August 6-8, 2021—Come to the 68th Annual Indiana Cave Capers 2021 Edition! This year we are back at Crawford County 4H Fairgrounds near Morengo, Indiana, home of the 2007 NSS National Convention. This will be another great Capers hosted by the Central Indiana Grotto featuring access to some of the most rare and beautiful caves in Indiana. Enjoy camping, live music, banquet, speaker, prizes and more! Watch for pre-registration discounts and more info coming soon. For more information, go to www.cigcaves.com

August 13 - 15, 2021—Karst-O-Rama, at Great Saltpetre Cave Preserve, Mt. Vernon, Kentucky. We’re bringing Karst-O-Rama back! Great cave trips and camping, vendors, and a live band with a costume party pair well with our sauna, hot tub, creek splashing, and, of course, feeding your thirst at the Guano Grill for three days of downright speleo-fun! This year’s theme has yet to be decided. KOR is hosted by the Greater Cincinnati Grotto with pre-registration discounts and info available soon! For more information, see our website at: karstorama.com.

October 7-10th, 2021—(Columbus Day weekend) The TAG Fall Cave-In, hosted by the Dogwood City Grotto, is an annual celebration of Caves, Caving, and Community, with 43 events in the last 44 years. After a year of Hindsight in 2020, where we all watched the world shut down and practiced social distancing during the COVID-19 pandemic, we are pleased to invite you to join us. Funds from the Cave-In registration are returned to the caving community through grants for cave research, conservation, exploration, and acquisitions, as well as rescue and training. Pre-registration opens July 4th at register.tagfallcavein.org and we’re looking forward to seeing you there. Let’s Go Caving!

November 1-5, 2021—2021 National Cave and Karst Management Symposium (NCKMS 2021) will be held in San Marcos, TX. Featuring Dale Pate, to speak at the banquet! Field trips to local caves and special access to local show caves! Glass-bottom boat tour of local spring! T-shirt! Online pre-registration is open. Reserve your hotel room for reduced rates. More details at symposium2021.nckms.org

December 29-30, 2021—NSS Conservation Expo 2021 will be held at the NSS Headquarters and Conference Center, Huntsville, AL. Open to the public. Purpose: to provide engaging “Leave No Trace” classes and cave simulation with focus on underprivileged children. See https://members.caves.org/event/nssconservationexpo2021

December 31, 2021—Bat Ball 2021 will be held at the NSS Headquarters and Conference Center. Huntsville, AL. A festive New Year’s Event for NSS members and their guests. See https://members.caves.org/event/BatBall2021 for more information and updates.

January 31-February 6, 2022—The Hawaii Grotto will be hosting Hawaii Cave Week. You know it’s gonna be cold where you are, so come bask in some Hawaiian lava caves, take part in removing invasive plant/tree species, and learn how to sketch a cave. The annual grotto meeting is scheduled for Saturday, February 5th, and will be held at Kāʻu Cave Farm on Hawaii Island. Membership to the Hawaii Grotto is included with your NSS Membership. For more information, or if you would like to join the Hawaii Grotto, please email Kim Fedrick at kfdrck@gmail.com. You can also find us on Facebook.

World of Worleys garnered an Honorable Mention for Ryan Maurer in the 2020 Photo Salon. It was taken in the well known Worleys Cave in NE Tennessee.
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ABOUT THE COVER

Front cover:
4 Wells Cave in Alabama. Photo by Chris Bell. The caver on rope is Veronica Bullock.

Back cover:
Right: Balcony Sinks Cave, Alabama. Photo by Chris Bell. The caver on rope is Veronica Bullock.

Left: Last month we published a black and white version of this image, Chimney Cave Stalagmites, and mistakenly attributed it to Nikki Fox. Credit should have gone to Daniel Pawlak, and this is the color version of the image which he also entered in that 2020 Photo Salon. Of the two entries, the judges gave the award to the monochrome one published in July, but we liked the color one as well.

Just a few miles south of Mammoth Cave National Park in west-central Kentucky, the Dripping Springs Escarpment winds its way across Edmonson County in a roughly east-west line. This erosional feature forms an irregular ridge that rises 250 feet above the sinkhole plain stretching on to the south. Bald Knob, a promontory on the edge of the escarpment, marks a spot where the sandstone caprock has begun to break up. Formed in the underlying limestone layers are the horizontal passages and vertical shafts of James Cave, Coach Cave, and a host of smaller caverns that have been the subject of exploration and study by members of the James Cave Project since the late 1950s.

With more than 11 miles of surveyed passage, James Cave is a complex maze under 37 acres. The upper level is an irregular grid of low, dirt-floored crawlways stretching to both sides of a canyon that gets rapidly deeper before plunging into the Bat Section, the floor of which is several hundred feet below the entrance. Forty Fathom Pit, a wide shaft in another section, blocked explorers in the early days, though the passage could be seen to continue on the opposite side. In the mid-1950s when single-rope technique was in its infancy, early explorers body-rappelled Forty Fathom, pushed through a hole at one side, and discovered more pits, climbs, and canyons. Through the ensuing decades, cavers worked hard to unravel the multi-level tangle, pushing squeezes and climbing to dark voids on the walls. James Cave is a horizontal and vertical puzzle, and many parties carried in coil after coil of rope, only to end their trip when they came to just one more climb or drop that needed a line.

Stretching in opposite directions from a common entrance room, nearby Coach Cave shows two distinct personalities in its 3.5 miles of surveyed passage. The eastern half is made up of thousands of feet of low, sandy crawlways that eventually lead to some impressive canyons, domes, and pits. In contrast, the western portion of the cave boasts spacious winding corridors that also end in an array of spectacular domes including Moonshiner’s Murder Hole. Open to the surface and measuring more than 200 feet from top to bottom, the Murder Hole features in a number of interesting folktales, none of which involves violent death.

One of the most enthusiastic members of the James Cave Project was Sara Corrie, a West Virginia resident who began serious caving in her mid-forties. Sara seemed to have boundless energy, going on long and difficult trips to the most remote areas of both caves. With her enthusiasm for caving and her friendly personality, she also recruited new cavers for the project, a necessary and ongoing chore because James and Coach seemed to produce many “one and done” cavers who never returned for a second trip. Sara was plagued with major health problems in her later years, and after her death her husband George established the Sara Corrie Fund to be administered by the National Speleological Society and used to support cave exploration projects in the United States.
As the cave revealed its secrets, some drops and horizontal traverses were semi-permanently rigged to save time and the effort of carrying heavy ropes on every trip. On the main route through the cave, it was eventually necessary to traverse more than 1,000 feet of rope, and new vertical features were still being found. These “nylon highway” ropes carried heavy traffic, and some were replaced from time to time through the decades. Original anchor points (large breakdown blocks, wall projections, and bolts installed in hand-drilled holes) were backed up or made more reliable, but constant moisture and mud continued to take their toll. Though everything looked and felt secure, the cavers began to question the safety of ropes and rigging hardware that had been in use for many years.

By the early 21st century, some of the first wave of James cavers began to slow down a bit after putting in 30 or 40 years on the project. Stepping aside from active caving, they began to sift through old survey notes, revise maps, and talk about the “good old times” when exploration trips frequently ran to 16 hours or longer. Steve Bishop, 25-year-old son of early James explorer Charlie Bishop, stepped up to lead a number of trips, joining a new generation of project members that also included Indiana cavers Anmar Mirza and Jess Deli. As instructors for the National Cave Rescue Commission, all realized that many of the ropes in James and Coach Cave were off limits because of a concern that the half-million bats hibernating there could possibly be infected by humans who might be carrying the virus. As an employee of the Emergency Management office in Lexington, Kentucky, Steve had his hands more than full with numerous COVID-related issues. Almost a year passed without a lot of progress in the search for suppliers of cave rerigging gear.

During this strange year when everyone stayed home, another project started to take shape. Catherine “Cat” Bishop had been a James caver since 1970 and had explored, surveyed, and pushed remote leads in James Cave and Coach Cave over the ensuing decades. As she learned the caves and listened to campfire tales, she realized that the various stories could be woven into one fascinating saga. With the idea of a book in mind, she began to gather oral history, survey notes, trip reports, slides, photos, and other material related to the caves. Current and retired project members supplied more information, and Cat and her husband Charlie made three weekend trips to the NSS reference library in Huntsville to do a painstaking review of Sara Corrie’s extensive caving records. Compiled in the days before email, these documents were a treasure trove of information about the earliest years of exploration beginning in the late 1950s.

Steve applied for a Sara Corrie grant of $1000.00, pointing out that Sara had been an active caver with the James Cave Project for many years. After reviewing the application, the US Exploration Committee voted to approve the grant, with the comment that they were pleased to see the money used to support a project in which Sara had been so deeply involved.

The grant was expected to cover only about a third of the final cost. Several of the James cavers added personal donations, and Steve began to look for suppliers who could fill orders for large quantities of caving rope and hardware at the best price. As this process was beginning in early 2020, the world was plunged into a virtual shutdown as the COVID-19 pandemic affected all aspects of national and international commerce. Caving trips were halted because of restrictions on travel and group size, and James Cave and Coach Cave were off limits because of a concern that the half-million bats hibernating there could possibly be infected by humans who might be carrying the virus. As an employee of the Emergency Management office in Lexington, Kentucky, Steve had his hands more than full with numerous COVID-related issues. Almost a year passed without a lot of progress in the search for suppliers of cave rerigging gear.

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Conceived as a simple history book that would document exploration and survey progress through the years, the volume somehow expanded to cover early uses (salt-peter operations), prehistory (petroglyphs and an ancient skeleton), commercialization of the caves in the early 1960s (both a curse and a blessing), equipment progressions (ropes, lighting, other gear), social and cultural history of the region (folktales and some unique individuals), spooky true stories about the caves (shivery first-person accounts), and efforts to protect the bats that use the caves for winter hibernation and spring maternity colonies (cooperation with The Nature Conservancy and Fish and Wildlife Service biologists). By the time Cat finally backed away from her keyboard, The James Cave Project: Sixty Years Inside Bald Knob had reached almost 500 pages. The book, illustrated with 99 photographs, was published by the NSS in December 2020 and is available for purchase from the NSS Bookstore.

Early in 2021, the world began to breathe again. Steve, with significant help from Anmar Mirza, found that purchasing rope would be much easier than acquiring rigging hardware. Stainless steel was in short supply, and even after buying the entire inventory of bolts and links and hangers from several merchants, Steve came up short on some items. In addition, costs were higher than expected. Still, orders were slowly being filled, a welcome development after months of waiting.

When Steve and Anmar drove their vehicles to the James Cave entrance on March 27, 2021 and opened their tailgates, bright sunshine reflected off a large spool of brilliant white rope and several heavy boxes of shiny metal hardware. The rope was laid out and divided into two 600-foot coils which would be carried into the caves to be cut into lengths for each drop. Rigging cord, webbing, bolts, hangers, and maillon links were sorted and packed into 40-pound piles, some of which were also taken in for the first day’s work. Steve, Anmar, and Charlie and Cat Bishop split up the loads and carried everything to the vertical Foot Dome entrance, lowering heavy packs and coiled rope down the 90-foot free drop. Anmar and Steve completed rerigging of several key drops, and dates were scheduled for the next several trips when more work would be done on routes that were further into the cave.

Members of the James Cave Project appreciate the help of the US Exploration Committee in funding this effort that will make the continuing exploration of James Cave and Coach Cave safer for those pushing the survey in future decades. The topography of Bald Knob indicates that there is more cave to be found.

This mystery of a local caving pioneer starts with a routine trip into Wayne Cave, Monroe County, Indiana on a snowy Sunday morning January 17th, 2021 with Rubia Hagans, Krista Reeves, Kevin Romanak, Christina Seuell, and me. Our purpose was to travel to the seldom-visited “150 Yards Passage” to determine whether or not it had the potential to connect to a nearby project cave we have been surveying for the past five years. Very little information on this passage exists aside from a trip report written by Justin Thompson in 2016. It took about three hours to make our way down the infamous 1,250 foot Wayne Crawlway and out past Camp 2. After inspecting the end of the “150 Yards Passage” we determined that although close to our project cave, it was at a higher elevation by as much as 60 or 70 feet. Turning to leave, I noticed a carbide signature at a duck-under, reading “FJC 4-24-55 NSS 2714”. Being familiar with the history of Wayne Cave, I realized this was a very early date for exploration. Krista had brought her phone for taking pictures and I asked her to document the initials, date, and NSS number.

Six days later while attending an Eastern Indiana Grotto meeting, the topic of the mysterious signature came up and I asked Krista to send me the picture, which I forwarded to Tom Nugent the following day. Tom lives on the Buckner Cave property in the former home of Richard Blenz which also houses the Central Indiana Grotto library.

With this new information, we had an avenue for finding out more about this early Indiana caver. Though this was a very different type of cave ‘lead’ than I was used to exploring, my curiosity was piqued and I had to see if I could find this guy, if he was even still around. What I learned through the pursuit of this mystery has forever changed the way I will look at old signatures on cave walls. Most of us reading this were taught caving etiquette and that writing on the walls is a top 5 on the ‘no-no’ list, however for early explorers it was common for them to push virgin passage and leave their mark as Jerry did in April of 1955 at the age of 19, just after he had officially joined the NSS in 1954.
Further research uncovered more information from this time period in an NSS News article dated November 1957. It recounted some of the very first exploration of Wayne Cave and stated that on March 6th, 1955 Bill Auckerman pressed through “Stalactite Squeeze” solo with Jack Dorsey waiting behind in the crawl. Auckerman went 300 feet into very tight, virgin crawlway before turning back, being at his solo two-hour time limit. On April 7th, 1955, Bill Auckerman, Jerry Clark, Ray Beach, and Warren Dunham worked their way through the same crawl to discover “big passage” beyond. Recounting the breakthrough trip, Bill Auckerman wrote, “Clark and I spearheaded the attack on the crawlway.” After passing the first tight spot at the beginning of the 1,250 foot crawlway, they got to a second tighter spot. Auckerman wrote that “considerable credit must be given to Jerry Clark who took the lead through a particularly difficult squeeze near the end of the long crawlway.” Years later, Ray Beach said that when he and Warren reached the end of the crawl into this “big passage”, Bill was running around in circles shouting over and over “look what we found!” A few days later on April 10th, Jerry returned with three others and explored further to an area that is now known as Camp 2—a considerable distance from where the previous discovery had been made. During August 27-29th of the same year, Auckerman, Clark, Don Peters, and another caver spent three days underground near Camp 1 and mapped the “American Bottoms” section. It was certainly a very ambitious and rewarding year for this intrepid young group of cavers.

