American Caving Accidents 1971

National Speleological Society

EDITORIAL

On reading back through the reported accidents of 1968, 1969, and 1970, I found that those of 1971 repeated most of the established themes. Involved were the usual handful of adventurers who were attempting feats far beyond their ability and for which they were ill-equipped. In the most extreme of these, a fatality, the victim was descending a more than 100 foot pit on an old fence. In another, two boys were drowned while siphon diving without any caving or diving experience, or any diving equipment. In both of these accidents and many other accidents, inadequacy of many types emerges as the culprit. What is and what isn't adequate in terms of experience and equipment, is clearly visible in most of the 1971 accidents. More hidden, and therefore, more insidious, is the inadequate caver.

It is quite chilling to realize how little value some of the victims of the accidents placed on their physical and mental well-being as a necessary part of being adequately equipped to handle a given cave. "He was bleeding from the ear before entering the cave"; "Two days before entering the pit, he suffered from kidney illness"; "He was wet, cold, and tired, at the top of the drop"; "She was nervous and shakey at the beginning of her descent": All of these quotations describe the victims in four vertical accidents of 1971. One was a fatality.

In the first two of these, the cavers were incompletely equipped because of their debility and were as much potential victims of mishap as were the boys who rigged the old fence to descend the pit. Being cold, wet, and tired, on the way out of a cave, can't always be avoided but excellent physical condition can certainly buffer the effects - the lowered ability to avert and correctly respond to a crisis. And, nervousness is not a bad ingredient in a caver. A nervous person is apt to be more careful but, by the time a person is shaking with nervousness, as in the last mentioned report, their ability to think clearly is questionable and they are prone to panic.

In short, 1971 accidents newly uncovered the need for cavers to begin to consider good mental and physical condition, part of being an adequately equipped caver.

Jennifer Anderson

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1971

New Mexico, Guadalupe Cave. In October, 1970, Carol Hill (30), an experienced caver and one of a group of 18 people, was climbing in a chimney about one half mile from the entrance. She fell 25 feet when a rock projection which she was using as a handhold, broke. As serious back injury was suspected, a litter evacuation was considered necessary. The cavers on hand organized the rescue using blankets folded over pipes to form a litter. The injuries were subsequently diagnosed as cracked ribs, a bruised right lung, and minor cuts.

Source: Carol Hill

Analysis: As a result of the accident, rock conditions were considered to be poor. With 25 feet of exposure, however, a belay should have been used; regardless of the rock conditions. More careful testing of each foothold and handhold before all the weight is placed on it, might have disclosed an unstable projection and thus, have prevented this accident.

Wyoming, Big Horn Caverns. On January 23, 1971, Renee Savio (19), a grotto beginner, was slightly injured while rappelling into the 65 foot pit entrance to the cave. She was with three others, Joe Mueller, Jim Chester, and Lee Tierney; all N.S.S. and grotto affiliated; who had come to the cave to measure the entrance for a gate. They rigged the pit for rappel and Mueller, the most experienced caver, descended. Savio followed. About one third of the way down the pit at a point where it narrowed into a vertical fissure about four feet in width, the rocks were slippery with snow. Savio slipped and apparently let go with her braking hand; hitting her head. She fell out of control for 25 feet before her fall was arrested by Mueller who was at the bottom of the pit. He immediately moved the victim to cover. Jim Chester arrived at the bottom 5 minutes later with a first aid kit. Although the victim was breathless for a short time, first aid proved unnecessary and the party continued on into the cave. There were no subsequent complications.

Source: Joe Mueller and Lee Tierney

Analysis: Savio was "nervous and shakey" before the accident and probably should have been dissuaded from dropping the pit. That state of mind makes people accident-prone and when an accident does occur, nervousness coupled with inexperience, makes incorrect reactions probable. She should have instinctively grabbed harder on the rope when she slipped rather than letting go as she did.

She was using only one carabiner and brake bar as a rappel rig which does not provide enough control under most circumstances. Two

carabiners and 2 brake bars in tandem configuration, should have been used; and it is regrettable that her more experienced companions did not discourage her from descending on her inadequate rig.

