

NSS NEWS

September 2005, Part 2



American Caving Accidents
2002-2003

**American Caving Accidents
2002-2003**

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Features

An Overview of the 2002 and 2003 Incidents	2
Caving Accident and Incident Statistics	4
Developing Judgment in Your Armchair.....	8
2002 Reported Caving Accidents and Incidents.....	10
2003 Reported Caving Accidents and Incidents.....	11
2002 and 2003 Reported Cave Diving Accidents and Incidents	12
2002 and 2003 Reported Caving-related Accidents and Incidents.....	12
2002 Caving Accident and Incident Reports	13
2003 Caving Accident and Incident Reports	26
2002 Cave Diving Accident and Incident Reports	42
2003 Cave Diving Accident and Incident Reports	43
2002 Caving-related Accident and Incident Reports	45
2003 Caving-related Accident and Incident Reports	47
The National Cave Rescue Commission.....	48

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Front Cover

Members of the Chattanooga-Hamilton County Cave and Cliff Team carry volunteer patient Lori Beth Armstrong through Raccoon Mountain Caverns in a mock rescue exercise. Photograph Copyright © 2005 Kris Green.

Back Cover

Students at the 2005 NCRC National Seminar move volunteer patient Pat Seiser past an obstacle in Mike's Wolf Cave during the final mock rescue exercise of the week-long training seminar. Photograph Copyright © 2005 Jeff Burns.

An Overview of the 2002 and 2003 Incidents

American Caving Accidents (ACA) is the journal of record for caving accidents and safety incidents in the United States and North America. This issue contains reports for incidents that occurred in 2002 and 2003. Following the custom of previous issues, 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. The cave diving incidents are grouped separately, and an overview is presented at the end of this section.

Since 1994 we have used the category “difficulty on rope,” to encompass such problems as becoming stuck at the lip of a pit, clothing or hair caught in the rappel device, jammed rappel safety, or simply becoming unable to ascend or descend. Our intent is to better describe these situations, which might otherwise be lumped under “stuck,” “trapped/stranded,” or perhaps “equipment problem.”

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

Incident Results

Fatalities

On average there are three or four fatal caving accidents in North America each year. When incidents involving untrained and inadequately equipped spelunkers¹ are excluded, the average drops to one or two fatal accidents per year.

In 2002 there were only two fatalities. Both involved inexperienced cavers who did not use proper safety equipment. The first occurred in May at Yo-yo Pit in New Mexico, when Joseph Lobato attempted to descend a 130-pit hand-over-hand to retrieve a lost cell phone. The second occurred in December at Bloomington Cave, Utah, when 17-year-old Kiley Jaquays lost her footing and fell down a steep slope in the cave.

There were six fatalities in 2003. In March, a 22-month-old boy fell into a cave entrance near his house and drowned in a pool at the bottom. Also in March, a woman was killed when she fell down a steep slope at the entrance to Gruta del Río Chontalcuatlán after being struck in the head by a falling rock.

As discussed in George Dasher’s editorial in the June 2003 issue of *American Caving Accidents*, the danger of water in caves should not be underestimated. In June, caver Allen Booth became trapped by rising water and drowned in Boundary Cave at Carter Caves State Park, Kentucky, after entering an active stream cave despite rainy conditions. About

¹ In the US, “cavers” generally consider “spelunkers” to be people who have no real knowledge or understanding of caves and caving safety, but who decide to enter a cave anyway, usually without proper equipment.

one month later, NSS member Bruce Brewer drowned in Climax Cave, Georgia, while apparently attempting to free-dive a sumped passage connecting two rooms in the cave.

In September, long-time caver and NSS member Dick Graham was killed by a fall in Lori Cori Canyon Cave, a part of Virginia’s Omega System, when his bobbin descender became detached from the rope shortly after he began his rappel down a 213-foot pit. Another rappelling accident resulted in a fatality when Dave Flannell, a BASE jumper with limited rappelling experience, lost control of his rappel rack and fell about 400 feet while descending the entrance drop at Sótano de las Golondrinas in San Luis Potosí, Mexico.

Injury and Aid

Incidents in this category resulted in injury to one or more people, who then required help in order to exit the cave. While many of these incidents involved rescue call-outs and outside assistance, others were resolved by the cavers themselves without calling for rescue.

There were fifteen incidents in 2002 in which cavers were injured and required rescue or assistance. Three involved cavers who were injured and trapped by rockfall or passage collapse. Another involved a group of cavers attacked by “killer bees” at Pozo de Gavilán in Nuevo León, Mexico. The remaining eleven incidents all involved caver falls.

In 2003 there were nine reported incidents in which injured cavers were rescued or required assistance. One incident involved a caver injured and trapped by rockfall at Land of the

NSS Membership and 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
1996	11140	43
1997	11470	43
1998	11685	32
1999	12098	44
2000	11773	40
2001	11967	34
2002	12261	31
2003	12264	35

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

Swirling Mists Cave in Colorado. In Mexico, a low-profile rescue was successfully executed at Cueva Cheve, Oaxaca, when a caver injured his knee while crossing a rebelay at a pit in the cave. Expedition members were well prepared, and brought in a litter and other rescue equipment from their camp outside the cave. The remaining seven rescues involved cavers injured in falls.

Aid, No Injury

There were four reported incidents involving uninjured cavers who required rescue or assistance in 2002 and fourteen reported incidents for 2003. Most incidents in this category 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, descend pits hand-over-hand, or get lost. Examples in this issue include the February, 2002, rescue at Connies Cave, California, and the March, 2003, rescue at Tiftonia Pit, Tennessee. In both incidents, individuals with no caving experience or equipment descended pits hand-over-hand and became stranded when they were unable to climb back up their rope.

Sometimes, however, even experienced and properly equipped cavers become ill and need assistance, or become trapped by rockfall or flooded passage. One such incident occurred at Trout Cave, West Virginia, in May, 2002, and involved a caver who was experiencing chest pain and other symptoms of a heart attack. Another occurred at Cemetery Pit, Georgia, in January, 2003, when a caver had a seizure while on rope in the entrance pit.

In December, 2002, a caver became stranded on rope in Coon Cave, West Virginia, when he was unable to make the transition from the climbing rope to a traverse line. In similar incidents in October, 2002 and June, 2003, cavers became stranded and required assistance at the 137-foot entrance pit in War Eagle Cave, Alabama, when they were unable to climb past a flowstone overhang at the lip. A group of cavers became stranded by flooding in Memorial Day Cave, West Virginia, in May, 2003, and required assistance to exit the cave. In August, 2003, a group of Scouts lost in Bear Cave, Pennsylvania, exited with help from the cave owner’s dog.

Injury, No Aid

These incidents resulted in injuries ranging from scrapes and bruises to sprained ankles and broken legs. In each case, the victim was able to exit the cave with minimal assistance from members of the caving party. In 2002 there were six reported incidents of this type, all resulting from falls. There were also six reported incidents for 2003. Two were caused by rockfall and three resulted from caver falls. The remaining incident occurred when a caver lost his footing while rappelling over a pit lip and slammed against the wall.

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 on a caving trip. Some of these incidents offer good illustrations of effective self-rescue or small-group rescue.

There were four incidents of this type reported for 2002. In January, a caver who became ill and passed out during a trip in Kennamer Cave, Alabama, eventually recovered and left the cave on his own. On May 10, cavers making a through-trip in

Idaho’s Crystal Ice Cave nearly became stranded when they pulled down their ropes after descending a pit, only to find the passage leading to the exit blocked by an unexpected amount of ice and snow. After some searching, they were able to dig their way through a small gap along one wall.

In two similar incidents at Hell Below Cave, New Mexico and Sótano de Cepillo, Mexico, cavers on rope climbing out of a pit discovered that the maillon link used to secure the seat harness of their climbing system had come unscrewed, probably due to movement of the rope against the screw gate during the climb. In each incident, the affected caver was able to secure the maillon and continue, but felt that other cavers should be aware of the problem.

Five incidents of this type were reported in 2003. In February, a caver dropped his ascenders down a pit while on rappel in Sistema de los Tres Amigos. His rope did not reach the bottom, but he was resourceful enough to use the end of his rope to fashion prusik knots and climb out. In April, a group of cavers was trapped for five hours by flooding in Onesquethaw Cave, New York, but was able to leave when the water level dropped. One incident involved a child who fell into a hole and the other two involved lost cavers who found their own way out before rescuers arrived at the cave.

Incident Types

Acetylene Hazard or Explosion

No acetylene-related incidents were reported for 2002 or 2003. It may be that the increasing availability of affordable high-quality electric headlamps has largely displaced carbide lights in US caving.

Bad Air

Two of the caving-related incidents reported in this issue involved bad air. Both were fatalities in abandoned mines, rather than actual caving accidents, however. Two men died in June 2002 while exploring Blue Light Mine in California. They were found in a flooded passage in 10 feet of water, but rescuers reported that the oxygen level in the mine was only 4%. It was not clear whether the low oxygen level was the primary cause or just a contributing factor. Bad air was clearly the cause of a fatality at the Maryland Mine in Idaho in 2003. In that incident, a man rappelled down a shaft in an abandoned mine to rescue a dog, but lost consciousness and died before he could be rescued. For a discussion of bad air in caves see Bill Mixon’s article in the April 2000 *ACA* and Bill Elliott’s article in the December 1997 *ACA*.

Caver Fall

Falls remain the leading type of safety incident or accident in caving, accounting for a large proportion of reported injuries and rescues. In 2002, for example, 20 out of 34 reported incidents involved falls. Many of the incidents could have been prevented by the use of a belay. Cavers should consider using a belay whenever the exposure of a climb or traverse is greater than a body length. Incidents at Ten Mile Pit, Carpenter-Swago Cave, Cassell Cave, and Buddha Cave in 2002, as well as Fort Stanton Cave in 2003 provide ample illustration.

A belay should be used with cable ladders, as illustrated yet again by the July, 2002, incident at Dynamited Cave, Washington, in which a caver lost her balance and fell near the bottom of a ladder climb.

Caving Accident and Incident Statistics 1986–2003

Result of Incident

Result	86	87	88	89	90	91	92	93	94	95	96	97	98	99	00	01	02	03
Fatality	4	3	4	1	4	6	5	5	1	2	1	4	4	4	2	5	2	6
Injury and Aid	10	15	11	16	18	16	17	22	19	17	16	22	14	14	20	11	15	9
Aid, no injury	21	15	20	20	23	20	28	33	26	17	16	13	12	18	15	13	8	14
Injury, no aid	10	15	14	14	10	12	10	4	11	8	10	4	2	8	3	5	6	6
No consequence	19	16	12	21	9	12	16	3	20	12	11	4	8	3	1	2	4	5
Total	64	64	61	72	64	66	76	67	77	56	54	47	40	47	41	36	35	40
Incidents Involving Fatality, Injury, or Aid	45	48	49	51	55	54	60	64	57	44	43	43	32	44	40	34	31	35

Incident Type

Type	86	87	88	89	90	91	92	93	94	95	96	97	98	99	00	01	02	03
caver fall	25	14	20	19	22	22	22	19	20	15	21	27	15	20	17	13	20	14
trapped/stranded	-	-	-	-	-	-	-	1	13	18	18	13	9	17	14	9	10	15
rockfall	12	17	7	11	11	12	16	11	12	10	5	5	2	4	2	3	3	5
lost	8	5	3	9	4	3	4	5	12	7	4	5	3	3	3	1	1	5
equipment problem	14	17	20	20	23	21	20	11	11	4	4	2	1	0	0	3	2	0
difficulty on rope	-	-	-	-	-	-	-	-	11	4	6	5	1	4	3	1	5	5
other	3	4	8	6	8	4	5	4	6	6	3	2	3	2	3	3	2	1
hypothermia	1	2	0	5	0	2	4	0	3	6	6	2	2	2	3	1	1	3
exhaustion	0	1	1	3	0	2	4	2	4	1	4	1	1	2	3	1	2	1
flooding	1	3	3	4	2	2	1	3	1	4	5	2	1	4	1	1	0	6
bad air	3	2	1	1	1	2	1	1	2	2	1	0	1	0	1	0	0	0
acetylene	3	0	1	1	0	0	0	1	3	0	1	0	0	0	0	0	0	0
illness	0	0	2	3	2	1	0	3	3	0	1	1	8	0	2	2	2	1
stuck	3	1	0	1	1	3	5	5	2	1	2	0	1	5	3	5	0	1
drowning	1	2	0	2	2	2	2	0	0	0	1	0	0	1	0	1	0	3
Caving-related Incidents	-	-	-	-	-	2	1	0	2	0	1	1	5	2	11	2	9	4

Cave Diving Incidents

Result	86	87	88	89	90	91	92	93	94	95	96	97	98	99	00	01	02	03
Fatality (one or more)	7	5	9	4	8	2	5	4	6	5	2	2	0	5	7	9	3	5
Injury and Aid	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
Aid, no injury	1	0	0	0	0	1	1	0	0	1	0	0	0	1	0	0	1	0
Injury, no aid	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0
No consequence	1	2	1	1	0	5	1	0	1	0	0	0	0	0	0	0	0	0
Total Diving Incidents	9	7	10	5	8	8	7	4	7	6	2	2	1	7	8	9	4	5

Cavers also fall on occasion while moving through “horizontal” passages, accounting for a number of accidents reported in this issue. The 20 reported incidents in 2002 involving falls include accidents in Bowden Cave, West Virginia, and Kaumana Cave, Hawaii, both in March. Similar incidents occurred in Langdons Cave, Indiana, and Morris Cave, Vermont in July and in Martin Cave, Missouri, and Cave Mountain Cave, Arkansas, in August.

An unusual incident occurred in Hawaii in September when a firefighter searching for some missing hunters stepped onto vegetation covering a 100-foot pit entrance to a lava tube. He was seriously injured, but survived the fall and eventually recovered. Cavers injured in falls are often able to exit with the help of their companions, as demonstrated in incidents at Howards Waterfall Cave, Georgia, in September, and Lechuguilla Cave, New Mexico, in November. Finally, a caver died from injuries sustained in a fall in Bloomington Cave, Utah, in December.

Only 14 of the 41 reported incidents for 2003 involved falls, but three of those incidents resulted in fatalities. As mentioned above, a visitor to Gruta del Río Chontalcuatlán died after a fall at the cave entrance. The other two fatal falls occurred to cavers who were attempting to rappel deep pits. As noted above, Dick Graham was killed in a fall in Virginia’s Omega System in September when his descender became detached from the rope, and Dave Flannell died in November from injuries sustained in a 400-foot fall when he lost control of his rappel while descending the 1,100-foot entrance shaft of Sótano de las Golondrinas.

In other 2003 incidents, cavers were injured in falls at Pettijohns Cave, Georgia, Rocky River Cave, Tennessee, and Lechuguilla Cave, New Mexico, but were able to exit with assistance from their companions. A Boy Scout was rescued after a fall in Laurel Caverns, Pennsylvania, in April, and another was rescued from Fort Stanton Cave, New Mexico, in June. Both were injured in falls.

In what may be the first reported incident of its kind, a Russian BASE jumper broke his leg in Mexico’s Sótano de las Golondrinas in February, 2002, when he delayed opening his parachute in order to set a record for the longest free-fall in the 1,100-foot pit. He was hauled out with a motorized winch.

Drowning

Drowning incidents are infrequent in “dry caving,” but have occurred when cavers became trapped by flooding or when they attempted to free-dive through sumped passages. Both types of incidents are represented in this issue.

There were no drowning incidents reported in 2002, other than the cave diving incidents discussed below. In caving-related incidents, however, two men drowned in June while exploring an abandoned mine in California and another man drowned in Hawaii when he fell into a blowhole.

In 2003 there were three drowning incidents reported. The first occurred in March when a toddler fell down the 25-foot entrance shaft of a small cave near his house and drowned in a pool at the bottom. Three cavers were confronted by rising water in Boundary Cave, Kentucky, in June. Two of the men escaped, but Allen Booth became trapped and drowned when the passage flooded. The third incident occurred when Bruce Brewer drowned while apparently trying to free-dive a flooded passage connecting two rooms in Climax Cave, Georgia.

Equipment Problem

This catch-all category includes rigging failures, slipping ascenders, light failure, rope failure, and misuse or lack of equipment. The most notable incidents in this category were two incidents in 2002 involving maillon screw-links used to secure seat harnesses coming unscrewed while the cavers wearing them were climbing out of pits. In one instance, the caver had accidentally attached the maillon to her harness backwards, increasing the tendency of the moving rope to open the screw gate as she climbed. In the other instance, it was not clear whether or not the maillon was installed in the preferred right-to-left orientation.

Flooding

There were no reported incidents involving flooding in 2002, but six incidents were reported for 2003. Two of these involved people who were trapped in sea caves by rising tides and required rescue. In April, a group of cavers was trapped in Onesquethaw Cave, New York, for about five hours when a section of passage flooded, blocking their exit route. In May, cavers on a survey trip in Memorial Day Cave, West Virginia, were stranded when heavy rains caused flooding which delayed their exit. Several men were trapped in a lava tube cave in Hawaii in November when a cloudburst caused the stream flowing into the cave to rise rapidly. In each of these incidents, the stranded cavers were rescued or were able to leave once water levels dropped.

As mentioned above, a fatality occurred in June, 2003, when three cavers entered Boundary Cave, Kentucky, on a rainy day. Allen Booth was unable to make it out of the cave when the stream flowing into the entrance rose suddenly and flooded the cave.

The lesson taught by these incidents is simple: pay attention to the weather conditions. Check the forecast for the caving area, and be alert for the possibility of flooding. If the cave is known to flood and you don’t have a clear forecast, go somewhere else. It’s just not worth the risk of entrapment, rescue, media attention, closed caves, injury, or death. For more on the dangers of water caves, see George Dasher’s editorial in the June 2003 *ACA*.

Hypothermia

Hypothermia is usually a secondary result in the reported incidents, occurring subsequent to cavers becoming injured, stranded, or trapped in a cave. There were several incidents involving lost or stranded cavers in which some of those rescued required treatment for hypothermia. Remember: hypothermia can kill you all by itself, but it also impairs your thinking and judgment, making bigger mistakes more likely.

Illness

A caver fainted due to exhaustion or overexertion during a January, 2002, trip in Kennamer Cave. In May 2002 a caver suffered an apparent heart attack in Trout Cave, West Virginia. He was evacuated from the cave and taken to a hospital for treatment.

In January, 2003, a caver suffered a seizure while on rope climbing the 153-foot entrance drop of Cemetery Pit, Georgia. Another caver helped her get off rope onto a ledge, where she waited until rescuers arrived and rigged a haul system to pull her up the drop.

There were no reported incidents for 2002 or 2003 of histoplasmosis infections due to caving.

Lost

Most of these incidents involved untrained and ill-equipped cavers with little experience. Many escalate to the “stranded” category when the batteries run out or flashlights get broken. When found, lost cavers often require treatment for hypothermia, sometimes including hospitalization.

The single reported incident of this type for 2002 involved a poorly-equipped group of inexperienced cavers at Bowden Cave, West Virginia, in April. There were five reported incidents involving lost cavers in 2003, including two incidents at Bear Cave, Pennsylvania, in August and October.

In May, 2003, an experienced caver was lost for about five hours in Minotaur Cave, Washington, when he entered a “small cave” solo and subsequently became disoriented and unable to find the exit. He found his way out just as searchers were beginning to arrive at the entrance.

Rockfall

As always, rockfall incidents accounted for several serious accidents and incidents during the reporting period, resulting in injuries and rescues as well as several cases of entrapment. There were three reported rockfall incidents for 2002 and five for 2003.

In February, 2002, a breakdown collapse in Three Falls Cave, New York, seriously injured two cavers, one of whom was trapped until rescuers freed him after several hours of effort. Two teenagers were rescued from Wyoming’s Tongue River Cave in June when a boulder shifted and trapped them in a small passage. In October a caver was pinned and injured by rockfall during a dig in Maxwelton Cave, Virginia.

A woman died in the entrance of Mexico’s Gruta del Río Chontalcutlán in March, 2003, when she fell down a steep slope after being struck in the head by a rock dislodged by another visitor climbing above her. Also in March, an experienced caver was trapped by rockfall in a small crawl in Womer Cave, Pennsylvania when a rock fell onto his legs as he crawled beneath a breakdown pile. Two other cavers were trapped in the passage behind him until he was freed.

Another entrapment occurred in June, 2003, during a dig in Land of the Swirling Mists Cave, Colorado, when a slab of rock separated from the ceiling and fell onto a caver. His companion was able to remove enough rocks from around and underneath him to allow him to wriggle free, but he suffered broken ribs and other injuries.

Also in 2003, cavers were stuck by falling rock in pits at Nellies Cave, Virginia, and Schlitz Pit, Arkansas, but escaped with minor injuries. These incidents, while less serious than the entrapments mentioned above, illustrate the danger of standing in the fall zone at the bottom of a drop.

Stuck

Despite popular perception, getting stuck is not much of a hazard for experienced cavers. Most victims are inexperienced cavers who just need a little coaching and assistance from their companions. In May, 2003, however, an inexperienced caver became stuck in a crevice in Buckners Cave, Indiana, and required rescue. He was freed after 17 hours in the cave when rescuers managed to remove a small rock from the crevice, allowing him to slide down to larger passage below.

Trapped/Stranded

This category is used to describe incidents in which the caver or cavers are prevented from exiting the cave by

rockfall, light failure, lack of equipment, equipment failure, or other causes. In many of the reported incidents, “spelunkers” became stranded due to inexperience, inadequate equipment and/or poor judgment.

There were ten reported incidents of this type in 2002. As mentioned above, three of these were rockfall entrapment incidents at Three Falls Cave, New York, Tongue River Cave, Wyoming, and Maxwelton Cave, West Virginia. An incident in February at Connies Cave, California, involved cavers stranded in a pit after descending hand-over-hand. Poorly-equipped “flashlight cavers” were also rescued from Bowden Cave, West Virginia, in April and at Casparis Cave, Pennsylvania, in August when their flashlights failed and they had no backup lights.

In May, 2002, a group of experienced cavers was briefly trapped by snow and ice in Crystal Ice Cave, Idaho, during a pull-down through-trip in the cave. In August, a caver was rescued from Cemetery Pit, Georgia, after becoming stranded on a ledge in the 153-foot entrance pit. The remaining incidents involved experienced cavers stranded on rope at War Eagle Cave, Alabama, and Coon Cave, West Virginia when they were unable to maneuver past obstacles on rope.

In 2003, there were fifteen incidents involving trapped or stranded cavers. Two of these were rockfall entrapments at Womer Cave and Land of the Swirling Mists Cave and four were flood entrapments at Onesquethaw Cave, Memorial Day Cave, Boundary Cave, and a lava tube cave near Kailua, Hawaii. Two men were rescued from Tiftonia Pit, Tennessee, in March when they descended the 80-foot pit hand-over-hand and were unable to climb out. Two boys were rescued from Midnight Cave, Texas, in a similar incident in April. Also in April, a group of teenage flashlight cavers was rescued from Cave Hill Cave, Illinois, after they became lost in the cave. Two other incidents involved individuals who became stranded in sea caves and required rescue.

An incident involving two stranded cavers at Hubbards Cave, Colorado, garnered national attention in August, 2003, when a man and a woman were found in the cave after being missing for almost five days. There was some speculation that the incident was staged, but family members insisted that the two had been in the cave the entire time, and that the search had been poorly managed.

Several incidents also occurred in which experienced cavers became stranded on rope and required assistance or rescue. In January, 2003, a caver was rescued from Cemetery Pit, Georgia, after experiencing a seizure while on rope. In a near-replay of the October, 2002 incident at War Eagle Cave, Alabama, another caver became stranded at the overhanging flowstone lip of the 137-foot entrance pit in June. Finally, in November a caver was unable to climb an eight-foot “nuisance pit” in Wind Cave, New Mexico, and had to be rescued.

Exhaustion

There were two incidents reported in 2002 in which exhaustion was a factor. The first occurred in January at Kennamer Cave, Alabama, when a novice caver attempted to drag an external-frame backpack through a 500-foot crawl in the cave. The other took place at Cemetery Pit, Georgia, when novice cavers became exhausted and stranded while trying to climb the 153-foot entrance pit using prusik knots. One reported incident involving exhaustion occurred in 2003 when

a caver failed to secure her seat harness properly, allowing it to slip down around her knees as she struggled to climb a small pit in Wind Cave, New Mexico. When she became exhausted and lost sensation in her lower legs, her companions called for rescue.

Several incidents have occurred in recent years involving cavers who became exhausted while climbing, either on rope or on cable ladders. This type of incident is potentially fatal due to the rapid onset of harness-induced pathology (also known as “harness-hang syndrome” or “suspension trauma”). Studies have shown that an immobile caver hanging on rope can lose consciousness in a matter of minutes, with death occurring soon after.

A number of articles on the subject are now available on the Internet and can be found with any search engine. A 2002 report prepared by Paul Seddon for the British Health and Safety Executive provides the most comprehensive review of research and literature on the subject published to date.² Additional reports and information may be found in the Internet by searching for the terms “suspension trauma,” “harness-hang syndrome,” and “harness pathology.”

The findings of the studies are quite serious: an exhausted or hypothermic caver left suspended can lose consciousness and die in a matter of minutes. Learn how to get yourself or another caver off rope with a change-over or pick-off.

Difficulty on Rope or Ladder

This category includes cavers who become stranded on rope and require assistance, or who experience significant difficulties and require assistance to complete their ascent or descent. Five such incidents were reported in 2002. One involved novice cavers attempting to use prusik knots to climb 153-foot Cemetery Pit. Another involved an experienced caver in Cassell Cave, West Virginia, who was attempting a change-over but failed to tie off his rappel device before removing his safety ascender. He broke his leg in the resulting fall.

Possibly the most frightening incident of this type was the “killer bee” attack at Pozo de Gavilán in June, 2002, when cavers climbing the 285-foot entrance pit were attacked and seriously injured after disturbing a colony of Africanized bees. The two remaining incidents occurred at War Eagle Cave, Alabama, and Coon Cave, West Virginia, when cavers were unable to negotiate past obstacles while ascending.

There were five reported incidents involving cavers who had difficulty on rope in 2003. In February, a resourceful caver performed a self-rescue after he dropped his ascenders down a pit while passing a rebelay on rappel in Sistema de los Tres Amigos. Another rebelay incident occurred a few days later when a caver injured his knee while crossing a rebelay in Cueva Cheve. In May, a caver was injured when he lost his footing and slammed into the wall while rappelling over the lip of Fountain Pit in Alabama. Also in Alabama, another caver became stranded at the overhanging lip in War Eagle Cave in June, requiring assistance. The final incident involved a caver who failed to secure her seat harness properly and was unable to climb a small pit in Wind Cave, New Mexico.

Some of the cavers involved in these incidents were relatively inexperienced and did not know how to use their gear. Others were experienced cavers who were simply out of

practice or out of shape. Some were unable to deal with situations such as crossing the lip of a pit with weight on the rope below, crossing an undercut or overhanging lip, changing from rappel to ascent and vice versa, or climbing a cable ladder. Clearly, competent cavers must master their systems and know how their equipment works. With practice, skilled cavers can perform a change-over in less than 60 seconds. Spend some time practicing; it could save your life.

