

PHOLEOS

JOURNAL OF THE WITTENBERG UNIVERSITY
SPELEOLOGICAL SOCIETY



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The Wittenberg University Speleological Society

The Wittenberg University Speleological Society is a chartered internal organization of the National Speleological Society, Inc. The Grotto received its charter May 1980 and is dedicated to the advancement of speleology, to cave conservation and preservation, and to the safety of all persons entering the spelean domain.

The National Speleological Society

This is to certify that

Wittenberg University Speleological Society

having fully complied with all the requirements established by the Board of Governors, and having accepted the responsibility which such status entails, is hereby chartered in the National Speleological Society, and is entitled to all due rights and privileges: in testimony whereof the President and the Chairman of the Internal Organizations Committee have hereunto set their hands and the Seal of the Society, this 14th day of May, 1980.



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6-268
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Cover: Profusion of chandeliers in the Chandelier Ballroom. Photo by Horton H. Hobbs III

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Editor's Note

The first trip through a cave is a special time. Initial impressions touch on a spectrum of emotions: fear, awe, surprise... Chances are you remember your first time. Whether hidden in a remote corner of your brain years ago, or freshly stashed in your memory, the first cave trip, for most, is one to treasure.

Join us, as we travel back to the 60's with Mike Hood, who "brush[es] off the 'ol cobwebs" to retell the tale of his first trip to Buckners's Cave, Bloomington, IN.

Then, if you have ever had the desire to be on television, now's your chance. Move forward to a more recent year, 1988, as your guide, Allen Wallace, followed by a crew of CBS cameramen, takes you "on-rope" on a suspenseful trek through Mystery Pit, Chattanooga, TN.

Now that you have had your chance to be a star, get a good night's sleep and take one long, last look at the sun; you won't be seeing it for a while. Your host is Horton Hobbs III and he promises not to release you from his grip for 59+ hours. Don't worry; you won't be bored. Pit fall traps, snakes, and vertical drops abound in Lechugilla Cave, NM. Just stay behind Hobbs as he leads you down the Yellow Brick Road and other exciting places. You'll eventually emerge safely back in the world of light.

Tired? Having difficulty adjusting your eyes to the light? We'll keep you above ground for a while. Now sit back, relax and enjoy ten-year-old Bradley Brown's fictional story about the adventures of two young boys, while stranded in a cave. Will they get out? Let's hope so! Stay where you are, especially if you are someone who thinks bats are "out to suck your blood." Myths surrounding bats have a significant impact on public opinion of bats. Annette Summers wants to tell you about some of the most common myths, in hopes that negative attitudes will change.

Interested in learning more about bats?—like where they come from and the unique adaptations they have made in order to fly? Timothy L. Lewis offers a brief review of a May 1992 BioScience article, "The Origin of Flight in Bats," which addresses these issues.

Let's go underground one more time and do our good deed for the day. Under Earth Day, as Mike K. Hood reports, has been a tradition for three years. The cite of this event is Sullivan Cave, IN and the goal is to remove as much trash and graffiti in one day's time as possible. So grab a brush or a trash bag and get ready to work!

We finish up this edition of *Pholeos* with a poem, "The Evolution of a Caver," by Annette Summers. It captures a caver's unique experience of being a part of a "timeless, ageless, infinite" entity—an experience with which many of us are quite familiar.

C.S.

My First Cave Trip

by

Mike K. Hood, NSS 24166L

I was trying to think of something to write for this issue of *Pholeos* (to get Julie off my back), but wasn't having much luck until Annette suggested I write about my first cave trip. Hmmm, now that will take some brushing off of the ol' cob webs.

Not counting a few commercial ventures back in the 1960s with my parents while on vacation, I guess my first wild trip was to Buckner's Cave in Bloomington, Indiana in the summer of 1974. My cousin knew of this "big cave" not too far from his house that he and some friends had explored before and asked if I was interested in going caving. Being the curious type, I quickly accepted. So, one sunny Saturday, we piled into his brother's car and the three of us drove to Buckner's. Having never seen a carbide lamp before, the older cousin spent roughly five minutes showing me how to work it. Adjusting my borrowed helmet and knee pads, I followed them down the hill to the entrance. I remember being a little apprehensive looking down into the large, dark entrance. However, I didn't have long to ponder what fate awaited me within because my lamp was quickly lit and away we went down into the cave. My apprehension quickly disappeared (for the moment), as I walked down the large, inviting passage. I was fascinated by the size of the passage and the large entrance room that waited at the end.

They let me climb around on the breakdown pile for a few minutes, then took me down a short side passage to show me my oldest brother's signature on the wall. There it was, "Jerry Hood, 1960." Also, close by was the inscription "Kent Lawson, 1960." Kent was a close friend of my brother and my middle name can be attributed to him. I found it interesting they had been here sometime during the year I was born. I guess writing on the walls wasn't frowned upon quite as much back then as it is now. The names are still there today, as Annette was gracious enough to follow me back there on a recent trip and photograph them for me.

After showing me this, I was led behind a big rock. Behind it was the foreboding opening of a small crawl. The apprehension was back even stronger now! Again, I wasn't presented much time to worry as my older cousin disappeared through the hole. I could hear him scraping through the crawl and his grunts and groans weren't helping matters at all. My cousin tapped me on the shoulder and with a wicked grin informed me I was next. I started slowly into the crawl and could see my cousin up ahead in a small cross passage. When the three of us were regrouped in the small passage, we were on our way again down the crawl. I thought that crawl would never end, but we eventually came to what I was told was the "T Room."

I was told that if you turned left at the T Room, you could actually make a circle route and return to the T Room from the opposite direction. However, our destination for the day was the "Volcano Room." That sounded interesting. I was also much relieved to be able to stand up again. We walked downhill into a large room, emerging at the top of a large breakdown pile. We were now in the "Signature Room," although at the time I don't recall them telling me a name for this room. Scrambling down the pile, I found myself following them down a low passage with a small stream flowing through it. We passed two other groups of people, who I noticed weren't wearing any helmets, nor had the type of light source we were using. They were carrying flashlights and a couple had the smell of beer on them. However, no spray paint cans were seen on this trip. I must admit, I enjoyed crawling through the water (maybe that's why I enjoyed wet caves so much—initial imprint on the brain). Soon, I again found myself scrambling over large breakdown piles before returning again to the water.

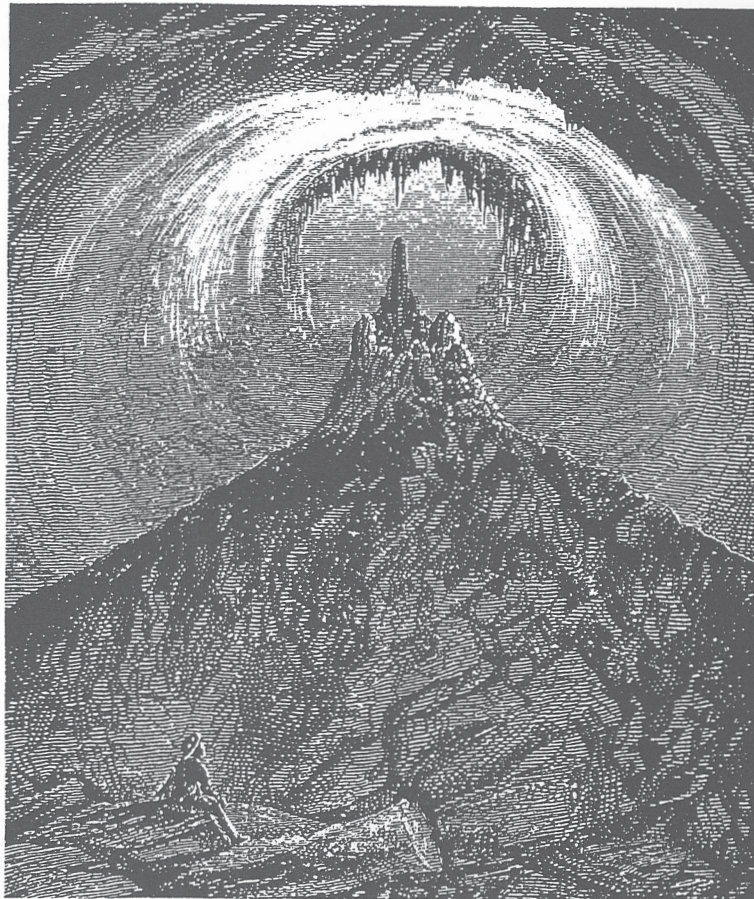
Eventually, we stopped in a small room at the bottom of a narrow, upslope crevice. Squeezing through it, I emerged into a large room shaped like a bowl—or, a volcanic crater, as I was corrected. We climbed up a steep mud slope into a large passage going off in either direction above the "crater." I was told I could run around and explore as much as I liked, as I "couldn't get lost"—just be careful I don't fall off the edge into the crater. I probably spent the better part of an hour poking in and out of every nook and cranny I could find. After exploring a while we stopped for a lunch break and changed carbide. All too soon, I was informed it was time to go.