Cold weather and slick conditions, and bad technique (not leaning back enough, braking hand too far behind her), were cited as contributing conditions by Tierney and Mueller.

Tennessee, Conley Hole. On April 7, 1971, Bill Bromer (17) was injured in a fall from the top of the 180 foot bell-shaped pit entrance to Conley Hole. Bromer, an experienced pit caver and one of a party of 8 from Brebeuf High School Spelunking Club, Indianapolis, had spent 4 hours exploring the cave and was returning up the pit when the accident occurred. He was wet and tired and, at the top of the rope, was attempting to get his prusik knots over the lip when they slipped on the muddy rope. Thinking that he was falling, he clutched at his prusik knots in panic. This further prevented them from catching and he began to rapidly slide back down the rope; all the while holding tightly onto his knots. Just as he was about to hit the ground, he threw out his hands to break the fall; thus releasing the prusik knots. They caught and held him which saved his life but not before he had hit bottom and bounced; due to the stretch in the rope.

Bromer, although injured, was talking and concious. News of the accident was relayed to the top and the leader, Lou Larocco, sent down a note containing first aid information. He was covered with a space blanket to protect him from the water which was falling into the pit. Some short time later he was moved away from the waterfall to a safer and more comfortable place. Blankets, warm clothing, and medical supplies were relayed from the cars to the victim. Two people left for help with a description of his condition. The Warren County Rescue Squad, headed by Roy Davis, hoisted the youth to the surface in a litter; four hours after the fall. An ambulance took him to Riverpark Hospital where a diagnosis of a broken talus (ankle) bone and a bruised chin was pronounced.

Source: Nicholas Noe

Analysis: This caver should, by instinct, not have touched his prusik knots when he first felt the unpleasant sensation of slipping. Had he left them alone, the knots should have automatically grabbed and locked on the rope almost instantly; thus holding him at the top until he could right himself and continue out of the pit. He was reported to have been wet and tired when the accident occurred. It is probable that both of these conditions contributed to his incorrect reaction to the mishap; cold and fatigue hamper the ability

to think clearly in a crisis.

His companions handled the situation well and the fact that exposure and shock did not compound the ankle injury, is largely due to their knowledgeable exertions. (Read "Almost Tragic Accident at Conley Hole" by Roy Davis, for a very thorough account of both the accident and the rescue operation. It is printed in the May, 1971, Speleonews.)

Alabama, Gray's Cave. On April 10, 1971, Michael Malakowski (24), a member of Huntsville Grotto for 4 months, was injured in a fall. He had been attempting a climb-down and, five feet from the floor, his foothold gave away. A broken leg was suspected so his companions called Huntsville for rescue aid. He was placed on a litter and carried out of the cave. He was admitted to hospital because of bone bruising, tissue damage, and some internal bleeding and he remained there overnight.

Source: Darwin Moss

Analysis: It seems that the climber should have been belayed down the drop and may not have been paying sufficient attention to testing each foothold and handhold before trusting all of his weight to them. The original report, however, was lacking in detail, so that it is difficult to know under what precise conditions the fall occurred. The degree of difficulty of the climb, its depth, rock conditions, and the climbers footwear, all important details for a useful analysis, are not noted.

Georgia, Cemetary Pit. On May 15, 1971, 16 people were exploring Cemetary Pit on a Georgia Tech. Outward Bound trip. Of these 16, 6 were N.S.S. and grotto members, and experienced pit cavers. Three others had a little pit caving experience. The other 7 had very little horizontal caving experience and no pit caving experience.

After about 5 hours of caving, the first group started out ot the 130 foot pit entrance to the cave. Three hours later there were only 3 people on the bottom. Two of these, Bill Hunsaker and Lawrence Catchpole, started out together on three knot prusik systems and each on a rope. Catchpole, at a point when he was about 15 feet higher than Hunsaker, accidentally kicked a rock (about a double handfull weighing several pounds) off a ledge. It hit Hunsaker squarely in the center of his hardhat. He reached the ledge, however, but while on the ledge, he complained of dizziness, nausea, and a headache (no mental confusion or pupil dilation was apparent). A rescue pulley

was rigged and he was then pulled out. A jumar safety was used at the top while hauling.