Other

This catch-all category includes cars driven into sinkholes, cuts by sharp rocks, dislocated shoulders, twisted ankles, animal attacks, and other incidents not covered above.

Cave Diving Incidents

In 2002, there were four reported cave diving incidents, all of which occurred in Florida, at Little River Spring, Devils Ear Spring, Bat Colon Cave, and Orange Grove Sink. Three of the incidents resulted in single fatalities, and one resulted in the surprising rescue of a stranded diver at Bat Colon Cave. The three fatalities all involved experienced and certified cave divers who lost consciousness while under water. The diver rescued from Bat Colon Cave was not cave-certified.

In a caving-related accident in February, diver Dale Fisher drowned while exploring a flooded mine in Pickens County, Georgia. He was using cave diving equipment and techniques, but was not a certified cave diver. The incident involved several days of searching before his body was recovered. News reports referred to the abandoned mine as a cave or cavern.

Five cave diving incidents were reported in 2003. Three took place in Florida, with one fatality at Cow Spring and two at Little River Spring. The Cow Spring fatality appears to have resulted from a loss of consciousness during the dive. The victim was a certified cave diver. One of the Little River Spring fatalities occurred when a diver collapsed and died, possibly due to an embolism, shortly after exiting the cave and leaving the water. The other occurred when a diver lost the guideline in silted conditions. Both victims were also certified cave divers.

One incident, also a fatality, occurred at Roubidoux Spring in Missouri when a diver ran out of air and became separated from his companions while leaving the cave. The victim was a certified cave diver. Another incident resulted in two fatalities at Ocean Blue Hole, near Andros Island in the Bahamas, when two open-water divers failed to return from their dive.

Caving-related Incidents

Once again we have a curious assortment of caving-related incidents, including bodies found in caves, people trapped, drowned, or asphyxiated in abandoned mines, and cars driven into sinkholes.

In 2002 there were nine reported caving-related incidents. The first occurred in February at State Trooper Cave, Kentucky, when a section of road collapsed into the cave, swallowing a pickup truck. The second was the diving fatality in Pickens Cove Mine, described above.

In April, three boys were rescued after being trapped in a mine in Arkansas. The boys were digging for treasure in an abandoned lead mine when the passage collapsed behind them, blocking their exit. *(Continued on page 9.)*

² http://www.hse.gov.uk/research/crr_pdf/2002/crr02451.pdf

Developing Judgment in Your Armchair

John Gookin

“This is the real core of everything I have to teach, be it in the wilderness or in a book. Judgment. I define judgment as the ability to relate a total experience to a specific activity. Learning judgment, assessing priorities, is as important as perfecting techniques; in fact the teaching of techniques (without commensurate judgment) can be dangerous.” – Paul Petzoldt, The Wilderness Handbook¹.

How do we learn judgment? Experience alone doesn't develop judgment; careful reflection on experience does. One way to look at it is that when we reflect on experiences, we make generalizations that help us to better predict what might happen in similar situations.² Eventually, we have a somewhat similar experience, reflect on the outcome, and fine tune our judgment. As we have more experiences, we repeat the cycle of experience, reflection, and prediction. Because each situation is unique, it isn't enough to just learn a system of rules. We need to intentionally learn from our experiences. Better yet, we can intentionally learn from the experiences of others.

Expertise Depends on Experience

Competence at using judgment comes in different levels. A “competent” caver shows wisdom regarding general caving skills and performs with more proficiency in his or her own specialized skill areas. Table 1, below, is a matrix that helps look at levels of expertise.³ It shows how people make decisions and how peer coaching can help them learn to make better decisions.

Note that in the table, people at different levels are learning vastly different things, but their ability to learn from experience is key to further development at any stage. This edition of *ACA* is riddled with lessons being learned by both novices and experts.

Judgment can be general. We need to assume that new cavers are novices in the world of outdoor judgment until they prove otherwise. Some people begin caving with more “common sense” than others. Novices need some basic rules to begin with, and they want to be told what to do. This gets them started but doesn't set them up with the ability to cave safely in different caves or even in the same cave when the water level is different.

New cavers also need to *not learn dogma*. When we teach dogmatically, we are providing simple rules that only work in identical situations. An example of being dogmatic is training people using superlatives like *always* and *never*. A non-dogmatic approach is to both tell them what the general guidelines are and to explain to them at least one reason why each guideline is in place. This “one reason why” level of understanding is important. If you can't teach people *one*

reason why, you are either teaching too much, or you lack the background to be a strong teacher. Dogma doesn't set newcomers up to make wise decisions later. More importantly, it doesn't train new cavers to think for themselves. The bottom line is that situational judgment is what teaches people to think for themselves.

Judgment can also be specific to different skills areas. An example of expertise being specific rather than general is the classic case of the BASE jumpers (19Nov03) who rapped into Golondrinas. Their gear choices alone portray them as novice cavers, but they may actually be experts at BASE jumping.

Normal Accidents

A “normal accident” is one in which a chain of seemingly small errors results in catastrophic failure.⁴ Contributing factors might include leaving late, forgetting some gear, being hung-over, bringing a novice along who slows everyone down, or twisting your ankle during a trip. Alone, these factors aren't disastrous. But sometimes factors can be “tightly coupled” to other factors. If you go alpine caving and bring a slowpoke along, the slow speed can result in others getting cold and tired, which makes them more prone to errors in judgment. Some caving trips are more tightly coupled systems and don't tolerate these small errors. This edition of *ACA* is riddled with normal accidents that involve numerous small problems that contributed to a disaster. Examples include the September 21, 2002 accident at Cassell Cave, the September 27, 2003 fatality in the Omega System, and the August 23, 2003 diving fatality at Roubidoux Spring.

Loosely coupled systems have more flexibility. These caving trips have many of the same problems we see in normal accidents, but the problems remain minor because they don't trigger a linear chain of other problems. As we become more expert at caving, we develop a knack for determining what errors are tolerable, and what errors aren't. The Caving Risk Assessment Grid in the December, 1997, *ACA* acknowledges many of the specific hazards in more dangerous caves, but more hazardous caves are also more prone to small problems cascading into disasters because of direct linear affects. For example if you have problems with your vertical system in a bad air cave, it is more significant than having the same problem in a cave with good air.

Novice	Advanced Beginner	Competent	Proficient to Expert
Unconsciously Incompetent at this Skill	Consciously Incompetent	Consciously Competent	Subconsciously Competent
<u>Ability to make judgment decisions:</u> Don't know what they don't know. Can't make judgment decisions.	Aware of what they don't know. Ask for help making decisions.	Competent, but correct actions are very deliberate. Need help with occasional decisions.	Can perform well without much thought about it.
<u>Coaching Suggestions:</u> Need basic instruction and directed experience.	Need coached experience and instruction in integration.	Need both coached experience and uncoached experience.	Need to learn from and contribute to collective global wisdom.

Table 1 – Levels of Expertise

Risk Analysis

Cavers can learn how to use judgment sooner, and develop a set of language tools for discussing judgment, by learning about *possibility/risk analysis*.

Cavers need to learn that sometimes it is okay to take risks, but only if the likelihood of a serious accident is very low. Charles “Reb” Gregg LLB uses the model shown in Table 2 as a simple tool for keeping an eye on both probability and severity of consequences in risk management.

possibility of accident	low consequences of risk	high consequences of risk
low	OK	Stop?
high	OK?	STOP!

Table 2 – Accident Likelihood vs. Severity of Consequence

Managing Risks by Probability and Severity

Knowing that things can and do go wrong is part of good judgment. If we wanted to be “safe” we would stay home, but we each have a certain tolerance for risk. This tolerance for risk shows up in how carefully we drive our cars, our lifestyle choices, and every aspect of our lives.

When we get a new “safety device” we (collectively) tend to take other risks because we feel the new device allows us to cut other corners. An example is the addition of anti-lock brakes to cars. The initial change was that drivers of these cars had an *increased* mortality rate because they drove more aggressively. They thought they were taking the same risk as before, but people thought ABS brakes were better than they actually were. So initially, the mortality rate went up, and now it is back down to what the rate is for non-ABS cars.⁵

With all of the advances in automotive technology, the mortality rate, when corrected for drivers and miles, hasn’t changed since the Model T. If you look through the equipment that appears in this edition of *ACA*, equipment choice is

seldom as important as how people used that equipment, with a couple of notable exceptions.

Learning From the Mistakes of Others

Reading *ACA* is an excellent way for us all to improve our judgment, and we can do it from our armchairs. When I began SAR work, I tended to criticize every victim as a yahoo. Today I almost always relate to the accident victim and can understand why they did what they did because I have so often made a similar decision but gotten away with it.

We learn our most powerful lessons from our own experiences, but we can still learn vicariously from reading about the experiences of others. Indeed, I feel we have an ethical obligation to help all cavers learn from the collective wisdom of the caving community.

Judgment

The best way to learn judgment is the best way to learn anything. Just keep doing all of these things:

- Seek knowledge via *formal education*, reading and networking with others.
- Use *mentors* and coaches.
- Practice, practice, & *practice*, learning from each experience by reflecting and predicting.
- Maintain a personalized self-development *plan* based on feedback you get from nature and from others.

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(*Caving-related Incidents – Continued from page 7.*)

Also in April, an intoxicated spelunker broke his leg on the trail to the Sinks of Roundstone in Kentucky. In June, two men drowned while exploring an abandoned mine in California. It was not clear whether they tried to free-dive a flooded passage, or were overcome by bad air.

An 18-year old man was killed in June when he was washed into a blowhole at a sea cave in Hawaii. The man was reported to have ignored signs and warnings from onlookers in order to stand atop the blowhole. An unidentified man was killed when a “sand cave” collapsed around him at a California beach. Finally, there were two reports of bodies discovered in caves: one in Hannibal, Missouri and the other in Limestone County, Alabama. In both cases, the individuals

had been missing for several days before being discovered in a cave.

There were four caving-related incidents reported in 2003. In May, an Idaho man died when he rappelled down a shaft in an abandoned mine and was overcome by bad air at the bottom. In July, a man walking on the beach discovered a body in a sea cave near San Diego, California.

Two reported incidents involved experienced cavers hiking from or searching for caves. A caver participating in an expedition on Coronation Island, Alaska, injured his eye when he fell while hiking back to camp from a cave. In December, a ridgewalking caver was briefly trapped by rockfall when the walls of a sinkhole he was checking collapsed on him as he climbed out.

2002 Reported Caving Accidents and Incidents

35 caving incidents reported

Date	Cave	Location	Result	Incident Type
January	Kenamer Cave	Alabama	no consequence	illness, exhaustion, lost consciousness
February 25	Connies Cave	California	aid, no injury	stranded in pit, inadequate equipment
February 27	Three Falls Cave	New York	injury and aid	rockfall entrapment
February	Sótano de las Golondrinas	San Luis Potosí, Mexico	injury and aid	caver fall, BASE jumping
March 17	Bowden Cave	West Virginia	injury and aid	caver fall, hypothermia
March 20	Ten Mile Pit	Tennessee	injury and aid	caver fall, climbing without belay
March 30	Kaumana Cave	Hawaii	injury and aid	caver fall, dislocated shoulder
April 7	Bowden Cave	West Virginia	aid, no injury	lost, stranded, inadequate equipment
April 18	Hell Below Cave	New Mexico	no consequence	equipment problem, maillon opened
April 19	Carpenter-Swago Cave	West Virginia	injury, no aid	caver fall, climbing without belay
April 20	Cassell Cave	West Virginia	injury, no aid	caver fall, climbing without belay
May 10	Crystal Ice Cave	Idaho	no consequence	stranded, passage blocked during pull-down
May 12	Trout Cave	West Virginia	aid, no injury	illness, heart attack
May 16	Yo-yo Pit	New Mexico	fatality	caver fall, inadequate equipment
May 27	Fault Cave	Colorado	injury, no aid	caver fall
June 2	Tongue River Cave	Wyoming	aid, no injury	rockfall entrapment
June 9	Pozo de Gavilán	Nuevo León, Mexico	injury and aid	difficulty on rope, killer bee attack
July 6	Dynamited Cave	Washington	injury and aid	caver fall, cable ladder, no belay
July 9	Langdons Cave	Indiana	injury and aid	caver fall
July	Morris Cave	Vermont	injury, no aid	caver fall
August 10	Martin Cave	Missouri	injury and aid	caver fall, inadequate equipment
August 11	Cave Mountain Cave	Arkansas	injury and aid	caver fall, inadequate equipment
August 17	Cemetery Pit	Georgia	aid, no injury	stranded, exhaustion, difficulty on rope
August 25	Casparis Cave	Pennsylvania	aid, no injury	stranded, inadequate equipment
September 11	unnamed lava tube	Hawaii	injury and aid	caver fall, fell into hidden pit entrance
September 16	Sótano de Cepillo	San Luis Potosí, Mexico	no consequence	equipment problem, maillon opened
September 21	Cassell Cave	West Virginia	injury and aid	caver fall, difficulty on rope
September 28	Howards Waterfall Cave	Georgia	injury and aid	caver fall
October 1	Maxwelton Cave	West Virginia	injury and aid	rockfall entrapment
October 6	Buddha Cave	Indiana	injury and aid	caver fall, climbing without belay
October 12	War Eagle Cave	Alabama	aid, no injury	stranded, difficulty on rope
November 15	Tower Cave	Colorado	injury, no aid	caver fall, climbing without belay
November 24	Lechuguilla Cave	New Mexico	injury, no aid	caver fall
December 14	Coon Cave	West Virginia	aid, no injury	stranded, difficulty on rope
December 24	Bloomington Cave	Utah	fatality	caver fall

Previously Unreported Incidents

Date	Cave	Location	Result	Incident Type
August 12, 2001	Hopkins Chocolate Cave	California	injury and aid	caver fall, inadequate equipment

2003 Reported Caving Accidents and Incidents

40 caving incidents reported

Date	Cave	Location	Result	Incident Type
January 1	unspecified cave, Estill County	Kentucky	injury and aid	caver fall, broken leg, hypothermia
January 11	Tower Cave	Colorado	injury, no aid	caver fall, climbing without belay, inadequate equipment
January 18	Cemetery Pit	Georgia	aid, no injury	stranded on rope, illness
February 1	Pettijohns Cave	Georgia	no consequence	caver fall
February 20	Sistema de los Tres Amigos	Oaxaca, Mexico	no consequence	difficulty on rope, dropped ascenders
February	Cueva Cheve	Oaxaca, Mexico	injury and aid	difficulty on rope
March 4	unnamed cave near Collegedale	Tennessee	fatality	child fell into cave and drowned
March 9	Gruta del Río Chontalcuatlán	Guerrero, Mexico	fatality	rockfall, caver fall
March 22	Sinks of the Roundstone	Kentucky	injury, no aid	caver fall
March 23	Tiftonia Pit	Tennessee	aid, no injury	stranded in pit, inadequate equipment
March 29	Womer Cave	Pennsylvania	aid, no injury	rockfall entrapment
April 15	Midnight Cave	Texas	aid, no injury	stranded in pit, inadequate equipment
April 26	Laurel Caverns	Pennsylvania	injury and aid	caver fall
April 28	Cave Hill Cave	Illinois	aid, no injury	lost, stranded, hypothermia, inadequate equipment
April 28	Onesquethaw Cave	New York	no consequence	flood entrapment
May 10	Memorial Day Cave	West Virginia	aid, no injury	flood entrapment
May 15	Fountain Pit	Alabama	injury, no aid	difficulty on rope
May 17	Buckners Cave	Indiana	aid, no injury	stuck, hypothermia
May 19	Ice cave near Kalispell	Montana	injury and aid	caver fall, inadequate equipment
May 25	Minotaur Cave	Washington	no consequence	lost
May 25	Tongue River Cave	Wyoming	injury and aid	caver fall
May 26	Two Door Cave	Hawaii	aid, no injury	stranded in sea cave
June 3	Lighthouse Cave	California	aid, no injury	stranded in sea cave
June 5	Fort Stanton Cave	New Mexico	injury and aid	caver fall, climbing without belay
June 14	Land of the Swirling Mists Cave	Colorado	injury and aid	rockfall entrapment
June 16	Boundary Cave	Kentucky	fatality	flood entrapment
June 21	War Eagle Cave	Alabama	aid, no injury	stranded, difficulty on rope
June 28	Rocky River Cave	Tennessee	injury and aid	caver fall, broken leg
July 3	Lechuguilla Cave	New Mexico	injury, no aid	caver fall
July 13	Climax Cave	Georgia	fatality	drowned while free-diving sump
August 19	Bear Cave	Pennsylvania	aid, no injury	lost
August 24	Hubbards Cave	Colorado	aid, no injury	lost, stranded, inadequate equipment
September 27	Omega System	Virginia	fatality	caver fall, rappel device came off rope
September 27	Nellies Cave	Virginia	injury, no aid	rockfall
October 25	Bear Cave	Pennsylvania	no consequence	lost, inadequate equipment
November 17	unspecified lava tube near Kailua	Hawaii	aid, no injury	flood entrapment
November 19	Sótano de las Golondrinas	San Luis Potosí, Mexico	fatality	caver fall, lost control on rappel
November 29	Wind Cave	New Mexico	aid, no injury	stranded in pit, difficulty on rope
December 18	Hawk Hole	New Mexico	injury and aid	caver fall, descending hand-over-hand
December 31	Schlitz Pit	Arkansas	injury, no aid	rockfall

Report accidents and incidents via the Internet at www.caves.org/pub/aca

or mail reports and information to:

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

2002 and 2003 Reported Cave Diving Accidents and Incidents

2002 Diving Incidents

4 incidents reported

Date	Cave	Location	Result	Incident Type
February 16	Little River Spring	Florida	fatality	seizure, cause unknown
March 9	Devils Ear Spring	Florida	fatality	lost consciousness, cause unknown
June 15	Bat Colon Cave	Florida	aid, no injury	siltation, lost guideline, stranded
November 8	Orange Grove Sink	Florida	fatality	lost consciousness, heart attack

2003 Diving Incidents

5 incidents reported

Date	Cave	Location	Result	Incident Type
January 1	Ocean Blue Hole	Bahamas	two fatalities	cause unknown
May 23	Cow Spring	Florida	fatality	lost consciousness, cause unknown
August 9	Little River Spring	Florida	fatality	cause unknown
August 23	Roubidoux Spring Cave	Missouri	fatality	out of air
November 26	Little River Spring	Florida	fatality	siltation, out of air

2002 and 2003 Reported Caving-related Accidents and Incidents

2002 Incidents

9 incidents reported

Date	Cave	Location	Result	Incident Type
February 25	State Trooper Cave	Kentucky	aid, no injury	road collapsed into cave
February 26	Cove Mine, Pickens County	Georgia	fatality	drowned diving in abandoned mine
April 4	unspecified cave near Hannibal	Missouri	no consequence	body found in cave
April 7	Sinks of Roundstone	Kentucky	injury and aid	caver fall outside cave
April 8	abandoned lead mine	Arkansas	aid, no injury	rockfall entrapment
June 23	Blue Light Mine	California	two fatalities	drowned free-diving sumped passage
June 30	Halona Blowhole	Hawaii	fatality	fell into blowhole and drowned
July 17	unnamed sand cave	California	fatality	passage collapsed
August 18	unspecified cave near Athens	Alabama	no consequence	body found in cave

2003 Incidents

4 incidents reported

Date	Cave	Location	Result	Incident Type
May 26	Maryland Mine	Idaho	fatality	hypoxia, bad air in mine shaft
June 30	Deer Bone Cave	Alaska	injury, no aid	caver fall while hiking back from cave
July 9	unnamed sea cave at Sunset Cliffs	California	no consequence	body found in sea cave
December 20	unnamed sink, Blount County	Alabama	injury and aid	rockfall entrapment while digging

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2813 Cave Avenue
Huntsville, Alabama 35810-4431**

Previously Unreported Incidents

12 August 2001

Hopkins Chocolate Cave, California caver fall, inadequate equipment

Joseph Huang (49) was visiting Lava Beds National Monument with his family. Using hand-held flashlights, they entered Hopkins Chocolate Cave. Mr. Huang was carrying a young child in one arm and a flashlight in his other hand when he lost his balance on the uneven floor and fell, breaking his leg just above the ankle.

Members of his family left the cave and notified park personnel at the Visitors Center. Park rangers and EMS personnel were dispatched to the cave, where they located Mr. Huang and splinted his ankle. He was then placed in a litter and carried from the cave to a waiting ambulance.

Matthew Reece, Incident report, 14 May 2002.

Comments: Reece reports that Huang was wearing tennis shoes, as do most visitors to the Monument. Sturdy boots with lug soles and ankle support are more appropriate for caving.

2002 Caving Accident and Incident Reports

January

Kenamer Cave, Alabama illness, exhaustion, lost consciousness

Tommy Royston, Will Marsh, Joe Glotzbach, and another caver entered the Orgy Entrance of Kenamer Cave at about 10:30 a.m. The Orgy Entrance is the lower entrance to the system, and the cavers planned to traverse the cave and exit via an upper entrance. The initial section of the cave inside the lower entrance is a long crawl with several pools. Glotzbach, a novice caver, was carrying his gear in an external frame backpack.

After about 500 feet of crawling, Glotzbach suddenly passed out. He regained consciousness very quickly, and was given a granola bar to eat. Royston decided to abort the trip, and led the way back out the lower entrance. The group exited at about 11:30 a.m.

Will Marsh, "January Grotto trip to Kenamer," Huntsville Grotto News, v44n3, March 2002.

Comments: Glotzbach was new to caving. He had reportedly just gotten off work and had nothing to eat before starting the trip. External frame backpacks are not appropriate for most caves.

25 February

Connies Cave, California stranded in pit, inadequate equipment

Connies Cave is a small marble cave with two entrances, one of which requires a rappel. The cave is well-known in the area and frequently visited. At about 3:00 p.m., a party of inexperienced cavers including two men (both 20) and one woman (19) entered the lower entrance of the cave equipped with hand-held flashlights and a seventy-five foot rope. They had no rappelling or climbing equipment and were not wearing helmets. After crawling through about ten feet of small passage, they came to a steep 50-foot-long slope. They tied the rope around a boulder with a makeshift knot, tied overhand loops in the rope at intervals, and used the rope as a handline to descend the slope.

At the bottom, the two men spent some time exploring passages off the main room. When they attempted to climb

back up the slope, the woman had some difficulty. After several attempts, she became tired and frightened and was unable to make the climb. One of the males climbed out to go for help. He hiked to the public road and flagged down a passing sheriff's deputy, who reported the situation.

The sheriff's department search and rescue team was dispatched, and arrived at the cave about 30 minutes later. They rigged a rope and lowered a rescuer into the room. He provided the female with a harness, helmet, and light, and then assisted as she was hauled up the slope. Everyone left the cave without further difficulty.

Greg Francek, Incident report, 19 February 2003.

Comments: Francek reports that a similar rescue occurred at the cave some years earlier, but does not provide the date of that incident.

27 February

Three Falls Cave, New York rockfall entrapment

Sean Greg (26), Raymond Polansky (23), and Liz Gonzola entered Three Falls Cave at about 8:00 p.m. Wednesday evening to do some exploring and look for bats. Greg and Polansky were soldiers stationed at nearby Fort Drum, and Gonzola was a resident of Watertown. The cave is privately owned and is posted. The entry was illegal due to the presence of hibernating Indiana bats in the cave. Gonzola, who had been caving for about two years, had told the others about the bats, piquing their interest.

After spending about three hours and seeing "a couple of thousand bats," they came to a small opening in some breakdown. Greg, who was the largest of the three, ignored the others' advice and tried to squeeze through. As he did so, rocks collapsed from above, pinning Greg and Gonzola. Polansky was able to free Gonzola by lifting the rock that had landed on her arm, but Greg was trapped by rocks too large for him to move. Gonzola's arm was broken, and Greg suffered internal injuries, two broken legs, and a fractured pelvis.

Polansky stayed with Greg and tried to help his friend while Gonzola went for help. Despite her injury, she made her way out of the cave and went to a nearby house for help. She returned to the cave with state trooper Scott Carr. She tried to

lead Carr back to the accident site, but her flashlight went out, and they were forced to exit and wait for other rescuers to arrive.

The unstable rocks had fallen on Greg's chest and legs. The largest boulder, later estimated to weigh 650-800 pounds, was pressing on his chest and pelvis. He began to have difficulty breathing, and Polansky did what he could to help his friend. He wedged rocks under the boulder, and braced it with his back and legs, shifting the weight from one leg to the other as he waited for help to arrive.

When rescuers arrived, they were able to shift and stabilize the boulder, relieving the pressure on Greg's chest and legs. They spent several hours digging and moving rocks. Volunteer firemen, a physician, and additional personnel and equipment from Fort Drum arrived to support the efforts, which continued throughout the night. Air bags were used to lift and support the rock, which was eventually moved aside enough to free Greg. He was carried from the cave, unconscious and in a litter, at about 10:30 a.m. Thursday and flown by helicopter to a hospital for treatment. He was later reported to be in stable condition.

Chuck Porter, "Spelunkers injured in Watertown cave accident," Northeastern Caver, June 2002.

Comments: Porter's report notes that agencies responding to the incident included seven fire departments, three ambulance services, two search and rescue teams, the sheriff's department, and the state patrol. An urban search and rescue team from Albany was en route with two 18-wheelers full of equipment but was turned back when the rescue was completed. A county official estimated the cost of the rescue at \$60,000 to \$80,000. He also writes that none of the rescuers had been in a cave before. Albany-area cavers heard of the incident Thursday morning and were preparing to go to the cave when they received word that Greg had been freed and was on the way out. Porter also reports that some of the agencies involved later contacted NCRC about obtaining training in cave rescue.

February

Sótano de las Golondrinas, SLP, Mexico caver fall, BASE jumping

A member of a Russian group engaged in BASE jumping the 1,100-foot entrance pit of Sótano de las Golondrinas was injured when he struck the bottom of the pit while trying to set a record for the longest delay before opening his parachute. Jumpers typically open their parachutes after four to six seconds of free fall. He achieved his goal, but broke his leg upon impact when his parachute did not have time to deploy fully. He was hauled from the pit using the group's motorized winch, and taken to a hospital for treatment.

Peter Sprouse and Jerry Fant, "Sótano de las Golondrinas," Caves of the Golondrinas Area, Association for Mexican Cave Studies, Bulletin 10, 2002, p. 28.

Comments: The term BASE is an acronym for Buildings, Antennas, Spans, and Earth. BASE jumpers parachute off of fixed objects including buildings, bridges, antenna towers, cliffs, and now into pits. BASE jumping at Golondrinas was

inaugurated in 1995. An earlier jump into the pit was made from a hovering helicopter in 1993. This was the first known injury to a jumper at the pit.

17 March

Bowden Cave, West Virginia caver fall, hypothermia

A Boy Scout (11) was exploring the cave with his troop when he fell near the entrance to the Watercourse. Out of concern that the boy might be seriously injured, the trip leader sent for help and did not allow the boy to move. While waiting for assistance, the scout, who was quite wet from an earlier fall in the Watercourse, became chilled and began to shiver uncontrollably. As fate would have it, a group of cavers who had recently completed an NCRC class happened to be in the cave at the same time and came upon the scene. The cavers took steps to warm the boy, assess his condition, and alert local rescue agencies. He was soon declared fit to travel, and was assisted toward the entrance. The call for help was cancelled, and the group exited without further incident.

