavier, CO_2-rich air can stratify. It can be quite dangerous to descend into such a pit, and cavers in bad air karst regions have had a lot of near misses. Sometimes the only thing that held them back was their carbide lamps going out just below the lip. Horizontal caves don't behave that way. Workers are not allowed to work a shift in more than 0.5% CO_2, but this would be a joke to most cavers. Many caves in Texas have > 1% CO_2 in the summer, and it's not even noticeable to the average caver.

In bad air cave areas, like San Saba and Burnet counties, Texas, cavers often use the **"Bic test"** to determine when to leave a cave. Butch Fralia (1989) determined that a common Bic butane lighter will begin to flicker and form a gap between the jet and flame at 18.5% O_2. A one-inch gap forms at 17.5%, and the lighter will go out but can be re-lit. At 17% the Bic will not light; at this level most cavers would be breathing hard, but the Bic test seems to give them a good advance warning. In Colorado Bend State Park cavers often use an oxygen meter with a long probe to check the air before entering very far into a pit cave; the meter is supplied by the Texas Parks and Wildlife Department. Sometimes they ventilate caves with hoses and blowers.

In the carbide days, a cap lamp going out or getting a weird, separated flame was also a good sign that it was time to leave. Some of the bad air pits in Texas are dangerous in the summer, with O_2 concentrations below 12% and CO_2 above 6%. I have measured O_2 as low as 11% in Skull Cave at San Antonio, by sucking air out via a small hose with a small air sampling pump attached. Skull had to be surveyed by two cavers wearing scuba tanks. The air was so "carbonic" that it burned their eyes, and they could taste the air when they took their mouthpieces out to speak (Veni and Elliott, 1994).

My studies usually found that CO_2 and O_2 levels mirrored each other rather closely – as one increased the other decreased. But at lower O_2 concentrations there was a lag in CO_2 increase. The difference is made up by nitrogen. Julia James has published some papers on "foul air" caves in which she has noticed this same phenomenon, which may be called "stink damp", an old British mining term. In Gorman Cave, Texas, I took air samples on charcoal for lab analysis but found no organic compounds in the bad air.

In bad air different individuals experience different **symptoms** at different times. CO_2 has anesthetic properties, and has been used to stupefy cattle before slaughter. Most people develop a headache, some get silly, some lose their judgment, some become animated, others become exhausted. In my experience, novices sometimes get panicky and may even hyperventilate in overreaction. Paranoia and claustrophobia sometimes set in quickly with novices, and I think even low levels of CO_2 can worsen this. Experienced cavers, in my opinion, become somewhat oblivious to mildly bad air and develop a "body expectation" that goes along with the whole caving experience. This expectation would unnerve many normal people. (Maybe it also causes minor brain damage and that's why we continue to go caving… hmmm. Maybe it also causes minor brain damage and that's why we continue to go caving… Wait, I already said that. That's all for now.)

Literature Cited

1. *Elliott, William R. 1995. Air monitoring during construction of a cave gate. pp. 45-51 in Pate, Dale L. (Editor),* Proceedings of the 1993 National Cave Management Symposium*, Carlsbad, New Mexico. National Cave Management Symposium Steering Committee.*
2. *Fralia, Butch. 1989. Bad air detection.* Texas Caver*, 34(2):30.*
3. *Veni, George, and William R. Elliott. 1994. Skull Cave. p. 308 in Elliott, W.R., and G. Veni (Editors). 1994.* The Caves and Karst of Texas. *1994 Convention Guidebook. National Speleological Society, Huntsville, Alabama. 352 pp. + viii + 13 maps.*

Caving Risk Assessment Grid

John Gookin

I use this caving risk assessment grid in teaching caving. It helps me talk to other instructors about what sorts of caves, or passages, are appropriate for different levels of students. It especially helps me be proactive about letting students go into a passage or new cave without instructor supervision. I realize that my peers in the NSS use informal mentors more than formal instructors, but the same principles apply. I would appreciate any comments or suggestions that might help make the grid more useful.

	Safe	Moderately Safe	Hazardous	Very Hazardous	Extremely Hazardous
General	**no apparent objective hazards; untrained people with common sense should be fine**	**nonlethal hazards present; untrained people need some supervision**	**some obvious but avoidable fatal objective hazards; untrained people need constant supervision**	**fatal objective hazards must be negotiated with technical expertise and cannot be avoided; untrained people inappropriate**	**high level of technical expertise, perfect teamwork, and consistent attention to detail needed to avoid fatal errors**
Remoteness	easy access for rescue	cave and/or passage access challenging for rescue	rescue access very difficult	rescue would be very risky and extremely difficult	rescue impossible before expiration due to location or environmental conditions
Cave Climate	comfortable to rest in	"chilly" due to temperature, humidity, water, ice, and/or wind	"cold", difficult to rest in the cave without getting chilled	very cold without wetsuit or other insulating layers	uncomfortably cold even with wetsuit or other insulation
Ropework	none	handlines needed, anchors obvious	simple vertical ropework, anchors obvious, one or two drops only, drops less than 400 feet deep	anchors complicated, multiple drops, mixed conditions, or drops over 400 feet deep	more than 20 drops on route, ropework requires complicated maneuvers, drops over 1,000 feet
Free climbs	less than 10 feet	less than 15 feet	more than 15 feet	more than 30 feet	more than 60 feet
Water	avoidable, impossible for a healthy adult to drown	less than 5 feet deep, above 50 degrees F, slow moving	over 5 feet deep or under 50 degrees F or fast moving, noisy	ropes required in current or below 40 degrees F	SCUBA gear required
Loose rock	none to little	easily avoidable	dangerous	difficult to avoid	unavoidable
Flooding	none	only seasonal	seasonal or with 10 year storms	annually with big storms	regularly with storms
Disease	none	minor hazard	significant presence must be assessed and negotiated carefully	hazardous areas which must be avoided	unavoidable, bio-hazard precautions required
Bad Air	none	nonlethal CO_2 causes shortness of breath	CO_2 or other bad air causes level of consciousness problems	bad air makes non-SCBA caving unsafe	SCBA and vertical gear used together
Ice	none	easily avoidable, risk of injury	must be negotiated carefully, passable with normal caving gear	ice tools, crampons needed, occasional icefall, difficult to avoid	frequent icefall, unavoidable
Maze	easy routefinding, small caves, linear passage development, obvious direction indication from streams, etc.	possible to get lost, less than 1 mile long, some directional cues from streams, airflow	easy to get lost, less than 3 miles total, directional cues not always available or reliable	easy to get lost, over 3 miles total, few cues for direction, boneyard or other non-linear passage development	extensive boneyard or non-linear passage, easy to get lost, no directional cues from streams, airflow, etc.
Lava Tubes	smooth solid floor, no ice or sharp rock	sharp rock hazard	hanging floors	hanging floors and ice	active volcanism in area
Caver	experienced, trained for conditions, able to self-rescue, healthy, rested and alert	inexperienced, but trained and properly equipped, supervised by experienced cavers	inexperienced, untrained for special conditions, stressed, or fatigued	level of consciousness compromises show in poor alertness, balance, or coordination	tunnel vision due to fatique or stress

Reported Incidents and Accidents for 1994 and 1995

1994 Incidents

Date	Cave	Location	Result	Incident Type
January	Mammoth Cave	Kentucky	no consequence	rockfall
5 February	Caballo Cave	New Mexico	fatality	rockfall
5 February	Nutty Putty Cave	Utah	injury and aid	caver fall
6 February	Fisher Ridge Cave	Kentucky	no consequence	difficulty on rope, equipment problem
13 February	Sloan's Valley Cave	Kentucky	aid, no injury	lost
February	Aire Fresco Cave	Mexico	aid, no injury	difficulty in swim, equipment problem
February	El Chorreadero	Mexico	injury and aid	caver fall
5 March	Hush Hush Cave	Utah	aid, no injury	found bomb in cave, difficulty on rope
12 March	Sinnett–Thorn Cave	West Virginia	aid, no injury	lost
22 March	Los Juanitos	Mexico	no consequence	bad air
26 March	Pine Hill Cave	Kentucky	injury and aid	caver fall
March	Bowden Cave	West Virginia	aid, no injury	lost
March	Sotano de San Augustin	Mexico	injury, no aid	caver fall, bolt failure
March	Sotano de San Augustin	Mexico	no consequence	chopped rope
March	Sotano de San Augustin	Mexico	no consequence	rappel rack rigged backwards
1 April	unnamed sinkhole	Maryland	fatality	drove car into sinkhole
17 April	Picnic Cave	Arkansas	no consequence	rockfall near-miss
April	Lechuguilla Cave	New Mexico	injury, no aid	caver fall
Spring	Valhalla	Alabama	no consequence	glove caught in rappel rack
1 May	Fulford Cave	Colorado	injury, no aid	caver fall, no helmet
5 May	Norman Cave	West Virginia	injury and aid	caver fall
5 May	Sotano de San Augustin	Mexico	aid, no injury	insulin imbalance
7 May	Lone Bat Cave	Alabama	aid, no injury	stranded, no light
21 May	Crystal Ice Cave	Idaho	aid, no injury	difficulty on rope, stranded in pit
21 May	Paradise Lost Cave	Indiana	injury and aid	caver fall, inadequate equipment
22 May	Formation Pit	Alabama	injury and aid	caver fall, stranded in pit
23 May	Pinnacle Cave	Nevada	injury and aid	caver fall, hypothermia
27 May	Puckett Cave	Alabama	injury, no aid	rockfall
28 May	Buffalo Creek Cave	Kentucky	no consequence	equipment problem, acetylene hazard
28 May	Devil's Dungeon	Alabama	aid, no injury	stranded in pit, no ascenders
12 June	Laurel Caverns	Pennsylvania	injury and aid	caver fall
15 June	Pozo de la Escalera Cristal	Mexico	no consequence	rockfall, near-miss
15 June	Sloan's Valley Cave	Kentucky	no consequence	lightning
17 June	Cueva del Brinco	Mexico	no consequence	flood entrapment
June	Emerald Sink Cave	Texas	illness	histoplasmosis
June	unknown cave, Stone County	Arkansas	injury, no aid	broken finger
5 July	Lechuguilla Cave	New Mexico	illness	histoplasmosis, exhaustion
6 July	Beaver Falls Cave	Alaska	no consequence	rockfall, near-miss, cut rope
9 July	Junkyard Cave	Tennessee	injury and aid	caver fall
13 July	Snowhole	Alaska	no consequence	stuck in crevice while on rope
16 July	Great Expectations Cave	Tennessee	injury, no aid	rockfall
21 July	Blowing In The Wind Cave	Alaska	injury, no aid	rockfall
July	Desoto Falls State Park	Alabama	aid, no injury	difficulty on rope, hair caught in rack
5 August	Keauhou sea cave	Hawaii	aid, no injury	washed out to sea exploring sea cave
6 August	J-4 Cave	Pennsylvania	injury and aid	caver fall
6 August	Three Fingers Cave	New Mexico	injury and aid	rockfall
9 August	Endless Cave	Indiana	aid, no injury	stranded, inadequate equipment
13 August	Barrack-Zourie Cave	New York	aid, no injury	exhaustion
13 August	Doghill-Donnehue Cave	Indiana	injury, no aid	caver fall
17 August	Oregon Caves National Monument	Oregon	injury and aid	caver fall
20 August	Stolen Well	Alabama	aid, no injury	lost, stranded

27 August	Bakers Hole	Idaho	aid, no injury	difficulty on rope
27 August	Fern Cave	Alabama	aid, no injury	stranded in pit, exhaustion, hypothermia
4 September	Cass Cave	West Virginia	aid, no injury	difficulty on rope
4 September	Raccoon Mountain Caverns	Tennessee	injury and aid	caver fall
10 September	Bowden Cave	West Virginia	injury and aid	caver fall
11 September	New Trout Cave	West Virginia	aid, no injury	lost, stranded, light failure
18 September	Sloan's Valley Cave	Kentucky	no consequence	lost, hypothermia
24 September	Sloan's Valley Cave	Kentucky	injury and aid	caver fall, rope failure
8 October	Pettijohns Cave	Georgia	injury and aid	caver fall
15 October	Doghill-Donnehue Cave	Indiana	aid, no injury	lost
15 October	Greenville Saltpeter Cave	West Virginia	aid, no injury	lost, stranded, light failure
15 October	Hughes Cave	Alabama	aid, no injury	lost
15 October	Turkey Cave	Virginia	no consequence	bad air
19 October	Fisher Ridge Cave System	Kentucky	no consequence	acetylene explosion
19 October	Lechuguilla Cave	New Mexico	no consequence	rockfall, near-miss
21 October	Lechuguilla Cave	New Mexico	aid, no injury	stuck in crevice
29 October	Cave at Optimist Boys Club Camp	Indiana	aid, no injury	stranded, light failure
30 October	Weybridge Cave	Vermont	injury, no aid	caver fall, out of control rappel
19 November	Millers Cave	Kentucky	aid, no injury	lost
19 November	Ganter Cave	Kentucky	no consequence	trapped, lost key to gate
26 November	Onyx Cave	Arizona	injury and aid	caver fall
5 December	Lawrence Welk Cave	California	aid, no injury	lost
11 December	Manitou Cave	Colorado	injury and aid	rockfall
12 December	Reeves Cave	Indiana	aid, no injury	lost, light failure
17 December	Cass Cave	West Virginia	no consequence	dropped pack in pit, acetylene hazard
21 December	Safford Shafts	Arizona	injury and aid	explosion, entrapment
26 December	Spanish Moss Cave	Utah	aid, no injury	difficulty on rope, exhaustion
December	unnamed cave in the Berkshires	Massachusetts	no consequence	rockfall

1995 Incidents

Date	Cave	Location	Result	Incident Type
8 January	Cookston Cave	Tennessee	injury and aid	rockfall entrapment
8 January	Sunny Jims Cave	California	injury and aid	stranded, washed into sea cave
13 January	Barberry Cave	Virginia	aid, no injury	flood entrapment
24 January	Grindstone Cave	Tennessee	aid, no injury	stranded in pit, no equipment
January	Cemetery Pit	Georgia	injury and aid	rockfall
3 February	Grassy Cove Saltpeter Cave	Tennessee	injury and aid	caver fall
11 February	McClendons Cave	Alabama	aid, no injury	lost, stranded, light failure
13 February	Doghill-Donnehue Cave	Indiana	injury and aid	caver fall
February	Hurricane Cave	Colorado	injury, no aid	hand injury
4 March	Pettijohns Cave	Georgia	injury and aid	caver fall
18 March	Real Well	Tennessee	fatality	stranded on rope in waterfall
29 March	Lechuguilla Cave	New Mexico	no consequence	difficulty on rope, equipment problem
March	unnamed dig	Vermont	no consequence	rockfall, near-miss
March	Los Juanitos	Mexico	no consequence	bad air
6 April	Clarksville Cave	New York	injury and aid	caver fall
8 April	Salamander Cave	Indiana	aid, no injury	flood entrapment
8 April	Trapdoor Cave	Indiana	aid, no injury	flood entrapment
29 April	Snail Shell Cave	Tennessee	no consequence	stranded, inadequate equipment
30 April	Helens Cave	New Mexico	injury and aid	caver fall
April	Black Cave	Arizona	fatality	solo caver, lost, light failure
14 May	Hunters Cave	Iowa	injury, no aid	asphyxiation, smoke bomb in cave
6 June	Foglepole Cave	Illinois	no consequence	flooding, near-entrapment
11 June	Ferris Pit	Tennessee	no consequence	tree fell on ropes, near-miss
21 June	Bowden Cave	West Virginia	aid, no injury	lost
21 June	Rainbow Falls Cave	Colorado	aid, no injury	stranded, hypothermia

22 June	Bowden Cave	West Virginia	aid, no injury	lost consciousness
30 June	Clarksville Cave	New York	aid, no injury	lost, hypothermia
1 July	Eon Cave	California	injury and aid	rockfall entrapment
1 July	Nielsons Well	Utah	injury and aid	rockfall
8 July	Fulford Cave	Colorado	injury and aid	caver fall
10 July	Rainbow Falls Cave	Colorado	aid, no injury	stranded, hypothermia
13 July	Superstitious Cave	Alaska	injury, no aid	rockfall
16 July	Rainbow Falls Cave	Colorado	aid, no injury	stranded, hypothermia
18 July	Pittsford Ice Cave	Vermont	injury and aid	caver fall
21 July	Moon Probe Cave	Alaska	injury, no aid	caver fall
21 July	Rainbow Falls Cave	Colorado	aid, no injury	stranded, hypothermia
23 July	Moon Probe Cave	Alaska	injury, no aid	caver fall
8 August	Lechuguilla Cave	New Mexico	injury and aid	caver fall, difficulty on rope
August	Rehobeth Church Cave	West Virginia	injury and aid	caver fall
3 September	Bigfoot Cave	California	no consequence	difficulty on rope
3 September	Owl Cave	Virginia	no consequence	stuck, trapped in cave entrance
9 September	Blowing Sink Cave	Texas	injury, no aid	rockfall
9 September	Hughes Cave	Alabama	injury and aid	caver fall
24 September	Lundays Roadside Cave	Florida	no consequence	bad air
September	Scott Hollow Cave	West Virginia	no consequence	lost
14 October	Gage Cave	New York	aid, no injury	lost, trapped by water
21 October	Hancock Cave	Virginia	injury and aid	rockfall entrapment
1 November	Clarksville Cave	New York	no consequence	lost
18 November	Natural Well	Alabama	no consequence	stranded in pit, equipment problem
23 November	Sotano del Pozo	Mexico	injury, no aid	rockfall
25 November	Laurel Caverns	Pennsylvania	injury and aid	caver fall
2 December	Jewell Cave	South Dakota	injury, no aid	caver fall
26 December	Easter Cave	Vermont	aid, no injury	rockfall entrapment
December	Hart County cave	Kentucky	aid, no injury	stranded, exhaustion
Winter	Pig Hole	Virginia	aid, no injury	stranded during pulldown trip
Winter	unnamed lava tube	Idaho	aid, no injury	drove snowmobile into cave entrance

Cave Diving Accidents and Incidents

1994 Diving Incidents

Date	Cave	Location	Result	Incident Type
February	unnamed island sea cave	Bahamas	no consequence	lost, stranded, snorkeling in cave
27 March	Sotano de San Augustin	Mexico	fatality	lost consciouness during dive
6 April	Zacaton	Mexico	fatality	lost consciouness during deep dive
April	Abaco Blue Hole	Bahamas	three fatalities	out of air
May	Convict Springs	Florida	two fatalities	out of air
May	Zoo Hole	Bahamas	two fatalities	out of air, inadequate equipment
17 July	Bakerton limestone mine	West Virginia	fatality	equipment problem, rapid ascent

1995 Diving Incidents

Date	Cave	Location	Result	Incident Type
7 July	Lake Apopka Cavern	Florida	two fatalities	out of air, inadequate equipment
14 July	Devils Den	Florida	fatality	out of air, inexperience
15 July	Thunderhole	Florida	fatality	incorrect gas mixture
17 August	Cenote Temple of Doom	Mexico	three fatalities	out of air, inexperience
22 August	unnamed sea cave	California	aid, no injury	snorkeler trapped in sea cave
6 September	Sharks Cove Lavatube	Hawaii	fatality	out of air, inexperience

1994 Accident and Incident Reports

January
Mammoth Cave, Kentucky
rockfall

A slab of limestone 50 feet long and 20 feet wide and about six inches thick fell from the ceiling of the Rotunda, about 800 feet into the cave from the Historic Entrance. The slab damaged the remnants of the historic 1812 saltpeter mining operation, however the tours through the area were not affected. Due to the severe weather, the park had been closed for three days and no one was present when the rockfall occurred. The damage was discovered when regular tours resumed on January 20th. It is thought that the extremely cold air entering the cave produced a frost-wedge effect which caused the slab to fall.

1. *Ian Ellis, "Rockfall in Mammoth Cave",* NSS News*, v52n4, April 1994, p. 129.*
2. *David Goodwin, "Fall from Greats", Louisville* Courier-Journal*, 29 January 1994, reprinted in* The CIG Newsletter*, v38n3, March 1994, p. 28.*

5 February
Caballo Cave, New Mexico
rockfall, fatality

Leland Smith (40) was killed while exploring Caballo Cave, New Mexico, when two large boulders fell and crushed him. Smith was a volunteer assisting in a youth group trip led by caver Steve Peerman.

The accident occurred as the group was exiting the cave. Peerman and several of the students had climbed over a sloping piece of breakdown in a chimney leading to the entrance room and were waiting for the rest of the group. As Smith helped one of the students up to the top of the slab, a large piece of it broke off and fell on him. Smith and the rock fell further down the chimney, and a second section of slab fell on top of them. Smith sustained numerous fractures including legs, neck, and spine, and was killed instantly. Peerman and another adult volunteer rushed to the scene and found that Smith was dead. They were unable to move the rocks which pinned him in the crevice. They group exited and notified the authorities.

A body recovery operation was conducted the next day. Shoring was used to stabilize the area around the slab, which was found to have been held in place primarily by flowstone cementing. A problem arose when it was discovered that Smith had been carrying a semiautomatic pistol concealed in a shoulder holster. He had been a police officer and had a permit for the weapon. With assistance from a law enforcement officer, the pistol was removed and rendered safe and the recovery proceeded. After a substantial amount of excavation and rock moving, the body was freed and removed. In the process, another slab was knocked loose, bumping a rescuer as it fell. He received only a minor bruise.

1. *Steve Peerman, "Accident Report",* Muddy Litter Letter*, Issue 19, May/June 1994, p. 6.*
2. *Duke McMullan, "Fatality in Caballo Cave"*, The Bexar Facts*, v94n2, February 1994, p. 10.*
3. *Steve Peerman, "Body Recovery Operation"*, Muddy Litter Letter*, Issue 20, July/October 1994, p. 3.*

Comments: Peerman notes that the route over the slab was part of the standard route in and out of the cave, and that it had been traversed by hundreds of people over the years with no previous problem. The cave had long been considered safe for novices.

5 February
Nutty Putty Cave, Utah
caver fall, injury

Ralph Powers, Eric Malm, and Brian Flick entered the cave for a Utah Cave Search and Rescue practice session. Shortly after entering, Powers' helmet-mounted light failed. He had left his spare batteries and backup light outside, and had to borrow a flashlight from Malm. He mounted the borrowed light on his helmet and continued. Later, while negotiating a chimney, he attempted to position himself in the chimney to point out holds to Flick, who was having difficulty. Powers lost his footing and fell, striking a ledge with his hip. He was able to climb back up and exit the cave with some assistance from his companions. He suffered a cut on his elbow as well as bruises and abrasions to his hip.

Ralph Powers, "Mommy I Fall Down Again", The Utah Caver*, v6n2, April 1994, p. 24.*

Comments: Powers notes that the experience taught him not to take even easy and familiar caves lightly. Also, he should have been carrying his own backup lights rather than relying on his companions.

6 February
Fisher Ridge Cave, Kentucky
difficulty on rope, equipment problem

Joe Saunders, Charlie Pflanze and Ken Aanderode entered the Remington Entrance of the Fisher Ridge Cave System in a surveying trip. After completing their work, they exited back into Fisher Avenue via a climb off of the ceiling of Roaring River. Joe Saunders had trouble going up rope due to his jumars slipping on the ice-coated rope. Charlie had splashed through the Remington Canyon and was suffering with very cold feet.

Joe Saunders, "Kentucky Cave Log", Feb. 5-6, 1994, D.C. Speleograph*, v50n5, May 1994, p. 10.*

Comments: Ascenders with spring-loaded cams will often slip on muddy or icy ropes. Layered neoprene socks can help prevent cold feet in wet caves.

13 February
Sloans Valley Cave, Kentucky
lost

Brandon Conlon (18) and Joe Van Eaton (18), both from Cincinnati, Ohio, were found after being lost for more than 40 hours in Sloans Valley Cave System. They entered the cave on the 13th with a companion, Daniel Hume (18, also from Cincinnati). Hume left the cave early, citing "a bad feeling about the cave." The others planned to stay in about two hours. When his companions did not return, Hume remained with their car and waited. He never called for help or reported them overdue. Asked why he did not call for help, Hume said he "didn't want to bring a bunch of people out (to search) and then they would come out." He stated that he spent the two days "mostly sleeping in a car" parked nearby.

Hume was overheard at a nearby store talking about waiting for his friends in the cave and was questioned by bystanders, who then called 911. Rescuers entered the cave and found the young men about 400 feet inside. The lost cavers had become totally confused, and were cold and hungry. They were poorly equipped, with only one flashlight between them, no helmets, and no food or extra clothing. After consuming food brought in by the rescuers, they exited under their own power.

1. *Editor,* Cave Cricket Gazette*, v19n1, Spring 1994, p. 20.*
2. *Bill Mardis, "Teens found uninjured after cave ordeal",* Somerset Commonwealth Journal*, v29n40, 15 February 1994, p. 1.*

Comments: Inexperience, inadequate equipment, poor judgment. One wonders just how long Hume would have waited before deciding to call for help.

February
Aire Fresco Cave, Mexico
difficulty in swim, equipment problem

While negotiating a 100-meter long swim in the cave, a caver had trouble and required assistance. A bag of equipment she was carrying was not buoyant as expected, but instead became filled with water, pulling her down. She called for help and was pulled from the water. The bag was lost.

Steve Knutson, personal notes, undated.

Comments: It is fortunate that the bag was not tethered to the caver. When crossing deep streams or pools you should be prepared to abandon your pack or equipment if necessary. It is better to lose the gear than to lose your life.

February
El Chorreadero, Mexico
caver fall, broken leg

A group of cavers were doing a pull-down trip in El Chorreadero. After pulling down the rope from the first rappel, one member of the party fell while climbing down a pitch. The caver's foot jammed in a crack, resulting in a broken leg. The leg was splinted with a piton hammer. Since there was no way back up, the group continued down to the lower entrance, traversing about two kilometers of passage and a continuing series of small pitches. The injured caver was not wearing gloves, and suffered hand injuries while crawling over breakdown and moving through the cave.

Steve Knutson, personal notes, undated.

Comments: The tenacity of the injured caver is admirable. Gloves are generally a good idea, though some cavers refuse to use them. In this incident, self-rescue almost certainly allowed the injured caver to exit and receive treatment sooner than the typical "wait here and send for help" rescue scenario would have allowed. The decision to attempt self-rescue depends on many factors. Since the cavers were doing a pull-down trip, the fastest way out was to continue.