Catchpole was at this time being violently sick on the ledge. Upon questioning, it was discovered that he had kidney trouble several days before and that pressure of his seat sling on his kidneys was causing great pain. He was hauled out on the already rigged pulley.

Source: John Sevenair

Analysis: The two ropes were rigged too close together. Had they been rigged much further apart, it is unlikely that a rock kicked down by one caver, could have hit the other. Having two or more ropes rigged in the same pit so that more than one person can descend or ascend at the same time is very useful but, when narrowness in the pit causes the ropes to come close together, it is far safer to rig only one rope.

The lack of previous vertical experience and instruction for the many beginners in this pit should be noted. Equipment was shared and, given that cavers come in widely dissimilar sizes, ill-fitting for some. In addition, the ratio of beginners to very experienced pit cavers, much less than 1:1, was unfavorable. These conditions all contributed to the liklehood of mishap on this trip.

Catchpole should have not been caving after recent illness.

West Virginia, unnamed pit in Greenbrier County. On May 23, 1971, the 60 foot pit was rigged with two 30 foot sections of ladder. Mike Peduzzi (22) started down the ladder, belayed by J.E. Gravenmier. When Peduzzi was about 15 feet up from the bottom of the pit, the lower ladder broke (both strands). He fell only about 2 inches before he was caught on belay. Gravenmier slowly lowered him to the pit floor. No one was hurt due to the effective belay. The broken ladder was replaced with another ladder then Peduzzi climbed out, belayed, under his own power.

Source: J.E. Gravenmier

Analysis: (Gravenmier) The cause of the accident was faulty equipment. The ladder was old and had not been tested for over a year. A visual inspection was given to the ladders prior to rigging the pit and they looked O.K. This seems to point out the definite need to have a planned testing of all rope and ladders on a scheduled basis. Also, this accident points out the need for a belay to be used with all ladder work.

Texas, Sparrow Sink (near Alpine). In early June, 1971, a young man from Ft. Stockton, Texas, was fatally injured in Sparrow Sink An old fence was being used as a ladder for the more than 100 foot drop. The fence broke and he fell 50 feet to his death. He was not a caver; nor were his companions.

Source: Dan Watson

Analysis: Untrained, inexperienced, and ill-equipped, this group of adventurers should not have considered going down the pit by any means. Using an old fence as a ladder was the ultimate in folly.

Alabama, Hooper's Well. On June 2, 1971, Steve Powell (16) and Murray Walker (16) obtained a long length of 1/2" electrical power cable to use as a rope for exploration of a pit that they had "found". The pit is known as Hooper's Well, a 91 foot free-fall pit, open to the outside, with no passages at the bottom, located within the city limits of Huntsville. After tying the cable to a tree with a square knot and dropping the rest into the pit, Powell began sliding down receiving minor skin abrasions to his left leg and hands. Unable to climb up the cable, he sent Walker for help. Time: ap proximately 8.00 pm.

Walker called the Police Department who called the Madison County Rescue Squad. The Rescue Squad asked the Police Dept. to dispatch a policeman to the County Courthouse to contact the Huntsville Grotto which was holding its monthly meeting. The Huntsville Grotto Chairman and Grotto Rescue Coordinator, dispatched three able vertical cavers to Hooper's Well. Time: approximately 8.30 pm.

Source: Darwin Moss and Bill Varnedoe

Analysis: (Moss and Varnedoe) Adventuresome, albeit inexperienced, youth. Both boys were informed of the N.S.S. and the Huntsville Grotto's next regular meeting. Hopefully, accidents of this nature will continue to be injury-free. The Huntsville Grotto cannot hope to reach every adventure-seeking youth in its caving area no matter how many talks we give to schools, youth organizations, and civic groups.

California, Church Cave. On June 18, 1971, Werner Jesse (24), an experienced pit caver with no grotto affiliation, arrived at the Cliff Entrance and prepared to lower photographic equipment down a pit to Michael Selna and Raymond Rodrigue who had entered the cave at a lower entrance and were at the foot of the pit below him. Selna and Rodrigue were planning to photograph Jesse's rappel after all the equipment had been lowered. Two bags of photographic equipment were

lowered and untied then, after raising the rope, Jesse started to tie on the last bag. He was standing on an 18 inch flat ledge, 146 feet from the bottom.

