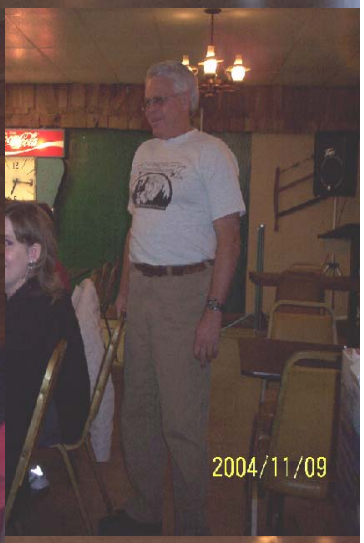
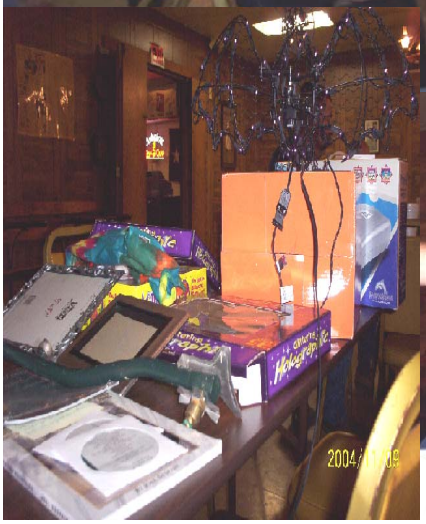
THE MAVERICK BULL

Volume 20, Issue 12 December 2004
The Newsletter of The Maverick Grotto





Maverick Grotto Information

The Maverick Bull is the monthly newsletter of The Maverick Grotto, an internal organization of The National Speleological Society (NSS G-322). The editor invites all individuals and other grottos to submit articles, news, maps, cartoons, art and photographs. If the material is to be returned, a self-addressed stamped envelope should accompany it.

Reprinting Articles: Internal organizations of The National Speleological Society may reprint any item (unless copyrights belong to the author as stated in the byline) first appearing in *The Maverick Bull* if proper credit is given and a complete copy of the publication is delivered to the editor at the time of publication. Other organizations should contact the editor of *The Maverick Bull* at the address herein.

Exchanges: The Maverick Grotto will exchange newsletters with other grottos. Contact the editor.

Complementary Newsletters: The Maverick Grotto will provide complementary newsletters to persons or organizations that provide cave access (i.e. landowners) or otherwise provide assistance to cavers. The Maverick Grotto will provide one free issue to persons interested in becoming members.

Subscription Rates: Subscription rates are $15.00 per year for non-members and free for members.

Membership Policy: Any individual with interests, beliefs and actions consistent with the purposes of The Maverick Grotto and The National Speleological Society is eligible for membership. Acceptance of new members is based on payment of dues and a mandatory three trip requirement with at least three different grotto members. These three members shall act as sponsors. At least one sponsor must attend the meeting at which the membership vote is taken. A two-thirds majority vote of the members present will be required for acceptance.

Meetings: Meetings are held the second Tuesday of each month at Bodacious BBQ, 1206 E. Division St., Arlington. The time is 7 p.m., and the food is good.

Carbide: Currently carbide is unavailable.

Library: Support your Grotto Library. Dennis Welch will be accepting books and magazines on cave-related topics, copies of homemade cave videos, etc. for our library. We wish to thank Dennis for his efforts to bring and set up the Grotto Library.

Photos & Map Credits

Cover Photos: Sharon Welch
Page 5: Sharon Welch-photo of Bill Steele
Page 7: Tammy Cox

Visit Our NSS Award-Winning Web Site! Butch has done an excellent job at constructing the grotto web site and keeping it up-to-date. You'll find information about getting into caving, trip photos and the PDF version of this newsletter (with color photos!):

Http://www.maverickgrotto.org

Cave Rescue: Call collect: (512) 686-0234

Next meeting, December 14th, 7:00 pm
Bodacious BBQ
1206 E Division St.
Arlington, TX. 76011
(817) 860-4248

Program:

Beyond the Lost Waterfall video by David Socky. Approx. 25 min.