Reluctantly, I followed my cousins as we retraced our path back the way we came. On the way, we passed at least four other groups—some of them had helmets and carbide lamps! In no time, we were back at the T Room and I found myself dreading the long crawl back. My thoughts were interrupted when my cousin asked if I would like to see a "nice little room." After indicating that I would, he pointed down a small passage just below the beginning of the crawl and assured me it was a nice little room. So, in I went, trusting soul that I was, and found myself in a small, cramped, dusty room which was barely large enough to turn around in. After fighting my way back out, I immediately and loudly protested that I had been tricked. My cousin politely informed me that he hadn't lied to me. "You must admit," he said, "it is nice and little!" The tradition stuck. It is now one of my favorite pranks for first time visitors to Buckner's—just ask Annette!

The crawl out didn't seem to take nearly as long as the trip in and I soon found myself back in the large

entrance room with the sun streaming in from the entrance. We emerged into a bright, hot sun and I was amazed that we had spent nearly five hours in the cave. This was my first lesson in how time has a tendency to get distorted while underground.

I had survived my first wild cave trip and was hooked. I couldn't wait to go caving again. I didn't have long to wait, as the very next weekend found the three of us at Salamanders Cave...but that's another story.



Wyandotte Cave, Indiana

• • **ALERT** • •

Recently, several cavers have reported that Mrs. Wells was unhappy with problems at her cave and was considering closing the cave. She expressed anger at people going into the cave without asking, about reports of trash in the cave, and damage to the formations. She also mentioned that cavers were damaging the fence on her property.

The cave is not closed at this time. She still will let people into the cave if she is asked. However, do not enter the cave if you have not talked to her. She is adamant about cavers asking permission. the fence has been repaired and a "climb over" has been built to eliminate any further damage to the fence. If people continue to enter the cave without permission and damage to the cave and fence continues, she will close the cave.

First Caving Trip

by
Allen Wallace

In the fall of 1988, a friend asked my wife, Kathy, and me if we would like to go caving. We both thought it would be an exciting experience and eagerly accepted.

We had taken several rope rescue classes. The caves we would be visiting were pits and sink holes, so our vertical experience would be very useful.

We traveled from Central Ohio to Chattanooga, TN, which took ten hours. Our transportation was a 31' Winnebago. There was a total of ten people.

Once under way, our "leader," Russ Born, told us we were to be accompanied by a CBS camera crew from Atlanta. The camera crew was there to film "A First Time Caver."

We arrived at camp around 6 a.m. After setting up tents, we were met by "Smokey" Caldwell from Pigeon Mountain Industries. Our first adventure was a sink hole about 100' deep. Neither Kathy nor I got to go in. Nevertheless, we both helped carry everything that would be needed for this filming.

The next morning, Friday, we were off to Look-Out Mountain. Our cave was Mystery Pit. The entrance was a rectangular opening (14" X 20"), which we entered feet first. Once inside, we stood in 6" water. The passage resembled a mine tunnel; it had flat ceilings and vertical walls. Water became deeper as we walked into the cave. About 75' into the cave the passage turned to the left about 30 degrees, then went straight for another 75'. At this point, there was a short passage to the right. It was about 20' long, 6' wide and 6' high. This passage lead to the waterfall that was at the top of the pit. This side passage was separated from the main water passage by a "wall" that was about 8' long, 4' high & 18" thick. In the bottom of this wall was a 12" diameter steel pipe that allowed water to flow from the main passage into the short side passage and over the waterfalls.

In order to do any vertical work into this pit, the water had to be stopped from flowing over the falls. This was done by covering the upstream end of the steel pipe with a 3/4" plywood plug, which resembled a toilet seat lid. It was affectionately called the "Toilet Seat." Once the plug was in place, water in the main cave passage would rise 3'. This would take about an hour. Then Smokey would pull out the plug and the water in the cave passage would flow through the pipe into the short passage over the falls to the pit bottom, 300' below. This was a tremendous flow of water—impressive to see, but even more splendid to watch from the bottom of the pit!

Just beyond this first lateral passage was another passage on the right. It was maybe 6'-8' higher than the first; thus, not affected by the rising water. We kept our

gear up there. This passage was about 30' long and also terminated at the top of the pit. This was where we would make our descents. Once all rigging was complete, two of the "seasoned" cavers were the first to descend to the bottom. Our plan was to have one caver descend, and at the same time, lower a cameraman on another line that traversed from the edge of the waterfall to the far side of the pit's bottom. This worked well and he was able to film the descent of the caver.

While the technical things were being done, we helped several get their personal items and team equipment to the elevated dry passage. Just getting everyone's personal gear inside was a lot of work. It was exciting to be part of the group and we were eager to help.

After about four hours, one of the team leaders decided we needed to get a message to the people at the bottom. So I volunteered to go down. That was thrilling! With my harness already on, I grabbed my vertical gear, some extra carabiners, runners' and my rack. I soon was rigged on the rope with my back to the opening of the pit. I smiled as Kathy took my picture. Down the rope I was going! The wall of the pit was against my feet for about 20' and then it was free hanging!

My instructions for the group at the bottom were to have one caver ascend the rope and the team on top would pull the cameraman back up the traversed line. But this did not happen, as the batteries for the camera light were dead. The crew at the top did not find this out until the cameraman was at the top.

Once the cameraman and caver were on their way up we had time to look around the pit bottom. There were two other cavers still down, in addition to myself. The pit bottom was about 250' X 150' and some small passages were located along the far side.

Remember the water falls? About every hour, Smokey would pull the "Toilet Seat" out and the water would flow over the falls. Being on a rope under the falls would be disastrous at these times! So, he would always yell, "Flush" and wait for the reply "Flush OK."

We waited for the flush at the far side of the pit looking up. I had my bright divers light shining up to where I thought the falls were. One of my companions said, "Notice how calm it is." I was in agreement, as I thought it was quite peaceful in the cave. However, this is not what he meant. Once the water started falling, water spray went everywhere. This was accompanied by fierce wind. After about a minute, I became chilled and concerned. I "took cover" beside a stone formation that looked like a sidewalk turned up on its edge. For the first time I was uncomfortable. I pulled up my collar, rolled down my sleeves, and

huddled with my hands in my armpits. This hurricane lasted 10-15 minutes. Then the falling water was gone and the wind subsided. My two companions and I watched the water level on the floor gradually disappear. Then out of the darkness came a cyalume light with a note attached advising us to "climb both ropes now." I got suited up in my vertical gear and climbed the line that was used to raise and lower the cameraman. One of the fellow cavers told me it would be a difficult climb because I would be leaning backwards for the first part of the climb. Soon I was on my way up. I would climb 50 steps and then rest. I would like to have warmed up before my climb, but we all felt a sense of alarm after reading the note.

I rested three or four times, about a minute each. I remembered looking up and seeing 10-15' of white rope above me which faded into the darkness. Suddenly, while climbing, my left leg felt like I stepped into a hole. I looked down and the "Chicken Loop" harness had come completely off my boot. Also, the elastic shock cord that pulls up the ascender came off my chest harness. I rebuckled the chicken loop. Needless to say, I tied about 40 knots in the shock cord.

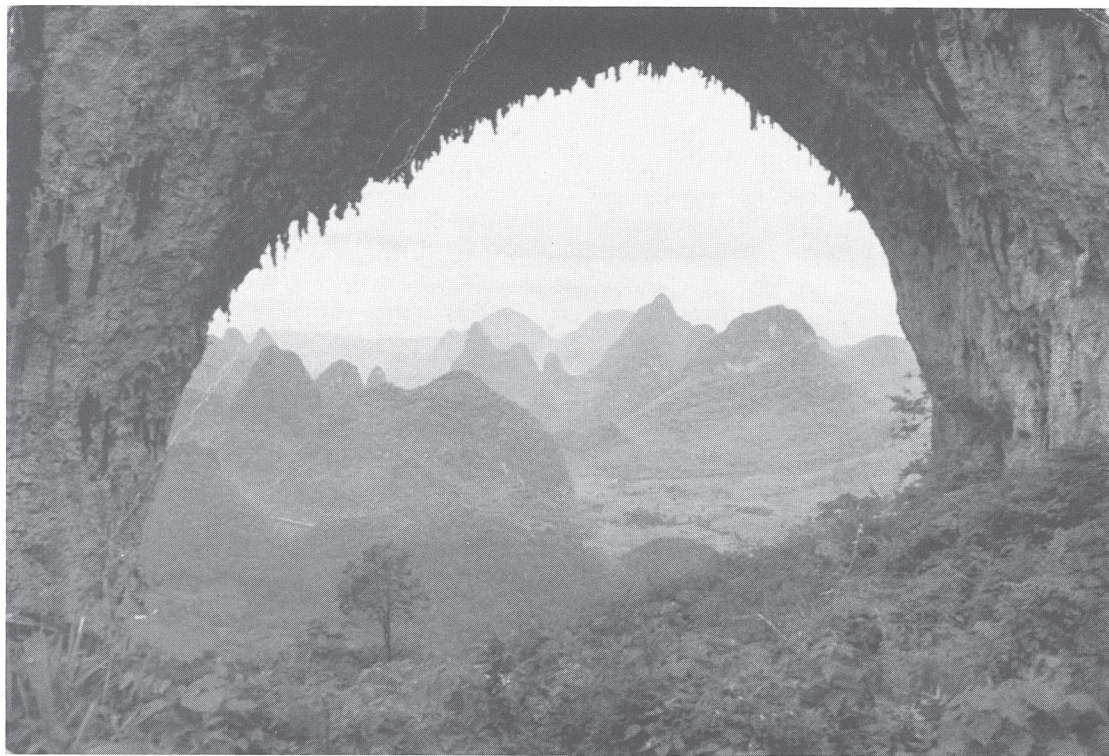
Now warmed up, I had my second wind. Since I couldn't see much at all, I turned out my light. Climbing in the dark, I felt confident and knew I could make it to the

top. Water droplets began hitting my helmet. I leaned back. It was refreshing. As I continued climbing, my helmet crashed into something. I turned on my light to find it was the wall of the pit. I was about 30' from the top. I called out to Kathy to bring me another ascender. As my head cleared the edge, I saw Kathy's boots and the cameraman filming my struggle. Ha! I made it! As soon as I was off rope, I got some munchies. Soon after that we started carrying gear out of the cave.