The two below heard a rumble. They dashed to the wall but before they reached it, the bag containing over $1500 worth of photographic equipment had smashed with a roar onto the rocky floor. They looked up and called to Jesse. There was silence. Rodrigue turned and saw a broken and torn body only five feet away. Jesse had obviously died instantly. Rodrigue estimates that the falling body missed him by only 2 feet.

Deeply shaken by the sudden tragedy, Rodrigue and Selna started for help. Before reaching the entrance, however, they met a group of cavers from Diablo and Sierra Mojave Grottos on a joint caving trip. Two of these cavers went to Grant Grove to notify park authorities and obtain a stretcher. The body was placed in the stretcher and eventually lifted to the top. The unpleasant task was made even more difficult by narrowness and overhang near the top of the pit. It took over six hours to remove the body from the cave.

Rodrigue recalls that Jesse had an ear operation a couple of years before. He was bleeding from the ears the night before the accident and had placed cotton swabs in his years before going into the cave. Rodrigue suspects that this might have resulted in a loss of equilibrium or a temporary blacking out.

Source: Hugh Blanchard

Analysis: (Blanchard) This tragedy simply underscores the absolute necessity of being alert and tied in whenever possible when near the top of the pit.

(Anderson) Whether or not Jesse's ear problem caused the fall, he should not have been in the cave with any medical problem.

Alabama, Stevens Gap Cave. On July 4, 1971, a large group of cavers, all grotto affiliated, visited the cave as a training session for the less experienced members of this group. Steven's Gap Cave has two entrances - one is a 132 foot pit, 30 feet in diameter and open to the outside, while the other entrance is a steeply sloped walking passage approximately 50 feet from the pit. This horizontal passage is about 200 feet long and connects with the pit entrance where it drops off 30 feet to the floor.

After the more experienced cavers had "yo-yoed" the pit, Joyce Carpenter (21) again descended to give belays to the trainees. Guy

Gunter (19) went into the horizontal entrance and was at the junction of the two entrances, about 30 feet above Joyce, relaying communications, when he slipped from the ledge. According to Joyce, he fell the full 30 feet, landed on his chest, bounced, and remained unconscious for about 5 minutes. Time: approximately 12.00 noon.

By 1.00 pm word of the accident had reached the Huntsville Grotto Rescue Squad. From the description of Gunter's injuries, broken ribs and a punctured lung were suspected. They gathered two blankets, cut two poles for a stretcher, and walked to the pit.

John Cole rappelled down to Gunter and with help from Joyce tied him and the stretcher to the main rope. As the stretcher was slowly pulled up to the 30 foot ledge, Cole climbed another rope alongside the stretcher to prevent it from hitting the side of the pit. At the ledge the stretcher was untied and hand-carried out of the cave. Time: 3.30 pm. While the stretcher was being pulled up, Miriam Cuddington telephoned the Huntsville Hospital with a description of Gunter's possible injuries.

Gunter was admitted to the hospital at 4.45 pm where he remained for approximately a week. In addition to a ruptured liver, internal bruises, and many external abrasions and bruises, he received 6 stitches in his right elbow.

Source: Darwin Moss

Analysis: (Moss) Gunter does not remember falling or landing on the rocks below. Apparently he "blacked out", causing his body to relax, thus possibly saving his life. Gunter does not have a history of dizzy spells or black-outs. I must assume that he merely slipped from the wet ledge. Although somewhat a novice in vertical caving, Gunter was skilled enough to accomplish Steven's Gap Cave.

(Anderson) This accident points to the necessity of being tied in when it becomes necessary to stand near the edge of a drop.

West Virginia, Organ Cave. A mile and a half into the labyrinths of Organ Cave, two young friends of John Canfield (16) lowered him by Parachute cord about 15 feet to the floor of a chamber. The friends were unable to hoist him up and so Canfield climbed from a stream bed at the bottom of the chamber onto a bank. That was about 9 am Friday and for the next 12 hours Canfield had little to do except reflect on why people should not explore caves without proper equipment. Rescuers en tered the cave at 5.30 pm Friday, after Canfield's companions got word to the authorities that their friend was stranded. They pulled him out through a waterfall in the stream and emerged from the cave at 11.15 pm.