During my research I was able to find and contact first Jerry’s sister, Nancy Strong, and then his brother, retired physician Dr. Jack Clark. They both still reside in Syracuse, Indiana and were willing to share stories about Jerry. Jack was the oldest sibling, born in 1932, while Nancy was the younger sister, born in 1941. Jerry was the middle brother, born December 18th, 1935. Nancy remembers when she was 13 years old Jerry excitedly sharing the news of a recent discovery. “He came home with great excitement, enthusiasm and pleasure in his voice, telling us that he and his friends had discovered a virgin cave that no one else had ever set foot in. I do not remember him calling it Wayne Cave, though I distinctly remember him calling it Lost Cave.” On an earlier version
of the Wayne Cave map, this new section is referred to as “Lost Cave.”

Though I was unable to find a trip report with the same date that Jerry left his carbide mark on 4-24-55, his brother Jack recalled a recreational trip he took with Jerry and The Purdue Outing Club at about that time. Jack describes using carbide lamps and the infamous Wayne Cave crawlway perfectly. Here is part of Jack’s story: “We ate lunch in one of the large rooms, and on the way out either I had eaten a little too much or our course was different enough that I got hung out either I had eaten a little too much or our course was different enough that I got hung up. I was caught between the roof and the floor. One member of the group squirmed around to get behind me and one member was in front of me holding onto my arms with us pulling on each other’s arms. My feet were against the shoulders of the person behind me pushing, and a third member of the group was digging underneath me. I finally broke loose, but not before the heel came off one of my old shoes. The exposed nails pushed into the inside of the shoe. I tried walking barefoot, but there were a good many areas where there were old limestone falls from the ceiling and walking barefoot was more uncomfortable than walking on the nails. The next day I was so sore that I couldn’t make it to my classes or clinical assignment in Indianapolis. That was the only day of Medical School that I missed.” It should also be noted that the south passage out of Camp 1 in Wayne Cave is called Clark’s Passage, and though no documentation could be found explaining how exactly it was named, there is no doubt that Jerry Clark was quite prolific in the early exploration of this challenging cave.

Raised by a physician father that loved the outdoors, Jerry and Jack learned to fish and hunt game birds and deer. After Jack left for college, Jerry and his dad learned to bow hunt and hunted together often. Jerry excelled in archery. Alice Prow Clark, his mother, grew up in Bloomington, Indiana and received a degree in music and arts from Indiana University. She often took the children for walks in the woods pointing out and naming birds, trees, and the beauty of nature. Alice’s mother and Jerry’s grandmother, Hallie Pace Prow, was a notable local painter who made several trips to an elderly T. C. Steele’s studio in Brown County, Indiana to paint and have the famous artist critique her work.

Scouting was also a big part of Jerry and Jack’s lives, with both achieving the rank of Eagle Scout. Jerry worked about twelve summers at a local scout camp, six of which he was Assistant Scout Master and Explorer Advisor. Jerry described himself as one of the “little guys” at 5 feet 7 inches and 145 pounds. He was quiet, friendly, outgoing, and open to friends. Jerry had many hobbies besides outdoor recreation, including ham radio, Hi-Fi, and all music—especially classical. He loved tinkering around with electronics and photography. Nancy said, “Jerry actually had a darkroom set up in the oil room of our basement when he was younger. He graduated to having 35mm slides developed of a professional quality from the pictures that he would take on his many trips.”

Jerry was class president and valedictorian of his high school senior class of 1953 before attending Purdue University and earning a BA in Electrical Engineering and a Master’s degree in Geophysics. Later in life he worked towards his PhD in Psychology. In 1959, pre-dating Richard Powell’s 1961 “Caves of Indiana”, Jerry Clark, John Jansen, and Wilton Melhorn compiled a pamphlet titled “A Catalog and Description of Some Indiana Caves.” While attending Purdue University, Jerry belonged to the Purdue Outing Club which organized trips for rock climbing, hiking, and caving, and later served as president during his senior year in 1958. As a grad student at Purdue, he was an advisor for a group of Explorer Scouts (ages 15-21), leading a canoe trip through the Boundary Waters between Minnesota and Canada. He also took a group mountain climbing and hiking at Philmont Scout Ranch in Arizona. Jerry’s brother and sister-in-law, Dr. Jack and Carol Clark, were also involved in youth groups, taking their daughters to “Cave River Valley” (Campbellsburg, Indiana) for caving excursions a few times in the 1960s.

As I continued to learn more about Jerry, I realized he was a true renaissance man with an impressive list of achievements and adventures. John Turner and Richard (Fig) Newton had lived with Jerry in a house during college at Purdue and joined him for many caving and climbing trips. John Turner said Jerry drove a huge late-1950s Chrysler
Imperial, which was a big car for the day. They would pile themselves and their gear into the car and travel to “Portland Arch” in Indiana to go climbing and a take road trips to “Devil’s Lake” in Wisconsin to climb, as well as many trips to southern Indiana for caving. Walt Taylor, a friend from Indiana, said he learned to water and snow ski from Jerry along with caving. Scuba had recently been invented in 1942 by Jacques Cousteau, though in the mid-1950s Jerry taught himself to dive, as there were no classes or certifications at the time. Jerry and some of his friends went cave diving in Florida and he also taught his brother Jack and his sister Nancy to scuba dive. Notably, Jerry worked on an international scientific project known as The International Geophysical Year (IGY) from July 1957 to December 1958, which was directed toward a systematic study of the earth and its planetary environment. In 1961 Jerry was working in Antarctica with the University of Wisconsin and National Science Foundation mapping surface and sub-surface areas of Roosevelt Island. This research work required living on the ice in tents, driving a snowcat, and scuba diving in a dry suit to retrieve samples. Jerry returned for a second season to work from Byrd Station to Filchner Ice Shelf. Jerry said between resupply flights, “there was time for an ascent of an unclimbed peak and a 24 hour attempt at another finished off in a delightful blizzard.”

Jerry even has a 2-mile long island named for him in Antarctica. [https://en.wikipedia.org/wiki/Clark_Island_(Antarctica)](https://en.wikipedia.org/wiki/Clark_Island_(Antarctica))

Jerry migrated from Indiana to Bend, Oregon and was employed by a psychological testing organization to assist in the development of an early version of a computer program created to administer psychological testing. While living in Bend, Oregon Jerry continued his interest in mountain climbing and became a climbing and ice safety instructor for the United States Antarctic Program, a mountain leader, a member of the University of Oregon Alpine Club, a member of the University of Wisconsin Hoofe Mountaineering Club, and the Eugene, Oregon Obsidians Club Rescue Team. Jerry mountain-climbed for 14 years with a number of very respectable summits to his credit including Grand Teton, Mount Owen, Hagerman Peak, Medicine Mountain, Symmetry Spire, Pinnacle Peak, Middle Teton, Mount Moran, Mount Oldenburg, Gannett Peak, Mount Oliver, Pingora Peak, Mount Rainier, Mount Jefferson, North Sister, Mount Adams, and Mount Hood.

In 1965, Jerry and his friends started planning a Mount McKinley summit for June/July 1967. Mount McKinley, known as Denali since 2015, is 20,320 feet tall and was first climbed in 1913. Mountain climbing in 1967 was still in its early days as mountain rescue. Military Air Support didn’t exist. Portable 5 watt CB radios were new and unreliable, but were used for the first time on this climb. The mountain rises 18,000 feet from the 2,000 foot plateau, and the trail from Wonder Lake to the summit is 36.5 miles.

Leaving Puyallup, Washington on June 13th, 1967 and driving 1,000 miles to Mount McKinley National Park, the twelve member expedition team had almost a ton of gear, despite packing relatively light by today’s standards. They hired a man and his sons with eight horses to help pack everything up to McGonagall Pass at 5,720 feet and 18 miles of the 36.5 mile trail, which took six days and two trips. The “Wilcox Expedition” as it is called today planned seven camps going up the mountain. On July 4th, the group photo was taken at Camp 2 on the Muldrow Glacier. July in Alaska brings the sunrise at 4:00 a.m. and sunset at midnight with no true darkness. Many trips must be made by each man between camps moving gear at all hours. During this process the body acclimates to the altitude.

On the evening of July 14th all twelve members had made it to Camp 7, at 17,900 feet. Some were suffering from altitude sickness, vomiting, and headaches. The morning of July 15th was clear and by 1:00 p.m. Wilcox and three others were making their way to the summit. Jerry Clark and seven other men had arrived later at Camp 7 the evening before and it’s presumed that they waited to see if those with altitude sick-
ness would acclimate and recover. At 7:00 p.m. Joe Wilcox radioed the ranger station that he was on the summit with three others and that it was beautiful and sunny. Wilcox and his team arrived back to Camp 7 late in the same evening.

The next day, July 16th, was overcast with 70 mile-per-hour winds, though the following morning of July 17th was sunny, with wind speeds reduced enough for Clark’s group to attempt to summit. Joe Wilcox and the three that had already reached the summit on the 15th planned to descend to Camp 6 at 15,000 feet, where they would wait on Clark’s group to rejoin them. This would leave plenty of food and fuel in Camp 7 for the remaining men on their return. Of Clark’s group at Camp 7, two were still suffering from altitude sickness and were unable to attempt the summit. One man decided to descend with the Wilcox group to Camp 6 while the other would wait at Camp 7 and descend with Clark’s group the following day when they returned after reaching the summit. As the five men reached Camp 6 with Wilcox, they could see the six climbers from Clark’s group getting a late start going up the mountain from Camp 7 at 3:00 p.m. At 8:30 p.m. Clark radioed the ranger station and reported that they were 45 minutes to an hour from the summit and having trouble route-finding.

On July 18th at 11:30 a.m. Jerry radioed that he was on the summit with four others. The existing reports are unclear as to why only five climbers reached the summit, though it is presumed that one member turned back early as there was no indication of any problem based on Jerry’s radio report. He said the wind was blowing and it was seven degrees Fahrenheit. When asked about the delay, he reported that, “they were fogged in and couldn’t go up or down and bivouacked until it passed. They would start descending soon and would radio in at 8:00 p.m.” That was the last communication with any of the seven men at Camp 7 and above. Jerry was 31 years old. Unknown to the climbers at the time, a low pressure front with moisture from the ocean and a high pressure front with cold air from the north were converging on the mountain. Climbers in 1967 didn’t have the weather forecasting technology available to us today and decided to climb if the weather looked favorable. Meteorologists today can study the storm of 1967 using modeling analysis and believe it was truly a storm of the century, with extreme blizzard conditions at minus thirty degrees Fahrenheit. Meteorologists have theorized that wind speeds during this storm could have gusted up to 300 miles per-hour with the funnel effect that the mountain has at elevations above 17,000 feet.

There was another climbing group on the mountain at that time of the storm; the Mountaineering Club of Alaska (MCA Team) had made camp at 11,550 feet on the 19th. This climbing group, now turned rescuers, attempted to reach higher elevations, but were shut down due to high wind and snow. On July 23rd, Joe Wilcox and four others, low on food and fuel, descended from Camp 6 at 15,000 feet and encountered the MCA Team at 12,100 feet, who fed them and provided water. It wasn’t until the 28th that the MCA rescuers finally reached Camp 7 at 17,900 feet. The catastrophic storm had lasted a week and the remaining seven climbers were unaccounted for and presumed dead. The rescuers found one body in Camp 7 and a shredded tent. On July 29th the MCA Team summitmed and on the way down spotted a red object on the slope below. Belaying a man down to inspect, they found two more bodies that were 300 to 400 feet apart. Both were sitting in a relaxed position. No pictures were taken, but based on the description the MCA climbers provided, none of the three found were Jerry. The bodies were not recovered and subsequent storms have since covered them over with snow. Since July 1967, a considerable number of reports and books have been written on this incident and blame for the disaster has largely been placed on the climbers not being prepared and the Park system’s slow rescue response time. Most agree that if the climbers were above 17,000 feet today and the same storm hit, survival would be extremely doubtful.

Writing this and learning more about a fellow Hoosier caver has been an adventure for me. Jerry lived his life as if he knew it would be short. He accomplished more in his 31 years than several men could have accomplished living a normal lifespan. I’ve said many times that we are walking in the footprints and standing on the shoulders of the cavers who came before us: none any more so than Jerry Clark NSS 2714.

Acknowledgements

Special thanks to Dr. Jack and Carol Clark and Richard and Nancy Strong for sharing their stories and a picture of Jerry. Without their help this story would not be complete. Several people have helped in finding pictures and facts: Tom Nugent, detective and editor of the Bloomington Indiana Grotto Newsletter, John Turner and Richard (Fig) Newton for their stories, Richard Powell, Sam Frushour, Keith Dunlap, John Benton, Tom Sollman, Laura Demarest, and Kevin Romanak for helpful information and guidance.