The last two cavers were finally at the top. The camera crew had left the cave, but had left their tripod behind.

While some of us were busy removing gear from the cave, Kathy and one of the other cavers got to "bounce the pit." They explored for a little while and then headed back up the rope. Kathy is a good climber. She teaches rope rescue, climbs a lot of water towers and, since then, has been to the bottom of Fantastic Pit three times.

This caving trip was a fabulous experience for us. We got to see and tour PMI, a rope manufacturer, where we were able to see the rope machines at work and meet some of the people there. Since then, I have been able to get our son, Keith, involved in caving. He enjoys it. Thanks to W.U.S.S.



Moon Hill, China



A Lechuguilla Cave Experience

by

Horton H. Hobbs III, NSS 12386 Re,Fe

As I backed off the edge of the upper rig point of the entrance pit, the rope moved slowly through the break bars even though a much too heavy pack was tethered to the rack and hung just below my feet. I removed the bottom bar, spread the remaining ones, and began the smooth descent into darkness. It was 10:00 A.M. on this warm October morning and I was the third of four cavers to leave behind the sunny and colorful desert setting of southeastern New Mexico to enter Lechuguilla Cave (Fig. 1).

During the previous few days about 20 people had converged at the Cave Research Foundation Hut at Carlsbad Caverns National Park for a three-day (12-14 October 1991) biological expedition into Lechuguilla. Four teams of four (actually one team had five members) entered the cave at staggered time intervals to conduct studies in various parts of the cave. One group went into the Western Borehole, another into the Eastern Branch, a third spent about 30 hours working in the front sections of the cave setting and later checking pit-fall traps, and we headed for the Southwestern Branch (see Fig 2).

The team I was with was comprised of Dick Desjardins of Albuquerque, NM and Andy Messer and Larry Sturdivant, both from Tuscon, AZ. Specifically we were taking numerous samples of microorganisms (bacteria and fungi), pulling SEM plates that had been placed in pools to determine if/what kinds of microorganisms live there, taking water samples, sampling corrosion residues, measuring temperature and pH of pools, gathering relative humidity data, accessing hair and lint accumulations, and searching for macroorganisms, particularly in bodies of water. This was a study supported in part by funds from The National Park Service awarded to Diana Northup of The University of New Mexico. Spores of histoplasmosis had been found previously in the entrance area and, for liability purposes, the University required that a mask filter be worn by everyone (Fig. 3) on the expedition in the front sections of the cave (not used on exploration/survey expeditions).

Our team was scheduled first to enter the cave and the trip began at 8:45 A.M. with an 8km (5mi) drive on the Scenic Loop Road in Carlsbad Caverns National Park. A 4-wheel drive turn-off midway through the loop led up Walnut Canyon to a pullover area where the vehicle was left behind and the trailhead of Lechuguilla Canyon began. A hike of approximately one mile in desert terrain (Fig. 4) brought us to the top of a ridge that overlooked the entrance and ultimately brought us to the pit. The previous afternoon we had made the same journey to rig the entrance drop and had yo-yoed it. While on the bottom and prior to ascending the 24m (80 ft) pitch we marveled

at the unbelievably loud roar that was heard from below as wind escaped the metal culvert that had been placed as a gate and to shore up the passage leading to the remaining cave. The stentorian wind sounded like an immense river flowing beneath us and certainly hinted that BIG CAVE was on the other side of the culvert.

On this day though, as the floor of the pit loomed into view, I could not hear the wind and realized that we had entered the cave during the low or calm end of the blow cycle. I reached the floor, derigged, adjusted my mask, and continued down a dusty slope that led to a narrow, vertical fissure. As I headed into the slot I sounded like a sick furnace. Breathing through the filter was a nuisance but the mask really did not interfere greatly. At the bottom of the fissure the low passage turned to the left and I saw Dick and Andy opening the cap to the culvert; Larry was right behind me. One by one we entered the nearly vertical pipe feet first, pulled our packs in on top of us, and climbed down (Fig. 3). At the bottom a strange note awaited us: "Beware of rattlesnake at top of culvert." Evidently snakes occasionally try caving in Lechuguilla! We continued down the well-trodden passage, removing our masks at the prescribed point and passing such features as the Liberty Bell, the roped flowstone slope at the bottom of Wooden Lettuce Passage (=Wouldn't Let Us - that's another story!), and Lake Lechuguilla which was at least one meter above "normal" level. Being accustomed to caving in the east and midwest it seemed strange to be underground in shorts and T-shirts and having sweat pour off of us (20 degrees C = 68 degrees F and 100% humidity).

At the top of Boulder Falls I left behind a small pack with a snack and some water (a welcome sight on our return trip). Boulder Falls is a shaft produced by rising waters and thus does not have vertical walls; rather, it exhibits very irregular sides and a quite smooth, curved ceiling. After gazing at the contours above and blackness below, we rappelled down the 46 meter (150 ft) drop that opened into the Colorado Room. There each of us left our racks and a little food and one liter of water. After spending some time looking for terrestrial invertebrates (e.g., crickets) a steep downclimb led us to Rim City, a beautiful area with many gypsum "rims" and "com-modes." We continued in an easterly direction to Glacier Bay. Lechuguilla Cave contains more gypsum than any other known cave in the world and this began to be apparent as we entered this area. Massive blocks coated with gypsum and resembling icebergs, numerous crevasses, and drip pits dominated this immense room. We worked our way down the front side of these deposits

and ultimately came to a relatively small passage called WindyCity. When the cave is blowing, air moves through this corridor at high velocities and the meter-long flagging tapes attached to the ceiling fly almost horizontally! We were not so lucky to arrive when the wind was at its peak. Here too, we saw a number of small hydromagnesite balloons, rare hydrated magnesium carbonate speleothems indicative of dolomite bedrock.

We continued on through a part of Sugar Lands and then reached the Rift, a deep, narrow, north-south oriented passage that is developed along a minor fault and leads to the major parts of the cave. We took the Rift Overpass, now heading south, and made a number of exposed traverses (e.g., Hang Ass Traverse, Freak-Out Traverse, Captain Hooks Traverse), always attached to safety lines (Fig. 5). A nuisance section of constricted passages made the E-F Junction a welcome relief stop.

A little over three hours had passed since we had seen blue sky on this Saturday morning and we were not to view it again until Tuesday morning. We had been moving slowly looking for organisms as well as gawking at the scenery, not to mention the 40+ pound packs on our backs. The break was over and we pressed on down the gypsum coated surfaces of F Survey; I really felt as if I were walking in snow. The path was narrow and well marked by flagging tape; hopefully conservative caving will continue to be the rule as the cave is further explored.

We entered a mazy section and remained in horizontal, gypsum-coated passages, although constantly up and down, for some distance. The cave abruptly changed and we descended into a low, steeply sloping fissure. It was a tortuous section coated with aragonite crystals and the pack made it that much more difficult to maneuver. I had to stay on my side to clip into the rope and slowly worked my way down, losing clothing fabric and skin as well. The rope was particularly dirty and thus the rappell very slow. Having to feed rope through a Figure 8 and being wedged into a slot that is trying to eat you is an interesting experience! Finally the tight section was passed and I could put my feet on relatively solid ground. A narrow section led to what appeared to be the end of the horizontal passage. A precipitous cliff and gypsum bridge (Fig. 6) overlooked clear, bluish-green pools rimmed with masses of white gypsum; however, that was not our route. The way continued at this level around a corner along a narrow gypsum ledge. I hooked my Jumar to a safety line and moved out, feeling the weight of the pack trying to pull me off the wall. A reasonable hand hold (in gypsum - not always dependable) remained secure and the traverse was behind me. I unclipped and immediately hooked into another rope and moved through a beautiful aragonite tunnel where I changed ropes and went down an ornate section of aragonite and flowstone and stood finally at the edge of Lake Lebarge. I had seen pictures of the lake but was unprepared for what lay before me. The high-ceiling chamber and shallow, clear, blue-green lake surrounded by aragonite-coated walls and flowstone were simply overwhelming!

We traversed the perimeter of the lake (Fig. 7) and continued through aragonite bushes and soon reached

Lake Chandalar. Although smaller than Lake Lebarge, the dark blue-green waters overhung by surficial calcite cantilevers denoted the 2m+ depth of part of this pool (Fig. 8). In the ceiling above the lake was a gaping hole and an immense flowstone deposit clung to the wall. Here we filled our water bottles (Fig 9). This would be our last major watering hole until we reached Underground Atlanta, our destination for the day.