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November 2004 Meeting Minutes By: Scott Boyd

The Maverick Grotto met Nov. 9 at Bodacious BBQ, on E. Division St. in Arlington.

Program:
The program was the annual grotto auction. There were lots of great items that were auctioned off, and $357 was raised for the grotto.

Reports from Officers:
Treasurer: There is a total of $1264.23 in the grotto treasury. This amount does not include the money taken in from the auction.

Old Business:
Ed Goff updated the status of the annual Christmas party. He was open for suggestions for someone's house to be the host, but had no offers.

New Business:
*The member database has not been updated.
*Sharon Mastbrook will be filing an annual report in December.
*Butch Fralia asked about which grotto newsletters were in the grotto library. He also wants to update the newsletters that are on the Website.
*Ed Goff brought up the suggestion of getting new grotto T-shirts made. A short discussion followed, but no further action taken at this time.
*All incumbent nominees for the grotto officer positions were running unopposed, so Ed Goff asked if there were any objections to just making a unanimous decision to re-elect all officers. There were no objections, so all officers were re-elected.

Trip reports and trip announcements:
*Bill Steele announced that there will be a trip to Jester Cave the first weekend in December, and asked if anyone was interested in going. There will possibly be a cleanup project that weekend and a Boy Scout troop will be going to clean up grafitti in the cave.
*Scott Boyd reported on a caving trip to an Ellis County ranch that he, Milo Marks, and Milo's grandson, Von, went to on Oct. 18-19.
*Butch would like to schedule another dig in Palo Pinto at Hill's Gate Cave if anyone is interested.

Caving Events Calendar

Second Saturday of every month Hilltop Project (Capitan, NM)
Ridge walking and digging in windy blowholes on USFS and BLM lands, about 5 miles south of Fort Stanton Cave, NM. Meet for Cave Diggers Breakfast on Saturday between 7:30 to 8 a.m. at the Smokey Bear Restaurant in Capitan. **Contacts**: Lee Skinner (505) 293-5723 *skinner@thuntek.net* or Dick Venters (505)437-3712 *cavedigger@msn.com*

Jan 07-09 Colorado Bend State Park Project: Semi-regular schedule. This is a terrific project for beginning cavers. **Contact:** Terry Holsinger (512) 443-4241 trhli@sprynet.com or Dale Barnard Barnard-dale@yahoo.com

Jan 15th TSS Quarterly Board Meeting and Work Session: Beginning at 10:30, the board of directors will meet at building 18A of the UT Pickle Research campus, Austin, TX. Afterward there will be a work session. If you haven't been to the office before, this would be a good chance to get familiar with the type of data maintained in the TSS files**. Contact:** Jim Kennedy jkennedy@batcon.org, or Butch Fralia-cavedba@charter.net

Jan 22 TSA Winter Business Meeting: This years meeting hosted by the TSS at 2:00 pm Saturday at building 18A of the UT Pickle Research campus, Austin, TX. Bill Steele has arranged for Saturday night camping at the TCC HQ in Cedar Park. There will be a party at the headquarters Saturday night with refreshments provided by Dave McClung and his blender of wonders. **Contact**: Jim Kennedy jkennedy@batcon.org or Bill Steele Speleosteele@aol.com

Jan 29-30 High Guads Restoration Project (Carlsbad, NM): On-going work amid spectacular scenery in beautiful caves of the Lincoln National Forest. Last weekend of the month. Permits often include Three Fingers, Virgin, Pink Dragon, Pink Panther, Hidden, Wonderland, and Black Cave. Activities vary from month to month. **Contacts**: Susan Herpin or Jennifer Foote *highguads@yahoo.com*

Feb 02-06 7th Mexican Congress of Speleology & 5th Congress of FEALC (The Speleological

Federation of Latin American and the Caribbean) (Monterrey, Nuevo León, México): "Legislation and Protection of the Subterranean Environment." Cost: US$50 until October 1, 2004, US$100 later. **Contact**: Rodolfo Gonzalez *rogonzalez@cydsa.com*

