



RMC

ROCKY MOUNTAIN CAVING

JUNE, 2021

**Commercial Caves of the Northern Rockies
The Wellpad Gully Caves on Shale Ridge
Mega-Patterns in Southwestern Karst
Historic Cave of the Winds Surveys
Obituary: Two Lives That Mattered**

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FRONT COVER

Rob McFarland's shot of Kenny Headrick looking up to the climbout in Well Pad Gully Cave. See the story beginning on page 11.

BACK COVER

Kenny Headrick's beautifully-framed photo of Tracy White looking out the entrance of Indian Cave.

Colorado Cave Rescue Phone Numbers:

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- **Colorado Search and Rescue Board 24 Hour Hotline (ask for SAR Coordinator):** 303-279-8855.
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EDITOR'S NOTES

Just when it looked safe to go out, **bam:** the 'delta variant'. I swear it's like the universe is just being mean, now.

Sad news this issue with the passing of Bill Yett and Al Collier. People tell me it's the "circle of life," but that sure doesn't make it any easier to accept. Be sure to cherish those you love and/or respect. Tell them so before it's too late!

If you're doing anything caving-related, I hope you'll write it up so we can get the word out. The *RMC's* pages are here for news, notes, and even well-reasoned opinions (that are not simply pot-stirring).

I think we should try to get more people to enjoy this fine magazine. If you have any ideas on how to get wider circulation, please let me know.

Special article this issue from veteran caver and internationally-renowned book author William Halliday. Thanks to him!

Do you have a fantastic cave-related picture you'd like to share? *RMC* is always looking for gorgeous, sharp, interesting photos for the front and back covers.

Norm Thompson has volunteered to be a proofreader. Thanks to him for signing up!

A tip o' the hat this issue to Paul Burger for sharing maps and images on short notice.


Still looking for a business manager, mostly to process subscriptions and keep the mailing spreadsheet up to date. If you'd like to enter the exciting world of speleo-volunteerism, please let us know.

RK


RMC Business Manager

Rocky Mountain Caving magazine needs a volunteer to take over immediately as Business Manager who manages finances and subscriptions for *RMC*. Interested? Contact Richard Rhinehart at NSS@rockymountaincaving.com.

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Call for Publishable Material

Please submit your articles about exploration, science, research, gatherings, interviews, original poetry and music, people, notes and happenings, and anything else cave-related. We'll try to print everything of quality. Keep it this side of R-Rated and please have patience with editing/condensing.

Please don't hesitate to submit your best vertical and horizontal photographs, cartoons, art, etchings, and other graphics.

Deadlines

RMC is currently published quarterly in March, June, September, December. That means editing and typesetting *should* commence around the 15th of the previous month so the magazine is ready for distribution at Grotto meetings.

Rolling deadlines seemed like such a great idea but, alas, no joy. For your planning purposes, the deadlines for material to be included are: November 15, February 15, May 15, and August 15.

Renewals

Don't forget to renew your subscription if it's coming due! Just \$20/year for grotto delivery; \$25/year for first-class mail delivery; \$9.99/year for a digital subscription.

Credit card users can renew at <https://rockymountaincaving.com>. Others can mail check or money-order (payable to "Rocky Mountain Caving") to P. O. Box 101091; Denver, CO 80250-1091.

Back issues, when they are available, are \$5 + \$2 postage.

Commercial Caves of the Northern Rockies

by Ed LaRock

Ed started caving in 1969 and joined the NSS in 1972. He enjoys visiting wild and tour caves across the US. Past cave projects include mapping and science in Wind Cave, South Dakota and in Lechuguilla Cave, New Mexico.

The International Union of Speleology (UIS) has designated 2021 (recently extended to 2022) as the International Year of Caves and Karst. In the northern Rocky Mountain States, there are many commercial caves that offer guided tours for the general public – no caving gear needed.

These caves are worth supporting with a visit as the pandemic allows. Tour operations and requirements vary from cave to cave, so it is important to check in advance before you visit. This article lists the commercial cave tours in the northern Rocky Mountain States that I have visited over the years.

Cave of the Winds in Manitou Springs, Colorado

A long-time project cave of Colorado cavers since the 1980s, Cave of the Winds overlooks scenic Williams Canyon and has been offering guided tours since July of 1880!

Today, there are two tours for the general public. The Discovery Tour is an ideal tour for the entire family. Explore the electrically lit portion of Cave of the Winds on a 45- to 60-minute guided walking tour which includes speleothem-decorated rooms, one-half mile of concrete walkways, and 196 stairs.

The Lantern Tour explores, by can-

dlelight lanterns, the unimproved Manitou Grand Caverns section of the cave. It is a 90-minute guided tour through nearly a mile of cave with dark narrow tunnels, low passageways, uneven stairs, and rooms with muddy, original floors. The tour includes folklore and ghost stories. Children under age 8 are not allowed on this tour.

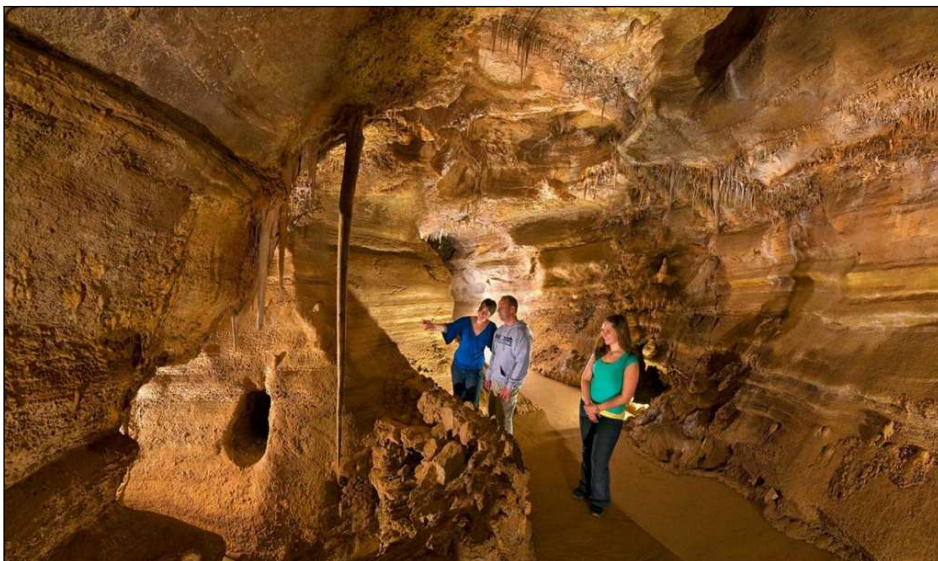
Glenwood Caverns/Fairy Cave in Glenwood Springs, Colorado

Glenwood Caverns hosted the Howdy Party for the 2011 National Speleological Society Convention and also offers two tours. The King's Row Tour journeys deep into Iron Mountain on a well-lit boardwalk with 120 stairs to one of the most highly decorated cave rooms in Colorado! The King's Row Tour lasts approximately 40 minutes and is suitable for families with small children.

The Historic Fairy Cave Tour is a 40-minute guided walking tour that is appropriate for most fitness levels. This tour leads you on a quarter-mile-long underground stroll through narrow, winding passages, and includes a stop at Exclamation Point: an outside viewing balcony with magnificent panoramas of Glenwood Springs and the surrounding mountains and river valleys.

Rushmore Cave near Keystone, South Dakota

Mary Jo Stark and I visited Rushmore Cave at the 1988 National Speleological Society Convention; it will be host-



Oriental Avenue in Cave of the Winds.

Courtesy of Cave of the Winds.



Reflection pools in Glenwood Caverns.

Courtesy of Fairy Cave.

the State of Montana and are open from May through September.

A 0.6-mile trail climbs about 250 feet from the visitor center to the upper entrance. A narrow, fissure passage slopes steeply down stairways and a flowstone slide. It has some low ceilings and is a lot like wild caving as you head toward the lower rooms of the cave.

The lower cave includes the Cathedral Room and also the Paradise Room with large, colorful, and active stalactites, stalagmites, and columns. The two different cave tours each run about 40 minutes.

Exit is via a man-made tunnel to another surface trail down to the visitor center. I believe the Park also offers a tour of just the lower rooms for those not wanting to traverse the upper entrance passage.

Minnetonka Cave near St. Charles, Idaho

Minnetonka Cave tours are operated by the Cache National Forest and are offered from around Memorial Day Weekend through Labor Day Weekend, depending on weather. Minnetonka Cave is near Bear Lake, a popular summer vacation area and tours fill up fast.

Mary Jo Stark and I visited en route to the 2016 National Speleological Society Convention and arrived early for the first

ing the Howdy Party for the 2022 National Speleological Society Convention.

The Scenic Walking Tour covers one-half mile with several staircases and takes about an hour. Tour highlights include the Floral Room with helictites on stalactites and The Big Room adorned with numerous stalactites, flowstone, and cave bacon.

Black Hills Caverns near Rapid City, South Dakota

I visited Black Hills Caverns – then called Diamond Crystal Cave – in 1982. The Adventure Tour is the complete tour of Black Hills Caverns. It usually takes about one hour, covers approximately 3/4 of a mile of passages and includes steep stairways to all three levels of the cave.

The Crystal Tour is an easy 1500-foot-long walking tour in the first level of the cave that takes one-half hour. Calcite Spar crystals and boxwork formations are seen on both tours.

Lewis and Clark Caverns State Park near Three Forks, Montana

I visited Lewis and Clark Caverns in 1981, and it is my personal favorite on this list. The cave tours are operated by



Ed LaRock and Mary Jo Stark at Minnetonka Cave.

Photograph by Mike Behn.



Photo courtesy Black Hills Caverns.

An enticing passage in Black Hills Caverns near Rapid City.

tour; by the time we exited the cave the parking lot was full. The cave is a cool 40°F and includes several tall rooms with stalagmites, stalactites, and long strips of cave bacon. The round-trip tour covers 3,600 feet with 896 stairs and lasts 90 minutes.

Other Commercial Caves

Other commercial caves in the northern Rocky Mountain States that I am

aware of but have not yet visited include Shoshone Ice Cave north of Twin Falls, Idaho and Wonderland Cave in the Black Hills near Nemo, South Dakota – they are on my list to do someday.