From the lake we looked southwest in awe at Lebarge Borehole (Fig. 10), a massive gypsum corridor glowing white as it beckoned us further into the cave. We headed into this remarkable gallery and continuously clambered up and down pure white gypsum-coated passages, sometimes crawling, always gaining and then losing altitude. Soon we came to the Yellow Brick Road, a passage floored with yellow calcite and with gypsum covering both ceiling and walls. This led to Tinseltown where we entered a complex boneyard maze (named because passages resemble a magnified view of the inside of bone tissue; also often compared to Swiss Cheese). This was a particularly demanding section because heavy packs had to be raised, lowered, and passed from one person to another as we slowly made progress. Finally we worked our way to the Chandelier Camp where we would sleep the following day. We rested and unloaded some gear we would not need until tomorrow. We still had a considerable workout facing us in order to reach our camp and so we continued our journey into the cave. We climbed up out of the camp area and almost immediately entered the Chandelier Ballroom, a 100m-long room with gypsum stalactites (chandeliers) up to six meters long, hanging from the ceiling and walls (Figs. 11, 12, and front cover). These speleothems have become the trademark of Lechuguilla Cave and, although are known from a few other caves in the world, are truly remarkable crystals that surpass all others in size and beauty.

With much regret, we hurried through the Ballroom and began the sometimes exposed climb to Prickly Ice Cube Room, one of the largest chambers in the cave. Not only does it sparkle with aragonite crystals but it contains massive gypsum glaciers. A steep walk carries one through aragonite bushes and everywhere it appears to have "snowed." We moved up through See-Saw Canyon and arrived at the base of a cliff from which hung a rope.

A vertical climb of 7m (20 ft) led to a steeply sloped section and I continued up, tethered by a Jumar safety. The steep climb lured me to the end of the rope where I transferred to another and proceeded up and up. At the end of the second rope we passed through a series of up and down climbs, always connected to main lines and finally a 5m vertical climb brought us to a large chamber. Here we worked our way along the left wall and after a series of up and down climbs we came to a balcony overlooking the room. By peering across this expanse we could barely see a rope hanging from a large, dark opening at the top of the far wall, our route to Underground Atlanta. We climbed down over flowstone and aragonite-covered boulders and made our way to the base of the cliff. One by one we ascended the fixed line to the top of the pitch (Fig. 13), derigged, and climbed up along some

exposed areas. A particularly "airy" traverse and one last short roped ascent led us to Underground Atlanta. This part of the cave is characterized by numerous large and unusually tapered stalagmites and has the deepest pit in the cave which drops 82m (300 ft) down to the Chicken Little Room. We skirted around the funnel top of the pit and worked our way up to Underground Atlanta camp. Here we unpacked our gear and heated water (Fig. 14) for a meal of assorted freeze-dried foods, bagels, and soups. We ended the "day" by filling our water bottles from a small pool not far from camp and bedded down for the night in as comfortable a spot as each of us could find. The camp was a large, relatively flat area (Fig. 15) and once we had ceased the rigorous activity of the day we began to cool rapidly. Even though the air temperature of the cave remains roughly 20 degrees C, with decreased activity a chill begins to set in fairly quickly. I slept in a thin nylon sleeping bag liner on a small Thermarest pad, wearing polypro underwear and gloves, wool socks, and a lightweight balaclava. We finally turned in at about 12:45 A.M. after a truly great day of caving.

I figured that I would retrace our steps during many dreams but I slept soundly until around 4:15 A.M. when I awoke a little chilled. I slept fitfully until 7:50 A.M. when the others began to stir. We were slow to get going and after taking care of a few personal needs and inhaling a breakfast of oatmeal it was 9:45 A.M. before we packed scientific gear and left camp. A short walk led us to the pool where we filled our water bottles the previous night. Above the pool was a large wall of flowstone; here we stopped and removed our boots and socks and began a delicate climb using a safety line. The rope brought us to the top of the flowstone and to a view of one of the most spectacular rooms in Lechuguilla Cave: Tower Place. Columns, flowstone, stalagmites, pools, and draperies dominate this beautiful upper level gallery (Fig. 16). Dark Star Column, up to 15m high, is the largest known dripstone in Lechuguilla Cave and in many ways is comparable in size to stalagmites in Carlsbad Caverns. It was tempting to spend hours looking at this exquisite grotto but we had much work to do. For an hour or so we gathered data or attempted to collect samples (Fig. 17) from the beautiful blue-green Tower Place Pool (problems with SEM vials forced us to abort one of our prescribed tasks). Once our work was completed we took one last look at the speleothems and pools and gingerly crossed the dripstone floor (Fig. 18) to the safety rope. Carefully, with bare feet exposed, we made our way down the flowstone mass, donned our socks and shoes, and were soon back at camp. Packs were filled to capacity and by 12:10 P.M. we were on our way for our return to the Chandelier Ballroom. Before leaving Underground Atlanta we located the entrance to Crystal Rain Passage since Andy and Larry would have to visit this part of the cave on an upcoming trip.

We descended two rope pitches and far too quickly had left behind Tower Place and Underground Atlanta. We retraced our steps of the previous day, either climbing or following numerous ropes into the darkness below. On the way through Prickly Ice Cube Room we took a short detour to see Dilithium Pool with its spectacular,

transparent, subaqueous, selenite crystals. We continued our descent through the Prickly Ice Cube Room gawking at the profusion of aragonite crystals and making a few exposed climbdowns. By 2:45 P.M. we had reached the Chandelier Ballroom. Here we took a number of fungus samples from the old Ballroom camp and then went to a high point in the room and took a lunch break (Fig. 19). Needless to say, the scenery for a picnic was stupendous!

After a snack and a few pictures, we left the Ballroom at 4:45 P.M. for the region of Lechuguilla called The Voids. To get to this area we walked carefully by numerous large, pendant chandeliers always in awe of our surroundings (Figs. 20, 21, 22). We turned down a well trodden and well flagged path and gingerly moved through an area famous for elongate gypsum hair speleothems. Some are nearly 1m long and they are reported to sway in the breezes created by movements; obviously we traveled very carefully through this delicate section. Many of the areas beyond were covered totally by gypsum and numerous dense gypsum formations resembled Lilliputian villages (Fig. 23, 24). We traversed a narrow ledge and headed into the Land of the Lost, well named because of the maze of passages. We worked our way through many junctions and headed down steep slopes of corrosive residue where we gathered several pounds of the "soil" for subsequent analysis. We retraced our steps (and crawls) and then headed into the FUZ survey to Big Sky Country. We collected a number of samples at FUZ Pool and then worked our way back through the myriad of passages and arrived at the Chandelier Camp at 7:10 P.M. We picked out fairly flat areas for sleeping, gathered the gear that had been left in the camp during our previous days' stop over, and consumed various foods (I ate broccoli soup, bagels, and chicken). It had been another long and tiring day and everyone was ready for a good nights sleep. I read for a while and turned in around 9:00 P.M.

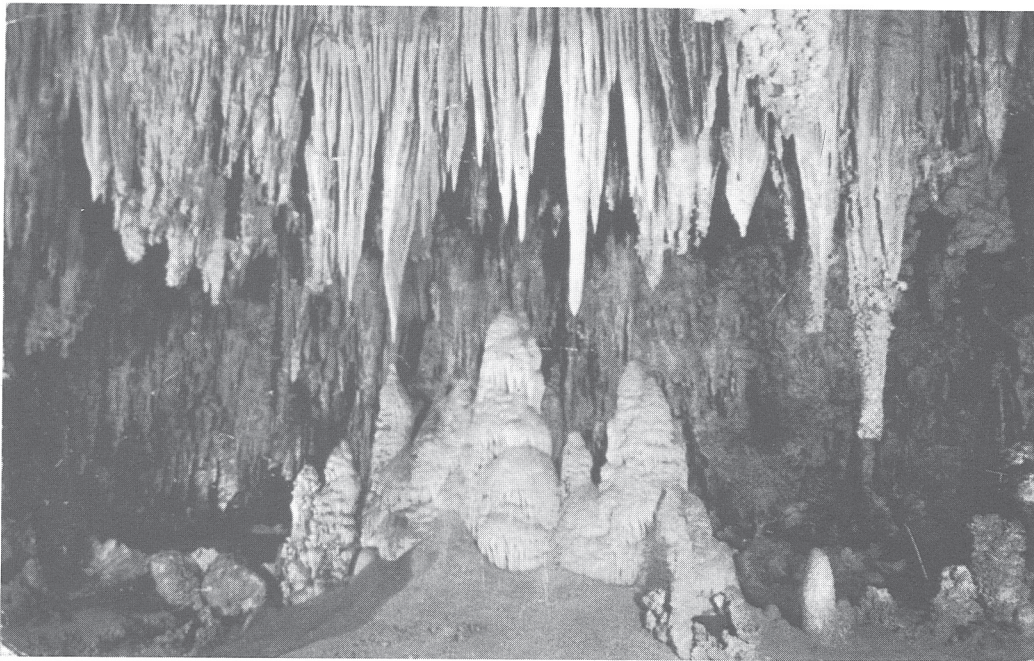
After eight hours of deep sleep we rolled out and prepared breakfast. We all seemed to be moving slowly but we packed and left the camp for a return to The Voids in search of the Voids Overlook Pool. We spent most of the time looking at many passages but did not locate the pool and, somewhat frustrated at being unable to find it (but happy that we had seen this section of the cave), we began the trek back to camp. We passed a science team sleeping in the area below Chandelier Ballroom and arrived at camp for the final time shortly after 10:30 A.M. We gathered all the gear and climbed out of the Ballroom via a different route than we had entered: the Discovery Route, the passage through which this area of the cave was first located. As we climbed up we stopped at a small room floored with breakdown. Instead of continuing up the Discovery Route we climbed through a window and headed into the Land of Awes. We scampered down large boulders (the ancient remains of a bat was well preserved on one rock) and made our way to Briney Pool (Gorilla Piss Pool), an area where very tiny hydromagnesite balloons cover the surface of the rocks. This was a particularly sensitive area and we very carefully collected samples from the pool and retraced our steps upward to return

to the Discovery Route around noon. We ascended the fixed line and soon were again in familiar territory, having reentered Tinsel Town Maze last seen two days previously. With heavy packs continually passed from one person to another we slowly made our way up and down and finally arrived at the beginning of the Yellow Brick Road. We had lunch and by 12:45 P.M. left for Lakes Lebarge and Chandelar. Within twenty minutes we arrived at Lake Lebarge where we left our large packs and returned to Lake Chandelar, collected samples, and took a little time out for a few photographic shots of the lake and Lebarge Borehole. We returned to Lake Lebarge where Dick and I remained to take samples and Andy and Larry started up rope on their way to Boulder Falls.