Announcements

TSA-Colorado Bend State Park Project

The TSA-Colorado Bend State Park Project is scaling back the number of regular trips. The project weekends will now be the second Saturday of October, January, and April.
*** There will not be a December trip. ***
We believe that the change is needed in order to improve the quality of the project, allowing more time for processing and organizing the data between trips and to concentrate on completing the database for a publication.
Since the project has a long history of maintaining a predictable schedule, we have chosen to continue the tradition, but with fewer project weekends, instead of announcing random trips as other projects usually do. There will be some additional trips that are not scheduled in order to target specific issues. If you would like to help us complete some of these internal projects on unscheduled weekends, feel free to contact us.
The project began sometime before 1987, at which point Butch Fralia, Keith Heuss, and Terry Holsinger took it over from Mike Walsh. Terry Holsinger dropped out of it in 1991 or 1992. In 1995, Butch and Keith decided to suspend the project, but Dale Barnard and Terry Holsinger teamed up to keep the project going. The project has kept a regular schedule since 1987.

The park offers a walking tour (Gorman Cave), the crawling tour (several small caves), and one self-guided "tour" (Cicurina). Cavers are allowed access to the park's 150+ caves only when specifically contributing to the objectives of the project. Feel free to contact either of the project leaders with questions: Dale Barnard at 512-847-1521 or barnarddale@yahoo.com Terry Holsinger at 512-443-4241 or trhli@sprynet.com

Cave Dig at Hard Bargin

Jan 14-16 there will be a dig at Hard Bargin. It is located south of Gatesville. Contact Mark Gee at (972) 557-1503 for more information.

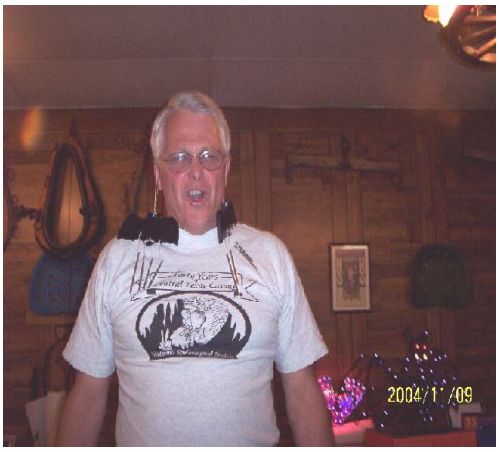
The 2004 Alpine Karst book is available December 2, 2004.

Publications details:
Size: 8.5 x 11
No. of pages: 130
No. foldout maps: 3
Maps Other: 21
Color Cover
Photo images 82
Graphics (geo graphics, drawings, etc): 11
Retail Cost: $16.00 (includes shipping)
Publisher: Cave Books
Editor: Tina Oliphant

Description:
A revival after 26 years. Alpine Karst was last published in the 1970's. Chuck Pease, Jim Chester/Ron Zuber produced four issues from 1975 to 1978. Alpine Karst focused on the unique challenges and rewards of exploring and documenting caves located in Montana, Wyoming, Idaho, Colorado, California, Utah, Canada, and Europe. It also featured articles on advanced techniques, geology, and equipment. Most alpine caves are located in wilderness areas adding interesting dimensions to the explorations and articles. And despite the 26 year gap, some things are timeless. This issue of Alpine Karst continues the classic stories of exploration and science as one reads of groans, llamas, skis, toboggans, rafts, mountain bikes, scuba flippers, the Grizzly, and some very sore feet. And in the end, we survive to explore and document the caves. Articles of science and exploration are included from Utah (the complete account of exploration of Nielsons Cave), California, Montana, Alaska, Colorado, Europe and Canada. Vertical techniques and new options for wet suit technology are explored. A generous amount of photos and maps accompany the publication. For more information go to www.alpinekarst.org

Annual Auction Report

The annual grotto auction held last month was a fun success. Thanks to all the great items that were donated and the wonderful participation of everyone there the grotto raised $357.00. This was a fun filled night of bidding wars, imaginative descriptions of the items by our auctioneer, Bill Steele, and lots of laughter.