Indiana Karst Conservancy property/visitation info

The IKC purchased the property that includes the Wayne Cave entrance in 2003. Since then, the property has expanded into a 57-acre preserve which serves to protect the undeveloped land above Indiana’s 9th longest cave.Wayne Cave property page https://ikc.caves.org/wayne-cave-preserve. Cave access can be coordinated through the Cave Patron (Dave Everton DEverton@indiana.edu). Camping and other requests can be sent to the Property Manager (Danyele Green iluvlabs2006@yahoo.com).
The remnants of the hickory torches in Buckner Cave, Indiana are not very impressive; about twenty narrow strips of bark, ranging from 5 cm (2 inches) to 48 cm (19 inches) long, and burned at one end. They were discarded as they got too short (hot) to hold and now lay scattered along the edges of the cave passages, under breakdown rocks, or tucked into crevices. Yet these humble wood fragments, scarcely noticed by visitors to the NSS Nature Preserve, speak to earlier eras of deep cave exploration in the late prehistoric and historic past. They represent both Native American and Euro-American cultures. Last studied over thirty years ago, this article presents new information about the hickory bark torches of Buckner Cave based on recent research at the site, including a re-assessment of the extent of exploration by torch, a revised interpretation of the radiocarbon date from 1990, and two new radiocarbon dates. Although Buckner Cave was horribly abused for years, when the NSS accepted its donation in 2008 it wisely recognized that the site still had valuable recreational and educational potential. It turns out Buckner Cave also contains important historic and archaeological resources, despite the fact it was once regarded as “the most trashed out cave east of the Mississippi River” (Rea, 1992).

Early Lighting Systems in Eastern North America

When people in the past went into caves, the decision as to what lighting to use was both cultural and pragmatic: what was appropriate, and which materials were readily available, either locally or through trade? The most widespread early type of cave lighting in eastern North America was the river cane (Arundinaria sp.) torch, utilized by Native Americans for more than six thousand years to explore caves (Watson, 1974; Simek et al, 2014). However, outside the range of river cane or in upland areas where it was locally scarce, other flora were used, including several types of tree bark torches. Native Americans in the Great Lakes region like the Ojibwa were famous for their use of birch bark torches, including for night fishing from canoes. Birch bark torches were used for lighting in Arnold Cave, a Late Woodland site in Wisconsin (Boszhardt, 2003). Strips of cedar bark have been noted in several caves, including Buckner Cave, and are usually attributed to Native Americans (Munson and Munson, 1990). Euro-Americans also turned to tree bark torches, especially in frontier contexts. Some used the bark of the yellow poplar (commonly called tulip poplar or tulip-tree) (Petrides, 1988). Around 1836, poet William B. Oaks explored “The Great Cave,” Wyandotte Cave, Indiana. He later wrote, “Now stop – wave your torches of poplar bark briskly, and as the flames burst freely out, survey the wild, the almost fearful sublimity of the scene around you” (Oaks, 1845). But in the broad area south of the range of paper birch and north of the cane stands of the Ohio River Valley, the most important bark torches for Native Americans and Euro-Americans were hickory.

Hickory Bark Torches

Hickory-oak forests were important components of the deciduous forest complex which extended over much of eastern North America in the not-so-distant past. Of the eleven species of hickory in the east, the shagbark (Carya ovata) and the shellbark (Carya laciniosa) are ideal candidates for supplying torch material, having very shaggy bark which loosens in long strips. While both species are common in the Midwest, the shagbark has a much greater geographic range (Petrides, 1988). Both were used. Several long strips would be held (or tied) together to make a single torch. In the nineteenth century, many strips were bound together into packs so a person could easily carry extra fuel (Stone and Haynes, 1901). Although one historical account by an old-timer complained the flame from hickory bark torches created an “unstable, flickering light” (Rushville Republican, 1887), experiments by University of Kentucky archaeologist George Crothers and Mammoth Cave National Park archaeologist Ed Jakaitis in 2020 found they produce a usable and long-lasting light, more than adequate for cave exploration. Hickory bark torches have
been identified in several caves in Indiana, Kentucky, and Tennessee. Mammoth Cave, Kentucky has a large assortment of Native America bark torches, including hickory. The cave most famous for hickory bark torches is undoubtedly Wyandotte Cave, Indiana, where prehistoric cavers used them to penetrate deep into the large cave. Once inside, they mined chert, aragonite, and probably epsomite. The site was studied by Patty Jo Watson in the early 1970s, who established its use during the Early and Middle Woodland Periods (Watson, 1974). Subsequent studies in 1980 and 1986 by Patrick J. Munson and Cheryl Ann Munson, revealed that Native Americans at Wyandotte Cave used hickory torches for three thousand years, with radiocarbon dates from the Late Archaic (4150 Before Present or BP) to the Late Woodland (1260 BP) Periods (Watson, 1974; Munson and Munson, 1990; Crothers et al, 2002).

There are many historical references for the use of hickory bark torches from pioneer settlements in the Midwest and South during the early to mid-nineteenth century. The practice extended into Canada. Euro-Americans (and African Americans in the South) used the torches as lanterns to travel at night, whether to attend camp meetings or some other event, or simply to get safely to their destination. (Sanderson, 1910; Chase, 1848; Dick, 1993). Hickory bark torches were also used to explore caves. During the Civil War, a group of Union soldiers from the First Ohio Regiment wanted to explore a cave in Franklin County, Tennessee but had no means, so they turned to the best available expedient light. Hickory bark torches procured from the forest provided light for twenty men to tour the cave. In 1998, historian Marion O. Smith found names from the soldiers written inside Keith Cave (Fawcett, 1862; Smith, 1998).

**Buckner Cave**

Buckner Cave, in western Monroe County, Indiana, is one of the archaeological sites with known hickory bark torches. Located in the Crawford Upland and developed in the Mississippian-aged Ste. Genevieve Limestone, Buckner Cave is a large and interesting cave with 5.58 km (3.47 miles) of mapped passages and a vertical extent of 37 meters (124 feet). The larger passages are oriented along an E-W axis while smaller passages trend N-S and NW-SE. The large Entrance Room extends 60 meters (200 feet) and ends in breakdown. The current way into the main cave, now protected with a strong gate, is the 210 meter (690 feet) long Thunder Crawl (the last bit is stoop) to the T-Room, a major junction. From there, the cave has dry upper levels, lower stream levels, large rooms, and small crawls (Richard Blenz Nature Conservancy Inc., 2012). At one time it contained attractive speleothems. It was well-known in the mid- and late-nineteenth century, but sometime early in the twentieth century the historic crawl into the cave filled with sediment, likely a consequence of deforestation and increased erosion. About 1958, Richard L. Powell and associates dug open the current route and mapped the cave. At the time, the L.V. Cushing (or Signature) Room had purported late eighteenth century graffiti, a single name and date, which are now destroyed. The mid- and late-twentieth centuries were not kind to Buckner Cave. By the late 1960s, vandalism in the cave was already bad, and it got worse in the following decades (Powell, 1961; Munson and Munson, 1990; Rea, 1992). Not until the twenty first century did the conservation tide turn. The key step was the creation of the Richard Blenz Nature Conservancy, Inc. (RBNC) in 2005, which spearheaded the site’s protection through access management, resource stabilization, and remediation projects. The site is now managed for the NSS by Anmar Mirza and the RBNC. The disturbed cave environment has been restored to a remarkable degree, thanks to the diligent efforts of many volunteers. But did any historical or archaeological value remain?

**1986 Research**

In August 1986, the same time as their Wyandotte Cave field work, Patrick J. Munson and Cheryl Ann Munson examined five other Indiana caves, two of which contained hickory torch fragments: Buckner Cave and nearby Coons Cave. At Buckner Cave, they documented the presence of anthropogenic features and artifacts, as well as potentially desirable minerals like gypsum and epsomite. To summarize from their report, they found “numerous strips of hickory bark, most charred at one end,” in breakdown and in a pack rat nest in the back of the entrance chamber. There were two bark torch fragments under a rock in the short southwest side passage of Thunder Crawl. Near the end of Thunder Crawl were two hickory torch fragments, several cedar strips, and an oak splint torch. Finally, “several” torch fragments were observed for 38 meters (125 feet) in the large dry passage to the Big Room. They collected the most interior hickory bark torch observed as a sample for radiocarbon dating. The authors concluded that explorers using hickory torches “penetrated as deeply as 500 feet [152 meters] from the entrance.” This was in addition to the entrance chamber. A careful examination of the 2012 map indicates they underestimated the extent of the torch-explored passages they documented. Based on their text, it is closer to 327 meters (1075 feet). At the end, the researchers were dismayed by cave’s highly disturbed condition and very pessimistic, writing, “[i]n short, the cave appears to have little potential for contributing additional information, either archaeological or historical, beyond what is noted here” (Munson and Munson, 1990).

**The 2018 Research Project**

In September 2015, I (JD) met Anmar Mirza and Jessica Deli of the RBNC through
the James Cave Project (JCP) in Kentucky. Later that fall, Marion O. Smith, Kristen Bobo, and I began work with the JCP to assess the prehistoric and historic resources of highly disturbed Kentucky cave, site #15ED23. During this work, Anmar and Jessica invited us to visit Buckner Cave. JCP cavers and experienced researchers Jim Honaker and Kristen Bobo agreed to help assess and document any remaining cultural resources in Buckner Cave, while Jessica and Anmar offered to serve as guides and field assistants. We wrote a formal proposal to conduct research at the site and submitted it to the NSS Research Advisory Committee, a requirement at NSS Nature Preserves. Our goal was to identify and document extant cultural features and artifacts in the passages previously examined in 1990, focusing on hickory torch fragments. When discussing the unexpected chronology of Buckner Cave, the researchers had written, “[o]nly the additional dating of torches from the cave would resolve this [uncertainty]” (Munson and Munson, 1990). We proposed to collect two small samples of hickory bark torches, if found, for radiocarbon dating using AMS (Accelerated Mass Spectrometry), which is more precise than previously available methods. On October 8, 2018, the NSS Research Advisory Committee granted permission for research, subject to the approval and oversight of the Preserve manager, Anmar. On November 1, 2018, Jim Honaker, Kristen Bobo, and I conducted field research at the cave, led and aided by Jessica Deli and Anmar Mirza.

November 1, 2018 Field Work

There is no need to discuss the research trip in detail, except to say that Jessica and Anmar were our excellent but bemused guides, having probably never gone so slowly through the cave in their lives. Before heading inside, Anmar procured bark from a shagbark on the Nature Preserve property to aid our in-cave identification. The team conducted a pedestrian survey, examining cultural/historic features and artifacts, recording them in photographs and notes, and locating them on the cave map. The following passages were surveyed: Entrance Room; Thunder Crawl and short side passage; L V Cushing Room; short passage from Cushing Room to downstream passage; downstream passage (part); passage from T-Room to Big Room; WPA Passage (part), and passage from the Big Room to Keens Grotto (part).

Results of Cultural Survey

There are numerous hickory bark torch fragments in the large Entrance Room, with most (n=7) in a crack on the east wall. We collected a small piece of one hickory torch fragment in the crack for radiocarbon dating, Sample #1, shown on the upper left of page 12. There is an additional fragment in breakdown along the east wall further north (closer to the entrance of Thunder Crawl). Intensive searching will likely yield additional torch fragments in the Entrance Room. We could not locate the two bark torch fragments previously observed at the end of the side passage off Thunder Crawl, although we did find a single fragment near breakdown.

Radiocarbon Dates from Buckner Cave, Indiana

<table>
<thead>
<tr>
<th>LAB NUMBER</th>
<th>CONVENTIONAL RADIOCARBON AGE</th>
<th>CALIBRATED DATES</th>
<th>PROBABLE CULTURAL AFFILIATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>BETA-17353 (Munson &amp; Munson 1990)</td>
<td>410 BP (1540 AD)</td>
<td>1410-1640 Cal AD (95.4%)</td>
<td>Prehistoric: Late Mississippian</td>
</tr>
<tr>
<td>BETA-509001 (SAMPLE #2)</td>
<td>190 BP (1760 AD)</td>
<td>1649-1695 Cal AD (22.2%)</td>
<td>Historic: American Indian</td>
</tr>
<tr>
<td>BETA-509000 (SAMPLE #1)</td>
<td>90 BP (1860 AD)</td>
<td>1687-1731 Cal AD (26.0%)</td>
<td>Historic: Euro-American</td>
</tr>
</tbody>
</table>

Calibration: OxCal v4.4. HPD Method: INTCAL 20. All dates are corrected for isotopic fractionation. Before Present (BP) is set at 1950 AD.

More disappointingly, we could not locate the hickory fragments, cedar strips, or oak splint previously found near the crawl’s terminus. We did note a small, unidentified piece of carved wood near the end of the crawl.

There were no observed hickory bark torches in the Cushing Room, the connection passage to the stream, or in the short portion of downstream passage we examined. Preservation in the stream passage is poor, although a search of breakdown areas above the stream, such as the Upper Level Breakdown Room, may prove worthwhile. The large dry passage extending c. 182 meters (600 feet) from the T-Room to the Big Room contains significant hickory torch material and was the main route chosen by torched explorers. Starting at about 18 meters and continuing another 106 meters (350 feet), there are at least five well-preserved torch fragments on the dirt floor along the south wall. We marked off several of the deposits to protect them from inadvertent damage. We collected a single hickory bark fragment from one of two adjacent deposits along the south wall, 15 meters (50 feet) anterior to the intersection with the WPA Passage, Sample #2. Two bark torch

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“R Watson 1846”. Note the serifs on the T, the backward n, and the old-style number 8. Somehow this historic wall marking survived, despite being surrounded by Twentieth Century graffiti.
fragments, one exceptionally long, were located a short distance past the junction with the WPA Passage. The last section of the main passage and the Big Room are damp-to-wet and do not contain extant torches. However, torch bearing explorers continued past the Big Room, as a single hickory torch fragment was noted a short distance inside the passage leading to Keens Grotto. There are three torch fragments in the first 22 meters (75 feet) of the WPA Passage. In sum, we observed and noted twenty torches remnants; there were likely many more originally but only those “out of the way” have survived. Luckily, Buckner Cave is a large space with many nooks and crannies where material has been preserved. Our field research extends the underground distance explored by hickory bark torch to 503 meters (1650 feet) of passage. Additional research will likely add to that total. Despite the terrible damage, we are happy to report the cave still contains evidence of visitors’ early lighting.