5 March
Hush-Hush Cave, Utah
bomb scare, difficulty on rope

David Herron, Dan Clyde, Marsha Clyde, Ralph Powers, Rob Cranney, and another (unidentified) caver entered Hush-Hush Cave, descending pits of 20 and 60 feet, with a short section of steep slope over breakdown between the pits. The second pit is permanently rigged with a ladder made of bars and chain. They opted not to use this, and rigged both drops with a 130-foot rope. The first cavers down found what appeared to be a crude, homemade pipe bomb. They examined it and decided to leave it alone and continue the trip.

On the way out, Marcia Clyde became stuck at the lip of the 60-foot pit where the rope was rigged over a sharp overhang. After about ten minutes and with some assistance, she made it over. The rope was relocated to provide an easier lip. On the way out they retrieved the suspected pipe bomb and took it out of the cave. After some discussion, they decided to leave it hidden under a large rock away from the road.

David Herron, "Adventures in Pack Rat Paradise", The Utah Caver*, v6n2, April 1994, p. 26.*

Comments: Suspected explosives found in caves should be reported to law enforcement authorities. They should not be disturbed.

12 March
Sinnett-Thorn Cave, West Virginia
lost

Six teenage Boy Scouts and one adult leader became lost while exploring Sinnett Cave when they could not locate the connection passage to the Thorn Cave entrance. They were located by a local rescue squad 13 hours after the group had entered the cave.

1. *Bill Klimack, "In the Media",* NSS News*, v53n1, January 1995, p. 22.*
2. *Pendelton West Virginia* Times*, 24 March 1994.*

Comments: It appears that the Boy Scouts of America policy on caving was not followed. There should have been another experienced adult caver on the trip.

22 March
Los Juanitos, Mexico
bad air

During the third year of exploration to the Los Juanitos Cave System a party was to try to reach the bottom of the entrance shaft. They knew from previous exploration that there was bad air 400 feet below the entrance. For this reason they carried a hazardous atmosphere analyzer. They also had oxygen cylinders for use at depth. Due to concern about rockfall, they rigged the pit in three pitches. They first descended the 170-foot drop to Dangerous Ledge. A second drop of 630 feet led to the Great Ledge. From there the group was to descend the remaining distance to the cavern floor.

Two ropes were rigged side by side for the descent, which was made by John Galdamez and Tim Matlick. Two hundred feet below the lip of the Great Ledge the ropes became tangled. Galdamez and Matlick tried undo the snarl, but became exhausted due to inadequate oxygen. They retreated to the Great Ledge to try to regain some strength. However, due to the bad air and high altitude (9,000 feet) they found recovery slow. They decided to abort the trip and return to the surface.

Jonathan Smith and Steve Ford, "Exploration of Los Juanitos", NSS News*, v53n10, October 1995, p. 270.*

Comments: Caving in a hazardous atmosphere is a serious undertaking and should be avoided by those not properly trained and equipped for the task. Special air packs are used by trained fire and rescue workers, not "supplementary oxygen cylinders" such as those carried by the cavers on this trip. It was wise to turn back. The equipment was inadequate to the task and the results, had they continued, might well have been tragic.

26 March
Pine Hill Cave, Kentucky
caver fall, injury

Mike Hood and Colin Gatland of the Dayton Underground Grotto led a group of 12 Boy Scouts and their leaders on a trip to Pine Hill Cave, Kentucky. At approximately 1:45 p.m., while climbing up an eight to ten foot high mud bank, one of the scouts, Joe Moore (14), slipped and fell forward. He was climbing the mud bank on all fours when he fell and both arms were extended backwards resulting in the dislocation of his right shoulder. One caver exited the cave and called for assistance. Two paramedics responded and were taken to the accident site by the cavers.

The victim's shoulder was immobilized and he was packaged and carried out of the cave. Moore was out of the cave by 7:00 p.m. and was taken to a local hospital where the dislocation was reduced.

1. Mike Hood, Accident report, undated.

2. Dan Flynn, "Pine Hill – Again!", DUG Carbide Courier*, v3n4, April 1994, p. 42.*

Comments: Hood notes that the boy had dislocated the shoulder twice before. He was not doing anything unsafe, and was climbing slowly and carefully when he slipped on the mud bank. Flynn notes that an adult member of the boy's group attempted to set the shoulder before the paramedics arrived. It is risky for an untrained person to attempt to reduced a dislocation. Unless there are extenuating circumstances, the best procedure in such cases is to immobilize the dislocated limb and leave the reduction to trained professionals.

March
Bowden Cave, West Virginia
lost

Two Boy Scouts were rescued from Bowden Cave after becoming lost. They had become separated from the others in their group when they went up a dead end passage. The noise from the high water in the cave prevented the others in the group from finding them immediately and hampered later search efforts.

Muddy Litter Letter*, Issue 18, March/April 1994.*

Comments: A whistle is a useful signaling device in such situations. Cavers should consider including one in their packs.

March
Sotano de San Augustin, Mexico
caver fall, injury, equipment failure

This incident happened in the Lower Gorge of Sotano de San Augustin about a week before Ian Rolland's death. Don Coons was leading a five person team to Camp III to carry equipment in support of the planned diving efforts. They were rigging the route from Tommy's Borehole to the San Augustin Sump. Coons had just rigged the Grand Cascade – a major waterfall in the Lower Gorge. The rig consists of five rebelays on two natural anchors and three bolts which serve to place the rope out of the waterfall along the right hand wall of the passage.

Coons decided to use the existing bolts and hangers since they were situated between the natural rig points. This hardware was 15 to 18 years old. Four of the team members passed the rebelays without incident. Just after Coons passed the third rebelay a bolt hanger broke, sending him crashing into the wall near the waterfall and into the water. The impact resulted in several cracked ribs. Coons was able to recover, continue past the remaining rebelays, and complete the descent. Because of the injury, the team decided to stop at Camp III, where they spent the night. They exited the next day. All of the team members inspected the bolts and hangers and noted them to be a bit rusty, but did not see any obvious cracks.

Pat Kambesis, "More Information on Death of Ian Rolland", The Bexar Facts*, v94n4, May 1994, p. 3.*

Comments: Hardware left in caves for long periods can degrade or be damaged without any evidence apparent to visual inspection. Be suspicious of old anchors and be sure to use adequate backups. Arrange your rigging to minimize shock loads in the event that a component fails under load.

March
Sotano de San Augustin, Mexico
chopped rope

It was also reported that during the March expedition to Sotano de San Augustin that there was an incident in which a rope at the entrance pit was cut or damaged by a machete while in use. No one was injured.

Steve Knutson, personal notes, undated.

Comments: In areas where this is a problem it is wise to leave a person on the surface to guard the equipment and rigging.

March
Sotano de San Augustin, Mexico
rack rigged backwards

In another near miss, a caver from Mexico City threaded his rack backwards at the top of a 110-meter pit, but caught himself just in time by grabbing a rebelay with his hand.

Steve Knutson, personal notes, undated.

Comments: Check your equipment before you put your weight on it. Use a safety ascender or cow's tail while rigging your rappel device, and don't remove it until you have placed your full weight on the descending rig. Checking your fellow cavers' equipment and rigging and asking them to check yours is an important part of good teamwork in the cave.

1 April
unnamed sinkhole, Maryland
drove car into sinkhole, fatality

In the early hours of April 1st, a 35 by 40 foot sinkhole opened in the middle of Maryland State Route 31 in Carroll County. This is within a karst area not very well known to cavers which extends across central Maryland. Robert Knight (24) of Taneytown drove his van into the hole and was injured. He was extricated after about 2 hours in the hole, but died later that day from head injuries sustained in the crash. The highway department later filled the hole with an estimated 1000 tons of rock. A geologist noted that fields in the area show evidence of many similar sinkholes. An estimated 4,700 vehicles travel the route daily.

George Dasher, "Rockin' Chair", The West Virginia Caver*, v12n3, June 1994, p. 11.*

Comments: This incident is not really a caving accident, but is included because it occurred in a sinkhole in a karst area and was reported in several caving newsletters. It is listed in the statistics as an 'outside' incident, and the fatality was not counted as a caving-related fatality.

17 April
Picnic Cave, Arkansas
rockfall, near-miss

Richard Honebrink, George Stowe-Rains, Robert Ginsburg, Martha Clark, and Calvin Clark entered Picnic Cave in Madison County for the purpose of checking out a high lead above Sam's Dome. At the dome, Honebrink made the easy, but very exposed 40-foot climb to a large room near the top of the dome. He was then followed by Stowe-Rains.

The rest of the party was behind a large projecting rock on the opposite side of the dome, except for Calvin Clark. He had been warned by Martha Clark to wait to begin his climb until Stowe-Rains was done, but instead started his climb before Stowe-Rains reached the top. Near the top Stowe-Rains dislodged a rock weighing over 100 pounds. It bounced off the walls several times barely missing Calvin Clark, who ducked into an intermediate level passage. The rest of the party climbed without incident.

Richard Honebrink, "Near Miss in Picnic Cave", The Boston Mountain Underground*, v6n2, Summer 1994, p. 17.*

Comments: Wait outside the rockfall zone until the previous climber is clear. Use signals to indicate when someone is beginning a climb or is clear, just as in rope work.

April
Lechuguilla Cave, New Mexico
caver fall, injury

Ron Delano, Steve Micola, Donald Davis, and Dave Jones entered Lechuguilla Cave for a multi-day survey trip. As the cavers were making their way through the Deep Seas complex beyond Lake Louise, Steve Micola made a small route-finding error just above the first hand-line. He started stemming up a chimney when a big knob foothold broke under his weight. He fell a few feet and hit his shoulder on a wall. Micola and Davis joined Jones and Delano at the start of the Western Borehole, where Micola's situation was discussed. Micola said his shoulder was bruised but not seriously hurt and felt that he could continue with the trip as planned.

The group returned to camp with little difficulty although Micola later indicated he was having some trouble moving his arm. On day seven as the cavers prepared to make the 160-foot rope climb at Boulder Falls, they were concerned that Micola might have trouble with his Mitchell climbing system due to the need to raise his arms. Micola used a rope walker system instead, and ascended slowly but without difficulty.

Ronald Delano, "Lechuguilla: Discoveries of the First Order", Rocky Mountain Caving*, v11n4, Autumn 1994, pp. 16-18.*

Spring
Valhalla, Alabama
difficulty on rappel, glove caught in rack

A group of five cavers were descending the 227-foot entrance shaft of Valhalla. Jane Prendergrast was the second person to descend. After passing the lip, she stopped to remove some bars from her rack. In the process, her glove became caught in the rack and she was unable to free it. At the time there were only three bars in place on the rack. She called for a bottom belay, which was provided, and was able to complete her descent with some difficulty, being forced to feed the rope through for the next 150 feet. During the descent the moving rope wore a hole through the glove.

1. *Joe Levinson, Incident report, 9 September 1996.*
2. *Jane Prendergrast, personal communication, 1 September 1997.*

Comments: Levinson comments that the appropriate action would have been to attach a safety ascender and either remove the obstruction, change over to ascent, or call for assistance. He notes that this would have been a bigger problem if her hair had been caught instead of a glove. In addition, he notes that three bars provide very little friction, and that she could have lost control of the rappel had the glove come free. It is very helpful in performing a change-over or clearing a jammed rappel device if the safety ascender has a foot sling that can be attached.

Effectiveness of the bottom belay would have been significantly reduced with only three bars on rope. Three bars do not provide sufficient friction for a safe rappel. In addition, if one more bar becomes disengaged the rappeller will go into free fall. Many experienced cavers consider five bars the minimum for safe, controlled descent. Lighter cavers who can not descend on five bars should use longer racks with more room to spread the bars.

1 May
Fulford Cave, Colorado
caver fall, head injury, no helmet

A group of three Colorado Grotto cavers entered Fulford Cave after a two mile hike in snowshoes. The cave is located at 10,000 feet of elevation and contains many ice formations.

At about 3:00 p.m. they encountered Bruce Stewart (30s) and a younger man (20s), each of whom was equipped with a single flashlight and wearing a bandanna across his forehead. The Colorado Grotto cavers politely reminded the men that three light sources and head protection are considered standard equipment for safe caving. Stewart and his friend ignored the warning and continued into the cave as the Grotto members headed for the exit.

Stewart later slipped and fell, suffering a cut on his forehead. He exited the cave under his own power and his bleeding forehead was treated by grotto members at the culvert entrance.

Michael Zawada, Accident report, 15 May 1994.

Comments: Inexperience, inadequate equipment, poor judgment. Zawada notes that the mishap could have easily become serious due to the freezing conditions in the cave. A helmet and a helmet-mounted light are the fundamental items of equipment necessary for safe caving.

5 May
Norman Cave, West Virginia
caver fall, multiple injuries

Susan Hanley (65) was injured on a commercially guided wild caving trip led by Danny Gillespie (50) when she fell through a hole in the passage above the waterfall. The group entered the cave at noon and was about 600 feet into the cave when the accident occurred. Hanley believed she was following the route indicated by the guide and traversed by the cavers ahead of her, but inadvertently went into an opening that dropped to the stream below. She entered the opening feet-first and slid down a hole, falling 27 feet to the stream below, crushing both heels, fracturing one leg, and fracturing several vertebrae.

Gillespie was taking photographs farther down the passage when the accident occurred. A member of the party helped Hanley out of the water and carried her to a dry upper chamber away from the wind and spray of the waterfall. Gillespie left the cave to summon help. It took 40 rescuers, hampered by hypothermia and the tightness of the bypass, until almost midnight to extract her from the cave and get her to a hospital.

1. *George Dasher, "Rockin' Chair",* The West Virginia Caver*, v12n3, June 1994, p. 12.*
2. *Dave Cowan, "Cavers Won – Lawyers Zero"*, The West Virginia Caver*, v15n2, April 1997, p. 17.*
3. *Susan Hanley, personal communications, October 1996.*

Comments: Hanley subsequently filed suit against the guide, a commercial cave where the guide had been employed and which had advertised wild caving excursions, and the cave owner. The NSS assisted in the defense of the cave owner, who was later dropped from the suit when it was established that he had no knowledge of or consent to the trip or the guide's activities. A trial resulted and the jury determined that Hanley was 70% responsible and that Gillespie was 30% responsible. No damages were awarded.

5 May
Sotano de San Augustin, Mexico
insulin imbalance

At 1:00 a.m. Bill Steele and Noel Sloan heard low grunts and moans coming from somewhere in Camp III of Sotano de San Augustin. Sloan found Don Broussard (46) thrashing about in his sleeping bag. He was suffering from low blood sugar and was too weak to manipulate the zipper.

Sloan, an MD, directed the other cavers to prepare a solution of sugar and water. Sloan held the bottle as Broussard drank the solution. After about 20 minutes Broussard was able to eat two small candy bars; soon he ate four more. Forty-five minutes elapsed before he could function.

The next morning Broussard felt reasonably well and was able to continue ferrying gear from the -620 depot to the top of the last pitch in the Bowl-Hole series. Broussard decided that the adjustment of insulin and food that he had made for his activity level was incorrect.

1. *Don Broussard, Incident report, undated.*
2. *Bill Steele, "Sistema Huautla 1994",* The Bexar Facts*, v94n4, May 1994, p. 4.*
3. *Bill Stone and Kenny Broad, "Accident Analysis",* Underwater Speleology*, v22n1, January/February 1995, p. 23.*

7 May
Lone Bat Cave, Alabama
stranded, no light

Kuenn Drake (35), Bernard Powell, and David Drake (38) entered Lone Bat Cave to continue their exploration of the new find by descending a 40-foot pit. At the cave entrance, David Drake discovered that he had no functioning lights. He borrowed a light from one of his companions and entered. The cavers rigged the pit and Kuenn Drake and Powell descended, leaving David Drake at the top. David Drake intended to do the pit also, but accidentally dropped his borrowed light into the pit and was forced to wait in the dark for help.

Kuenn Drake, "Lone Bat Cave: The Final Chapter", Cullman Grotto Flowstone*, v1n4, June, 1994, p. 3.*

Comments: Check your gear before the trip, not at the entrance. Each caver should have three working sources of light in his possession.

21 May
Crystal Ice Cave, Idaho
difficulty on rope, stranded in pit

A group of four cavers (no names given) planned to make a through-trip from the Crystal Ice Cave entrance to the Great Cavern entrance. One of the group was not experienced in vertical techniques, so they held a brief vertical training session at his home on the day before the trip. The new caver was using a home-made ascending system using high-mounted Gibbs ascenders tethered to his seat and chest harnesses. The new caver had a lot of difficulty trying to use the system but they decided to take him on the trip anyway.

At the cave the next day, the cavers prepared for a through-trip by rigging a rope at the 140-foot pit into Great Cavern. They then entered Crystal Ice Cave and descended a 42-foot drop. They toured the cave and then rigged a 60-foot pull-down rappel into Great Cavern. In order to exit they had to climb the 140-foot pit. Two of the cavers ascended, taking about two hours. After reaching the top they decided that the rope needed to be repositioned. The new caver had become very cold, stiff, and scared. He tried to climb but was unable to get more than a few feet off the floor. The leader got him back down, and decided to climb out and try rigging a haul system.

The trip leader had a come-along in his truck, but decided it would be too slow. He drove his Land Cruiser to the lip and tied his haul rope to it. He padded the lip with carpet and some pants and stationed some of the group at the lip to watch for problems. Using the vehicle, the leader slowly hauled up the new caver. The new caver reported that he was scared stiff but that he was happy to get going after waiting on the bottom of the drop for three hours.

Scott Earl, "Near Miss at Crystal Ice Cave", Idaho Down Under*, Summer 1994, p. 6-7.*

Comments: Vehicles should *never* be used to haul people up drops. They can not be controlled precisely enough for safe use, and do not allow any feel for the tension in the rope. Should the haul rope or the patient become snagged, rope failure and/or severe bodily injury can easily result. Earl notes that at one point the stranded caver's feet became caught in a crack, but fortunately he was able to free them before they were pulled off. A haul system is much safer. In this case a 3:1 Z-rig would probably have done the job nicely.

The new caver's climbing system was inefficient and inadequate for a 140-foot climb. On the previous day he had been unable to climb much more than a foot off the ground. Since they knew this from the practice the day before, one is left wondering why he was permitted to make the trip. The trip was clearly not advisable for a novice vertical caver.

In addition, the four cavers were sharing two sets of vertical gear, which is never a good idea. Each caver should have his own rig. Earl also writes that the trip leader's first words when describing the trip afterwards were, "I knew it was going to happen." As Earl notes, that should have signaled the cancellation of the trip.

21 May
Paradise Lost Cave, Indiana
caver fall, injury, inadequate equipment

Phil Kreese (19) was rescued from Paradise Lost Cave after he fell approximately ten feet while climbing a knotted ¾ inch manila rope hand-over-hand up a 35-foot pit. Kreese was exploring the cave with four friends. All had helmets, but no vertical gear and very little caving experience. Kreese was taken to a nearby hospital where he was treated and released. He received some stitches in his head, had a probable concussion, and multiple lacerations.

Anmar Mirza, Incident report, 25 May 1994.

Comments: Inexperience, inadequate equipment. Manila rope is unsafe for caving. Doing pits hand-over-hand on knotted rope is unsafe no matter what kind of rope is used.

22 May
Formation Pit, Alabama
caver fall, stranded in pit, no equipment

Chad Weismiller (14) was rescued from 76-foot deep Formation Pit after becoming stranded on a ledge part way down the drop. He had discovered the cave while playing with two friends, and crawled underneath a protective steel grate to

enter the pit. He then lost his footing and fell into the pit, where he was lucky enough to land on a small ledge. Rescuers had to cut away the grate in order to descend and help the stranded youth. He was pulled from the pit after about five hours on the ledge. He suffered multiple bruises and abrasions from his fall.

1. *Kristie Sharp, "Teen rescued after plunging into hole on Redstone Arsenal",* Huntsville News*, 23 May 1994, p. A3.*
2. *Dave Harris, "Redstone rescue workers save youth who fell into mountain hole Sunday",* Redstone Rocket*, 25 May 1994, p. 2.*

Comments: Inexperience, inadequate equipment, poor judgment. Weismiller had no rope, harness, helmet, or vertical caving equipment. The gate was there for a reason.

23 May
Pinnacle Cave, Nevada
caver fall, hypothermia

Elizabeth Boone, Patrick Shugrue, and James Miller entered Pinnacle Cave southwest of Las Vegas. They had expected to be accompanied by a more experienced caver, but when he failed to arrive they decided to go on their own. Miller and Shugrue had been in the cave before.

They rigged and descended a 70-foot entrance pit and a second pit of 40 feet. Using a ball of string to mark their path, they proceeded through various rooms and crawlways, unrolling the string behind them. After touring for a while, they decided to leave the cave. Miller was reeling in the string as he walked over a large boulder when he slipped and fell off the boulder, landed on his back on the rocks below, and tumbled into a five foot deep hole in the rocks. The total length of his fall was about 10 feet.

When Miller could not sit up because of the pain, the others thought he might have a serious back injury. They left him with food and water and exited the cave to call for help. At approximately 8:45 p.m. rescuers were called. The initial team entered the cave at about 11:00 p.m. and found Miller at about 1:00 a.m. Tuesday morning. He was suffering from hypothermia, shivering uncontrollably and slurring his speech. Oxygen hot packs and an IV with 1000cc glucose was administered.

At 3:00 a.m. a second team arrived with a paramedic to further assess Miller's injuries. The rescuers decided that the numbness and tingling in Miller's legs was due to his long stay in a cramped position rather than to a back injury. They helped Miller from the hole. As he began to warm up he felt he could leave the cave with a little assistance. Rescuers stationed themselves along the route through the cave and assisted Miller through crawlways and belayed him up the climbs. Miller was packaged into a litter at the bottom of the 40-foot drop and hauled up both pits. At 6:40 a.m. Miller exited the cave and was taken to a nearby hospital where he was found to have bruised his coccyx (tailbone).

Steve Ross, Accident report, undated.

Comments: Inexperience was clearly a factor in this accident. Experienced cavers do not use balls of string to mark the way. It would appear that the victim was not seriously injured, but rather simply too scared to get up. He thought he had spinal injuries and refused to move. As a result of his immobility, he became hypothermic.

It was later discovered that Miller is known as "The Fan Man" for his exploits in landing a propeller driven parachute atop Buckingham Palace and at the Caesar's Palace casino during a heavyweight prize fight in 1993. Outside the hospital, Miller told a reporter that he went into the cave because he was bored, and "it was a bad day for flying."

27 May
Puckett Cave, Alabama
rockfall, injury

Kuenn Drake (35), David Drake (38), Ricky Brewer, and Lee Gibson were exploring Puckett Cave when they came to a large room with an unstable breakdown pile. David Drake was the first one to find the room and had found a crawl around the bottom of the breakdown to the other side. When the others joined him, Drake showed them the crawl but Kuenn Drake and Brewer decided to attempt to cross over the breakdown pile. They made it to the other side without incident.

David was about to enter the crawl to join them on the other side, while Gibson considered whether he was going further, when the "pile shifted and huge pieces of breakdown came raining down in the passage." Part of the debris struck Gibson on his left arm causing lacerations. David Drake, partially in the crawl, was hit on the shin but escaped serious injury. After finding out that Brewer and Kuenn Drake were all right, and that the passage had not been sealed off, they exited through the crawlway and retreated to a safer place.

The laceration on Gibson's arm was about seven inches long and had two deep puncture wounds. Brewer had a new pair of cloth gloves in his pack. One was used as a "wash cloth" and one was used for a "gauze pad". It was tied in place with shreds from Gibson's T-shirt. Gibson was able to exit under his own power.

1. *David Drake, "Near Miss in Sommerville",* Cullman Grotto Flowstone*, v1n4, June 1994, p. 6.*
2. *David Drake, Accident report, undated.*

Comments: The cavers were in virgin passage, where loose rock is to be expected. It is possible that the passage of two cavers over the pile was enough to destabilize it and cause the collapse.

28 May
Buffalo Creek Cave, Kentucky
equipment problem, acetylene hazard

A party of five cavers entered Buffalo Creek Cave, Kentucky, on a survey trip. A short distance into the cave there is a stretch of 150 feet which requires some swimming. This was known to all before they entered the cave. One member of the party did not package her extra carbide in a waterproof container.

After the swim the smell of acetylene impurities was noticed and the caver discovered that the carbide had become wet. She wondered if it should be dumped into the stream to dispose of it. At that moment two other cavers with carbide lights were sitting about ten feet from this person. Fortunately, the others realized that a pound of carbide dumped in the water all at once might produce enough acetylene for an explosion, and prevented this.

Although some acetylene was generated, it did not ignite. The pack was left behind to be collected on the way out. The cavers felt that they had enough spare carbide and food, and the trip proceeded without further incident.

Steve McLuckie, Incident report, undated.

Comments: This incident was erroneously reported in the previous issue of ACA as 29 May 1993. McLuckie notes that the caver knew how to use a carbide lamp, but did not really understand what carbide and acetylene are all about. Calcium carbide, whether new or spent, should not be dumped in caves.

28 May
Devils Dungeon, Alabama
stranded in pit, no climbing equipment

Jonathan Wilson, Jason Burney, and Brian Smith entered Devils Dungeon with rope and rappelling gear to do the 147-foot pit located a few hundred feet into the cave. They had practiced rappelling on cliffs, but had no experience in caves. They rigged the pit with a 360-foot caving rope, and Wilson and Burney used Petzl Stop descenders to rappel to the bottom. They erroneously believed that the Stop could be used as an ascender to climb the pit. They soon found that they were stranded. Smith had remained at the top, and was able to exit the cave and call for help. Rescuers soon arrived and rigged a second rope. A rescuer descended the pit, provided the boys with ascenders, conducted a brief training session in their use, and sent them up the rope with the rescuer climbing alongside. The rescuers then escorted the boys out of the cave, about three hours after they had become stranded.

1. *Butch Feldhaus, "A classic TAG non-caver rescue",* TAG-Net *#122, 3 June 1994.*
2. *Larry Glass, "Two youths help rescue selves from deep cave in Jackson",* Huntsville Times*, 29 May 1994, p. B3.*

Comments: Inexperience, inadequate equipment, poor judgment. The boys had not told anyone where they were going. The cave is closed by the owner and is rarely visited. Had the third one descended the pit, they would have been stranded for a long, long time. The boys lived nearby and had heard about the cave from their friends. They were thankful to be rescued, and were encouraged to join the local grotto.