High Guads Trip Report October 23,24,25
By: Kristopher Megahan

An amazing trip.
We left early on Friday morning, for a nice leisurely drive to New Mexico. In attendance was Me and my three girls, and a couple from my work, Jerry and Ruth Davis. We stopped at a really cool shelter cave along Dark Canyon Road, and did some scrambling there before proceeding to Texas camp where we arrived at around 6 PM. We set up camp and dined on some really good beef soup and bread, before finishing the evening with s'mores. The wind was howling most of the night and there were clouds but no rain.
Saturday morning was potatoes and onions, with sausage to start our day. We briefed on the journey, and everyone signed the permit for the pink dragon. Jerry was to stay at camp, and Ruth and I with my three children were going to do the hike. We opted to take the trailblazer over the dragon's teeth since it was a rental (made sense at the time). We arrived at the trailhead for the pinks at around 9 am, and only drug the bottom of the truck on rocks 9 or 10 times on the way up the ridge. The hike down the ridge was pleasant, and I found the cave after only a few "wait there and let me go look", attempts. I forgot how steep that pit entrance was…yikes. We managed to snake our way in, and I got to listen to all the nouveau cavers cooing over the formations. The cave was as impressive as we had left it, and after walling out the right side of the dragon room (after the slide), we made it back to the junction, and I could tell the kids were getting wiped. We exited without incidence, and left the other side of the tunnel for another trip. The hike out was painful…painful. I swear that trail is at least twice as long coming back as it is going. Jerry made spaghetti for us on our return and everyone was passed out in their tent by 7:30 pm. We had another pleasant night with no precipitation. Sunday morning came early, and we had camp broken down by 7 am. I took everyone to Queen, and we went and looked at the Red Lake Pit, but since there wasn't 4 vertically proficient cavers with me, we just gazed down the hole (this was my attempt at tempting Ruth to learn vertical). We ate breakfast at the Queen Café and then headed to Sitting Bull Falls Cave. It was the icing on the cake. It was the first travertine waterfall cave I had ever been in, and though afterward I questioned the sanity of climbing a waterfall with my three children, it all turned out well in the end. The climb up is slippery, but short and manageable. The cave only goes back 100 feet, but it is highly decorated, and you are basically walking along the shore of a very large pool of crystal clear cave water. We all made it down alive, and took a dip in the waterfall pool, before heading back and changing in the park restrooms, and starting the long trek back home.

Trip to a San Saba County ranch - Oct. 18 - 19, 2004

By: Scott Boyd

Participants: Milo Marks, his grandson Von, and Scott Boyd.

After I arrived Monday morning, I pitched my tent, and we got our gear together and went to explore and push a lead in ELL-011, also known as Scott's Cave. Milo drove most of the way there, parking along the fence line on the south. We briefly looked at a small hole near the fence line, and then went on to ELL-011. We found it, and all three of us went inside. In the main room, I counted a total of eight bats roosting on the ceiling. Von spotted a "cave toad", and I spotted a leopard frog at the entrance of the passage that I was going to push. The inhabitants of this cave also included quite a few cave crickets. While Von explored around in the cave, I started down the passage that I wanted to push. This lead is a very narrow, vertical crevice. About 6 feet in, there is some breakdown that is wedged between the walls of the crevice, about a foot off the floor. The plan had been to dig out the dirt floor a little bit, in order to crawl under the breakdown. I decided it would be easier to move a few small rocks on top of the pile of breakdown, and climb over, which is what I did. The passage curves a bit to the right, and sloped down somewhat, making it difficult to see down the passage. I crawled as far as I could, until the passage got too narrow. I could see some daylight coming in about 10 feet up ahead, so I knew that there was another opening to the surface. The passage didn't go down to another intersecting crevice like I thought it did during my previous visit to this cave in March. Although this cave isn't really very big, it would still be worthwhile to survey and map, as it has three narrow passages, and one medium size room. Once we got back on the surface, we tried to find the other entrance to the cave. We found it, but determined it was too small to enter. We went back over to the main entrance and gathered up our gear. At one point, I dropped a water bottle. It bounced around a few times, and before I could grab it, it slid/rolled down a small hole, and ended up falling into the cave! Von went in to retrieve it for me, and reported that the bottle had ended up by the wall on the opposite side of the main room from the entrance. We then went to a crevice that Milo said was unnamed and untagged, and had no number assigned to it yet. (We both marked it as a waypoint on our GPS units though.) Milo rigged a rope, and we both dropped about 20 feet into it. We didn't go too far before it got too narrow to continue on.