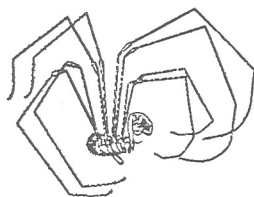
By 3:10 P.M. Dick and I were beginning the climb up many ropes, leaving behind some of the most spectacular cave passages I have ever seen. By 4:15 P.M. we reached E-F Junction where we took a welcome break; the gear, water and soil samples, our own wastes, and much sweat made the packs feel as though they were stuffed with lead. We began the series of traverses, took the Rift Overpass, and retraced our steps through Sugar Lands, Windy City, and climbed huffing and sweating into Glacier Bay. As we passed through Rim City and came into the Colorado Room below Boulder Falls we could hear Andy and Larry as they prepared to ascend the 46m fixed line. We snacked and gathered the gear that we had left at

the bottom of the drop. Andy began the ascent and fired several flashes as we attempted to photograph this immense chamber (Fig. 25). Upon reaching the top, water that had been stashed at the top of Boulder Falls was a welcome sight and after guzzling the precious liquid we headed for the entrance. Up flowstone and mud-coated rock we trodded with mixed emotions. All too soon we arrived at our masks and made the final climbs huffing through the filters. One of the most difficult parts of the entire trip was climbing through the culvert, pushing the heavy pack up rung by rung, and then wrestling off the cap to the pipe. The nuisance slot was then negotiated and we stood at the bottom of the entrance drop. With two ropes rigged it did not take long for all of us to climb out of the cave. What a sight it was while ascending the rope to see the clear night sky with a new moon shining down on us. By 9:15 P.M. Andy, Dick, Larry, and I stood at the top of the entrance drop in the desert cool air and shook hands as we reminisced the last 59+ hours in Lechuguilla Cave. What a trip — what a cave!!

Note: For an excellent account of Lechuguilla Cave, see the 1991 publication edited by Michael Ray Taylor, *Lechuguilla: Jewel of the Underground*, Speleo Projects, Caving Publications International, Therwilerstrasse 43, CH-4054, Basel, Switzerland (ISBN 0-909158-55-2).



King's Palace, Carlsbad Caverns National Park, New Mexico



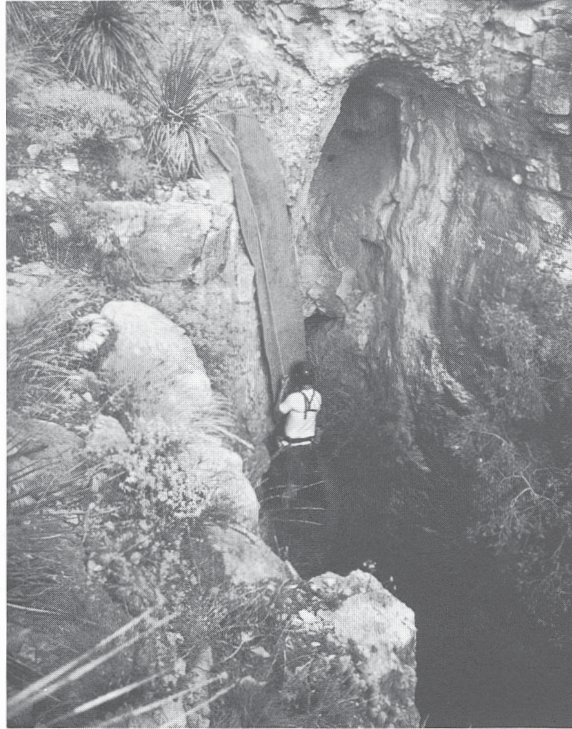


Figure 1. Rappelling the 24m entrance drop.

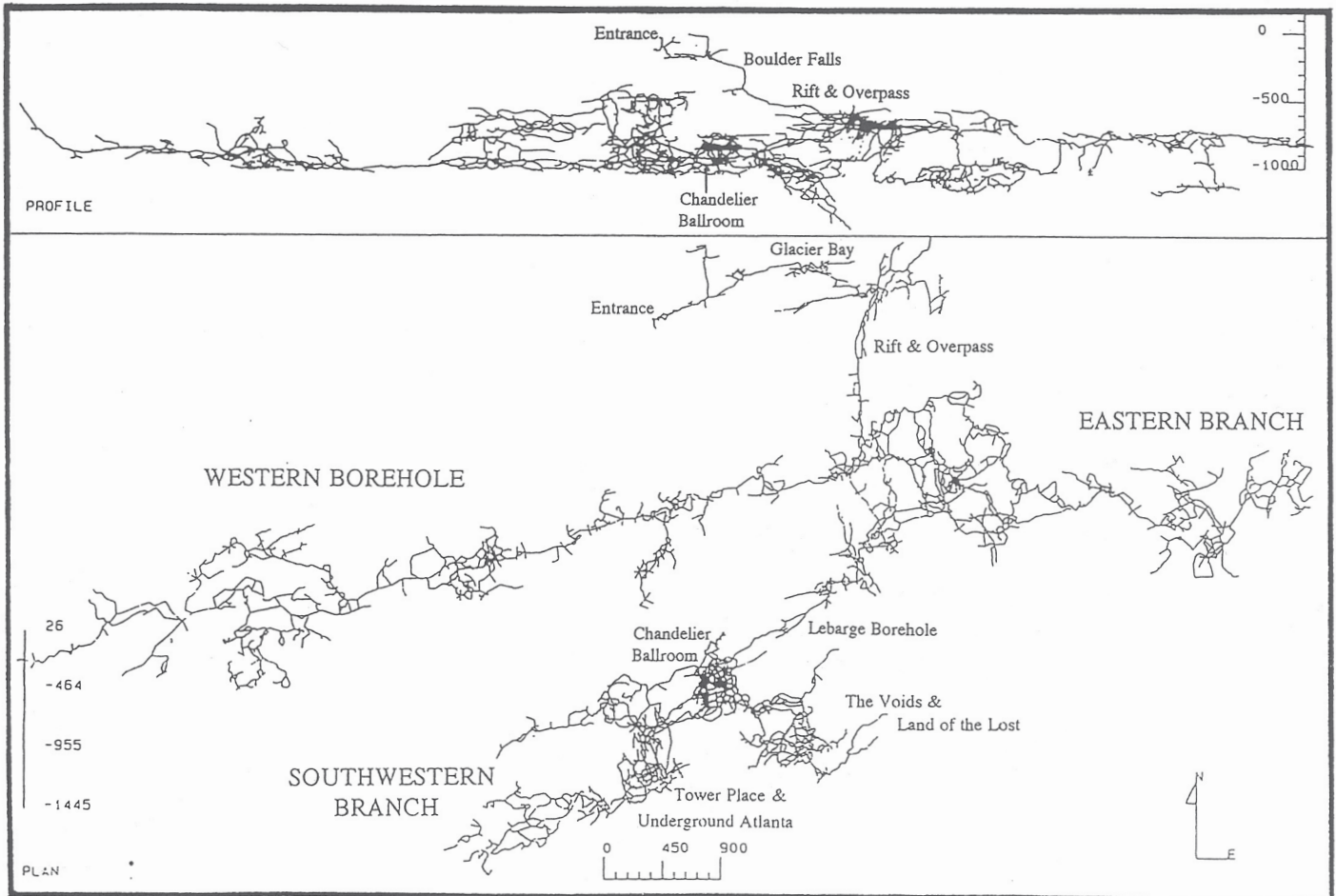


Figure 2. Map of Lechuguilla Cave; modified from Kambesis 1989 [NSS News, 47(12)302].



Figure 3. Andy Messer heading down the culvert wearing mask with filters.



Figure 4. Hike to the entrance.



Figure 5. Hooked to safety line on one of many traverses.

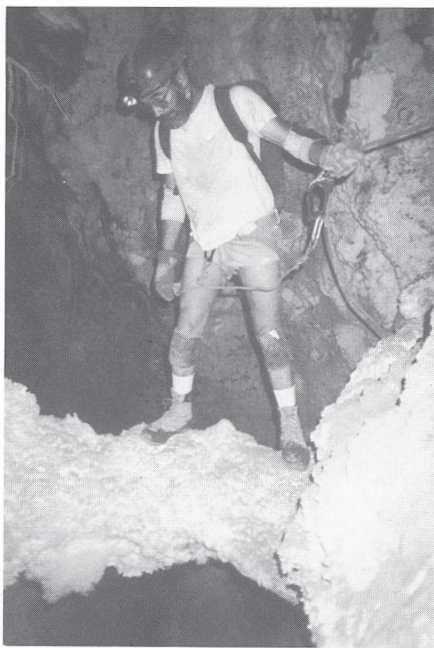


Figure 6. Dick Desjardins on gypsum bridge peering into darkness below.