**Historic Wall Markings**

Although one account states that “Graffiti has covered or obliterated all the historic dates” (Rea, 1992), Anmar and Jess knew that a few historic wall markings had survived in the cave and ensured they were preserved during clean-up work. Also, some of the older marks in the Entrance Room have been previously recorded in a preliminary signature project. Although not our primary goal, historic graffiti are important cultural resources and should be part of cultural resource surveys. We recorded a few surviving old names in the L.V. Cushing Room and examined the former location of his Nov. 23, 1775 inscription. It is truly gone, making assessment of its authenticity impossible. However, on the northeast wall of the downstream passage there are several previously unknown and unrecorded historic graffiti, which are not damaged by post-1958 vandalism. An 1867 graffiti was also noted in the passage to Keens Grotto. The old and new wall markings confirm the history of the site, as we recorded dates from the 1840s to the 1890s, but none in the decades afterward until the late 1950s. The cave still contains previously untapped historic resources besides torches. We suggest a comprehensive survey of historic names be undertaken. The results will be useful in reconstructing the nineteenth century history of the cave.

**Chronology of Prehistoric and Historic Exploration**

At Buckner Cave cultural affiliation is difficult to determine beyond general categories due to of the lack of diagnostic artifacts such as pottery, and the fact many different cultural groups used identical lighting systems. There is total technological continuity for hickory bark torches across millennia and the prehistoric/historic divide, which is also true for Indigenous use of canoe torches. Ancient torch material on the cave substrate appears identical to much more recent deposits (Crothers et al, 2002). Thus, radiocarbon dates are a key source for investigating site history and hickory torch use. Unfortunately, there are unique problems associated with radiocarbon dating materials from the last 500 years, including reversals, plateaus, and wiggles in the calibration curve, especially in the sixteenth and eighteenth centuries, which yield ambiguous results. For this study, the 1990 radiocarbon date from Buckner Cave and the two new radiocarbon dates, Samples #1 and 2, were calibrated using OxCal v4.4, which incorporates IntCal 20, the most recent calendrical calibration curve. We hoped to clarify the chronological uncertainty concerning Buckner Cave. Instead, the new radiocarbon dates complicate its history: results indicate the site is multi-component, with both historic and prehistoric torch materials, from Indigenous and (probably) Euro-American cave visitors.

**New Perspectives on the 1990 Radiocarbon Date**

Based in part on their previous work at Wyandotte Cave, Patrick J. Munson and Cheryl Ann Munson “assumed that utilization of the [Buckner] cave occurred within the date range of the prehistoric use of Wyandotte.” This proved incorrect. A radiocarbon assay on the hickory bark torch sample yielded a conventional radiocarbon age of 410 +/- 70 BP (1540 AD), a prehistoric Late Mississippian date. This result was so unexpected the researchers did not accept it at face value, saying the date should be viewed with “some skepticism.” They suggested several possible reasons why it should not to be trusted; the lack of contemporaneous surface sites; possible contamination; laboratory error; or old wood, used centuries later by Euro-Americans, perhaps linked to the eighteenth century graffiti. Aside from a discussion of the old wood problem, little evidence was presented at the time to support the skepticism (Munson and Munson, 1990).

Today, these explanations seem strained. Over the last thirty years, new research and associated radiocarbon dates at many sites have led to changing perspectives concerning cave chronology and site types in eastern North America (Watson, 2012; Simek et al, 2014). The most parsimonious explanation for the 1990 radiocarbon date is that it is late prehistoric, as reported by the lab. A Late Mississippian date is in line with current knowledge. While in 1990, there only one temporally comparable eastern cave site, Indian Cave in Tennessee, with a radiocarbon date of 400 BP (Faulkner, 1987; Faulkner, 1997), in 2021, we know of at least nine well-studied caves with twelve AMS dates between 460 and 370 BP, bracketing the Buckner Cave date. What once seemed anomalous, Native American cave sites from the fifteenth or sixteenth century are now viewed as part of larger regional activity at the time.

Patrick J. Munson and Cheryl Ann Munson concluded Buckner Cave was primarily an exploration site, one of the four categories of prehistoric deep cave usage identified by Patty Jo Watson (1986). We concur with this assessment. Despite the presence of minerals like gypsum, which were mined at times in other caves, there is no evidence for mineral mining, mortuary use, or non-mortuary ceremonial (i.e. art) activity. This was considered problematic in 1990, as the site type and age seemed mismatched. While several exploration-only deep caves sites were known by early researchers, almost all were much older, like Jaguar Cave, Tennessee and Lee Cave, Kentucky, both from the Late Archaic. It was originally thought that exploration-only caves would generally be very old. It was also thought most late prehistoric sites were art caves, which Buckner Cave clearly was not. However, scholarship has changed here also. There are now numerous, well-documented deep cave exploration sites from many different time periods, including the late prehistoric Mississippian and Historic eras. Exploration was one of the major forms of Native American interaction with the underground environment in the past, occurring at scores if not hundreds of sites (Crothers et al, 2002; Faulkner, 1987; Watson, 2012; Simek, 2007; Douglas et al, 2007).

**New Buckner Cave Radiocarbon Date – Sample #2**

Buckner Cave Sample #2 returned a conventional radiocarbon age of 190 +/- 30 BP (1760 AD). When calibrated, there is a modest probability it is from the mid-late seventeenth century, but it is most probably an eighteenth century date. Due to wiggles in the calibration curve, the results also implicate the twentieth century. While we can eliminate that possibility using other lines of evidence, the late intercept makes it difficult to accurately assess, beyond stating that Sample #2 is an historic-era hickory bark torch fragment. When calibrated, the Sample #2 assay overlaps with the radiocarbon date obtained from hickory bark in Coons Cave, Indiana, located approximately one mile north. There are numerous comparable radiocarbon dates (from river cane torches) from eastern caves explored by American Indians in the seventeenth and eighteenth centuries. While it is possible
the eighteenth century radiocarbon date from Buckner represents Euro-American exploration (Munson and Munson, 1990), we see no compelling reason to make that cultural assignment. We think it is unlikely that Sample #2 is from a torch from the one purported white exploration trip in Buckner Cave in the eighteenth century, and not from one of the many American Indians groups living in southern Indiana in the historic era: Shawnee, Miami, Delaware, and others. We believe it more likely Buckner Cave was primarily a component of Native American landscapes from prehistory into the early nineteenth century.

New Buckner Cave Radiocarbon Date – Sample #1

Sample #1, collected in the Entrance Room, returned a conventional radiocarbon age of 90 +/- 30 BP (1860 AD). When calibrated, there is a modest probability the torch dates from the late seventeenth to early eighteenth century, which would support historic American Indian exploration, but it is probably a nineteenth century date. We interpret this date as historic, likely Euro-American, cave exploration. American Indian land title in the area was extinguished by treaties in 1809 and 1818. After the end of the War of 1812, increasing numbers of Euro-Americans settled in southern Indiana, where they assessed the region’s natural resources, including caves. Monroe County was created in 1818, the same year Bloomington was founded. The population swelled from 2679 in the 1820 census to over 10,000 persons in 1840. By the 1850s, Euro-American hickory torch use sharply declined, as frontier areas in Indiana were integrated into larger regional markets. While bark torches were still used occasionally, candles and oil lamps became the standard forms of lighting, including in caves. Then the industrial revolution brought kerosene and acetylene lamps. When Buckner Cave was reopened in 1958, the modern explorers didn’t consider using bark torches; they had carbide miner lamps. The use of hickory bark torches, which had lasted thousands of years, was finally over.

Conclusions

Hickory bark torch use shows remarkable technological and chronological continuity. Considered a good (and expedient) source of illumination, they were widely employed across the Midwest and elsewhere by Native Americans to explore caves throughout prehistory, from the Late Archaic to the Late Mississippian. Periods. The two new radiocarbon dates from Buckner Cave extend hickory torch use at the site into the historic era. Bearing in mind the ambiguities inherent in radiocarbon dating of relatively recent material, Sample #2 shows that historic American Indians used hickory bark torches to explore Buckner Cave, probably during the eighteenth century. They also broaden hickory torch use at the site; Sample #1 likely represents Euro-American presence in the Entrance Room, probably during the mid-nineteenth century. Together, the three phases of deep cave exploration documented at Buckner Cave, late prehistoric, historic American Indian, and historic Euro-American, are each part of larger regional patterns in eastern North America. Finally, even the most damaged caves might provide important historical or archaeological information, although incomplete. If we can stop further resource loss and stabilize abused caves, we can help preserve the finite and non-renewable evidence for our collective human past.

Acknowledgments

The authors thank Anmar Mirza, Jessica Deli, and the RBNC for their hospitality and assistance. We also thank the NSS, including the NSS Research Advisory Committee. Jan F. Simek read an early draft of the paper and made helpful comments. Marion O. Smith gave us a copy of his article on Keith Cave and other sources. George M. Crothers and Ed Jakaitis related their recent experiments with hickory torches. The authors are responsible for all errors.

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Knoxville: University of Tennessee Press.


Chatting with Patricia “Ann” Dunlavy today, her enthusiasm about sharing caves with the world is obvious. She views her position at Lincoln Caverns as caretaker of two beautiful caves: a steward in sharing how amazing the caves are with anyone willing to lend an ear. This year began her 50th season at the caverns, a 3rd generation show cave owner and a NSS member. She focuses on education at Lincoln Caverns and loves finding ways to make learning about caves and karst fun for all ages. Surprisingly, growing up with a show cave in the family, she did not originally intend to be a show cave operator. If anything her first season almost scared her away.

Nestled into the Helderberg Limestone of Pennsylvania was a hidden treasure unknown prior to the 1930s. Like many caves in this region and geologic unit, Lincoln Caverns did not have a natural entrance. It was discovered during construction of U.S. Route 22 in May of 1930. The farmer who owned the land had it open for tours by June of 1931 as “Hi-Way-May” Caverns. He quickly discovered this business was not in his wheelhouse and had the caverns up for sale at the end of the first season. This was fortunate for Myron Dunlavy, Sr. (NSS# 44), an entertainer who dabbled in vaudeville, the circus, theater, amusement parks, and had a deep love for caves. He had been seeking a cave to call his own, placing wanted ads for caves. He quickly entered into a 5 year lease/purchase agreement and changed the name to “William Penn Caverns.” Once the cave was purchased in 1937, Myron Sr. officially changed the name to “Lincoln Caverns” to honor his favorite president.

Myron Jr. (NSS# 459) came to work at Lincoln Caverns as a teen and became an avid caver like his father. He spent his free time digging at sinks on Warrior Ridge, always looking to find the next cave. In September of 1941 his work finally paid off when he found a new cave, small but with pristine speleothems. Roy Davis (Cumberland Caverns founder and renowned show cave light designer) suggested the name “Whisper Rocks” and Myron Jr. liked it. Myron Jr. would take his family for “tax deductible vacations” Ann jokes, visiting show caves everywhere they went. She was raised on tourism and the show cave industry through and through and never imagined herself having such a career.

In 1972 Ann came to work her first season at Lincoln Caverns as a tour guide during college. The Flood of ’72 did not make for a fun first season. Instead of laughing with guests and sharing her knowledge of caves she found herself shoveling tons of icky mud left behind from floodwaters her first week. She remembers how the awful smell made her question leaving her college job at J.C. Penny to work at the cave. She went back to Harrisburg for college but by 1977 she found herself moving back to Huntingdon fulltime to be the manager and caretaker of Lincoln Caverns. It seems she had mud in her blood just like her father and her grandfather before him. All these years later she finds herself enjoying the smell of cave mud.

Education has become a true calling for Ann. She loves sharing the caves with children and helping instill the “cave softly” ethics with the next generation of cavers and cave enthusiasts. Lincoln Caverns offers a variety of educational options, most of which begin with an in-class visit to the school planning a field trip. This may seem like an extra-generous service of Lincoln Caverns but Ann jokes that in some ways this is for their own self-interest. It makes sure those taking trips to the cave already have an appreciation and respect for the
natural resources that are the caves before they even step foot in one. Ann loves partnering with cave scientists like Will White to not only give special talks, but also to help calibrate her guides and make sure they get the narrative right. They strive to change the perception of caves as quirky roadside attractions. As many NCA member caves have found, today’s audience demands more, and “Edutainment” is common. Learning can be fun when presented in entertaining ways. It turns out the true story of caves are pretty cool when you share their natural and human history with genuine enthusiasm. Conveying the importance of caves and karst to the public in a way the information sticks is how a show cave increases the respect and value a visitor places on these fragile environments.

Joining the Cave Preservation Network was another layer Lincoln Caverns could add to their commitment in not only protecting cave environments, but also to promote awareness to all who visit. Allowing visitors to take a part in raising the funds for the NSS preserves helps them feel like they are a part of something bigger than themselves, and they can feel good about visiting a show cave that cares about the bigger world of caving. The International Year of Caves and Karst, being extended into 2022, provides an opportunity to show guests and school groups how important these special places are to everyone. Cavers already know how amazing the cave world is, but getting that message to the public lies heavily on the stage of show caves like Ann’s.