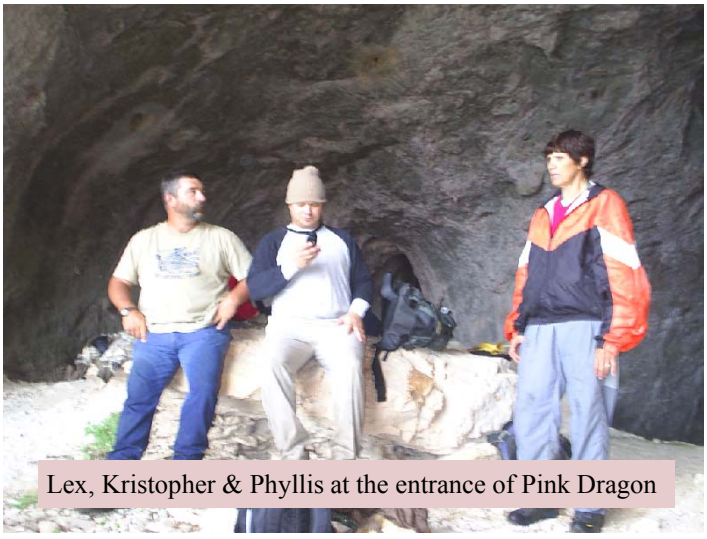
Tuesday morning, we drove over to ELL-003, intending to drop into it and explore it. Milo had been to this one in the past, and it had bad air, so it couldn't be explored any further than the crevice opening. Milo lowered his high-tech oxygen-testing device (a candle mounted in a can on a wire) into the crevice at several spots, and found out the air was good. I dropped down in it first, and moved off to the side so Milo could come down. After he came down we went down the passage to the east, and found out that it intersects another crevice trending north and south. This crevice was about 20 -25 feet high, but very narrow. To the south, the crevice went for quite a ways. To the north, we could see daylight coming in through a small entrance. Near the intersection, there was another crevice in the floor that looked like about an eight foot drop below. We discussed how we would rig a rope on another visit to get down into that crevice. At this point, we went back to where the rope was, and Milo decided to go back up to the surface. He was concerned about Von trying to climb down into the crevice and getting hurt. I continued in the other direction of the main crevice, where it got very narrow, and I had to crawl and squeeze to get through it. Eventually, I came to an intersection with a passageway that I think also trended north and south. (I'm not sure - I didn't have my compass with me.) This passage had a soft dirt floor, and varied from 2 - 4 feet high. To the south, the passage ended after about 4 - 6 feet. I crawled into the north passageway for a few feet and entered a small room that was shaped like an inverted claw foot bathtub. The room was only about four feet wide, and maybe 3 feet high at the apex of the curved ceiling, and 8 - 10 feet long. There was one lone bat hanging from the ceiling. The passage way continued on past the room through a constriction, where it ended after another 2 - 3 feet. I then turned around and headed back out. After climbing back out of the cave, I suggested to Milo that we should call this Double-T Cave, because of the layout of the cave. He thought it was a good name, so Double-T it will be. Milo dropped a tape at the spot where we had rappelled in, and measured the drop to the floor as 26 feet. This is

another cave that, although small, would be worth surveying and mapping. We then went back to the campsite, had lunch, and left for home by about 3 or 4 pm. I felt that we got quite a bit accomplished, even though there were only three of us there.