The northern Rocky Mountain States also have several cave tours operated by the National Park Service. I have been on the public tours in both Wind Cave National Park and Jewel Cave National Monument in the Black Hills of South Dakota;

in Timpanogos Cave National Monument near Salt Lake City, Utah; and in Lehman Caves at Great Basin National Park in eastern Nevada (the Grand Palace tour to see the parachute shield formations is my favorite here).

Craters of the Moon National Monument in eastern Idaho also has a few small, wild lava-tube caves.

All these National Park Service caves are a must-see. 🗺️



Photo courtesy Rushmore Cave.

A stairway into the big room at Rushmore Cave.

Two Lives that Mattered: Remembering Bill Yett and Alvin Collier

by Richard Rhinehart

Richard Rhinehart serves as the digital editor for Rocky Mountain Caving. The journal's founding editor, he began caving in 1973 and joined the National Speleological Society in 1974.



The Colorado caving community lost two influential cavers within only six days in June, 2021. On June 18, Alvin Collier of Bayfield passed at age 82, owing to complications of late-stage Lewy Body Dementia. Just six days later, on June 24, William Yett of Delta passed at age 83 from cancer.

These two men were leaders in Colorado caving for more than three decades. They both excelled in exploration and in conservation and the protection of caves throughout the state and in the Rocky Mountain Region.

Bill Yett

Bill joined the Colorado Grotto in the mid-1960s after members found his lost wallet in Fulford Cave and returned it to him, with an invitation to become a part of the Colorado caving community. Perhaps owing to this kindness, Bill always took the time to welcome and help new members of the grotto.

He is recognized as the founder of the National Speleological Society's Colorado Cave Survey. Organized in 1969 specifically to manage access to Colorado's longest known cave, Groaning Cave on the White River Plateau, the Survey in its early years also maintained Colorado's files on known caves and surveys. The Colorado Grotto donated its cave files to the Survey, and several cavers have provided data and materials in the decades since. For much of the early to mid-1970s, Bill was the keeper of the combination to the lock on the entrance gate to Groaning Cave – if you wanted to lead a trip to the cave, you talked to Bill first.

In July 1974, when the Colorado Grotto found itself without a meeting space, Bill reached out to his church, the Friends Meeting House, near the University of Denver, to see if the grotto could make the facility their home. The church leadership agreed to the monthly meetings, and the grotto met at that location for more than three decades. For several of these years, Bill served as grotto chair.

In 1989, Bill agreed to serve as one of the initial directors of the Williams Canyon Project of the National Speleological Society. Active in conservation in the Cave of the Winds and other

canyon caves, Bill helped with the organization of the project. In his conservation activities, he designed, built, and installed the environmental gate at the entrance to the Cave of the Winds' Whale's Belly in December 1985. This innovative gate uses an old tire with an innertube and a plastic cork to maintain the high humidity of the Whale's Belly and adjacent Silent Splendor.

In cooperation with the National Park Service, the Colorado Grotto in 1990 created the Wind Cave Weekend Survey Project. Bill Yett was instrumental in the creation of this new survey project, resuming efforts by the organization that began in the 1960s. Bill directed the every-second-Saturday project before passing leadership on to Rich Wolfert.

With Pat Jablonsky, Bill also became involved in caving in Carlsbad Caverns National Park. They created the annual lint camps at Carlsbad Cavern that included cavers from across the



Bill Yett admires his gate in the Cave of the Winds' Whale's Belly.

Photograph by Gary Hall.



Photo from archives.

Al Collier ca. 2000.

country. Participants in the camp removed prodigious amounts of lint and trash from along the cave's commercial trail, one of the first large-scale restoration and ongoing maintenance efforts in a National Park Service managed cave.

Bill and Pat decided to move from Denver to Carlsbad, New Mexico. Later, they moved back to Colorado, retiring in the small community of Delta in western Colorado. They remained active in caving through these relocations. Bill visited and explored the White River Plateau until 2020.

Al Collier

Al Collier joined the Colorado Grotto in the early 1970s, after contacting the organization for access to Groaning Cave. A veteran of the United States Navy who served on the U.S.S. Midway aircraft carrier, he lived in Littleton for 37 years with his wife and family.

An employee of the Rio Grande Railroad since 1959, and subsequently the Union Pacific Railroad, Al retired in 1998 after 39 years of service. He and his wife moved to Olathe in 2004 and then on to Vallecito Lake, north of Bayfield, in 2017.

Although Al is best remembered today for his efforts in cave conservation and formation restoration, in the 1970s, he was considered one of Colorado's strongest cavers. In a 1974 trip to Spring Cave near Meeker, Al snorkeled in the water at

Sump 1, recognizing there was additional passage to be discovered upstream. He encouraged Jerry Hassemmer and Tom Taylor to join him in learning SCUBA, taking open water certification classes at a Denver dive shop.

In 1975, a large group of cavers entered Spring Cave to assist Al and Jerry in diving the sump. Though this trip was unsuccessful in pushing to a small air bell partway through the water-filled passageway, the following expedition continued beyond another air bell originally entered by members of the Colorado School of Mines Student Grotto in a 1963 diving attempt.

Finding the route beyond the air bell, Al and Tom were the first to see about 400 feet of large canyon passage extending beyond the inner shore of Sump 1. Owing to equipment limitations, the two reluctantly turned back. The addition of Norm Pace in an early August 1976 expedition revealed the full extent of this passage, some 2,700 feet, ending in Sump 2.

Active outside Colorado, Al traveled to Mexico for caving in the late 1970s, visiting caves such as the famous Sotano de las Golondrinas.

Participating in trips to caves of Williams Canyon at Manitou Springs in the 1980s, Al could see many of the passages were damaged through years of visitation. With Walt Rubeck and Tom Dotter, Al worked to see the caves were protected from additional damage. Conservation was important to the project leadership and to the owners of the Cave of the Winds, and the three undertook many projects in restoration and repair.

As the project's Conservation Chair, Al developed innovative techniques to repair damaged stalactites and speleothems using glue. He also created devices to hold the pieces together while the glue dried. He undertook repairs not only in the Cave of the Winds, but also in Breezeway Cave. The latter was discovered in 1993, but by the end of the decade was already showing signs of accidental damage through carelessness.

In western Colorado, Al undertook a number of restoration

projects within the former Fairy Cave, commercially developed in 1998-1999 by Steve and Jeanne Beckley as Glenwood Caverns. In addition, he worked with Colorado cavers in repairing broken speleothems in Groaning Cave.

Although Al scheduled week-long trips to the White River Plateau for cave restoration in the early 2000s, these visits became less frequent as the years passed. In his final years, Al took disabled and able-bodied veterans on fishing excursions on the waters of Vallecito and Ridgway Reservoirs, using his fishing boat named *Freedom*.

Bill Yett, NSS 3604, was honored for his many contributions as a Fellow of the Society in 1987. Al Collier, NSS 14546, was honored in 2001. They will be greatly missed by their friends and colleagues, but their legacy in caving continues. 🐾

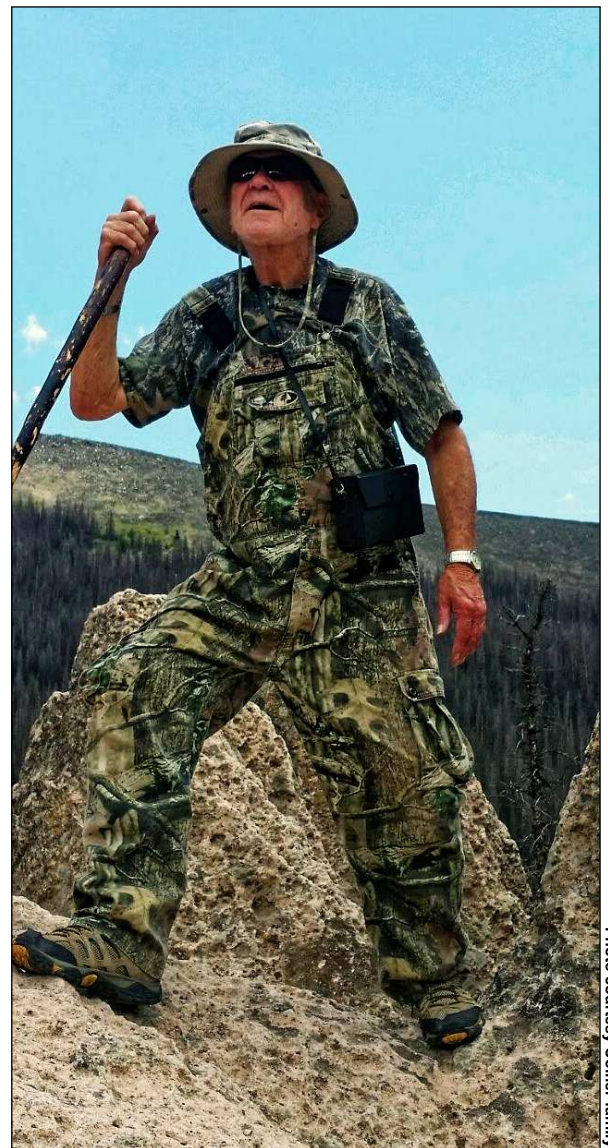


Photo courtesy Collier family.

Al Collier exploring.

Mega-patterns in Southwestern Karst and Pseudokarst

by William R. Halliday, M.D.

William R. Halliday, M.D., NSS 812, is Honorary President of the Commission on Volcanic Caves of the International Union of Speleology. He is co-founder and Honorary Member of the Colorado Grotto of the NSS. Formerly, he has served on the NSS Board of Governors across five decades and was Chairman of the Hawaii Speleological Society from 1989-1998. Some of his books are classics in the speleo-adventure genre.



Order and pattern exist throughout geology, but in the American Southwest, so much variety exists in karst and pseudokarst that at times it is difficult to detect basic patterns concealed by local phenomena.

On my 95th birthday (on 9 May 2021), it gives me great pleasure to review the remarkable progress and evolution of southwestern speleology during my lifetime.