Lincoln Caverns is open 7 days a week during season and by appointment in the winter. They focus on cave education with many different experiences to offer. With strong ties to the caving community and building relationships with everyone who loves caves & karst they would love to see you when you are in town. To learn more about Lincoln Caverns visit lincolncaverns.com
Nearly 700 feet above the Colorado River, the shouts and cries of passing boatmen and women in rafts and kayaks are clearly audible. Above the dull roar of traffic traveling along Interstate Highway 70, the excited conversations of rafters give me the feeling I am not alone on a canyon side. Yet, I am, and I work on digging out a rough extension of a new foot trail to Colorado’s Cave of the Clouds. Once the state’s third commercially-exhibited cave, Clouds today lies silent and still, protected at last by its current owners, Mike Frazier and Donna Renee.

It is summer, and the trail work in the sun and heat is demanding. Enjoying the shade of a large tree overlooking the canyon below, I am unable to see the four-lane expressway, but the sound of traffic is always present. Further off are the screeches and yelps of visitors riding the Giant Canyon Swing at Glenwood Caverns Adventure Park, swinging out a vertigo-inducing thousand feet above the highway.

I think back to the late 19th century, when this canyon was wild and untamed, and the new settlement of Glenwood Springs offered riches for those willing to work hard and create a destination for summer visitors. A growing number of middle- and upper-class Americans were traveling west by rail, and Glenwood was a prime destination owing to its mighty hot spring waters and popular Vapor Caves.

As late as 1881, this region was Ute Tribal Territory, but the federal government forced the tribes off these lands to a reservation in eastern Utah. An additional unfortunate consequence of this was local wildfires that burned to the ground great groves of trees that had stood for centuries.

In the summer of 1886, railroad survey teams from the Denver & Rio Grande, and the Burlington & Missouri, worked both sides of the Colorado River, then called the Grand River. On the north side, the Burlington crew carefully worked on a line that would allow the railroad to expand to the west. E.R. Alexander from Denver was a member of this survey team, and from an airy station on a ridge at what was called the Horseshoe Bend, he spotted what he termed a “peculiar” landslide far above the survey station, near the massive blue-gray, Mississippian Era Leadville Limestone cliffs.

Curious about this feature, he climbed the canyon wall that evening from the railroad’s camp at No Name. Accompanied with the camp cook, Mr. Wheeler, they scrambled and clawed their way up steep, rugged terrain. At about 700 feet above the river, they came upon the nearly hidden entrance to a natural cavern. Thick, green undergrowth nearly blocked the low passage from view. They pushed through the leafy bushes into the low crawlway, and emerged into a grand chamber.

The green outside light provided dim illumination of the chamber as they climbed to their feet. It was filled with a genuine fairyland of large stalagmites on a steep slope ascending into darkness. Above, the ceiling was filled with stalactites white and glistening with moisture. This was truly a significant discovery.

It is possible, then, that the “landslide” Alexander spotted from his survey station were simply loose rocks and rubble the boys removed from a tight, low passageway. These might have been tossed down the hill by the boys as they made their way into the cave, their pristine whiteness from not being exposed to the elements standing out to the surveyor.

It was not until late October of 1886 that Alexander announced his discovery to the public, and his intent to open the cave as a visitor attraction. In the months since his initial visit, Alexander and others explored most of the known cave, finding a large upper chamber. The cave was exceptionally decorated throughout with a profusion of
large speleothems that would not be out of place in the caves of southern New Mexico’s Guadalupe Mountains.

The Leadville Daily Herald described the cave in its November 12 edition. “The party say they were in raptures of delight at the beauties of the cave, which they report to be from 75 to 100 feet wide and about the same in height [sic] and that they explored it to a length of 300 feet or more. The crystal pendants and drapery hanging from the ceiling are gorgeous and grand, some of them being over twenty feet in length, and in many places resembling immense lace curtains and lace hangings. In some parts of the cave the stalactites and stalagmites almost touch each other, in other places pillars were formed.”

It is no wonder then, that Alexander decided to develop the cave as an attraction once the Burlington line survey was completed. In May, 1887, the cave opened for public tours. It was given the name “Alexander’s Cave” in honor of its discoverer and developer.

More than 130 years later, in January 2018, Frazier and Renee closed on the purchase of the 45-acre parcel of Glenwood Canyon property. The sellers were a family who had owned the land since the early 20th century. Their family home had been at No Name until 1965, having been built by their parents. At that time, it was jacked up and loaded onto a truck for transport west to property in Canyon Creek. The federal government purchased a portion of the No Name property adjacent to the river for the construction of Interstate 70. Twin highway tunnels drilled through the ridge where Alexander had first spotted the cave entrance emerged at what had been the back yard for the house.

As members of the National Speleological Society, Frazier and Renee had been active for many years in Colorado caving. Renee had worked briefly at the Cave of the Winds at Manitou Springs, and Frazier had served as the chair of the Society’s Williams Canyon Project. Both had been searching for a cave they might purchase, and considered properties outside of Colorado before approaching the family owning the cave Alexander opened as a visitor attraction.

The owners reported they had no overwhelming desire to sell the property, but found the interest and dedication of Frazier and Renee toward cave preservation and protection to be compelling. Since the parcel is bounded by federal highway land to the south, City of Glenwood Springs land to the west, and Bureau of Land Management to the north, development of the parcel for even a private residence will be difficult. It also is very steep terrain, so cutting a road for a house would be a significant expense, even if access were to be granted by the federal or city government.

In 1887, access was a considerable challenge for Alexander and his commercial cave tours. A rough trail steeply climbed the canyon wall, but even in an era when “roughing it” for outdoor adventure was not uncommon, the lack of an easy route to the cave greatly restricted the number of paying customers.

Alexander sold out his interest to M.S. Yarwood in the summer of 1887, and moved south of Glenwood Springs with his wife and young son. He started a confectionery, stationery, periodical and grocery store in the new town of Carbondale, where he and his family lived for many years.

With greater personal finances, Yarwood began promoting Alexander’s Cave and improving access for visitors. By that fall, a new toll road had been constructed to the No Name settlement along the Grand River. At Cascade Creek, on the west side of Horseshoe Bend, Yarwood had a trail constructed that led up and over the ridge, traversing east to the cave entrance.

A showman, Yarwood used colored chemical compounds that would burn brightly under flame. The use of such burnable substances undoubtedly created hazardous smoke within the cave, but also illuminated passageways and chambers more brightly than the candles or hand-held lanterns of the era.

Although Glenwood residents and presumably Yarwood talked about improving the foot trail to the cave, or even constructing a wagon road, traffic remained light. Burros provided sure-footed rides from Glenwood for some, but most visitors chose to walk.

With visitors to the growing resort community increasing following the arrival of the Denver & Rio Grande and Midland railroad lines, the city was in need of additional attractions. The Glenwood Hot Springs Pool was constructed and improved in 1888, with the majestic Hotel Colorado arriving in 1893 to provide top quality overnight lodging for Glenwood visitors.

The settlement of the No Name region in the far western portion of the Canyon of the Grand following the opening of the toll road brought several residents. Charley Brown discovered his property extended up the canyon wall, including the entrance to Alexander’s Cave. In 1893, Yarrow had decided to move on from managing the cave, and Brown allowed the former Montrose County Sheriff, Frank Mason to lease the attraction. Arriving in Glenwood in February, 1887, Mason had held a number of different positions before he undertook the cave project, including working as a steward at the Hotel Glenwood. He also served as Chief for the Glenwood Hook and Ladder firefighting team.

An affable and popular leader, Mason immediately began promoting the cave. He also hired a force of men to improve and reconstruct the trail to the cave, which would allow visitors to ride horses for the full distance.

One of Mason’s first promotions was a contest to rename the cave. In the spring of 1893, visitors were encouraged to submit potential names. In late April 1893, Mason hosted a “rechristening” of the cave. The winning entry was “Stalactite Cave of the Clouds.” A New York City socialite wintering in the city, Mrs. J.J. Reilly, provided the
engaging name.

The rebranding of the cave was accompanied with the introduction of the superior kerosene-fueled Rochester Lamp, a glass lantern that provided a brilliant white flame and protection from drafts. Such lamps would allow visitors to see the wonders of the Cave of the Clouds more clearly.

As bright as the future appeared, in July 1893, the federal government made the decision to drop the Silver Standard for the dollar, creating what was termed the “Panic” of 1893. Over a few weeks, mines in Colorado that depended on the inflated value of silver ore closed, throwing hundreds of men out of work. This created a “run” on banks throughout the state as individuals and businesses began drawing out their funds. Since many banks did not have the full value of the deposits on hand owing to their investments, this created numerous bank failures, particularly in Denver. Unemployment soared in Colorado.

Mason recognized the Panic would impact the tourism business and took a position as the manager of the Hotel Yampa in Glenwood Springs. He gave up his lease of the cave by mid-July, and so Brown assumed management of Cave of the Clouds.

Although Brown was well known in Glenwood Springs, he was more skilled as a contractor and handyman than an entrepreneur. He told the papers he planned to introduce electric lights to the Cave of the Clouds in 1894. However, the electrical lines from the city’s power plant near the hot springs pool were never installed. Brown turned to a local excursion company to manage cave trips for 1894. This company offered trips into the cave, along with other nearby destinations.

The following summer, in early July 1895, Glenwood City Attorney Charles W. Darrow was riding horses with his friend Horace Devereux on his Iron Mountain property overlooking the city. Darrow had recently acquired the lots through federal land patents, and was looking his land over for potential building sites.

Not far from the summit, Darrow and Devereux noticed a curious whistling noise that drew their attention. Seeking out its source, they were surprised to find the high-pitched whistle emitted from a small hole in the limestone. Most likely, thunderstorms were moving into the area, creating a change in air pressure.

Curious as to what treasures might be found within, Darrow hired men to excavate the small hole. They opened the entrance to a previously unknown cave, which Darrow named Fairy Cavern.

Well decorated with stalactites and stalagmites, the cave also included a number of small helictites, which may be the source of the name. Darrow recognized the potential the cave had for the city’s tourism business. Although Fairy Cavern was not as spectacularly decorated as Cave of the Clouds across Cascade Creek to the east, it had an advantage. It was significantly closer to the city, and more importantly, an access trail for horses could easily be constructed. Indeed, the Hotel Colorado had already built a rough foot and horse trail up the mountain to a viewpoint overlooking the Canyon of the Grand and No Name.

With financial backing reported to be about $25,000, Darrow spent the winter of 1895-1896 creating a commercial trail within his new cave. He also paid for a road to be constructed to the cave’s entrance from Glenwood, and built an entrance building with a broad porch overlooking the city. By mid-June, electrical wires had been run to the cave up the mountain from the city power plant. With these lights, tour groups were treated to underground excursions without having to hold kerosene lanterns or unreliable candles.

Brown simply could not compete with Darrow in encouraging visitors to the city who had an interest in caves. Although Clouds apparently opened for tours in the spring of 1897, visitors were much more interested in the new Fairy Caves. It is probable the lack in paying customers allowed locals to undertake mischief at Cave of the Clouds. The lock at the cave’s entrance door was apparently knocked off by vandals, and local residents began touring the cave on their own. With this lack of supervision, the cave began suffering damage to its many speleothems.

By the autumn of 1951, when members of the newly-chartered Colorado Grotto of the National Speleological Society visited Cave of the Clouds, they discovered it was badly vandalized. Broken stalactites and smashed draperies were found throughout its extent.

Fairy Caves, to the west, was equally damaged and abused. Though it won the battle with Cave of the Clouds in paid visitors, the declining economy during World War One encouraged Darrow to give up his commercial efforts. He discovered that notwithstanding a carriage road to the entrance, visitors were uninterested in making the journey. Even the addition of a mined tunnel from the cave to a cliffside grotto with an exceptional view of the Grand River failed to improve visitor numbers. The tunnel opened to visitors in 1900, but by the early teens, photographic images show the entrance gate had been broken down and vandalism had damaged the entrance building.

In October 1961, Colorado Grotto members Peter Prebble, Bob Wilber, and Bob O’Connell pooled their money and purchased the 80-acre lot containing Fairy Cave from the Darrow family. Their purchase was in part to protect the cave from potential expansion of the nearby Marblehead Limestone Quarry, but it also was with a potential prospect of creating a future commercial business. These plans were never realized, and in 1999, Steve and Jeanne Beckley arranged with Prebble a lease-to-purchase agreement that allowed them to redevelop the property as today’s Glenwood Caverns. With the addition of a second tour route and a mountaintop adventure park with several thrill rides, a passenger...
Cave of the Clouds
“Alexander’s Cave”
Garfield County, Colorado

Total Surveyed Length: 577 feet
Total Surveyed Depth: 96.0 feet

Surveyed on May 15, 2010 by:
David Lambert, Dave Schmitz,
Derek Bristol, Ken Headrick,
and Steve Reames

Cartography by David Lambert
August, 2010

Feature names labeled in quotes refer to an article from the Leadville Daily Chronicle, November 24, 1887.

All symbols are NSS standard.

Lithologic pattern is for reference only and is not meant to imply stratigraphy.

Entrance
Datum 0.0

“Queen’s Hall”
Signatures circa 1902

“Garden of the Gods”

Tight Pinch (≤9 inches)

“The Sentinel”

“Queen’s Hall”

90° PROJECTED PROFILE

Entrance

Feature names labeled in quotes refer to article from Leadville Daily Chronicle, November 24, 1887.
tramway from the city provided the key to transportation that Darrow and later Prebble, Wilber and O’Connell had lacked in their business plans.

From my canyon side perch, I could see the Cliffhanger Coaster Beckley had installed at the edge of the cliff overlooking the Colorado River. He had found the coaster in a defunct Missouri amusement park, disassembled it, and rebuilt it on the edge of the canyon where its comparative tameness was negated by thrilling views of the deep gorge. For more than a century, these two caves have been linked, but Fairy Caves, now as Glenwood Caverns, has been the clear winner in terms of financial gain and public notoriety.