High Guads Trip Report

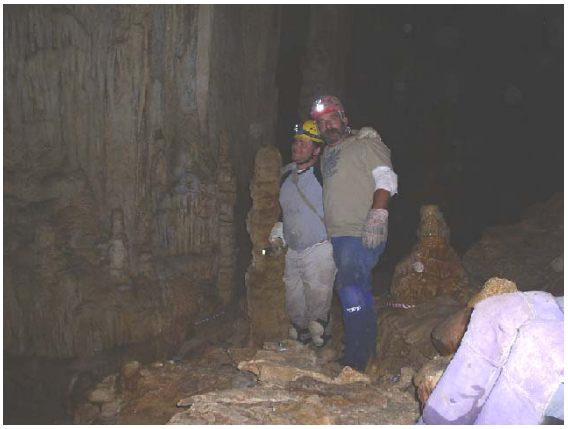
By Tammy Cox
Sept 24-26

Lex and I left Friday morning about 9:00 am to start our long drive to New Mexico. We reached Texas Camp in the High Guads about 5:30pm. We were the first to arrive. The view was spectacular. Kristopher and RD got in around 1:00 am. The weather turned out cold and rainy- So the rest of the crew got there early the next morning (to avoid setting up in the rain). Our trip leader, Jennifer Foote, went over choices on



Lex, Kristopher & Phyllis at the entrance of Pink Dragon

caves we could either monitor or do restoration in. Lex, Kristopher and I decided to go do a monitoring trip to Pink Dragon. Susan Herpin and Phyllis Boneau were our fearless leaders to the cave. We did a 2 hour hike up and down the mountain ridge over pretty pink stones (thus the name pink) to get to the entrance. The cave was filled from top to bottom with amazing formations. There was a path marked with marking tape for us to stay on. We had to do one short crawl to get to the back of the cave. After coming out of the crawl there was a large formation hanging from the ceiling that looked like a dragon. Now the name made sense. We ventured on to gawk at the rest of the cave. As Kristopher and I repeatedly commented on how beautiful the formations were and how large the cave was, Susan and Phyllis laughed and said it seemed like we had never seen a cave before. We had not seen one like this before, it was definitely worth the 2 hour hike. After exploring all that we safely could without damaging any formations we worked our way out of the cave. We took a short break to have a snack before heading back to the truck. Susan jokingly said it is 1 mile to the cave and 3 miles back- Well, that's exactly what it seemed like. We finally made it to the truck, it was a short drive to the camp from where we parked, but fun. We went over rough boulders, through large puddles of water and across the dragons teeth. Both of Lex's front hub caps popped off along the way. It had continued to rain all day. When we got back to the camp we were tired and hungry. After dinner we visited with everyone for a while and decided to go to Black cave the next day for a short trip. The weather did not give us a break, it was still very cold and raining the next morning so Jennifer decided to call it quits and we all headed home. This was a trip that was well worth our time and we are looking forward to going again.



Caving Slang Glossary

Ascending - This is the practice of climbing a rope, many systems have been developed for this purpose.

Descending- This is the practice of going down a rope, this could either be using your ascending system in reverse or using one of the many rappel devices available such as a figure 8, or a rappel rack.

NSS - The National Speleological Society is the national organization in the US, devoted to the study and exploration of caves. They publish a magazine for the mainstream caver as well as a scientific journal for publication of professional research. The NSS structure includes four types of Internal Organizations (IO). The IOs include Grottos, Regions, Sections, and Surveys. The NSS, some of the Sections and Surveys, and many of the Regions and Grottos have World Wide Web pages. Most of these also publish newsletters, or magazines in one form or another.

Region - This is a regionally organized branch of the NSS. The Regions typically cover several states. The current number of NSS Regions is fourteen. Membership in a Region will include several Grottos or chapters as well as individuals.

Southwestern Region (SWR) - This is the NSS Region that includes New Mexico. Although Arizona and Texas sponsor their own Regions, participation in SWR includes many individuals and Grottos from these two states. SWR maintains a World Wide Web page.

Grottos - The Grottos are the locally organized groups under the NSS. There are on the order of 200 grottos and local chapters. The NMT caving club does not (at this time) have official affiliation with the NSS as a Grotto or membership in the SWR. The NMT caving club has however, provided support to the SWR in conservation efforts.

Sections - These are Internal Organizations under the NSS which concentrate on specific aspects of caving These sections include history, biology, conservation and management, diving, rescue, communications and electronics, digging, geology and geography, human sciences, paleontology, photography, speleophilatelic (cave related stamps), survey and cartography, underground lighting, and vertical.