I easily recall the time when it consisted mostly of isolated features scattered from Oregon's Sea Lion Caves to something called the Devil's Sinkhole in Texas. In 1926, Carlsbad Cavern was newly explicated in National Geographic Magazine. Perpetual Ice Cave (New Mexico), Sunset Crater Ice Cave (Arizona), and Trout Lake Ice Cave (southwestern Washington) were isolated freaks of nature.

Southwestern littoral caves were naively limited to the Pacific coastline and experts still debated whether Arizona's Meteor Crater was really an impact phenomenon.

Now the American Southwest is a world center for piping caves, whose existence was not even suspected in 1970, and Rocky Mountain Caving has become something of an "American Journal of Pseudokarst." Karstic caves have yielded information important in deciphering the complex history of the Grand Canyon. Gypsum caves have been discovered from Gypkap (New Mexico) to Lake Mead and beyond. Southwestern lava tubes and crevice caves serve as models for similar caves on Mars and perhaps the Moon.

Staff members of the U. S. Geological Survey in Denver and Flagstaff have intensely studied the region's breccia pipe karst because of the presence of commercial deposits of uranium ore in some of them. In doing so, they have introduced a new symbol on several topographic maps. Such features exist widely in northern Arizona and southern Utah. This symbol is important to economic geologists but may confuse speleologists because it denotes some features which are not spelean. At least these types of breccia pipes are included:

- Open shafts,
- Open shafts with adjacent centripetal and/or vertical deformation, and

- Barely perceptible saucer-shaped surface depressions.

A different type of vertical pseudokarstic shaft exists at Nevada's Cathedral Gorge State Park. This type of shaft resembles karstic domepits but opens laterally into tall, narrow, twisting topless streamways.

Farther east in Nevada, a humongous vertical-walled overhang cavity in fine-grained sandstones is difficult to categorize. It plunges downward from a small, shallow gypsum karst overlying



William Halliday heading underground in the 1950s.

Photo credit: Bob & Ira Spring.

the sandstones, but might be an outlying feature of a small salt karst exposed nearby in the lower west wall of the canyon of the Virgin River above Lake Mead with deep piping of the former arenaceous fill.

Crevice karst (“earth cracks”) exists in a wide east-west band from Wupatki National Monument eastward to Holbrook Basin where it is replaced by a large area where piping caves dominate. South of the Wupatki area, headward erosion by the Verde River has captured part of the Coconino Aquifer and produced a complex drainage pattern.

Near Sedona, largely unrelated features are locally termed “The Seven Sisters of Sedona.” These sandstone buttresses include largely rectangular closed depressions which might be tectonic features related to crevice caves. At least one local karst developed in sandstone, which likely overlies a similar feature in soluble rock.

Southeast of Winslow in the area of Chevelon Creek are “The Sinks,” a group of symmetrical steep-walled sinks which apparently have not been traced to cryptokarst in the Redwall limestone. They are commonly considered to be gypsum-dissolution features, but are much larger than most gypsum dissolution sinks in Arizona and Utah. Farther south are beds of salt which give the Salt River its name, and “The Sinks” may be surface manifestations of salt karst.

The remnant of the east portion of the Coconino aquifer,

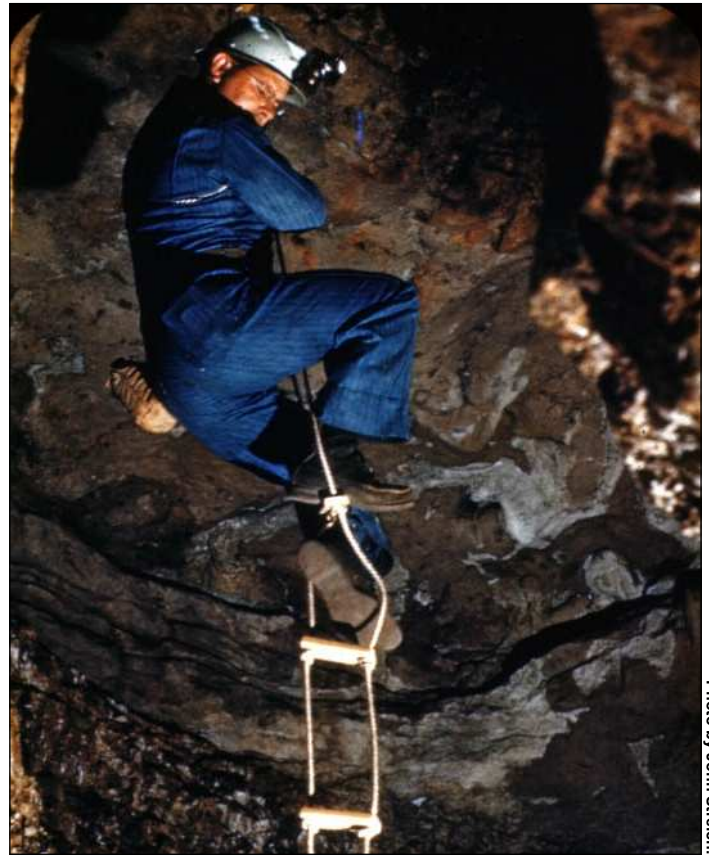


Photo by John Streich.

Halliday underground in Table Mountain Cave.

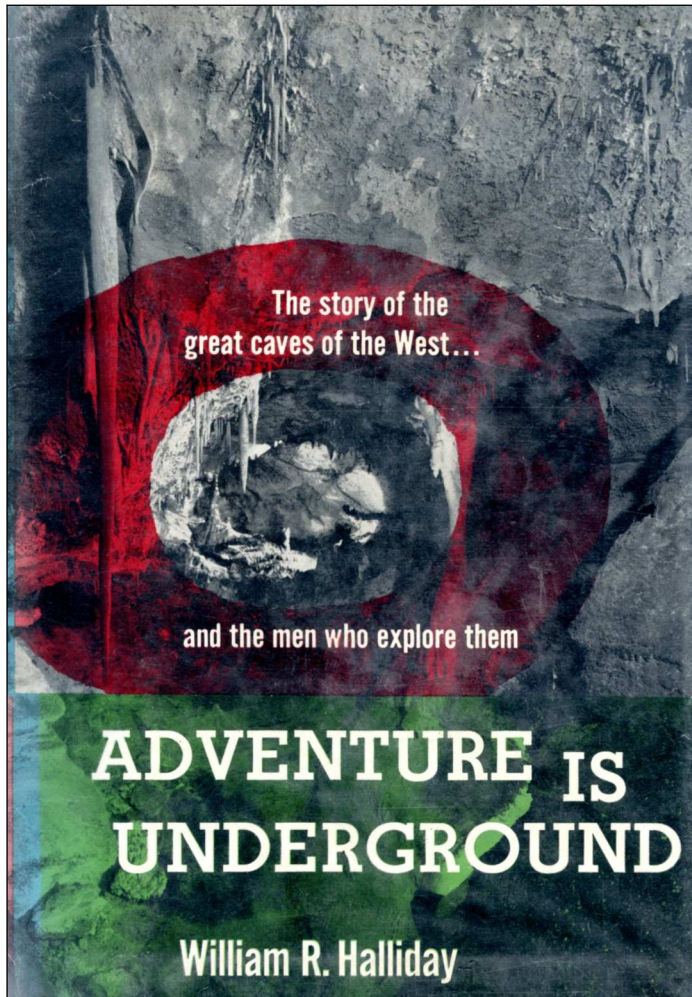


Photo supplied by Richard Rhinert

William R. Halliday's 1959 cave adventure book with Cave of the Winds' Oriental Gardens on its cover.

together with a certain fraction of the drainage of the Colorado Plateau, surface at the bottom of the canyon of the Little Colorado River. Here, downcutting of that river has intersected an anticline containing a large water-filled cavern in the Redwall Limestone. The Kaibab aquifer north of the Grand Canyon and west of Marble Canyon has an entirely different pattern. Innumerable active sinkholes in the Kaibab Plateau feed drainage caves in the Grand Canyon, but a second-generation of dissolution caves in Kaibab limestone also is present, and breccia-pipe caves such as Antelope Cave south of St. George, Utah, and shallow gypsum karst throughout the Arizona Strip, also are part of the Kaibab system.

A three-dimensional crevice network cave also found south of St. George, Utah, however, is unique in my experience, and other possibly unique features also may be present.

In any event, however, the simplistic text above clearly demonstrates the need for a map – preferably published in Rocky Mountain Caving – that clarifies the various patterns of karst and pseudokarst intermingled in the Southwest. If I were ten years younger, I would enjoy preparing such a map, but age and time being what they are, I just hope someone can do it while I can still see enough to enjoy the story it will tell. It can show the sequence and interrelationships of karst and pseudokarst throughout the great American Southwest, as far north as the Wyoming piping caves puzzled over by geologists in the 1950s and 1960s, as far south as the similar caves in Texas's Palo Duro Canyon, as far west as the Channel Islands of California, and as far east as the sandstone caves in Denver's backyard. To the most fortunate Rocky Mountain Caving readers, I wish you 70+ years of caving as joyous as mine. To all, the best of caving forever. 🐉

The Wellpad Gully Caves on South Shale Ridge

by Doug Medville

Although Doug began as a limestone caver, he was lured over to the dirty side by Donald G. Davis on a 1998 survey trip into Anvil Points Claystone Cave. Since then, Doug has found and surveyed hundreds of claystone caves in Wyoming, Colorado, and New Mexico. This is the story of these claystone caves, west of DeBeque in western Colorado.



Over the years, I've written several articles about soil piping caves on the south side of South Shale Ridge, a few miles west of De Beque. Although these caves are in the same rock as Anvil Points Claystone Cave (the Wasatch Formation), they tend to be much shorter with lengths ranging from 50 to 250 feet.

A few years ago, I took a hike above an abandoned well pad about six miles west of De Beque and hiked up a gully containing numerous entrances. The lowest of the entrances is a blowing body-sized hole that opens to a crawl and then, after a short climb, to walking passage. I solo-surveyed about 100 feet in it before stopping at a sharp bend at a narrow place. A steep climb just before the bend led to a steep slope and another entrance.

Wellpad Gully Cave

Hiking farther up the gully, I found two pits and figured that these would be higher entrances to the cave. Beyond that, I found several more entrances, finally stopping at a 22-foot overhang pit with a canyon passage below. Not wanting to do too much more without others, I returned to the gully in June with Rifle cavers Kenny Headrick and Rob McFarland.