After purchasing the Cave of the Clouds property, Frazier and Renee reached out to Colorado cavers to assist with protecting the cave and creating better access. Frazier flagged a foot trail route from a large pull-off on Interstate 70, providing a direct route to the cave. Several volunteers worked on creating a trail along this route over the following year. This trail quite likely is similar to the route used by Alexander and his tour groups in the cave’s first year of commercial operation.

A major challenge for the new owners was to install a sturdy entrance gate to protect the cave from additional vandalism. The original entrance door probably was removed completely by the first World War; its broken padlock was found by Lorie Sheader of Glenwood Springs in 2017, buried in debris on the slope below the entrance. A new gate needed to allow bats easy entry and exit, as studies from Colorado Parks and Wildlife biologists found the cave has served as a roosting site for a summer colony of bachelor Townsend’s Big-Eared Bats.

Rob McFarland of Rifle was encouraged to create the new steel gate. He welded the gate in two sections, which cavers laboriously carried and dragged up the canyon side to the cave. Volunteers also assisted in carrying more than 1,400 pounds of concrete and water to build a new footing, along with a gasoline-powered generator. The latter allowed McFarland to weld together the sections of the gate in place.

On September 15, 2018, the new gate was completed and locked. It provides the first protection for the cave from vandalism in 121 years.

With the cave now protected, efforts began to clean and restore passageways and chambers. During the winter season, a tarp is hung at the walk-in entrance, allowing greater moisture to collect. In June and July, the owners have created a closure order to avoid disruption of the bachelor colony.

Joshua Berthiaume, a Glenwood Springs caver, undertook a dig in the cave through a very tight passage. This led into a previously-unknown chamber with pristine stalactites and flowstone. Surprisingly, many of these were broken. Speculation has been that the chamber may have experienced damaging shock waves from blasting at the Marblehead Limestone Quarry to the northwest. For three decades beginning in the early 1950s, significant amounts of limestone was removed.

It is because of this apparent experience with quarry operations that the Cave of the Clouds owners are concerned with the proposed expansion of the Mid-Continent Quarry. Although this quarry expansion is more distant than the Marblehead Quarry, blasting at this expansion will be considerably more extensive over a comparable 20-to-40-year period. An overwhelming majority of Glenwood businesses and residents oppose the expansion of quarry operations, so it is uncertain the Bureau of Land Management will approve the project. It remains a threat, however, particularly to the caves.

Colorado cavers also undertook a major cleanup of Drapery Den, the second largest known cave on the property. Although it is a cold-air trap, this cave was used by local homeless residents as a home for several years. During this time, a large amount of trash and debris accumulated in the cave’s entrance chamber, all of which was left behind when the last resident vacated. Multiple trips were undertaken by cavers, with trash bagged, and dragged and carried down to the Interstate parking area. There it was collected and transported to the county dump.

In 1879, a group of prospectors from Leadville trespassing on Ute Tribal lands created a temporary camp on the high White River Plateau overlooking the Grand River. This camp was named the Defiance Camp owing to their defiance of property law. Glenwood Springs temporarily took the name from this camp when it was first established, so the Cave of the Clouds owners decided to name their canyon property the Defiance Cave Preserve. Frazier and Renee welcome members of the caving community to visit. Ken Headrick of Rifle coordinates visitor access, which includes borrowing an entrance gate key for those entering Cave of the Clouds.

Caving is not the only activity in the Preserve. The lower Leadville Limestone cliffs on the property, adjacent to Interstate Highway 70, is a popular technical rock-climbing area called the Puoux. Regional climbers enjoy climbing the limestone during the cooler months of the year. Owing to its south and west exposure, the cliffs keep mostly snow-free. At least one rock-climbing school also conducts classes on the rock outcroppings.

From my shady rest spot, I take a long drink of the lukewarm water, repack my day pack, and set off for another section of trail needing work. I am grateful that Frazier and Renee stepped forward to protect this property, and Cave of the Clouds. While the cave has only a shadow of its former beauty, it is easy to understand why my friends fell in love with it.

In September 1899, the Glenwood Post newspaper reported about a visit to Cave of the Clouds by a group of local boys. This description is still relevant today.

“About half way back we paused and resolutely began the ascent of the hill itself. We forced our grasping way through tangled shrubbery and climbed like flies, clinging with fingers and feet to the crevices over bare, slippery stretches of rock tilted at an angle of 50 degrees. At last we reached a shelf on the mountain and saw the dark mouth of a cave which plunged recklessly into the heart of the mountain. The cave of the clouds. No electric light throws fantastic shadows on its walls. The feeble candle made our images dance distorted through the cavern as we ascended the slippery ladders, and made our way into the vaults of the gnomes. Why anything in the earth should seem unearthly is unaccountable, but so it is.

Water with its precipitate of rock, dropped ceaselessly from the walls and roof, has done so for many years, for there are stalactites and stalagnites of considerable proportions. The light of the candle shows them pink and pearl with glistening crystals of pure white. Many of them were twisted into queer, withering shapes.”
The Untold Cave Rescue Story from 1978  
Dan Smith, NSS #4704

Note: This story is mentioned as a paragraph in a couple different sources. Here is the account from Dan Smith, founder and first national coordinator of the National Cave Rescue Commission (NCRC). Shortly after setting up the framework and recruiting regional coordinators and medical and cave diving experts, he got a call. It was the first test of the NCRC—it wasn’t a cave rescue team, but was set up to help train people and get resources where needed. Could the NCRC help authorities with a cave rescue deep in Mexico?

Here’s the story of a cave rescue so complex that it required the rescue resources of four states, two countries, the US Air Force, the CIA, the State Department, the Secretary of State of the US, and over 100 civilian and military personnel, over a 72-hour period. It was a rescue operation that never made the news, never was sensationalized, and wasn’t even made into a media event.

“We need Help!”

It was early morning, 5AM, in the Fall of 1978, in Petaluma California. I answered the phone and a haggard Texan said, “You’re the national coordinator for cave rescue. Well, we need help and we need it bad. Anything, help us please.”

He explained that a group of Association for Mexican Cave Studies cavers had gone to a remote section of Mexico and were deep underground when one of their members sustained serious life-threatening injuries (later shown to be a broken femur).

He asked, “Can you help us get to him? It’s over 600 miles below the border!”

I took down the facts and told him to hang on, that I would help him, and that I would call him back in 30 minutes. I called my fire department, where I worked as Senior Division Chief. They agreed to release me for the duration as it was an operational emergency and that is what I did for my day job.

Next, I contacted the Air Force Rescue Coordination Center (RCC) and inquired as to the possibility for an emergency extraction of a group of Texas cavers some 600 miles into Mexico. The reply was swift.

“No problem,” answered the Air Force Major on duty. “Where are your people?”

“San Antonio area,” I replied.

“Ok, have them respond to Bergstrom Air Force base. We will have transport all set up for them. Tell me, how many people and how much equipment?”

I phoned the Texas cavers to get the details as to how many people and what equipment they had. They already had been ready with a loaded truck to drive to Mexico, which was maybe a two-day trip. They were shocked when I told them, “You head to the airbase. Now. Get Moving.”

They did, in short order.

At this point, the Air Force officer invoked a national defense act to exclusively acquire my telephone line and make it a direct line—a hot line—between myself and the Air Force command. They requested I be available 24/7 if they had questions or needed advice if problems arose. In effect, while not on scene, I would be their overhead advisor to coordinate the units involved, if need be. In a professional command structure, it should be noted that an incident commander in the field is placed in such a position that he needs additional information to make complex decisions at times. This was truly the position of a cave rescue coordinator, akin to an orchestra conductor to ensure everyone was working together.

Back in Texas, the cavers, with doubts, drove as instructed to the Air Force base nearby. They were expecting all sorts of red tape and problems. What surprised them was that the gate to the base was swiftly opened and air police with red lights flashing were waiting there to escort them straight to the runway where a big C130 with engines turning was waiting for them!

The cavers were shocked to see the crew pull the cavers’ truck directly into the plane and lash it down. The pilot asked where they wanted to go. The cavers showed him in detail, and they computed the navigation to the site.

In minutes, the Texas group was airborne, flying at 350 miles per hour into Mexico. Mexican government initial clearance was obtained for the military plane from the US State Department. But more US government help would soon be needed.

Within hours, the C130 located a farmer’s field about 10 miles from the cave location and was able to land without a runway and get the cavers and gear out of the plane. Things were working well. Cavers were now on site to help their teammates. It had taken less than six hours from the first phone call to put boots on the ground where needed.

Back in Petaluma, I waited and the RCC waited hours upon hours for communication from the Texas group. We waited! What was happening? We needed feedback.

At this point, the RCC suggested that maybe the Texas team had problems. They suggested going to the CIA for risk assessment for problems that might be inherent to the area. A CIA officer told us that the area was filled with bandits and factions, and that our Texas group might have been attacked, or worse.

With no feedback we decided that as a precaution, a second team should be sent. All agreed that was prudent.

Using the NCRC regional inventory, which we had developed prior to this incident, it was determined that the next appropriate resource to send in was the sheriff’s professional search and rescue unit, out of Tucson Arizona, which included a number of good Arizona cavers. We contacted them and requested they assist. They agreed, and an emergency meeting with the county supervisors was held on the phone with us in order to get the county group out of not only Arizona but into Mexico.

Again, the NCRC functioned as an overhead advisory, not an operational unit. It went just as planned: we advised and supervised, based on experience.

Within an hour, the sheriff’s department in Arizona had dispatched its best SAR team and equipment. They were told, just like in Texas, to respond to the nearest Air Force base, Davis Montham.

While they were responding, the Air Force command then alerted a C141 Starlifter jet to land at the air base, dump his cargo on the ramp, and pick up a “high priority mission.”

The sheriff’s SAR team was quickly loaded into the jet transport and sent to San
Antonio at 550 mph.

On arrival, the Tucson team met up with a local Texan caver who knew the area. All were loaded onto a ready C130 needed for remote landings and headed off. After 24 hours, there still was no word from the Texas group, and, the tension was high.

What was happening: problems, bandits, or worse? This second response was deemed a necessary and standard emergency tactic in such situations when you lack contact or communications with an operational unit.

Since communications was deemed incident mission critical, another C130 was sent to orbit the site to serve as a communications relay platform for the duration of the incident. A C130 tanker also was made ready so that the communications aircraft could be refueled in flight and remain on station for long periods.

There were now three or maybe four US military aircraft cruising into Mexico needing top Mexican governmental approval. The US State Department now stepped up to assist with the air force's mission. They established radio contact with the US Secretary of State, Alexander Haig, to get permission for the extended mission.

The Air Force RCC was not just sitting idle all this time. They wanted to be proactive in case they need to supply more help. On their own accord, they used the NCRC list of US resources and determined that if things were to escalate then they wanted to be prepared. They felt we would probably contact the Virginia Cave Rescue Network out of Charlottesville next. So, they dispatched another C141 Starlifter to the Charlottesville airport to stand by for orders.

Folks in Charlottesville were all in a state of wonder as a huge C141 suddenly appeared, landed, and parked with the crew sitting there awaiting orders. The NCRC inventory was working better than we ever hoped.

When the Tucson SAR group arrived in Mexico, they established radio contact with the Air Force RCC confirming their arrival and quickly went to the cave. There, the Arizona team met the Texas cavers, who were just coming out. The Texas team wondered what was happening, and it was explained that, without communication, it was proper strategy to send in support units to see what the problem was. All this was radioed back to the US, confirming that all was good.

The Texas group had never considered that they needed to give real time feedback. Everyone was safe and the caver victim was flown to San Antonio for medical care. Everyone involved returned home and the incident was declared closed.

I was returned use of my phone and went to work at the fire department the next day. All was good. Most amusing was that neither the Texas cavers nor the victim ever said thanks or acknowledged the massive combined efforts on their behalf.

All concerned were both pleased and impressed how so many different resources were able to be mobilized in such a short time and, with the exception of communications, how well everyone worked together, swiftly, and efficiently, just like it was planned to run.

As I mentioned, the operation involved the use of three C130 aircraft, two C141 Starlifters, the CIA, the US Secretary of State, the Tucson Arizona Sheriff’s Department, the Association for Mexican Cave Studies, the Mexican Defense Minister, the Air Force RCC, and me. Over 150 different people, many of them cavers, came to help. All this was enabled by the structure organization, planning, and inventory of the NCRC that I had established and created.

The most remarkable thing of all was that there was no media coverage. There was no “Caver risks death in Mexican death cave” story, no television reports, and no newspaper headlines.

Everyone involved did his job and did not seek recognition, other than the personal satisfaction of doing a good team operation.

Initiation to Caving

*text and photos by Julie Helbling, NSS #66694*

Neither would I consider myself an expert nor a very experienced caver. I have, however, survived a few years of most wonderful underground activities and would like to share with you my story of initiation to the amazing world of caverns.

English is not my mother tongue, and my native language in caving is Spanish. I apologize if some of the technical terms used are not precise or incorrect.

I live on Mallorca, a Spanish island in the western Mediterranean Sea. Most of our rock is limestone, and to date more than 4500 caves have been discovered. While the majority are rather insignificant, some range from pretty to stunning to important. My house sits on top of the aquifers which are feeding Sa Cova des Pas de Vallgornera, and I still hope that my cave-sniffing dog will one day find a back door to its numerous miles of precious galleries.

More than a decade ago, a friend showed me a local cave, a huge dome, easily accessible through a manmade tunnel and with daylight shining through the natural cave entrance 170 feet above. Her intention was to find out if I liked it, and when she saw how I was immediately drawn to this new environment, she asked if I wanted to participate in a one day trip to one of the bigger caves on the island. What a question! Of course!