12 June
Laurel Caverns, Pennsylvania
caver fall, injury

A woman caving in Laurel Caverns dislocated her knee while climbing. She was 400 feet from the entrance when the accident occurred. A group of Boy Scouts offered first aid. Rescuers from six fire companies responded and got her to the entrance five hours after the accident.

1. *Bill Klimack, "In the Media",* NSS News*, v52n11, November 1994, p. 340.*
2. Pittsburgh Post-Gazette*, June 13, 1994.*

15 June
Pozo de la Escalera Cristal, Mexico
rockfall, near-miss

Don Bittle, Steve Taylor, Ray Nance, and Paul Mocal entered the cave to map a new lead. They rappelled down the 82 and 37-foot drops without incident. Meanwhile, with the other leads near camp dwindling down, several other people followed them into the cave. The first group asked the incoming cavers not to descend further because of the possibility of rockfall.

The new passage sloped down at a 30 to 40 degree angle. Forty five minutes passed as the passage was mapped and photographed. Suddenly a softball-sized rock fell down the pit. Shouting up to the top of the pit, the four on the bottom told whoever was at the top to get back. On the way out the first group encountered six other cavers below the first and second drops.

Steve Taylor, Incident report, 14 July 1994.

Comments: Taylor notes that the cavers at the bottom were not expecting anyone to be at the top of the drop and were therefore not avoiding the rockfall zone as they would have had more cavers been expected to descend. The rock at the top of the pit was loose and easily broken. He suggests that caving with a large group of people of unknown skills and abilities was probably the primary contributing factor, and that one would be better off avoiding such situations.

15 June
Sloans Valley Cave, Kentucky
lightning

Waiting for a storm to pass before entering Sloans Valley Cave System, Wayne Hansen, E.T. Davis and Gina Turner were shocked when lightning struck nearby. Hansen was on his hands and knees underneath the second (vertical) entrance and felt a "good buzz" through his hands and a little "trickle" in his knees. Davis also felt a tingle.

Wayne Hansen, "Sloans Valley Conservation Task Force Field Trip Log", Cave Cricket Gazette*, v19n2, Summer 1994, p. 37.*

Comments: Electrical current from a lightning strike tends to run along the surface of the ground and will sometimes jump across the "spark gap" created by a cave entrance. If you happen to be standing in or near the entrance when this happens, the current may find a better path through your body than through the air, causing a potentially serious shock. Avoid standing or sitting in the entrances of caves during electrical storms. It is also risky to be on rope or cable ladder in an entrance pit during a storm. The best course is to

wait it out well back from the entrance. If you can not retreat back into the cave, sit on your packs and ropes for insulation from the ground.

17 June
Cueva del Brinco, Mexico
flood entrapment

During the week before the 1994 Convention, Louise Hose, Dave Lester, Steve Lester, and Pete Squires attempted to make a through trip from Cueva del Brinco to Cueva de Infiernillo. Only Hose had been in the cave before, on a trip 13 years earlier. They knew that given the season there was a risk of being trapped by water for several days between the upper and lower sumps, but felt that the risk was acceptable. On the way up the mountain to the Brinco entrance, Hose noted that the springs that sometimes emerge high on the cliff as well as the spring at the base of the cliff downstream were flowing but the volume of water was less than that observed on previous trips.

As they progressed through the cave they noted that the air flow was good and the water level was not high. In the middle part of the cave near the Titan Chamber the group had difficulty finding the route. Hose had only been in that part of the cave once, and was unable to find the route onward. During the search they noticed that the air movement had stopped. After spending many hours trying to locate the route, the group napped for several hours and then headed out of the cave.

When they reached the World Beyond, they were surprised to find the waterfall at the Hall of Angels much larger than it had been 16 hours earlier. They decided to move quickly and headed immediately for the Brinco entrance. Places where a drizzle of water had dropped from the ceiling when they entered were now significant waterfalls.

When they entered the smaller passage leading from the World Beyond there was no air flow. Hose swam on alone and found that the water and ceiling met. Hanging a piece of flagging tape to measure the height of the water, the group returned to a sandy area where the old route and the bypass route split. It was 8:00 p.m. on Friday, June 17th.

They cavers changed out of wetsuits and into dry clothing, laid their wetsuits on the ground for padding, inventoried their food and supplies, and prepared to wait it out huddled together under one rescue blanket. A breeze returned at about 3:00 a.m. on the 18th. Around 7:00 a.m. on Saturday, June 18th, the flagging tape was checked and the water had dropped 42cm. The group put on their wet suits and exited the cave, finding the route out very challenging due to the high water level. They were underground for 49 hours. Once out the group discovered that there had been a heavy rain from about 9:00 a.m. to 9:00 p.m. on Friday. The Infernillio entrance was still sumped, and they felt lucky that they had not found their way through the connection after all.

1. Louise Hose, Incident report, 19 November 1994.
2. Louise Hose, "Sistema Purificacion in Flood: Un Otra Vez", undated.

Comments: The cavers chose to enter knowing that there was a possibility of multi-day entrapment. It is fortunate that no one outside became alarmed and initiated a rescue when this came to pass. Had the group not failed to find the connection, they would have had an even longer wait at the lower entrance.

June
Emerald Sink Cave, Texas
histoplasmosis

Seven out of eight cavers on a trip to Emerald Sink cave developed acute pulmonary histoplasmosis after arriving home from the 1994 NSS convention in Brackettville, Texas. With this usually benign illness, several were put in the hospital, one was hospitalized twice because of a relapse, and the most severely ill needed months of convalescence. Three cavers who caved in Mexico on a post convention trip were similarly afflicted. One caver became symptomatic about a week later while on a trip deep into Lechuguilla Cave (see 5 July 1994 report).

Most of those affected lived outside the southwestern caving area. It was frightening because, in general, doctors were unfamiliar with their acute illness. All those who were ill are believed to have recovered.

1. Jay Jorden, "The Dreaded H Word", The OZTOTL Caver*, v12n8, 22 August 1994, p. 6.*
2. Dr. Warren C. Lewis, Incident report, 29 February 1996.

Comments: It was reported that some of the afflicted cavers had also visited caves in the Langtry area, including Langtry Lead. Warnings and descriptions of the disease were included in the convention guidebook and other published materials, and caves with an obvious history of histoplasmosis were identified before the convention.

Many cavers do not realize how serious the disease can be. The convention guidebook stated: "It is a serious fungal infection of the lungs, eyes, or other organs and it can be life-threatening without proper treatment. Bat caves often contain *Histoplasma* spores. Cavers who have not been exposed to 'histo' should think twice about entering bat caves in Texas or Mexico. Novices and cavers from the northern U.S., Canada, and Europe are especially at risk." A description of the disease and its symptoms was also provided, as well as a list of caves known to harbor the organism.

There is some evidence that an acute exposure can result in infection and serious illness even in cavers with prior exposure, who would expect to have some degree of immunity.

June
unknown cave in Stone County, Arkansas
injury

A caver fractured and dislocated his finger on the way out of a cave in Stone County, Arkansas. It was reported that the accident happened after the group had gone through the most difficult area of the cave and that the victim was not

really doing anything wrong or unsafe. The victim was able to exit the cave without assistance.

Ray Hardcastle, "Ray's Review", NSS News*, v53n6, June 1995, p. 168.*

5 July
Lechuguilla Cave, New Mexico
histoplasmosis, exhaustion

Andy Belski, Randy Brown, and Doug Strait (42) entered Lechuguilla Cave for a seven day exploration and mapping trip to the Far East. The trip to the Grand Guadeloupe Camp involves a descent to -1,200 feet followed by an ascent to about -800 feet. The party reached camp in about nine hours without incident.

On July 5, the third day of the trip, Strait began to feel ill. Initial symptoms were headache and lack of stamina. He discussed his condition with Brown and Belski, and the three cavers decided to confine their surveying to leads near the camp until he felt better. Strait's condition grew worse over the next three days. He slept poorly and suffered from fever and chills. Strait awoke on July 9 feeling quite weak, but willing to attempt to exit the cave as planned. He had already packed, and knew the route, so he started out ahead of Belski and Brown to make best use of his time. Belski and Brown caught up with him near the low point of the route at -1,200 feet and they traveled together for the remainder of the trip out.

Strait's progress slowed considerably as the party ascended. Belski and Brown carried his pack the final 700 horizontal feet to the entrance shaft and up to the surface. About 10.5 hours after leaving camp and after 156 hours in the cave the group reached the surface. Afterward, Strait remarked, "I once had to crawl for five miles on alpine karst with a broken ankle, and this was far worse."

The following morning, Strait felt too ill to begin his drive home. He spent another night in the bunkhouse, during which he had a fever of 104.1 degrees despite having taken aspirin throughout the day. When his condition had not improved by the next morning, he went to a physician in Carlsbad, where a diagnosis of lobar pneumonia was made. He was admitted to a local hospital and a treatment regimen of broad spectrum antibiotics was initiated. Within 48 hours his fever abated, and he was discharged on the fifth day. He remained in Carlsbad under medical supervision for an additional 5 days before being cleared to return home.

Several weeks prior to the Lechuguilla trip, Strait had gone on a trip to Emerald Sink Cave, Texas, during the Brackettville NSS Convention. After returning home, Strait was contacted by Dave Locklear, who had led the convention trips to Emerald Sink, and informed that a number of cavers who had visited the cave had developed histoplasmosis afterward. Four weeks after becoming ill in Lechuguilla, Strait remained ill with symptoms that appeared consistent with histoplasmosis. He visited his personal physician, who confirmed the diagnosis of lobar pneumonia based upon X-rays taken in Carlsbad. The physician concurred with Strait's hypothesis that he was suffering from histoplasmosis, which had facilitated his contracting pneumonia. Treatment for histoplasmosis was initiated, and full recovery was attained in three weeks.

Doug Strait, Incident report, undated.

Comments: Strait notes that the convention guidebook contained a warning about histoplasmosis in Texas caves. Some may wonder why he did not decide to exit sooner. He notes that at no time was he too ill to continue mapping, and that the group had a comfortable and well-stocked camp. Strait did not realize that he had histoplasmosis, and believed that his condition would improve prior to the scheduled exit.

6 July
Beaver Falls Cave, Alaska
rockfall, near-miss, rope damage

Peter Branson, Paul Hadfield and Darcie Ziel entered Snow White Passage in Beaver Falls Cave to continue surveying**.** They descended a 40-foot pit and found that it ended into two sumps. Paul noticed that the passage continued via a lead 20 feet down the pitch, and swung over to it. Ziel then began ascending the rope. When she attempted to swing over to Hadfield, her rope caught on a small nubbin three to four feet above her. A five foot by four foot boulder and associated debris pulled loose and fell. Ziel had just enough time to turn her shoulder towards the rock as it tilted past and shoved her aside. Branson was around the corner, but the boulder exploded very close to him.

At the bottom, the rope had been cut except for a few fibers. About ten feet up it appeared as if a flying rock fragment had cut through the sheathing and part way into the core. Ziel had by this time swung into the side lead and had released the rope for Branson to climb. He had trouble climbing up to clip his ascender above the cut, but joined the others with further incident.

Kevin Allred, "1994 and 1995 Tongass Cave Project Expeditions Accident Report", undated.

Comments: Use care when making traverses or pendulums while on rope. This incident demonstrates how easily a flying rock fragment can cut or damage a free-hanging rope.

9 July
Junkyard Cave, Tennessee
caver fall, injury

Howard Wayt (24), a counselor with a group of high-school students from Vanderbilt University summer engineering program, suffered broken ribs when he slipped on rocks and fell about five feet. He fell hard, landing on his back, and felt he was hurt too badly to make it out on his own. Traci Horn (10), whose father was leading the trip for the group, led the students out of the cave and to a nearby highway where they called for help. Wayt was carried out of the cave about four hours after the accident was reported.

Tini Tran, "Injured explorer rescued", Nashville Tennessean*, 10 July 1994, p. B1.*

Comments: Anyone can slip and fall in a cave, but this appears to be another case of inexperience, probably compounded by poor footwear.

13 July
Snowhole, Alaska
stuck while on rope

Aaron Gissburg, David Ek, and Kevin Allred were surveying in the far reaches of Snowhole about 600 vertical feet from the entrance. They had negotiated several squeezes, rope pitches, and very tight, muddy fissures during the trip in. The worst one was called "The Stripper". It is a chest compressing fissure at the top of a drop which bells out below. On the way out, Allred sent Gissburg ahead to save time while waiting for the next person to climb. As Ek reached the "The Stripper" he became stuck. His pack was on a tether below him and kept getting hung up in the fissure. After 45 minutes Allred yelled up to see what was wrong. Ek replied that he was stuck and Allred suggested that he drop his pack, which he did. Eventually Allred and Ek reached the surface safely.

Kevin Allred, "1994 and 1995 Tongass Cave Project Expeditions Accident Report", undated.

Comments: Allred writes that, while tethered packs do have their advantages at times, the technique did not work in this case. He notes that it is easier at this particular spot to hand the packs through to someone above the squeeze.

16 July
Great Expectations Cave, Tennessee
rockfall, injury

Mike Rogers and Jack Thomison visited Great Expectations Cave to survey and continue exploration. After finding about 1,000 feet of new walking passage and 600 to 800 feet of smaller passage, they were checking out "a miserable lead" when a large boulder fell on Rogers, nearly crushing him. He escaped with bruises and scrapes on his hip, side, and knee.

Jack Thomison, "Great Expectations", TAG-Net *#162, 20 July 1994.*

Comments: Loose rock is often encountered in newly discovered caves and passages. Use caution.

21 July
Blowing In The Wind Cave, Alaska
rockfall

Aaron Gissburg was hit by a rock while surveying in a remote area of Blowing in the Wind Cave near Elbow passage. He had descended a pit with no problems, and determined it to be blind. He then proceeded to rig for ascending. When he took his first step and loaded the rope, a flake the size of an open phone book was pulled loose from the lip and fell approximately 40 feet striking him first on the head and then on the shoulder. The rock weighed approximately 12 to 15 pounds and hit Gissburg "exactly flat and square" on his helmet. His head was upright and his helmet was not damaged. Gissburg suffered only a sore neck from the impact

Kevin Allred, "1994 and 1995 Tongass Cave Project Expeditions Accident Report", undated.

Comments: Gissburg suggests cleaning the lip of a new pit thoroughly to remove loose rock. It is fortunate that the flake landed squarely on his helmet rather than striking his shoulder edge-on. The incident demonstrates the value of a good quality caving helmet. A 12 pound rock falling 40 feet and striking an unprotected head would probably be fatal.

July
Desoto Falls, Alabama
stranded on rope, hair in rack

While rappelling at this practice cliff, Steve Snider got his hair caught in his rappel rack. Steve's father was six feet below him on another rope, and neither of the two was carrying ascending gear. Fortunately a group of cavers and firefighters were practicing vertical rescue near by preparing for NCRC.

One of the participants, Doug Carson, descended a new rope rigged beside Snider and changed over to a frog ascending rig, tethered into Snider's harness, and lifted him to relieve the tension on the rack and allow him to free himself. An ascender was also attached to Snider on his own rope. He was pulled up using a straight haul with a Gibbs capture cam.

Doug Carson, Incident report, undated.

Comments: While this incident did not take place in a cave, it involved caving equipment and techniques at a location used for caver training. This type of incident has happened many times to cavers while descending pits. It illustrates the importance of having a safety ascender or vertical rig on while rappelling. All vertical cavers should practice changing from rappel to ascent on rope so that they will know how to free themselves from this predicament.

5 August
Keauhou sea cave, Hawaii
washed out to sea while exploring sea cave

Timothy Anderson (18) of Vacaville, California and Winton Nicholson (25) of Kihei, Maui were injured while exploring a cave on the shoreline of Keauhou. While they were in the cave the surf washed them off of the rocks and into the ocean. They were able to swim to the shoreline where they were stranded at the foot of a cliff. The police responded to a call and the two men were picked up and transported to the Kona Community Hospital. Anderson was reported to be in stable condition with head injuries. Nicholson was treated for minor cuts and abrasions and released.

Newspaper clipping from an unidentified Hawaii newspaper, 8 August 1994, p. 10.

Comments: These incidents involving people being washed into and out of sea caves demonstrate the danger posed by waves and currents. Sea caves are more dangerous than they might appear. People have been drowned under similar circumstances in previous years.

6 August
J-4 Cave, Pennsylvania
caver fall, injury

A group of 11 people, mostly Boy Scouts from Delaware, entered J-4 Cave on a trip lead by experienced caver Kirk Holzapfel. The group entered the Dome Room sometime before noon. At about 4:00 p.m. the group was exiting the cave. On the way out they stopped at a large column known as Goliath. While traversing along an exposed ledge, Nick Terranova (13) lost his grip and fell through a hole in the floor to the right of Goliath. He fell about 40 feet, striking the walls on the way down, and landed in an area about 300 feet from the entrance. When his father and the trip leader climbed down to him, Terranova had lost his helmet and there was a pool of blood under his head from cuts on the left side of his head. He was complaining of difficulty in breathing and he lapsed in and out of consciousness. The commotion alerted another group of Scouts already in the cave and they made their way to the accident scene.

Some of the cavers exited and called the local fire department for help at 4:22 p.m. Members of the fire department and the Nittany Grotto entered the cave at about 4:50 p.m. and reached the victim in about five minutes. After Terranova's injuries were examined he was packaged into a SKED for the carry out.

Terranova arrived at the entrance at about 8:00 p.m. He was placed into a Stokes litter and lowered down the entrance cliff. He reached the bottom at about 8:30 p.m. and was taken to the incident command center where an ambulance was waiting to take him to the hospital.

1. *Kevin M. Winter, "J-4 Cave Trip Report",* Commander Cody Chronicle*, v15n1, Winter 1995, p. 4.*
2. *Mark Jancin, Accident report, 21 October 1996.*
3. *Mark Jancin, "Rescue at J-4: 8/6/94",* Nittany Grotto News*, v41n5, September 1994, p. 66.*

Comments: Inexperience, and possibly inadequate equipment. A good helmet does not come off in a fall. There have been several similar accidents at this location in the cave. A safer alternate route is available which avoids the exposed ledge.

6 August
Three Fingers Cave, New Mexico
rockfall, broken ankle

Sondra Denney was exploring Three Fingers Cave with five companions. The group had stopped to rest and regroup. While a member of the party was looking around above the others he dislodged a watermelon-sized rock. It fell and struck Denny on the lower leg, breaking her ankle. After a lot of discussion Denny decided to try to make it out under her own power with the assistance of the others in the group. One of the group was sent out to tell the others in their camp that there was a problem.

Denny basically crawled through the cave. She was able to climb up and out of crevices and pitches, sometimes with the aide of a belay line. Occasionally members from the group on the surface would come in with food and Gatorade. Denny made it the to entrance drop where an EMT had come into the cave to help. There was a lot of discussion about letting her climb out under her own power. It was decided that because of the nature of the entrance and the lack of good anchors for hauling that it might be better for her to try it.

Denny rigged in with her Frog system with a Z-rig haul line attached to her seat harness for assistance. A member of the group climbed alongside to provide tension on the rope for her as she climbed and to help her past ledges. She made it out the entrance at 6:00 a.m. She then spent five to six hours crawling up the trail (she did not want to be carried up the steep, exposed sections) to a level area where a helicopter landed to pick her up.

1. *Sondra Denny, "Three Fingers Cave: A Victim's Perspective",* Speleospace*, September 1994, p. 6.*
2. *Spencer Woods, "Three Fingers and a Broken Ankle",* The Bexar Facts*, v94n8, October 1994, p. 9.*

Comments: Use extreme caution when climbing or moving above others in a cave. Rockfall is always a threat in such situations. It is best to avoid climbing above others and to remain safely out of the rockfall zone below a climber.

9 August
Endless Cave, Indiana
stranded, inadequate equipment

Joshua Garner (19) and Chris Keiner entered Endless Cave in Washington County, Indiana. After negotiating a stream crawl and a steep 15-foot slope which they rigged with a hand line, they visited the Formation Room, roughly 3,600 feet into the cave. At 2:30 p.m. the two decided to exit the cave. They tried several times to climb the hand line, but were unsuccessful. Keiner tried once more and made it to the top. He exited the cave and went for help. He called the police at 3:50 p.m. and they notified the Campbellsburg Volunteer Fire Department.

Rescuers found Garner at the bottom of the 15-foot drop at about 5:30 p.m. They lowered a rope and harness and pulled Garner up the climb. Garner was then able to exit the cave under his own power at 7:30 p.m. Rescuers determined that he was just wet and cold.

1. *Bruce Bowman, Accident report, undated.*
2. *Cecil J. Smith, "Trapped caver's five-hour ordeal has happy ending",* The Salem Democrat*, p. 1.*

Comments: Inexperience, inadequate equipment.

13 August
Barrack-Zourie Cave, New York
exhaustion

Gloria McKusick entered Barrack Zourie Cave with Kevin Harris, Lynne Jesaitis, Marc Scott, and Tony Hopkins. After surveying, the group headed out the Berkshire Entrance. Although McKusick had shown signs of tiring near Le Grande Chambre, she perked up near the swims. Unfortunately she began to fade at the climbs. Not only was it her first wet suit caving trip, but she was wearing a 1/4 inch wet suit. The resistance of the stiff material depleted McKusick's energy, leaving her unable to ascend the cable ladder climb. Harris and Hopkins got a rope and hauled her up the last two drops.

Tony Hopkins, "Barrack Zourie: The Continuing Saga", Northeastern Caver*, December 1994, p. 107.*

Comments: Thicker material makes a wetsuit harder to cave in, but it is preferred by many cavers in cold climates. In this case, McKusick's unfamiliarity with wetsuit caving was a probably a factor.

13 August
Doghill-Donnehue Cave, Indiana
caver fall, injury

Mike Hood, Dave Rice, Sandy Rice, Stephanie Caldwell (26), Scott Sweet, Jason Stallard, John Wisher, and a caver named Doug (last name unknown) entered Doghill-Donnehue Cave near Bedford. They entered the cave around 12:30 p.m. and made an uneventful trip through the cave.

On the way in, the group had slogged through about 100 feet of knee deep mud in a section of one passage. When exiting the cave, Hood and Dave Rice took the lower passage back through the mud. Sandy Rice was next and chimneyed above the passage to avoid the mud. She experienced some difficulty near the end of the traverse, where a ledge ends and the caver must climb up to the next level of ledges in order to continue.

Caldwell was next to do the chimney and had reached the same spot that Sandy Rice had trouble with. She also had difficulty climbing up to the next level. Caldwell was unable to back up due to the presence of two cavers behind her.

After trying several times, Caldwell lost her footing and fell about 15 feet to the mud-floored passage, injuring her ankle. She was able to exit the with cave without much difficulty but did experience some discomfort. Upon subsequent examination she was found to have a sprained ankle.

Mike Hood, Accident report, 18 August 1997.

Comments: Hood notes that the accident could have been prevented by simply walking through the mud. The cavers wanted to stay dry. The deep mud probably prevented more severe injury.

17 August
Oregon Caves National Monument, Oregon
caver fall, injury

Park employee Erica Kaplan was participating in an after hours caving trip when her group entered the breakdown passage about 20 feet from the Bird of Paradise phone platform. As Kaplan was walking through the passage her foot slipped on an uneven rock surface and she fell, first landing on her tailbone and then falling backwards, hitting her head. Her helmet had fallen off during the tumble. She was evacuated from the cave and transported to the Hospital in Medford. She was wearing proper footwear, the standard guide helmet, and carrying a flashlight.

National Park Service Incident Report, 2 September 1994.

Comments: According to the NPS accident report, the "standard guide hard-hat" was not considered a proper caving helmet and "no hand-held objects should be carried when going off the established tour route." A better caving helmet with an inelastic quick-release chin-strap would remain on the head. A helmet-mounted light would leave the hands free to arrest a fall. Kaplan reported that she was already tired before they went into the cave.

20 August
Stolen Well, Alabama
lost, stranded

Pat Smith and B. Stickney entered Stolen Well as part of a party of six including Tom Moss, Angela Morgan, John Parker, and Dan Legnini. The group entered the upper entrance and descended the six drops (21, 55, 75, 53, 131 and 45 feet) to the bottom of the cave. After negotiating 100 feet of passage and two difficult climb-downs of 15 feet and nine feet the group was ready to exit the cave.

Smith and Stickney decided to exit through the lower entrance, which is reached by about 1,300 feet of low crawlway. That entrance was known to be closed by its owner. They planned to meet the others back at the upper entrance if they could find it. If not, they would rendezvous at the parking place or at a nearby church.

The other four cavers exited via the upper entrance by 6:30 p.m., removing all ropes from the cave as they went. Smith and Stickney were not waiting at the upper entrance as expected. When the group returned to the vehicles there was still no sign of the missing pair. They checked the church, but the two cavers were not there. The group had decided that 9:00 p.m. would be the time to became concerned if Smith and Stickney did not show up.

The four cavers drove between the parking area and the church looking for the two missing cavers. During this time a strong thunderstorm moved through the area, causing concern over possible flooding of the lower entrance passage. Morgan used a cell phone to call other cavers to obtain more information about the cave.

At 2:00 a.m. the lower entrance was located by Parker and Moss. Parker went in about 200 feet and found no

evidence of anyone going through the passage. The cavers decided to call for help.

At 4:00 a.m. the first of the rescuers arrived. Parker and Moss once more went in the lower entrance while Morgan waited for others to arrive to take them to the upper entrance. Parker and Moss followed the lower entrance route to the passage below the last climb-down where Parker had been the day before. Parker was caving solo at this point, as Moss had stopped earlier in the crawl due to cold and exhaustion. Parker did not go up the two climbs. There was no sign of Smith and Stickney.

Parker and Moss exited the lower entrance at about 10:30 a.m. Shortly afterward a team re-rigging and descending from the upper entrance located the missing cavers in a room below the last pit and above the two climbs. Smith and Stickney had been unable to find the connection for the lower entrance. They had ascended the two climbs and returned to the bottom of the 45-foot pit, but the rest of the group was out of ear-shot. They left an arrow and a sign reading "Buffoons" pointing to a nearby dry chamber where they waited for rescue.

They were wet and cold, but uninjured. Once found, they exited under their own power and left quickly to avoid the media. Approximately 45 rescuers were involved.