Climbing down into the entrance that I had come out of on my solo trip, we surveyed past the bend labeled "Windy Corner" on the Wellpad Gully Cave map. After some crawling, we popped up into a 40-foot long by 15 to 20 feet wide. One of my pit entrances dropped to the lower end of the room and we could see light from another one at the upper end of the room.

Beyond the room, the passage narrowed to a two-foot-wide, three-foot-high canyon that Rob followed to an end at a dome. With 208 feet surveyed, this ended the cave.

While we were in the cave, Rob noticed a neat looking spider in an alcove on the wall. He took a picture of it and, following the trip, I sent it to David Steinmann at the Denver Museum of Nature and Science. Dave identified it as "a female lamp spider, probably *Hypochilus Bonetti*." He pointed out that this spider has a distinctive lampshade-shaped web – the circular outline can be seen in the picture.



Lamp spider in Wellpad Gully Cave.

Photo by Rob McFarland



Doug Medville sketching in South Shale Crystal Cavern.

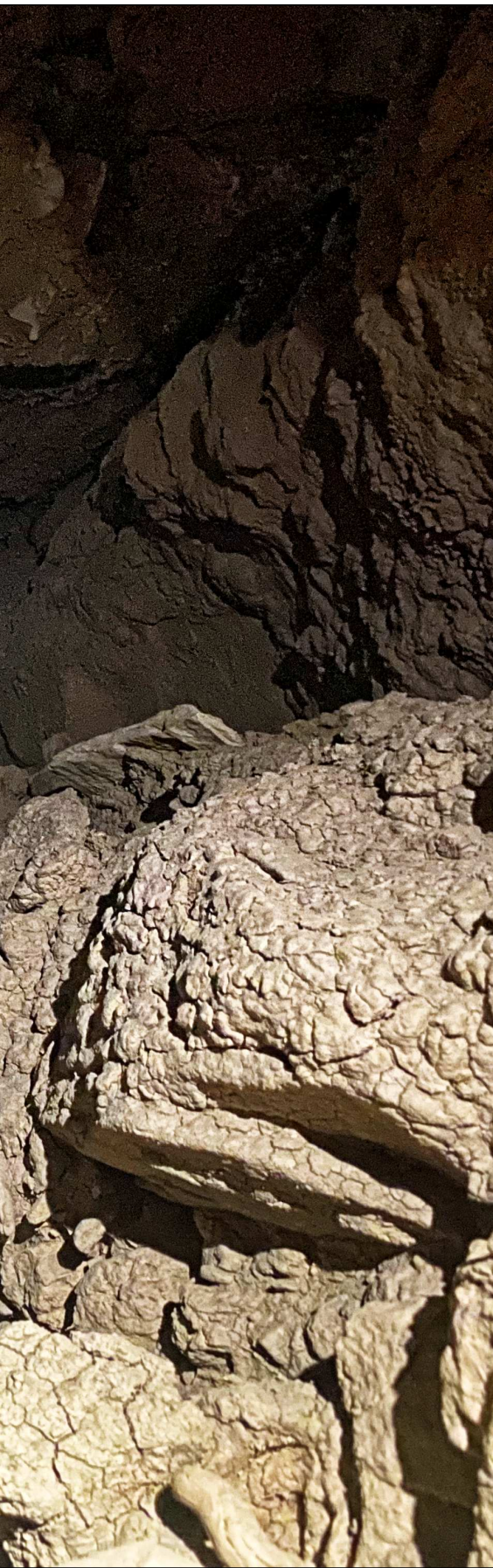
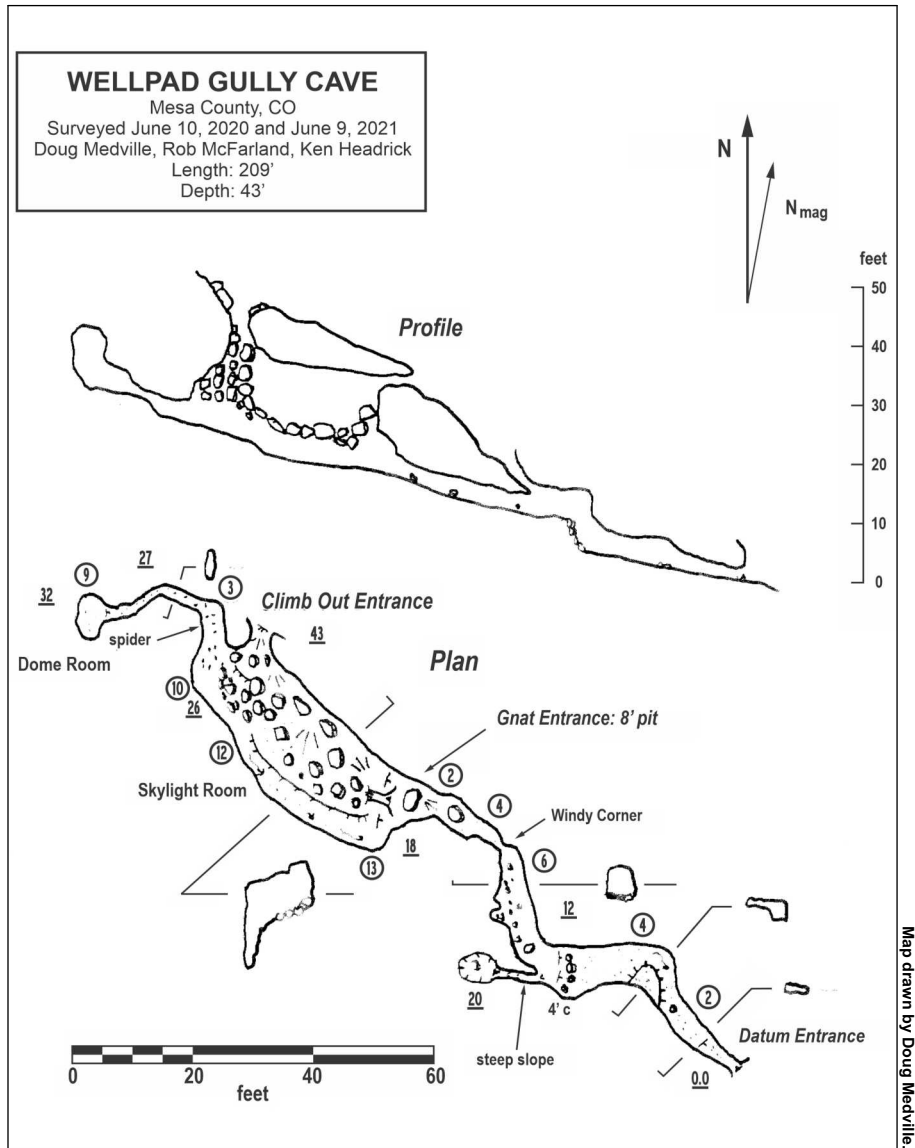


Photo by Rob McFarland



After the spider photo, we decided to exit the cave by climbing up a steep and shaky-looking breakdown slope at the upper end of the room; this led to one of the pit entrances that I had previously found. Kenny went first and, after going up 25 vertical feet, he climbed out of the cave with Rob and me following.

South Shale Ridge Crystal Cavern

We then climbed farther up the gully, checking out entrances as we went. When we got to the 22-foot pit at my previous high point, I said that there could be an even higher entrance, as indicated by Google Earth imagery. Although the gully is steep and it was a hot day, we trudged farther up to see if there was anything up there.

After a few minutes, Kenny shouted that he did find an entrance and that it looked good below. He climbed down into a steep-sided sink and hollered that the passage below was big and that it went down the gully. Rob followed him and said the same thing. I figured that they were just trying to suck me into climbing down since the South Shale Ridge caves do not have “big” passages in them.

However, I was mistaken; this one did have a good sized passage – 15 or so feet wide and high and sloping steeply downhill. No crawling; what a treat!

We first tried going upstream but the passage ended in breakdown in that direction. Hoping that the cave would take us to the bottom of the 22-foot pit, we then headed downstream, surveying and taking pictures as we went.

About 70 feet in, the passage became wider with breakdown to our left. The ceiling then became lower and, after a short down climb, the passage turned into a

too-low belly crawl. Rob probed it and said that there was no air-flow in it. So, although it was heading for the pit farther down the gully, we weren't going to get there.

While we were in the lower part of the cave, Rob saw gypsum crystals in an alcove. He suggested naming the cave "South Shale Ridge Crystal Cavern" in honor of the crystals and the relatively big passage. I liked that somewhat grandiose name, and it appears on the cave map.

Although we only got 165 feet of survey in the cave, for once it was nice comfy passage. Although it's a "claystone" cave, the walls were composed of hard rock, perhaps allowing the passages to be larger than usual for caves in that area.

After exiting the cave, we spread out to look around some more. I found a blowing opening in an adjacent gully, and Rob found a large steep-sided sink with passage below. He called it a "crater"; this is something to return to with a rope or sling.



Looking down the passage in South Shale Ridge Crystal Cavern; Kenny Headrick below, Doug Medville above

I also found a good-looking 19-foot-deep pit above the gully with passage visible below. This too, will require vertigear to enter, so between the 22-foot pit, the 19-foot pit, and Rob's crater, we'll probably return, take more pictures, and get more numbers in the book. All in all, it was a good, productive day. 🦿



Photo by Rob McFarland.