My friend took it upon herself to show me the use of basic caving equipment: harness, descender eight, cowstails, and jumar with a foot sling. She lent me a helmet and I bought a headlamp, which promised to illuminate up to five feet of my surroundings. We went with a group from our work environment, a typical “I know somebody who knows somebody who knows somebody who knows about caves” expedition. In hindsight, I am very grateful that they took me along and showed me a whole new world. I feel, however, that this form of initiation, probably the most common one, involves some avoidable risks.

We set off with a group of seven, the leaders being inexperienced at best, and, looking back, my even more inexperienced friend being the most professional member of the team. Back then, I was in the very comfortable situation of having no clue of what was going on and, to make things even more relaxing, hardly any knowledge of the Spanish language. We entered the cave and rappelled down 100 feet of steep ramp to the first chamber. We then crossed an enormous hall on a downhill trail until we reached the second rappel. There our rope was tied to a rock formation and off went the first caver. Halfway down, he was surprised to find himself without enough rope. He yelled to us to send down more rope, and the group obliged. Once the rope slackened, I was sent down. I rappelled happily until, on an almost vertical stretch and a few feet below a comfortable balcony, I hit the inevitable knot where the two ropes had been united. Please remember, I was equipped with a Figure eight and a jumar, and this was not my first rappel underground but my second. Lacking any alternatives, I stopped and put in some thinking. I engaged the jumar and passed the eight to the lower part of the rope. I had no idea how to lock an eight, and in the absence of a sling in the rope to hook into with the cowstail, I was now, of course, dangling from the jumar. It took a little bit of creativity to release the jumar without entering an uncontrolled descent. The situation later on led to a shouting match between my friend...
and the colleague who had installed the rope. Back then, I didn’t understand why she was so angry. Nowadays, I do see some more deficiencies apart from uniting two ropes in an inadequate manner and place, and sending down a complete beginner without proper briefing. The rope was one that had had a former life tying down animal crates in aircraft bellies. I found a similar rope at the local hardware store with a breaking load of 200 pounds. The rope was tied to only one anchor point, there were no rebelays or deviations to avoid rub points, nobody in the group had ever heard of a rack or other descender suitable for caving, although one had a Petzl Stop. A chest roller or Croll was unknown or, as I later learned, unpopular among some of the team members. Hardly anybody had a backup light. But, in general, we were motivated and in high spirits.

We climbed down a muddy ramp, crawled through a very muddy tight spot, descended an even muddier ramp, rappelled another 100 feet or so and arrived at the most magnificent water-filled basin at some 600+ feet below the entrance.

The ascent worked surprisingly smooth, and when we exited the cave, I was clearly infected with the cave virus.

Shortly afterwards, I teamed up with a supposedly professional caving partner, who was offering guided tours to the island’s caverns. He had taken an entirely different approach to caving: He read books and had the incredible mental ability to remember most details. He then put into action what he had read. Had he received feedback from an experienced caver, this would have been an efficient way of learning. Unfortunately, nobody was there to correct minor mistakes like incorrect knots or inadequate procedures. Instead, his knowledge was passed on to me, and I very happily applied what I had been shown. It was many months before I started caving with other professional cavers, and with mutual astonishment we recognized the difference in very basic caving practices. This was when I finally learned how to lock a descender, how to make a correct Y-anchor, and started thinking about some basic backup procedures and self-rescue techniques.

During the first years of caving I did see some mishaps, the closest call being the use of a rope installed in parallel with the primary rope, with the intention of helping a fellow caver who had entangled himself on ascent. I was about to step off the edge and rappel down to him when he was able to untangle himself. I unclipped from the rope, continued my ascent on the primary rope, and found the secondary rope slung through the anchor point without being tied. The team member who had put it there later justified his dubious installation by “I didn’t expect that anybody would really use it”.

An anchor point jumped at us because the spit had been introduced without its corresponding cone. A convincing reason for at least two anchor points at a pitch head or critical rebelays!

I learned that the D-ring on the harness needs to be checked at regular intervals as otherwise a caver’s hair tends to turn grey instantly when the screw is found open while descending an 800-foot pitch. A self-locking carabiner is a quick and comparably inexpensive fix for the lazy or forgetful among us (such as myself).

Speaking about hair. I learned the hard way that long hair had better stay out of the way while rappelling. This learning experience was documented by a change from long to short hair, so that the remaining hair would match the length of the part which had been devoured by a hungry Petzl Stop.

We also learned that there is a reason to carry rope in a dedicated cave pack during descent and that it is inadvisable to let 500 feet of brand new rope dangle in a pitch while removing rocks near its top end. It is just as inadvisable to do the same thing with any other length of rope of any age, but losing this one was particularly painful.

Another situation I got myself into unexpectedly and unprepared for was foul air. Having struggled with some respiratory issues during my youth, I am quite aware of my body’s reaction to physical activity and recognize an unusual breathing pattern. My work requires a basic understanding of simple physiological processes. In a 350-foot
La Sima, Cantabria, Spain

once disturbed, the carbon dioxide-laden air tends to ascend while only very gradually mixing with the more breathable air above. This implies that an ascending caver, once having disturbed a pocket of contaminated air, will have to pursue a physically demanding activity while breathing foul air. In this particular case, the carbon dioxide rose some 170 feet with us before its level dropped notably.

Since we had the gauge, we went looking for foul air and found carbon dioxide in a considerable number of caves, some of them easily accessible even to non-cavers and displaying levels in excess of 7%. A very old friend of mine had done his first research on foul air over 30 years ago, and it was impressive to see how the concentrations vary—or don’t vary—over the seasons, but generally have increased over the last few decades. This is a wide field to still be explored.

I consider myself very lucky to have been introduced to the magical world underground and I am grateful to all the people who went through the trouble of showing me things. Although their levels of experience and knowledge were quite diverse, their intentions were always the best. At some point, I left the wide and comfortable area of unconscious incompetence and ascended to the less comfortable level of conscious incompetence. This allowed me to select my teachers wisely, adjust my learning techniques and refine my skills to reach what I consider a safe level—and still keep learning something new on every single trip. I enjoy introducing new cavers to spelunking and work part time for an adventure company which offers guided tours and technical courses in different areas of the outdoors. We are in the process of developing a concept which allows a new caver to learn and enjoy spelunking in a challenging but safe environment. Having so many freely accessible (I will skip the complex set of local regulations regarding adventure activities) caves at our doorstep is wonderful, but it comes with the inherent risk of spelunking being underestimated when it comes to equipment, technical skills, physical preparation, standard, backup and safety procedures, knowledge, preparation...

Our local caving federation as well as a number of dedicated companies are nowadays offering a guided learning experience in a somewhat more controlled environment. The risks have shifted. While the newbie would formerly depend on “someone who knows about caves” to lead the way to a hidden cave entrance, this task can nowadays be mastered by researching the internet to find the coordinates and feeding them into a GPS. The internet offers loads of useful information, but also provides access to inexpensive caving gear from retail sellers based in remote parts of the eastern hemisphere. This gear may or may not lack official certification. Orthographic errors in the inscription stamp of safety relevant equipment may generally be regarded as a warning sign of an improperly made knock off of a product you’d normally trust (i.e., mispellings, improper characters). Chinese headlamps have, on the other hand, caused a revolution in cave illumination and cave photography. Carbide residues and soot in protected environments are distant memories while thousands of lumens allows us to appreciate great domes above as well as abysses below—the latter being a scary view for those who recently upgraded from a match-like headlamp to a Chinese flashlight.

I am quite optimistic that we will master the challenging change from spelunking being a niche only pursued by a few highly specialized “weirdos” to being a widely appreciated pastime at various levels of difficulty. Hopefully this change will go hand in hand with new cavers developing an understanding of required knowledge, skills, material and preparation from their first cave trip on as well as a growing respect for the magic world underground.
I hope that everyone enjoyed the NSS Virtual Convention and that we’ll be able to meet in person at the 2022 NSS Convention in South Dakota. A special thanks to Matt Bowers, Pat Kambesis and the rest of their staff for all their hard work on the 2021 convention.

Caving and climate change
As I write the column, I have just returned from the Pacific Northwest while it was experiencing record setting temperatures. It was over 100 degrees when I left Seattle and only 80 degrees in San Antonio when I landed. Crazy that you have to go to south central Texas to escape the summer heat in the northwest. Climate change is driving the increasing frequency of extreme weather events. Carbon dioxide, from the burning of fossil fuels is storing more heat in the atmosphere and driving up temperatures and climate change. Polar ice and alpine glaciers are retreating; oceans are becoming more acidic and are rising because of thermal expansion and melting ice; and we have more record high temperatures than record lows, which implies warming across the planet. Many animals, insect pests and associated diseases, are expanding their range. Humans now move more soil and rock than natural processes.

We are now in the sixth great extinction event in the geologic record. Geologists are proposing the creation of a new geologic epoch called the Anthropocene because of the impacts humans are having on the planet. For supporting information on climate change, I would recommend you read the International Panel on Climate Change reports at https://www.ipcc.ch/reports/.

Most of our members are involved in and live conservation-oriented lifestyles. The NSS promotes the conservation of caves and karst but we should also reflect on our carbon footprint in our day-to-day lives. All of our decisions involve energy—from driving, to a caving trip, to turning on the faucet. Here are some basic thoughts on small changes we can make to improve the planet. I don’t think they will significantly impact our lifestyles but it will make, in some small way, for a smaller carbon footprint. A search of the Internet will reveal many hundreds of ways we can help protect the planet and the caves we love.

- Minimize your use of disposable plastics. For example, that drink container can be reused as a water bottle or even pee bottle—just don’t get them mixed up.
- Turn off your car rather than letting it idle at stop lights or while waiting for people.
- Don’t waste water at home. Water requires the use of large pumps which are energy intensive.
- When looking at a new vehicle, consider its mpg rating or getting an electric or hybrid vehicle. I think that we will soon have electric cars with the range and size we will find suitable for caving trips.
- Host hybrid meetings, both zoom and in-person.
- Do we really need to have giant bonfires at some of our caving events?
- Plant more trees, collect rainwater for your garden, repurpose and recycle.
- Think globally and act locally.

Retiring the Headquarters Mortgage
Please be aware of the push to retire the NSS Headquarters mortgage by December and help out if you can. We have been working on generating matching funds to help with the effort. Stay tuned on social media and the NSS webpage to be up on our progress. At the end of August, we will owe approximately $41,000.

We have received a very generous pledge from longtime NSS member Roswell Jones (4822CL, OS, FE, CM). Roswell has agreed to match donations up to $20,000 to retire the Headquarters mortgage. With Roswell’s pledge and other donations, we are well on our way to meeting our goal of $45,000 to retire the mortgage. Any additional funds we raise will go toward improving and maintaining the Headquarters. Please call the NSS office at 256-852-1300 or visit our website at www.caves.org to donate today.

The Vertical Caver Training Ad Hoc Committee
In April, I created an ad hoc Vertical Training Committee to address consistency in training and techniques on a national level. The committee has been meeting every two weeks and hopes to have a recommendation to the NSS Board in the near future.

Special thanks to The North Face
Adam Weaver and Peter Johnson made a presentation to The North Face athletes about cave conservation and ethics for cave aid climbing and TNF has agreed to be a Diamond Level sponsor at the 2022 NSS Convention in support of Conservation Tuesday.

Special Thanks for Karst Waters Institute and Southwest Geophysical Consulting, LLC.
The American Geophysical Institute’s (AGI) Earth Science Week will be held the second week in October this year. AGI has prepared an Earth Science Week packet and 50 copies will be sent to the NSS as a member organization. The Karst Waters Institute (KWI) has also donated their 50 packets to the NSS and Dave Decker, owner of Southwest Geophysical Consulting, LLC (SWGC) has donated $500 to help defray shipping costs for the packets. Thank you to KWI and SWGC for your donation.

Membership Trends
NSS Membership increased by 61 during the month of June with a total of 7,586 members with 71,100 being the highest NSS number issued. Membership appears to have stabilized and is now increasing. Since December 31, 2020, we have gained a total of 383 members. See graph below:
The Carbide Dump
Blue Ridge Grotto
June 2021, Vol. 56, Number 6
Nick Socky, Alex Faunce, Silas Springer and Paul Walko returned to the Yeet Canyon lead in the Maxwelton portion of the Great Savannah Cave System. Completing two short aid climbs up consecutive 10-foot-tall waterfalls, the group of cavers found themselves in virgin canyon passage. Extending 10 to 20 feet high in places, the new passage is mostly walking dimensions. Over 700 feet was added to the survey books with five promising leads still to explore.

The Speleograph
The Oregon Grotto
Spring 2021, Issue 431
Claude Koch is working hard on the Picking Cave System, with several project-digs involving known sections of the cave or nearby surface features. Garry Petrie and Ahrlin Bauman have been working with Claude to correct prior survey errors and generate a more accurate relationship between Pickings and the nearby Chubby Bunny Cave. A potential connection between the two systems would create the largest lava tube system in the continental United States at nearly 3 miles long.

Ahrlin Bauman and Calvin Sanders worked with several other cavers in late 2020 and early 2021 to document The Hole Punch System, a series of lava features that are clustered together. The total length of the system is 1,145 feet spaced across three different lava tubes and several tree wells and tree molds.

Steve Higham has documented and produced maps of several short talus caves in western Massachusetts and a fissure feature in Grafton County, New Hampshire.

Cave Crawlers Gazette
Central Arizona Grotto
July 2021, Vol. 63, Number 7
A group of 18 cavers spent the weekend project caving at Earth Cracks, a series of fissures with several closely related caves. Across four different caves a total of 1,115 feet was mapped. Teams also spent a day digging in Choke Cave, attempting to connect it into Buffalo Cracks. Despite survey data showing the two caves are quite close, not even a voice connection was made. Apache Death Cave, at 447 feet long, was the largest cave surveyed during the weekend. It sits on land recently purchased by a developer and may influence future construction plans for the property.