Doug Moore, Incident report, 9 April 2002.

Comments: Trip leaders, especially those leading youth groups such as Scouts, should have at least basic first aid training and should carry an appropriate first aid kit. Wilderness first aid courses typically include training in the assessment of injuries and evaluation of an injured person's ability to travel. The decision to wait for help or head for the entrance can be a difficult one, especially for those with no training. One must be aware that waiting presents its own risks – in this case, hypothermia – and that those risks may be quite serious.

20 March

Ten Mile Pit, Tennessee caver fall, climbing without belay

Armed with nothing more than a rope and flashlight, Joel Brooks (24) and Josh Allmon (23) ventured into the depths of Ten Mile Pit on a Wednesday evening. The gated entrance to the cave is adjacent to a golf course in suburban Knoxville, and is a stair-stepped drop of about 75 feet, comprised of an initial free drop of 15 feet, a mud slope about 40 feet long, a 10-foot climb-down to a ledge, and a final 20-foot drop to a stream. Several thousand feet of cave passages lie beyond.

According to reports, Allmon lost his purchase near the top of the climb and fell, tumbling down the slope and over the final drop to land beside the stream. He injured his shoulder in the fall, and could not climb out. Brooks climbed down to help his friend, pulling him as far as he could, but was unable to get Allmon out. Brooks then climbed out of the cave and ran across the fairway of the 18th hole to a nearby house to summon help.

The Knox County cave rescue team was dispatched, and soon arrived at the scene. As a crowd of golfers and residents watched, rescuers rigged and descended the pit, placed Allmon on a backboard, packaged him in a litter, and hauled him out of the cave. The rescue operation took about two hours. Allmon was taken to a hospital where he was reported

to have a shoulder injury and several broken fingers. Brooks told reporters that the duo would go spelunking again, but stated, "I'll never be back in this one. I know that." It was reported that trespassing charges were under consideration, and that the cave gate was to be repaired.

1. *David Brace, "Cave Accident," TAG-Net Digest #2786, 25 March 2002.*
2. *Bryan Mitchell, "Rescue squad retrieves man, 23, from cave at Gettysvue," Knoxville News-Sentinel, 21 March 2002.*
3. *"Men may be Charged with Trespassing after Knox Co, Cave Rescue," WATE 6 News, www.wate.com, 20 March 2002.*

Comments: The name of the cave was reported in the news accounts as "Pips Cave." There are several closed and gated cave entrances in and around the golf course community. The men stated that they had stumbled across the cave a few days earlier and that the gate was open when they found it.

30 March Kaumana Cave, Hawaii caver fall, dislocated shoulder

While exploring Kaumana Cave, near Hilo, Jen DuBois (21) tripped and fell, dislocating her shoulder. Her companions sent for help, and rescuers from the local fire and rescue department responded, reaching her about 15 minutes after entering the cave. Her arm was immobilized, and rescuers assisted her as she made her way to the surface. She was then taken to a hospital for treatment.

1. *Desmond Wery, Incident report, 10 August 2002.*
2. *"Woman Injured in Hilo Cave", Hawaii Tribune-Herald, 1 April 2002, p. 10.*

7 April Bowden Cave, West Virginia lost, stranded, inadequate equipment

Four individuals (early 20's) entered Bowden Cave early on Saturday morning. They had no knowledge of the cave, had little or no previous caving experience, and lacked proper equipment such as helmets and backup light sources. When they failed to return home Saturday evening, the parents of one of the individuals called the State Police to report them missing. The police notified the Elkins Fire Department, which dispatched its cave rescue team.

By 1:30 a.m. Sunday morning, about 20 rescuers had arrived at the cave, and a search began for the missing party. They were found at the far end of the Watercourse at about 2:25 a.m. They were uninjured, and were led from the cave without further difficulty.

Doug Moore, Incident report, 9 April 2002.

Comments: Moore observes that this was the first incident for the newly-formed cave rescue team, which includes several local cavers.

18 April Hell Below Cave, New Mexico equipment problem, maillon opened

After about nine hours of caving in Hell Below, Cindy Heazlit (44) donned her seat harness and prepared to climb the first pit on the way out. She was tired from the combination of the long trip, a lengthy day of travel and caving the previous day, and accumulated sleep deprivation from a difficult week at work, and did not notice that she had accidentally reversed the orientation of the half-round maillon rapide used to close the seat harness of her Frog climbing system. Instead of the customary right-to-left orientation, the maillon was oriented left-to-right.

Heazlit clipped her cave pack to the gate side of the maillon with a carabiner and began climbing. As she climbed, she noticed a clicking sound as she took each step. She also noticed that the rope was not feeding through the chest ascender normally. She stopped about 10 feet off the floor and inspected her system. She noticed that the maillon was turned at a 45-degree angle on her harness, which was unusual, but was probably due to the weight of the tethered pack.

Heazlit did not see anything else wrong, and so continued her climb, reaching the top and proceeding across a rope traverse. She then unclipped her pack, went through a tight spot, and climbed another 15-foot drop. At the top, she discovered that the maillon was completely unscrewed and open, leaving her seat harness unsecured.

Cindy Heazlit, Incident report, 22 April 2002.

Comments: Heazlit believes that the maillon gate was unscrewed by movement of the carabiner against the screw gate during her climb. The movement of the climbing rope against the maillon gate during climbing has also been known to open maillon gates when they are not properly oriented, and could have been a factor.

Always check your maillon or carabiner gate orientation to make sure that friction from the climbing rope will tend to rotate it toward closure, rather than toward opening. Heazlit had several indications that something was not right with her system, but, probably due to fatigue, did not heed them. See the 16 September 2002 report of a similar incident at Sótano de Cepillo.

19 April Carpenter-Swago Cave, West Virginia caver fall, climbing without belay

Walter Young (41) was attempting a 10-foot climb-down in Carpenter-Swago Cave when his clothing became snagged and then released suddenly as he was trying to squeeze through the opening connecting Lower Carpenters Canyon with the Stream Level. Young lost his purchase and fell, breaking three metatarsal bones in his right foot.

Young found that by keeping his weight back on the heel to avoid placing pressure in the mid-foot area, he was able to walk without assistance. He made it back up the climb with some difficulty, and was able to make his way from Lower Carpenters Canyon to the Carpenter Pit Entrance, climbing three rope drops in the process. Young tightened the heel strap

on his Mitchell system so that the foot loop was held as far back toward the heel as possible, reducing the pressure on the injured area. Upon reaching the surface, Young was driven to a hospital where he was treated and released.

1. *Walter Young, Incident report, 9 February 2003.*
2. *Pete Johnson, "Northeast News," Northeastern Caver, June 2002.*

20 April

Cassell Cave, West Virginia

caver fall, climbing without belay

Charles Danforth (29) and companions had just completed a 13-hour survey trip into the South Fork of Cassell Cave. The trip was described as "very sporting ... with a number of nuisance drops and climbs and plenty of exposure." The entire party was tired and muddy when they reached the last obstacle before the entrance – a 25-foot climb-down.

While the other members of the party descended via cable ladder, Danforth, being the most accomplished rock-climber on the team, remained above to derig the ladder and then free-climb down the exposed face. He had done the climb half a dozen times before, in both directions, and felt that it was not difficult. A short piece of webbing used as a handline helps protect one exposed part of the climb, and several hand and foot placements are available.

After moving down the face about five feet, Danforth was reaching for the webbing when his foot slipped from a broken stalagmite that he was using as a foothold. He fell about 20 feet, and landed in a hole in the massive breakdown below. Danforth fractured the talus of his right ankle in the fall, and briefly lost consciousness soon after.

After he regained consciousness, the other three team members fastened a harness on Danforth, got him warm and hydrated, and belayed him as he crawled up a breakdown slope about 100 feet to the entrance crawlway. The entrance itself is very tight and two people on the outside and one inside helped Danforth through the hole. The car was only another hundred feet away. His companions drove him home to Baltimore, where he went to a hospital for treatment.

1. *Charles Danforth, "Snap, Crackle, Pop: A Cassell Cave Survey Trip with the Gangsta Mappers," The West Virginia Caver, v20n3, June 2002, p. 13.*
2. *Charles Danforth, Incident report, 1 November 2004.*

Comments: Danforth notes that he was tired and perhaps inattentive, and that a belay would have prevented the accident. It should have been easy to arrange, since a belay of some sort should always be used with cable ladders anyway. A climb like this can be belayed from below by running a rope through a carabiner or screw link attached to a sling anchored at the top.

10 May

Crystal Ice Cave, Idaho

trapped, stranded, passage blocked by snow

Crystal Ice Cave is a former commercial cave formed in lava in southeastern Idaho. The cave contains large rooms and ice formations, and is a popular vertical trip for local cavers. A

42-foot entrance drop leads to various passages and eventually to a second, 50-foot drop into a room with a 150-foot skylight entrance. At about 10:00 a.m., Lance Taysom (41), his son Jesse (8), a climber friend of Taysom's (39), and the climber's son (13), prepared to rig a rope at the skylight entrance in preparation for a through-trip.

The bottom of the skylight pit is visible from the surface, and cavers can easily look down to verify that the rope hangs free and reaches the bottom. The floor of the skylight was covered in snow, which was not unusual for that time of year. Typically the snow is less than two feet deep and makes rigging for the ascent easier, as the snow makes a nice flat platform over breakdown. Taysom rigged the pit with a 200-foot rope and was able to see several coils lying on the floor, verifying that it had reached the bottom and would be in place when the party was ready to exit.

The group then went to the main entrance, where they rigged a rope and descended the 42-foot drop without incident. The cavers spent the afternoon exploring the cave, eventually making it to the second drop, which they rigged as a pull-down. After negotiating the drop, the cavers pulled the rope and continued toward the skylight room and their anticipated exit climb.

As the group approached the area of the skylight, Taysom, who had made the through-trip several times before, was puzzled by the absence of the light usually visible from the skylight entrance above. When the group reached the area just before the skylight, they found that the entire passage leading up to the breakdown floor of the skylight shaft was blocked. The exit was apparently completely filled by 15 to 20 feet of hard-packed snow.

They were further puzzled by what appeared to be tracks in the snow plume leading part-way up to the point where the snow met the ceiling. Using a sharp rock and an ice screw, Taysom was able to cut steps up the snow plume, eventually reaching the ceiling and verifying that the passage was indeed blocked.

A thorough search of the perimeter of the snow-filled passage revealed an area where the snow, through settling or sublimation, had pulled away from the passage wall, creating a four- to six-inch space extending out of sight in the direction of the skylight. Taysom placed an ice screw and belayed his son Jesse up the plume.

Working together, they were able to enlarge the space enough for Jesse to enter. After about three feet, the space widened to about 18 inches and Jesse was able to follow this new "lead" for about 20 feet until he could see sunlight filtering through from above. Jesse was able to push and dig his way out of the passage and onto the floor of the skylight pit. He then returned and helped Taysom enlarge the space enough to get the other members and their gear through. The group then ascended the previously-fixed rope and exited without further difficulty.

Lance Taysom, Incident report, 28 September 2003.

Comments: Taysom writes: The area surrounding the cave is normally covered with grass and sagebrush extending for several miles in all directions. During the previous summer, a wild-land fire had removed the sagebrush, allowing the prevailing east wind to transport large amounts of snow, which fell into the skylight, filling the room to a depth which

covered the connecting passage. When the party dropped the rope into the exit and saw that it reached the floor they did not realize they were looking at a floor some 20 feet higher than normal.

The second drop was unclimbable without ice-climbing equipment. Had the party been unable to get through the snow barrier, they would have had to wait several hours for their overdue pre-plan to be activated and rescuers to arrive and re-rig the second drop to allow them to exit. Although the group had extra lights, water, food and a few extra dry layers, it would have been a long, cold wait.

Taysom later learned that a group of college students completing a short course on caving had entered the cave two weeks earlier, planning to make a through-trip in a similar fashion. That group descended and pulled the first drop rope but discovered the snow-filled passage before pulling the rope from the second drop. The group was able to back-track to the bottom of first drop where they were stranded for almost an hour, periodically blowing a rescue whistle until a student who had not entered the cave heard and came to their aid. With instructions from the cavers below, the student was able to re-rig the drop, enabling the stranded cavers to ascend and exit.

Taysom advises all cavers planning through-trips of Crystal Ice Cave to verify that the passage between second drop and the skylight floor is passable before entering the cave. He also advises cavers to consider carefully the added risk and commitment of pulling the first or second drop ropes during a through-trip.

12 May Trout Cave, West Virginia illness, heart attack

An NCRC mock-rescue training exercise in Trout Cave turned into a real rescue when a somewhat-overweight firefighter experienced chest pain while in the cave. Stephen Mosberg, a caver and physician participating in the exercise, gave medical assistance and the stricken man was helped to the entrance. There he was placed in a stretcher and lowered down the hill to the road. A waiting ambulance took the man to the Petersburg hospital for evaluation and treatment.

Bob Hoke and Pauline Appling, "Trout Cave Rescue," The West Virginia Caver, v20n4, August 2002.

16 May Yo-yo Pit, New Mexico fatality, caver fall, inadequate equipment

Ignoring a mandatory National Forest closure due to fire hazard, Joseph Lobato (29) and his girlfriend went to Yo-yo Pit near Santa Fe. Also known as Pankey's Crater, the pit is an ancient volcanic vent with a 130-foot drop. It is located in a remote area accessible only by high-clearance vehicles.

The reason for their visit is not clear, but Lobato apparently dropped his cell phone into the pit while exploring around the top. He went to his vehicle and retrieved a nylon tow-strap, a come-along, several pulleys, some heavy-duty chain, and two ropes. The ropes were of the type sold in hardware stores for non-life-safety applications, and were apparently not designed or rated for climbing or rappelling.

Lobato constructed a makeshift anchor by girth-hitching the tow rope around a tree, backed up by the come-along, to which he attached one of the pulleys. He tied his two ropes together with a series of half hitches, and threaded one end through the pulley and tied a series of six half-hitches to secure the end. Together, the two ropes reached the bottom of the pit, with the joining knot about 30 feet above the floor.

Lobato's girlfriend was concerned for his safety, but he assured her that he had "done this type of thing before." She later related that Lobato had no caving experience, but that he had taken her out "climbing" a couple of times in the past, so she deferred to his judgment.

Lobato prepared for his descent of the pit, taking with him a fishing creel containing two pulleys and several screw-lock U-bolts. It is not known how he planned to use this equipment, but it was not used for the descent. He began by placing the rope under his bottom and, wearing gloves, letting the rope slide through his hands. This was apparently unsatisfactory, and he quickly changed his technique to descending hand-over-hand.

He made it to a ledge about halfway down before losing his grip and falling to the bottom. His girlfriend reported that he was laughing all the way to the ground, and still laughing after he landed. According to her account, he first said that he thought he had broken his arm. A few minutes later, he said that he could not feel his back. Finally, he said that he couldn't move, and that she should get help.

Their only cell phone was at the bottom of the pit, so she had to drive back out along the rough dirt road and find a pay phone, which took several hours. She called 911, and reported the accident to the local fire department. Search and rescue teams from surrounding areas were called in, but when they reached the pit and called down to Lobato, there was no response. Two rescuers rigged the pit and rappelled to the bottom, where they found that he had expired. His body was placed in a litter and hauled out of the pit.

1. *Marc Beverly, "Accident Report: Yo-yo Pit, Santa Fe Co., New Mexico 5/16/02," Southwestern Cavers, v40n4, July-August 2002, p. 41.*
2. *Erika Davila, "Rappelling victim died before help arrived," Santa Fe New Mexican, May 18, 2002.*

27 May Fault Cave, Colorado caver fall

A geo-cacher visiting Fault Cave slipped and fell into a crevice as he was leaving the cave, resulting in facial injuries including a possible broken cheekbone. He was reportedly wearing a helmet, but was also reported to have been taking "unnecessary risks."

Anonymous report under the pseudonym "Indiana Cojones," Fault Cave Cache web page, www.geocaching.com, 2 May 2002.

Comments: Placement of geo-caches at this and several other Colorado caves and the subsequent posting of location coordinates on geo-caching web sites resulted in conflict between local cavers and geo-cachers. Fault Cave is well-known locally and has been heavily vandalized. Note the

similar incidents at nearby Tower Cave on 15 November 2002 and 11 January 2003.

2 June Tongue River Cave, Wyoming rockfall entrapment

Barry Blaha (16), Danna Herbert (16), and seven other teenagers were exploring Tongue River Cave on a Saturday afternoon when a 300-pound boulder became dislodged and fell, trapping Blaha and Herbert in a small passage. Several of their companions went for help, and Sheridan County rescue personnel responded. After several hours of work, rescuers were able to move the boulder using a winch and other tools, and the teens were freed at about 10:30 p.m.

1. *Richard Rhinehart, "Briefly: News and Notes Regarding Caves and Karst," Rocky Mountain Caving, v19n2, Spring 2002, p. 25.*
2. *"Cave Rescue," KROE News, www.sheridanmedia.com, June 4, 2002.*

9 June Pozo de Gavilán, Mexico difficulty on rope, "killer bee" attack

Helios Medina and nine other cavers arrived at Pozo de Gavilán, on a Saturday afternoon. The cave is a 300-foot deep sinkhole about 200 feet in diameter, with a large, deep pool at the bottom. Five members of the group, including Medina, were cave divers and planned to enter the pool and explore the submerged caverns below. The rest of the cavers were there to help with the equipment and to practice vertical skills for an upcoming trip to Sótano de las Golondrinas and Hoya de las Guaguas.

On Sunday morning the cavers rigged the cave for descent. There were no suitable trees or boulders near the pit, so the cavers used one of their vehicles as the primary anchor and placed two ropes side-by-side in the pit. Medina began his rappel of the 285-foot drop at about 10:00 a.m., with his diving equipment tethered below his harness. About 100 feet into the rappel, Medina noticed that his rate of descent was increasing dramatically as the amount of rope hanging below him decreased. He wrapped the rope around his leg to add some friction and regain control of his descent. He managed to slow down, but suffered a rope burn in the process.

The remaining cavers descended, and Medina and the other divers entered the pool and explored to a depth of 120 feet, stopping at the entrance to a passage leading off from the pool. Leaving that passage for another day, they turned their dive and exited the pool without incident at about 2:00 p.m. They began packing up their diving equipment, and prepared for the climb out.

Medina decided to wait while the others climbed and be the last one out, so that there would be an experienced caver on bottom to check climbing systems and assist the less experienced climbers. Another experienced caver climbed out first, to help any of the climbers who might have difficulty at the top. At about 3:00 p.m., two cavers were on the surface, and four others, one male and three female, were climbing in tandem on the two ropes when Medina heard a scream from

above. One of the climbers had accidentally disturbed a large nest of Africanized bees, which immediately swarmed and attacked the four cavers on rope.

The two cavers on the surface heard the commotion, and went to the edge of the pit. When they did so, they were also attacked by the bees. Fighting off the insects, the more experienced of the two cavers rigged a third rope into the pit and rappelled down to help the stricken climbers. He attached a lanyard to the first caver's harness, cut her ascender slings, and climbed out of the pit, dragging her to the surface. He then repeated the feat, rescuing the upper climber on the second rope. Exhausted and vomiting as a result of his exertion and the bee stings that he had suffered during his efforts, the caver then used a cell phone in the vehicle to call for help.

Down below, Medina had donned his wetsuit for protection, and told the other cavers still on the bottom to do the same. He called up to the stricken cavers, telling them to change over to rappel and come back down. One of the cavers was about 80 feet above the bottom, and the other was about 40 feet higher. Whenever they tried to move, the bees would renew their attack.

Medina decided to try to climb up to each of the climbers and do a pick off, hoping that his wetsuit would protect him from the worst of the insect stings. He climbed up to the lower of the stranded climbers, while another caver climbed up the second rope to help. Medina changed over to rappel, and attached a cows tail to the stranded caver's harness. The second caver then cut the stranded climber's slings, and Medina rappelled to the floor with the stranded caver hanging below him.

As Medina prepared to get back on rope to rescue the remaining stranded climber, the ropes started jerking and rising up the pit. Up on top, one of the cavers had decided to start the SUV that the cavers had used for a primary rig point and use it to haul the cavers out of the pit. He stopped when he realized the plan was not working, but Medina was concerned about the safety of the ropes and rigging, and felt that it would not be safe to climb. The final stranded caver dangled 120 feet above the floor, sobbing and pleading for help.

Medina and the other cavers at the bottom, one of whom was a medical student, turned their attention to the rescued caver, who was showing signs of shock. He had become unresponsive, started shaking, lost sphincter control, and was breathing irregularly. As the cavers started giving him artificial respiration, they heard sirens above as emergency personnel arrived at the pit.

By 4:15 p.m., about 50 rescuers had assembled at the top of the pit. By this time, the caver still stranded on rope had stopped moving and was unresponsive. Rescuers hauled up the ropes, bringing her to the surface, and carried her to a waiting ambulance. They were hampered in their efforts by the bees, which continued to attack anyone moving within 300 feet of the pit.

As darkness fell, the stricken caver on the bottom was also hauled out and taken to the hospital. The remaining cavers climbed out, with Medina last. He reached the surface at about 1:00 a.m.

Helios Medina, "El Pozo de Gavilán," The DecoStop, www.thedecostop.com, 4 June 2004.

Comments: The caver who worked at the top of the pit to rescue two of the climbers spent that night and the next day in the hospital. One of the women that he rescued had received more than 600 bee stings, and was hospitalized for three days. The other woman, who had accidentally precipitated the attack and was the closest to the nest, received more than 900 stings and was hospitalized for two weeks.

The male caver rescued by Medina had received about 400 stings, and was hospitalized for three days. The female caver hauled out on rope had received more than 1,200 stings. She spent a week in intensive care, then two more weeks in the hospital, was returned to the intensive care unit for two days due to a blood clot, and was finally released after several weeks for an extended convalescence.

Africanized “killer” bees have been reported at a number of pits in Mexico, most notably at Hoya de las Guaguas, and now, Pozo de Gavilán. They have also been reported in cave entrances in Arizona and New Mexico. Their venom is no more potent than that of ordinary bees, but they tend to swarm more easily and attack in greater numbers. They nest in holes and crevices in cliffs and cave walls, and often build large colonies that can be seen hanging from the rock.

The bees are aggressively territorial, and will pursue for great distances. They are reported to be attracted to dark clothing and movement, and to be disturbed by sound, vibration, and certain odors. Most victims are overcome by stings to the head and face. Fatalities have been reported primarily among elderly victims.

Experts recommend covering your face and head with clothing or other means during an attack and seeking shelter in an enclosed place away from the bees. A section of mosquito netting can be carried in a pocket and may provide some protection for the face and head during an attack. The best strategy would seem to be to avoid the bees whenever possible.

6 July

Dynamited Cave, Washington caver fall, climbing cable ladder without belay

During the weekend of the Cascade Grotto’s 50th anniversary celebration, grotto members led several trips to nearby Dynamited Cave, a large multi-level cave with a “severely undercut” 15-foot drop which is sometimes rigged with a cable ladder and sometimes bypassed via an exposed climb. Eileen Bergen (52), her husband Van, and about 13 other cavers planned to enter the cave on Saturday and divide into two groups for a tour of the cave. Van Bergen would lead one group, while the other would be led by Dick Garnick.

Garnick had a cable ladder to use at the 15-foot drop, and had rigged the ladder at the campground the previous evening to allow those who had not used one to practice before the trip. Eileen Bergen had no previous experience with cable ladders, and took advantage of the opportunity. She had difficulty with the “wrap-around” technique used to climb the free-hanging ladder, and planned to use the bypass climb instead.

On Saturday morning, the group entered the cave and made its way toward the ladder drop, about 650 feet into the cave. Eileen Bergen had suffered previous problems with her knee and foot, and was moving slowly and carefully to avoid

re-injury. Garnick and other cavers reached and rigged the drop as she made her way through the cave. Most of the group descended the ladder before Bergen arrived. No one used a belay, even though a rope was available.

When Bergen reached the drop she thought it looked easy, so she decided to use the ladder rather than the bypass climb. Cavers at the bottom offered to hold the ladder, and told her that the “wrap-around” technique was not needed. She started down the ladder using a conventional “toes-first” technique, and without a belay.

The bottom of the ladder was resting on the top of a large boulder at the top of a breakdown pile. As Bergen reached the bottom and stepped from the last rung down to the boulder, she lost her balance and her grip on the ladder and fell, somersaulting onto the breakdown below, landing directly on her head, and tumbling onto the rocks ten feet below. She heard something pop or snap as she bounced on her head, and felt pain in her neck and upper back.

A member of the party with First Responder training went to her aid, and advised her not to move. She was not bleeding or having trouble breathing, but the possibility of a neck or back injury was a serious concern. The cavers took steps to immobilize her neck, fashioning a neck brace from a SAM splint and some duct tape, and tried to keep her warm while they decided what to do.

Bergen felt that she could get out with a neck brace and a little assistance, and did not want to call for a full rescue. Her husband, Van, and two other cavers went out to retrieve a neck brace, a sleeping bag, and equipment for a haul system, while Garnick and the others stayed with Eileen. After further discussion, they decided that it would be wise to notify authorities and get some additional help, since the consequences of improperly moving a person with a cervical spine injury can be severe. One of the cavers left to go to the nearest phone and call for assistance.

Van Bergen soon returned with the haul system gear and a sleeping bag, and other cavers brought in an aluminum extension ladder from the campground. Eileen Bergen waited, wrapped in space blankets and the sleeping bag while the cable ladder was removed and replaced with the extension ladder and a hauling system. An EMT from the local fire department arrived, and replaced the improvised cervical collar with a real one. Bergen was packaged in a spine splint and a litter, and was hauled up the drop in short order. A group of about 20 cavers moved the litter over and through 650 feet of breakdown passage to the entrance.

Bergen reached the surface about four hours after her fall, and was taken by ambulance to a nearby hospital for evaluation and treatment. Initial scans were negative, but a more thorough examination revealed that she had suffered compression fractures of her L3 and L4 vertebrae.

1. *Van Bergen and Dick Garnick, Incident report, 21 July 2003.*
2. *Tish Korbly, Incident report, 11 July 2002.*

Comments: Van Bergen wrote: “Obviously, everyone on the ladder climb should have been belayed. No one was because the drop seemed too short and too easy to bother. I suspect that attitude is responsible for the majority of accidents [...] Just as obviously, proper ladder technique should be used, regardless of what one’s companions say and do, or whether anyone is

holding the bottom of the ladder. Cable ladders are deceptively dangerous.” Amen. Reports of falls from cable ladders, almost always while climbing without a belay, are a regular occurrence in *American Caving Accidents*.

Korbly, who was on the trip, wrote: “It seems to me we failed to organize ourselves to be safe. All ladder climbs should be belayed. Eileen especially needed to be belayed. She had had trouble outside at the practice. [...] We failed to protect ourselves and each other. I can imagine it would be very hard to be the first one to ask for a belay when several people had gone down without one.” Difficult perhaps, but not as difficult as the potential consequences of not asking. There is no shame in asking for a belay. Trip leaders, if unsure of trip members’ abilities, can strongly encourage use of belays.