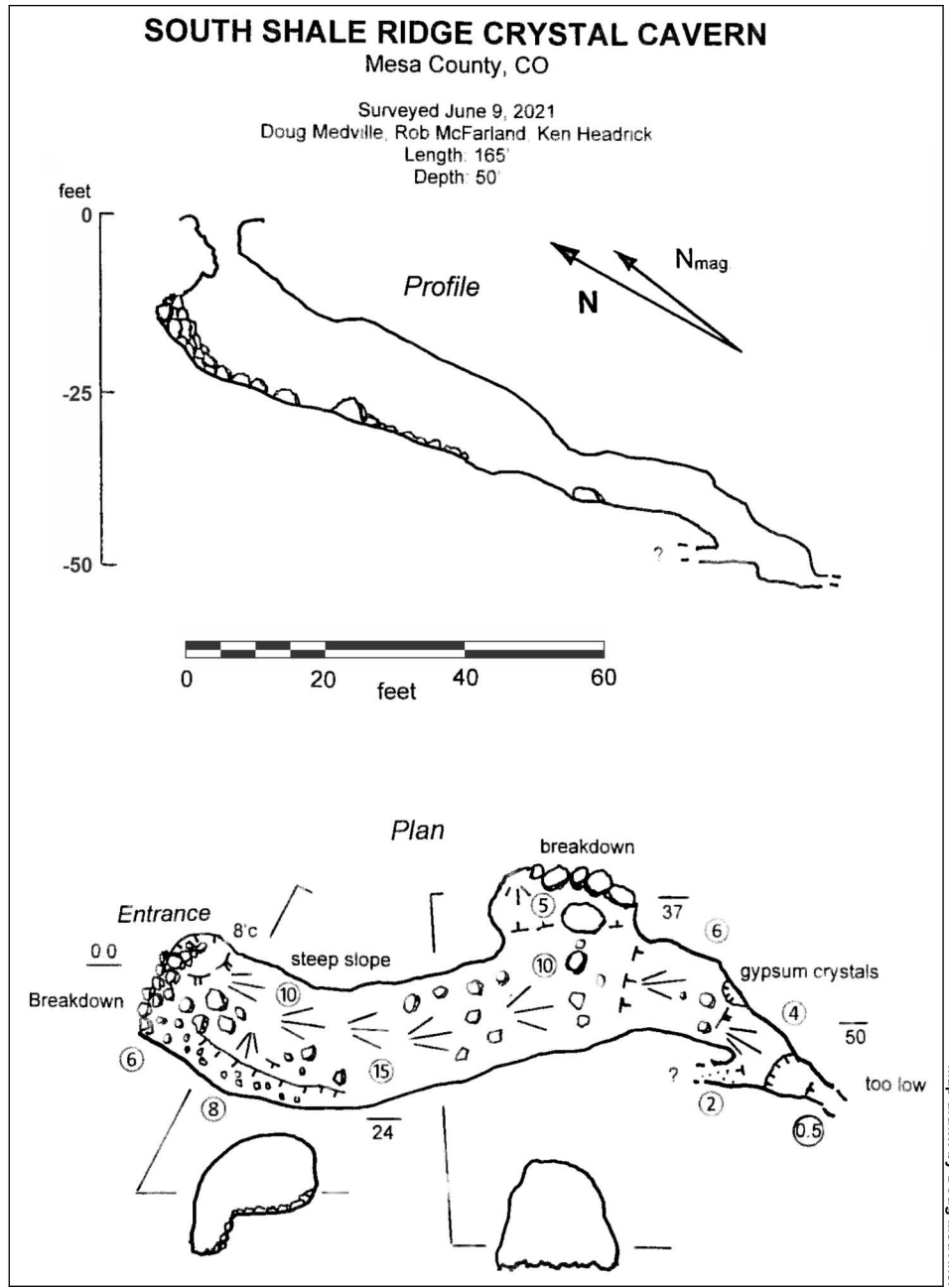


Photo by Rob McFarland.

Crystals in Lower South Shale Ridge Crystal Cave.

The Historic Cave of the Winds Surveys of Sawyer and Garstin

by Richard Rhinehart



Richard Rhinehart serves as the digital editor for Rocky Mountain Caving. The journal's founding editor, he began caving in 1973 and joined the National Speleological Society in 1974.

On March 8, 1895, the El Paso County Sheriff's office notified Mrs. Samuel Snider and Mrs. Emma Austin of Manitou Springs, Colorado, official notice they had received joint possession of the celebrated Manitou Grand Caverns. Located on the west side of what was called Temple Hill, the Grand Caverns had been George W. Snider's response to his family and his former business partner, Charles Rinehart, regarding disagreements as to the management and revenue distribution from the Cave of the Winds.

Rinehart had sued Snider in 1886 regarding the opening of the Grand Caverns as a sole proprietorship, even though Snider had agreed five years earlier that revenue from cave enterprises on their jointly-held lands would be evenly split. Although surveys had shown that the Grand Caverns entrance in Cavern Gulch was clearly on Snider's private land, interior passageways were believed to extend onto the Cave of the Winds property. When he opened the Grand Caverns in 1885, Snider sold his interest in the Cave of the Winds to his mother and family to concentrate on the new cave.

Various survey efforts of the property boundary failed to show conclusively that the Grand Caverns passageways were exclusively on Snider's land. The multiple surveys didn't prove they were not, either.

In losing his appealed case in the Colorado Supreme Court in January 1895, Snider soon departed Manitou, eventually settling in Los Angeles. He would return only on vacation visits for the remaining 26 years of his life.

For his mother and Austin, however, the court decision not to review the appellate court's decision in favor of the plaintiffs was welcome relief. In nine years of litigation, family relationships had been strained or broken altogether. Rinehart died before the final decision, leaving his daughter Emma as the beneficiary to his estate.

In addition to forthcoming receipts from the popular Grand

Caverns tours, revenue set aside in receivership amounted to about \$12,000. In 2021 dollars, this was the equivalent of a nearly \$385,000 windfall.

The Cave of the Winds management recognized that part of the appeal of the Grand Caverns was the absence of substantial stairs along the tour route. At Cave of the Winds, visitors first had to climb a steep wooden staircase from the canyon floor to the cave entrance. Inside, another series of stairs were climbed to reach Canopy Hall, the cave's largest chamber.

The receivership money would enable Cave of the Winds management to excavate a horizontal entrance tunnel directly to Canopy Hall. In addition, a carriage road ascending the canyon wall to a parking area adjacent to the portal would eliminate the long climb.

To determine the course of the proposed entrance tunnel, Cave of the Winds turned to local land surveyors Edwin A. Sawyer and William Garstin. On April 16 and 17, 1895, the two men undertook a survey of the cave from its natural entrance to Cascade Hall, then up the stairways to Canopy Hall. Within Canopy Hall, the men took a series of survey shots – one east to a point near today's Curtain

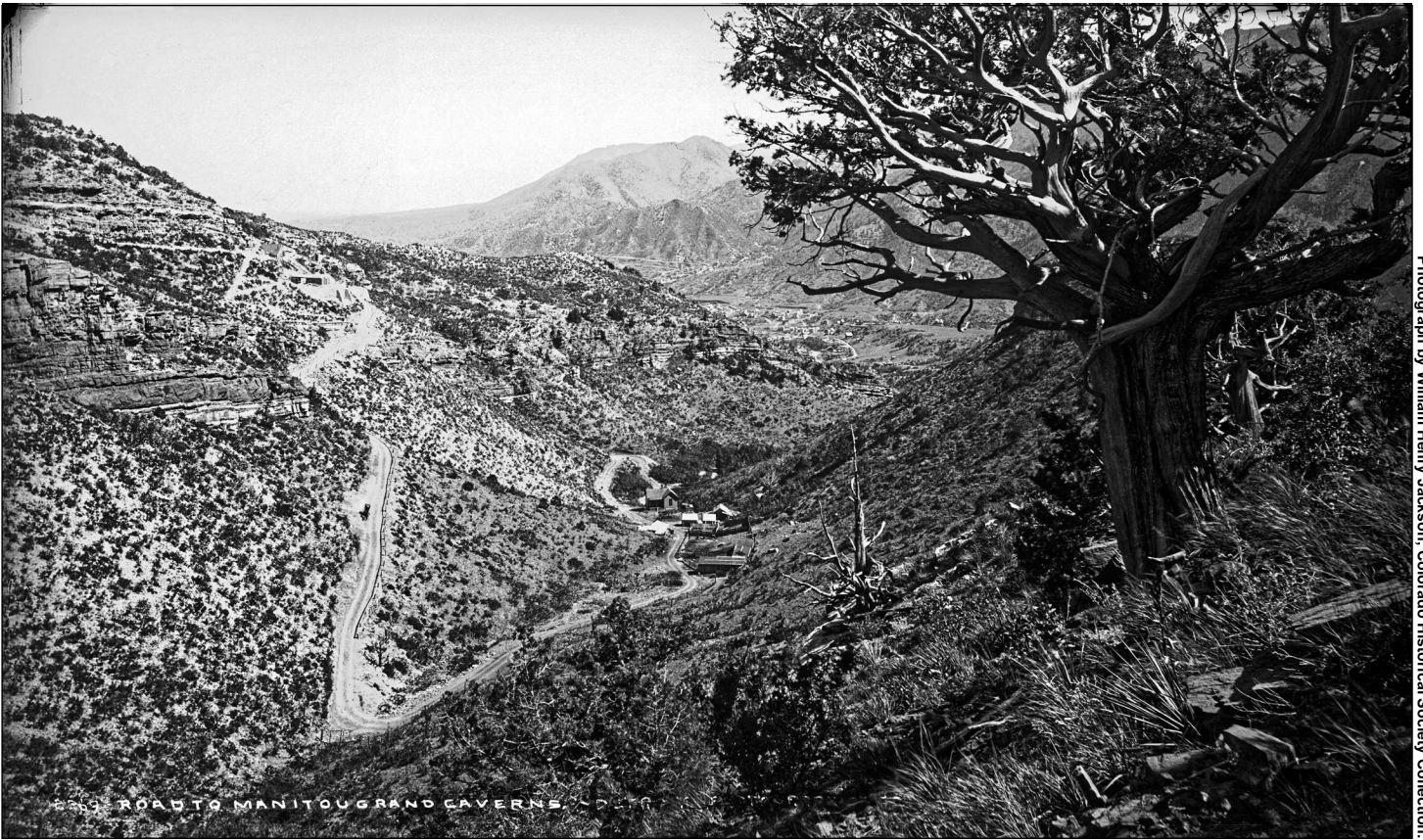
Hall, another descending to the low point of Canopy Hall, and the third leading north to a low, tight passage that was too small to enter.

From the cave's entrance, they took shots up and out of the "sinkhole" to the top of the limestone cliff. This was necessary to calculate the elevation of Canopy Hall with the surface, to allow for the drilling of the tunnel.