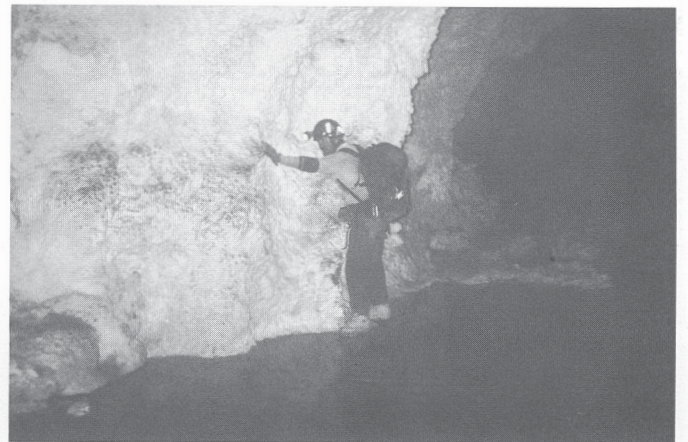


Figure 7. Lake Lebarge traverse (note hand marks on white gypsum-coated walls).

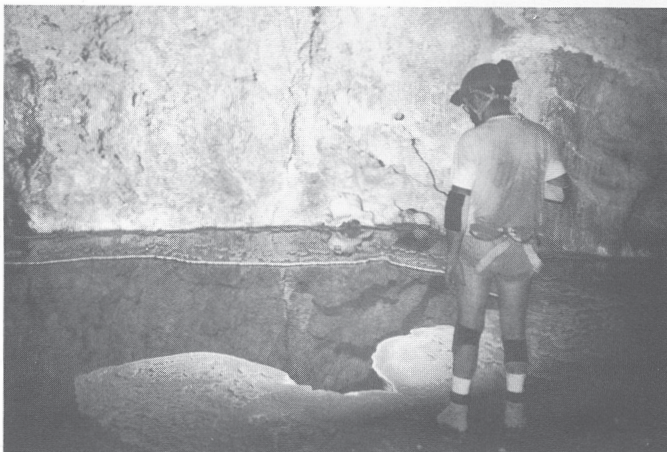


Figure 8. Lake Chandalar.

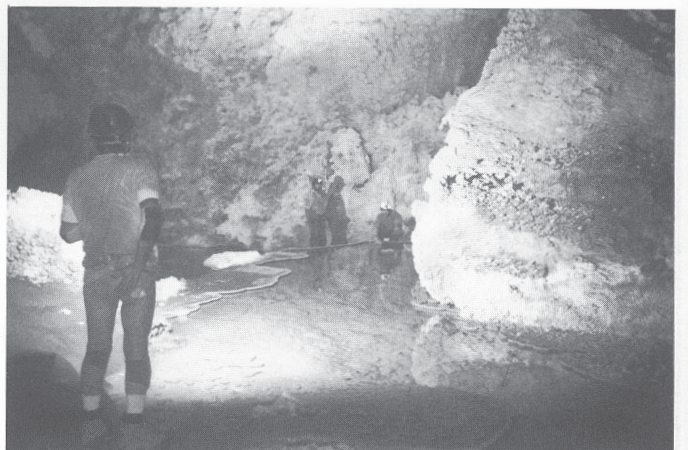


Figure 9. Filling water bottles at Lake Chandalar.



Figure 10. View into Lebarge Borehole.

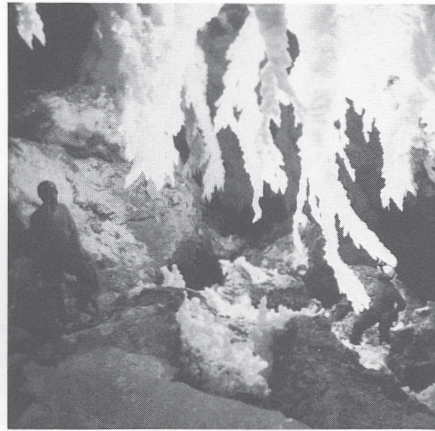


Figure 11. Profusion of chandeliers in the Chandelier Ballroom.

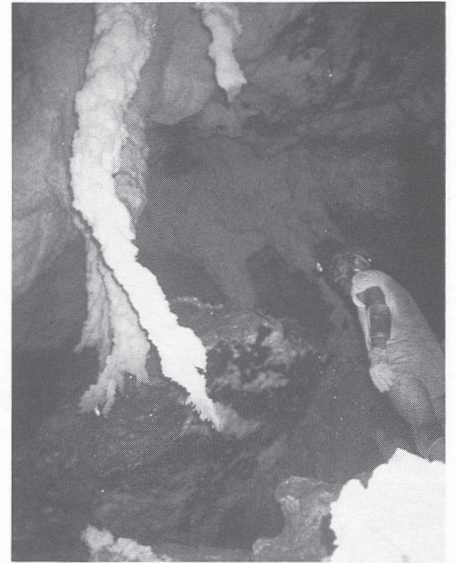


Figure 12. Chandeliers pendant from walls of the Chandelier Ballroom.

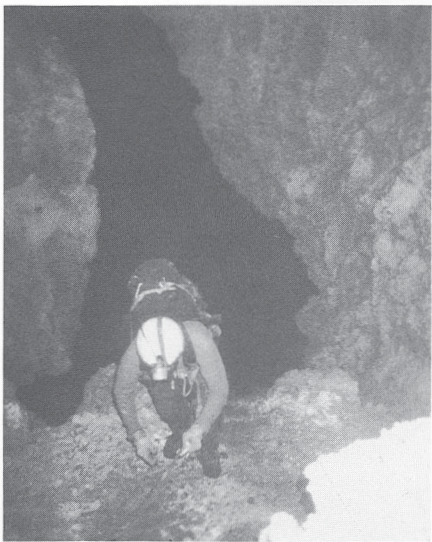


Figure 13. Larry Sturdivant ascending a fixed rope near Underground Atlanta.



Figure 14. Cooking at Underground Atlanta camp.



Figure 15. Preparing to sleep at Underground Atlanta camp.

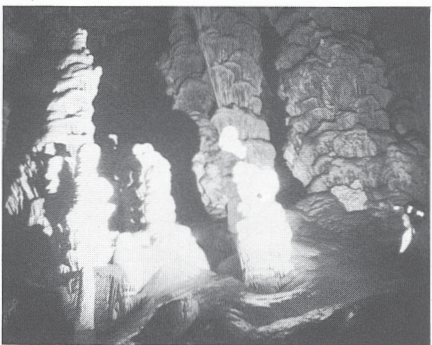


Figure 16. Massive speleothems in Tower Place.



Figure 17. Collecting water samples at Tower Place Pool.

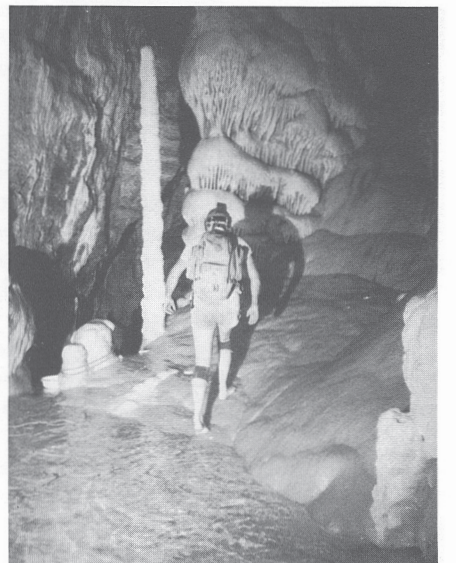


Figure 18. Barefooted in Tower Place.

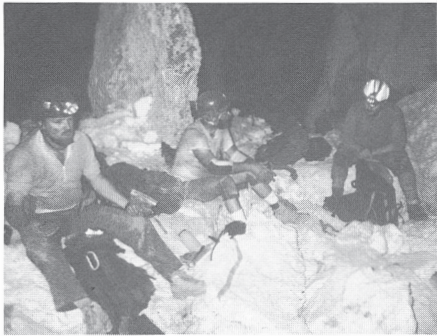


Figure 19. Lunch in the Chandelier Ballroom.



Figure 22. Leaving the Chandelier Ballroom for The Voids.



Figure 23. Walking through Lilliputian gypsum villages in The Voids.



Figure 20. Gypsum chandelier in the Chandelier Ballroom.

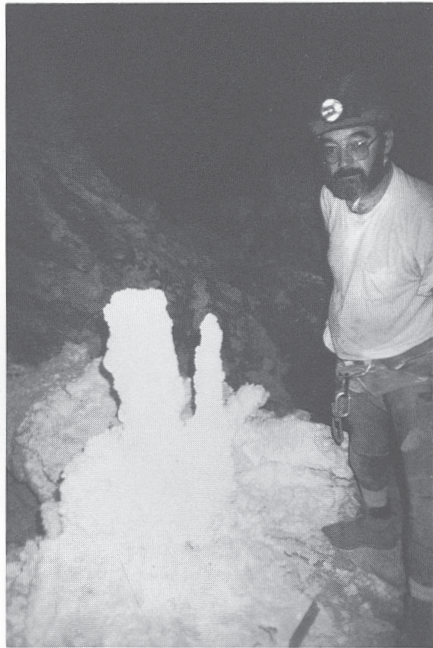


Figure 24. Massive gypsum in The Voids.