9 July Langdons Cave, Indiana caver fall

Brent Lewis (33) was leading a group of four teenage cavers (ages 16 to 17) on a trip through Langdons Cave. After the group cleared the breakdown leaving the Keyhole, Lewis slipped on a wet slab of rock and fell, breaking his left arm. His companions cleaned and dressed the 6-inch laceration on his arm, controlled the bleeding, and splinted the fracture, then assisted him in exiting the cave and drove him to a hospital.

Brent Lewis, Incident report, 9 December 2002.

Comments: Lewis notes that the teens had completed the NCRC Orientation to Cave Rescue class earlier in the year, and had made a point to practice their training and to carry an emergency kit containing first aid supplies on their caving trips. We should all be as capable and diligent as they were.

July Morris Cave, Vermont caver fall

It was reported that during a July trip to Morris Cave a boy slipped and fell down a slope, striking his back on a rock and sustaining a fractured vertebra. Fortunately, he was able to exit the cave with minimal assistance.

Chuck Porter, “Northeast News,” Northeastern Caver, September 2002.

10 August Martin Cave, Missouri caver fall, inadequate equipment

Tracy Harrison (39) was celebrating her upcoming birthday with a group of friends in Martin Cave, a privately-owned cave on scenic easement property near the Current River. She left the group with the intent of exiting the cave, but failed to take a light with her. Harrison’s friends heard her fall, found her lying unconscious and bleeding from the ears at the base of an eleven-foot-high drop-off, and summoned help.

Ranger Kelly Knutson responded by boat and was guided to the scene. Upon receiving the report, Knutson had radioed for help from other rangers and requested an ambulance.

Knutson, an EMT, found Harrison about 250 yards into the cave. He administered oxygen and directed Harrison’s friends to keep her still while he radioed for additional help.

Rangers and other park personnel evacuated Harrison from the cave. Harrison was then transported by a park boat to a waiting helicopter that had landed on a nearby gravel bar in the river. She was flown to Ozarks Medical Center in West Plains, then to St. John’s Hospital in Springfield, where she underwent surgery, and was reported to be in critical condition. The rescue was accomplished in just over two hours.

Larry Johnson, “Cave Rescue; Life Saved,” The Morning Report - 18 September 2002, United States National Park Service, www.nps.gov/morningreport, 18 September 2002.

Comments: Caving with no light? A helmet-mounted light would be less likely to get left behind, but it seems that she wasn’t wearing a helmet anyway.

11 August Cave Mountain Cave, Arkansas caver fall, inadequate equipment

Michael Wilson (45) was exploring Cave Mountain Cave in the Buffalo National River Park with another man and two women when he apparently lost his footing and fell into a pit located about 300 feet into the cave. Wilson, who was reported by his companions to have been “free climbing” around the top of the pit, had no caving equipment or experience, and was wearing sneakers, a T-shirt, Budweiser shorts, and a black San Francisco Giants baseball cap. He tumbled about 35 feet, bounced off a ledge and fell 10 more feet to the bottom, where his companions could hear him moaning in pain.

One of Wilson’s companions started out of the cave to get help and came upon a group of three cavers who had just entered the cave. Mike Nimmo and his teenage sons Michael and Alex had decided to visit the cave that day, and were planning to descend the pit. Wilson’s companion enlisted their aid, and they followed him to the top of the pit, where they could hear Wilson moaning and talking below.

“You couldn’t make out a lot of what was being said,” Mike Nimmo reported, “but we could clearly hear, ‘Get me the Hell out of here.’”

Wilson’s companions stood by as Mike Nimmo rigged his rope and prepared to rappel the pit. Before descending, he dispatched one of Wilson’s companions to call for additional help. Nimmo then rappelled to the bottom, followed by Michael and Alex.

They found Wilson lying on the floor, covered with scrapes and bruises. Michael and Alex, who worked as lifeguards at a local swimming pool, followed their first aid training, checking Wilson for wounds and injuries, advising him to keep still, treating him for shock, and covering him with towels to help keep him warm and prevent hypothermia. Wilson complained of pain in his ankles and hip, and mentioned feeling numb. They noted that he already had bandaged ribs, apparently from an earlier injury.

Michael and Alex tended Wilson for about 45 minutes, until rescuers including park rangers and county emergency

personnel began to arrive and paramedic Lowery Hill rappelled down to take over the medical care. Rescuers rigged a haul system at the top and lowered a Stokes litter and backboard into the pit, while Hill treated Wilson, starting an IV drip and administering oxygen. Wilson was then packaged in the litter and hauled out of the pit.

Rescuers carried Wilson out of the cave and to a waiting helicopter, which transported him to a hospital for treatment. He was later reported to be in fair condition, recovering from multiple injuries, including head trauma.

1. *Robert J. Smith, "Dad, sons climbing in cave help rescue man injured in fall," Arkansas Democrat Gazette, 15 August 2002, p. 1B.*
2. *Tonya Fell, "Cave Rescue," The Morning Report - 26 August 2002, United States National Park Service, www.nps.gov/morningreport, 26 August 2002.*
3. *Associated Press, "Spelunker injured in fall," 16 August 2002.*

Comments: The cave is well-known locally, and has been the scene of several similar incidents, including one fatality.

17 August Cemetery Pit, Georgia stranded, exhaustion, difficulty on rope

Rescuers were dispatched to Cemetery Pit when a man called 911 and reported that his companions were stranded at the bottom of the 153-foot entrance shaft. Apparently, a group of four men had rappelled into the pit, equipped with camping gear, intending to explore the caverns below. Two of the men had a little prior caving experience, while the other two had none at all. One of the men had become stranded on a ledge about 30 feet above the bottom of the pit. The men were using prusik knots for the climb, and the stranded man was reported to be "too tired to climb out."

The local cave rescue team responded, and rigged a haul system at the top of the pit. The stranded caver was plucked from the ledge, and his two companions were hauled out as well, along with a large quantity of camping equipment.

Diane Cousineau, Incident report, 17 August 2002.

Comments: Clearly, the men should have spent more time practicing their techniques before attempting a deep pit. Several local grottos offer vertical training.

25 August Casparis Cave, Pennsylvania stranded, inadequate equipment

On Sunday afternoon, Matthew Klink (29) and his nephew Michael Williams (19) decided to take family member Shane Klink (11) caving at Casparis Cave. The men had been to the cave several times before, and wanted to show it to Shane. They were driven to the cave by Klink's girlfriend, Kim Geyer, who dropped them off at about 4:00 p.m. and planned to pick them up later in the evening.

Shortly after the trio entered the cave, Williams dropped and broke his flashlight. A short time later, Shane lost his flashlight as well, leaving the group with a single working

light. "Just as we were on our way out, the bulb in my flashlight went," said Matthew Klink. Having brought no backup lights or spare bulbs, they had no choice but to sit in the dark and wait for rescue.

Geyer returned to pick up the group at 6:30 p.m. as agreed, but there was no sign of them. Thinking that they were still exploring, she left to visit with Klink's mother and give them more time. She returned an hour later, but there was still no sign of the trio. Geyer asked another person who happened to be at the cave to look for the missing group, but he was unable to find them. She became concerned, and decided to call 911.

By about 10:30 p.m., rescuers from local fire departments were assembled at the cave entrance, along with state police and other emergency services personnel. They began a search of the cave and eventually located the stranded party, bringing them to the surface at about 4:30 a.m.

"Kim and my mom knew where we were, so I knew someone would come and find us," said Matthew Klink. "It was pretty cold," he said. Klink stated that neither he nor his companions planned to go caving again in the near future, but that, "When I do, I plan to take a couple more flashlights, more batteries and bulbs, and maybe a few more people."

Patty Shultz, "Spelunkers rescued from cave," Uniontown Herald-Standard, 27 August 2002.

11 September unnamed lava tube, Hawaii fell into hidden pit entrance

Firefighter Brent Matsuda (41) was participating in a search for three missing hunters when he stepped on a fern and fell through the foliage down a 100-foot pit. The search was in the area of the Captain's Trail, which leads to the Puu Oo eruption area from the rural Fern Forest subdivision. Matsuda fell through a five-foot by eight-foot opening hidden by ferns and other foliage, and plummeted about 100 feet into an unusually large lava tube about 10:00 a.m.

Matsuda was pulled from the hole by fellow firefighters using ropes, and was taken by helicopter to a hospital. His injuries included broken ribs and vertebrae, and damage to his liver and kidneys. He was later listed in critical but stable condition, and was expected to recover. "His helmet and backpack probably helped save his life," said Fire Captain Quince Spencer.

The missing hunters walked out uninjured later in the day about two miles from the trail where they started.

1. *Newswatch, "100-foot lava-tube fall injures firefighter," Honolulu Star-Bulletin, 12 September 2002.*
2. *Rod Ohira, "Firefighter rescued from inside lava tube," Honolulu Advertiser, 13 September 2002.*
3. *"Firefighter recovers from wild ride," Honolulu Star-Bulletin, 18 September 2002.*
4. *Cindy Heazlit, Incident report, 8 November 2002.*

Comments: Heazlit writes: "This sort of thing happens all the time in Hawaii. The vegetation is so thick that you are bouncing around on top of it, never touching the ground. Cave openings are 'dark spots' in the vegetation. If you're not specifically looking out for them, you won't see them. I've fallen into cave entrances several times this way – the

vegetation has always caught me before the final crash. It looks like Matsuda wasn't so lucky.”

16 September **Sótano de Cepillo, SLP Mexico** **equipment problem, maillon opened**

Guillermo Gonzalez Canales (26) was on rope climbing out of the 415-foot entrance shaft of Sótano de Cepillo when he stopped to rest. As he sat down, he felt something strange about his seat harness and looked down to discover that the half-round maillon rapide used to close his harness had come completely unscrewed, and that one of the harness attachment loops had come out. He was suspended by the open maillon and a single attachment loop. With some difficulty, he was able to reattach the screw link and secure his harness. He then completed the climb without further incident.

Guillermo Gonzales Canales, Incident report, 16 September 2002.

Comments: Canales was certain that he had completely closed the screw gate on the maillon before beginning his ascent. It seems likely that movement of the rope, or perhaps his clothing or equipment, during the climb worked to unscrew the gate. See the 18 April 2002 report of a similar incident in Hell Below Cave. The orientation of Canales' maillon is not known, but it is clear that cavers who use a harness employing a maillon for closure and attachment should be aware of this issue and take appropriate precautions. Canales reported that he was planning to get a new harness that would not use a maillon for closure.

21 September **Cassell Cave, West Virginia** **caver fall, difficulty on rope**

At approximately 8:00 p.m. on Saturday evening, Mary Schmidt, Mike Masterman, and Todd Leonhardt prepared to descend the Pit Entrance of Cassell Cave in Pocahontas County, intending to do a through-trip to the Windy Entrance. As they were suiting up at the cars, rain began to fall, soon increasing in intensity.

Leonhardt was the last person into the cave. He was completely soaked before he began his rappel, and by the time he was at the bottom he was cold and shivering. Given that he was already soaked, hadn't slept in about 36 hours, and was expecting a six-hour, fairly strenuous, through-trip, Leonhardt thought it would be best to “bag the trip, ascend, and call it a night” – he didn't want to risk becoming hypothermic. Masterman and Schmidt agreed.

Masterman decided to ascend first, in case Leonhardt needed any help getting over the lip at the top. Masterman climbed a little over ten feet up the rope and stopped, saying that he was tired. He had helped someone put the roof on a barn that morning, his ascending system wasn't adjusted quite right, and it was taking him longer to ascend than expected. Schmidt and Leonhardt suggested that he change over to rappel and come down, then figure things out from there.

Masterman rigged his figure eight for descent and tried to switch over to rappel, but was unable to remove one of his

ascenders from the rope. The torrential downpour had coated the ropes with mud, hampering his efforts. The bottom 30 feet of the pit requires ascending through a small waterfall, made significantly worse by the hard rain, and Masterman was becoming chilled hanging in the water.

A second rope had been left rigged by a party of cavers surveying in the cave, so Leonhardt ascended that rope to help Masterman. As Leonhardt climbed up, Masterman accidentally dropped some equipment which fell and struck Leonhardt's helmet, causing his light to go out. Fortunately, it was a model with dual bulbs, so Leonhardt switched to the alternate bulb. Among the dropped items were Masterman's foot slings.

Leonhardt felt that without the foot slings to stand up in, the situation had just gone from “very bad to truly frightening.” He tried to get Schmidt to throw them up, or tie them to the rope so they could haul them up, but the noise of the waterfall prevented communication. Leonhardt then tried to support Masterman's weight enough to allow him to remove his remaining ascender from the rope, but that effort also failed.

After struggling for some time, Masterman told Leonhardt that he was “losing it” and couldn't hang on much longer. He asked for a knife to cut himself loose, but none of the cavers had one.

Leonhardt and Masterman kept trying and were eventually able to get Masterman's ascender un-jammed. Unfortunately, Masterman had not tied off his descender. As soon as his ascender came off, “he dropped like a rock” about 15 feet to the floor below, breaking his left tibia and fibula.

Masterman and Schmidt told Leonhardt to climb on up and go for help. After hanging in the waterfall with Masterman, however, Leonhardt felt that he was also “starting to lose it” and was worried about his light malfunctioning, so he changed over and rappelled down.

While Schmidt started out to get help, Leonhardt tended to Masterman, helping him remove his wet clothing and put on some dry polypro. He then used some sticks and webbing to splint and immobilize Masterman's leg.

Schmidt had some trouble getting up the pit – her ascender jammed, and she had trouble with a redirection that the other party had rigged in their rope. She decided it would be easier to switch over to the other rope, so Leonhardt pulled it toward her and she was able to make the switch and get out.

About this time, the cavers of the survey party arrived. They offered more warm clothes for Masterman, including a balaclava and a space blanket. Three of them started out to get more clothing for Leonhardt and a radio for communication at the pit.

Schmidt made it out of the cave and went to a nearby house, where she called for help. The local rescue squad responded, and joined with the assembled cavers to bring Masterman to the surface. The rescue was complicated by weather, rigging, and communication problems, and took several hours. Masterman reached the surface at about 2:30 a.m. and was taken by ambulance to a hospital in Elkins.

1. *Todd Leonhardt, Incident report, 25 September 2002.*
2. *Bob Robins, “Cassell Cave Survey – The Bratwurst and More,” mywebpages.comcast.net/rrobins/pages/trip_reports/Cassell_Cave_092102.html, undated.*

3. *Todd Leonhardt, "Cassell Cave Accident," The West Virginia Caver, v20n6, December 2002, p. 7.*

Comments: Leonhardt writes: "Heavy rain, fatigue, equipment malfunction, and perhaps Mike being out of practice ascending all played a role. Lack of adequate planning might also have played a role – the party was planning a through-trip and not on having to ascend out. [...] Don't ask me how they [Masterman's foot loops] managed to come off his ascender. Perhaps he purposely took them off, but maybe not. It was obvious that he was getting severely hypothermic and not thinking straight at this point." Perhaps one should say "operator error" rather than "equipment malfunction."

As one reviewer observed, this is a classic example of cascading errors in judgment and procedure. Weather and fatigue were merely secondary contributors to the incident. Rehearsal of the change-over procedures for their vertical systems would have greatly reduced the severity of their other problems. The hazards associated with poor change-over technique are well-documented.

Masterman's failure to tie off his descender was a critical mistake – it should have been done when he put the descender on rope. Leonhardt notes that he did not think to check it either. Vertical cavers should practice their change-over technique until it is second nature. As in this incident, you may be called upon to use it under difficult conditions.

Finally, it is worth noting that even on a pull-down or through-trip, cavers should be prepared to climb back out if necessary. The failure to plan is a plan for failure.

28 September Howards Waterfall Cave, Georgia caver fall

Ashley Chan, Andrea Burgess, and Suzi Beaumont were leading a group of nine female university students on a novice caving trip. After visiting nearby Sittons Cave, where they were turned back by high water part-way through the cave, they decided to tour Howards Waterfall Cave.

The group entered the main entrance and followed a crawlway about 100 feet to a junction room with passages leading in several directions on multiple levels. After exploring several dead ends, they traversed across a steep slope above a small pit to reach the main passage beyond. The slope can be intimidating to novice cavers, and Burgess and Chan coached and spotted the women as they crossed.

The group explored the passages beyond until about 5:00 p.m., when they decided to start out. At the junction room, Beaumont led while Chan and Burgess once again assisted as the cavers crossed the slope. As Chan was coaching the group across the traverse, she noticed that one of the novice cavers standing near her, a woman named Candy, had ventured near a hole leading down to the lower level. Before Chan could call out a warning, the woman stumbled and fell into the hole, falling about 10 feet to the floor below.

Candy complained of pain in her right ankle and lower back. She was alert and calm, and did not believe she had broken anything, reporting only a feeling like "sore muscles." Beaumont checked her for injuries and palpated her spine, finding no point tenderness or other indication of fracture. The location of the accident was within 150 feet of the entrance to

the cave. With the exception of the spot where Candy fell, there was no difficult terrain. There was, however, a "window" through which Beaumont had crawled to get to Candy, and Beaumont wasn't sure a litter would fit through this spot. She knew that a cave rescue with a litter would have taken several hours and many resources. Beaumont explained this to Candy, and asked her if she thought she could crawl and/or walk out of the cave. Candy agreed to try.

Chan and Beaumont helped Candy move slowly, first crawling, then inching through the window. Eventually she was able to stand up and walk, with support. When they got up to the spot where Candy had fallen, Burgess, with help from some of the students who remained in the cave, spotted and assisted Candy as she crossed the tricky slope on her belly. Once past this spot she continued, crawling on hands and knees, through the final 100 feet to the entrance.

The women assisted Candy to their van, helped her to remove damp clothing, and made her as comfortable as possible. They took her to a hospital, where examination revealed a sprained ankle and a hairline fracture of the L2 vertebra. A CAT scan later revealed additional damage to her vertebrae, and she remained hospitalized for three days before being released. She was directed to wear a back brace for 12 weeks, and was expected to recover fully.

Suzi Beaumont, Incident report, 17 October 2002.

Comments: Beaumont reports that after the incident, Candy explained that her headlamp had gone out just before the accident. She knew she was at a tricky spot, but chose to proceed, relying on the light from nearby cavers, until she was across and could deal with the problem. Many experienced cavers wear a backup light on their helmets for just such an occurrence.

Beaumont adds that, in hindsight and knowing the extent of the injury, it might have been better to send for help and a backboard or spine splint. The decision to stay or go can be a difficult one, especially when back or neck injuries are involved.

1 October Maxwelton Cave, West Virginia rockfall entrapment

Jeff Bray, Dave Scott, and Carroll Bassett entered an ongoing dig on Scott's property near Maxwelton Cave around 7:00 p.m. Bassett was about 100 feet into the cave when he brushed against something, triggering an avalanche of rock. A large breakdown slab shifted and pinned his right arm and leg to the floor. He was unable to free himself, and his companions could not move the slab. Bray left the cave to call for help and to get a jack from one of the vehicles while Scott, a physician, remained with Bassett.

After making the initial call, Bray returned with a car jack and an attempt was made to move the rock. When this failed, Bray left to call for more help. Cavers began to arrive, and a second jack was taken in, along with a crowbar, sledge, wedges, and other equipment.

The two jacks were placed to lift and support the slab, with one located near Bassett's right shoulder and the other near his feet. Once the first jack was raised to support the slab, the

second was used to raise the foot of the slab until Bassett could remove his leg. A few more turns on the first jack then raised the upper portion of the slab, and Bassett was able to pull his arm from underneath.

Bassett had been pinned, lying in a prone position, for about 90 minutes, and his arm had gone completely numb. When he stood up to leave the cave, he suddenly felt chilled. He began shivering uncontrollably and could not catch his breath. After about a minute, the shivering subsided and he felt able to leave the cave. He crawled toward the entrance, and then rested while a paramedic assessed his condition. Bassett was able exit on his own and was out of the cave by 9:30 p.m.

Carroll Bassett, Incident report, 26 February, 2003.

Comments: Bassett suffered nerve damage to his right arm and hand, but expected to recover full use in about six months, following extensive treatment and therapy. The dig later became a new entrance to Maxwellton Cave.

6 October Buddha Cave, Indiana caver fall, climbing without belay

Everett Pulliam (49) was injured when he fell from an exposed climb about 15 feet inside the entrance of Buddha Cave. He started up the climb wearing a heavy backpack containing his photography and vertical equipment and using a hand-line for support. He was part-way up when he lost his balance, then lost his grip on the hand-line and fell about 10 feet to the cave floor.

Pulliam landed on his backpack, which may have cushioned the fall somewhat. He reported feeling pain and tenderness in his lower back. He left the cave and was driven to a local hospital for evaluation, where he was found to have badly bruised his back, left arm, and left foot.

Everett Pulliam, Incident report, 16 February 2003.

Comments: Pulliam reports that he had done the climb before, was not worried about it, and did not feel the need for a belay. He did not think about the pack, which probably put him off-balance, leading to the fall. He notes that it would have been better to remove the pack and pass it up, and that a belay would have prevented the fall. A hand-line can give you a false sense of safety. If you are not clipped on or tied in, they are of little use in a fall.

12 October War Eagle Cave, Alabama stranded, difficulty on rope

Glenn Hicks, Joe Prucinsky, Sherry Smith, and two other cavers descended the 137-foot entrance pit of War Eagle Cave without incident and explored the cave at the bottom. When they were ready to leave, Hicks climbed out first so that he could coach or assist the others at the lip if necessary. Prucinsky climbed last, in tandem with Smith.

The lip of the pit is a smooth flowstone slope curving downward for about six feet with the profile of an open umbrella, then steeply undercut, leaving the rope free-hanging

for the remainder of the drop. The climbing rope lies flat against the flowstone, making it difficult to move an ascender upward for the final few feet of the climb whenever there is any weight on the rope below the ascender. Users of ropewalker and Mitchell systems have struggled with this lip on many previous occasions.

Smith climbed over the lip without difficulty, even with Prucinsky hanging below her, but when Prucinsky started over, he ran into problems. He had attached an additional tethered ascender and unclipped the chest roller on his ropewalker system in order to negotiate the lip, but the ascender was below the edge of the flowstone. When he stood up to push the ascender upward, his weight on the rope held it tight against the flowstone, preventing movement. Further, the attempt left a large amount of slack in the tether of the ascender, which was at that point just above his knee ascender. He found himself dangling in a precarious, semi-inverted position. He struggled to move the ascender upward, but soon became tired, and began to lose sensation in his legs.

Smith got back on rope and down-climbed to the edge of the flowstone. She helped Prucinsky remove his foot ascender and slide the knee ascender down so that he could sit normally in his harness and rest. Meanwhile, one of the other cavers ran down to the vehicles and returned with a second rope. The cavers attached a carabiner to the end of this rope and dropped it down to Prucinsky, along with the foot ascender from a Frog system. He attached the Frog ascender with its long foot sling just below his tethered ascender, and clipped the rope and carabiner into the top hole of his tethered ascender. While Prucinsky stood in the foot sling of the Frog ascender, the others pulled on the tag line and were able to drag the tethered ascender upward. With this assistance, Prucinsky soon reached the top.

Glenn Hicks, "Incident," TAG-Net Digest #2997, 29 October 2002.

Comments: The lip at War Eagle is notorious among local cavers. It is common practice to rig a short rope with a knot and loop in the end alongside the main line for assistance. Climbers can stand in the loop or clip in to the short rope with an additional ascender attached to their seat harness in order to un-weight the climbing line and raise their ascenders.

While ropewalker and Mitchell systems have obvious advantages in reducing the effort needed to ascend a rope, the Frog and Texas systems offer better performance when passing lips, rebelay, and obstructions. Cavers should know their capabilities and limitations using their chosen vertical systems, and ensure that they are appropriate for the conditions they will encounter.

15 November Tower Cave, Colorado caver fall, no belay, inadequate equipment

A geo-cacher slipped and fell while descending a chimney to reach a geo-cache located in the cave. He was able to catch himself, but reportedly tore some muscles or ligaments in the process. He apparently had a rope and was descending hand-over-hand.

Anonymous post under the name "brderX," Tower Cave Cache web page, www.geocaching.com, 15 November 2002.

Comments: A similar incident occurred at the cave on 11 January 2003 and another occurred at nearby Fault Cave on 27 May 2002.

24 November Lechuguilla Cave, New Mexico caver fall

Tom Dotter and several companions were surveying in the North Rift, where they were working on a steep, moist, mud-covered slope. Dotter was working on the sketch when a section of mud and corrosion residue broke loose, precipitating him down the slope, sliding on his stomach. The slide ended after several feet when his "tail bone intersected a small pinch." He felt a little stiff, but was able to continue surveying for three more hours before exiting the cave. He was later reported to have fractured his coccyx.

1. *Tom Dotter, Trip report, Carlsbad Caverns National Park, 25 November 2002.*
2. *Richard Rhinehart, "Briefly," Rocky Mountain Caving, v20n2, Spring 2003, p. 5.*

14 December Coon Cave, West Virginia difficulty on rope, stranded

Mike Frisina and two companions entered Coon Cave to explore and check some leads. Frisina had been ill the previous evening, but felt up to a short trip. They descended several climbs, traverses, and drops, including a 90-foot pit, and reached the bottom of the cave without incident. When they had completed their explorations at the bottom, they climbed back up to a window in the side of the 90-foot pit. The window is reached by a 30-foot rope traverse across a ledge located about 30 feet above the bottom of the pit.

When Frisina reached the ledge, he clipped into the traverse line with an ascender attached to his seat harness. He began to pull himself toward the window, but found himself struggling with the main line, which was pulling on the chest roller of his ropewalker system. He detached the roller from the main line, and suddenly found himself in danger of becoming inverted. The ascender on the traverse line was lower than his ropewalker ascenders, which were still attached to the main climbing rope.

Frisina struggled to reattach the chest roller, but was unable to do so. He wound up hanging with his hands interlocked over his feet, struggling to avoid complete inversion. Frisina called for help, and one of his companions tried to drop a line to him. Everything was covered in mud, and in his semi-inverted position, Frisina could not manage to secure himself to the line. The companion tied a loop in the end and tried again. This time Frisina was able to grab the loop and get his wrist through it. With a helpful pull from above, he was able to stand up and chimney over to the window and the safety of the passage beyond.

Mike Frisina, Incident report, 14 December 2002.

Comments: Frisina writes: "I have been climbing for 15 years and have never had anything like this happen before. Was I complacent? Maybe. Should I have gone on a vertical trip after getting sick? Maybe not. Why did I remove the roller? Not thinking? I have gone over it a thousand times in my head. No one contributing factor, just many little things."

As several reviewers noted, Frisina's closing comment is the key to this incident, and many others as well. Accidents are seldom the result of a single catastrophic event. Rather, errors in judgment and technique accumulate over time, leading eventually to disaster.

Users of ropewalker systems should make sure to connect a short sling between their seat harness and the upper of their two foot ascenders. This safety sling is an essential component of the ropewalker system and serves to prevent a full inversion in the event that the chest roller is detached. Some ropewalker users wear a Croll or similar ascender below the chest roller for resting and for additional security. Others climb with an ascender on rope above the roller. Time spent outside the cave practicing change-overs and rebelayes, and negotiating transitions between rope traverses and ascent or descent is a worthwhile investment for all vertical cavers.