1. *Tom Moss, Incident report, 23 August 1994.*
2. *Tom Moss, "Stolen Moments",* TAG-Net *#193, 23 August 1994.*
3. *Pat Smith, "Stolen Screw-up",* TAG-Net *#195, 24 August 1994.*
4. *Angela Morgan, "Another Stolen Well account",* TAG-Net *#196, 25 August 1994.*
5. *"Cavers rescued in Jackson",* Huntsville Times*, 22 August 1994, p. B10.*
6. *Peggy O'Hare, "Experience may have saved cavers",* Scottsboro Daily Sentinel*, 23 August 1994, p. 1.*

Comments: Members of the party felt that Smith and Stickney were such strong and experienced cavers that they must have been trapped or met with an accident. Some reported that it did not occur to them that the pair simply might not be able to find the route through. After waiting most of the night, they felt that they could not take chances with their friends' lives and decided to call for rescue.

The initial search team sent in through the lower entrance consisted of two tired cavers from the original group who had been up all night. They were unable to push on far enough to reach the waiting cavers and lead them out the lower entrance. The other two cavers from the original party led a team in through the upper entrance which ultimately found the missing pair. The initial response team sent into the lower entrance should have included some fresh cavers properly dressed for the long, wet crawl. Caving solo, Parker was stopped just a few hundred feet from the waiting cavers. As a result, they exited via the upper entrance somewhat later.

Smith and Stickney had overlooked the opening of the exit passage and followed the water to a sump. Thinking the passage had silted in, they retreated without really searching for an alternative. A map of the cave had been published, but no one on the trip had a copy or was aware of its existence. The cavers had not originally planned to go out the lower entrance, which was closed, but decided to do so after reaching the bottom. This incident was easily preventable and should not have happened.

27 August
Bakers Hole, Idaho
stranded on rope, equipment problems

Mike and Debbie Allen, Jim Hathorn, David Kesner, Dave Russell, and Charlie Wilkerson planned to descend the 225-foot entrance drop to Bakers Hole. They rigged the pit with two ropes side by side. The main rope was marked at 75 feet, 150 feet, and 250 feet with small pieces of duct tape.

Wilkerson descended first using a five bar rack. Russell went next using a six bar rack. Wilkerson and Russell both used a prusik knot rigged below the rappel rack as a safety. Both were stopped during descent when the prusiks jammed on the duct tape. They also experienced some difficulty with the two ropes, which tended to become tangled. Mike Allen had a six bar rack and did not use the prusik safety. He had no problems during his descent.

Kesner descended using a five bar rack with a prusik safety below, and was stopped by the piece of duct tape at the 75-foot mark. After some struggling he was able to release the knot and resume his decent. At the 150-foot mark he was stopped again. This time the prusik was jammed so badly that he could not loosen it. He tied a long prusik to the rope above the rack to take his weight off of the jammed prusik. However, with the weight of his pack (a full backpack) pulling him backward he was unable to hold himself up long enough to loosen the safety prusik.

Kesner decided to change over to his ascending system. After attaching a Jumar to his seat harness and putting on his foot Gibbs he was able to push up his safety Jumar and sit down. Unfortunately, Kesner was using a homemade chest harness which was improperly tied. When loaded by the Jumar sling and the climbing rope, it tightened around his chest like a noose. The pack continued to pull him backwards, and the slack in the harness prevented it from holding him upright. Eventually he became exhausted and unable to move. He was also having trouble breathing due to constriction from the chest harness.

Kesner called to the surface for help. Unable to understand, Hathorn called the bottom crew using a radio. Russell started to climb the second rope to assist. Kesner continued to try to climb to the surface. Each time he tried to stand the chest roller would not feed and the harness continued to tighten. Eventually, Kesner collapsed on rope, unable to hold himself up or breathe normally.

When Russell reached Kesner, he suggested cutting the harness loose with a knife. Kesner would not allow this, so Russell got behind him and pushed him up, relieving the pressure on his chest. Russell tried to loosen the chest harness but could not. He removed Kesner's pack and dropped it to the floor. He yelled "Pack!" but the cavers on bottom could not understand and as a result "were mortified when it hit after dropping over 100 feet."

Russell convinced Kesner to open his chest box and release both the rope and Jumar sling while he held Kesner in place. Once this was done Russell was able to loosen the chest harness. Kesner was then able to climb out of the cave with Russell climbing beside him. The whole incident lasted almost an hour.

1. *David Kesner, "Incident at Bakers Hole",* Gem Caver*, v26n3, Fall 1994, p. 1.*
2. *Jim Hathorn, "Bakers Hole: Another View",* Gem Caver*, v26n3, Fall 1994, p. 5.*
3. *Unsigned letter to the Editor,* San Francisco Bay Chapter Newsletter*, v37n12, December 1994, p. 5.*

Comments: The cavers are to be commended for performing a self-rescue. There are, however, several lessons to be learned from this incident. Ropes should not be marked with duct tape or other methods that can cause an obstruction. The initial problem was the tape, which should not have been there, and which caused the safety to jam when it would not have otherwise done so. This precipitated the change-over and the problems that followed.

Kesner normally climbed on a Frog system, but was using a ropewalker rig on this trip. Kesner had practiced with the system, but had not used it in a cave before. He replaced the borrowed chest harness with one of his own design that he believed would be more comfortable. The chest roller was mounted on a home-made, improperly constructed chest harness which worked like a noose, tightening around his chest when loaded. Using an unfamiliar system and an untested chest harness in a deep pit was not a good idea, and was the primary cause of the second part of the incident – stranded and strangling on ascent.

Kesner was wise not to allow Russell to cut him loose while on rope. Knives and loaded ropes make a lethal combination. Loaded caving rope cuts like hot butter. There is a high risk of accidentally cutting the wrong rope or sling, and the consequences are severe. There is almost never a need to cut someone free while on rope. In this case Kesner needed only to open the chest roller and remove the rope and the Jumar sling to relieve the tension on the chest harness. Kesner had a safety ascender attached to his seat harness to allow him to sit down and rest without becoming inverted.

The dropped pack presents another lesson. Whenever anything falls down a pit, the best thing to yell is "Rock!" Not "Camera!" or "Water Bottle!" or "Pack!" or whatever. The universal signal for objects falling down a pit is "Rock!" People on bottom are much more likely to understand that and take cover instead of staring up the pit while they try to figure out what you are yelling. In this case, the cavers on bottom did not understand the warning and were nearly hit by the pack, which was quite large and could have caused serious injury.

27 August
Fern Cave, Alabama
stranded in pit, exhaustion, hypothermia

Lonnie Epperson (43), Mark Epperson, Ruth Epperson, Lane Purser, and Lynn Purser entered Fern Cave intending to descend 437-foot deep Surprise Pit. They had made arrangements for a local caver who knows the cave well to accompany them, but he became ill and was unable to make the trip. They decided to go ahead on their own, and proceeded to the cave using his directions. They entered and rigged the drop at the customary dry rig point away from the waterfall. Using that rig point gives a drop of 404 feet.

Lane Purser descended without incident. Epperson began his descent at about 2:20 p.m. He used a prusik knot above his rappel rack as a safety. During his rappel the prusik jammed repeatedly, stopping his descent. Each time he had to struggle to work the knot free. To release the knot, Epperson apparently pulled himself up the rope hand-over-hand, held on with one hand, and loosened the knot with the other. It took about one hour for him to complete the rappel.

When Epperson reached the floor, he rappelled straight into a supine position and asked Purser to remove his equipment. The prusik sling was so interwoven into the rappel rack that Purser had to cut it free. The struggle left Epperson completely exhausted and suffering from arm and leg cramps. He felt he could not make the 400-foot climb out. Purser communicated this to the cavers above using a radio. They decided to let Epperson rest for 20 minutes to see if he might be able to ascend. After the rest, Epperson still felt that he could not climb out. The others decided they had no choice but to call for help.

Rescuers arrived at the pit at about 10 p.m. Epperson and Purser were suffering from mild hypothermia, and Epperson still felt unable to climb the pit. He was treated for hypothermia with heat packs and a warm air inhalation system while the pit was rigged for hauling. Rescuers were hampered by the small space at the top of the pit, which permitted only six cavers to haul and required them to sit and pull rather than walk. Crews quickly became tired and had to be rotated.

Epperson was hauled up by his seat harness with a rescuer climbing beside him. The haul was completed in about 20 minutes. Purser climbed out in about 20 minutes on his own. Revived by the warm air machine and some food and drink, Epperson exited the cave and walked down the mountain under his own power.

1. *Lane Purser, "Surprise Pit Trip", West Tennessee Grotto* Twilight Zone*, v9n5, September/October 1994, p. 7.*
2. *Lynn Purser, "Trip report", West Tennessee Grotto* Twilight Zone*, v9n5, September/October 1994, p. 9.*
3. *Laura Coleman, "Cold, dark cave held unwanted experience",* Memphis Commercial Appeal*, 30 August 1994, Metro section page 1.*
4. *David Brewer, "Tired spelunker pulled from pit",* Huntsville Times*, 29 August 1994, p. A1.*
5. *Jim Hall, "Fern Rescue",* Huntsville Grotto Newsletter*, v38n9, September 1994, p. 5.*
6. *Tom Moss, "Surprise Pit Rescue",* TAG-Net *#200, 29 August 1994.*
7. *Butch Feldhaus, "Rescue Report",* TAG-Net *#200, 29 August 1994.*

Comments: A Prusik knot often does not work well as a rappel safety. Other devices such as the Petzl Shunt or a Gibbs ascender rigged in the "Spelean Shunt" configuration may be better. Placing the safety above the rappel device

makes it more difficult to release when engaged and increases its tendency to jam. The sling can also become tangled in the rappel device. Placing the safety device below the rappel device allows better control, but requires careful arrangement of the rappel device and the safety.

Most American cavers do not use rappel safety devices, preferring to rely on the bottom belay. While the effectiveness of the bottom belay may be reduced by the rope stretch inherent in drops over 300 feet, it is still an important safety technique. It will almost always slow if not stop an out-of-control rappel, unless the rappeller has too few bars engaged on the rappel rack. For maximum effectiveness, especially in a deep pit, the belayer must be directly below the rappeller so that the amount of slack and stretch in the rope is minimized. This often places the belayer in the rockfall zone. Belaying is serious business.

It is standard practice to have a safety ascender on the harness which can be easily attached and used to relieve tension on the rappel device or the rappel safety. It is helpful to have a foot sling to stand in during the procedure.

It is worth noting that it was several hours after Epperson became stranded before rescuers reached him. It takes a long time to mount a rescue and get people to the patient. Some of the rescuers wondered why the group did not simply provide Epperson with food and a sleeping bag or warm clothing and let him rest for a few hours before climbing out. The decision to call a rescue sets in motion a large operation involving many people. When no injury and no immediate threat are involved, it is usually appropriate to consider self-rescue.

4 September
Cass Cave, West Virginia
difficulty on rope

Three Ohio cavers were planning to do the 185-foot drop in Cass Cave. They only had a 165-foot length of rope and decided not to do the drop. A group of cavers from the nearby Old Timer's Reunion arrived, however, and offered to share their rope. Both groups descended and proceeded to explore the cave. More groups of cavers continued to arrive, so the Ohio group decided to exit the cave. They had to wait for about an hour due to other groups descending.

A group from Pennsylvania had arrived at the cave, but only one decided to do the pit. As the Ohio cavers prepared to climb, the Pennsylvania caver returned to the bottom of the rope and wanted to be the first to climb. One of the group from Ohio held the rope so that the Pennsylvania caver could get started. His gear appeared new and he had a lot of difficulty rigging. He began climbing, ascending with much difficulty. His foot cam did not appear to be working correctly.

When he reached the rope pad, about 35 feet from the top, a problem developed. The caver yelled down to the cavers below, but they could not understand and became concerned. After about twenty minutes of struggling, there was a call of "Off Rope." Twenty-three people stood on the bottom of the pit thinking something was wrong with the rope.

The next caver to climb found the rope under the pad and against the rock. He placed the rope back on top of the pad and climbed out. The rope appeared to be undamaged. Once out he found some red webbing hanging into the pit. Apparently the people at the top had untied part of the anchor rigging and used it to help rescue the stuck caver. The Pennsylvania group was gone. The rest of the group on the bottom began their ascents at 6:00 p.m. It was 2:00 a.m. before everyone was out.

Mike Liston, Incident report, undated.

Comments: The new gear and difficulty rigging were red flags, suggesting that the climber was not familiar with his rig. When dealing with cavers of unknown abilities, do not hesitate to ask about their experience. It is always best to let an experienced climber go first.

The best way to prevent this kind of incident is to go elsewhere when the cave is crowded. It is also a good idea to carry along some webbing or a short rope to assist a climber who becomes stuck at the lip.

4 September
Raccoon Mountain Caverns, Tennessee
caver fall, injury

While on a "wild cave" tour in the commercial cave, a woman (30) slipped and took a tumbling fall of about 12 feet. The accident happened about 100 feet from the tourist trail. The fallen caver complained of severe upper and lower back pain. Rescuers were called, and the woman was packaged and carried out of the cave. She was taken to the hospital where she was found to have no serious injuries. She was treated and released.

Butch Feldhaus, "Another TAG cave rescue", TAG-Net *#207, 6 September 1994.*

Comments: Inexperience may have been a factor. Proper footwear (boots with lug soles) can help prevent slips.

10 September
Bowden Cave, West Virginia
caver fall, injury

Iain Lake (19) fell and was injured while attempting the Hairy Traverse, located just inside the Groundhog Entrance to Bowden Cave. The fall was about 20 feet, and Lake was not wearing a helmet. The Groundhog Entrance is tight. Initial attempts to bring Lake out on a stretcher and then a backboard were not successful. In the end it was necessary to enlarge the entrance. The rescue took about seven hours. Lake was taken to the hospital, where he was found to have a ruptured disk.

George Dasher, "Cave Rescues!", The West Virginia Caver*, v12n6, December 1994, p. 4.*

Comments: Inexperience, inadequate equipment. Caving without a helmet is considered very poor technique. Lake was fortunate not to receive a head injury from his fall. A belay should be considered for climbs over 12 feet in

height, or in locations where the consequences of a fall could be serious.

11 September
New Trout Cave, West Virginia
lost, stranded, light failure

Five novice cavers became lost in New Trout Cave in Pendleton County. The group ranged in age from 15 to 22 and had learned of the cave from a newspaper article. They carried only a few hand-held flashlights. Entering the cave on Saturday, they became stranded when their lights failed.

Fortunately, an experienced caver saw the group enter the cave and called the police later to make sure they later exited. The police checked the vehicle registrations and called the cavers' families to determine that they were overdue. They were found and rescued the next day.

1. *George Dasher, "Cave Rescues!",* The West Virginia Caver*, December 1994, v12n6, p. 4.*
2. *Greg Sholly, "Breakfast at the Franklin Café",* The West Virginia Caver*, December 1994, v12n6, p. 13.*

Comments: About 60 rescuers were called in to search the three caves on the NSS-owned preserve. The youths had not indicated on the sign-in sheet which cave they intended to explore. They were fortunate that the experienced caver decided to have someone check on them.

18 September
Sloans Valley Cave, Kentucky
lost, hypothermia

Twenty people, including trip leader Chris Kerr, entered Sloans Valley Cave to do a through-trip between two of the entrances. Seven were experienced cavers and the rest were novices. About four hours into the trip the group became disoriented in the Grand Central Spaghetti region and was unable to find the exit. They were only a few hundred feet from three different entrances, but could not find one. Some of the inexperienced cavers began to become hypothermic and anxious. The group spent over four hours looking for the exit, which they finally discovered by following a bat.

Jennifer Murray, "Field Trip Reports: Sloans Valley Cave", Loyalhanna Troglodyte*, v8n1, Fall 1994, p. 28.*

Comments: Bats, air flow, and water flow are often useful as directional indicators in caves. It would have been helpful to have a person in the group who was more familiar with that region of the cave.

24 September
Sloans Valley Cave, Kentucky
caver fall, injury, rope failure

Gregg Harrington (25) entered the Post Office entrance of Sloans Valley Cave in a group of 11 cavers. The group entered at 1:30 p.m. and proceeded to an overlook into the Big Room. An obscure route through the breakdown leads to the floor of the room, but the group was unable to find the way. An alternate route to the bottom descends eight feet from a point the South Overlook to a ledge, which leads around and down to the floor. The cavers had come prepared with a rope for this climb-down, in case they could not find the route through the breakdown. A manila rope rigged to a bolt was present at the eight-foot climb-down when the cavers arrived. It was tied with loops for use as a rope ladder.

While they were looking for the breakdown route, Alan Abt decided to descend the climb-down using the existing rope. He made the descent to the ledge without incident. John Young was nearby, and was startled to see that Abt had made the descent using the old rope. Young told Abt that he should not have used it. While they were talking, Harrington went around to the climb-down and prepared to descend. Abt saw him, and told him not to use the old rope. Harrington either did not hear this or ignored it. He wrapped the rope around him for a body rappel and started down. Before Young could speak, the rope broke.

Harrington fell about ten feet to the ledge below, striking the outermost boulder of the ledge with both feet. He glanced off the boulder and fell 35 more feet to the breakdown floor below. His helmet had no chin strap, and came off during the fall. He landed between two boulders, breaking both arms and sustaining back and other injuries. He could not feel anything below his upper torso. The cavers above called down to Harrington, and after a few moments heard him moaning.

Young sent the others down to stay with Harrington, then exited the cave with Jeff Novac. They proceeded to a nearby house and called for help. Rescuers soon arrived, and after a difficult 13-hour operation Harrington was carried from the cave and taken to a hospital. In addition to the broken limbs, his impact resulted in multiple instantaneous dislocations of his vertebrae which damaged his spinal cord without severing it, causing paralysis below the waist.

1. *John Young, "Post Office/Garbage Pit Through Trip? Not!",* Cave Cricket Gazette*, Fall/Winter 1994, v19n3-4, p. 63.*
2. *John LaMar Cole, "Rescue from the Big Room",* Cave Cricket Gazette*, Fall/Winter 1994, v19n3-4, p. 66.*
3. *David Holthaus and Sarah Summons, "Caver rescued after 75-foot plunge",* The Cincinnati Post*, 26 September 1994.*
4. *Richard Green, "Fall paralyzes cave explorer",* The Cincinnati Enquirer*, 27 September 1994.*
5. *Bill Mardis, "Cave rescuers launch effort to save spelunker",* Somerset Commonwealth Journal*, 25 September 1994.*
6. *Amanda Garrett, "7-hour rescue brings caver to surface",* The Cincinnati Post*, 26 September 1994.*
7. *Sharon Dodson,* Somerset Commonwealth Journal*, 26 September 1994, page 1.*

Comments: Ropes and equipment found in caves are always suspect and should not be used. Decay causing microorganisms are common in caves. They can rapidly weaken and degrade ropes and other equipment without changing their outward appearance. Do not use ropes or equipment if you do not know their history. Bring your own.

Manila and other natural fiber ropes are weaker and more susceptible to decay than nylon ropes of the same size and are therefore not safe for caving. The rope that broke in this incident was reported to have been in the cave for no more than a few months.

8 October
Pettijohns Cave, Georgia
caver fall, injury

Geralyn Devezin entered Pettijohns Cave with six companions, including Tom Moss, Paul Agarwal, and Jane Prendergast. The others were experienced cavers, but it was Devezin's first trip. The group spent about three hours exploring without incident, and Devezin was doing well and enjoying the trip. At that point, Devezin, Moss, and Agarwal decided to head out while the other four continued to explore. On the way out, Devezin slipped on a six foot flowstone climb and hyper-extended her knee (heel towards butt). She heard it pop when she slipped, and felt severe pain in the joint.

Moss gave her 400mg of ibuprofen from his pack and they continued slowly toward the entrance. Devezin had difficulty getting through the Z-Bend Crawls, but persevered. Eventually, the rest of the group caught up with Devezin's party, and two of the cavers were dispatched to the entrance to call for assistance.

Devezin's leg was splinted with a rappel rack to prevent excessive movement and discomfort, and the group continued. The route involved numerous climbs and crawls over and through large breakdown, and the group was glad that they had brought extra hand lines.

Before they had gotten very far, they met up with the two cavers who had been sent out to call for help and who were now lost. With Prendergast to lead the way, they started out once again to call for assistance. The rest of the group moved slowly onward, helping Devezin as needed as she crawled towards the surface. They reached the entrance about 4 hours after the accident, just as rescuers arrived. Devezin was taken to a nearby hospital. Her knee was badly sprained.

Tom Moss, "Incident at Pettijohns", Undergraph Interground*, v7n9/10, September/October 1994, p. 11.*

Comments: Devezin's determination and the assistance of her companions made it possible for her to exit the cave several hours earlier than she would have had they simply waited for the rescue. Moss notes that Devezin was inexperienced and probably getting tired when she fell. He also notes that the two cavers who were sent for help were not really known to the others, and were not as experienced as they appeared. In an emergency, it is usually better to rely on people whose abilities are known to you.

15 October
Doghill-Donnehue Cave, Indiana
lost

Dan Horner, Tom Geimer, and a teenager named Ryan entered the Donnehue entrance around 6:00 a.m. They became lost when they encountered more water trying to exit than they had seen when they came in.

Their families called authorities when they failed to return home at 3:00 p.m. Police and firefighters tried to find the group and were not able to locate them. Bloomington cavers heard about the rescue and volunteered to help. Six teams of cavers entered the cave about 10:30 p.m. and found the group huddled around a candle about 1:00 a.m. They had plenty of light and food, but could not find the way out. They were led from the cave and exited after 19 hours underground.

1. *"Three spelunkers are led to surface",* Associated Press*, 17 October 1994.*
2. *Tom Sollman, Incident report, 2 April 1997.*

Comments: Inexperience. The cavers were not really lost – they just didn't think the passage they were in was the correct one. They had helmet mounted lights with flashlights for backup.

15 October
Greenville Saltpeter Cave, West Virginia
lost, stranded, light failure

Michael Paul Reynolds (25) and John V. Davis (23) became lost when their lights failed in Greenville Salt Peter Cave, Monroe County, West Virginia. They entered the cave with two others, became separated, and were stranded when their lights failed. Searchers entered the Water and Millpond entrances and spent hours looking for the men. Eventually a team entered the Hilltop Entrance, where they found the men a short distance inside. They had two light sources: a gasoline lantern and a cigarette lighter. The lantern had been knocked against a rock, ruining the mantle. They were then unable to make their way out of the cave with the lighter. They exited the cave 17 hours after entering. The remainder of the day was spent recalling the search parties.

1. *George Dasher, "Rockin' Chair",* The West Virginia Caver*, v12n6, December 1994, p. 10.*
2. The Charleston Gazette *17 October 1994, p. 6D.*

Comments: Gasoline lanterns are not rugged enough for use as a caving light. A cigarette lighter does not qualify as a backup light. Every caver should carry three independent sources of light. Each one should be adequate to permit a safe exit from the cave.

15 October
Hughes Cave, Alabama
lost

Mike Pessoney, his son Thomas (15), Brian Strickland, and his son Nathaniel (15) entered the Hughes entrance at about 10:00 a.m. planning to make the trip through the cave and exit via the Foxes Lost entrance. They made it through the cave and arrived at the wet climb below the entrance at about 3:30 p.m. They all got wet climbing up into the upper room. Everyone waited about two and a half hours while Pessoney searched for the exit. He was directly below the Foxes Lost Entrance by about 50 feet.

They had left instructions to call for help if they were not home by 7:00 p.m. Realizing that they could not make their callout time, they decided to wait where they were. After an hour, however, they decided go back out through the Hughes entrance. They were wet, cold, and tired, but felt that they would be better off moving than sitting. At 7:00 p.m. they started back, taking about six and a half hours to make the trip.

They encountered a search party about 300 feet into the cave from the Hughes entrance. They were out of water and thirsty, but after receiving water from the rescuers they were able to exit under their own power after 16 hours underground.

1. *Tom Moss, "Hughes Cave Rescue",* TAG-Net *#246, 18 October 1994.*
2. *"Huntsvillians rescued from Morgan Cave",* Huntsville Times*, 17 October 1994, p. B2.*

15 October
Turkey Cave, Virginia
bad air

Benjamin Schwartz, John Murray, Bob Thren, Janice and Tony Preston, and Ted Andrus entered Turkey Cave, Rockbridge County, Virginia. The cave had been closed for several years, but the group had been able to obtain permission to survey.

The group passed through the Big room and entered the passageway that leads to a 15-foot drop down to the lower level. Janice Preston developed a problem breathing only a few feet into the passage. She negotiated a tight constriction and then dropped into a small room and regained her breath. The rest of the group decided her trouble was probably caused by medicine she had taken earlier that morning.

Murray mentioned he was having trouble keeping his carbide lamp going. Others were also having with their lamps. Schwartz was at the rigging point still trying to catch his breath. He noticed yellow, sooty flames from the carbide lights, and some of the lights would not stay lit. Everyone in the group began to experience trouble breathing. They decided to exit the cave.

Everyone had trouble breathing on the return trip to the Big Room. Andrus suffered from impaired thinking and severe difficulty breathing and moving. Once they reached the Big Room the cavers were able to catch their breath. They left a sign above the "bad air" passage to warn others of the danger.

Ted Andrus, "Bad Air Day", The Region Record*, Winter 1994, v8n4, p. 5.*

Comments: No one in the party had ever run across bad air before. Symptoms included labored breathing, dizziness, rapid heartbeat, fatigue, disorientation, and sooty orange flames on the carbide lamps in the group. The cave was reported to have bad air in the 1940s, but there had been no recent reports despite many trips deep into the cave.

A follow-up trip was made on 21 October and an air quality meter was used to measure the oxygen content at various points in the cave. Normal air has about 21% oxygen. The air in the passage where the cavers turned back was found to measure about 17% oxygen. Levels below 15% are life threatening.

The oxygen level decreased rapidly as the passage went deeper. The meter showed no methane present. Had the cavers descended the 15-foot drop where they stopped, they might have been unable to climb back out, resulting in fatalities. Bad air is extremely dangerous, and cavers are advised to leave immediately when it is suspected.

19 October
Lechuguilla Cave, New Mexico
rockfall, near-miss

Chuck Crandell, Joel Despain, Kyle Fedderly and Steve Bumgardner were in Lechuguilla Cave, Carlsbad Cavern National Park, for a survey trip. While Crandell was walking up a slope past the Ruby Chamber Pitch, a baseball-sized rock became dislodged and hit Despain in the foot. Despain was wearing steel toed boots and the rock dented the boot toe. At the time, Fedderly was lying face up about three feet from Despain's feet. It is believed the rock became dislodged as Crandell was walking up the slope. Despain and Fedderly did not realize that they were in the rockfall zone.