The Northeastern Caver
Northeast Regional Organization/ NSS
June 2021, Vol. 52, Number 2
John Dunham and friends descended upon Merlin’s Cave to check a high lead that has been looked over several times. Located on Northeastern Cave Conservancy property, the cave and surrounding property has been the site of several projects in the past. With insight from a recent dig nearby to Merlin’s Cave, cavers were hopeful this ceiling fissure feature may be related to a trend line found in the adjacent cave project. While John was able to access the lead without damaging surrounding features or hitting any problem rock, he was disappointed to find the lead had no air and was less than six inches wide.

John Dunham, Jacob Morris-Siegel, Ramon Armen and Larry Bernier took a project trip into Masshole Cave, stabilizing dangerous breakdown hanging near the entrance culvert, removing a boulder choke, and digging out the terminal stream passage. Masshole is now significantly safer and about 20 feet longer, with the dig terminating in a gravel plug. A new map of the Massachusetts cave is expected to be published shortly.

Dale Chase
NSS 7321

Dale Chase died unexpectedly on May 3, 2021 at age 75 from a heart attack. He was in his home on Hornby Island, British Columbia, Canada.

Dale grew up in southern Indiana—good cave country. In his book, Journey To The Center Of The Earth, Dale wrote:

When I started this Journey To The Center Of The Earth in Shiloh Cave in 1959, I realized what was really important in life: going into caves and discovering new caves and passages, and I was right.

It’s been great to go over all this again and relive the process, the best and worst—especially the best. I’m 71 now, as I’ve mentioned before, and I have to tell you, getting old sucks. How did this happen to ME? It’s not for wussies or the faint of heart. As Pogo put it...”From here on down it’s uphill all the way”. Seems like the only thing worse is the alternative.

One of the things I regret the most is that I didn’t make more effort sooner to get in touch with the caving community on Vancouver Island.

When I first entered Shiloh Cave all those years ago I had no idea of how far that first adventure would take me. I just knew that I wanted to go wherever it led. Over the years I have made many caving friends and have, unfortunately, lost a few of them as well. My love of caving has allowed me to explore different countries and cultures. I would not trade the laughter, sweat, and tears that I have experienced for anything else. Not everyone has been blessed to see or discover the amazing things that are underground and I count myself lucky to be one of those who has. Caving has been a lifelong adventure that excites me to this day. I loved caves when I was young and in a way I’m still on the journey I started at age 13.

After their first cave adventure in Shiloh cave, Dale and his brother Dan lost no time finding other caves and cavers. The years from 1959 thru 1963 included a lot of local Indiana caving, finding new caves, mapping many, and many out-of-state trips. Almost all of the new discoveries and maps were published in the Lucifugus Letter, which was the newsletter of the caving group called Geo-Lucifugus formed during that time. The most memorable out-of-state trip up to that time was to Schoolhouse Cave in West Virginia in 1963 in Steve Brandlein’s old 1939 Chevy, with Steve, Jim Richards, and Dale and Dan Chase. Dale and friends explored numerous horizontal and vertical caves in Tennessee, Alabama, Georgia, Kentucky, Missouri, West Virginia and, of course, Indiana.

The years 1963 through 1968 focused
on the Blue Spring Cave project in Lawrence County, Indiana, in which Dale was a major contributor with many surveying trips with Art and Peggy Palmer and others. He was in on making many of the new discoveries. It was thrilling to read in the NSS News, January 1969, that Blue Spring Cave was declared the sixth longest cave mapped in the world at 18.9 miles. Part of the cave has been a successful tour business for 40 years, managed by one of the original Geo-Lucifugus explorers, and a long time friend, Jim Richards.

December 1964 was the first of many trips to Mexico to explore deep pit caves, mostly those first visited by Texas cavers. Among the most memorable was Ventana Jabali, a 503-foot drop from a skylight in a cave with a large walk-in horizontal entrance visible from miles away. It was at that time the deepest known free fall rappel in a cave in North America. Another very memorable one was Sotano de Tlamaya, a multi-drop pit cave over 1200 feet deep.

In 1968, Dale moved to Toronto, Ontario, Canada. He married caver Ava Darlene Mullen, another longtime friend from Indiana University in Bloomington, Indiana. Dale lived in Toronto for several years, where he made a good living doing tree work. It was fun doing the rope work in tree jobs, but there was not much caving done in that area then. Dale and Darlene enjoyed canoeing the rivers and the old fur trade routes in Ontario.

In the late 1970s Dale got the chance to move to the west coast and jumped on it. Plenty of tree work to do there. He spent a few years getting established on Hornby Island, BC, in the Straight of Georgia, between the Mainland and Vancouver Island. He raised his son, Darian Chase, there, and enjoyed time with his grandson, Oliver. They now live on Vancouver Island in the town of Courtenay, British Columbia, Canada.

In 1987 the urge to get back into caving finally took hold again, and it was his passion going forward. Thirty-four years of cave discoveries, survey trips, digs, pushing leads, and assisting with rescues and training followed with the Vancouver Island Cave Exploration Group (VICEG), and the British Columbia Speleological Federation (BCSF).

Dale chronicled most of his noteworthy caving adventures in a book titled Journey To The Center Of The Earth, available in both the e version and paperback from Blurb.com.

For those who would like to hear Dale telling and reading some of his caving adventures, along with a dose of Dale humor, a podcast called Remembering Dale Chase is available at The Caving Podcast: https://cavingpodcast.podomatic.com/

Dan Chase
NSS 7746

PINE MOUNTAIN GROTTO

This beautiful grotto patch has just been produced by the Pine Mountain Grotto. This grotto, based in Pineville, KY, officially became the 380th NSS affiliated grotto back in 1993.

Kenneth Story, an active NSS member, designed the nice 11-color patch based on a photo he took in Jolly Saltpetre Pit. The grotto motto is also shown on the bottom of the patch.

The patch measures 4 by 2.75 inches wide. A total of 100 patches were made thru Kelley Williams of A B Emblem, which is based in Weaverville, North Carolina. Thor Bahman is the grotto chairman, and Melinda Rice is handling them. The Pine Mountain Grotto is now the 189th different NSS affiliated grotto which has produced a patch.

Gary K. Soule, Archivist

PINE MOUNTAIN GROTTO KENTUCKY

PROTECT SURVEY EXPLORE

Caution: The patch measures 4 by 2.75 inches wide. A total of 100 patches were made thru Kelley Williams of A B Emblem, which is based in Weaverville, North Carolina. Thor Bahman is the grotto chairman, and Melinda Rice is handling them. The Pine Mountain Grotto is now the 189th different NSS affiliated grotto which has produced a patch.

Mexican cenotes such as “Garden of Eden” are not only tourist attractions but may help offset global warming.

Cenotes are vaults of stored carbon

According to an article in Biology Letters, summarized in Science, May 7, 2021 edition, the cenotes in Mexico’s Yucatan Peninsula are major carbon storage reservoirs. Levels in cenotes near the city of Tulum were studied and found to contain carbon stored for over 3000 years. The carbon is taken up by mangroves on the edges of the cenotes and stored as peat.

World’s Earliest Home: A cave

Wonderwerk Cave in South Africa appears to be the earliest confirmed site inhabited by our ancestors two million years ago based on dating of sediments in the cave. Dating was accomplished using magneto-stratigraphy, which examines magnetic reversals. This corroborated earlier, controversial findings based on cosmogenic dating in 2008. Stone tools found in the cave dated 1.8 million years ago. Read it at https://news.artnet.com/art-world/wonderwerk-cave-worlds-oldest-home-1961900

Neanderthal Art Unearthed

A carved bone fragment found in Unicorn Cave, Germany in 2019 may be the earliest known example of art by Neanderthals. It was radiocarbon dated to 51,000 years old. The symbolic carving represents the first piece of evidence that they were capable of “conceptual imagination” according to the researchers. Read it at https://news.artnet.com/art-world/neanderthal-art-sirovery-1986242

Cave Sediments provide Neanderthal DNA

A collaborative study compared DNA samples taken from cave sediments versus skeletal remains of Pleistocene hominids and found consistency between the two. It focused on caves in Spain and Siberia known to have been occupied by Neanderthals. This work will allow genetic analyses from a host of sites where it wasn’t considered feasible.

Source: Science, May 7, 2021
Items sent by Rick Banning and Walter Lipton
The James Cave Project is the brainchild of Glen Merrill, the project’s leader for over 50 years. Glen’s biography, which fills the second chapter, explains Glen’s passion for discovering and surveying the full extent of two well-known caves in Bald Knob: James Cave and Coach Cave.

Catherine Bishop’s book, "The James Cave Project: Sixty Years Inside Bald Knob," is a trove of information about a region of karst in west-central Kentucky known as Bald Knob. The book follows the James Cave Project from its inception in 1959 to 2020 as the “James Cavers” push promising leads and comb the hills for new caves. Although much of the book documents caving expeditions and exploits, equal attention is devoted to the region’s history, unique geology, folklore, and the James Cave Project’s efforts to preserve the caves and their endangered bat populations.

The book is not just about exploring caves, however. We learn of prehistoric visitors that mined gypsum and buried their dead in the caves, early modern explorers in 1859, salt peter mining and Civil War graffiti, beginnings of systematic exploration that began in the 1940s, commercialization of two caves followed by post-commercialization restoration, and White Nose Syndrome that threatens the bat populations.

In 1959 the James Cave Project was in its infancy, and the total known length of the James and Coach caves was little more than two miles. As of 2020, and with the addition of Jackpot Cave, discovered in 1994, the James Cavers have mapped more than 18 miles of passages, and the James Cave Project has formally partnered with The Nature Conservancy and the U.S. Fish and Wildlife Service to protect the caves and the bat habitat in perpetuity.

Nothing about Bald Knob and its caves seems to have escaped consideration in "The James Cave Project: Sixty Years Inside Bald Knob" as it describes a caving project that originated in the 1940s and is still ongoing. It tells of exploration, discovery, climbing, surveying, geology, hydrology, anthropology, conservation, and local history. The book is based on solid research gathered from NSS archives, personal interviews, firsthand experience, and Glen Merrill’s original maps, survey notes, and logbooks from 1959 to 1976.

The numerous cave trips are documented with so much detail that the reader will likely skim these sections or skip them entirely on the first reading. Readers can peruse the book, cherry-pick sections that grab their attention, and then revisit those parts they skimmed, all without losing the thread. They won’t want to miss the informative personal accounts as told by the James Cavers, scientific and historical discoveries, and Uncle Charlie’s tales about the outlaw gangs: the James-Younger Gang and the Jollie Boys.

Bill Koehler

Comments From Other Readers
(Collected by Catherine Bishop)

"This is a great telling of the James Cave Project and a great statement to all your hard work in assembling all of this information."

"I loved the way you structured the book between the technical and the non-technical stories to keep your readers interested."

"Thanks for this fine demonstration of what dedicated cavers can accomplish to enrich their lives and tell the rest of us why we go underground."

"Read the intro and got claustrophobic."

"You have done a great job in explaining what happened behind the scenes in the development of James Cave."

"I love the way you alternated the timeline with chapters that focused on specific topics: history, Steve’s making of a project caver, folklore, equipment, management, bats and so much more. I am about to read the accidents and incidents with trepid anticipation."

LETTTERS

Correction Overdue

Back in October 2020, our Convention wrapup article published a list of 28 members who had been NSS members for 60 years. Unfortunately the list omitted Dave Brison, NSS 5255F. Dave lives in France and gets his issue later, and let me know of this in January. Somehow I misplaced his note but am now noting this important oversight.

Dave hasn’t dropped off the caving map. He maintains a website—http://caveinspiredmusic.com/—which is an annotated international listing of commercially recorded cave and bat-inspired music and spoken word. NSS members who have contributed caving ballads are very visible on his site.

Dave Bunnell
But medicine made strides. Reports from the disastrous French retreat from Moscow in 1812 recorded soldier after soldier becoming uncoordinated, laying down by the side of the road to sleep, begging to be left alone, and never rising. What happened was obvious. Nobody seemed to know the "why." By 1885, however, the term “hypothermia” was entering general use among physicians even though most would say a victim died of cold.

While people for millennia survived and even thrived in the frigid Arctic, people died of cold in temperate and even tropical regions. They might fall into a stream or tumble off a boat into water that was colder than the ambient air temperature. Since synthetics were not yet invented, they soon died. The earliest known report of death by hypothermia comes from Herodotus in 494BC when a fleet of Persian ships fighting the Greeks in the sunny Mediterranean Sea sank. He wrote that many victims died “by reason of cold.”

Jaekl, whose doctorate is in cognitive neuroscience, takes the reader on an exploration of hypothermia that starts with the invention of an early thermometer called a thermoscope to the recent experiments done by Robert White (labeled “barbaric” in the press). White kept monkeys alive for extended periods by careful application of hypothermia. Cleveland Grotto members will recall stories about his monkeys undergoing head transplants at a Case-Western Reserve lab in their city.

Yet hypothermia is not all bad. Induced hypothermia in the range of 90-93 F degrees has proved efficacious in treatment of cardiac arrest and gunshot victims by slowing metabolism and giving surgeons more time to work. Jaekl covers much ground. He looks at the early use of medically induced hypothermia to treat mental and physical illnesses… treatment that often led to the death of the patient. He spends time, some of it bizarre, on cryonics. He touches on why bats, among other mammals, can drop body temperature at will without ill effect while humans can’t. He touches on inducing hypothermia for space travel: A sleepy Mars trip would be easier on the astronauts and require a lighter food payload. There is a long way to go before clinical guidelines for therapeutic hypothermia are firmly established, he states. “We still have more questions than answers.”

One thing remains certain: it is vital to stay warm and dry in hostile environments and to watch companions’ actions if your group is in tough conditions. The book is an easy, interesting, sometimes whacky but still important read…filled with cold facts.

Curt Harler