Frisina notes that he plans to use a Frog system for future trips in "these muddy, tight, traverse-laden West Virginia treasures." Frog users are quick to extol the virtues of their chosen system in such conditions, with good reason.

24 December Bloomington Cave, Utah fatality, caver fall

Kiley Jaquays (17) visited Bloomington Cave on Christmas Eve with 14 other students and five counselors from a residential treatment program for troubled teens. The cave is a mile-long tectonic cave in limestone near St. George, and is a popular and well-known destination.

Jaquays was near the cave's register in a passage known as the Boardwalk when she stumbled and fell, tumbling about 275 feet down a 45- to 50-degree slope covered with breakdown. Members of her party witnessed the fall, and immediately sent for help.

Rescuers arrived within 90 minutes, but found that the girl had died from her injuries. They worked through most of the day to bring out her body.

1. *Associated Press, "Teen dies in St. George Cave Fall," The Salt Lake Tribune, 26 December 2002.*
2. *Jane Zhang, "Name of fall victim released," St. George Spectrum, 26 December 2002.*
3. *Richard Rhinehart, "Illinois girl's death may close cave," Rocky Mountain Caving, v20n1, Winter 2003, p. 6.*

Comments: The cave is a popular destination, and few visitors are equipped with helmets and other appropriate caving gear. According to the *Rocky Mountain Caving* article, a similar accident occurred in the cave earlier in 2002, when a teen fell in the cave and had to be rescued.

2003 Caving Accident and Incident Reports

1 January

unspecified cave, Estill County, Kentucky caver fall, broken leg, hypothermia

Phillip Brown and companions were exploring a small cave in Estill County when Brown fell down a 30-foot pit about 40 feet inside the entrance, breaking his leg. His companions left the cave to get help, and local firefighters were dispatched to the scene. The entrance to the cave is a 12-inch by 16-inch crack, leading to a chimney traverse above a 10-foot pit followed by a squeeze through a short keyhole passage to the top of the 30-foot pit.

Firefighters entered the cave and quickly located Brown. They could see and talk to Brown, but were unable to get through the keyhole and down the pit to reach him. After several attempts, they called for assistance from another department with cave rescue training and equipment. They dropped some cotton blankets down to Brown, hoping that he could at least keep warm during the wait. Unfortunately, water dripping into the pit soon soaked the blankets, and they were of little comfort.

After a 50-mile drive, rescuers from the Jessamine County fire department arrived at the cave. Rescuers Chad Greathouse and Mark Traylor entered the cave, rigged the pit, and rappelled down. They found Brown sitting at the bottom, suffering from a compound fracture of his lower right leg, a lacerated hand, and mild hypothermia. His light had been smashed in the fall, and had been sitting there in the dark for about five hours.

Greathouse and Traylor bandaged and splinted Brown's leg, bandaged his hand, and checked him for other injuries, particularly spinal injuries. Finding none, and realizing that the keyhole and entrance squeezes were too small to pass a litter through, they decided to haul him up the pit in a harness. While arrangements for the haul were being made, they constructed a heat tent for Brown using a space blanket and a carbide lamp.

A haul line was rigged from outside the cave, through several directional pulleys, and down the pit. Greathouse attached himself and Brown to the end, and rescuers began hauling. As they reached the top of the pit, Greathouse changed over to the rappel line and guided Brown through the keyhole passage. Brown was then lowered down the 10-foot drop, hauled up the other side, and pulled through the entrance. Outside the cave, he was placed in a litter and hauled up the hillside, then driven to a waiting ambulance. He was taken to a hospital for treatment.

Chad Greathouse, "A Muddy Mission: Kentucky Cave Rescue," Advanced Rescue Technology, October/November 2003, p. 76.

Comments: Greathouse reported that the heat tent worked so well that Brown was soon warm, and did not become chilled again until he reached the surface, where the temperature was just above freezing. He also notes that running the haul system from outside the cave reduced congestion in the cave but resulted in excessive friction in the system, as well as difficulties in communications.

Finally, Greathouse notes that Brown had specifically asked for a cave rescue team when he sent his companions for help, but that "somewhere along the way this was translated into dispatching the local fire department." Cavers should be aware that local emergency response agencies may not have cave rescue training, and may not be aware of cave rescue resources available to them. While requests for assistance must come from the local authority having jurisdiction, cavers should be aware of cave rescue teams and resources in their area, know how to contact them, and be prepared to help and encourage the local authorities to call on them for assistance.

11 January

Tower Cave, Colorado caver fall, no belay, inadequate equipment

A geo-cacher slipped and fell while descending a rope ladder to reach a cache located in the cave. He fell to the bottom of the ladder, but suffered only scrapes and bruises.

Anonymous post under the name "ChrisDish," Tower Cave Cache web page, www.geocaching.com, 11 January 2003.

Comments: Similar incidents occurred at Tower Cave on 15 November 2002 and at nearby Fault Cave on 27 May 2002.

18 January

Cemetery Pit, Georgia stranded on rope, illness

After several hours spent exploring passages in Cemetery Pit with several companions, a female caver was on rope climbing the 153-foot entrance pit when she began experiencing seizures. Her husband, who was climbing alongside her on another rope, was able to pull her over to a large ledge and get her off rope.

After evaluating her condition, the woman's husband felt that they should get some help and haul her out of the pit rather than having her try to climb. Other members of the party climbed out, went to a phone, and called for help. The Dade County cave rescue team responded, rigged a haul system at the cave entrance, and hauled the woman up to the surface. She declined transport to a hospital.

Diane Cousineau, Incident report, 19 January 2003.

Comments: The caver reportedly had a history of seizures, and was on medication for them. She had discussed caving with her physician, who had approved the activity.

1 February

Pettijohns Cave, Georgia caver fall

A youth group of 13 children and one adult leader were exploring the cave when one of the children, a young girl, took the wrong route and fell about 10 feet while climbing down a hole in the breakdown. The group leader was able to pull her out. She was bruised and shaken, but not seriously injured.

Eric Ingman, Incident report, 3 February 2003.

Comments: Children in caves require constant supervision. A group of 13 should have been accompanied by several experienced cavers, and provided with proper lights and helmets. Some caves, such as those requiring a lot of climbing on or over breakdown, are not suitable for such trips.

20 February

Sistema de los Tres Amigos, Oaxaca, Mexico difficulty on rope, dropped ascenders

Mike Frazier was on rappel in a 200-foot pit when he stopped to set a bolt for a rebelay. In the process, he inadvertently dropped the pack containing the foot and safety ascenders of his Frog system down the pit. He decided to finish setting the rebelay and continue to the bottom, hoping that the rope would reach. Unfortunately, it did not, and he was left hanging well above the floor.

Frazier tied off his rappel rack, pulled up the end of the rope, and used the tail to tie a makeshift foot sling above the rack. Several half-hitches served as a climbing knot, a butterfly knot in the middle provided a clip-in point for his cows tail, and a double figure eight formed a pair of foot loops. He clipped the chest ascender into the rope, removed his rappel rack, and climbed out of the pit. Frazier and companions then re-rigged the pit with additional rope and descended without further incident.

Michael Frazier, "Mexico Caving Adventure," Rocky Mountain Caving, v20n2, Spring 2003, p. 16.

Comments: Frazier's skill and quick thinking got him out of a sticky situation, and serve as a good lesson for vertical cavers.

February

Cueva Cheve, Oaxaca, Mexico difficulty on rope, injured knee at rebelay

Aaron Zumpf entered Cueva Cheve with three companions on a trip to rig drops en route to Camp Two. While descending the Elephant Shaft, Zumpf hyperextended his knee while crossing a rebelay. He made it to the bottom, and told his companions what had happened. His knee was painful, but was not swollen and did not seem to be fractured. Zumpf felt that he could leave the cave after some rest. Another team of cavers, who were making a day-trip, was following, so he told his companions to continue on without him and settled down to wait, planning to make his way out with the second team.

By the time the second team arrived, however, Zumpf's knee had become very painful and he realized that he would need more than a little help to leave the cave. One member of the team stayed with him while two others left the cave to get help and equipment.

Expedition members entered the cave with ropes, pulleys, and additional equipment to rig hauling systems. They rigged a counterbalance haul to get Zumpf up the Elephant Shaft, and started helping him toward the entrance. A litter was brought into the cave to make it easier to move Zumpf through the horizontal sections of the cave. After several hours of work and a few more hauls up the entrance pit series, Zumpf reached the surface at about 4:00 a.m.

Michael Frazier, "Mexico Caving Adventure," Rocky Mountain Caving, v20n2, Spring 2003, p. 20.

Comments: Frazier notes that Zumpf had just picked up some additional rope before starting down the pit, and did not have his pack tethered. He speculates that the additional weight and the resulting high center of gravity probably contributed to the accident.

4 March

unnamed cave near Collegedale, Tennessee child fell into cave entrance and drowned

A 22-month-old boy drowned after falling through the 25-foot deep entrance shaft of a small cave and landing in a pool of water. The boy was playing in his back yard when he apparently fell into the entrance, a narrow shaft in a sinkhole about 150 feet from his house. When the boy's mother noticed that he was missing, she searched the yard and found the cave. Fearing that he had fallen in, she called 911 and the cave rescue team was dispatched to the scene. The first rescuers to arrive could not fit through a constriction in the entrance. A smaller caver was able to squeeze through, and found the child in the pool. Rescuers were unable to revive him.

1. *Buddy Lane, Incident report, 4 March 2003.*
2. *Dick Cook, "Toddler dies in backyard cave fall," Chattanooga Times Free Press, 5 March 2003, p. B-1.*

9 March

Gruta del Río Chontalcuatlán, Guerrero, Mexico fatality, rockfall, caver fall

A female visitor was climbing down the entrance canyon of the upper entrance of the cave when a person above her dislodged a rock. When the rock struck the woman in the head, she lost her purchase and fell down the slope. She died from injuries sustained in the fall. Several rescue groups from the surrounding region worked together to recover her body from the cave.

1. *Bill Mixon, "Mexico News," AMCS Activities Newsletter Number 26, June 2003, p. 7.*
2. *Sergio Santana, "Asunto: Accidente en el Río Chontalcuatlán (Mexico)," Iztaxochitla email list, 10 March 2003.*

Comments: Mixon writes that another fatality, a drowning, was reported to have occurred in the Dos Bocas caves earlier in 2003. He notes that the caves of the area are very popular destinations, and that untrained local guides take poorly equipped tourists into the caves.

22 March

Sinks of the Roundstone, Kentucky caver fall

Peter Stow (22) was leading a group of Boy Scouts on a caving trip when the group came to a large sloping rock lying across the passage. The rock was wet and slippery, and sloped into a 5-foot deep hole, so Stow positioned himself to help the Scouts across. One of the Scouts slipped as he was crossing

the rock and threw his arms up for balance, inadvertently striking Stow in the face and breaking his nose. The Scout slid into the hole, but was uninjured.

Peter Stow, Incident report, 28 March 2003.

Comments: Stow observes that a belay or a traverse line might have been more effective in avoiding or stopping a slip. We concur. Cavers leading youth groups should probably err on the side of caution. A 20- or 30-foot length of rope or webbing can be useful as a safety or belay line, and does not take up much room in the pack. "Be prepared."

23 March Tiftonia Pit, Tennessee stranded in pit, inadequate equipment

Rob Rodd (32), David Brian (23), David Ware (20), and Chris Billing (21) rigged a 1½-inch rope of indeterminate origin at Tiftonia Pit at about 7:00 p.m. on Sunday evening. Two of the men had joined the Marine Corps, and were scheduled to leave for Paris Island the next morning. They had decided that some rope climbing practice might be helpful, and thought that the 80-foot entrance shaft of the popular roadside pit seemed like a good place for it.

The men had no helmets, lights, or vertical caving gear, and descended the pit hand-over-hand. Brian and Billing managed to get out, but Rodd and Ware were unable to make the climb back up the rope. After trying unsuccessfully for some time to get the stranded men out of the pit, Brian and Billing decided to get help. They went to a nearby house and called 911 at about midnight.

The cave rescue team was dispatched to the pit to help the stranded men. Upon arrival, rescuers found one of the men waiting on a ledge in an alcove about halfway up the pit, and the other waiting at the bottom. Rescuers rigged their own rope next to the one the men had used, and a rescuer descended and provided each of the stranded men with a seat harness. They were then hauled out of the pit. The rescue was completed shortly after 1:00 a.m.

1. *Mark Brown, "Rescue at Tiftonia Pit," The TAGline, Chattanooga Grotto, May 2003, p. 4.*
2. *Buddy Lane, Incident report, 23 March 2003.*

Comments: The cave is a large pit entrance beside a paved road in a suburban area. It has been the scene of many similar events over the years, and is closed by its owners.

29 March Womer Cave, Pennsylvania rockfall entrapment

A group of York Grotto cavers visited Womer cave for a trip organized by Mark Engle. The cavers were divided into two groups, one led by Engle and the other led by Kevin Dunleavy (41).

Dunleavy took his group into the cave, eventually arriving at a junction with a tight passage leading to the Shoemaker Room near the back of the cave. He had not been down the passage himself, but had been told that it was only a 10 to 20 minute side trip, so the cavers decided to leave their packs at

the junction. Three of the cavers decided to wait with the packs.

Dunleavy followed three other cavers down a small passage and through an 18-inch high crawl underneath wedged rocks. As he emerged from the crawl, the cavers discovered that the passage ended.

When he turned to go back through the crawl, Dunleavy was dismayed to see that they had crawled underneath what appeared to be an unstable pile of breakdown. He started back through the crawl on his back, being very careful to avoid touching the rocks in the ceiling. Suddenly, a 50-pound rock slid down onto his upper legs, pinning him in the crawl.

Dunleavy called to the three cavers trapped behind him, asking them to try to move the rock. It was tightly wedged, however, and they were unable to free him. They felt that they might be able to break the rock with a hammer, or possibly wrap it with webbing and lift it. Unfortunately, they had left their packs in the passage on the other side of the crawl.

Dunleavy called to the three members of the group who had waited at the start of the passage, and told them what had happened. Two of the cavers went to get Engle and the other group, while the other, Skye Fisher, stayed to try to help the trapped cavers.

After working on the rock for a while, Dunleavy found that he could move it somewhat, relieving the pressure on his legs. About 30 minutes into the incident, one of the trapped cavers remembered that he had some rope in his pack. This was quickly retrieved by Fisher, who was able to pass it through a crack in the breakdown to the cavers beyond.

After some experimentation, Dunleavy was able to lift and move the rock just enough for the others to pass the rope around it. With that advantage, they were able to lift the rock and allow Dunleavy to crawl free. The passage was quickly cleared, and the other three cavers soon joined their companions. Engle and the rest of the group arrived a few minutes later. After some rest, the cavers continued their tour and left the cave without further incident.

Kevin Dunleavy, Incident report, 4 May 2003.

Comments: Dunleavy writes: "Cavers should never be separated from their packs, but this was 'only 10-20 minutes, we'll be right out.' I've heard that many times before and it bit four of us."

15 April Midnight Cave, Texas stranded in pit, inadequate equipment

Two teenage boys were rescued from Midnight Cave in Southwest Austin on a Tuesday evening after becoming stranded at the bottom of the 50-foot entrance drop. Firefighters believed that the boys descended a rope hand-over-hand, but were unable to climb out because "the rope was 15-to-20 feet short." Neither boy was seriously injured, but one boy was reported to have hurt his back. Rescuers were reported to be uncertain how the boys managed to get into the gated cave.

"Firefighters rescue boys in cave," News 8 Austin, www.news8austin.com, 15 April 2003.

26 April Laurel Caverns, Pennsylvania caver fall

John Graybeal (12) was part of a group of nine Boy Scouts from a Maryland troop participating in a “high adventure” trip into the wild section of Laurel Caverns. Led by a guide, the group was in a passage known as “The Beach,” where a sandy floor surrounds large breakdown blocks. Graybeal was crossing some of the breakdown when he slipped and fell, breaking his femur and wrist.

Laurel Caverns is a commercial tour cave, and the operators have installed a phone line though much of the cave in case of emergency. Guides used the phone to call for help, and cavern employees called authorities to request a cave rescue team, before starting into the cave with heat packs, blankets, and other supplies. When they reached Graybeal, they moved him to a safe location, splinted his leg and arm, and treated him for shock, covering him with blankets while they waited for the rescue team.

Rescuers worked for about seven hours to bring Graybeal to the surface, placing him in a litter and carrying him through several thousand feet of passage. He was flown by helicopter to a hospital for treatment.

Jan Ackerman, “Boy Scout rescued after fall deep inside Laurel Caverns,” Pittsburgh Post-Gazette, 28 April 2003.

28 April Cave Hill Cave, Illinois lost, stranded, hypothermia, inadequate equipment

Josh Myogeto (15), Garrett Mausey (19), and Garrett DeCoursey (18) set out at 3:30 p.m. looking for adventure in Cave Hill Cave, a popular wild cave known for its mazy passages. They found it when they became lost in the cave and spent the night searching for the way out, before finally being located by rescuers at about 6:30 a.m. the next day.

The teens entered the cave at about 4:00 p.m., using string to mark their route. The string ran out before the cave did, but they kept going. Soon, they were completely lost. They wandered around the cave until about 3:30 a.m., when they finally settled down to wait for rescue.

Fortunately, DeCoursey’s father was aware that they had gone to the cave. When his son missed curfew and did not answer his cell phone, DeCoursey knew something was wrong. “It wasn’t normal,” he told a reporter. “He still had to be in that lousy cave.”

DeCoursey called the Sheriff’s Department at about 10:25 p.m. to report that the boys had not returned from the cave. An officer located their vehicle parked nearby, and a search was initiated. A rescue team from the Illinois Department of Mines was called in from Springfield, while local rescuers made a hasty search of the area just inside the entrance. Members of the mine rescue team arrived as the hasty search was completed, and entered the cave at about 3:13 a.m.

After about three hours of searching, the boys were found. They were settling down to sleep when they heard searchers calling their names. The teens were wet, muddy, and thirsty, but unharmed. Rescuers led them to the entrance, where a

large crowd had gathered. They were treated for mild hypothermia and returned to their parents.

1. *Raygan Swan, “Cave trip turns into all-nighter for teens,” Evansville Courier, 30 April 2003.*
2. *Brian DeNeal, “Three rescued after 11-1/2 hour cave exploration,” Harrisburg Daily Register, 29 April 2003.*

Comments: One member of the rescue team told reporters that “people who explore caves should be properly prepared.” He explained, “To avoid getting lost, use a string or cable system leading to the entrance of the cave.” As noted above, the boys had used string, but ran out. Somehow, that always seems to happen.

28 April Onesquethaw Cave, New York flood entrapment

A group comprised of seven students and four friends visited Onesquethaw Cave on a trip sponsored by the Union College Outing Club. Most of the participants had been caving before, and the two leaders were familiar with the cave. The group had obtained permission, and had appropriate equipment for the trip, including helmets, lights, warm clothing, and extra batteries.

The cavers entered at about 9:00 p.m. and spent about two hours exploring before heading out of the cave. When they arrived at a small chamber about 1,000 feet from the entrance, they found the passage flooded. One of the leaders tried to crawl through, but the passage was completely sumped.

With no alternative, the cavers settled down to wait in the 20-foot long, four-foot wide, three-foot high chamber. They shared their food and clothing, and huddled together for warmth as they waited.

The water level in the passage continued to rise slowly for about two hours, and then began to subside. After about three more hours, it had dropped enough for them to make their way out. They emerged at about 4:15 a.m., cold and tired, but very relieved.

1. *Carolyn Stead, Incident report, 12 May 2003.*
2. *“Spelunkers happy to be above ground,” Union County Chronicle, v58n5, 2 May 2003.*

Comments: The cause of the flood event remains unknown. There was no rain in the area, and the passage was not known to be prone to flooding. There was some speculation that leakage from an inadequately cased well at a nearby house might have affected water levels in the cave.

10 May Memorial Day Cave, West Virginia flood entrapment

Mike Frisina and five companions entered Memorial Day Cave at about 10:00 a.m. on a survey trip to a remote section of the cave. They expected to be in the cave for about 24 hours, and were prepared and equipped for a lengthy trip. They made their way through the upper section of the cave without incident, arriving at the 125-foot Puppet Buster drop

at about 12:30 p.m. and descending into Columbia Canyon, a large lower-level trunk passage leading to the survey area.

The cavers made the three-hour trek to the far end of Columbia Canyon, where they split into two teams and began surveying. At one point, one of the teams surveyed through a large room floored with mud hills 20 to 30 feet high. They noted that the mud was very slick, apparently from recent flooding. As they completed their survey of the room they discovered that one of their earlier survey points, located close to a pool, was now under water.

The cavers continued surveying until about 1:30 a.m., and then headed for the entrance. As they neared the bottom of the Puppet Buster drop, they found themselves stopped by an unexpected obstacle. Water had filled the passage, forming a pool almost 100 feet long and 15 to 20 feet deep. There was no way around, and no other way up the pit. The prospect of a 100-foot long swim, weighted down with vertical gear and other equipment, was not enticing.

Pete Penczer decided to give it a try. Emptying his pack of all but the essentials, he entered the water. He made it about 10 feet, struggling to stay afloat, before turning back. In a flash of inspiration, the cavers filled Penczer's pack with empty water bottles. With the aid of this makeshift flotation device, Penczer was able to swim and float across the pool and reach the rope hanging just beyond. As his companions settled down to wait, he started out of the cave to get some help.

Penczer made his way out without incident, and arrived at the cavers' nearby field house at about 9:45 a.m. He reported the situation to the cavers there, and a rescue party was assembled. Shortly after 11:00 a.m., a group of cavers entered the cave carrying an air mattress, food, and extra clothing.

After six hours spent waiting at the edge of the pool, the stranded cavers were relieved to hear the sound of their friends as they arrived at the Puppet Buster. A wetsuit-wearing caver swam across the pool trailing a rope and carrying the air mattress, and the cavers were pulled across the flooded section, one by one. Food and dry clothes were distributed, and the cavers began making their way out. The last members of the group reached the surface at about 7:15 p.m., after 33 hours underground.

Mike Frisina and Kevin Flanagan, "Memorial Day Delayed Exit Trip," www.psc-cavers.org, undated.

Comments: Frisina reports that it was a rainy weekend, with cloudbursts dropping as much as two inches of rain in an hour for a total rainfall of about six inches in the area. The cave was a relatively recent discovery, and the passage had not been known to flood before this incident. As one reviewer noted, new caves should be regarded with extra caution, since their hazards and characteristics are unknown.

Limestone caves are formed by water and in many areas they serve as natural storm drains. In such areas, flooding is always a possibility. Cavers should keep this in mind when exploring new discoveries, and especially when planning lengthy trips underground. Many cavers seem to possess an unfounded confidence in their weather forecasting abilities, or in their understanding of hydrology, or both. Entering a stream cave on a rainy day might be considered unwise.

15 May Fountain Pit, Alabama difficulty on rope

A group of cavers was visiting Fountain Pit and enjoying the 100-foot entrance drop. Several cavers had descended without incident when one member, a 44-year-old man, prepared to rappel. As the caver started over the lip, he kept his feet planted at the edge of the drop as he let the rope feed through the rack, lowering himself to a near-horizontal position. At that point, he lost his footing and was thrown sideways against the side of the shaft. He lost control of the rope, and his rappel rack became wedged in a slot in the lip, leaving him unable to descend.

With some assistance from other cavers at the top, the man was able to regain the surface. His rack had been bent in the fall, and he sustained some scrapes and bruises on his arms. After straightening the rack and resting for a while, the man made the descent without further incident.

Ira Sasowsky, Incident report, 6 June 2003.

Comments: Sasowsky notes that the caver had been caving off and on for about 26 years, but had not been on rope in some time. The cavers apparently felt that the damaged rack was safe to use. It is generally a good idea to retire and replace damaged life safety equipment.

17 May Buckners Cave, Indiana stuck, hypothermia

Jarod Watt (20) and two friends entered Buckners Cave early on Saturday morning. While crawling through a narrow crevice above a stream crawl, Watt became stuck. His companions were unable to free him, so one stayed with him while the other went to summon help.

Emergency personnel including cave rescue team members worked through the night to rescue Watt, using drills and other equipment to remove a rock in the crevice that was obstructing his movement. He was finally freed when rescuers were able to dislodge the rock and allow him to slide down to the stream below.

With some encouragement, Watts was able to crawl out of the squeeze. Rescuers gave him food and water, and then helped him exit the cave. He reached the surface at about 6:00 a.m. Sunday morning. He was treated for hypothermia, but was otherwise uninjured.

Michael Koryta, "Man rescued after 17 hours in cave," Bloomington Herald-Times, 19 May 2003.

19 May unspecified ice cave near Kalispell, Montana caver fall, inadequate equipment

Roderick Dye (23) was climbing down a makeshift ladder to enter an ice cave near Kalispell when he slipped and fell. Dye, who was reported to weigh about 200 pounds, plummeted 30 feet, struck a ledge, and then fell an additional 15 feet before becoming wedged between the walls. He was

suspended partway down a shaft believed to be 200 to 300 feet deep.

One of Dye's companions had a cell phone, and used it to call for help. Rescuers from several teams and agencies worked together to rig a haul system and extract Dye from the shaft. He was trapped for about two hours, but was uninjured.

Richard Rhinehart, "Illinois Girl's Death May Close Utah Cave," Rocky Mountain Caving, v20n1, Winter 2003, p. 6.

Comments: It is not clear whether Dye was using some sort of homemade ladder or whether he was trying to cut steps in the ice. In either case, it would have been better to rig a rope and rappel the drop.

25 May Minotaur Cave, Washington lost

Chris Molyneux (36) took his wife, Michelle, and their three children (ages 7, 4, and 18 months) up to the mountains for a day in the outdoors, planning to visit some small lava tube caves. The older children had accompanied him on an earlier visit to Ape Cave, and had asked to go caving again.

Molyneux decided to try a visit to Ice Rink Cave. Using a GPS receiver and coordinates for the cave, he drove to a parking spot about 200 yards from the entrance, parked, and led the group to a sink with a cave entrance. The cave map indicated that there were several entrances, and Molyneux was not sure which one he had found. He decided to go in a short distance to make sure that the passage was suitable for the children, and to try to determine which entrance it was.

Donning his helmet and light, Molyneux entered the cave. He did not take his cave pack, but was wearing a fanny pack containing two backup lights, spare batteries for his headlamp, and a map of the cave. After about 100 feet Molyneux came to an apparent end. An 18-inch high crawl led to the right. Studying the map, he decided that the passage looked more or less like part of Ice Rink Cave near the west entrance. It appeared that he could pop through the crawl, travel a short distance through the cave, and come out at the main entrance with the eponymous ice deposit.

Molyneux crawled through the opening into larger passage leading both left and right. He headed off to the left, believing the main entrance to be in that direction. After walking for some time, he came to a section of breakdown not indicated on the map. Wondering whether he had somehow missed the entrance, he squeezed through. Finally, he came to what appeared to be a collapsed entrance, completely plugged by dirt fill.

Deciding that he was not in Ice Rink Cave after all, Molyneux turned around and started back the way he had come. He squeezed back through the breakdown and made his way back along the larger passage. After several hundred feet, he found himself at what appeared to be another collapsed entrance. It looked suspiciously like the one he had just left. He marked an 'X' in the dirt, and turned once again. After traveling about 400 feet, he found himself once again at the 'X'-marked spot.