Chuck Crandell, "Lechuguilla Expedition Notes", 21 October 1994.

Comments: Rockfall is always a possibility in caves. Be aware of the location of other cavers in your party and be alert for potential rockfall threats.

19 October
Fisher Ridge Cave System, Kentucky
acetylene explosion

Tony Mulbrecht, Dave McFarlane and Joe Saunders entered the Remington Entrance of Fisher Ridge Cave on a survey trip. While surveying in a low crawl, Mulbrecht was reading the compass on his belly when his lamp got too close to his pack. The bottom of his the pack exploded, scattering its contents and throwing mud into his face. Mulbrecht was uninjured, so the cavers fashioned a makeshift pack out of a pants leg and some boot laces and went on with the trip.

Joe Saunders, "Kentucky Cave Log", DC Speleograph*, v51n1, January 1995, p. 8.*

Comments: Store spent carbide in a loosely sealed container or bag, so that any acetylene that is generated can escape rather than build up in the pack.

21 October
Lechuguilla Cave, New Mexico
stuck while on rope

Rick Sundquist led Rob Gillespie and Paul Rozal back to the Mother Lode in Lechuguilla on a one day trip to push a breakdown crevice. Gillespie and Rozal turned out to be the only ones who could fit through the crevice. Despite

being thin, Gillespie became stuck while on rope and had to be forcibly pulled out by Rozal.

Donald G. Davis, "Lechuguilla: The Mother Lode", Rocky Mountain Caving*, v11n4, Autumn 1994, p. 13.*

29 October
unnamed cave at Optimist Boys Club Camp, Indiana
stranded, light failure

Carrying flashlights, Todd Edwards (14) and Clint Voyles (14) entered a cave on the property of the Optimist Boys Club Camp. Both lights failed soon after they entered, leaving the boys stranded in darkness. They tried to burn their T-shirts for warmth. Edwards' father became concerned when they were late returning home. He drove to the camp and, unable to locate the boys, called the police. A police dog led them to the cave. Twenty minutes later, members of the Bloomington Grotto found the bare-chested boys, cold, wet and very thirsty.

Associated Press report, Louisville Courier Journal*, October 30, 1994, p. B4.*

Comments: Inexperience, inadequate clothing and equipment, no backup lights.

30 October
Weybridge Cave, Vermont
caver fall, out of control rappel

Tim, Travis, and Jeff (last names unknown, ages mid-20s) and Jim Bigelow (37) entered Weybridge Cave expecting to be in the cave for two to three hours The group negotiated the entrance chimney to the top of the main 45-foot drop. Travis and Tim rigged the drop. Travis descended and was followed by Tim.

Jeff started the rappel with the rope passed once through a standard figure eight descender, but without gloves or any form of belay. He lost control early in the rappel and rapidly descended 30 to 35 feet, striking the wall several times along the way and losing his helmet following an impact close to the bottom. He was badly shaken but suffered relatively minor injuries, consisting of rope burns to both hands and bruises to his thigh and elbow.

First aid was applied to Jeff's hands. Although the tape made the climb difficult, Jeff made it to the top and exited the cave with Travis. Tim and Jim de-rigged and exited.

1. *James Bigelow, Incident report, 4 November 1994.*
2. *Editor, "Northeast News",* Northeastern Caver*, March 1995, p. 3.*
3. *James Bigelow, "Accident Report"*, Vermont Cavers Association Newsletter*, v3n6, December 1994, p. 7.*

Comments: Bigelow notes that the lack of gloves probably contributed to Jeff's inability to control his descent. The rope was a static line, but was smaller and faster than ropes that Jeff had previously descended using the figure eight. Jeff is a large man, and the eight did not provide enough friction when rigged with only a single pass through the device. A bottom belay might have prevented or arrested the loss of control. Belayers must take care to avoid rockfall.

Jeff's helmet probably prevented a head injury, but should not have come off due to the impact. A UIAA approved helmet with a quick-release inelastic chin strap is the best choice for caving protection.

19 November
Millers Cave, Kentucky
lost, inadequate equipment

Nine girls with the High Adventure program of Buckeye Trails Girl Scout Council entered Millers Cave in Rockcastle County, Kentucky. They were accompanied by three adults with prior caving experience, two of whom were NSS members. Knowing that the cave contained many climbs with significant exposure the group had brought vertical gear to rig belays.

About two hours into the cave, the group encountered a group of Boy Scouts of about the same age. The boys were uncertain of the route through the confusing Malfunction Junction, and were not confident that they could return the way they had come because they had already descended points that they could not climb in the other direction. Although they had the assistance of a competent caver, he was not familiar with the cave. Furthermore, the boys did not have the equipment to belay the climbs. The Girl Scout group took them through the cave and out the lower entrance, loaning them harnesses and belaying when required.

Duane Vore, Incident report, undated.

Comments: Be prepared.

19 November
Ganter Cave, Kentucky
trapped, lost key to gate

A group of eight cavers entered Ganter Cave in Mammoth Cave National Park after obtaining a permit and the key from rangers. Once in the cave, they hid their car keys and the gate key behind a conspicuous rock about forty feet inside the entrance.

The group explored the cave without incident. Upon returning to the entrance, they found the car keys undisturbed but the gate key missing. They were locked in the cave. Since there was no other group in the cave they decided that a pack rat had to be the culprit.

The group searched under every rock in the entrance zone but could not find the key. They knew that the park rangers would come looking for them if they did not return by 7:00 p.m., so they decided to sit and wait. At 10:30 p.m. a large pack rat was spotted. Members of the group followed it in the hopes that the key would be found, but were unsuccessful.

Around 11:30 p.m. some of the cavers decided to look for a second entrance shown on their map. They could not find it and rejoined the others to wait. One of the cavers eventually found a weakness in the gate. The cavers managed

to extract themselves with some minor damage to the gate. They exited at 3:15 a.m. after 18 hours in the cave. They left a note on the gate that they were out and headed back to the ranger station.

About one hour later they encountered a park ranger who was just beginning the hike to the cave to look for them. The park ranger from the previous day had forgotten to relay the message to the next shift that there was a group in the cave.

Glenn Johnson, Incident report, undated.

Comments: Johnson notes that it was not a good idea to leave the key unprotected. He later learned that the same thing had happened to some cavers previously. In Mammoth Cave National Park, where most caves are gated, the regulars often thread the gate key on a string and wear it like a necklace.

26 November
Onyx Cave, Arizona
caver fall, injury

While caving with two companions in Onyx Cave, Clarissa Osborne slipped and slid 30 feet down a 45 degree slope, injuring her foot when she hit bottom. She was able to bear some weight on it, though she thought it might be broken. She exited under her own power, crawling much of the way and receiving some assistance at a climb. Later examination revealed that she had torn ligaments and muscle in the foot.

Steve Knutson, Incident report, undated.

5 December
Lawrence Welk Cave, California
lost

A group of seven teenagers entered Lawrence Welk Cave to do some exploring. The cave is a talus cave, consisting of a 400 foot deep canyon filled with boulders. A stream runs along the bottom of the canyon through the cave. There are several entrances along the canyon.

As the group was exploring the middle section of the cave they decided to split into two groups. One group of three headed up the canyon and out of the cave and to the car where the two groups were to meet by 5:00 p.m. The other group of four headed downstream where they became lost in the maze of boulders.

When the second group did not return to the vehicles, a callout was made and a large search and rescue operation ensued. Eventually, a three man team of cavers found the group when one of the rescuers heard their voices down a small passage. The teens had heard the voices and helicopters all day during the search, but could not make contact or find the way out. The place they picked to wait was warm and dry so they were able to sit in relative comfort and wait for help.

1. *Tom Gilleland, Incident report, undated.*
2. *David Decker, Incident report, undated.*
3. *Lisa Petrillo, "4 boys lost in N. County cave rescued"*, San Diego Union Tribune*, 6 December 1994.*

Comments: Inexperience. The large-scale search and rescue operation was hampered by the lack of integration of cavers with local rescue groups. It helps to establish those relationships in advance.

11 December
Manitou Cave, Colorado
rockfall, injury

Mark Molberg was injured when a falling rock briefly pinned his leg in a dig in Williams Canyon's Manitou Cave. Molberg was in a line of cavers passing buckets of dirt, rocks and other debris from the face of the Deepwater section dig, when he was pinned by a large rock that fell from the ceiling of the passage. Members of the group quickly pried the rock off and Molberg was able to exit the cave without assistance. At first it was thought that Molberg only suffered from bruising, however he later found that he had also sustained some ligament damage.

Richard Rhinehart, "Caver Injured in Manitou Cave Dig", Rocky Mountain Caving*, v12n1, Winter 1995, pp. 4-5.*

Comments: Rhinehart notes that one of the contributing factors was thought to be the use of novice cavers who had little or no caving experience. He suggests that more experienced cavers might not have removed a chock stone that held up the larger rock that later fell, or they might have insisted on cleaning up the passage to remove any dangerous rocks or on installing shoring for additional protection.

12 December
Reeves Cave, Indiana
lost, light failure, inadequate equipment

Two men from Bloomington decided to take a short trip into a small cave they had heard about. When they could not find it, they entered Reeves Cave instead. They had been given the location by a gas station attendant.

They had one flashlight each, with no spare bulbs or batteries, and were not wearing helmets. The men left their jackets a few hundred feet into the cave and continued. They soon found themselves lost. When their flashlight batteries ran out they were stranded without food, water, light, or adequate clothing.

When the men did not return home on Sunday, family members contacted law enforcement officials who in turn contacted local cavers to help. The men were found about 3,000 feet into the cave, uninjured, but suffering from mild hypothermia. They spent 45 hours in the cave.

1. *Anmar Mirza, "Rescue – Reeves Cave, Indiana",* Near Normal News*, v5n1, January 1995, p. 9.*
2. *Associated Press report,* Louisville Courier Journal*, 14 December 1994.*

Comments: Inexperience, inadequate equipment, no backup lights, poor judgment. Mirza reports that they tracked the men by the trail of Marlboro cigarette butts and the

remains of the bats they had killed along the way. The rescuers informed the owner about the bats and pointed out that the Indiana cave protection law allowed him to file charges, but he declined to do so. He did however, ask the men never to return.

17 December
Cass Cave, West Virginia
dropped equipment, acetylene hazard

Five cavers from Ohio entered Cass Cave, descended the 185-foot drop, and explored the cave. Jerry Galbraith was the first to ascend. His pack became snagged near the top, tearing the shoulder strap loose. Galbraith yelled "Rock!" as the pack fell 165 feet, hit a ledge, and bounced sideways, narrowly missing Jason Glancy on the bottom.

Glancy was the next to climb, followed by Mike Liston. Each carried some of Galbraith's gear up to him. The group de-rigged and began to exit the cave. While in a low stream crawl Galbraith's pack became flooded. The pack contained a large amount of carbide, which produced a dangerous amount of acetylene gas in the confined space. Duane Galbraith yelled for everyone to extinguish their lights. There was no explosion and the group exited the cave.

Mike Liston, Incident report, undated.

21 December
Safford Shafts, Arizona
explosion, entrapment

Branden Silverhorn, Christopher Reed (18), Gus A. Hansen, John P. Salazar, and Jeremy Platt went to the Safford Shafts, also known as Red Knolls. The area contains a series of 40 to 60 foot deep pits in the raised bed of an ancient lake. A four foot thick cap rock layer overlays 60 feet of silt. The five arrived at 9:00 p.m. and climbed up to the area just a few yards from the edge of the cliffs facing the road.

They dropped about four gallons of gasoline down a fissure about a foot square. They then ignited a rag and threw it down the hole. This caused a "geyser like" explosion, opening up the fissure to about six feet by twelve feet, throwing four of the men back and sending Branden Silverhorn 40 feet down, where he was buried under rocks and dirt capped by a three foot by five foot slab.

Three of the group went to the car and headed to town to get help. Rescuers rigged a tripod over the hole and where eventually able to maneuver Silverhorn out of the hole. He was brought up at 8:27 a.m. The rescue effort took over eleven and a half hours. Silverhorn's injuries included a broken leg, kidney failure, and hypothermia. He was taken to Tucson Medical Center. The other members of the group sustained lacerations and abrasions. One young man suffered a sprained ankle and a fractured left wrist.

Mike Johansen, "Man rescued from 40 foot deep hole", Eastern Arizona Courier*, 21 December 1994, p. 1.*

Comments: Extremely poor judgment.

26 December
Spanish Moss Cave, Utah
stranded on rope, exhaustion

Dan Clyde led two novice cavers, Pat and Bud Snedecor, to Spanish Moss Cave near Provo, Utah. The entrance is vertical for about 80 feet. The top 40 feet descends as a narrow, wet, but climbable passage. The bottom 40 feet is a free hang, dropping into the main passage room of the cave.

After the group explored the cave, Pat Snedecor was the first one out. Bud Snedecor made it only half way up the 40-foot free hang before exhaustion stopped his progress. Clyde, who was still at the bottom of the cave told Pat Snedecor to go get another group of cavers who he knew were visiting Red Baron Cave across the canyon. When the Red Baron group descended to the canyon floor, they encountered Pat Snedecor who told them that Bud Snedecor was stuck half way up the pit and could not go up or down. They agreed to help, and followed Pat Snedecor to the cave.

While the group on the surface was assembling a hauling system, Clyde, still on the bottom, talked Bud Snedecor into rigging his figure 8 descender. Clyde ascended to Snedecor and helped him remove his ascenders and rappel back to the floor. Snedecor weighed about 250 pounds, so they decided to use a 4:1 hauling system to pull him out. Snedecor was hauled up the 40-foot drop and was belayed while he climbed the remainder of the way out.

Kevin Dickerson, Incident report, undated.

Comments: A nice example of small group self-rescue. It would appear that Snedecor did not have sufficient practice with his ascending system before the trip.

Late 1994
unnamed cave in the Berkshires, Massachusetts
rockfall

Larry Botto and Frank Harrington were digging in a cave discovered a few days earlier at the bottom of a large sink. They began digging and gained entrance by collapsing the breakdown into the cave. They could see into a larger room about 15 feet below, but needed some shoring before proceeding. They jammed tree limbs wherever they could to hold back the loose rocks. In the process, Harrington "was nearly flat-rocked by a 500 pound rock that slid off the surrounding bedrock wall, but luckily sidestepped it." Several days later the pair returned to continue the dig. As Botto was entering the cave, "a 300 pound piece of what I thought was bedrock came off in my hand and landed smack dab across the entrance of the cave."

Larry Botto, "More Berkshire Digging", Northeastern Caver*, March 1995, pp. 6-7.*

Comments: Sometimes the cave is trying to tell you something.

1995 Accident and Incident Reports

8 January
Cookston Cave, Tennessee
rockfall entrapment

Clinton Ferrell (25) and a friend were searching for artifacts in the cave when a 500-pound rock shifted and pinned his head against the wall. He was unable to free himself, so his friend went for help. Cave rescue personnel from Sequatchie and Hamilton Counties responded. Ferrell and the boulder were stabilized, and a come-along was used to move the boulder enough to free him. He was placed in a litter, hauled up a 100-foot slope, and airlifted to the hospital where he was listed in critical condition, but expected to recover.

1. *Associated Press, "Man trapped in cave for nearly five hours",* Huntsville Times*, 9 January 1995, p.B3.*
2. *Butch Feldhaus, "Rescue Report",* TAG-Net *#310, 11 January 1995.*

Comments: The victim and his friend were dressed in street clothes and cowboy boots, with no helmets, lights or other equipment. They were not cavers. The cave was closed as a result of the incident.

8 January
Sunny Jims Cave, California
washed into sea cave, stranded

Veteran surfer Lyle Smith (24) was washed into the submerged entrance of Sunny Jims Cave while trying to take advantage of a period of unusually large waves in La Jolla Cove. He surfaced in an air filled chamber which is part of a commercial cave connected to the La Jolla Cave and Shell Shop. Bruised and bloodied from being dashed against rocks and barnacles, Smith felt his way along a man-made connecting tunnel and up 145 steps to the back door of the shell shop. He pounded on the locked door until he was heard and released. Smith was treated for multiple cuts and bruises to his hands, feet, and back. He was reported to have said: "I'm bummed that I didn't get to surf the big waves, but very happy I didn't get hurt worse."

Terry Rodgers, "'Lost' Surfer washes up alive in Shell Shop cave", San Diego Union Tribune*, 10 January 1995, p. A1.*

13 January
Barberry Cave, Virginia
flood entrapment

Mike Ficco, Ben Schwartz, Tommy Shifflett, Mike Artz, and Nevin Davis entered Barberry Cave on Friday, January 13. They carried food and supplies for a multi-day camp and planned to spend several days surveying. About 30 minutes into the cave there is a 114-foot long excavated low-airspace crawlway. The weather forecast was reported to be scattered showers.

Sometime Saturday, a four inch deluge produced a flood which washed mud and gravel into the crawlway, reducing its size substantially and creating a sump.

The cavers were awakened on Sunday by the sound of high water. Their camp was located in a large dry passage about 3/4 mile from the entrance and they felt that they were in no danger. However, they did decide to ration food in case they became unable to exit on Monday as planned. On Monday morning they proceeded to the entrance where they discovered the sumped passage. They returned to camp to wait for the water level to go down.

By Tuesday morning the water had dropped to produce about two inches of airspace, but the mud fill had reduced the passage size. Ficco and Schwartz (the smallest two) had done the original excavation of the passage and were able to dig their way out, but the larger cavers could not fit. Their plan was for Ficco and Schwartz to exit, check the weather, and either return with more supplies or get some rest and come back Wednesday morning to dig out the others, who would return to camp and wait.

When Ficco and Schwartz exited, they found a large rescue operation in progress. After some discussion, they were allowed to return to the cave mid-morning Wednesday and continue their excavation. The remaining cavers were freed by late afternoon.

1. *Jeff Uhl, et al., "But I Don't Want a Rescue",* BCCS Newsletter*, v20, 1994-95, pp. 36-46.*
2. *Barbara Belshaw, "VA Area Rescue ad infinitum"*, Muddy Litter Letter, *Issue 22, January/February 1995, p. 5.*
3. *Mike Futrell, "Self Rescue in Burnsville VA",* Muddy Litter Letter, *Issue 22, January/February 1995, p. 6.*
4. *Editor, "Surveyors Trapped in Bath County Cave",* Tidewater's Ooze*, v15n2, February 1995, p. 2.*
5. *Nevin Davis, "Much ado about nothing",* The Groundhog*, v25n1, January/February 1995, pp. 9-10.*
6. *Aaron Bird, "'Rescue' at Barberry Cave",* The West Virginia Caver*, v13n2, April 1995, pp. 15-16.*

Comments: The rescuers were called by the families and friends of the cavers. Once initiated, such operations usually grow rapidly and attract media attention. The trapped cavers felt that only a small group of experienced cavers was needed to support and assist in their digging efforts, and were surprised at the size of the rescue response. Unfortunately, rescue and emergency response agencies and organizations are bound by legal and societal constraints to provide a response adequate to the worst case scenario. Having no information about the condition of the trapped cavers, they had to assume the worst and respond accordingly or risk being held liable for a bad outcome. It appears that the response was not unreasonable given the situation and the information available outside the cave.

It was reported that the rescuers were reluctant to let Ficco and Schwartz re-enter the cave to continue their digging, preferring to let a fresh team work on the silted passage. This appears to have delayed the exit of the

remaining cavers. The cave was closed as a result of the incident.

24 January
Grindstone Cave, Tennessee
stranded in pit, no equipment

Five youths (ages 16-18 years) entered Grindstone Cave on Monday afternoon. The cave has a 20-foot entrance pit which is easily climbed due to its small diameter. Using a piece of utility rope as a hand line, all but one of the youths were able to make the climb and exit. Ryan Sides (18) became exhausted in his attempt to exit and became sick. He remained at the bottom while the others went for help. The cave rescue team responded and the boy was pulled out with a Z-rig haul system. He was uninjured. The boys received a lecture on safe caving techniques and an invitation to the local grotto meeting.

1. *Butch Feldhaus, "Rescue Report",* TAG-Net *#320, 26 January 1995.*
2. *"Crew pulls man from cave",* The Chattanooga Times*, 25 January 1995, p. B3.*

Comments: Improper clothing, no equipment, no training or experience. The rope used by the youths was an old one left rigged by earlier explorers. When rescuers were cleaning the site after the rescue, they discovered that though one end was tied to a tree near the entrance, the rope had been severed between the tree and the pit. The rope was buried in the dirt, and a campfire built on top of it had burned through it. It was supported only by the friction of the overlying dirt. This serves as an excellent reminder that rescuers should always rig their own ropes and equipment. Ropes and equipment placed by unknown parties should be viewed with a healthy suspicion.

January
Cemetery Pit, Georgia
rockfall, broken leg

Peter Hontazs and five other cavers descended the 153-foot entrance drop in Cemetery Pit and proceeded to the Rockeaters Extension area of the cave. While looking for the route onward, Hontazs attempted to climb some breakdown, which collapsed. A large boulder struck his right leg causing a compound fracture just above the ankle. He also suffered a deep tear on his left hand while trying to brace himself as the boulder fell.

After examining the injuries, two cavers left to get more rope and re-rig the entrance pit for the rescue. The others began helping Hontazs back toward the entrance. En-route they encountered the first two cavers, who had become lost. Hontazs walked, crawled, and was carried to the bottom of the entrance pit, taking about seven hours for the journey, which normally takes less than one hour.

At the entrance pit, the cavers rigged a counterweight system using two cavers for ballast and hauled Hontazs up and out of the pit. He was carried down the mountain and taken to the hospital and has since recovered.

Bubba Geyer, Accident report, undated.

Comments: The cavers did a good job with a difficult situation. The counterweight haul system is often useful in small group and self rescues. Hontazs would probably not have gotten out any sooner had he waited for a rescue from outside.

3 February
Grassy Cove Saltpeter Cave, Tennessee
caver fall, multiple injuries

Matt Gore (19) and two companions entered Grassy Cove Saltpeter Cave at 6:00 p.m. on Friday evening. They proceeded about 7,200 feet into the cave, arriving at the Waterfall Room around midnight. While attempting to climb down the pit to the base of the waterfall, Gore apparently dislodged some rocks which struck him and caused him to fall to the bottom of the 60-foot deep pit. He suffered skull and facial fractures, an epidural hematoma, two dislocated fingers, and neck and shoulder injuries.

His companions left their equipment at the top of the pit and free-climbed to the bottom to try to help him. At the bottom of the pit their lights failed, leaving them all in total darkness. They waited for three hours until one managed to climb back up using a Bic lighter as a light source. Once on top, he sent fresh batteries, a blanket, and a stove down to the friend who would remain with Gore. It took him another three hours to exit the cave and call for help at 7:00 a.m.

Local and regional rescue groups responded, including cave rescue teams. Gore was brought out of the cave at 7:42 p.m. and flown to a hospital where he was later reported to be in stable condition.

1. *Butch Feldhaus, "Rescue Report",* TAG-Net *#332, 8 February 1995.*
2. *"Caver suffers serious injuries",* The Chattanooga Times*, 6 February 1995, p. B3.*
3. *Tim Roche, "Pinellas native injured in cave"*, St. Petersburg Times*, 7 February 1995, p. 3B.*
4. *Mike Moser, "Teen critically injured during caving expedition",* The Nashville Tennessean*, 5 February 1995, p. 2B.*

Comments: The "cavers" were not wearing helmets, did not have proper lights or equipment, and had no training or experience in proper caving technique. They did not tell anyone where they were going. Climbing down the pit and leaving their equipment at the top very nearly left them all stranded indefinitely. Gore would probably not have survived. Backup lights are useless if you don't keep them with you. Many cavers mount two lights on their helmets for this reason.

11 February
McClendons Cave, Alabama
lost, stranded, light failure

Three local men entered McClendons cave without permission on a Saturday. They used a knotted rope to descend the 40-foot entrance pit. One decided to explore on his own and became separated from the others. While

exploring alone, he dropped his only light source, a lantern. He spent the next three hours in the dark. His companions were unable to find him and exited to call for help. Local cavers were notified and soon arrived to help search. The lost caver was found about 30 minutes into the cave, scared but uninjured.

Tonya Smothers, "McClendons Cave Rescue", TAG-Net *#338, 16 February 1995.*

Comments: Inadequate equipment and poor technique. Lanterns are fragile and unsuitable for caving. Cavers should carry two backup lights. Doing a 40-foot pit hand-over-hand on knotted rope is dangerous and unsafe. The lost caver was reportedly in possession of marijuana, which may have been a contributing factor. He apologized to the landowner and promised never to return. The owner was reported to be considering closing the cave.

13 February
Doghill-Donnehue Cave, Indiana
caver fall, injury

A caver named Shelly (last name and age unknown) fell and injured her foot near the connection area of Doghill-Donnehue Cave. One of her party members exited and called local cavers for help at 5:45 a.m. Based on the information supplied, the cavers decided to initiate a small group rescue and call for more help later if needed.

The responding cavers, including an EMT, reached the injured woman at about 7:25 a.m. and examined her foot, concluding that she had probably broken one or more of the metatarsal bones. The rescuers treated Shelly for hypothermia, splinted her foot, and helped her through the cave, carrying her when possible. They reached the entrance at about 11:00 a.m. Shelly was driven to the hospital, where she was found to have pulled tendons in her foot, but no broken bones.

Anmar Mirza, Incident report, 15 February 1995.

Comments: Mirza reports that Shelly was exhausted by time she reached the entrance due to hypothermia, exertion, and lack of food and drink. He suggests carrying some form of liquid nourishment in your pack if you are among the first responders to an accident. A small backpacking stove can be used to prepare hot drinks which can revive cold, tired cavers or at least make the wait for help more bearable. Extra clothing for the patient and her party would also be good.

Mirza also notes that the rescue was 'low profile'. It involved only 5 cavers assisting the members of the original party, and did not attract any news coverage. Mirza made the decision for limited response based on his knowledge of the cave and the patient's relatively minor injury.

February
Hurricane Cave, Colorado
injury

Three cavers were attempting to find the connection between the highest and middle entrances of this high relief, alpine cave in granite. After hiking about one kilometer through snow, they rappelled the very wet entrance pit and started exploration.