Source: The Evening Star, Washington, D.C., August 23, 1971

Analysis: These boys should have been accompanied by an experienced caver who could have advised them on the choice of proper equipment and would have undoubtedly vetoed the parachute cord descent.

Missouri, unnamed cave on Courtois Creek in Huzzah State Forest. On Sept. 1, 1971, Billy Lotz (40), Bill Pitti, and Pat Downey, none of whom had any caving experience or affiliation with a caving organization, entered the above cave at about 8.00 am. They passed through the entrance cavern, a 20 foot crawlway, then another cavern until they were confronted with a high ledge with a 15 foot long tunnel slanting upward from it. Pitti stayed in this cavern while Lotz and Downey negotiated the tunnel. At its end, and about 6 feet above their heads, there was a small hole. Without difficulty - there were many footholds and handholds - they climbed up into the small room above the hole.

On the return journey some ten minutes later, Downey descended the hole into the tunnel then waited for Lotz to do the same. Lotz lowered himself until Downey said he was near the ground, then dropped about one foot to the floor. His feet slid out from under him on the slanting, slick floor and his lower back heavily hit the ground. He tried to stand up but the pain was so intense that he returned to the floor. Any movement below the waist triggered severe pain. He lay on his stomach while Downey and Pitti went for help.

They summoned the conservation agent in Leasbourg Fire Tower, the sherrif's office, a Cuba ambulance service, and the State Forestry Office at Sullivan. From these contacts, a party of four rescuers entered the cave with a stretcher. Lotz was strapped into this and evacuated without further incident. Four hours after entering the cave, he was in Sullivan Hospital where a diagnosis of "severely wrenched back" was pronounced.

Source: Billy Lotz

Analysis: This is one good example of how a little slick mud can turn an easy cave, well suited to novice caving, into one of potential hazard. This group, being completely inexperienced, should have had at least one experienced caver with them. He would probably have advised Lotz to use the plentiful footholds to descend the drop rather than dropping to the slick floor; dropping, leaping, or jumping in a cave is dangerous because of the slick, unstable flooring usually found underground.

Mexico, Gruta El Carrizal. On November 26, 1971, Chris Cleveland (18), Bruce Stone (17), both Explorer Scouts and inexperienced cavers, were drowned while attempting to push a siphon to get to dry cave passage beyond. The following extractions are taken from reports submitted by Jon Everage (21+) who was leading the Explorer Troop, and various other people who were involved in the search and rescue operations following the disappearance of the boys.

(Everage) The members of Post 43 and guests left Houston, Texas, on Wednesday, Nov. 23 for Busta Mante to go caving. We arrived on Thursday morning, set up camp, and spent the rest of the day preparing for the next two days of caving. On Friday morning we traveled over to the cave Carrizal which was near the camp. Upon reaching the cave the large group of approximately 20 people divided into parties, one group going into the cave first, and the other following them in about 10 minutes. The cave is a simple one with large walking passages on two levels and a spring fed siphon at the end of the lower level passage. This siphon had been entered many times and consists of a swim of around 25 feet under water to reach the other side of the cave.

While one group was caving in the upper level, my group arrived at the siphon. After a few moments I decided to push the siphon. I undressed, took a light, swam under the rock, and entered the cave on the other side. The cave is not extensive so after exploring what there was, I swam back to the other side. Upon reaching the other side, I found that the other party had joined ours at the siphon. I answered questions about the other side and told everyone how far it was and how to follow the roof of the tunnel to the other side. Then, while I was putting on my clothes, Chris Cleveland decided to try to go through. He said nothing to anyone but just went in before anyone knew what was happening. This was approximately 3.15 pm. After Chris had apparently gone through, Bruce Stone deci ded to try, so once again, I explained how it was done and after attaching a line to Bruce, he swam in. After about 2 minutes, a couple of jerks were given on the rope and it was pulled back untied. We therefore assumed that Bruce had made it. Some of the party left and the rest of us sat down to wait for their return.