Having now realized that the passage made a 400-foot long loop, Molyneux decided to carefully search the outer wall of

the passage all the way around, looking for the opening to the crawl. Another circumnavigation yielded no result. It occurred to him that he had been in the cave for quite a while, and that his wife would be worried. Perhaps she would decide to go for help. As he contemplated this, Molyneux realized that he had the vehicle keys in his pocket.

Molyneux decided to make another traversal of the loop, this time scouring the inner wall. This also failed, and he sat down to rest and think. He had searched the passage carefully, leaving pieces torn from the cave map to mark dead ends and other features. He was sure that he had entered the cave at the opposite side of the loop from the collapsed entrance. He returned to that area and made another search, but found nothing.

After several hours and five or six passes around the loop, Molyneux began to question his assumptions and his recollection of the cave. Perhaps he had erred in focusing his attention on the far side of the loop, away from the collapsed entrance. Beginning once more at the dirt fill, and staying low, he found the obscure opening about 50 feet down the passage. Apparently, when he had entered the cave he had turned left and gone almost completely around the loop before encountering the collapsed entrance. Not realizing this, he had formed the impression that the crawl must be on the far side of the loop.

Molyneux scrambled through the crawl and out of the cave. He had been underground for about five hours. In the meantime, his wife had indeed become concerned, and decided to take the children and hike back up the road to seek assistance. She managed to hitch a ride to a Forest Service station staffed by two interns, where she explained the situation and asked for help. After calling the Sheriff's office to request assistance, they returned to the cave, arriving just as Molyneux emerged. The cave was subsequently surveyed and named Minotaur Cave.

Chris Molyneux, "Very Bad Cave Trip," 27 May 2003.

Comments: The perils of solo caving – need we say more? Molyneux's wife had called to him at the entrance and blown a whistle repeatedly, but he was too far into the cave to hear. She could not leave the small children alone to enter the cave and search for him, and had little choice but to seek assistance when he failed to return. Molyneux observes that since his wife and children were his caving partners, "I should never have gone anywhere that they couldn't follow, and I shouldn't have gone beyond voice contact range." He also suggests that three adults should be considered a safe minimum when taking children caving.

25 May Tongue River Cave, Wyoming caver fall

A man was rescued from Tongue River Cave after he fell about 14 feet in the entrance room, breaking his leg near the hip. The man was with two companions, and had entered the cave to take shelter from a rain storm. Members of the Sheridan Area Search and Rescue team carried him out of the cave and down to rescue vehicles waiting in the canyon below.

1. "Man breaks leg in Tongue River Cave," Casper Star Tribune, 28 May 2003.
2. Richard Rhinehart, "Illinois Girl's Death May Close Utah Cave," Rocky Mountain Caving, v20n1, Winter 2003, p. 6.

Comments: Rescuers were again called to the cave two days later when two teens were reported overdue from a caving trip. The rescue was called off when the boys turned up on their own.

26 May Two Door Cave, Hawaii stranded in sea cave

Four Kauai residents became stranded in Two Door Cave on the Na Pali coast when the inflatable boat they had used to enter the cave capsized. They managed to signal a passing tour boat by firing a signal flare from the cave. The boat crew reported the situation to authorities.

Two lifeguards stationed nearby soon arrived by jet-ski and attempted to enter the cave. On their first attempt, they were thrown from their craft by violent surf. Carefully timing the swells for another attempt, lifeguard Mark McKamey was able to enter the cave and drop off his partner, Chris Pico. One by one, the two lifeguards retrieved the stranded explorers and delivered them to a tour boat that had stopped to help.

Anthony Sommer, "Kauai lifeguards rescue 4 at Two Door Cave," Honolulu Star-Bulletin, 8 May 2003.

3 June Lighthouse Cave, California stranded in sea cave

Two people were rescued from Lighthouse Cave after they became stranded in the cave by a rising tide. According to a newspaper report, the unidentified couple, a man and woman in their mid-20's, were walking along the cliff above the cave entrance when the woman lost her footing and fell into the water at the cave entrance. The man then jumped in to try to help. The tide was rising at the time, with surf height ranging from three to five feet. The two were able to climb out of the water onto a ledge in the back of the cave, where they waited for help.

Firefighters were called to the scene, and used personal watercraft to ferry two lifeguards into the cave. The lifeguards were able to swim the stranded beachgoers out to the watercraft, which took them to a waiting boat.

1. Bill Starrs, "Surf Rescue From a Cave," Santa Cruz Fire Department, Media release, 3 June 2003.
2. Cathy Redfern, "Couple rescued from Lighthouse Point sea cave," Santa Cruz Sentinel, 4 June 2003.

Comments: Correspondent Cindy Heazlit reports that the cave is an easy one, reached by a climb-down from the cliff above the entrance, but that it can be dangerous when the surf is in. The deep 'V' shape of the passage amplifies the force of the waves as they enter the cave.

5 June Fort Stanton Cave, New Mexico caver fall, climbing without belay

On Thursday morning a group of Boy Scouts from Troop 108 visited Fort Stanton Cave, an eight-mile-long cave managed by the Bureau of Land Management. The Scouts had proper clothing and equipment for the trip, including helmets, lights, knee pads, gloves, and boots, had obtained the necessary permit for the trip, and were accompanied by several adult leaders.

At about 2:30 p.m., the Scouts had completed their trip through the Key Hole and were on their way out of the cave. While traversing across the top of Three Way Hill they got off route and found themselves on a balcony overlooking the Trophy Room. Instead of backtracking to find the easier route, they opted to climb down from the balcony. Reilly Walker (14) was climbing down when he slipped and fell, sliding about 15 to 20 feet and sustaining injuries on impact.

Walker suffered a major laceration to his lower left leg, a possible broken nose, minor lacerations to his face, arms and hands, and a twisted ankle. Some of the scouts remained with Walker while the others exited the cave to call for help, using the emergency numbers found on the permit.

Personnel from several local emergency service agencies responded, along with cavers from a local grotto. The first rescuers reached the accident site around 4:30 p.m. Walker was approximately two miles from the entrance, and rescuers realized that more help would be needed to bring him out. The New Mexico State Police were notified and a rescue mission was initiated. At about 5:00 p.m., the Southwestern Regional Coordinator of the NCRC was contacted. He then called in additional cave rescue resources from several parts of the state. Around 5:30 p.m., a team with medical personnel and equipment reached Walker and began treatment.

As more rescuers arrived at the cave, they were formed into teams and were assigned to tasks such as laying phone lines, carrying equipment and supplies into the cave, and rigging ropes at climbs and drops along the evacuation route. Around 8:30 p.m., three more teams of six rescuers were sent into the cave to assist with the evacuation. By 11:00 p.m., Walker had been packaged in a litter and rescuers had begun moving him toward the entrance.

The route from the Trophy Room to the entrance goes through the Hell Hole passage, about 1,700 feet of mostly hands-and-knees crawling, and then through the Crystal Crawl, another 800 feet of hands-and-knees crawlway. Three locations in the cave were rigged with ropes for hauling and belaying: the Twenty Steps, the Devils Backbone, and the climb out of the Bridal Chamber.

At about 2:00 a.m., rescuers brought Walker out of the Hell Hole crawl, and everyone took a break while medics cleaned Walker's wounds and administered antibiotics and pain medication. By 3:00 a.m. Walker was re-packaged in the litter and the evacuation resumed.

From that point the route was primarily walking passage except for the Crystal Crawl, where the litter was dragged by tag-line and rope along the smooth, flat, clay floor. Walker was carried from the cave at approximately 7:30 a.m., placed in a waiting ambulance, and taken to a hospital for treatment.

1. *Bob Rogers, Incident report, 9 July 2003.*
2. *Associated Press, "Crew Rescues Injured Scout From N.M. Cave," ABCNews.com, 6 June 2003.*
3. *Rick Rhinehart, "Briefly," Rocky Mountain Caving, v20n2, Spring 2003, p. 6.*

Comments: The rescue operation involved more than 50 rescuers from a dozen different organizations. It is a good example of a serious cave rescue, and demonstrates the complexity and duration typical of cave rescue operations. Even though the rescue progressed as quickly as possible, with no major obstacles such as pits or flooded passages, the first rescuers did not reach Walker until several hours after his fall, and it took almost 15 more hours to bring him to the surface.

14 June

Land of the Swirling Mists Cave, Colorado rockfall entrapment

Shortly after the discovery of the main level of Land of the Swirling Mists Cave, explorers began searching for new leads to explore. Many of the cave's passages end in breakdown piles, and Tom Dawson and Bob Sacco decided to try to dig up and over one at the south end of the Lobby – the first large room in the cave. Dawson started moving rocks and digging up into the breakdown, staying close to the cave ceiling and away from the larger rocks in the pile. Lying on his side and reaching up with his right arm, he was able to pull rocks out and begin making some progress.

Suddenly, a portion of the ceiling above Dawson broke loose. With a "sick, scraping sound," a 10-inch-thick slab of rock three feet wide and four feet long settled onto Dawson, pinning him to the floor. Sacco could see Dawson's legs sticking out from underneath the slab, and heard his cry for help. He dug frantically, trying to free his friend. Dawson's right arm was still above his head, and his left arm was at his side. He could not move, and felt the slab crushing him as it slowly continued to drop.

Sacco kept digging, and was able to remove enough dirt and rock to allow Dawson to shift his position slightly and move his right arm. As he did so, however, the slab shifted and its weight came onto his helmet, pinning his head. Dawson could now move his arm, but his head was stuck, holding up the rock. Sacco continued to dig, and Dawson helped as much as he could. He could feel a little space around his lower body, and realized that he might be able to slide out from under the slab if he could free his head.

Dawson tried to release the chinstrap on his helmet, but it was held tight by the pressure. Pinching as hard as he could Dawson was finally able to release the strap. In a single, swift motion, he slid out from under the slab, which immediately settled into the space he had vacated.

Dawson could think of only one thing – to get out of the cave as quickly as possible. He bolted for the entrance, leaving his helmet and gear behind. Sacco chased him down the slope and handed him a light. Dawson stopped only long enough to take the light and ask Sacco to alert the other cavers in the cave before continuing his exit.

As he approached the cave entrance, Dawson came to a hands-and-knees crawlway. When he reached the low point of the crawl, about halfway through, Dawson realized that he

needed help. His wife, Nancy, was near the entrance of the cave and heard him call for help. She dragged Dawson by the collar of his cave suit as he pushed with his feet against the floor and walls of the crawl. With her assistance, he made it out of the crawl and through the larger passage to the cave entrance.

While Dawson made his way down the hillside to his car, his wife ran ahead to get their cell phone and call for an ambulance. When Dawson reached the car, she drove him down to the visitor's center, where the ambulance picked him up and took him to a hospital for treatment. Dawson suffered several broken ribs, internal bleeding, a separated shoulder, and other injuries, and underwent extensive rehabilitation therapy after the accident.

Thomas Dawson, "Trapped: A Narrow Escape in Swirling Mists," Rocky Mountain Caving, v20n4, Autumn 2003, p. 24.

16 June

Boundary Cave, Carter Caves SP, Kentucky fatality, flood entrapment

Allen Booth (22) and two teen-age companions went to Boundary Cave, a small cave near the northeastern boundary of Carter Caves State Park, on a rainy Monday afternoon. Two and a half inches of rain had fallen, and park officials had stopped issuing cave permits earlier in the afternoon due to concern over the potential for flooding. The cavers did not go into the visitor's center, however, and were unaware of this. They entered the cave at about 4:00 p.m., despite the weather conditions and the presence of an active stream flowing into the entrance.

They had gone less than 50 feet into the cave when they realized that the water was rising and turned to leave. Before they could exit, however, the passage was flooded by the rapidly rising stream. The two teens were able to pull themselves out of the cave, but Booth did not make it out. His companions made their way to the visitor's center, about two miles away, and alerted park rangers.

Rescue personnel were called to the park, but by the time one of the teens led them to the cave area, darkness had fallen and he was unable to find the entrance. Rescuers spent the night searching all the caves and sinks in the area. Booth's body was found the next morning, about 150 feet inside the cave.

1. *Andy Mead, "Caver drowns in Carter," Lexington Herald-Leader, 18 June 2003.*
2. *Associated Press, "Michigan man drowns in cave during heavy rains," www.FOX41.com, 17 June 2003.*
3. *Allen Blair, "Missing caver found dead," Ashland Daily Independent, 18 June 2003.*
4. *George Dasher, "Rockin' Chair," West Virginia Caver, v21n4, August 2003, p. 9.*

Comments: Many experienced cavers feel that water is the most dangerous element in caving. It should never be underestimated. According to the reports, the park officials were not certain whether the cave is inside or outside the park boundary.

21 June War Eagle Cave, Alabama stranded, difficulty on rope

Jennifer Keeling (mid-20's) became stranded on rope when she was unable to climb past the overhanging lip of the 137-foot entrance drop at War Eagle Cave. Scott Shaw tried for about ten minutes to talk her over, but Keeling grew tired and said, "I need help now."

Zeb Henson clipped on to the rope with a safety ascender, hung over the top of the pit, and lifted her, removing her weight from the rope at the lip. Keeling was then able to move her ascenders past the overhang and finish the climb.

Shaw and Henson found that Keeling's chest harness had slipped down to her waist, reducing the distance she could step up with the lower ascender of her Mitchell climbing system. She simply could not step high enough to get past the lip. She had not tightened the harness properly at the beginning of the climb, and it caught on the edge and slid down as she tried to get past the overhanging lip of the pit.

Scott Shaw, Incident report, 8 July 2003.

Comments: Shaw writes: "Chest harnesses feel tight when you're on the ground, but can be loose once you're on rope. Experienced cavers know to check the tightness of their chest harness after a few steps. This was not done in this case and caused a bit of trouble."

Vertical cavers should include in their climbing systems an ascender attached by a cows tail or lanyard to their seat harness. This is sometimes referred to as a quick attachment safety, or QAS. When crossing an obstacle such as a difficult lip, a knot, or a rebelay, the climber can usually reach up and clip the QAS on the rope above the obstruction, and then sit down. This transfers the climber's weight to a point above the obstruction, making it a simple matter to raise or move the remaining ascenders and climb past the difficult spot.

28 June Rocky River Cave, Tennessee caver fall, broken leg

On a Saturday morning a group of nine cavers entered and explored Rocky River Cave. After descending two small rope drops and exploring to the sump, the group started back out. While negotiating the stream passage in the rear of the cave, Brian Wilson stepped onto a ledge which suddenly collapsed. He fell about three feet and landed on his left leg with the full weight of his six-foot, two-inch, 200-pound frame, plus cave-pack and water-soaked wetsuit and cave suit. Wilson's leg buckled and he went down.

It was immediately clear that Wilson's leg was severely injured and would not support his weight. One of the other cavers in the group was an EMT, and two were physicians. They examined Wilson and decided that he might be able to limp out with assistance if they could splint and immobilize the injured leg. Several of the cavers started out to retrieve rescue equipment from their vehicles and alert the cave rescue team in case assistance was required.

The two doctors splinted Wilson's leg with a pair of adjustable trekking poles, knee pads and lots of duct tape.

When he was pronounced ready to travel, the cavers helped Wilson toward the first drop via the lower stream passage so that he could float as much as possible. Using pulleys and ascenders, the cavers rigged a 3:1 haul system and pulled Wilson up the first pit, then repeated the process at the second pit. All members of the group then helped Wilson hop and drag himself toward the entrance.

The entrance sink has been used as a trash dump for many years, and the cavers had to help Wilson make his way between discarded appliances and other debris. The sloping side of the sink was muddy and slippery, so Wilson was carried out with a combination of the fireman's carry and "a homebrew uphill Tyrolean traverse." He reached the surface about six hours after his fall, and was driven to a hospital for treatment. An X-ray Saturday night and CT-scan Sunday showed a broken tibial plateau and a fractured fibula. Wilson underwent surgery to repair the damage.

Troy Fox, Incident report, 30 June 2003.

Comments: Fox writes: "This could have been a truly miserable time for us all, but thanks to having cavers present trained in medicine and in NCRC techniques the rescue went well and quickly. Brian's determination to hop out rather than wait for a full rescue with a litter helped to get him to an ER quickly."

3 July Lechuguilla Cave, New Mexico caver fall

Cathy Borer (38), Art Fortini, Ron Miller, and Daniel Chailloux were returning to camp after a long day of exploration and survey in the Promised Land, a newly discovered area at the western edge of Lechuguilla Cave, when they stopped for a rest at the Keel Haul. Shortly after the cavers resumed their journey through the Western Borehole, Borer lost her footing as she stepped down and somersaulted about 12 feet down a steep rock slab. As she fell, her elbow became caught between two boulders and was injured. She came to rest on a 3-foot wide boulder-covered ledge at the top of a second, steeper drop of about 30 feet.

Borer felt pain in her arm and elbow, and the cavers suspected that she had suffered a fracture, in addition to bruises and abrasions. Fortini, an EMT, bandaged her wounds and fashioned a sling for her arm. The other three cavers carried Borer's pack and gear as she made her way back to camp. There, the cavers cleaned and re-dressed Borer's wounds and applied a SAM splint to her arm. They had been up for about 28 hours, and decided to get some sleep before starting out of the cave. Borer was able to leave the cave under her own power, carrying a light pack.

1. *Ron Miller, Incident report, undated.*
2. *Joe Davis, "Accident Narrative for Cathy Borer, Volunteer," 5 July 2003.*
3. *Art Fortini, "Trip report for exploration performed 6/28/03-7/6/03," Carlsbad Caverns National Park, 24 July 2003.*

Comments: Borer could not recall exactly what precipitated her fall. She was traveling at the rear of the group, and the

others did not see it. Miller writes that fatigue may have been a factor, since they were on the way back to camp from a very remote section of the cave. They had been camped underground for several days, and had adopted a schedule of 30- to 36-hour “days” between sleep periods. Davis notes that Borer was wearing appropriate footwear, and that her helmet and backpack protected her during the fall and prevented more serious injuries.

13 July

Climax Cave, Georgia fatality, drowned while free-diving sump

Bruce Brewer (33) entered Climax Cave at about 11:00 a.m. on Saturday morning, leading a group of seven other cavers from a nearby ecological research center on a routine tour of the cave. Brewer had been in the cave more than 100 times, and had led dozens of groups on the same trip over the years. The other members of the group were novice or first-time cavers. The cave is home to a large colony of bats, and the visitors hoped to make some recordings of their calls and sounds.

The standard tour, known as “the loop” to those familiar with the cave, involves several thousand feet of crawling and walking through a series of rooms connected by smaller passages. After spending about nine hours in the cave, the group was in a room known as Razor Hall, named for a formation suspended above a deep pool. On one side of the room, a natural partition hangs down above the pool and separates the room from an adjacent chamber known as the Turnage Room.

When the pool level is low, cavers can enter the pool and swim under the partition, or crawl around a narrow ledge at the edge of the pool to pass from one room to the other. On this particular day, the water level was higher than normal due to recent heavy rainfall, and Brewer told the others that he had never seen it so high. There was no airspace visible at the partition. Brewer told the group to wait while he entered the pool to try to determine whether the route to the Turnage Room was passable. He swam toward the partition, held his breath, and submerged.

The other cavers waited for several minutes, but Brewer did not return. Thinking that he might have surfaced on the other side of the partition, they continued to wait. After a while, they turned out their lights to conserve batteries. When they did so, they noticed a glow coming from underneath the partition. Some of the cavers climbed into the pool, holding on to those at the edge, and tried to feel around under the water and reach for Brewer, but they could not locate him in the deep water. They decided that they should leave the cave and get help. Working together to find the route, they made their way to the surface, where they contacted authorities at 11:30 p.m.

Sheriff’s deputies arrived quickly, but soon realized that they needed help. They contacted local caver Will Summer, who knew the cave and came to assist. At about 2:30 a.m., Summer and two divers from the Sheriff’s department accompanied the cavers back to the pool, where the divers found Brewer’s body in about 10 to 12 feet of water. They retrieved him from the pool, but realized that they needed help

to bring him out of the cave. The group returned to the surface at about 7:30 a.m., and authorities began to assemble personnel and equipment for the recovery.

Rescuers, including cavers and other volunteers, arrived throughout the day. In a 13-hour effort, more than 130 people worked through the ensuing night to bring Brewer’s body to the surface. The effort was hampered by small passages and constrictions in the cave, some of which were enlarged using portable air-hammers and chisels. Brewer’s body reached the surface at about 4:19 a.m. on Monday morning.

1. *Kim McCoy, “Explorer dies in cave’s depth,” Tallahassee Democrat, 14 July 2003.*
2. *Gerald Ensley, “More than 100 take part in arduous recovery,” Tallahassee Democrat, 15 July 2003.*
3. *Melanie Yeager, “Cavers emphasize attention to safety,” Tallahassee Democrat, 15 July 2003.*
4. *Paul Aughey, Incident report, 15 July 2003.*

Comments: Some cavers who frequent Climax Cave reportedly engage in a practice they refer to as “sumping” – free-diving in the cave pools from one chamber or air bell to another. Some consider the practice to be safe and fun. In this case it was neither.

19 August

Bear Cave, Pennsylvania lost

Charles A. Miller, two other adults, and seven Boy Scouts from Troop 92 arrived at the Bear Cave parking lot at about 10:00 a.m., planning to spend the day exploring the cave. At 5:00 p.m., cave owners Tom and Kim Metzgar arrived after work to go to the entrance area and scrub off graffiti that vandals had painted at the entrance a few days before. As they approached the cave, Kim Metzgar encountered the disoriented group near the entrance and led them to the cave. Some Scouts drank from the cave stream, reporting that they had run out of water several hours before.

The Scouts then proceeded to pull out six-foot lengths of twine, weave an end through the belt loops of their jeans, and attach the ends to their hardhats in order to hold the hardhats on their heads. They all had flashlights. The Metzgars warned the group that the property closes at dusk, and offered them a ride down the hill if they were out by 8:00 p.m. While the Metzgars scrubbed graffiti, their dog Barton, snuck into the cave with the Scouts.

Since they had come to do clean-up work at the entrance, the Metzgars had no caving gear with them. When 8:00 p.m. arrived with no sign of the Scouts, Kim Metzgar left to carry equipment back to the Jeep, and prepared to head down the hill to get her caving gear in the event the Scouts did not emerge. Tom Metzgar waited until 8:30 p.m., and then entered the cave dressed in shorts, t-shirt and tennis shoes, with only a mini-mag flashlight

About half-way through the maze, he heard the Scouts, from a distance, arguing about which way to go. Not wanting to go through Backbreaker Pass with only shorts and t-shirt on, Metzgar whistled softly for Barton. The dog took off toward his master and some Scouts followed, against the

advice of the leader. Then the whole troop routed, following the dog.

Metzgar made his way back toward the entrance ahead of the dog. The lead Scouts only saw the dog, not Metzgar, and lifted Barton up several ledges and climbs on the way out. Near the entrance, the dog bolted through the rest of the maze, leaving the Scouts behind.

When Barton and Metzgar reached the entrance, there was no sign of the Scouts following them. A bear in the area scared the dog back into the cave, where he found the Scouts and led them the rest of the way out.

Kim Metzgar, Incident report, 28 October 2003.

Comments: Metzgar writes: "Group leader Charles Miller said he had visited the cave a number of years ago, but the "trails had changed," thus leading to his inability to find the entrance. Concerned that the disoriented troop would have trouble finding their way out of the cave, since they couldn't find it in the first place, the Metzgars stuck around to assist in their exit.

Fortunately, they were on hand to scrub graffiti (unfortunately), or the troop might have been lost in the cave for a longer period of time. The six-foot lengths of twine to hold their hardhats on were a novel idea never seen at Bear Cave before. The Scouts were given safe caving information and asked to go with a local grotto if they returned."

24 August Hubbards Cave, Colorado lost, stranded, inadequate equipment

Local residents Sherry DeCrow (49) and John Hadar (54) were reportedly stranded for more than four days in Hubbards Cave when their flashlights failed while they were exploring about 400 feet from the entrance. According to published reports, they entered the cave on Sunday afternoon, leaving their Suburban parked at the trailhead. Unfortunately, they had not told anyone of their plans to visit the cave, and were not missed for some time.

By Tuesday morning, members of DeCrow's family had become concerned when they were unable to reach her. Some members reportedly thought that the pair had eloped; others worried that something more serious had occurred. On Tuesday evening, they called the Sheriff to request assistance.

Authorities began an investigation, which was soon colored by the suggestion that DeCrow's ex-husband might be vengeful and violent. On Wednesday, county officials requested assistance from the Air National Guard, and a helicopter flew over the area searching in vain for any sign of DeCrow, Hadar, or their vehicle. Family members were not satisfied with the search, and persuaded a family friend to fly over the area in his plane on Thursday, using DeCrow's house as a starting point. About 30 minutes into the search, the pilot spotted the Suburban and reported its location.

Deputies went to the trailhead where they secured and flagged off the Suburban, treating the area as a potential crime scene. A search dog brought to the vehicle led officers to the cave entrance. Deputies shouted into the entrance of the cave, but reportedly did not search it thoroughly, and did not find the stranded duo. Family members and friends of the missing pair offered to enter the cave, but deputies would not allow

them, citing safety concerns. As thunderstorms moved into the area, officials suspended the search and sent everyone home.

On Friday morning, everyone returned to the cave and deputies allowed the family members to enter. DeCrow and Hadar were located in a matter of minutes, and escorted from the cave. An altercation erupted between family members and some of the deputies, with family members accusing the deputies of hampering the search and delaying the rescue.

Hadar and DeCrow were examined by medical personnel, and reported to be in good condition, despite having spent more than four days without food or water in the 35-degree cave. Family members later told reporters that the two were weak and dehydrated. They declined further medical attention and left in the Suburban, and were reported to have checked into a local hotel for recuperation.

1. *Rick Rhinehart, "Hubbard's Cave Site of Bizarre 'Rescue'," Rocky Mountain Caving, v20n3, Summer 2003, p. 7.*
2. *David Frey, "Couple rescued from cave," Denver Post, 31 August 2003.*
3. *"Locals found after four days in Hubbard Cave," Glenwood Springs Post Independent, 31 August 2003.*
4. *"Pair rescued after four days in cave," Casper Star Tribune, 31 August 2003.*

Comments: One of the basic safety rules of caving is to let someone know where you are going and when you expect to be out of the cave. Another basic rule is that each caver should carry three sources of light, as well as spare parts and extra batteries or carbide. A third rule is to carry some food, water, and extra clothing. Note that there is no mention of the expected trip length in these rules.

There was some speculation that Hadar and DeCrow were never actually stranded in the cave, and that they had gone in via another entrance early Friday morning and staged their rescue. Family members denied this, and insisted that the Sheriff's department had mismanaged the incident, leaving the two stranded much longer than necessary. The Sheriff was reported to have said that he was aware of cave rescue resources in the region, and that they were not brought in because officials "had no reason to presume they were lost in a cave."

27 September Omega System, Virginia fatality, caver fall while rappelling

On Saturday, September 27, a crew consisting of Mike Ficco, Andrea Futrell, Mike Futrell, Dick Graham (59), Sue Setzler, Ron Simmons, and Steve Wells entered the Lori Cori Canyon Cave entrance to the Omega System in Wise County, Virginia. A routine survey trip had been planned.