Their survey indicated that the elevation of their hillside station above the entrance was within a foot of the elevation of their survey point near Curtain Hall. Indeed, at that point there was a small hole in the rubble, suggesting that the tunnel excavation might simply follow collapsed cave passage.

A week later, the *Manitou Journal* reported that the managers

Cave of the Winds turned to local land surveyors Edwin A. Sawyer and William Garstin.



Photograph by William Henry Jackson, Colorado Historical Society Collection.

Road to the Manitou Grand Caverns entrance ascending Cavern Gulch from Rainbow Falls, circa 1886.



Photograph by C. E. Herson, Norman R. Thompson Collection.

Cave of the Winds entrance building, circa 1896.

of the Cave of the Winds, George's younger brother Charles E. Snider and Emma's husband Charles H. Austin, intended to build a road to the top of Temple Hill. By June 1, the paper reported that 25 men were employed in constructing this new road from the canyon bottom. The project was nearly completed by June 15.

On June 21, the *Journal* noted that "[w]ork was begun yesterday on the tunnel to the new entrance to the Cave of the Winds and will be pushed as rapidly as possible." Excavation of the new tunnel and cement work took less than ten days, with the *Journal* reporting in its June 29 edition that the new entrance tunnel and curio building on the canyon rim would be open for visitors on July 1.

Over the coming years, the Cave of the Winds management would turn to Sawyer and Garstin again and again for not only outside land surveys, but in surveying the Cave of the Winds and the Manitou Grand Caverns in an effort to join the two former rivals. In 1910, a new group of competitors would also use the services of this accomplished survey house in their process to develop their own commercial attraction in lower Williams Canyon, Manitou Cave.

The Manitou Springs Historical Society at the historic Miramont Castle acquired from the surveyors their collection of maps, survey books, correspondence, and other materials that document commercial surveying in Colorado Springs and El Paso County from the late 19th century until the mid-20th century. Although the collection is still being archived, Peggie Yager, the Society's administrator, agreed to look through the files in March 2021 for anything related to Cave of the Winds and Williams Canyon.

Like the survey data for the 1895 entrance tunnel project, these survey books provide an interesting glimpse into history that otherwise was undocumented by local media.

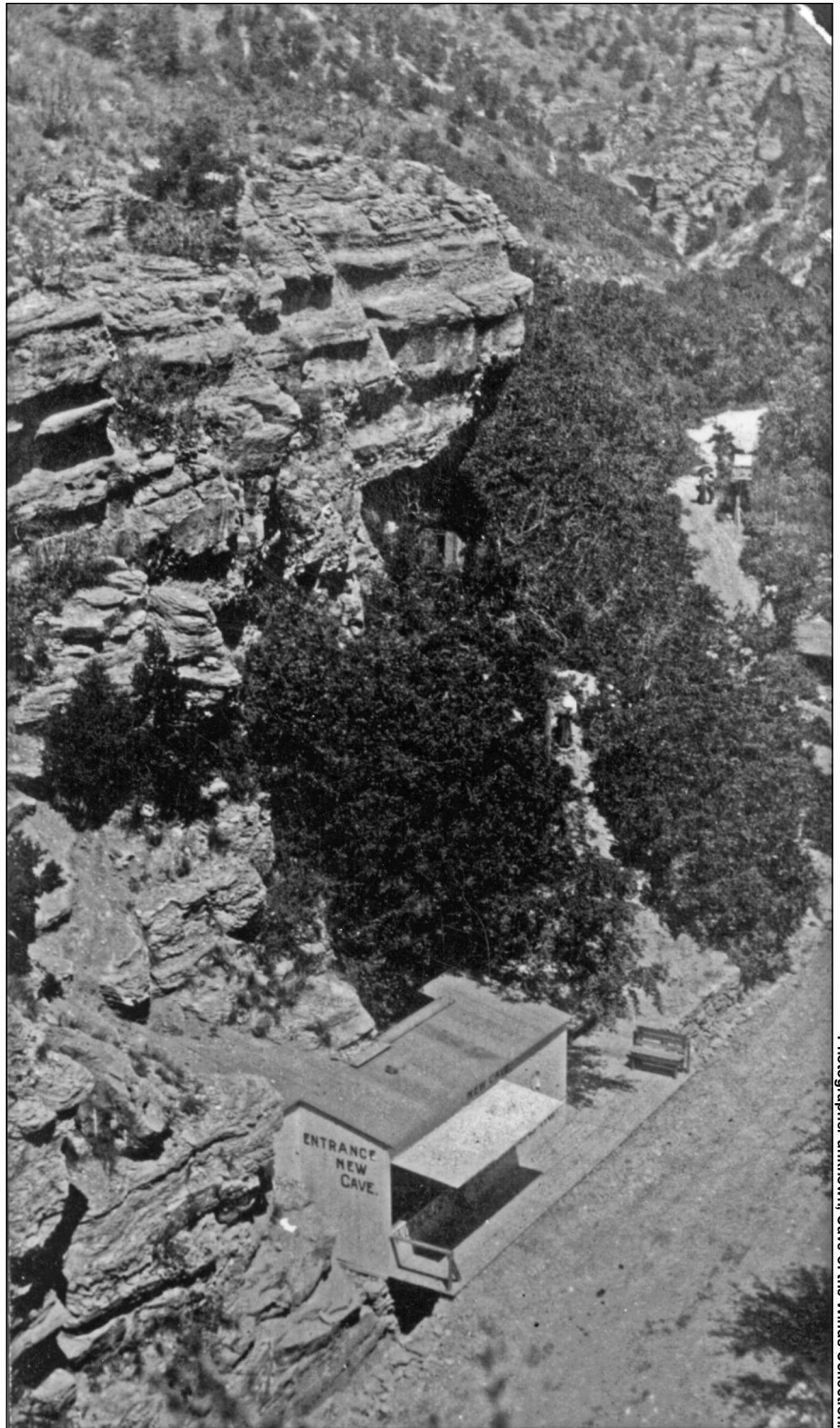
Connecting the Caves

In late 1909, Sawyer and three colleagues undertook a substantial survey project for Austin and Snider at the Cave of the Winds.

Following the 1907 business decision to add electric lights along only the Cave of the Winds tour route, the Grand Caverns had sat dark and neglected. Its Grand Concert Hall and the unique stone monuments to Presidents Grant and Lincoln, along with the more recent monument in honor of explorer Zebulon Pike, were still fresh in the public's memory, however.

With more than 50,000 visitors touring the cave in 1909, including 15,000 during the month of August alone, the Cave of the Winds was the busiest it had been in its history. In a November 19, 1909 *Manitou Journal* article, it was reported that visitation to the Williams Canyon cavern was greater than any other regional attraction, including the summit of Pike's Peak or Seven Falls.

Through reopening the Manitou Grand Caverns and connecting it with the Cave of the Winds on the eastern side of Temple Hill, it would be possible to increase visitation and



Entrance building to New Cave, aka Manitou Cave, in lower Williams Canyon, circa 1911.

Photographer unknown, Cave of the Winds Collection.

revenue dramatically. Though this was an attractive business prospect, the westernmost points within Cave of the Winds were discouraging at best. Breakdown and dirt fill were common in many passages, while others simply became too small.

In early December 1909, the Cave of the Winds managers learned that former *Manitou Journal* publisher Lisle Harris had purchased a 32-acre plot north of Manitou, in lower Williams Canyon. This was a region that contained a few known caves, all of which were small and uninteresting. In a December 10 report

in the *Journal*, Harris reported she was interested in having these caves thoroughly explored “with a view of having them opened up as an attraction here if they are found to be attractive enough to warrant it. Several of these caves have never been explored to any great extent.”

Quite possibly, Harris had taken notice of the record crowds headed to the Cave of the Winds during the summer season, and decided that someone else could benefit financially from the public interest. She hired a force of men to begin exploration.

On December 16, less than a week after Harris expressed her interest in cave exploration in the lower canyon, Cave of the Winds brought in Sawyer and his team to carefully document the relationship between their show cave and the Manitou Grand Caverns. This survey could help determine which passages in the caves came closest to each other for a team of men to excavate a connection.

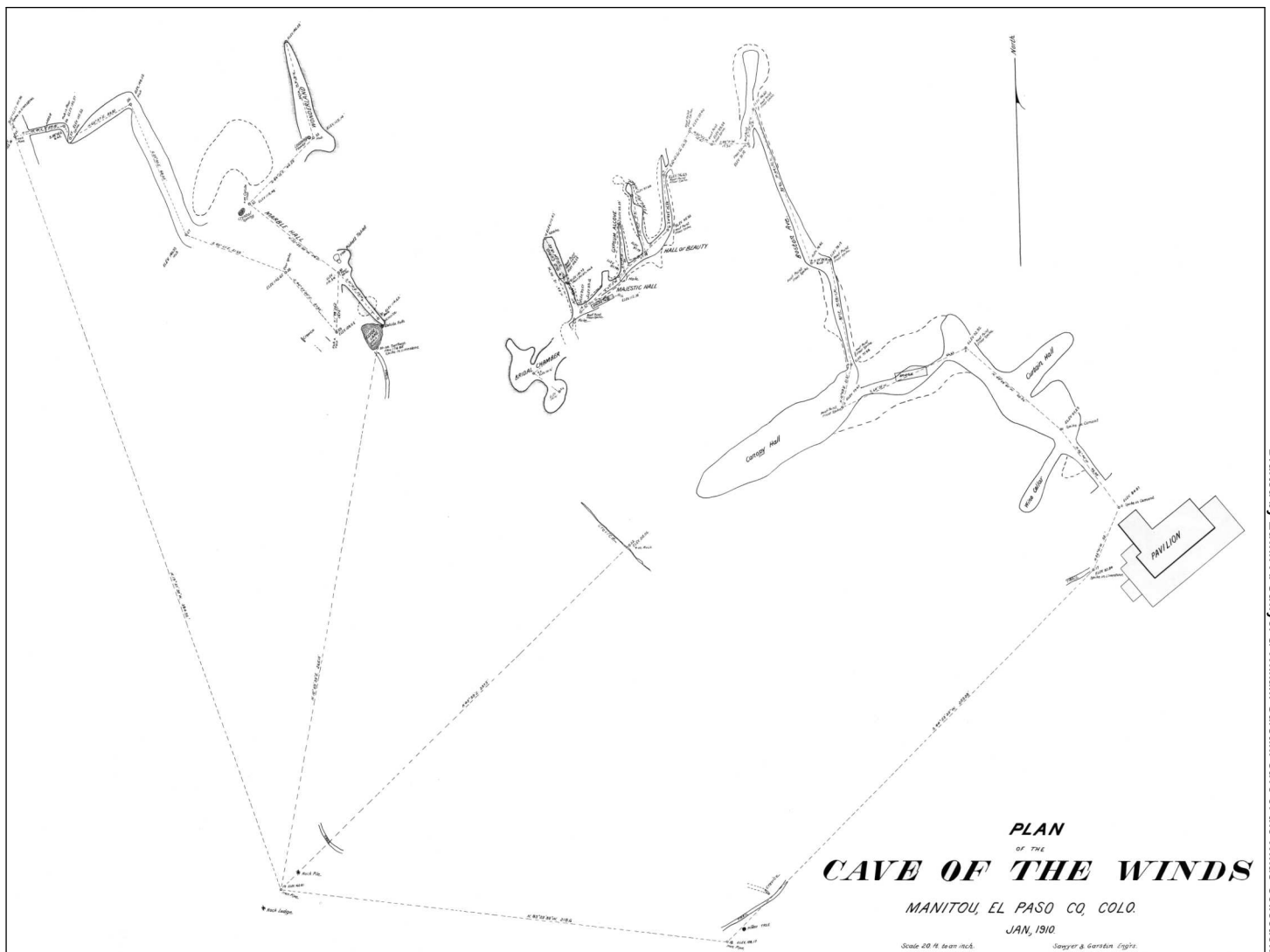
This survey effort would be similar to the 1895 survey project, in that it included both underground surveying of passageways, and outside surveying to tie together the two caves. Careful precision would be necessary to show the true relationship between the caves.