After about 2 hours I became worried that something might have gone wrong so I once again entered the siphon and went through. Upon reaching the other side, I called for the two boys but received no answer. I searched for them then returned. I then sent most of the boys after the rest of the party to try to locate someone to help with the search. That was around 6.15 pm. Later that night, we started trying to call someone for help but to no avail. All the American Consuls refused to answer even the emergency lines. We then called on an individual in the U.S. and had him try to call the Government. This also proved to be of no avail as he called everyone from the Air Force, Army, and Navy,

to the State Department in Washington. Failing at this he called some cavers in the St. Louis area who were cave divers. They agreed to come and prepared to come. In the meantime, some divers had been located in Laredo, Texas, and after some delay, they arrived at the cave on Saturday night. They dove in the siphon but found the water too muddy so the search was stopped until the next morning. Early Sunday morning they dove again. They found the bodies of the two boys still in the siphon, off to one side. They felt that the boys had panicked and drowned.

The bodies were brought to the surface by the divers who then refused to help remove them from the cave. This job was done by myself and some of the scouts as well as members of another caving group which was helping. The bodies were taken to Laredo, Texas.

(Carl Kunath, Bill Elliot, Ronnie Fieseler, Jon Vinson - Association for Mexican Cave Studies Newsletter, Vol. III, No. 4) Siphon diving in itself is dangerous. The Carrizal siphon is especially treacherous in that it is not a simple tube that one can follow blindly. To reach the air-filled room one must stay to the right. At low water stages, it is only about 10-15 feet horizontal distance to the other side. When the water is only a little higher, the length of the siphon is greatly increased. At the time of this incident, the water was up perhaps a foot, but the siphon was about 25 feet long. To reach the other side, one must dive at least 10 feet deep and follow the ceiling. The water on the right side is about 15 feet deep. To the left, the floor drops off to at least 40 feet deep and there are several small air pockets in the ceiling. The bodies were found to the left, 40-50 feet from the entrance to the siphon. Stone's body was floating against the ceiling. Cleveland's body was within 15 feet of Stone's and was neutral in the water.

Errors directly contributing to the accident.

1. The group from Houston was large and inadequately supervised. Everage was responsible for 14 people. They were also ill-equipped and inexperienced and were entirely too casual about going to Mexico, more so about caving in Mexico.
2. Everage, group leader of the Houston group, set a poor example in diving the siphon without taking the slightest safety precautions.
3. Cleveland, a near novice caver, attempted the same feat as Everage. Everage said that he did not know Cleveland was in the water or of his intentions and that at the time he was dressing on the bank with his back turned.
4. Stone, a complete novice on his first caving trip, was allowed to enter the siphon, his intentions perfectly clear. A rope was used, but was entrusted to a completely inexperienced belayman, and the signals which were arranged were backward. Again, no time limit was discussed for their proposed venture.

5. So far as can be determined, at no time was either of the boys instructed as to the physical nature of the siphon, nor did they inquire.

Problems complicating the rescue effort

1. Few cavers go to Mexico with adequate contingency plans in case of an emergency. After the incident, the Houston group was helpless and could have done little to organize a rescue. Luckily, some of the non-Houston group spoke spanish and knew what to do.
2. Communication problems.
   a) The accident was in Mexico, but Americans were needed to help.
   b) This was a major holiday weekend for Americans. Many of the people who might have been able to help were unavailable, being involved in various holiday trips themselves (this was only the second time in 8 years that Kunath had been home during Thanksgiving).
   c) A lack of information about who might be qualified to help, and the absence of any back-up numbers for some key people (Laidlaw, Florida Rescue, Bundrant, etc) who might have been able to help
3. The help received from the American Government was worse than useless. The American Embassy in Mexico City has an emergency phone, but no one would answer it. After wasting an hour of Kunath's time, the Air Force refused to fly the St. Louis divers, even to Laredo, so long as any commercial transport was available. The American Consul in Nuevo Laredo cancelled the St. Louis diver's flight when the Laredo divers were contacted - this could have been a serious mistake should help have been needed. Once the bodies were recovered, the assistant consul was contacted and asked to provide a police escort to Nuevo Laredo and through the heavy holiday traffic. He did nothing. The man appears to have been either stupid or drunk --- he asked ridiculous questions, repeated himself many times, and lapsed into lengthy silences. In short, the Air Force is unsympathetic and the American officials in Mexico are inept political fixtures. It is obvious that we need to find someone in the government with responsibility and the initiative to help in situations like this one.
4. The simple fact that cave divers were needed. It is hard enough to find people who are qualified to make the "standard" cave rescue (i.e. search a horizontal cave for a lost or injured person and evacuate if necessary), let alone try to find people qualified to perform a pit rescue, but when you need cave qualified divers, you narrow the list to a precious few.....