Everything proceeded normally as the group climbed down the entrance, and then crawled, climbed, and chimneyed down to the top of a 90-foot pit. The drop was rigged with an 11-millimeter PMI static caving rope.

When Graham began his descent of the pit, Setzler was at the top of the pit. For about the first ten feet at the top while Setzler could see him, Graham rappelled very slowly. Setzler heard him exclaim, "Man! This rope is really slow. I'm really

having to feed it a lot.” Setzler looked over and could see him pulling up the rope to feed it, but she did not take any particular note of his rappel device and assumed he was using a rack. Actually, Graham was using a bobbin ‘simple’ descender, attached to a triangular maillon on his seat harness with an oval maillon or “quick link.”

Graham wrestled with his bobbin as he rappelled down the pit. His voice was clear and Setzler could see the rock lit up by his light, so he was probably just out of her sight. The drop is free at that point. Setzler heard Graham say, “Hold on a minute, I have to make an adjustment.” He paused for a couple of minutes and then finished his rappel without further comment. Setzler followed him down the drop.

A few hundred feet farther, beyond some tight drops and difficult passage, there is a 213-foot drop. This pit was also rigged with 11-millimeter PMI. At the top of the pit, cavers clip in to a traverse line to approach the drop, and rig for rappel while standing or kneeling on a very slick sloping shelf approximately four feet wide. A heavy pad was in place at the lip to protect the rope.

From the lip, the rope hangs free to the bottom, but for several dozen feet the rope hangs just a few inches away from the wall, gradually increasing to a distance of several feet. By the midpoint of the drop, the wall is eight to ten feet away. At that point a flowstone shelf rolls out and comes within two inches of the free-hanging rope. Below the flowstone are some nice draperies; below them the wall gradually recedes again to a distance of about ten feet at the bottom of the pit.

The narrow passage leading to the 213-foot pit requires a group to spread out along the passage while approaching the drop and waiting to descend. Andrea Futrell was in the lead, and elected to go first. Futrell talked to Graham briefly at the top of the pit, stating that her micro-rack was very slow on the stiff, muddy rope. Graham commented about his own descending gear, saying, “This thing seems to be working pretty well so far.”

Futrell descended the pit and called, “Off rope.” Mike Ficco waited as Graham rigged in. Graham began his rappel in a normal fashion and Ficco watched the reflected light from his lamp begin to fade as he descended. Ficco estimates that Graham had rappelled about 20 to 30 feet, when he heard Graham say, “No, No!” This was immediately followed by a very loud “Boom-BOOM,” which was heard by all, presumably a result of Graham first hitting the flowstone shelf followed by the floor of the shaft. Instantly, Futrell began yelling for Graham as she raced down and over to the bottom of the drop from the waiting area in an alcove about 100 feet away.

Futrell found Graham on the floor of the pit about 25 feet from the bottom of the rope, completely detached from the rope. He had been killed in the fall. With great difficulty she communicated that Graham was dead and that someone else should come down, carefully observing the rope and ledge.

Ficco was ready and descended next. He confirmed Futrell’s observations. Graham’s bobbin descender was attached to his harness but open. His safety ascender was attached to his seat harness by a carabiner, but was not otherwise clipped in to his harness. The rest of his gear appeared normal. Futrell and Ficco did not observe any evidence of rock fall.

Stunned and in disbelief, the cavers made their way back out of the cave and hiked back to their vehicles in a raging thunderstorm. They drove to the sheriff’s office to report the accident and initiate a call for assistance.

Cavers and rescue teams from around the region responded, traveling to the site during the night and preparing to enter the cave on Sunday morning. After a 24-hour effort, Graham’s body was brought to the surface at about 11:00 a.m. Monday morning.

1. *Andrea Futrell and Bill Storage, “Lori Cori Cave Accident Analysis,” NSS News, v63n6, June 2005.*
2. *Mike Ficco, Andrea Futrell, Mike Futrell, Sue Setzler, Ron Simmons, and Steve Wells, Incident report, 3 October 2003.*
3. *O’Donna Ramsey, “North Carolina man killed while exploring cave on High Knob,” The Coalfield Progress, 30 September 2003.*
4. *Clifford Jeffrey, “North Carolina man dies in fall at cave near Norton,” Kingsport Times-News, 30 September 2003.*

Comments: In addition to being published in the *NSS News*, Futrell and Storage’s full report is available on the web at www.bstorage.com/speleo/LoriCoriAccident. The analysis is very thorough, and suggests several scenarios that could have resulted in Graham’s bobbin descender opening and becoming detached from the rope. Included with the on-line and published versions are photographs of Graham’s equipment in the configuration that he is believed to have been using when the accident occurred.

It appears that Graham’s bobbin descender came open while he was on rappel. There is no way to determine whether he failed to close and latch it completely, or whether it was opened by the twisting and movement of the bobbin and the maillon link and carabiner he had used to attach it to his seat harness. In either case, when the bobbin latch is not closed and latched, the side plate can swing up and allow the rope to escape from the device, detaching the rappeller from the rope. Feeding or forcing the rope into the bobbin, as Graham was observed doing, can exacerbate the problem. Users of bobbin-style descenders should read Storage and Futrell’s analysis carefully, study the photographs, and examine their own equipment and techniques.

Some bobbins, such as the Petzl Simple, can be secured against accidental opening by clipping a second carabiner through the attachment eye. Many cavers incorporate a single or double cows tail in their vertical system, and clip the ends of these cows tails to the side of their harness while rappelling. Clipping one into the bobbin instead offers added security without requiring an extra carabiner.

Maillons or quick links should not be used to attach descenders of this type. A locking carabiner made from large diameter bar stock is the recommended method. For those whose harness design uses a maillon link for closure and for the primary attachment point, the semicircular or “demi-rond” maillon is a better choice than the triangular maillon. It is less likely to cause binding of carabiners, cows tails, and ascenders attached to it as part of the climbing or rappelling system.

In experiments conducted by *ACA* committee members with bobbins of several designs, we found that twisting of the carabiner or maillon used to attach the bobbin to a seat harness

can, in some cases, open the latch on the bobbin gate and allow the side plate to un-latch and swing open. The way in which this happens is similar to the way that a carabiner and the attachment eye of a rappel rack or figure eight descender can be twisted to force the carabiner gate open. Clearly, cavers must pay close attention to the attachment and orientation of their rappel device, especially when crossing lips or rebelay.

Futrell and Storage note that Graham published an article about bobbins in the Safety and Techniques column of the March 1982 *NSS News*. In the article, Graham mentions trading his used rappel rack to Philippe Crochet for a used bobbin during the pre-Congress camp of the 1981 International Congress of Speleology in Kentucky. The bobbin Graham used for the Lori Cori Canyon Cave trip had "PC" engraved on it. It appears that it is the same bobbin he acquired from Crochet in 1981.

It should be noted that the descender that Graham was using was more than 20 years old, and that the manufacturer has improved the design in a number of ways over the last two decades. In particular, the gate design has been improved to resist accidental opening. Cavers should consider retiring old equipment (especially vertical gear) and upgrading to current versions in order to take advantage of improvements in utility and safety.

The use of bobbins and mini-racks has become more popular in the US in recent years, but many users report problems with the devices when using stiff or muddy ropes, especially in the larger diameters, such as 11 millimeter. These devices do not have the same degree of friction variability as the full-size rack, and it is often necessary for the rappeller to feed the rope, especially at the start of a long rappel. Feeding or forcing the rope into the device during a rappel can result in various problems, including, under some circumstances, loss of control or even detachment from the rope.

The problem is exacerbated for lighter cavers, who need more variability (e.g. a six-bar rack) rather than less. Cavers should choose a descending device and technique which allows a smooth, controlled descent in actual cave conditions. The type of rope and rigging to be used must be considered as well.

One manufacturer of bobbin-type descenders, Petzl, includes in its instructions for the devices a caution against the use of maillons or non-locking carabiners to attach the descender to the seat harness, recommending instead a locking oval carabiner. Maillons are a particular problem, because the relatively short minor axis dimension makes it relatively easy for them to open the bobbin gate when twisted in a certain way. Some of the lightweight locking 'D' carabiners currently favored by climbers are also unsuitable for use with these devices for similar reasons.

The size of the rod stock from which the maillon or carabiner is made is also an issue. In our experiments, we found that maillons and carabiners made from 10 millimeter or smaller diameter rod or bar stock were more likely to open the bobbin gate when twisted than those made from larger diameter stock.

27 September Nellies Cave, Virginia rockfall

Fred Grady was working with a group of about a dozen cavers engaged in a clean-up at Nellies Cave when he was struck on the right side of the neck and shoulder by a rock weighing approximately five pounds. The cavers were using ropes to haul trash up several small drops in the cave, and the activity had apparently dislodged the rock.

Grady was knocked to the floor by the impact, dazed but conscious. Another caver rushed to his aid. Grady knew he had been injured, but was not sure how badly. He was able to exit the cave with some assistance from other cavers.

Grady had suffered an abrasion on his neck and a large bruise on his right shoulder. After inspecting the damage, he decided that the injuries were not serious and did not seek medical attention. His neck and shoulder were sore for about a week.

Fred Grady, Incident report, undated.

Comments: Grady reports that, during the clean-up work, smaller rocks had been falling almost constantly as trash was dragged against the cave walls. Earlier, a tire being hauled out had been dropped from above, narrowly missing several participants. Grady suggests that better placement of the ropes used to haul the trash might have helped prevent the accident.

Whether cleaning or caving, cavers should be careful to stay out of the fall zone below drops. If something should fall, yell "Rock!" – even if the object is actually a tire.

25 October Bear Cave, Pennsylvania lost, inadequate equipment

Chris Duncan (26), Megan Duncan (19), Dan Mills (20), and Keri Shipley (21) entered Bear Cave on a Saturday morning. The four, dressed in jeans, t-shirts and sweatshirts, were not well prepared for their trip, with only cloth caps as headgear, and one light each. They had no cave packs with extra gear, warm clothing, food or water.

NSS member Bob Eppley, a friend of the owners, was in the cave with his daughter and son-in-law, and his three grandchildren, and encountered the four spelunkers at about 4:00 p.m. Observing their lack of equipment, Eppley lectured the spelunkers about wearing helmets with proper lighting and carrying backup lights. He also warned them about the mazes of the cave and told them that they should go with someone who was familiar with the cave. One of the female members of the group told Kathy Jennings, Eppley's daughter, that she had already hit her head several times.

Bear Cave is open to properly-equipped cavers from dawn to dusk. Cal Smith, uncle of Kim Metzgar, one of the owners, keeps an eye on the parking area for the cave. Smith and his wife were away all day Saturday, however, and arrived home very late. On Sunday morning when he awakened, Smith noticed that a car from the previous day was still in the parking lot. He called cave owners Tom and Kim Metzgar, who arrived at the parking lot within 45 minutes to begin a preliminary search of the area.

The Metzgars found the foursome a few hundred yards outside the cave entrance (which is about a mile and a half from the parking lot). One girl was crying and said that they had spent 22 hours lost in the cave and that they were severely dehydrated. They were escorted off the ridge by Tom Metzgar, who, after talking to the “leader,” determined that the man had visited the parking area and kiosk the week before and even picked up a brochure that lists the proper equipment and gear, along with references to NSS grottos in the area.

Kim Metzgar, Incident report, 28 October 2003.

Comments: Metzgar writes: “The ‘leader’ had picked up a ‘caving safely’ brochure the week before, and the group was lectured by Eppley while in the cave. Yet they insisted on continuing further into the network maze cave instead of following an experienced group out and coming back later with a grotto. They were asked not to return.”

17 November unspecified lava tube near Kailua, Hawaii flood entrapment

Maui resident Michael Gingerich and four other men were exploring a lava tube off the Hana highway near Kailua when a sudden rainstorm caused a flash flood. A large stream formed, flowing into the entrance and blocking their exit. As the entrance flooded, Gingerich and another man managed to swim underwater and pull themselves through the entrance to safety, but the other three men remained trapped in the cave.

Fire and rescue personnel responded to the call for help, arriving at the scene shortly after 4:00 p.m. They found the cave entrance completely flooded, with no sign of the trapped men. They also discovered about two dozen hikers, including several children, stranded on the far side of the flooded stream.

With only a few hours of daylight remaining, rescuers focused on retrieving the stranded hikers. They felt that the high water made the cave entrance too dangerous to enter, and were uncertain whether the men were still near the entrance or had been swept downstream in the strong current. A helicopter equipped with a rescue basket was used to retrieve the stranded hikers, two at a time, and ferry them to a landing zone near the highway.

At about 10:00 p.m., officials called off the search efforts for the night. Friends and family members of the missing men were not satisfied, however, and went to a store to get flashlights and glow sticks, intending to continue the search themselves.

When they returned to the cave, the searchers lit the glow sticks and tossed them into the water flowing into the cave. Almost immediately, they heard the trapped men yelling in response. They were still unable to leave the cave, however, and were forced to wait several more hours for the flood to subside. They emerged unharmed after about nine hours underground.

Gary T. Kubota, “Flash flood strands Maui hikers overnight,” Honolulu Star Bulletin, 19 November 2003.

Comments: Gingerich told reporters that he did not plan to go into the cave again. “The biggest lesson we learned was the weather is very volatile out there,” he said.

19 November Sótano de las Golondrinas, SLP, Mexico fatality, caver fall, lost control on rappel

While rappelling the 1,100-foot entrance drop of Sótano de las Golondrinas, BASE jumper Dave Flannell (52) lost control of his rappel device about 400 feet above the floor and fell to the bottom. He died of injuries sustained on impact.

Flannell was a very experienced BASE jumper and was visiting the pit with a commercial expedition. He had no prior caving experience, however, and only a limited amount of rappelling experience. He had never done a rappel longer than 200 feet before attempting the descent of Golondrinas.

Members of the expedition rappelled into the pit to inspect and mark the landing zone at the bottom before parachuting into the pit. A motorized winch had been set up to haul the members back out after their descents by rope or parachute. Three members of the expedition made the descent before Flannell. The first was lowered down the drop using a rappel rack rigged at the top. Two others elected to rappel, with the first taking about 20 to 25 minutes and the second taking over an hour for the descent. Both used brand new 5-bar rappel racks provided by the expedition organizers.

Flannell also used a 5-bar rack. Like a number of the participants, he did not wear a helmet. He began his descent with all five bars engaged. The 1,100 feet of 7/16-inch caving rope hanging below him in the pit weighed about 60 pounds, creating a substantial amount of braking force in the rack. Observers reported seeing him feeding the rope into the rack during the first 100 to 150 feet of his descent, until he was out of sight.

Flannell apparently continued to feed the rope into the rack for some time, and took about 20 to 25 minutes to descend the first 700 feet of the pit. At that point, the three expedition members at the bottom heard Flannell yell, and looked up. He was about 400 feet above the floor and appeared to be in free fall, lying back in a recumbent position, both hands away from the rope. The observers did not see him make any attempt to grab the rope or regain control before striking the bottom.

The others rushed to his aid, but he was unresponsive. They used a radio to inform those at the top that an accident had occurred, and began administering first aid and CPR while another expedition member with medical training was sent down. He arrived at the bottom about 25 minutes after the accident, and worked for about 20 more minutes, trying to revive Flannell, before suspending efforts at resuscitation.

Expedition leader Jay Epstein Ramirez went to Aquismón and informed authorities of the accident. No trained or experienced rescue personnel were available in the area, but police returned to the pit with Ramirez to assist with the body recovery and conduct an investigation. Flannell’s body was recovered by expedition members using the motorized winch.

1. *Bryan Stokes, Incident report, 23 November 2003.*
2. *Jay Epstein Ramirez, Incident report, 2 December 2003.*

Comments: Rappelling is an activity that requires training, especially when descending long drops such as the 1,100-foot rappel at Golondrinas. Skill and experience in another activity, such as BASE jumping, does not prepare a person for such a rappel. Even experienced vertical cavers practice and develop their skills on smaller pits and drops before tackling a thousand-foot rappel.

Flannell did not have adequate training and experience to make the descent safely. His rack was correctly rigged, and all five bars were still on rope when his equipment was examined after the accident. When he lost control, he did not know how to regain it or slow his descent. The reason for the loss of control remains unknown.

While it is possible to make a safe descent of a 1,100-foot drop with a 5-bar rappel rack, it is not the best choice for a drop of that size. Experienced vertical cavers know that longer drops call for longer racks, so that the bars may be spread farther apart in the early stages of the rappel to compensate for the substantial weight of rope hanging beneath the rappeller and allow the rappel to proceed smoothly, without the necessity of pulling up on the rope and feeding it through the rappel device.

As the rappeller descends and the amount of rope hanging below decreases, the weight of the rope decreases and the braking effect of the rappel rack is reduced. The rappeller can compensate for this by pushing upward on the bars, forcing them together to increase the friction between the rack and the rope and slow the rate of descent. A special type of brake bar known as a "hyperbar" can also be used with a standard rappel rack to provide additional friction as well as additional leverage when squeezing the bars together. The hyperbar is particularly useful for long rappels or for cavers rappelling with heavy loads suspended below them.

A 6-bar rack with at least 14 inches of bar travel is recommended for drops in excess of 300 feet. For longer drops, additional rack length increases the degree of control. Smaller cavers also benefit from longer rack frames, even on shorter drops, as the longer frame allows them to spread the bars farther apart and reduce the braking effect of the rack to a degree appropriate for their lesser weight.

Inexperienced rappellers are often surprised by the acceleration than can occur during a long rappel as the rope weight decreases. Sometimes, they fail to realize the danger until they are going too fast. This may have been the case during Flannell's descent. Having spent more than 20 minutes feeding the rope through the rack and descending the first 700 feet, it is also possible that he became tired and lost his grip and thus his ability to control the rack.

When a rappeller's rate of descent becomes excessive or the rappeller loses control and begins to fall, there are several techniques that may be used to increase friction and slow the descent. These include jamming the brake bars together, pulling the rope upwards and passing it over the shoulder and around the hip, wrapping one's leg repeatedly around the rope, and calling for a bottom belay. Various types of rappel safety devices such as a rappel shunt or a prusik safety rigged below (not above) the rappel device may also be employed to prevent rapid descent and loss of control.

The effectiveness of a bottom belay is limited by the amount of rope stretch present on a long drop, and is dependent upon the timeliness and the force with which it is

applied, but the technique has been used successfully in a number of incidents to slow and even stop out-of-control rappels on drops of 600 to 1,200 feet. Cavers should know the technique and be prepared to use it, especially for novice rappellers.

Helmets are considered mandatory safety equipment for vertical caving. They serve not only to protect against injury from falling rocks or other objects, but to protect the skull in the event of a fall.

29 November Wind Cave, New Mexico stranded in pit, difficulty on rope

Rescuers from the Carlsbad Fire Department, the Bureau of Land Management, and Carlsbad Caverns National Park were called to Wind Cave (also known as Hicks Cave) when a 45-year-old woman became stranded on rope at an eight-foot "nuisance drop" about 175 feet inside the cave. The woman had reportedly failed to secure her seat harness by doubling the webbing back through the buckle, and the harness had slipped down around her thighs, constricting her movement and circulation. When the woman became exhausted and lost sensation in her lower legs while struggling to climb the pit, her companions decided to call for help.

By the time rescuers arrived, the woman had managed to get off rope and was resting at the bottom of the drop. The rescuers used a 1:1 "Georgia Haul" to get her up the pit, then belayed and assisted her as she climbed the rest of the way out of the cave.

1. "Carlsbad Caverns National Park (NM): Cave Rescue," *The Morning Report, US National Park Service, 3 December 2003.*
2. *Tom Bemis, Incident report, 12 January 2004.*
3. *Victoria Parker-Stevens, "Caver rescued," Carlsbad Current-Argus, 29 November 2003.*
4. *Associated Press, "Texas woman rescued from cave," www.KOBtv.com, 30 November 2003.*
5. *Richard Rhinehart, "Briefly," Rocky Mountain Caving, v20n4, Autumn 2003, p. 7.*
6. "Cave Rescues," *Southwestern Cavers, v41n6, November-December 2003, p. 77.*

Comments: Cavers should be sure to double back or otherwise secure any buckles on their seat harnesses. Many cavers prefer harnesses that are secured by a half-round maillon rather than a buckle. Maillons present their own issues, however, as demonstrated in the incidents at Hell Below Cave and Sótano de Cepillo in 2002.

One wonders why the cavers were not able to resolve this situation themselves, without outside assistance. Cavers should practice and perfect their vertical skills in a safe environment outside the cave, and should be capable of handling an apparently minor incident such as this one.

18 December
Hawk Hole, New Mexico
caver fall, descending hand-over-hand

Jason Coon (16) and five companions descended the 70-foot entrance pit hand-over-hand on a knotted rope tied to a stake at the entrance. At around sunset, as Coon was climbing out, he lost his grip and fell approximately 20 to 25 feet back into the cave, injuring his ankle and lower back. His friends climbed out and dialed 911 to summon help.

Personnel from Carlsbad Caverns National Park, the Bureau of Land Management, and the Carlsbad Fire Department, as well as volunteer rescuers and a number of state and county officials, were called to the scene. Rescuers rappelled into the pit to assess Coon's injuries and package him in a litter, while others rigged a haul system at the top. The lip area of the pit was very unstable, so rescuers placed a tarp over the loose material to reduce rockfall during the operation. Coon was hauled to the surface and taken to a hospital for treatment. The rescue was concluded about two and a half hours after the accident.

1. *Tom Bemis, Incident report, 12 January 2004.*
2. *Jason P. Montoya, "Teenager rescued from cave," Carlsbad Current-Argus, 19 December 2003.*
3. *Richard Rhinehart, "Briefly," Rocky Mountain Caving, v20n4, Autumn 2003, p. 7.*
4. *"Cave Rescues," Southwestern Cavers, v41n6, November-December 2003, p. 77.*

31 December
Schlitz Pit, Arkansas
rockfall

Michael Bayona (23) and Mike Sisco (24) led Lois Wintergreen (46) and Jeff Reed to a new pit they had found, but not explored. Bayona rappelled into the pit first, stopping to check several ledges for loose rocks as he descended. Once down, he provided a bottom belay for Sisco. When Sisco got off rope, he asked Bayona to belay Wintergreen, while he looked for passage.

In his excitement at being in a new pit, and because he had checked for loose rock on the way down, Bayona did not think about the rockfall danger while belaying Wintergreen, and stood almost underneath her. When she was about seven feet from the bottom, Wintergreen put her foot on the edge of a rock shelf for balance, and the edge of it broke free. A rock fist-sized rock fell and struck Bayona in the face, resulting in bruises and a cut near his left eye.

Michael Bayona, Incident report, 23 February 2004.

Comments: Bayona writes: "The excitement of being in a new pit led to my carelessness. I could have stood elsewhere, away from the wall, to minimize exposure to rockfall."

The bottom belay is a useful technique, but it is not safe if the belayer stands in the fall zone. In narrow or unstable pits where a belayer cannot find a safe location, it would be better to forego the bottom belay and use a self-belay technique such as the rappel shunt or prusik safety.

Common Caving Mistakes and Consequences

1. Primary light failed; didn't carry backup lights, or backup lights inadequate – stranded.
2. No map, no guide, and poor route-finding skills – lost.
3. Wore inadequate or inappropriate clothing for conditions – hypothermia.
4. Didn't bring extra clothing – hypothermia.
5. Moving but not paying attention – caver fall.
6. Free-climbing more than a body-length without belay – caver fall.
7. Traversing above drop without belay or safety line – caver fall.
8. Ignored rainy weather forecast; entered water cave – flood entrapment or drowning.
9. Careless movement in tight passage or crevice – stuck.
10. Entered bat cave or passage without precautions – histoplasmosis.
11. Solo caving and something went wrong – stranded.
12. Didn't tell anyone where you were going – delayed rescue by hours or days.
13. Vandalized cave formations, gates, or wildlife – criminal prosecution, fines, jail.
14. Didn't clear loose rocks from lip – struck by falling rock.
15. Climbing or descending rope hand-over-hand – lost grip and fell.
16. Climbing cable ladder without belay – fell off.
17. Lost control of rappel; no bottom belay or rappel safety – fell to the bottom.
18. Out of shape or unfamiliar with climbing system – stranded on rope.
19. Didn't know how to change from rappel to climb or from climb to rappel – stranded on rope.
20. Hair or clothing in rappel device; didn't know how to recover – stranded on rope.
21. Rappelling without wearing climbing system – stranded in pit or on rope.
22. Attempted pull-down trip without map or guide – stranded.
23. Sharing vertical gear; lost equipment passing it up or down the pit – stranded.
24. Didn't tie a knot in the end of the rope – rappelled off the end and fell.
25. Moving around lip of pit without being belayed or on rope – fell into pit.
26. Didn't check attachment of rappel device to harness – became detached from rappel device and fell.

2002 Cave Diving Accident and Incident Reports

16 February Little River Spring, Florida fatality, seizure, cause unknown

Pete Reagan (55) and Frank Murphy (43) were diving with friends in Little River Spring. The group turned their dive before the Dome Room and started out. Two other divers made a side trip up Harper Tunnel while Murphy and Reagan proceeded toward the entrance with Murphy in the lead.

About 500 feet from the entrance Murphy realized that Reagan was not behind him. He turned back upstream and found Reagan about 40 feet behind in a state of full body convulsions. Murphy went to Reagan's aid, and was able to insert a regulator into Reagan's mouth. Reagan was not breathing, so Murphy began forced ventilation using the purge valve. Reagan began breathing intermittently, but stopped several times as Murphy towed him toward the entrance, requiring repeated forced ventilation.

About 30 feet before they reached the entrance, Murphy ran out of air and began using Reagan's air. As they reached the entrance, other divers and support personnel helped pull Reagan from the spring pool. They began CPR and continued until paramedics arrived to transport Reagan to a hospital. He never regained consciousness.

1. *Susan Lamb, "Little River Springs claims life," Suwannee Democrat, 20 February 2002.*
2. *Incident report, International Underwater Cave Rescue and Recovery, www.iucrr.org, 17 February 2002.*

Comments: Reagan was an experienced and certified cave diver, with more than 300 logged cave dives.

9 March Devils Ear Spring, Florida fatality, lost consciousness, cause unknown

Terri Vichich-Williams (31) entered Devils Ear Spring with her husband, Alan Williams, and friend Renee Erdman at about 1:10 p.m. The group planned to make a single-stage dive up the Main Line, jumping to Hill 400 and leaving stage bottles at the jump, and then following the Double Lines to the Ice Palace. They reached their destination without incident and turned the dive at about 45 minutes, having consumed about 1/3 of their air. They began their exit along the same route.

As the group passed through the Keyhole at about 2:25 p.m., Vichich-Williams went vertical and turned to face her companions. Erdman reached her first and noticed that she had switched to a backup regulator. Alan Williams offered her his regulator but saw that her eyes were closed and she was not breathing.

The two divers grabbed her harness and swam her out of the cave. They surfaced at about 2:35 p.m. and called for help. Several people helped pull the woman from the spring, and CPR was started while others went to call an ambulance. She could not be revived.