Surveys - The Surveys are Internal Organizations within the NSS that maintain data on caves and pursue further exploration. Some surveys operate under an NSS charter while others are more loosely affiliated.

Internal Organizations (IOs) - These are groups within the NSS that include Grottos or local chapters, Regions, Sections and Surveys.

NSS, Other Internal Groups - In addition to the IOs, the NSS structure also includes Affinity groups, Projects, a Congress of Grottos, Conservation Task Forces, Cave Preserves, and internal committees. Numerous regional and national events and conventions are either sponsored by or affiliated with some level of the NSS structure.

Cave Research Foundation (CRF) - This group was founded to consolidate exploration and research efforts on federal lands, mostly national parks. CRF is active in the Mammoth Cave system, Carlsbad Caverns and the Guadalupe Mountains, caves in the Ozarks, and Lilburn Cave. The CRF Personnel Director can be contacted directly for information on trips, but it is probably best if you can get a recommendation for a slot on a trip from someone who has an established Joint Venture-ship. Affiliation with the CRF is through a Joint Venture agreement which serves to define the release of information and discoveries on CRF sponsored activities and propagates the CRF policies and practices through the aggregate of the participating cavers. Membership in the CRF is through appointment by a board of CRF advisers.

Ridgewalking - The name of this activity comes from traversing rock outcroppings, usually limestone, that would be likely locations for cave entrances. Most ridgewalking involves off trail hiking, some under extreme conditions with respect to terrain and physical stamina.

GEOLOGY FACTS

AGE OF CAVE : Has been dated from approximately 2 to 10 million years.

ALABASTER: Hard compact calcite or aragonite that is translucent.

ANTHODITE: (Greek origin: flower like.) Thin crystal strains found in clusters on cave ceilings can resemble a flower.

ARAGONITE: Calcium carbonate ($CaCO_3$) that differs from calcite by having a greater density and crystallizes into an orthorhombic form. (ortho rhom bic - three unequal axes at right angles to each other).

BEADED HELICTITES: (same as Beaded Anthodites) Start out as small tubes, like stalactites. Unlike stalactites, which grow down because of dripping water, beaded anthodites grow from small drops of water that are forced into the cave through cracks. The surface tension of small drops is stronger than the force of gravity. For this reason, beaded anthodites can grow in any direction. There are several theories that explain the beads on beaded anthodites and helictites. One theory suggests that beads are related to climate change. Periods of high rainfall may cause bead growth. Another theory maintains that some crystal growth mechanism controls the formation of the beads and that climate may not affect growth.

BREAKDOWN: in the Cave of the Winds is caused by two processes. The breakdown seen near entrances and in passageways that are near the surface is caused by freezing and thawing. As water seeps into the cracks, it will freeze and thaw, causing the water to expand and contract. This expansion and contraction widens and shifts the cracks, causing the rock to eventually break away and fall from the ceiling of the cave. Since it is close to the surface, the ceiling of the cave will collapse, causing a sinkhole. Some of the breakdown near the Old Manitou Grand Caverns entrance may have been caused by freeze-thaw action more than ten thousand years ago. The large breakdown from deep in the cave fell from the ceiling millions of years ago. As the passageways were being formed, some would become too wide to support the ceiling, causing the ceiling to fall.

BOTRYOIDS: (Also known as Botryoidal Coral or Cave Coral) Formed at or under water level, air bubbles surrounded by calcium carbonate solution solidify leaving behind round nodules.

CALCITE: Calcium carbonate that crystallizes in hexagonal form (six-sided); similar in structure to chalk.

CARBONIC ACID: (H_2CO_3) This acid is formed by rainwater picking up carbon dioxide from the air and from decaying plants and animals as it seeps through the dirt. Once this acid would reach the limestone under the soil, it would enter into the cracks and dissolve the limestone away to create the rooms, passageways and speleothems of the cave.

CAVE PEARLS: consist of layers of calcite or aragonite, which precipitate on particles in small pools of water. Flowing or dripping water agitates particles within the pool, preventing particles from becoming cemented to the cave floor. Cave pearls can be spherical, oval, irregularly shaped, or even shaped as cubes.