Conclusions; (Anderson) The preceding reports are thorough and it is easy to conclude that the tragedy was caused by inexperience and ineffectual leadership in the Scout troop. However, some of the tragedy lies in the fact that there was a group of N.S.S. and grotto affiliated cavers in the vicinity of the cave at the time of the accident. There were actually two experienced cavers at the scene of the accident who, if they had chosen to, could have verbally or physically restrained the boys to stop them taking their fatal dives. While the presence of this group of experienced cavers in the vicinity obviously expidited some of the search and rescue operations, it might also have prevented the accident.

Puerto Rico, pit near Rosario, six miles east of Mayaguez. On December 24, 1971, Viola Boyer (23) was injured when the rope on which she was ascending the 50 foot pit, became untied; dropping her 15 feet where she glanced off a ledge and fell another 10 feet. She, and five others; all skilled and experienced cavers and N.S.S. and grotto members, were exploring a 50 foot pit on the summit of a steep jungle-covered hill. The pit was rigged with half-inch Samson line. Four people, including Viola, rappelled in, leaving the other two cavers at the top. About 3.15 pm, Viola ascended the rope first, using a pair of Jumar ascenders. After a 25 foot free climb, she was unable to get around the lip of the overhang, and requested assistance. The three cavers at the bottom pulled the free end of the rope downward and away from the lip with a combined force of about 150 pounds. The rope came loose, causing the fall.

Her injuries were determined as a possible broken elbow. She had no feeling in her left arm and was therefore unable to operate the ascenders. An attempt to pull her up the pit using three adults at the top was abandoned as too risky (one of the people on top was needed to operate the Jumar safety anchor). Two people went to Mayaguez for help and returned in 2½ hours with six other people, including an M.D. from nearby Bella Vista Hospital. Viola was tied into the end of the rope and quickly brought to the surface. Dr. Henning discovered no fracture at that time so the arm was not splinted. She was able to assist herself down the hill.

Source: Paul Boyer

Analysis: (Boyer) The knot used by the person who rigged the rope was a variation of a hitch on a bight around a tree. Neither the anchor nor the rope broke. Apparently the hitch was improperly tied, and the free end pulled through.

(Anderson) The easily tied and easily recognized bowline would have been a better choice for tying off the rope, and as a routine safety procedure, the rigging should have been checked by at least one other knowledgeable person before use.

American Caving Accidents - 1971

S U M M A R Y

Situation	1970	1971
General	11	6
Vertical	3	7
Diving	2	2
Immediate Cause		
Fall	3	10
Falling rock or object	0	1
Failure of equipment	0	1
Stumble	2	1
Exposure and/or exhaustion	5	0
Burns	0	0
Asphyxiation	0	0
Illness	0	2
Drowning	2	2
Contributory causes		
Climbing unroped	2	2
Caving alone	0	0
Exceeding abilities (inexperience)	4	5
Inadequate equipment	3	6
Bad weather (incl. flooding)	2	0
Exposure and/or exhaustion	2	1
Loosing way	3	0
Light failure	4	0
Party too large	1	2
Party separated	2	0
Getting stuck	2	2
Hurry	1	0
Poor judgement	1	13
Age of individuals		
"Boys"	0	0
Under 15	3	0
15-20	8	7
"Young, or college age"	1	3
21-25	1	4
26-30	1	1
31-35	1	1
Over 35	1	1
Unknown	0	0
Affiliation with Caving Group		
Unaffiliated	11	9
Not stated	0	1
Member of caving group	5	5
Estimate of experience		
None or little	8	9
Moderate	1	6
Experienced	4	4
Unknown	2	3