1. *Incident report, International Underwater Cave Rescue and Recovery, www.iucrr.org, 9 March 2002.*

2. *"Maryvillian died during [cave] scuba dive," Knoxville News-Sentinel, 15 March 2002.*
3. *Kevin Robinson, "Re: Cave death," Yahoo E-CAVERS discussion group, <http://groups.yahoo.com/group/E-CAVERS/message/1912>, 13 March 2002.*

Comments: Vichich-Williams was a certified cave diver with more than 500 logged cave dives. Her tanks were tested and found to contain 38% oxygen. There was some speculation in cave-diving discussion groups that oxygen toxicity might have caused the blackout, and that the 38% oxygen mixture might have been too rich for the dive. The other divers using the same mixture reported no ill-effects.

15 June Bat Colon Cave, Florida aid, no injury, stranded, lost guideline

Mark Orr (26) and three fellow divers came to Florida looking for a cave to dive. All were certified open-water divers, but none had any cave diving training or certification.

Shortly after entering the cave, the divers stirred up the silt and lost visibility. Orr became disoriented and lost contact with the other divers and with the rope they were using as a guideline. He remembered an air pocket that they had encountered earlier, and managed to reach it just as his air ran out. Orr crawled up on a ledge to get out of the water, and waited for help. He prayed for a while, and then fell asleep.

Scott Hunsucker, a certified cave diver, entered the cave six hours later on Saturday evening expecting to find a corpse. Instead, he found Orr alive but stranded. After exchanging greetings, Hunsucker led Orr from the cave.

1. *Associated Press, "Diver rescued from Panhandle cave after six hours," 18 June 2002.*
2. *Incident report, International Underwater Cave Rescue and Recovery, www.iucrr.org, 20 June 2002.*

Comments: According to the newspaper article, Orr was believed to be the fourth person rescued alive out of nearly 500 divers reported missing in caves in Florida, Mexico, and the Caribbean since 1960.

8 November Orange Grove Sink, Florida fatality, lost consciousness, cause unknown

Chester Sciechowicz (58) and Jack Haller were diving in Orange Grove Sink at Peacock Springs State Park when Sciechowicz apparently suffered a heart attack and died. The divers had entered the cave along with another team of two divers. Sciechowicz and Haller turned their dive about 1,100 feet into the cave and started out, with Haller in the lead, while the other team continued into the cave.

During their exit, Haller looked back and saw that Sciechowicz did not appear to be moving. Haller turned back to check on his partner and found him floating, motionless, in a dome. His regulator was in his mouth and his equipment appeared intact, but he was unresponsive and not breathing.

The second dive team had also started out, and came upon Haller and Sciechowicz at the dome. Haller and one of the other divers headed out to get help, while the remaining diver began moving Sciechowicz toward the entrance.

Haller surfaced and called for help. Other divers at the scene responded, and helped pull Sciechowicz from the water.

He showed no signs of life, and could not be revived. He was reported to have had a history of heart problems.

1. *Incident report, International Underwater Cave Rescue and Recovery, www.iucrr.org, 8 November 2002.*
2. *Susan Lamb, "Pennsylvania man dies in Peacock Springs," Suwannee Democrat, 13 November 2002.*

2003 Cave Diving Accident and Incident Reports

1 January

Ocean Blue Hole, Andros Island, Bahamas two fatalities, cause unknown

Two divers were reported missing after they failed to return from a dive in Ocean Blue Hole, a well-known dive spot off Andros Island which exceeds 500 feet in depth. The missing divers were employees of a nearby field research station, and were reported to have been diving blue holes in the area, using recently-purchased dive computers. When they did not return, searchers found their boat anchored at the site.

Initial search dives to a depth of 210 feet did not yield any sign of the missing divers. Recovery divers were called to the scene, and made additional dives on January 2 and 3 to search likely areas of the cavern at depths of 220, 330, and 470 feet, but the missing divers were not found. Further efforts were deemed inadvisable due to the extreme depth and the changing weather conditions.

Incident report, International Underwater Cave Rescue and Recovery, www.iucrr.org, 11 January 2003.

Comments: One of the missing divers was reported to be a Diving Instructor and the other a Dive Master. It was also reported that the divers were using basic open-water equipment, with no redundant backups other than lights, and that neither diver had been trained in technical or cave diving procedures.

23 May

Cow Spring, Florida fatality, lost consciousness, cause unknown

Chris Henson (35) filled his tanks at a local dive facility on the evening of May 23 and went to Cow Spring for a solo dive. He was reported overdue at about noon the following day. After his vehicle was located at the parking area, recovery divers were called to the site and entered the water at about 2:30 p.m. They followed the permanent guideline and found his body near the line about 1,100 feet from the entrance at a depth of 86 feet. He appeared to have been on his way out of the cave. His lights and other equipment were found to be fully functional, with 2,000 psi of air in back-mounted double tanks and 2,000 psi in a "buddy bottle."

1. *Incident report, International Underwater Cave Rescue and Recovery, www.iucrr.org, 28 May 2003.*
2. *"News – Past & Present," NSS Cave Diving Section Web Site, www.nsscds.org, undated..*

Comments: Henson was a certified cave diver with more than 400 dives, including three at Cow Spring. Cow Spring is owned by the NSS Cave Diving Section. Access is restricted to members of that organization.

9 August

Little River Spring, Florida fatality, cause unknown

Katherine Cattell (42) had just completed her second dive at Little River Spring and was walking to her car, still wearing her diving equipment, when she complained of chest pain. According to reports, Cattell told her diving companion that she felt "pains radiating through her body." She collapsed, and could not be revived. Authorities stated that they believed the death to be dive-related, possibly due to an embolism.

Violet McDonald, "Female diver dies," Suwannee Democrat, 14 August 2003.

23 August

Roubidoux Spring Cave, Missouri fatality, out of air

Steven Wibracht (50), Ron Shirley, and John Davis entered Roubidoux Spring Cave for a stage dive to the Big Room, located about 1,400 feet from the entrance at a depth of 165 feet. All three divers were cave certified in accordance with the access requirements for the site. Each diver wore double tanks filled with tri-mix and carried an additional stage tank of tri-mix, as well as a nitrox tank to be used during the entry stage of the dive and then staged for use during decompression. All three divers were equipped with scooters for propulsion. The water temperature was about 50 degrees, and they were wearing drysuits.

Their dive plan was to enter using the nitrox tank and proceed to a stage point at the Drop Off, a room located about 350 feet into the cave, where the passage descends from a depth of 50 feet to about 135 feet before entering the lower tunnel passage. There they would leave the nitrox tanks for later use during decompression. After switching to the tri-mix travel tank, they would use their scooters to travel about 1,100 feet along the lower tunnel to the Big Room, then switch to the back-mounted doubles for the trip out, with decompression stops at the Drop Off and at the spring pool. They planned to turn the dive at the Big Room, or whenever one of the divers exhausted the air in his travel stage bottle.

Leaving oxygen bottles at 20 feet for use in the final stage of decompression, they located the permanent guideline,

which begins in the cavern zone, about 75 feet from the entrance, and entered the cave. Using their scooters, they followed the line into and through the upper tunnel for about 350 feet at a depth of 45 feet until they reached the Drop Off. Each diver left a tank at 70 feet for use during decompression on the trip out, and they proceeded toward the Big Room.

The lower tunnel, also known as Whichaway Avenue, runs for about 1,600 feet to the Big Room and beyond, and has an average depth of about 150 feet. The passage has an average height of about four and a half feet. The three divers made their way toward the Big Room without incident. Wibracht, however, used up his stage bottle sooner than expected, and switched to his back tanks early. The other divers were apparently unaware of this, and the trio continued to the Big Room, where they turned the dive as planned, and started out.

As they traveled back through Whichaway Avenue, Wibracht checked the pressure in his back tanks and found that he had only 500 psi remaining. He showed this to Shirley, who offered Wibracht his extra regulator, which was attached to a long hose for use in such circumstances. Sharing Shirley's air supply, the two divers continued toward the Drop Off. Wibracht had some difficulty controlling his buoyancy, hindering their progress. Davis, apparently unaware of the problems, proceeded ahead of them.

Wibracht and Shirley made it to the end of the lower tunnel, at 135 feet, and started up the Drop Off. Wibracht had managed to get his buoyancy under control in the tunnel, but as they ascended above 100 feet he began, once again, to have problems. He floated above Shirley until he reached the end of the long hose on the regulator, which was then pulled from his mouth. Wibracht swam back down to Shirley and took Shirley's backup regulator. He took a few breaths, then gave an "OK" signal. Shirley tried to locate his long hose regulator. He found it, but when he looked up, Wibracht was nowhere in sight. The activity had stirred up the silt, reducing visibility.

Shirley moved up to the decompression stop at 70 feet where he, Davis, and Wibracht had left bottles earlier. Davis had already picked up his bottle and started out, but Wibracht's bottle was still there, along with Shirley's. Seeing no sign of Wibracht, Shirley retrieved his own decompression bottle and continued his ascent toward the entrance. Another team of divers was passing through the room, and Shirley thought that Wibracht might have gone to them for assistance.

Upon reaching the surface, Shirley was unable to locate Wibracht, and sought help. Divers entered the cave and soon found Wibracht's body, floating on the ceiling above the area where Shirley had last seen him. His stage tank and both of his double tanks were empty. The exhaust valve on his drysuit was found to be completely closed.

1. *Jodi Thompson, "Diver drowns in Roubidoux Springs,"* Waynesville Daily Guide, 26 August 2003.
2. *Incident Report, Pulaski County Sheriff's Department, 23 August 2003.*
3. *"Roubidoux Spring Fatality," The DecoStop Internet forum, www.thedecostop.com, 2 October 2003.*

Comments: According to the incident report, Davis and Shirley stated that Wibracht did not signal them to call the dive when his travel tank was exhausted, as called for in the dive plan. Wibracht's back-mounted tanks were apparently already nearing empty when he switched to them. They were

full when he started the dive. The official report of the incident noted that his regulator was set to its most sensitive setting, and suggested that this might have allowed the regulator to vent in a "free flow" condition. The dive was Wibracht's first experience using a scooter, and it was suggested that the unfamiliar noise of the scooter may have masked the sound of a leak during the trip in.

There was some degree of miscommunication between the three divers as to the nature and severity of the situation. Davis reported that he looked back to check on the others during the trip out, and that Wibracht repeatedly gave the "OK" signal. Shirley was apparently unaware of this, and reported that he had signaled for assistance, to no avail. Poor visibility and separation of the group hampered their communications. The buoyancy control problems were attributed to the closed exhaust valve on Wibracht's dry suit. The gas management and buoyancy problems, compounded by miscommunication and siltation, led to a tragedy.

26 November

Little River Spring, Florida fatality, silt, lost guideline, out of air

Jerry Duwayne Beets (42) and Kane Overfield (46) entered Little River Spring at about noon, planning an 80-minute dive. Both divers were certified cave divers with over two years of experience and had dived Little River 15 to 25 times. Each diver had a scooter, and they intended to travel into the cave until one-third of their air was consumed and then exit.

The divers made their way to the Well Casing, where Beets stopped. Overfield continued for 200 to 300 feet before realizing that Beets was not following. He returned to the Well Casing and found the area silted out.

While searching for the line in zero-visibility conditions, Overfield bumped into Beets and grabbed him. Beets seemed okay, so Overfield let go of him for a moment to clip his scooter into the line. When he reached for Beets again, he was gone. Unable to locate Beets, Overfield left the silted area, swam until he reached clear water, and waited, banging on his tanks as a signal. Eventually, he decided that Beets must have gone out ahead of him and made his own way out.

Overfield completed his decompression and exited the water. When he could not find Beets on the surface, he sought help. Other divers at the spring entered the cave and found Beets at the end of the Florida Room, about 1,200 feet from the entrance, apparently dead. They attempted to give him air, but he was unresponsive. Both of his air tanks were empty. They clipped his body to the guideline and left the cave.

A recovery diver summoned by authorities entered the cave and retrieved the body. The two scooters were also retrieved from the cave. Overfield's scooter was found at the Well Casing, clipped to the guideline. Beets' scooter was found about 100 feet past the Dome Room, with its nose and shroud covered with red clay.

1. *Incident report, International Underwater Cave Rescue and Recovery, www.iucrr.org, 26 November 2003.*
2. *Len Dramesi, "Diver dies in cave,"* Suwannee Democrat, 4 December 2003.
3. *"Man dies while cave diving in Suwannee,"* Gainesville Sun, 28 November 2003.

2002 Caving-related Accident and Incident Reports

25 February

State Trooper Cave, Kentucky road collapsed into cave

Four cars were damaged but no one was injured when a 300-foot by 200-foot area including a section of Dishman Lane collapsed into State Trooper Cave at 5:15 p.m. on a Monday evening. The resulting sinkhole was estimated to be at least 40 feet deep. Following the collapse, a pickup truck was visible at the bottom of the sink. The area around the cave is an active development, with new homes, businesses, and a large church under construction. The cave is about 50 feet below the surface.

1. *Steve Gaines and Jim Waters, "Dishman Lane collapses," Bowling Green Daily News, 26 February 2002.*
2. *Amy Wagner, "Road Caves in Under Cars," www.wkbo.com, 26 February 2002.*
3. *Karl Niles, "Just a matter of time!" TAG-Net #2759, 26 February 2002.*

Comments: Niles reports that the city knew about the location of the cave, but constructed the road anyway. A city engineer was reported in the newspaper account to have said that the cause of the collapse was unknown.

26 February

Cove Mine, Pickens County, Georgia drowned diving in abandoned mine

Travis Jenkins and Dale Fisher entered Cove Mine seeking to explore flooded tunnels in the abandoned marble mine. Both men were open-water divers, but neither of the two had any formal training or certification in cave or cavern diving. They were equipped with standard open-water gear plus one light each. The men tied off a dive reel and entered an open pool in a large chamber. Jenkins was carrying the reel, and stopped briefly to clear it when it jammed. When he looked up, Fisher was missing.

When he could not locate his partner, Jenkins left the mine and called for help. Rescue divers made several attempts to locate Fisher, but were hampered by poor visibility in the sediment-filled water. Efforts were eventually suspended in order to allow time for the water to clear. Fisher's body was later recovered from a side tunnel off the main chamber.

1. *Saeed Ahmed, "Diver is missing in Pickens cave," Atlanta Journal-Constitution, 27 February 2002.*
2. *Incident report, International Underwater Cave Rescue and Recovery, www.iucrr.org, 27 February 2002.*
3. *"Second Cove Mine Diver says they weren't in over their heads on fatal exploration," Pickens County Progress, 14 March 2002.*

Comments: Jenkins told reporters that the men had permission from the city of Jasper to explore and map the mine. He also said that the men were properly trained and equipped for the dive, and that they were not cave diving because they planned to dive only in the open pools of the mine, rather than in the

overhead environment of the flooded tunnels. Experienced cave divers may disagree with Jenkins' assessment.

4 April

unspecified cave near Hannibal, Missouri body found in cave

The body of Brenda Sue Link (46) was found in a cave near Hannibal. She had been reported missing on April 1. Police began searching caves in the area after finding her scooter nearby. Police said that there were no signs of a struggle, and that they did not suspect foul play.

"Woman's body found in cave," Jefferson City News Tribune, 8 April 2002.

7 April

Sinks of Roundstone, Kentucky would-be caver fall, alcohol related

After downing a few cold ones, a group of six people equipped with flashlights and a cooler of beer headed for the Sinks of Roundstone, expecting to have a splendid adventure. As they approached the cave, one member of the already-intoxicated party decided to jump rather than climb down a six-foot drop from a ledge just outside the entrance. This didn't work out very well, and he suffered a broken tibia, broken fibula, and a variety of scrapes and bruises.

Other members of the party eventually notified authorities, and rescuers soon arrived at the scene, where they found the injured man lying on the ground, shivering. He had been lying there for about three hours. The man refused all offers of blankets or other methods to keep him warm, but allowed rescuers to immobilize his broken leg, place him in a litter, and carry him to a waiting ambulance. He was taken to a hospital for treatment.

Stephen Vaughn, Incident report, 7 April 2002.

Comments: Friends don't let friends cave drunk.

8 April

abandoned lead mine, Arkansas rockfall entrapment

David Foster (11), William Foster (9), and Jeffrey Foster (19) went looking for treasure in an abandoned Civil War-era lead mine near Thida. Inspired by local legends, they had begun exploring the mine the previous week, and had noticed sparkling dust on their shirts after the trip. They returned with digging tools hoping to strike it rich. Instead, they were trapped for more than 24 hours when the dirt ceiling and walls of the passage collapsed behind them about 250 feet inside the mine. Volunteers spent hours digging through the collapse to rescue the boys, who were unharmed by the experience.

1. *Brian Skoloff, "Three boys survive night after cave-in at old mine," Cleveland Plain Dealer, 10 April 2002.*

2. *Associated Press*, "Volunteers rescue 2 boys, teen from old mine," 9 April 2002.

Comments: Sheriff's Captain Bill Lindsey told reporters that there was no basis for the local legends of gold or treasure in the mine.

23 June
Blue Light Mine, California
drowned in abandoned mine

Nicholas Anderson (23), his brother Glenn Anderson (18), and their friend Matt Murphy (17) hiked up Pine Canyon on a Sunday afternoon planning to explore abandoned 19th century mines near the ruined mining town of Silverado. They entered the abandoned Blue Light Mine wearing shorts and T-shirts, equipped with flashlights.

The group encountered a water-filled passage, and Murphy decided to wait while the Andersons continued. When they had not returned after two hours, Murphy left the mine to summon help. Authorities soon arrived and began a search of the mine. On Monday morning, divers arrived to search the flooded sections. After a 30-minute search, the bodies were located in about 10 feet of water in a tunnel about 600 feet from the mine entrance.

1. *Mike Anton, Dave McKibben, and Tina Borgatta*, "Brothers Die While Diving in Old Mine," *Los Angeles Times*, 25 June 2002.
2. *Associated Press*, "Two brothers swim to their deaths in abandoned mine shaft," *San Diego Union-Tribune*, 25 June 2002.

Comments: The *Times* article notes that about half a dozen people die and dozens more are injured each year exploring abandoned mines in California. Rescuers also reported that the oxygen level in the mine was about 4%. The brothers were described in the newspaper reports as "experienced swimmers and cave explorers," but were not NSS members and did not have proper caving equipment.

30 June
Halona Blowhole, Hawaii
fell into blowhole and drowned

Daniel Dick (18) ignored warning signs, a locked gate, and the verbal warnings of onlookers as he climbed down and stood straddling the opening of Halona Blowhole, a popular tourist attraction near Oahu's Sandy Beach. As Dick stood atop the opening at about 3:15 p.m., water shot up through the blowhole and blasted him into the air. As he fell, he was

sucked into the opening. Bystanders called authorities, who began a search. Dick's body was recovered from the blowhole by divers the next day.

1. *Associated Press*, "Body of teen recovered from Oahu blowhole," *San Diego Union-Tribune*, 1 July 2002.
2. *Associated Press*, "Teen's body recovered," *Hawaii Tribune-Herald*, 2 July 2002.
3. *Leila Fujimori*, "Divers retrieve Blowhole victim," *Honolulu Star-Bulletin*, 1 July 2002.

Comments: Dick was reported to be the third person to drown in the blowhole since 1969.

17 July
unnamed sand cave, California
fatality, passage collapsed

An unidentified man died in a sand "cave" he was apparently using for shelter when it collapsed around him. He was found by two boys who came to explore the opening, which they had spotted the day before, about 30 feet above the beach. The boys ran and told their father, who called 911. Police, lifeguards, and park rangers worked to dig the man out from the sand, as the walls continued to crumble.

Kevin Clerici and Pauline Repard, "Apparent drifter dies in cave-in at beach in Carlsbad," *San Diego Union-Tribune*, 19 July 2002.

Comments: It was reported that the opening was less than 10 feet wide and was dug into soft sand. As one reviewer noted, this incident should be a reminder to all who dig in sediments that as little as three to four feet of depth in a trench or tunnel can be fatal if the walls collapse.

18 August
unspecified cave near Athens, Alabama
body found in cave

Searchers looking for a man who had been reported missing found what was thought to be his body in a cave near Shanghai, west of Athens. The badly decomposed body could not be readily identified, but the man appeared to have died from a gunshot wound to the head. A gun was found near the body. It was believed that the body had been in the cave for about a week. The missing man had last been seen on the roadside in that area on August 10.

Holly Hollman, "Body found in Limestone [County] cave may be missing man," *Decatur Daily News*, 19 August 2002.

Report accidents and incidents via the Internet at www.caves.org/pub/aca

or mail reports and information to:

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

2003 Caving-related Accident and Incident Reports

26 May

Maryland Mine, Idaho fatality in abandoned mine, bad air

Travis Michaelis (25) and members of his family were exploring the abandoned Maryland Mine near Salmon, Idaho, when their dog ran ahead of the group and fell into a 125-foot deep mine shaft. Michaelis, who was reported to be an experienced climber, returned to the mine the next day to try to retrieve the animal from the shaft.

As other family members stood by, Michaelis rigged a rope and rappelled into the shaft. As he descended, he called up, "The air is getting thin." Shortly after that, he lost contact with the group above, and did not respond to their calls. Family members went for help, and search and rescue personnel were dispatched to the site.

A rescuer wearing an air pack was lowered to the bottom of the shaft, where he found Michaelis' body. An autopsy later determined that he had died from hypoxia. His body was placed in a litter and hauled up the shaft, then carried out to the surface.

1. *Janet Taylor-Nelson and Mike Warner, Incident report, 26 May 2003.*
2. *Leslie May Shumate, "Tragedy for Rexburg Family," www.lmshumate.com, 29 May 2003.*

Comments: Rescuers found no sign of the dog. The passage at the bottom of the drop sloped away from the shaft.

30 June

Deer Bone Cave, Alaska caver fall while hiking back from cave

Fred Grady (55) was on a paleontological expedition to dig in caves on Coronation Island. While walking back to camp from Deer Bone Cave, he fell and a branch struck his left eye, lacerating the lower lid. Later that evening he began to see "flashing halos" in the peripheral vision of his left eye. By the next morning, these symptoms were greatly reduced, though he continued to experience "slightly clouded vision" in the affected eye.

Grady elected to stay with the expedition, but when he returned home he went to his doctor and was informed that the vitreous humor in his eye had been affected by the trauma, causing the cloudy vision. The symptoms gradually faded.

1. *Fred Grady, Incident report, 30 June 2003.*

2. *Fred Grady, "A Trip to Coronation Island, Southeastern Alaska," The West Virginia Caver, v21n6, p. 5, December 2003.*

Comments: Grady reports that he lost the trail due to jet lag and fatigue. It had been marked with orange and pink flagging, but Grady is red-green color blind. He also notes that he was wearing contact lenses due to the rainy conditions, and that he would probably not have been injured if he had been wearing his glasses.

9 July

unnamed sea cave at Sunset Cliffs, California body found in sea cave

The body of an unidentified man was found in a small sea cave at Sunset Cliffs Park in San Diego. A man walking on the beach spotted the body at about 1:00 p.m. and used his cell phone to call police. Cause of death was unknown, but the medical examiner reported that the man had been dead for several days before being found. It was not known whether the body had floated into the cave during high tide or whether the man had walked into the cave and died there.

"Body of man found in sea cave," San Diego Union-Tribune, 10 July 2003, p. B2.

20 December

unnamed sink, Blount County, Alabama rockfall entrapment

While ridgewalking with two companions, Van Cain (32) climbed down into a small karst feature to check for cave passage. Finding none, he started to climb out. He reached up to get a handhold for support, but when he pulled on the rock it gave way.

Large rocks and rubble collapsed onto Cain, striking him on the head and pinning him. Cain braced himself to prevent further collapse while one of his companions moved rocks to free him. He sustained cuts and bruises to his face, hands, and lower legs, but was not seriously injured.

1. *Van Cain, Incident report, 22 December 2003.*
2. *Van Cain, "Cave Digging and Near Miss," TAG-Net Digest #3404, 22 December 2003.*

Comments: Cain reports that he did not test the hold before pulling on it, and will be more careful in the future. He also notes that he was wearing his helmet, which prevented more serious injury.

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The National Cave Rescue Commission

The National Cave Rescue Commission (NCRC) is a volunteer group developed to train cave rescue personnel throughout the United States. It is part of the NSS, located within the Department of the Administrative Vice-President.

The NCRC does not perform cave rescues. It organizes, develops, and provides training in cave rescue techniques, maintains lists of individuals trained in cave rescue, and can help locate rescue resources in times of need. Most NCRC-trained cavers do participate in rescues, but not as part of the NCRC. They work as members of their local rescue teams, civil defense units, or cave rescue groups.

The NCRC also works to:

- Maintain good working relationships with other rescue-oriented individuals, organizations, government agencies, and sources of specialized equipment and services (e.g., the Air Force Rescue Coordination Center and the Center for Mine Safety and Health Administration).
- Maintain current files of potentially useful equipment (e.g., underground communications equipment and cave-oriented medical kits) and services that can be obtained through the above sources.
- Acquire and maintain a limited supply of certain equipment such as special rescue litters and vertical rescue gear in key locations throughout the country.
- Increase the number and proficiency of cave rescuers across the United States by sponsoring training sessions and seminars, and by encouraging other caving, rescue, and EMS organizations to sponsor such educational programs.
- Encourage international cooperation by developing contacts with cave rescuers and rescue agencies in other countries, by preplanning with these groups where US involvement is anticipated, and by inviting participation of cave rescuers from other countries in NCRC seminars.

Organization

The NCRC is led by a Board of Regional Coordinators. The Board includes a National Coordinator, Training Coordinator, Medical Coordinator, and Diving Coordinator (each of whom coordinates resources and activities at a national level), and Regional Coordinators for each of ten

regions in the United States and its territories. Board members are nominated by cavers and cave rescue personnel, and are appointed by the NSS Board of Governors. The NCRC depends on many volunteers without official positions whose special knowledge, talents, or contacts make the network more effective.

Training

The NCRC sponsors a week-long Cave Rescue Operations and Management Seminar each year that is held in various locations around the United States. The seminar serves as a “boot camp” of cave rescue and involves three levels of training. Cave rescue is constantly evolving, and the most up-to-date techniques are presented each year. In addition to the annual national week-long seminar, the NCRC regions sponsor regional week-long seminars, regional modular seminars (taught over a series of weekends), courses in small-group and self-rescue techniques, and weekend cave rescue orientation courses.

NCRC seminars consist of extensive classroom and field work designed to maximize the learning experience. The cave rescue programs provide studies in underground environments, vertical rescue, mechanical advantage systems, extrication techniques, basic medical principles, communications, and management of cave rescue operations. Emphasis is placed on practical skills and techniques, with realistic exercises in a variety of cave environments.

The seminars provide basic and advanced material for students who typically include cavers, emergency services personnel, and emergency managers. During the eight days of a seminar, students receive about 100 hours of instruction, and are on the move from early morning well into the evening. The NCRC uses and teaches the Incident Command System (ICS) used by fire departments, rescue squads, and other emergency agencies and services.

Course Listings and Contact Information

Information on NCRC operation, activities, and training, including contact information for NCRC Coordinators, is published each year in the *NSS Members Manual*, and is also available on the NCRC web site at www.ncrc.info. Upcoming seminars are announced on the web site and in the *NSS News*.

National Cave Rescue Commission Course Listings and Contact Information:
www.ncrc.info

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