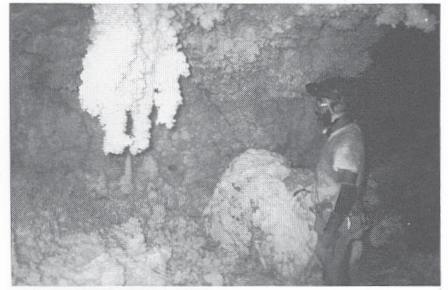
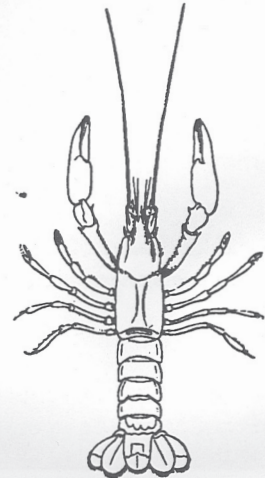


Figure 21. Gypsum crystals hanging in the Chandelier Ballroom.



Figure 25. Andy Messer climbing fixed line at Boulder Falls (note large pack hanging below him).



Three Days In A Cave

by
Bradly Wade Bond

I am happiest when I am in a cave. When I am in a cave, I look around at all of the stalactites. It's fun in a cave because you crawl and most of all you get dirty. You bring little snacks to eat. You also bring water. When you go caving you need lights, a helmet, food, water and special clothing.

Story's Characters:

HoweredA little boy
FrankeyA little boy
ChelsyA little smart aleck girl
BlummerHowered's dog
FiretailFrankey's cat
AllinThe school bully
ClairabellA smart little girl that likes Frankey
MomFrankey's mom
DadFrankey's dad

Chapter 1

One bright early morning Frankey woke up tired. He and his dad had stayed up all night playing cards. Suddenly Frankey's mom yelled, "Get up Frankey!" He rushed into the kitchen because, as always, Frankey was hungry. Mom was cooking gravy and biscuits for breakfast. Dad, Mom and Frankey sat down and ate until there wasn't a bite left.

When they were done eating, Frankey took care of the animals. He threw corn to the chickens and pigs and gave hay to the horse and the sheep. After that Frankey walked to school.

Chapter 2

On the way to school Frankey caught up with Howered, his best friend. They walked to school together.

"We have to take a spelling test today," said Frankey.

"I know. I studied. Did you study too?" asked Howered.

"Yes, I did," said Frankey.

They were at school so they couldn't talk anymore. Howered earned money by ringing the church bell every school morning.

The class took their spelling test. Howered got a 92 and Frankey got a 96.

After school Frankey and Howered usually walked to the creek and fished, but today they wanted to check out a cave they had found.

Chapter 3

Frankey and Howered walked into the cave. They had been going there for about a week. It was dark and damp in the cave. It was Friday so Howered and Frankey planned on staying in the cave all night. They hurried to Frankey's house to get everything they'd need to stay in the cave.

Howered started to name the things on their list. He named off four flashlights, two sleeping bags, a lantern, wood, water, lots of food, Howered's dog Blummer and Frankey's cat Firetail. By the time they left Frankey's house and walked to the cave it was dark. They turned on the lantern and set up camp. Frankey and Howered made a little fire and roasted hotdogs. When they were done, they fell asleep.

Chapter 4

Frankey and Howered woke up during the night when they heard a noise. It was the school bully Allin. He had heard Frankey and Howered talking at school and wanted to pick on them. Allin was messing around with the lantern. Frankey sat up and let out a wildcat scream. Allin was scared. He ran away as hard as he could run. Frankey and Howered went back to sleep.

When Frankey and Howered woke up, it was a bright, sunny morning. But their morning was ruined because Chelsy and Clairabell tried to kiss him.

Finally, the two boys could go into the cave. They were going to take their sleeping bags, food, water, wood, flashlights and a lantern. Howered and Frankey were ready to start into the big and black cave opening.

Chapter 5

Frankey and Howered walked into the dark and wet cave. They were more scared than a bunch of girls with a snake. During the first few hours, Frankey and Howered walked in complete dark silence. Then they started to talk about what would happen to them. Frankey wondered if they'd get hurt by falling rocks or sliding down a drop-off. Howered wondered if they'd find some old bones or maybe some buried treasure. Frankey and Howered heard water dripping from the cave ceiling. They saw lots of stalactites and stalagmites.

Frankey and Howered had been walking in the cave a whole day and they were tired. They decided to rest and eat an apple. The two boys were so tired that they fell asleep with their dog and cat beside them.

Chapter 6

In the middle of the night Howered and Frankey were woken up by an awfully loud noise. A rock slide had blocked the cave entrance. Howered and Frankey were scared. They only wanted to stay one night in the cave but now they might never get out!

"Good thing we brought food," whispered Frankey.

"Yeah, because it'll take us a long time to dig out of here," said Howered.

So Howered and Frankey started to dig their way out. For hours they moved big rocks and little rocks. They threw dirt behind them. Howered and Frankey were covered with mud and dirt. Finally, they stopped and ate hotdogs.

Howered and Frankey dug a little longer and made a tiny hole not big enough for them to fit in. They decided to stop and sleep.

The boys had spent their second day in the cave digging their way out.

The next day Howered and Frankey woke up and got right to work. The boys dug out a little hole just big enough for a leg to fit in. Howered and Frankey dug and dug. Finally, they got a hole dug big enough for Frankey and Howered to squeeze through.

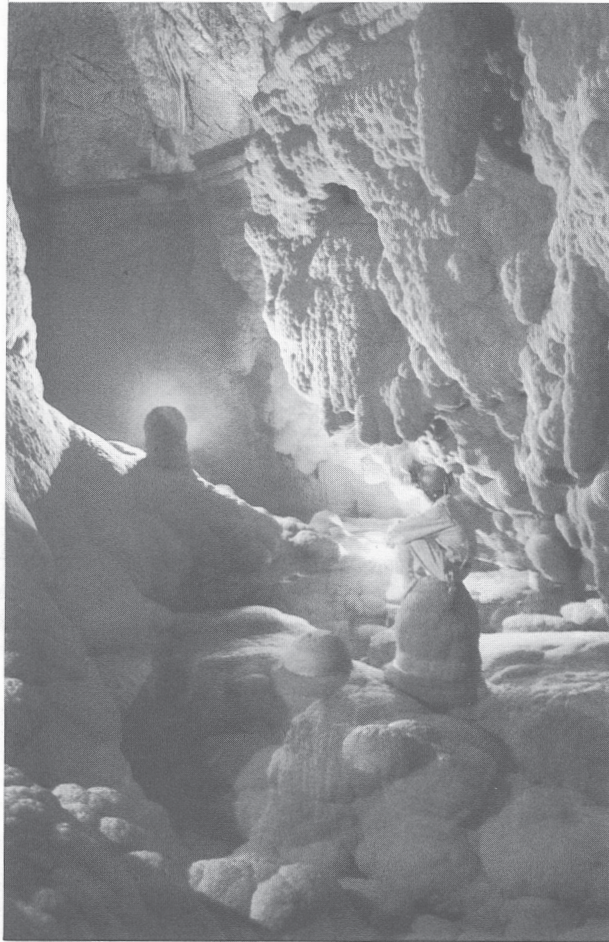
"That sure was a scary experience," said Frankey.

"Let's pack up and leave," Howered said.

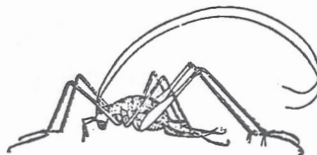
"Yeah, I'm glad Blummer and Firetail were with us. I liked having them with us."

Frankey, Howered, Blummer, and Firetail walked home. They could hardly wait to tell their moms and dads about their great adventure in their cave!

The End



Lechuguilla Cave. New Mexico.



Bats and Public Opinion

by
Annette Summers, NSS 31319

INTRODUCTION

Bats are mammals, belonging to the order Chiroptera, which means "hand-wing" in Latin. A bat's wing is supported largely by elongated fingers, which are joined by a tough, elastic wing membrane of flesh. These wings carry the bat everywhere it needs to go in search of food and shelter.

A Wittenberg student that I was discussing bats with remarked, "If you chop off their wings, they might be cute." I asked, "Why do you say that?" She replied with a shiver, "I think it's the wings that scare people. The wings scare me more than anything else about them." I smiled. She could be right. Another student commented, "I don't get along with bats . . . They're so ugly! They are just so damn ugly!" The appearance of the bat, or any creature for that matter, is very important. In result, the bat is a victim of his looks.

Through centuries of evolution, bats have developed wings that assist them in their sophisticated system of flight. Unfortunately, the wings are disliked by some humans. Yet, throughout history, the human race has desired to fly. However, prejudice towards bats does not end with their wings or appearance. By misinterpreting the facts, public opinion has turned these innocent creatures into frightening monsters. In addition, myths and folklore have created false images of bats, resulting in panic among different sectors of the population. In order to protect bats, people must become educated to the reality of their existence. People must learn to respect these creatures and view them as gentle, essential animals that share our world.