The Grand Caverns extended significantly farther to the east from the end of the shuttered tour route at the Rio Grande

Tunnel and the Fairy Bridal Chamber. A low, tight crawlway led east, very possibly explored by George Snider in the late 1880s. If Snider did explore, he most likely backfilled it owing to the lawsuits of the era. Snider understood the property lines on the surface, and the extent of the cave system. Even though the commercial Caverns tour route was fully on his property, the extension almost certainly led onto Cave of the Winds land.

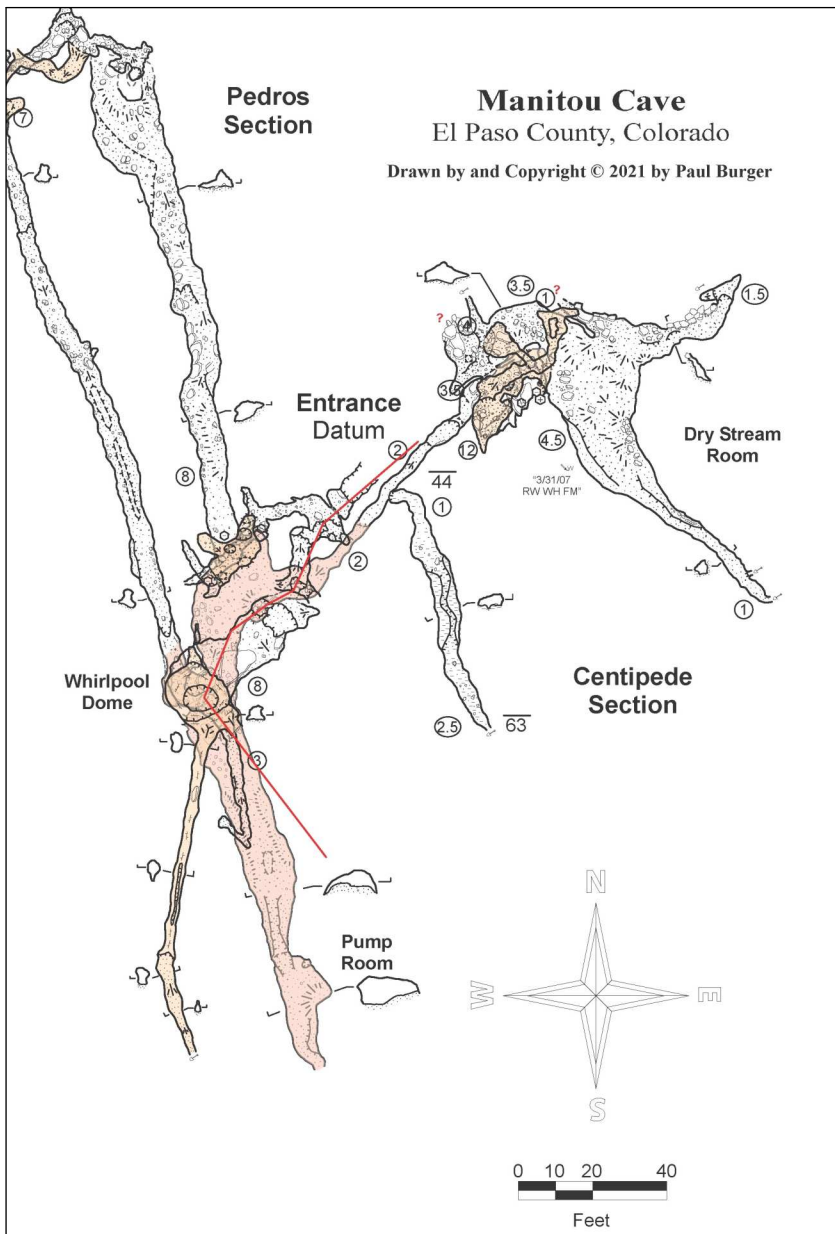
With the caves’ combined ownership since the 1895 Colorado Supreme Court decision, property boundaries no longer were important, at least relating to the two caves. The low, tight crawl led east, eventually opening into larger, decorated chambers that include rooms on today’s Cave of the Winds Discovery Tour route. Passages such as the Adventure Room, Oriental Gardens, and the Valley of Dreams were all first reached from the west.

By 1909, exploration of this area was simple, owing to the 1893 excavation of a new entrance to what was called the “Middle Cave.” This now-sealed entrance was at a place later called the “Wire Hole” during the 1972 Lloyd Parris survey of the cave system, owing to a wire extended through a small hole to the surface by cavers. Excavated to walking height, a wooden door and frame installed by the Cave of the Winds owners provided protection.



Survey map of the Cave of the Winds and Middle Cave, January, 1910.

Drafted by Edwin A. Sawyer & William Garstin, Cave of the Winds Collection.



Modern survey map of Manitou Cave, Pedro's Cave and Centipede Cave sections.
Historic February 1911 survey by Sawyer & Garstin shown as red line.

Sawyer's team took advantage of this new entrance, avoiding several hundred feet of low passage survey from the Grand Caverns tunnel entrance. The notes from this survey call the cave the "new cave," rather than Middle Cave.

The day's surveying efforts began at the Cave of the Winds entrance building. The team surveyed into the adjacent cave, following the tour route through Canopy Hall and Boston Avenue, beyond Manitou Dome to both Diamond Hall and the Crystal Palace. Interestingly, Lover's Lane, the passage leading north to Diamond Hall (today's Majestic Hall) was provided an alternate name of Chicago Tunnel, previously unreported.

The complexity of Crystal Palace took multiple shots, with lines being sent down each of the short side passages such as Gypsum Alcove and Finlay Hall. At the end of the excavated tour route, a steep steel stairway led to the upper level and the Bridal Chamber. This was the end of the known cave system, and the point closest to the Middle Cave and the Grand Caverns.

An extension led north from this point, into a chamber known as the Old Curiosity Shop.

A low, debris-filled opening continued south and west of the stairs, noted in the survey to be about one foot wide by six inches high. Leading about four feet, it opened into a low chamber about five feet across that appeared to end. This tight passage was not appealing, so the surveyors did not climb into it. They did sketch this extension onto their map. By their survey, the Bridal Chamber was closest to Clyde Lake, the final chamber in the Middle Cave. This natural pool was south of the Pickett Tablet, the shield in today's Valley of Dreams. However, their survey showed that the Bridal Chamber is about seven feet higher in elevation than Clyde Lake.

Not surprisingly, the low passage the surveyors failed to enter later proved to lead to a new route – to the "rat hole." The narrow passage led down through a shallow pool, and then sharply ascended into the Temple of Silence. It would be another 20 years before this passage was pushed by Clyde Snider, George's nephew, despite its proximity to Middle Cave.

After completing the Cave of the Winds survey line, Sawyer and his team surveyed across the mountain to the Middle Cave entrance. Entering the cave, they surveyed through the stooping-height passageways leading to the east. This opened into a larger chamber, today's Adventure Room. From this chamber, they surveyed a loop. One side passage from the Pickett Tablet led downward and to the southeast. This passage ended in a tight, impassable crevice just beyond what was called Calcite Falls, an outlet from Clyde Lake ten feet above and to the south.

A surface survey to a point immediately above Clyde Lake indicated that it is 50 feet below the surface, at the edge of a surface gully draining from the top of Temple Hill. This same drainage contains today's Grand Caverns lantern tour entrance, the excavated Carey Entrance.

In 1935, when Cave of the Winds mined and excavated the passage between the stairs to Temple of Silence and the Valley of Dreams, the lower passage at Calcite Falls was ignored, perhaps to provide visitors a more impressive experience of dropping into the Valley. This development decision resulted in a walking channel being drilled and blasted through the center of Clyde Lake. Sadly, it was one of the largest known natural pools in the Cave of the Winds and the Manitou Grand Caverns.

Clearly, the results of the survey and resulting map were disappointing to the Cave of the Winds management. Though Austin and Snider told the *Colorado Springs Gazette* just prior to Christmas they were considering opening the Middle Cave for tours, no development was undertaken. This published report stated that the Middle Cave had been known for nearly two decades, but the distance between it and the Grand Caverns was not known.

They also spoke to the *Manitou Journal*, which reported of the Middle Cave, "One room in particular is known to exist, which can easily be made accessible, where the entire walls and ceiling are covered with formations as white as snow." This room could be the Valley of Dreams, or potentially a chamber not included on the Sawyer survey and unknown today.