Louise Hose was wearing thin polypropylene liner gloves under stouter rubber gloves. While working on her carbide lamp and performing other tasks during the trip, she removed both pairs of gloves and was not careful to ensure that her hands were clean when she replaced the gloves. Because of the near-freezing temperature in the cave, Hose did not notice when her hands received numerous abrasions on the fingers. Apparently sand inside the polypropylene gloves rubbed against the wet, tender skin and abraded deep wounds on the sides of her fingers. She did not notice the injuries until she removed the gloves and started to warm her hands. The wounds were cleaned and dressed when discovered, but took several weeks to heal.

Louise Hose, Incident report, 31 October 1996.

Comments: Hose notes that the main cause was her failure to clean her hands before donning the gloves, and that you have to be more careful about such things in a cold cave when the skin can be numbed. Wet skin is also more susceptible to injury. She suggests that wearing surgical gloves as liners might provide protection while preserving dexterity.

4 March
Pettijohns Cave, Georgia
caver fall, injury

Ricky Rawlins (34), Terri Rawlins, and Wayne Kester were exploring Pettijohns Cave and were exiting the Volcano Room via a climb through breakdown. While handing a cave pack up the climb, Ricky Rawlins slipped and dislocated his shoulder. He did not feel that he would be able to exit unassisted, so Terri Rawlins remained with him while Kester exited and called for help. Cave rescue personnel responded and a paramedic on the team was able to reduce the dislocation at the scene. Ricky Rawlins then exited the cave with their assistance. He was belayed on all climbs during his exit.

Butch Feldhaus, Incident report, Chattanooga-Hamilton County Cave Rescue, 4 March 1995.

18 March
Real Well, Tennessee
stranded on rope, hypothermia, fatality

Andrew Fust (32) and Attila Szedmohradszky (26) rappelled the 160-foot entrance pit of Real Well in extremely wet conditions. A large waterfall was flowing in the pit, and their rope was rigged directly in the water. They were not wearing wetsuits. Szedmohradszky was not wearing a helmet.

After caving for about half an hour, Szedmohradszky began to feel uncomfortable and wished to exit. He rigged a climbing system consisting of a commercial seat harness, hand-tied chest harness, one Petzl handled ascender, and a Petzl Shunt. The handled ascender was attached to his harness by a long cow's tail and a chain of six non-locking carabiners. The Shunt was attached to a long foot sling.

Szedmohradszky climbed some distance up the pit, but began to have difficulty with the Shunt. He yelled to Fust that he was replacing it with a prusik knot. He made the change and began climbing again, but more slowly than before. After about 40 minutes he stopped climbing about halfway up the pit, hanging in the full force of the water. He tried to communicate with Fust, but could not be understood.

Fust called to him and told him to change over and rappel back down. After about 30 minutes, Fust heard him say clearly, "I can't!" Fust then got on rope and climbed up to and past Szedmohradszky, who was conscious but unable to move. Fust attempted to execute a pick off, but was unable to complete the maneuver and rappel back down. He then tried to climb out with Szedmohradszky tethered to his harness, but was able to ascend only 15 feet before becoming exhausted. Both cavers were now stuck on rope, hanging in the waterfall without wetsuits or other protective clothing.

As a last resort, Fust swung over to a ledge and got out of his seat harness to get off rope. He was shaking uncontrollably, and retreated to a dryer area on the ledge where he passed out. Regaining consciousness some hours later, he was able to re-rig his equipment and cut the tether to Szedmohradszky, who was by then apparently dead. Fust then climbed out of the cave and called for help.

Cave rescue personnel responded and found Szedmohradszky's body still hanging on rope in the waterfall. A doctor on the team examined him and noted that he had been dead for many hours. The body was recovered without difficulty. An autopsy revealed that he had died of hypothermia.

1. *Buddy Lane, Incident report, Chattanooga-Hamilton County Cave Rescue, undated.*
2. *Andrew Fust, Incident report, undated.*
3. *Beena Hyatt, "Caver found suspended in dark pit",* The Hustler*, South Pittsburg, Tennessee, v96n12, 23 March 1995, pp. 1,13.*

Comments: Szedmohradszky was reported to have visited only five caves previously. He had no wetsuit and no helmet and was using an unsafe, pieced-together climbing system. From his position on rope and the configuration of his equipment, rescuers concluded that he became stranded when one of the six non-locking carabiners he was using in a chain to attach his seat ascender became unhooked. He was left hanging by the cow's tail sling, which was so long that he could not reach the ascender. The prusik knot was also out of reach.

Chains of carabiners should not be used to attach ascenders to a climber's harness. Use a sling or a cow's tail for that purpose, with a single carabiner or quick link at each end. The attachment slings should not be so long that they leave the climber unable to reach the ascenders.

Both cavers should have been wearing helmets and wetsuits or other protective clothing. Fust reports that they had wetsuits, but left them in the car. It appears that neither caver was sufficiently experienced or prepared for a wet vertical cave. The pick off maneuver that Fust attempted allows a caver on rope to lower a stranded companion to the bottom of a drop. It is an important self rescue tool for vertical cavers. It requires practice, however, before you can expect to use it in a waterfall in the dark.

29 March
Lechuguilla Cave, New Mexico
difficulty on rope, equipment problem

A team of four cavers was exiting Lechuguilla Cave after a five day exploration and mapping trip. When Donald Davis began his ascent of the 145-foot Boulder Falls pit, using a three-Gibbs ropewalker system, his knee and foot ascenders failed simultaneously to grip the rope. He was stranded a few feet off the floor. Using an emergency prusik sling for his feet, Davis was able to complete the ascent in about a hour. The foot ascender later failed again at the 65-foot entrance pit.

Donald Davis, Incident report, undated.

Comments: Davis notes that the ascenders were about 30 years old. By his description, the cams were apparently extremely worn. They worked well enough on dirty ropes deep in the cave, but slipped on the newer, cleaner ropes near the entrance. It is a good idea to check and replace worn equipment before a big trip or expedition. Ascender cams need to be checked and replaced periodically. Gibbs cams should be replaced when wear is evident beyond the fourth tooth. Cams worn beyond this point will often slip.

March
unnamed dig, Vermont
rockfall, near-miss

While digging in a small cave in Vermont, a caver was nearly crushed when a boulder the size of a small refrigerator broke loose and fell toward him. Disaster was averted by a companion, who saw the rock start to move and grabbed the digger by the collar, pulling him to safety. The digger had dislodged the rock by pulling on a root in the passageway.

Larry Botto, "Falling Rocks! – To be or not to be flattened", Northeastern Caver*, September 1995.*

March
Los Juanitos, Mexico
bad air

The fourth expedition to Los Juanitos encountered bad air 600 feet below the entrance, as on the previous expeditions. Based on observation of the performance of a cigarette lighter, the cavers concluded that the oxygen content was below 17%. The cavers had brought oxygen cylinders to use at depth, but decided not to proceed.

Jonathan Smith and Steve Ford, "Exploration of Los Juanitos", NSS News*, v53n10, October 1995, pp. 271-272.*

Comments: See the summary and comments from the March 22, 1994 incident in the same cave. Entering a cave or other confined space with a hazardous atmosphere present requires special training and equipment. Even with air packs or air lines it is dangerous. Cavers should not attempt it.

Oxygen cylinders are not a substitute for SCBA air packs. In addition to low oxygen content, bad air in caves may contain toxic gases.

6 April
Clarksville Cave, New York
caver fall, injury

Mike Young led a group of 10 Westfield State College geology students on a trip into Clarksville Cave. It was the first caving experience for all ten students. On their way out of the cave they were about 100 yards upstream from the Big Room when Kelly Morrisey (20) bumped her helmet hard against the cave ceiling and lost her balance. She slipped on the muddy surface and fell, dislocating her knee. Young reached Morrisey about one minute after the accident. He decided to have her remain still and that help was needed.

Leaving the other students with Morrisey, Young took two students and exited the cave via the Ward Entrance. A space blanket was left to keep Morrisey warm. Once out, Young sent a student to a nearby restaurant to summon assistance. He left the students at the parking area to direct rescuers to the cave, and reentered the cave carrying a heavy wool blanket for Morrisey.

Rescue personnel soon arrived. Morrisey's leg was splinted and she was placed in a SKED litter. The whole group assisted in carrying her from the cave. Sometime during this process the dislocation reduced itself. Morrisey was taken to a hospital, where x-rays showed no broken bones.

Thom Engel, "Incident at Clarksville Cave", incident report edited and expanded from a report by Mike Young, undated.

Comments: Morrisey was a first-time caver, and was reported to have had problems with her knee prior to the trip. The group was equipped with helmets, but most did not have helmet mounted lights and were carrying flashlights. A helmet mounted light leaves your hands free to avert a slip or fall. Young should probably have taken someone with him when he reentered the cave.

8 April
Salamander Cave, Indiana
flood entrapment

Ronald Erb (19) and Elizabeth Hershman (19), both students at the University of Indiana, were trapped in Salamander Cave for 15 hours when a storm cell dropped over three inches of rain in the area. Rescuers were summoned when neighbors reported that the pair had not exited after they were seen entering the cave earlier in the afternoon. The rescuers were already in the area, having been called to nearby Trapdoor Cave when four people and two dogs were reported trapped by flooding.

The combination of the two flooding incidents provoked a massive response from rescue workers and the media. Cave rescue personnel were able to persuade authorities to wait for the water to recede rather than risking the lives of divers. By Sunday morning the water was down enough that a group of cavers was able to enter and bring out the stranded students, who had been waiting out the flood in a large room several hundred feet into the cave.

1. *Andrew Welsh-Huggins, "Explorers rescued from flooded cave",* Bloomington Herald-Times*, Sunday, 9 April 1995, p. 1A.*
2. *Marian Young, "Students safe after night in cave",* Bloomington Herald-Times*, Monday, 10 April 1995, p. 1A.*
3. *Sara Brazeal, "Rapid flooding traps IU students in cave",* Indiana Daily Student*, 11 April 1995.*
4. *Anmar Mirza, Incident report, 9 April 1995.*

Comments: Mirza noted that the two students were ill-equipped for caving, lacking helmets and carrying only flashlights. They had been told by a friend that the cave doesn't flood. In fact, flooding of the lower levels is well known to experienced local cavers. In 1975 three people drowned in the cave under similar circumstances when they tried to exit through the water rather than wait it out. Mirza notes that the danger in this cave is that the flood waters tend to sweep cavers down a side passage and into a sump.

When a safe area is available it is usually best for trapped cavers to wait out a flood rather than to fight the water and risk being swept into a sump and drowned. In most flood entrapments, the best course of action for rescuers is also to wait for the water to go down rather than risk the lives of divers and other rescuers. It is sometimes difficult for trained cave rescue personnel to convince local authorities and distraught family members that this is the best thing to do.

This rescue was complicated by uncertainty as to how many people were in the cave and the possibility that they might actually be in one of several other caves nearby. Consequently, those caves had to be checked as well.

8 April
Trapdoor Cave, Indiana
flood entrapment

Timothy Baker (17), Josh Baker (12), Nick Fizette (18), Aaron Lancaster (21), Derek Lancaster (26), and two dogs named Blackie and Socks were exploring Trapdoor Cave when they noticed the water rising rapidly. The cave is close to Salamander cave and was being flooded by the same storm cell. Derek Lancaster raced for the entrance and was able to make it out before it sumped. He went to a nearby house and called for help. The others were trapped in the cave and retreated to a dry area to wait. A large rescue operation ensued, but was of little help until the water level dropped during a lull in the storm. Taking advantage of the opportunity, a caver entered and was able to escort everyone out one at a time. He also retrieved the two dogs. During the evacuation the rain resumed and the water level began to rise. The evacuation was completed just before the water reached its earlier flood level.

1. *Andrew Welsh-Huggins, "Explorers rescued from flooded cave",* Bloomington Herald-Times*, Sunday, 9 April 1995, p. 1A.*
2. *Marian Young, "Students safe after night in cave",* Bloomington Herald-Times*, Monday, 10 April 1995, p. 1A.*
3. *Anmar Mirza, Incident report, 9 April 1995.*

Comments: The group was trapped for about four hours. They did not have helmets or other proper caving equipment.

29 April
Snail Shell Cave, Tennessee
stranded, inadequate equipment

Three men attempted to explore Snail Shell Cave using an inflatable raft to negotiate the flooded upstream passage, which extends for about 2,500 feet with water depths exceeding 10 feet. They each had one flashlight and were not wearing wetsuits or personal flotation devices. They managed to get about halfway through the passage before puncturing the raft on a rock projection. As it deflated, the three men swam to the side and managed to climb up into a breakdown room. One was a strong swimmer and volunteered to try to swim out using a mini-mag flashlight for light. Fortunately, he made it out and was able to call for help. He then headed back in with another raft. By the time rescuers arrived the group was exiting the cave.

Don Lance, "Rescue at Snail Shell Cave", TAG-Net *#411, 5 May 1995.*

Comments: Inexperience, inadequate equipment, and poor judgment. The swimmer was lucky that his flashlight didn't fail during his exit. If it had, he might have drowned. Experienced cavers wear full wetsuits and take personal flotation devices when exploring this cave. They also take proper caving lights and carry backup lights. Two of the men claimed to be former NSS members.

30 April
Helens Cave, New Mexico
caver fall, injury

John Leland (35), Leslie Gilkie (32), Ken Keeling (53), Sharon Chong (39), and Jackie Garcia (age unknown) rappelled into the entrance of Helens Cave and spent three hours exploring. They began to exit, taking turns free-climbing the 30-foot entrance drop using a Jumar on the rappel line as a safety. Chong was the third person to climb. When she reached the lip, she had difficulty finding holds and held on to the Jumar with her right hand as she moved up. Suddenly, she lost her footing and fell. The Jumar failed to engage and slipped on the rope, allowing her to fall 20 feet to the bottom.

Chong struck her lower back on the right side when she landed. Her backpack helped cushion the fall, but she became stuck in a crevice. She was quickly freed by Leland, and felt that she would be able to climb out. She rigged a second Jumar with a foot loop and climbed out without incident. She suffered bruises and abrasions on her back, shoulder, and arm.

Sharon Chong, Accident report, undated.

Comments: Chong notes that the Jumar was the yellow model with the hand grip. The rope was an 11mm dynamic climbing rope with a worn, fuzzy sheath. She speculates that the failure of the Jumar to grip the rope could have been due to the use of worn dynamic rope. Another possibility is that her hand was pulling on the ascender in a way that prevented the cam from functioning properly.

Jumar ascenders are not really designed to be used as a self belay device to catch falls, and may not be reliable when used for that purpose. Chong notes that a better option would have been to have one of the people at the top give her a conventional belay. Another would have been to simply climb the rope using standard vertical technique.

April
Black Cave, Arizona
solo caving, lost, light failure, fatality

Thomas Edward Benning entered Black Cave on a solo exploration trip in April, 1995. He had been in the cave several times before. He had no helmet, but was carrying an electric miner's lamp. He entered the cave and went down a somewhat obscure passage leading out of the entrance room.

About an hour into the cave, he left the normal travel route and went through a crawl into an area of unexplored cave. It is believed that he had become lost and was searching for the way out. At some point his lamp failed. He left it in the passage and apparently attempted to make his way out using matches for light. When these were exhausted, he apparently continued his search in the dark. He left various objects in the passages as he went, possibly to mark the route as he searched for the exit passage. Eventually, he climbed down into a tight, four-foot deep fissure where he became stuck.

When Benning did not return home by the next day, his wife called the police and reported him missing. About 24 hours after the report was made, his vehicle was located at the parking spot for Black Cave and several other smaller caves. The area was searched and his shirt and sunglasses were found in the entrance room of Black Cave. Local search and rescue teams were sent to the cave several times, but they were not familiar with the cave and did not find the opening leading to Benning. Cavers were never notified or called to help in the search.

On December 14, 1996, Bill Graff, Elizabeth Robb, and Dale Green entered the cave. It was Graff's second trip to the cave, and he was leading the way. About an hour into their trip they came upon a book of matches lying in the passageway. All the matches and the book itself had been burned. About eight feet further down the passage they found a Wheat Lamp. It was inoperative. In a nearby side passage they noticed a set of keys, the insole from a shoe, a torn trash bag, some clothing torn into strips, and a straw. They thought this was strange, but did not investigate further at the time.

The cavers continued their trip, returning to the area about three hours later on their way out. They decided to explore the passage where the keys had been found, which was about three feet wide and 18 inches high. Robb led the way, following the air flow to the right at a fork. She found a shoe in the passage, then a sock. A short distance further she came upon what appeared at first to be a clump of fur. Upon closer inspection it turned out to be the head of a body wedged in a crevice in the passage floor. The body appeared

to have been in the cave for quite some time, and was mummified to a great extent. The cavers photographed the body and the area, took the keys for use in identification, and left the cave, leaving reflective markers to indicate the route back to the body.

They reported the discovery to the sheriff's office. A deputy small enough to fit through the cave was sent to accompany them back to the site for a preliminary investigation. The deputy was unable to fit into the crevice, so Robb took additional photographs while the deputy examined the scene. Taking the shoe, lamp, and other items for evidence, they left the cave.

A body recovery operation was initiated, and the cavers volunteered to assist. Additional cavers were called in from outside the county. The recovery was complicated by the tight passage and the mummification of the body, and required three more trips into the cave. Benning was identified when his wallet was found in the crevice during the body recovery.

1. *Bill Graff, "Death in Black Cave", Incident report, undated.*
2. *Ray Keeler, Incident report, 13 January 1997.*
3. *Elizabeth Robb, personal communication, 26 February 1997.*

Comments: Benning told his wife that he was "going caving," but did not say where. He was discovered about 20 months after he entered the cave. The passage he took is hidden by a large rock a short distance into the cave and was not found by the searchers. Benning was in a fairly remote area off the normal route.

Cavers were aware of the cave and had quietly been mapping it for some time. It was a "secret" project, so maps and information were not generally available. The cave owner was reported to have been unaware of the cave until the body was discovered. No cavers were notified or involved in the original search in April 1995. Some of the searchers were reported to have had experience in mines, but not caves.

It is a good idea to let someone know where you are going, and to carry backup lights adequate to allow you to safely exit the cave. Solo caving is generally not a good idea. It is unknown how long Benning was trapped before he died. It is possible that he was still alive when searchers found his shirt in the entrance. Had cavers been called in at that point, with their map, experience, and knowledge of the cave, it is possible that Benning might have been found alive and rescued.

14 May
Hunters Cave, Iowa
asphyxiation, smoke bomb in cave

Neil Crider (19), his friend Lucas Thomsen (18), his brother Charles Crider (21) and Andy Cornwell (21), entered Hunters Cave for an afternoon of exploring. A short distance into the cave, Cornwell set off a military smoke grenade, apparently as a practical joke. Smoke from the grenade quickly filled the passage. The men were unable to see and were nearly overcome by the smoke and fumes. Realizing his friends were in trouble, Cornwell left the cave, soaked his shirt in a nearby stream, and held it over his face as he reentered. Holding on to each other, they were able to crawl out to the surface, where they were racked by nausea and vomiting. Charles Crider continued to have difficulty breathing, so the others rushed him to a nearby store and called for an ambulance. He was taken to a hospital and placed in intensive care. All four of the men suffered from smoke inhalation.

1. *Rema Graham, "'I thought we were dead'",* Quad-City Times*, 16 May 1995. p. 1M.*
2. *"Cave joke leaves 4 injured",* Associated Press*, 17 May 1995.*

Comments: Inexperience combined with extremely poor judgment. Caves are not the place for this sort of horseplay. Cornwell had recently been discharged from the service and had apparently kept the grenade as a souvenir. Neil Crider was quoted as saying that he would like to go caving again, but "probably not with Andy."

6 June
Foglepole Cave, Illinois
flooding, near-entrapment

Steve Taylor, Jean Krejca, and Don Webb entered Foglepole Cave to perform biological inventory work for the US Fish and Wildlife Service. Before entering, they noted that clouds appeared to be building. The forecast was for isolated scattered showers across the region. They decided to stay close to the entrance in case a storm started and to keep an eye out for rising water.

The cave has two entrances located in a large sinkhole with an in-flowing stream. Both entrances are gated, but the cavers had the necessary permit and key. A small trickle of water was flowing into the lower of the two entrances. The cavers entered through the upper entrance and went through several short low sections and one climb before reaching the main trunk passage about 350 feet into the cave. They began their collection work there, intending to remain near the entrance and keep an eye on the water level.

After working for a while, Krejca heard what she believed to be thunder and alerted the others. Moments later, the sound of rushing water was heard by all three. Taylor looked back toward the entrance and saw a muddy torrent of flood water coming down the passage. In about three minutes the stream bed changed from virtually dry to a 15-foot wide, one-foot deep flood. The group quickly grabbed their equipment and raced toward the entrance. The 15-foot long and two-foot high entrance crawl, which had been dry earlier, was now flowing with about six inches of water. They scrambled through the crawl and out of the cave. The lower entrance had become a nasty whirlpool in the bottom of the sink. It was raining steadily, but not as hard as they had expected to find.

When they walked back to their vehicle, they noted downed trees and wind blown vegetation. They later found that an extremely strong storm cell has passed directly over the cave and that a tornado had moved through the area. Apparently, the storm cell dumped a large quantity of rain in

the drainage area of the cave in a very short period, producing a flash flood.

Steve Taylor, "A Unique Trip to Illinois' Sinkhole Plain", Crawlway Courier*, v29n1, Winter 1995, pp. 1-3.*

Comments: Taylor notes that the group was aware of the risk from rain, but did not expect such an intense storm. Recent rains and flooding in the area may have left the ground saturated and increased the probability of flash floods in the cave. The cavers were well prepared with extra lights, extra clothing, and food, but wisely decided to stay near the entrance "just in case." Had the group gone further into the cave, they might well have needed the extra supplies during an entrapment. It is hard to believe just how quickly cave streams can rise to hazardous levels unless you have experienced the phenomenon.

11 June
Ferris Pit, Tennessee
tree fell on ropes, near-miss

Jeff Bowers, John Morgan, Tom Loring, Zane Grey, and Nelson Delk were visiting 251-foot deep Ferris Pit when a strong thunderstorm swept over them. Bowers and Delk were climbing on separate ropes when the storm hit. They were soon soaked by the water falling down the shaft. Strong winds and lightning racked the surface above. Suddenly, Bowers heard a loud crashing sound and his rope was jerked upward. Debris rained down the pit, covering the cavers with mud and leaves. Bowers climbed quickly to the surface and found that a large tree had fallen across his rope, barely missing the rigging tree. Delk's rope was unaffected.

Bowers was unable to communicate with Delk over the noise of the storm, and decided to retreat to a nearby barn for shelter while Delk completed his climb. During a lull in the storm he returned to the pit to check on Delk and was able get a response to his calls. He then retreated to the barn as the storm continued. When the storm abated, he ran back to the pit and found Delk climbing over the lip. The cavers observed seven trees down in the area around the pit.

Jeff Bowers, "Close Call at Ferris Pit", Speleotype*, v16n3, Fall 1996, pp. 52-53.*

Comments: Bowers notes that Delk was the least experienced member of the party, having done only one 80-foot pit prior to the trip. Bowers had been accompanying him on a second rope during the climb until the tree fell and he decided to go on up to find out what had happened. This unfortunately left Delk on rope by himself during the storm. It is a good idea to send novice climbers up in the middle of the party, so that there are experienced people above and below them if they get into trouble.

Climbing alongside the novice, as Bowers was doing, is also helpful when there is room to do so. In this case, the storm altered the cavers' plans and Delk was left on his own. Fortunately, he made it out without any problems.

21 June
Bowden Cave, West Virginia,
lost

Four unidentified novice cavers entered Bowden Cave. They made it through the first room and attempted to find the main passage back into the deeper regions of the cave. After searching for about 30 minutes, they returned to the first room, but were unable to locate the passage leading to the entrance. Anthony Clark and Eric Massa were present as part of a Wilderness EMT hypothermia class being conducted in the cave. They were able to lead the lost cavers back to the surface.

Robert Duncan, Incident report, undated.

21 June
Rainbow Falls Cave, Colorado
stranded, hypothermia

A group of teenage explorers became stranded in this small cave when they traversed a narrow ledge along the falls and swam across a 12-foot deep pool but were unable to reverse the procedure. The normally gentle creek was swollen by heavy spring runoff from the surrounding mountains combined with frequent afternoon thunderstorms. During the ensuing rescue, a firefighter suffered a shoulder injury when he slipped and fell while carrying a victim out of the water.

Richard Rhinehart, "Rescues Common at Rainbow Falls Cave", Rocky Mountain Caving*, v12n2, Spring 1995, p. 11.*

Comments: The cave had become a popular destination for local teenagers. The high water made the traverse and swim treacherous. The cave was the scene of four similar rescues in a five week period that spring, even though area newspapers repeatedly warned of the danger.

22 June
Bowden Cave, West Virginia
lost consciousness

During a National Cave Rescue Commission Eastern Region mock rescue at Bowden Cave, two volunteer cavers were being transported through the cave in a litter-bearing exercise. The route was about 1,500 feet from the Water Course to one of the entrances. After being transported about 300 feet one of the volunteer patients, a woman named Kim, lost consciousness. The exercise was immediately halted and a doctor was called to the scene. After about five minutes she revived. She was removed from the stretcher and escorted from the cave. The cause of her blackout was unknown.

Douglas Moore, Incident report, 21 September 1997.

Comments: Any time you are moving someone in a stretcher or litter you must keep a close watch for breathing problems, vomiting, or other difficulties. The person being transported is usually unable to move or take action to alleviate the problem without assistance. This is true even in a practice session.

30 June
Clarksville Cave, New York
lost, hypothermia

Three novice cavers from Schenectady arrived at the cave, but one decided not to enter due to concern over heavy rainfall. The other two, a man and a woman, went in through the Gregory Entrance. They went through Brinleys Sump, getting soaked in the process, and made it to the Slickenside Room before becoming disoriented. When the pair failed to emerge, their companion called for help. Two search teams entered via the Ward Entrance, and the pair were soon found along the Ward-Gregory connection route. The woman was suffering from hypothermia. Both refused medical attention, but were escorted from the cave.