CHERT: Silica nodules formed during the time that limestone layers were being laid down. Chert is not as easily dissolved away by carbonic acid as limestone. Due to this fact, nodules of chert are sometimes left behind on the cave wall after the formation of the cave has stopped. These can be seen in Manitou Dome.

COLUMN: The name given to a formation where a stalactite and a stalagmite grow together.

FLOWSTONE: also referred to as travertine. As the calcium carbonate solution slowly trickles down cave walls, it builds a formation called flowstone. Flowstone starts as a thin cover of calcite on the walls and floors of the cave. Over long periods of time, layer after layer is added, sometimes creating a formation that looks like a curtain or frozen waterfall

FOSSIL: Remains or traces of ancient plants or animals embedded in sedimentary rocks.

FROSTWORK: consists of radiating clusters of aragonite needles. This formation is similar to that of beaded anthodites.

GEOLOGY: The scientific study of the history of Earth and its life, especially as recorded in rocks.

HELICTITE: (Greek origin: spiral or twisting.) A formation that crystallizes in a twisted and curled fashion, defying the laws of gravity. Scientists still do not agree on how they are able to grow in this fashion.

LIMESTONE: A sedimentary rock composed of at least 80% calcium carbonate. It usually originates through the accumulation of skeletal remains from shells, living coral and other sea animals and plants.

NAMES OF LIMESTONE: **Manitou Limestone**-deposited during the Ordovician Time Period approximately 450 million years ago. This is the rough limestone seen in Manitou Dome below the crack. **Williams Canyon Limestone** (found between the Leadville and Manitou limestone)-deposited during the Devonian time period approximately 350 million years ago. **Leadville Limestone** (found above the Manitou Limestone)-deposited during the Mississippian Time Period approximately 350 million years ago. This is the smoother limestone seen above the crack in Manitou Dome.

ONYX: Horizontal or parallel layers of translucent calcium carbonate that flow over the existing rock, producing different shades of color with wax-like luster. Also known as Cave Onyx or Banded Travertine.

RIMSTONE DAMS: formed because of the upward growth of calcite around the edges of pools. The precipitation of calcite is enhanced right at the point where the water flows out of the pool causing a dam to form. Small pools can eventually become large enough and deep enough to swim in.

RIBBON STALACTITES(or cave bacon): form just like stalactites, except that ribbon stalactites grow on slanting ceilings instead of horizontal ceilings. On horizontal ceilings, the water droplet is pulled off of the ceiling by gravity and stalactites are formed. On slanting ceilings, the water droplets move down along the ceiling

depositing a small ridge of calcite. As the water continues to flow down the same path, the calcite ridge grows out from the wall forming a ribbon.

SHIELD: Water is forced out of a crack in the cave wall. As the water is forced out of these cracks, the calcite crystallizes out of the water and a plate begins to grow away from the wall. As water continues to flow from the crack, the minerals are deposited on the edge of the plate causing the plate to grow farther and farther away from the wall.

SODA STRAW STALACTITE: Are relatively young stalactites. They are hollow and are the same diameter at the top as they are at the bottom. As a bead of water enters the cave, the minerals will be deposited on the outside of the bead of water in a ring. This process occurs over and over, giving the stalactite a hollow center with the same diameter from top to bottom-like a roll of lifesavers candy. When the hollow center gets plugged, the water must flow along the outside of the straw-like formation depositing more minerals at the top than at the end of the formation. This gives rise to the more familiar stalactite shape.

SPELEOLOGY: The scientific study or exploration of caves.

SPELEOTHEM: Greek origin: general name for any cave formation.

STALACTITE: Stalactites are created within rooms and passageways when calcium carbonate-rich water from the surface reaches the ceiling of a room and starts to drip. Each time a water droplet collects on the ceiling, a small amount of calcium carbonate crystallizes into a calcite ring around the outside of the water droplet. As this process continues over thousands of years, icicle-shaped stalactites form.

STALAGMITES: Stump-like formations formed as calcium carbonate crystallizes and builds up on the cave floor. Stalagmites usually have a broader base and a blunter tip than the stalactites.

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