Drafted by Paul Burger



Photograph by Louis Charles McClure. Denver Public Library Western History Collection.

View looking south in Williams Canyon, circa 1900.

Rise of a Challenger

While the Cave of the Winds managers pondered whether to excavate a route between the end of the commercial tour route and the Middle Cave, developers in the lower canyon were continuing their explorations in search of a cave worthy to present to the public.

George N. White owned property in the lower canyon he called "Little Switzerland." In December 1909, the *Journal* reported that White was building new roads and cottages in the subdivision. He was also engaged in creating a mining exhibit for visitors farther north into the canyon where he was digging into the canyon's eastern wall, anticipating finding a new cave.

This area was long known to have hosted cave development. Significantly, a cave adjacent to the road was called "Runner Cave" and was popular with local school children. In August 1908, two women, three young girls, and a man were lost in the cave for eight hours after a sudden "puff of wind" blew a flame from a candle, catching one woman's hair ablaze. The group's frantic action to put out the burning hair resulted in everyone losing their lights.

In the darkness, they were unable to find their way through the confusing, winding passage back to the surface. Finally, an evening carriage with lantern drove by the roadside entrance, giving them a momentary glimpse of the correct passage to ascend to safety. Learning of this experience, the Manitou city authorities determined that this cave was too dangerous so it was subsequently sealed with rock and concrete. White began his tunnel excavation just northeast of the sealed entrance.

In his excavation, a previously unknown cave passage was exposed, this one receiving the name Centipede Cave. The developers, Manitou's Robert Weir and J. F. Sanford, hired Sawyer and Garstin to survey the discovery. On May 30, 1910, the survey team began their underground project. The surveyors had been in the canyon the previous November, surveying the course of the Williams Canyon creek from the northern extent of Canon Avenue to the Manitou City boundary. This was marked by a stone wall and gate at the Cave of the Winds property line, north of White's property.

The surveyor noted in his book that their survey began at a recoverable station from the 1909 canyon survey. This station

was about 30 feet south of the entrance of a cave Lisle Harris owned on the west side of Williams Canyon – likely the entrance to today’s Pedro’s Cave. The team surveyed north/northeast to a tree stump at the Centipede Cave entrance on the east side of the canyon.

Entering the cave, they began following the passage as it steeply descended. After reaching a level point, the surveyors began ascending again, gaining elevation in several short survey shots of six to seven feet in length. For the last few stations, the cave is basically level. “End of line of work to date” is the notation in the book at the final station.

The survey book notes that they also took additional shots on the surface, mostly to the north. Was there something in the cave that suggested a northern trend? On July 17, a member of the team returned for one shot south with a pocket compass. Clearly, the owners were attempting to determine where the cave was heading.

In recent times, cavers rediscovered Centipede Cave and Runner Cave. The former was found through an excavation on the surface in 2001; the latter was found from a connection to Pedro’s Cave, beneath the Williams Canyon streambed. It is probable that Weir and Sanford’s team of men was aware of the intersection to the sealed Runner Cave, and were attempting to determine a route to the cave on Harris’s property to the south. The tunnel excavated by George White also intersects a low, tight crawl ascending from Centipede Cave.

Although published reports indicate that Harris and Sanford were involved in a lawsuit at one time, there is no indication of animosity between the two. On November 7, 1910, Harris died after serious heart issues that began in mid-August finally took her life. At the beginning of February, 1911 Sanford and Weir, joined by a new partner, D. H. Rupp, purchased the property in lower Williams Canyon from Harris’s estate. Rupp was the son-in-law of banker Jerome B. Wheeler, one of the developers of Manitou and of Aspen in western Colorado, and so had a ready line of capital available for projects.

About two weeks after their purchase of the Harris property, the men again engaged Sawyer and Garstin’s firm to survey a cave. This time, they surveyed a portion of what would soon become Manitou Cave, the first competitor to Cave of the Winds since the joint operations with the Grand Caverns in 1895.

Noted in the book as *Survey of Cave in Williams Canon for Weir, Sandford [sic] & Rupp*, the February 16, 1911 project seems curiously incomplete. Paul Burger, consulting with National Park Service surveyors who had converted a 1912 survey of an Alaskan archaeological site to modern standards, was able to successfully interpret the notes of the 1911 survey.

He plotted a map from the survey, showing that the team entered the cave through the standard entrance, dropped down to the Whirlpool Dome feature, then shot steeply up to the second, now-sealed pit entrance. Other passageways in the cave,

such as the two parallels leading north from the Whirlpool Dome, were ignored.

Since commercial tours began only five months later, on July 10, this survey may have been simply to determine where the electrical lines should be installed along with the distance for the wiring. The survey up and out of the pit entrance, which would be sealed with a cement wall by the owners prior to first tours, might have potentially been for determining the length of piping for transporting water out of the cave.

An article published in the August 11, 1911 *Manitou Journal* reported that water was found within the newly-opened commercial attraction. “There is a ‘spirit lake’ – a pool of water,



Photographer unknown, Cave of the Winds Collection.

View looking north in Williams Canyon with Cave of the Winds entrance building upper left. Circa 1900.

which at a certain time every day, rises as though it would flood the cave and as mysteriously disappears again – like some manikin, pulled by a string. In one portion of the cave a flow of crystal water is encountered.”

Four decades after the abandonment of the cave as a commercial attraction in about 1913, Colorado Grotto cavers found decaying remnants of the tour improvements. This included an iron rod handrail leading down the entrance series, a safety railing at the Whirlpool Dome, a ladder leading to the sealed pit

Four decades after the abandonment of the cave as a commercial attraction, Colorado Grotto cavers found decaying remnants.

entrance, and sections of the electrical lighting system.

It has been rumored that there had been a vintage water pump in a lower-level passage, below the Whirlpool Dome. If this is true, this device could have been used by the owners to periodically pump water up and out of the cave to the outside stream channel. This might be the explanation for the mysterious spirit lake in the cave. The pumping might have been done daily in the early morning hours, before tours began, leaving the rising water level as an intriguing story for visitors.

In the last four decades, water has been found in the cave relatively regularly, sometimes nearly filling the passages below the Whirlpool Dome railing. In the mid-1980s, water was found entering the cave through a collapse in the streamway outside, flowing down a low passage to the Whirlpool Dome and cascading into the lake. Perhaps this was a similar experience to what the visitors in 1911 experienced.

Developing Ordovician Avenue and Zephyr Dome

In the initial exploration of Cave of the Winds in mid-January 1881, George Snider and his brother Horace dug into a low passage about a foot high leading north from Canopy Hall. Pushing through, they crawled for about 30 feet before reaching a larger chamber some 20 feet wide by 30 feet long. At the northern end of this new chamber, a very short excavation of loose debris opened into a continuing passage that was of walking height at first, but lowered to a stoopway and then to a crawlway as they continued.

These passages today are known as Zephyr Dome and Ordovician Avenue. Continuing exploration in this region discovered a pit dropping from an upper level to a lower, larger passage. Descending the pit on a rope, George found a series of small chambers and corridors, including Boston Avenue, one of the passageways on the current tour route. Except for the well, which was bypassed in favor of a drilled opening direct to Manitou Dome, Boston Avenue was excavated and opened for tours.

This route was used for tour groups going into the cave and exiting, creating jams in the cave during busier times of the year. Snider's original route through Ordovician Avenue remained unexcavated and undeveloped. In 1929, a power cable for a new electrical lighting system used the route, but it was not until the mid-1950s that management began considering this alternative route for tours.

On April 9, 1956, Sawyer and Garstin sent a team to the cave, apparently surveying the passage leading from Zephyr Dome to Manitou Dome. This survey was entitled “New Observation Point,” and consisted of 25 shots, ranging in length from 1.28 feet to 9.41 feet, indicating the tightness of the passage. While portions of this passage were considerably more spacious

during Snider's 1881 exploration, it likely had been used as a depository for cave fill and rock from nearby tour route excavations in the initial development of the cave.

Whether this expansion was intended to be only a spur to Zephyr Dome, or perhaps the first step in opening an alternative route to Canopy Hall, is unknown. Two years later, on May 10, 1958, a group of four corporations from Colorado Springs, Denver, Oklahoma City, and Los Angeles joined together and arranged a 99-year lease of the cave from the Cave of the Winds Scenic Attractions Company.

This group of businesses was well-financed, and had big plans for the cave. They intended to undertake many improvements to the property, including a new lighting system for the cave, expansion of the parking area, widening of Serpentine Drive for two-way traffic, and other improvements to the building and visitor facilities. The group also sought to continue underground explorations to discover new chambers, and to reopen the long-shuttered Manitou Grand Caverns to the public.

On February 23, 1959, the managers of the Cave of the Winds again summoned Sawyer and Garstin, this time for another underground survey project. This survey was less extensive than their 1956 survey, apparently surveying only the area around a proposed tunnel from Zephyr Dome to Canopy Hall. This survey was likely to provide instruction to the mining team as to the angle and the length of the tunnel they were to drill through the rock to connect the natural cave passages.

In early March 1960, work commenced on the project. Published news reports indicated that more than 750 tons of rock and clay were removed from the passageway in nearly 30 days of work. The crew used a special self-powered narrow-gauge dump truck leased from a Grand Junction mining company to transport the material from Canopy Hall to the entrance for disposal.

The new route with indirect electrical lighting was opened to visitors in mid-April. It would be another 28 years before a new chamber was added to the commercial route, the Adventure Room in May, 1988.

For 64 years, Manitou's Sawyer and Garstin survey house played an important role in the development of Cave of the Winds. Their professional expertise assisted in the joining of Cave of the Winds to the Middle Cave and the Grand Caverns, in opening a tunnel entrance, and in creating an important interior tunnel for tour groups. Sawyer and Garstin also assisted the last rival to Cave of the Winds, the owners of Manitou Cave in lower Williams Canyon, as they attempted to find and develop an attraction that would provide a handsome return on their investment. Sawyer and Garstin are gone today, but their books survive at Miramont Castle in Manitou Springs, overseen with care by the Manitou Springs Historical Society. 🐿️



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