Editor, "Northeast News", Northeastern Caver*, September 1995, pp. 75-76.*

1 July
Eon Cave, California
rockfall entrapment

Bill Kenney (47), Roger Jones, and Tim Studebaker entered Eon Cave in the Marble Mountains on a survey trip during a Klamath Mountains Conservation Task Force field expedition. The cave is about 300 feet long and is located in an alpine environment reached by hiking several miles over rough terrain. The cavers were working out of a base camp established for the expedition.

As they finished the survey, Kenney climbed up out of a small pit. He reached a ledge level with the main passage and placed both hands on it to raise himself up. As he did so, the ledge collapsed and a slab of rock six feet high, four feet wide, and two feet thick fell and pinned his left leg against a blade of rock on the left wall. His calf muscle was severely compressed, causing him great pain. Once the group determined that everything was stable and that they could not move the rock, Studebaker was dispatched to summon help from the nearby camp. During the wait, Jones used smaller rocks to try to break the slab or the projection and free Kenney, but was unsuccessful.

About an hour after the accident, Steve Knutson, Bonnie Crystal, and Ruth Schwartz arrived from camp armed with a pry bar and a radio. Knutson and Jones worked on the slab with the pry bar, but could not move it. They called back to camp on the radio and requested hammers and chisels, which were quickly brought to the scene. Using a large hammer, Knutson was able to break off the blade of rock that Kenney's leg was pinned against, releasing him.

Kenney was unable to walk, but managed to crawl and climb the 100 feet to the entrance with some assistance. He had been trapped for about two hours. His leg was examined and was found to have deep wounds on both sides of the calf. He was in mild shock and suffering from muscle spasms and severe pain. The wounds were bandaged and an air splint was applied.

A Stokes litter had been brought up from a nearby Forest Service guard station and Kenney was carried back down to the camp, where his wounds were cleaned and dressed. Arrangements were made by radio for a helicopter evacuation the next morning. Kenny was placed near the fire and made as comfortable as possible, with someone staying awake to watch over him through the night. The next morning he was carried up to the helicopter landing site and flown to the hospital. There were no fractures, and the deep wounds were closed with staples and sutures. He was given pain medication and IV antibiotics and released.

1. *Bill Kenney, "When is Two Hours an Eon?",* SAG Rag*, v14n4, July-August 1995, pp. 5-6.*
2. *Steve Knutson, "Eon Cave Incident"*, The Underground Express*, v15n3, Summer 1995, pp. 6-8.*
3. *Bonnie Crystal and Ruth Schwartz, "Rescue in the Marbles 1995",* San Francisco Bay Chapter Newsletter*, v38n7, July 1995, pp. 2-4.*

Comments: Knutson notes that the incident was handled very efficiently, but that they were fortunate that it was in a shallow cave and not very far from camp. A similar incident in one of the deeper, colder caves in the area would be quite serious. Given the size of the slab, Kenney's injuries were less severe than one might expect. The presence of emergency equipment was important, as was the radio which allowed them to arrange a quick evacuation. Knutson suggests having more rock moving tools available in the future as well as a SKED litter and a first response kit with hypothermia supplies for in-cave use. He also suggests establishing a formal emergency plan and communication arrangement with the Forest Service and regional authorities to allow emergency use of agency radio frequencies and rescue equipment.

1 July
Nielsons Cave, Utah
rockfall, injury

Robert Cranney (22) was rappelling the 315-foot entrance pit in Nielsons Cave when a large rock fell and struck him on the head. His helmet absorbed and deflected the blow, which knocked his two lights off of his helmet. Cranney immediately tied off his rack and called out to his companions that he had been hit and was bleeding. A caver on the bottom got on rope and climbed up to him to assist. He arrived at Cranney's position in about five minutes. Cranney felt at that point that he would be able to climb out on his own. He changed over to his ascending system and was able to climb out in about ten minutes. Two of his fellow cavers escorted him along the four mile hike back to the car and drove him to a hospital where he was treated. He suffered a cut on his head which required five stitches.

Robert Cranney, Accident report, undated.

Comments: Cranney notes that his helmet probably saved his life. We agree, and further suggest that the quality of a caving helmet makes a statement about the value the wearer places on its contents. Cranney remained calm, changed to ascent, and exited in good order.

8 July
Fulford Cave, Colorado
caver fall, injury

While chimneying up to a ledge, Susan Gray (48) slipped, kept her grip on a hold to stop her fall, and dislocated her shoulder. Paul Burger was spotting her from below and kept her from slipping back down a slope into the passage below. Upon examination, the cavers felt that she would not be able to exit without assistance, so Randy Reck and Steve Lester remained with Gray while Burger went for help. Lester and Reck rigged a heat tent using garbage bags and a candle and tried to keep Gray warm in the 35°F cave.

When rescuers arrived, the Incident Commander told Burger to go back into the cave, reset the shoulder, and start moving Gray toward the entrance. Though he was an experienced caver with some rescue training, Burger was not enthusiastic about this plan because he had no experience with shoulder dislocations and because the injured person was his mother. A paramedic showed him how to set and sling the arm and gave him a bag of supplies, so he decided to proceed.

Burger reentered the cave accompanied by the Chief of the Volunteer Fire Department and the two made their way back to Gray, flagging the route as they went in case others had to follow. Following the paramedic's instructions, Burger was able to reduce the dislocation, relieving most of Gray's pain. Her arm was placed in a sling and the group helped her out of the cave, belaying her on the climbs. Once outside the cave, she was found to have also sprained her ankle in the fall.

Paul Burger, "The Rescue Review", Rocky Mountain Caving*, v12n2, Spring 1995, p. 7.*

Comments: Reduction of a dislocated joint by an untrained person is somewhat risky. It is possible to cause significant injury if the procedure is not performed correctly. It was not clear from the report why the paramedic or other trained personnel did not enter the cave to perform the procedure.

Burger notes that he missed the sprained ankle in his initial examination, probably because the pain was masked by the greater pain of the shoulder injury. He suggests checking for additional injuries once the obvious ones have been treated. It is important to be thorough in the initial examination so that appropriate treatment can be applied and so that rescuers, if summoned, can bring in the necessary equipment and supplies.

10 July
Rainbow Falls Cave, Colorado
stranded, hypothermia

This was the second of four similar rescues which occurred at this cave in 1994. In this instance, the victims were four youths ages 12 to 20 who were stranded at the mouth of the cave after swimming across the pool to reach the entrance. They were reportedly unable to make it back across due to a strong undercurrent. The youths were treated for hypothermia, as was one firefighter involved in the rescue.

Richard Rhinehart, "Rescues Common at Rainbow Falls Cave", Rocky Mountain Caving*, v12n2, Spring 1995, p. 11.*

13 July
Superstitious Cave, Alaska
rockfall

Marcel LaPerriere and Shunichiro Go were to survey in Superstitious Cave on Heceta Island. As LaPerriere was digging in a stream passage which was formed down a bedding plane, a slab of ceiling came down on his helmet, which was about two inches below the ceiling. The slab was about three to four feet long, 18 inches wide, and four inches thick. The slab shoved him to the floor and broke upon impact. LaPerriere's neck was sore for the afternoon.

Kevin Allred, "1994 and 1995 Tongass Cave Project Expeditions Accident Report", undated.

Comments: LaPerriere points out that when digging one should watch the ceiling. Allred notes that the material disturbed in a dig can influence unstable material in the surrounding area.

16 July
Rainbow Falls Cave, Colorado
stranded, hypothermia

Third in the series of similar rescues at this cave, this incident involved Jesse Bolling (15) and Jerad McCuster (15), who became stranded on the ledge leading into the cave. Both suffered mild hypothermia before being rescued.

Richard Rhinehart, "Rescues Common at Rainbow Falls Cave", Rocky Mountain Caving*, v12n2, Spring 1995, p. 11.*

18 July
Pittsford Ice Cave, Vermont
caver fall, injury

Two local youths entered the cave via a small skylight entrance above the main room while a friend waited on the surface. That entrance can be chimneyed for about 15 feet of its 45-foot depth but bells out below and requires a rope to safely descend the drop. The boys were equipped with a 3/8-inch polyethylene rope and one flashlight each. They were wearing jeans and T-shirts and did not have helmets. They reached the floor of the cave by descending hand-over-hand and spent some time looking around before deciding to climb out.

They attempted to climb the rope hand-over-hand, both climbing at the same time. They had apparently reached the bottom of the chimney when the lower of the two (age 14) lost his grip and fell to the floor. There was a large buildup of ice sloping away from the wall which redirected much of the energy of the fall from vertical to horizontal. The youth suffered a broken right leg and numerous minor bruises and abrasions on his chest, arms, and hands. The youth who had remained on the surface called for help. The other youth descended to his injured companion and helped him to the main entrance and out of the cave. Rescue personnel arrived

and carried him down the steep ravine to the road, where he was taken to a hospital.

Kevin O'Classen, Incident report, 21 July 1995.

Comments: Inexperience, inadequate equipment, poor judgment. The hand-over-hand vertical technique claims another victim.

21 July
Moon Probe Cave, Alaska
caver fall, injury

Aaron Gissburg was on a survey trip on the first day of work in Moon Probe Cave on Dall Island. After descending pits of 135, 90, and 60 feet, he was standing on a muddy slab on the floor. The top of the slab was sloped and about 2.5 feet above the ground. His feet slid out from under him and he fell backwards. His left calf hit the edge of the slab and was badly bruised. It was sore for about 10 days. He exited the cave using a Texas system with the uninjured keg. The extreme soreness did not become apparent until after his exit.

Kevin Allred, "1994 and 1995 Tongass Cave Project Expeditions Accident Report", undated.

21 July
Rainbow Falls Cave, Colorado
stranded, hypothermia

Fourth in the series, this incident found a teenage boy named Sam Rude stranded on the same ledge as the 16 July incident. He was rescued and treated for hypothermia.

Richard Rhinehart, "Rescues Common at Rainbow Falls Cave", Rocky Mountain Caving*, v12n2, Spring 1995, p. 11.*

23 July
Moon Probe Cave, Alaska
caver fall, lost consciousness

Shunichiro Go (Japanese) and Sergay Levachev (Russian) were exploring and surveying at the furthest point of previous exploration in Moon Probe Cave on Dall Island during the Ketchicave Expedition. Shunichiro did not speak Russian and Levachev did not speak Japanese, so the two were using English to communicate. Neither was fluent in the language. Shunichiro was on rope cleaning rocks at the entrance of one pit while Levachev was trying to figure out how to rig a second pitch about 15 to 20 feet away. Levachev slipped and fell six feet or more, landing in a small depression in the floor. When Shunichiro returned he found Levachev unconscious. When Levachev regained consciousness, they determined that he had been out for three to five minutes. Levachev exited the cave under his own power and was examined by an EMT at camp. He exhibited no injuries other than a bruised leg.

Kevin Allred, "1994 and 1995 Tongass Cave Project Expeditions Accident Report", undated.

Comments: Allred notes that it was a good idea to exit the cave immediately, especially considering its remote location. Any time a caver is knocked unconscious it is time to leave and seek medical attention. Head injuries can be quite serious, and may not display immediate problems. Symptoms that may manifest following injury include: drowsiness, nausea, vomiting, and unequal or unresponsive pupils.

8 August
Lechuguilla Cave, New Mexico
caver fall, injury, stranded on rope

Brad Christian, an experienced rock climber, was climbing over some breakdown when he slipped and fell a short distance, striking his torso on the rock resulting in broken ribs. He was able to make the trip back to Boulder Falls, but became exhausted while climbing out and was unable to continue. He was about 60 feet up the rope in the 150-foot pit.

A second rope (kept at the top in case of emergencies) was lowered, and Art Fortini climbed up beside Christian to assist. Fortini executed a pick-off maneuver and lowered Christian to the floor with his rappel rack. A doctor was present and examined Christian, diagnosing broken ribs with no signs of lung involvement. She indicated that it would be safe to haul him up the pit as long as he avoided exertion or heavy breathing, which might result in a punctured lung.

Fortini left the cave to inform the Park Service and bring back hauling equipment and assistance for the operation.

Cavers and Park Service personnel returned with Fortini and a 3:1 haul system was set up. They decided to package Christian in a SKED litter and haul him in a vertical orientation to minimize the danger to Christian from the rockfall which gives the pit its name. The haul was executed without difficulty as Fortini climbed the rope alongside Christian.

At the top, Christian was removed from the litter and was able to make his way to the bottom of the entrance pit. There he was re-packaged in the SKED and hauled out. He was able to walk back to the car, and elected not to go to the hospital.

1. *John Lyles, "Incident at Lechuguilla",* Windy Passages*, v8n3, Fall 1995.*
2. *Art Fortini, "Lech Accident",* Cavers Digest *#5201, 14 August 1995.*

Comments: Christian was climbing using the two-ascender Yosemite system, which is similar to a Mitchell system but not as efficient, requiring more upper body strength. It also uses a chest harness, which placed pressure on the injured ribs.

The pick-off is a maneuver which allows a single rescuer to lower a stranded climber down the pit while on rope with or beside the climber. It is a very handy technique to know, and was used effectively to remove Christian from a dangerous situation. Fortini notes that bolts placed at Boulder Falls as a result of Emily Mobley's rescue made the haul system safer and easier to arrange. The rescue ran smoothly and quietly, with minimal media attention. Christian was out

of the cave about 17 hours after becoming stranded at Boulder Falls.

August
Rehobeth Church Cave, West Virginia
caver fall, injury

A woman from New York reportedly fell and broke her wrist while on a trip following the NSS Convention. Members of her party applied a splint and she was able to exit the cave on her own.

George Dasher, "Rockin' Chair", The West Virginia Caver*, v13n6, December 1995, p. 9.*

3 September
Bigfoot Cave, California
near misses on rappel, inexperience

Seven cavers entered Bigfoot Cave via the Discovery Entrance. The cave begins with a 75-foot entrance pit. At the bottom is a ledge leading to a second drop into the remainder of the cave. The first person down was a novice caver. For unknown reasons, he decided to get off rope on a narrow ledge halfway down the drop. A fall from this point would have been more than 100 feet in length. The second caver down found him on the ledge, clinging to a crack in the wall. He told the first caver to wait until he was clear and get back on rope to complete the descent. The first caver did this and soon was on the correct ledge at the bottom.

Other cavers descended and the group prepared to descend the second drop. A traverse line was rigged along the ledge and out to the rig point to allow cavers to remain clipped in while getting on rope. The novice caver approached the rig point to descend, but did not clip in to either the safety line or the main line. Another caver pointed this out and the novice caver replied that his safety ascender was in his pack. The novice caver began to rig his rappel rack, but became nervous and confused after putting on four bars. He took his rack off of the rope and moved away from the drop. Then, suddenly, he changed his mind and lunged for the rope. He pulled it back from the lip and started to rig his rack, placing three bars on the rope. As he moved toward the edge to rappel, one of the cavers stopped him and told him that if he went over on three bars he would not be able to stop and would fall to the bottom.

The novice caver became agitated and hostile. He took his rack off rope and began yelling at the other caver, announcing that he was leaving the cave. The other cavers continued down the drop, and the novice caver changed his mind and continued, this time using his safety ascender while getting on rope. Later the group split into two parties, and the novice caver left with the first group out.

Steve J. Davis, Incident report, 11 September 1995.

Comments: Novice cavers should not be sent down first, especially when they do not know the route. The novice caver may have thought that he was getting off onto the correct ledge. Someone more experienced or more familiar with the cave should have gone first. A safety ascender kept in the pack is useless and offers no added safety. It should be on the harness where it can be easily reached and used.

Rappelling on four bars is inadvisable. Rappelling on three is suicidal. It is usually a good idea to clip in with a safety ascender while preparing to rappel, especially when other cavers are on the bottom. There is always a possibility that someone may move or pull on the rope while you are rigging your rappel device, yanking you into the pit. It is also a good idea to clip in to a rope or safety line while standing or moving on an exposed ledge at the top of a drop. Judging by the emotional outburst, the novice caver was having some difficulty and feeling stressed. He probably should have been escorted out at that point, if not sooner.

3 September
Owl Cave, Virginia
stuck

Three cavers entered Owl Cave on Sunday morning, intending to explore the 3,000-foot cave and exit by the "back door," a small entrance on the other side of the ridge about 15 minutes from the main entrance. Two of the cavers were familiar with the cave and exited without difficulty. One remarked that the entrance was smaller and tighter than he had remembered. The third caver (33) attempted to exit and became stuck, right at the entrance, with his head and shoulders outside the cave.

The owner of the cave, Phil Lucas, was nearby with several other cavers who were camping on the property for the Labor Day weekend. They were within earshot of the entrance and responded to a call for help. Initially, the stuck caver thought that he just needed a couple of people to help pull him out. The sinuous passage made it difficult for him to push with his legs. Initial efforts at pulling, however, caused him considerable pain. A caver went back around through the main entrance to get behind him and try to help him back into the cave. Unfortunately, the caver had pushed forward as far as he could and was now unable to move in either direction.

The passage in which the caver was stuck occurs between several desk-size breakdown blocks which would have been difficult to move. The rescuers used a battery powered drill to make a row of holes along the edge of the rock and then hammered stonemason's wedges and shims into the holes to break out a section of rock. The process was repeated several times, removing rock in a gentle and controlled fashion, until the trapped caver was able to slide back into the cave. The process took several hours, and the small crowd of cavers who had gathered to watch raised an uproar at that point, insisting that the rescuers had gotten it all wrong by putting him back into the cave instead of getting him out. A few blows from a sledge quickly removed the remaining protrusions and allowed the caver to exit, four hours after he had become stuck.

Bill Royster, Incident report, undated.

Comments: Lucas notes that the wedges and shims are very useful in situations where rescuers have limited working room. They do not require much effort to use and can be used in close proximity to a patient without imposing

undue risk. The shims and wedges are available in various sizes. A portable rock drill is required to make the holes. When confronted with a tight spot, it is generally a good idea not to advance beyond your ability to retreat.

9 September
Blowing Sink Cave, Texas
rockfall, injury

A group of six experienced cavers were exploring the lowest level of the cave where they encountered large unstable breakdown. Five of the cavers entered a very low crawl. Lloyd Morrison was about to enter when some of the others turned around and started out. One of them grabbed a boulder which was balanced precariously over the entrance to the crawl and found it to be loose. The five in the crawl did not want to risk crawling under the loose boulder.

Morrison climbed to an upper level where a digging project had been in progress and returned with some boards which he used to brace the boulder. This constricted the crawl opening and only one of the cavers was able to fit through. Morrison again climbed to the upper level and returned with a hammer which he used to enlarge the opening until the four cavers were able to exit.

Morrison then decided to remove the hazard presented by the boulder. When he knocked out the bracing boards, the boulder immediately fell and blocked the crawl. Morrison attempted to push it out of the way. As he was pushing, the rock rolled suddenly to one side and caught Morrison's left hand between a sharp edge of the boulder and the wall. Morrison's little finger was severed just below the base of the nail. The end of the finger was attached only by a flap of skin and the bone was visibly shattered and protruding. The ring finger was also lacerated.

Morrison borrowed a glove from another caver to protect his hand, and exited the cave in about two hours. He went to the emergency room at a nearby hospital where a hand surgeon was called in to reattach the finger. The ring finger also required stitches. The reattachment was successful and the fingers made a complete recovery.

Lloyd Morrison, Incident report, 25 March 1996.

Comments: Use caution when dealing with unstable breakdown. It might have been better not to have entered the crawl, or to have left well enough alone once the cavers were out.

9 September
Hughes Cave, Alabama
caver fall, injury

Tommy Young (30) was exploring with two friends when he slipped and fell while climbing up a 20-foot pit. The men were caving with hand-held flashlights and did not have helmets. Young fell onto a pile of boulders, landing on his right side, and suffered internal and spinal injuries. He was about 2,000 feet into the cave when the accident occurred.

Two of his companions remained with him while another left the cave to summon help. The Huntsville cave rescue team was called, and Young was brought out of the cave in a seven hour operation. He was airlifted to a nearby hospital and admitted in stable condition.

1. *Christopher Bell, "Rescuers free Arab man from cave after 7 hours",* Huntsville Times*, 10 September 1995, p. A24.*
2. *Wes Coleman, Incident report, undated.*

Comments: Inexperience, inadequate equipment, exceeding abilities. A 20-foot climb should probably be belayed, especially when the consequences of a fall are severe. The men should have been wearing helmets and helmet-mounted lights.

24 September
Lundays Roadside Cave, Florida
bad air

John Martello (30) and Daniel Sloan (27) entered the cave intending to search for new cave in the Drain Passage beyond the Ordeal Squeeze. As he passed through the squeeze, Martello noticed that his breathing had become rapid and shallow and that he was sweating abnormally. He retreated from the passage and the two moved to another part of the cave.

Martello's breathing recovered somewhat, but he began to have difficulty again at the Flat Pass. In the Colossus Room they sat down to rest. By this time Sloan was also experiencing difficulty. The cavers became suspicious of the air quality and decided to leave immediately. As they neared the entrance and felt air flowing in their breathing returned to normal.

John Martello, Incident report, undated.

Comments: Martello notes that they had made previous trips to the cave without incident, but that the lower levels had been altered recently due to sand and silt movement by flooding. A cave entrance across the street had also been sealed recently, possibly affecting airflow in the cave. Cavers should be familiar with the signs and symptoms of bad air, and should exit immediately when bad air is suspected.

September
Scott Hollow Cave, West Virginia
lost

A group of local youths entered the cave without permission and became lost. They were reportedly rescued by the owner, who is a caver and NSS member.

George Dasher, "Rockin' Chair", The West Virginia Caver*, v13n6, December 1995, p. 9.*

14 October
Gage Cave, New York
lost, trapped by water

Five Rensselaer Outing Club members entered Gage Cave about 6:00 p.m. intending to explore the Lost Passage. All had full wetsuits and packs with two backup lights, food, and water. They passed easily through the low airspace and

reached the Battle Room at about 8:00 p.m. The group decided that, for the return trip, they would enter the water one at a time, yell at the low air space and then proceed through. Each person would then go down the passage trying not to make waves, and wait for the previous person to clear the low air space before proceeding. They hoped to avoid bunching up in cold water waiting to pass through the low air space.

Sarah Cutler was the coldest so she went first. As planned, at the low air space, she yelled back. Scott Stepenuck was next. He also yelled at the low air space and Joe Baj followed. Baj yelled and was followed by Thomas Howell and then Eric Kirchner. At the low air space Kirchner encountered Howell who said that Cutler and Stepenuck had gone down a side passage which appeared to sump. Stepenuck's yell had apparently been an attempt to report that Cutler was missing. Howell and Kirchner both tried the passage and found insufficent air to continue. They returned to the Square Room hoping Cutler and Stepenuck had gone on ahead.

Cutler had in fact not followed the S turn all the way and had gone straight, taking the wrong passage. She ducked through two small sumps and came up into a room which she thought would be the Square Room. When Cutler realized she was not where she should be, she called out to the others but received no response. She tried to retrace her route, but could not get back through the sumps. She returned to the small room and this time was able to make voice contact with Stepenuck, who had gone through the correct passage and was in the Square Room. They established that she was in a passage below the Square Room, but that the access was blocked by breakdown.

Kirchner and Howell returned to the Square Room, where Stepenuck reported that Cutler was in the chamber below. Hoping to help her find the way out, Howell went back through the low airspace and around to Cutler. Once there, he too felt that it was not possible to go back through the sumps. Both cavers were now stranded. Cutler was out of the water on a ledge, and was eating some food from her pack. Howell joined her on the ledge.

Realizing that Howell and Cutler were not in the water, Kirchner and Stepenuck saw two options: dig them out or use scuba gear. Either option would require assistance. Stepenuck and Baj went for help while Kirchner remained in the cave to provide support. Kirchner began to dig with what few tools he had and managed to create a triangular opening about 15 inches on each side. Cutler could not quite fit through.

Stepenuck and Baj went to the nearby home of Emily Mobley to call for help. When they were unable to rouse Mobley, they called the Sheriff. Mobley was awakened by the time an ambulance arrived, and proceeded to the cave with heat packs, extra clothing, and food. She entered and proceeded to the Square Room, which is not far from the entrance. The heat packs and food were given to the trapped cavers.

Thinking that others were following her and would soon arrive to help, Mobley stayed in the Square Room to help Kirchner dig. After removing one or two big blocks, Kirchner and Mobley were able to pull Cutler and Howell from the chamber. Cutler and Howell exited under their own power with some assistance at climbs from rescuers arriving at the cave. They were taken to a nearby hospital and treated for hypothermia.

1. *Chuck Porter, "Gage Cave Accident Report"*, Northeastern Caver*, December 1995, pp. 114-116.*
2. *Emily Davis Mobley, Incident report, undated.*
3. *Eric Kirchner, Sarah Cutler, Thomas Howell, and Scott Stepenuck, Incident report, undated.*
4. *Mike Hurewitz, "Rescuers pull RPI cavers out of deep trouble",* Albany Times Union*, 16 October 1995, p. B-2.*
5. *Lori Heymann, "Student rescued from Schoharie cave",* The Daily Editor*, Cobbleskill, NY, 16 October 1995, p. 1.*

Comments: The cavers went through the low-airspace separately to minimize waves. Cutler thought that she was in the correct passage but that the water had risen, until she reached the breakdown room and realized her mistake. She was then unable to get back through the two near-siphons that she had passed through on the way in. Howell hurried after Cutler because he was concerned that she was in trouble. As a result, he became stranded with her. If someone more familiar with the route had gone through the low-airspace first, the incident might have been avoided.

Kirchner notes that the initial rescuers brought in no digging tools, even though Stepenuck and Baj had asked for digging help. Porter reports that rescuers on the surface were expecting Mobley to come back out and report, and did not know what to send into the cave. Mobley indicates that she thought they would be coming in behind her, and therefore did not need to go out to report. In a more serious incident these small miscues could compound the situation. In this case they did not affect the outcome, but do serve to illustrate some important points for rescuers to consider.

It is important not to make a situation worse by getting additional cavers or rescuers stranded with the victim. It is also important to communicate with the surface during a rescue operation, especialy in the early stages. Written communication is preferable over oral messages. A pencil and paper are useful for first responders. Fortunately in this case, Mobley and Kirchner were able to free the trapped pair without too much difficulty. Everyone remained calm, and the incident was quickly resolved.

21 October
Hancock Cave, Virginia
trapped by rockfall

Darrin Smith (29) was in a group of seven experienced cavers who were exploring Hancock Cave. They were in a large trunk passage which appeared to end at a crawlway. Two cavers crawled through, but Smith decided to climb over the obstruction. As he began to climb, a section of wall and ledge broke loose, and two ten-foot square by seven to ten-inch thick slabs fell on him. He was knocked to the ground and his legs were pinned beneath the slabs.

The other cavers were able to move the 300-pound slabs and free Smith, who was found to have sustained only scrapes and bruises. The soft earth apparently cushioned the blow, and the flat shape of the slabs may have distributed the

weight evenly, preventing more severe injury. Smith was able to exit with assistance from his companions.

1. *Amy Shelton, Incident report, 17 November 1995.*
2. *Darrin Smith, "Omen of the Lights",* Underground Mountaineer*, v17n11, December 1995, p. 2.*

Comments: Smith was very lucky not to have been seriously injured. Loose rock comes in all shapes and sizes. Cavers must be suspicious of every ledge and hold. In spite of this, some incidents may be impossible to avoid. Loose rock is one of the fundamental hazards of caving.

1 November
Clarksville Cave, New York
lost

Four cavers from Hartwick College entered the cave, explored the Ward section and visited the Gregory end. In the process they waded through the Bathtub and became chilled. As the group was exiting the cave, some confusion developed regarding the route. At a junction about 100 feet in from the entrance there was a disagreement on how to proceed. Two of the party insisted on going through a low crawl, while the other two insisted on taking the larger passage. The first two took the crawl and exited the cave. Rather than go back through the crawl and retrieve their companions, they called for help. Thom Engel and Emily Mobley responded, along with local emergency services. The two missing cavers were quickly found in the Root Room and led out. Each had one functioning flashlight.

Editor, "Northeast News", Northeastern Caver*, December 1995, p. 109.*

18 November
Natural Well, Alabama
stranded in pit, inadequate equipment

Two men attempted to explore Natural Well sharing a single set of vertical gear, which they used in turn to descend the 180-foot deep shaft. The first man climbed out and dropped the equipment down for the man on bottom. Unfortunately, it landed on a ledge 50 feet above the floor, leaving the man stranded. The Huntsville Cave Rescue Unit pulled him out.

"Spelunker rescued from well", Huntsville Times*, 19 November 1995, p. B5.*

Comments: It is very poor form to share vertical equipment in a cave. Each caver should have his own complete rig. It is also very poor form to drop or toss gear down a pit. In addition to being dangerous for cavers at the bottom, it can damage the equipment, sometimes in subtle ways, making it unsafe for use. And, of course, it can leave you stranded.

23 November
Sotano del Pozo, San Luis Potosi, Mexico
rockfall, injury

Paul Aughey (28), Alan Cressler, Chris Hudson, and Jim Hewett visited Sotano del Pozo during a caving trip to Mexico. The cave begins with a 60-foot entrance drop down a steep, vegetated slope strewn with loose rocks. At the bottom there is a 376-foot pit, which also has loose rock around the top. They descended the first pit and rigged the second, placing rope pads and clearing debris from the lip. Cressler descended, clearing more loose rock as he went. He was followed by Hewett and Aughey

When he reached the bottom, Aughey found Cressler and Hewett crouching in a fissure 70 feet from the rope in order to avoid the rockfall zone. Cressler and Hewett climbed out, and Hudson descended. Aughey then began his climb. When he reached a point five feet below the lip, the rope popped out of a crevice and dislodged a football-sized rock. It fell and stuck Aughey on the front of his helmet, breaking his light.

He caught the rock with his right arm and held it while he turned on his backup light. He then looked for a safe place to put the rock. Finding none, he yelled "Rock!", waited for Hudson to take cover, and dropped the rock down the pit. Aughey received a cut on the bridge of his nose, a small cut below his left eye, and a black eye.

Paul Aughey, Incident report, 5 February 1996.

Comments: Aughey notes that the cavers cleared as much loose rock as they could before descending, rigged carefully, and climbed carefully to avoid causing rockfall. They also took care to stay out of the rockfall zone while on the bottom. In spite of these precautions, an injury occurred. Always be alert for rockfall around pits. It is sometimes unavoidable. Aughey's helmet prevented more serious injury. His helmet-mounted backup light allowed him to see after his main light was broken by the rock.

25 November
Laurel Caverns, Pennsylvania
caver fall, injury

Long-time caver Dale Ibberson was injured during a survey trip in Laurel Caverns when what he took to be a one foot step down turned out to be about three feet. He was reeling out tape to set a station when he fell and struck a rock with his hip, fracturing his pelvis. He was unable to stand.

Laurel Caverns is a commercial cave, and a party of tourists happened by shortly after the accident. They stayed with Ibberson while his companion, Jay Reich, went for help. A caver-employee of Laurel Caverns called in local cavers to assist. Within an hour of the accident, Ibberson was packaged and on his way out in a litter.

During the evacuation, a large group of fire and rescue personnel arrived, accompanied by reporters. No one was sure who had called them. They "blew past" the caver handling entrance control and entered without helmets and

lights. After some initial confusion, the evacuation proceeded without difficulty.

Keith Conover, Incident report and analysis, undated.

Comments: This incident was handled well by the rescuers involved, but demonstrates the importance of establishing a good working relationship with local fire and rescue agencies *before* an accident occurs. There were various miscues during the evacuation attributable to inexperienced and untrained rescuers among the cavers and fire department members. Joint training exercises between cavers and local rescue groups can be valuable. Even with that kind of practice and preplanning, things can go awry when people get excited.

2 December
Jewell Cave, South Dakota
caver fall, injury

Marc Ohms, Mike Wiles, Kelly Mathis, and Keen Butterworth were on a survey trip in a recently-discovered section of Jewel Cave. While mapping, the party had to descend a smooth 10-foot slope. Holding the survey tape in one hand, Mathis tried to chimney down. He slipped and fell about six feet. His right leg struck a sharp piece of breakdown causing a 6-inch long gash on his shin which left the bone exposed for two to three inches. They did not have a first aid kit, but improvised a bandage using a clean shirt and duct tape.

On the way out of the cave, they passed one of the in-cave first aid caches. The improvised bandage was holding up well, so they decided not to disturb the wound by changing the dressing. They took extra gauze pads and some pain medication from the kit and continued the 3.5 hour journey to the surface. Mathis was driven to the hospital, where he received treatment including 30 stitches and a course of intravenous antibiotics to prevent bone infection.

1. Mike Wiles, Incident report, 26 January 1996.
2. Marc Ohms, Incident report, 31 January 1997.

Comments: Wiles and Ohms note that Mathis could have attached the tape to his pack or lowered it to free his hands for the climb. They also note that it would have been helpful to have a small first aid kit with the party instead of relying on the in-cave rescue caches, the nearest of which was over one hour's travel from the accident site.

26 December
Easter Cave, Vermont
trapped by rockfall

While digging in newly-discovered Easter Cave, Bob and Tom Dion were pulling rocks out of the ceiling as they tried to get into an upper passage. Tom cleared an opening into the void above and stood up, placing his head and shoulders into the passage. He felt something brush the back of his head. Thinking that he had dislodged some small rocks, he ducked back down. Heavy breakdown slid into the opening, pinning his arm above him. He yelled for Bob, who reached him in a few seconds. They managed to free Tom's arm and moved away from the hole to recover. Suddenly a large avalanche of rock fell, sealing the opening.

Larry Botto, "Been to Any Good Digs Lately?", Northeastern Caver*, March 1996.*

Comments: Loose rock is endemic to digging projects. There is always the possibility of a collapse.

December
unnamed cave in Hart County, Kentucky
stranded, exhaustion, inadequate equipment

A stranded caver was rescued from a pit after becoming too tired to climb out. No details were available. The article suggested that the caver did not have proper vertical caving equipment.

Hart County, Kentucky, News-Herald*, 23 January 1996.*

Winter
Pig Hole, Virginia
stranded during pull-down

A group of cavers visiting Pig Hole planned to rappel into the upper entrance, pull the rope down, tour the cave, and exit by the lower horizontal entrance. They neglected to check the lower entrance beforehand, and were unaware that it was choked with debris. They were unable to remove the obstruction from inside the cave, and were stranded.

About three or four hours after the first group entered, a group of cavers from the VPI Grotto entered the cave. They had checked the lower entrance, but were not planning a through trip. They encountered the first group in the cave and made their rope available to the stranded cavers, who exited without further incident.

Report from NCRC Eastern Region web site, undated.

Comments: When contemplating a pull-down through-trip, be sure the lower entrance is open and that you know how to find it.

Winter
unnamed lava tube, Idaho
caver fall, drove snowmobile into entrance

A party of cavers went searching for caves in a snow-covered lava field using snowmobiles for transportation. The snow cover was about eight feet deep. One caver inadvertently drove over a lava tube entrance, fell through the snow cover, and was pinned by the machine hanging upside down about 10 feet above the floor of the cave. He was rescued by his companions and the machine was hauled out of the cave.

Scott Earl, Incident report, 12 April 1995.

1994 Cave Diving Incidents

February
unspecified Caribbean island cave
lost, stranded snorkeling in cave

While on a Caribbean island vacation, David Parks and his friend Gerry (last name unknown) heard from locals about a deep cave with a large pool. They decided to go exploring, and climbed down a 70-foot vertical shaft into the cave carrying snorkeling gear and diving lights. They found the pool, put on their gear, and proceeded to explore. At the far end of the pool they found a passage. They proceeded down the passage deeper into the cave, swimming from one air pocket to another. Eventually they surfaced in another large room. After sitting there for a few minutes they decided to exit the cave.

Parks led the way, but became disoriented and ended up heading off in a different direction from Gerry. The silt from the bottom clouded his view and added to his confusion. As his lungs began to burn, he realized that he was swimming deeper into the cave

Fortunately, Parks discovered an air pocket just in time. He was so desperate for air that he hit his head on the stalactites that hung from the low ceiling. He climbed up on a small shelf to rest and collect his thoughts. He was very worried that he might not be able to get out.

After a while, he put his mask back on and stuck his head into the water. Turning off his flashlight, he looked for any trace of light from Gerry or from the entrance. Gerry had exited safely, and was waiting at the other end of the tunnel. When Parks did not appear, he became concerned and began calling and shining his dive light back into the tunnel. Parks saw a hint of light in the milky water. Taking a deep breath he swam toward the light, surfacing next to his companion.

David Parks and Jennifer Rinne, "Snorkeler Lost and Trapped in an Underground Cave", Skin Diver*, v43n4, April 1994, p. 182.*

Comments: Inexperience, inadequate equipment, poor judgment. Parks writes that they did not realize how lucky they had been until they talked about the experience with some scuba divers afterward. Air pockets do not always contain breathable air, and the thick silt can take days to settle and clear the water.

27 March
Sotano de San Augustin, Mexico
lost consciousness during dive

Ian Rolland (29) was a member of a multi-national expedition to the Huautla Cave System, Sotano de San Augustin, Oaxaca, Mexico. The object of this project was to pass an underwater tunnel known as the San Augustin sump at the bottom of the system and push on to greater depths. The divers used an experimental closed-circuit rebreather apparatus (Cis-Lunar MK4) developed for the project by Bill Stone. All divers had received training in the operation and use of the apparatus.

In a series of seven dives during the first three weeks of the expedition, Noel Sloan, Steve Porter, and Ian Rolland penetrated about 750 feet into the sump at depths up to 80 feet. Water temperature was 64 degrees Fahrenheit and visibility was five to ten feet. There were no problems with the diving apparatus other than the discovery that the useful life of the lithium hydroxide canisters used for carbon dioxide removal was found to be about six hours rather than the expected seven to eight hours. This was attributed to colder water and more frequent use of the canisters than in the training dives.

On March 26, Rolland and Kenny Broad arrived at Camp 5 (the sump) to continue the exploration. In three dives on the 26th and 27th, they traversed approximately 1,400 feet of passage and broke out into a large air filled tunnel 60 feet wide and 40 feet tall. They decided that Rolland would make one more dive to push on from the chamber before they would return to Camp 3 with news of the discovery.

Rolland left Camp 5 at 4:00 p.m. on the 27th, anticipating a four hour tip. At 10:00 p.m. when he had not returned, Broad suited up and ascended to Camp 3 to organize a rescue party in accordance with a pre-existing plan.

At 5:00am on March 28, a team consisting of Bill Stone, Jim Brown, Rick Stanton, Paul Whybro, and Kenny Broad descended to the sump. A second rebreather unit was assembled and tested, and Broad prepared to dive. At 12:15 p.m. Broad entered the water and at 12:45 p.m. he reached the air-filled chamber. He noted footprints leading out of the water, across a sand bar, and back into the water. He swam around the sand bar and continued for about 50 feet along the surface until he spotted Rolland lying on his right side on the bottom in nine feet of water, with open surface above.

There was no sediment in the water, nor was there any silt on the body. The bottom was smooth and undisturbed. Rolland's mouthpiece was out and there was no sign of a struggle. The rebreather computer display indicated full tanks and a partial pressure of oxygen of 0.17. It appeared that Rolland began a second dive after traversing the first sump and sandbar, and that he passed out, sank, and drowned after spending some time tying lines near the surface. The direction of his dive line and the location of his body suggested that he was returning to the sandbar when he passed out. The rebreather computer depth sensor recorded a descent from the surface to nine feet at 4:57 p.m.

The following morning, March 29, at 8:37 a.m. Stone returned to the chamber and began a two hour investigation. Rolland's mouthpiece was in the closed circuit (rebreather) position. The oxygen cutoff valve on his rebreather was in the closed (off) position. Some of the divers, including Rolland, often turned off the valve when surfacing to conserve oxygen. By 11:30 a.m. Stone returned to Camp 5 with Rolland and the rebreather. The rebreather was tested and found to be functioning properly once the oxygen cutoff valve was

opened. It was subsequently used by another diver during the expedition without incident.

The body recovery took six days. An autopsy was performed one week after the accident and the cause of death was determined to be "asphyxia due to immersion in water." It was not listed as "drowning" because there was no water in the lungs.

1. *Bill Stone, "Accident Analysis",* Underwater Speleology*, v22n1, January/February 1995, pp. 15-25.*
2. *Don Broussard, Personal communications, November 1995.*

Comments: Rolland's location and position suggest that he re-entered the water to begin his second dive, began tying line, then started back to the sand bar, possibly in response to some sort of problem. On the way, he lost consciousness, lost his mouthpiece, sank to the bottom, and died. The reason for the loss of consciousness is unknown.

The rebreather computer contained a data log for the fatal dive. Information from the log was later downloaded, but in the process some data from the first few minutes of the dive were apparently lost. It was therefore not possible to determine exactly what happened prior to 4:57 p.m. when the computer recorded Rolland's descent to the floor of the passage. The rebreather system appeared to have functioned as designed.

The failure to re-open the oxygen cutoff valve was significant, but Stone argues in his analysis that this would not have resulted in hypoxia during the first few minutes of the dive, when the system was pre-charged with oxygen. Log data indicating an oxygen partial pressure of 0.24 at 4:57 p.m. would appear to support this. Without the missing log data it is impossible to determine whether Rolland breathed an hypoxic gas mixture during the first few minutes of his dive. In addition to the rebreather, Rolland carried a "bailout tank" of air for emergencies. It was not used. It also appears that he was swimming at or near the surface when he became unconscious.

Rolland was an insulin-dependent diabetic, and there was some speculation that an insulin imbalance might have contributed to the accident. The lack of evidence of struggle or convulsions, the presence of Rolland's unopened energy bars in his pouch, the fact that he was strong enough to walk out of the water and across the sand bar wearing 160 pounds of equipment, and the absence of water in his lungs do not appear to support this scenario.

6 April
Zacaton, Mexico
lost consciousness during deep dive

Sheck Exley (45) and Jim Bowden (52) entered Zacaton, a 1,025-foot deep cenote in Tamaulipas, on an attempt to set a world record for deep diving on scuba equipment. They had pre-placed two dive lines about 30 feet apart as well as additional air tanks for the lengthy decompression. Their plan was to descend quickly along the guide lines to the bottom at -1,025 feet and then start immediately for the surface. The water was murky, and Bowden lost sight of Exley about 850 feet below the surface.

Bowden developed a problem with his equipment and stopped his descent after 11 minutes at -925 feet. He began the nine-hour ascent to the surface. Observers on the surface noted that the stream of bubbles from Exley's tank stopped about 18 minutes into the dive. As he ascended and light from the surface improved visibility, Bowden discovered that Exley's decompression tanks on the adjacent line were untouched. The next day Exley's body was recovered. It was wrapped in the guide line at a depth of 906 feet.

1. *"Record try sees 1 man die, 1 man succeed",* Austin American Statesman*, 8 April 1994, p. A1.*
2. *Joy Waldron, "Death of a Cave Diver",* Underwater USA*, reprinted on the Diver Down BBS.*

Comments: Sheck Exley was widely known as an expert on cave diving and deep diving with scuba equipment. He was a diving instructor and had written extensively on diving and cave diving safety and techniques. He was the holder of the previous depth record (881 feet). It is thought that he blacked out during descent. He had reportedly experienced some difficulty with high pressure nervous syndrome on the earlier dive to 881 feet in South Africa. Diving at these depths is extremely hazardous.

April
Abaco Blue Hole, Bahamas
out of air

Two divers and their guide drowned while diving in the blue hole located in a creek. When Jason Hensley, (24) Matthew Craig Fidler, (17) and Ryan Christopher Smith (17) did not return to the surface after one hour a search was begun. The following day Fidler and Smith were found. However, it was not until 4 days later that Hensley's body was found after an extensive search by professional cave divers flown in from St. Petersburg, Florida.

1. *Bill Klimack, "In the Media",* NSS News*, v2n11, November 1994, p. 340.*
2. *Dianne Penn,* The Tribune*, city unidentified, submitted by Dennis Williams.*

May
Convict Springs, Florida
out of air

Two divers drowned in Convict Springs after silting the water. Their bodies were found within a few feet of the fixed line. No other information was available.

Bill Klimack, "In the Media", NSS News*, v52n11, November 1994, p. 340.*

May
Zoo Hole, Bahamas
out of air, inadequate equipment

Michael Brown (37) and Randy Smith (30) died while diving in waters near Freeport, Grand Bahamas. They entered a blue hole that led to a cave in about 120 feet of water. They did not use a guide line or lights, though both were reportedly available in their boat. Brown was a certified cave diver, who had been diving for over 20 years and taught courses in advanced diving. He had dived the cave previously. Smith learned to dive in the Navy and had worked as a commercial diver. Brown was found about 100 feet from the entrance. Smith was located the next day by two professional divers from Gainesville, Florida.

1. *Bill Klimack, "In the Media",* NSS News*, v52n11, November 1994, p. 340.*
2. *Newspaper article, source unknown, submitted by Dennis Williams.*

Comments: It is difficult to understand why a diver with Brown's reported level of experience would not use the available equipment.

17 July
Bakerston mine, West Virginia
equipment problem, rapid ascent

Edward Suarez Jr. (48) died during a dive in an abandoned limestone mine near Bakerston. Suarez and partner Abdur Choudri had begun the dive using air, and switched to trimix at a depth of 200 feet. They continued to the end of the fixed line at a depth of 285 feet and a penetration of 1,650 feet. They continued, laying an additional 150 feet of line and reaching a depth of 305 feet.

They turned the dive at that point and went back to the place where they had left Suarez' propulsion unit. Suarez tried to switch from his trimix double tanks to a trimix single, but was unable to get the regulator to work. Choudri gave him a spare regulator and shared a tank with him as they swam back up to 250 feet at the 1,200 foot penetration point. Both divers then switched to regular air, and they continued out using their propulsion units.

Choudri reported that they had traveled about 300 feet and ascended to a depth of 200 feet when Suarez "blew by me" and crashed into the ceiling of the passage. When he reached Suarez he found him dead. Running low on air, he left Suarez and completed his ascent. Suarez was reported to be a master diver and a PADI certified instructor. He had dived at the mine many times.

1. *Lamar Hires, "Accident Analysis",* Underwater Speleology*, v21n5, September/October 1994, pp. 10-11.*
2. *Eugene Meyer, "Experienced Scuba Diver Dies Doing What He Lived to Do",* The Washington Post*, 20 July 1994, p. D1.*

Comments: Hires notes that Suarez was not following the "rule of thirds" commonly used for air management in diving. His double tanks were empty and he was attempting to switch to what should have been an emergency reserve.

Suarez had a reputation for not following prescribed air management rules, and had reportedly been banned from several dive boats. One of the recovery divers was a friend of Suarez who had been involved in three previous out-of-air situations in which he had to give Suarez air during a dive. On a previous dive at this site, Suarez had experienced a deep water blackout at 210 feet while switching from bottom mix (trimix) to air. He was out for ten seconds with his buddy holding his regulator in his mouth until he came around.

The trigger of the propulsion unit was stuck in the on position. It is possible that Suarez became light-headed from the gas switch and became unable to control the propulsion unit, which then pulled him too high too fast resulting in embolism. The regulator failure may have been the first link in a chain of circumstances which resulted in the fatality.

1995 Cave Diving Incidents

7 July
Lake Apopka Cavern, Florida
out of air, inadequate equipment

The bodies of Kevin Gokey (26) and Daniel Smith (30) were found in 96 feet of water after they drowned while scuba diving in the cave. The divers were not using a guide line and had only two small lights each. They apparently became disoriented when they stirred up the silt and lost visibility, then ran out of air before they could find their way out. They had arrived at the cave by boat with several companions, and entered the cave with tanks holding about 45 minutes of air. When they did not return in an hour, their companions called authorities. They were not trained or certified in cave diving.

Newspaper article by Mary Murphy dated 7 July 1995, Montverde, Florida, source unknown, quoted on The Cave Diving Accident web site at http://grove.ufl.edu/~ken/cave-accidents.html, maintained by Ken Sallot.

Comments: Cave diving is an activity which requires extensive training and specialized equipment. Open water dive training and equipment are not sufficient.

14 July
Devils Den, Florida
out of air, inexperience

Samuel Williams (35) and Steven Dismukes (28) pulled down a fence which blocked the cave passage leading out of the large spring. The passage is reportedly "low flow

and high silt, as well as a tight squeeze." At some point during the dive, Williams noticed that Dismukes was missing. He returned to the surface for a fresh air tank and attempted unsuccessfully to locate Dismukes. Authorities were called, and summoned Woody Jasper, Lamar Hires, and Mark Leonard of the NSS Cave Diving Section. They found Dismukes's body in the cave in about 35 feet of water. Neither diver was trained or certified in cave diving.

Newspaper article dated 14 July 1995, Williston, Florida, source unknown, quoted on the Cave Diving Accidents web site at http://grove.ufl.edu/~ken/cave-accidents.html, maintained by Ken Sallot.

Comments: Inexperience, improper equipment. The fence was there for a reason.

15 July
Thunderhole, Florida
incorrect gas mixture

Robert McGuirre and Dell Moats were conducting a mixed gas dive involving two different nitrogen/oxygen mixes. Apparently the bottles were not marked for depth, but were marked as to the mix. McGuirre mistakenly took the 50/50 mix to 140 feet depth instead of the lesser nitrox, which he left at 70 feet. On the way out, McGuirre began convulsing during decompression. Moats was unable to save McGuirre, who drowned. There were no other divers present in the cave or on the surface for support. McGuirre was reported to have taken several Sudafed tablets shortly before the dive.

George Irvine, Incident report, 16 July 1995, posted on the Cave Divers Email List and quoted on the Cave Diving Accidents web site at http://grove.ufl.edu/~ken/cave-accidents.html, maintained by Ken Sallot.

Comment: This fatality resulted from something that could become more common in the future as and more cave divers take up mixed gas to explore to greater depths. The 50/50 mix (50% oxygen) is considered to have a maximum depth limit of only 70 feet. At depths greater than this, the oxygen in the breathing gas becomes more and more toxic as depth is increased.

Oxygen which is necessary to live becomes toxic when the pressure is increased above atmospheric. Oxygen toxicity comes on very rapidly, usually with no warning. The main effect is convulsions during which the diver drowns. If a diver is going to use more than one breathing gas during a dive, it is absolutely essential that the diver know which tank and regulator delivers which mix. – *Ron Simmons.*

17 August
Cenote Temple of Doom, Yucatan, Mexico
out of air, inexperience

A local open water diving instructor led five customers on a trip from Cozumel to the mainland to dive in several cenotes near Tulum. Their first dive at Grand Cenote was without incident. During the second dive of the day, at Cenote Temple of Doom, the guide led the clients out of the cavern region and into a cave passage known as the Madonna Passage. There were two warning signs near the passage entrance, which they ignored.

After swimming down the passage for a while, the guide turned back and found several of the other divers missing. Returning to the cavern zone, he found two divers out of air and one very low. He surfaced and swapped tanks with a client who had remained behind. He then went back to retrieve the others. He found one woman out of air but still alive and took her to the surface. He searched again and found a second woman and a man, both dead. The first woman was taken to a hospital, where she died later in the day.

Steve Gerrard, undated letter, quoted on the Cave Diving Accidents web site at http://grove.ufl.edu/~ken/cave-accidents.htm, maintained by Ken Sallot.

Comments: It would appear that poor air management was a factor. Ignoring warning signs is usually a bad idea.

22 August
unnamed sea cave, California
snorkeler trapped in sea cave

While snorkeling near La Jolla, William Jones II (21) followed a friend into a small sea cave located near Sunny Jims Cave. While in the cave he broke his mask and was apparently afraid to try to swim back out. His friend exited and led lifeguards to the cave. A veteran lifeguard was able to reach Jones by swimming into the cave with a small scuba tank. Jones was wearing a wetsuit and had a flashlight, and was able to exit using a second scuba tank brought in by the lifeguard.

Terry Rodgers, "Diver rescued from uncharted submerged cave", San Diego Union-Tribune*, 24 August 1995, p. B12.*

Comments: Improper equipment, inexperience.

6 September
Sharks Cove Lava Tube, Hawaii
out of air, inexperience

According to a newspaper account, two divers entered a submerged lava tube near a popular diving site known as Shark's Cove on Oahu's North Shore. They were reported to be searching for lobsters. They apparently stirred up silt and became disoriented. One diver found his way out, but the other did not. His body was found about 180 feet into the cave with no air left in his tank. The divers were not certified or trained in cave diving. Three divers were reported to have drowned in the area under similar circumstances several years earlier.

Anonymous undated report from the Cave Diving Accidents web site at http://grove.ufl.edu/~ken/cave-accidents.htm, maintained by Ken Sallot.

Comments: This appears to be another case of open water divers entering a cave without the necessary training and equipment.