WHY ARE THERE SO MANY MISCONCEPTIONS?

A bat navigates with high-frequency sounds, using a technical process referred to as echolocation. The sound waves emitted from the bat bounce off objects and reflect back to its ears or facial features; this enables it to perceive anything but color. Barry Keller, a biologist at Idaho State University, describes echolocation as the ability to detect obstacles as fine as a human hair and, at the same time, determine the width, and change of location ("Mammalogy" 9). Keller suggests that, "if we can study the bat and improve on our radar systems, we can make our skies and waterways safer for everyone" (9). Dr. Merlin Tuttle, a leading bat authority and author of *America's Neighborhood Bats*, reiterates this idea by explaining that the sophistication of bats' unique echolocation systems exceed scientific understandings and "on a watt-per-watt,

ounce-per-ounce basis has been estimated to be literally billions of times more efficient than any similar system developed by humans" (9). Consequently, the common myth of a bat blundering into a woman's hairdo is false because of a bat's refined navigational system.

However, there is a cost for the bats' echolocation. Some bats ARE ugly. Bats have distinct facial features, depending largely on geographic location. According to Tuttle, most bats in the United States have small ears (9). Those in tropical rain forests, however, have "enormous ears, nose leaves, and intricate facial features;" these characteristics may "seem bizarre at first, but become more fascinating than strange" when their role in navigation is explained (9). The unattractive physical features of bats must be looked at as essential, rather than gross. Without these facial features, some bats would be incapable of flight.

Superstition of vampires, generated by fictional stories, Hollywood movies, and folklore, have also contributed to the fear of bats. Dracula, who was played by Bela Lugosi, is a classic example of a vampire myth. A vampire is any creature, living or dead (as in Dracula's situation), that requires blood from another creature to survive. Paul Barber, author of "The Real Vampire", traces the bat's emergence in vampire legends to a South American bat known to suck blood from cattle; it is the first bat to be given the name "vampire" (76). According to scientific knowledge, only three bats in the world have vampire characteristics. They are the common vampire bat, the white-winged vampire bat, and the hairy-legged vampire bat. Fortunately, they confine themselves to warm and tropical regions of the Western Hemisphere. Also, according to the authors of "Vampires: The Real Story," when the Europeans settled in these equatorial areas, the vampire bat population rose sharply. Vampire bats seldom attacked humans. Instead, they were known to prefer pets and cattle, which existed in abundance (Belwood 11). Vampire bats identify victims by odor, outward shape, and detection of radiated body heat. Perhaps the vampire bats thought that humans were too thin or cold, or even smelled too odd to risk taking a few drops of blood.

Blood from individual victims is relatively minute, but a vampire bat can drink up to or surpassing 40 milliliters per night from several different victims. Since a vampire bat weighs one to 1.2 ounces, this blood amounts to 132 percent of its body weight (Grzimek's 568). A bat begins its dinner by first licking a section of exposed flesh, thereby identifying its victim. Eventually, the bat bites into the skin. A vampire bat has less teeth than any other bat

and, oddly enough, its mouth is very tiny. Since no pain is detected, the victim never knew it was bitten. The vampire bat's tongue is shaped so that the bat can place the tip near the wound, while the blood flows down grooves into the bat's mouth. The whole feeding process lasts from eight to ten minutes. Rarely does a single bat bite cause death to any animal. However, growing populations of vampire bats in Latin America can generate problems for cattle ranchers. The bats tend to feed on particular herds, ultimately causing some cattle to die from constant feedings (Grzimek's 568).

Paul Barber, explaining the existence of bats in vampire legends, believes that the bat came into vampire fiction by a circuitous route. The discovery and naming of the Central and South American vampire bat and the correlation of the vampire in traditional myths in Europe blended the bat into fiction. Now, "the modern vampire is apt to transform himself into a bat and fly off to seek his victims" (77).

Interest in vampires has increased over the years. Author of *The Soft Whisper of the Dead*, Charles L. Grant, claims that vampires are the most favored of all the monsters, "they're the most dangerous . . . the most human. Their habitat is night and you can't tell who's a vampire and who's not. Everyone loves the vicarious danger" (Ramsland 33). As an example, during the seventies, the first soap opera dealing with the supernatural was introduced to television, "Dark Shadows," with Barnabas Collins as the main character. Barnabas was a suave and handsome vampire, creating a saga of a frustrated and reluctant monster who stalked the night searching for beautiful women. During January of 1991, the series was reintroduced to anticipating audiences. The horror of the new "Dark Shadows" included bats, witches, werewolves, zombies, vampires, ghosts, demons, and a few less classifiable misfits of society.

In "Hunger for the Marvelous: The Vampire Craze in the Computer Age," Katherine Ramsland attests to vampire popularity. She cites a discussion between a History professor at Middlebury College, and the director of the Vampire Research Center (33-34). She also uses references from books written about vampires by Anne Rice and movies, such as *Vampire's Kiss*, which deals with a young vampire's "coming of age" and introduction to vampire behavior (35). According to Ramsland, there seems to be a tremendous craze over vampires in recent years.

However, these myths are impacting the lives of the other bat species of the world, especially in North America. Three species of nectar-feeding bats, which inhabit the Mexican border of Arizona and Texas, and all other bats in the United States that are insectivorous are dying as a result of vampire legends taken to extreme (America's 51).

Bat Conservation International (BCI), an organization of scientists and concerned citizens dedicated to bat preservation, supports this idea. Founded in 1982 by Dr. Merlin Tuttle, BCI hopes that "when the shrouds of myth and superstition are stripped away, bats will be appreciated as fascinating and likable animals" (America's 51).

BCI reports that in Latin America "millions of beneficial bats—essential to rain forests—are destroyed each

year because people mistakenly assume all bats are vampires" ("They carry" n.p.). Vampire control programs contribute to the confusion between harmless bats and vampire bats. Such programs work toward limiting the vampire bat population. In Latin America, where both species exist, it is common to confuse the two; therefore, innocent bats are caught in the crossfire of misunderstanding and are killed. Such confusion is understandable. However, similar programs have been implemented in Texas and other southwestern states, where vampire bats do not exist. The result is the unnecessary death of many innocent bats.

Tuttle relates the tragic story of the Mexican Free-tail Bat. In 1963 they boasted the world's largest known bat colony: approximately 30 million insectivorous Mexican Free-tails lived in Eagle Creek Cave, Arizona. By 1970 the numbers were reduced to a mere 30,000, a 99.9 percent decline (51). Tuttle speculates on the reason for the disappearance, noting the existence of bullet shells along the hillside (51). Fear of bats is a valid explanation for the deaths. At quick glance, a Free-tail Bat could look like a Vampire Bat. A free-tail has large, sharp teeth and blood-thirsty eyes, especially when looked at with fear.

Even with our culture's fascination with vampires, which ultimately impacts bats, why are bats not liked? It seems that people generally do not believe in vampires, yet are still attracted to myths concerning them. Some people hate bats because they are real and cannot be forgotten by closing one's eyes or turning on a light, as is often done while watching a movie about vampires. According to Grzimek's Encyclopedia, bats are still looked at as "sinister, eerie, and demonic" (622). Bats are hunted down and killed out of ignorance and fear. The author continues: "Fear of bats perhaps is closely related to our instinctive fear of the dark, and before we had electric lights, bats no doubt had the appearance of demons" (622-623). The explanation is followed with a description from folklore of demons and dragons that have bats' wings. There is also an explanation from the Middle Ages, when bats were thought of as "witches birds that brought evil to life and home" (623). Although unfair, bats are disliked due to cultural myths and superstitions.

Bats are also detested because they are considered to be carriers of disease. Teresa Keenan, a former student at Wittenberg University, states, "Bats are no dirtier than any other mammal" (19), including humans. Bats can harbor fleas, mites, or ticks, but bat parasites are highly host specific, meaning they rarely bite people or pets. Bats groom themselves, also, so a chance of finding a parasite on a bat is uncommon.

Rabies generates yet another fear of bats. This issue is addressed by Dr. Merlin Tuttle and Dr. Denny Constantine, a public health veterinarian and one of the world's leading authorities on the health implications of rabies in bats. They believe that mistakes about rabies and bats are a result of poor research, performed 50 years ago. The faulty contention that bats are not affected by rabies and, therefore, can contract, carry and transfer the disease to other animals is a result of this research. After further investigation, bats were found that carried a Rio Bravo virus different from rabies, which is not harmful either to

bats or people (America's 18). Unfortunately, the Rio Bravo virus has proved fatal for mice tested with bat blood. Consequently, people believed the bats were rabid, because rabies and bats were all that was known at the time and dying mice meant something bad. After the discovery of this mistake, twenty years of dedicated and intensive research have eliminated an error that has already influenced the attitudes of many people.

Tuttle points out that the incidence of bats contracting rabies is infrequent: "Less than a half of one percent of bats contract rabies, a frequency no higher than that seen in many other animals" (18). Tuttle's book and the BCI brochure, "The Most Famous Bat in the World," both state that only ten people in the United States and Canada have contracted rabies from bats in the past four decades. In contrast, "more people die annually from dog attacks, food poisoning contracted at church picnics or even at the hands of their own spouses" ("The Most" n.p.).

Even though the chances of contracting rabies from bats are rare, Tuttle offers precautions in his book, *America's Neighborhood Bats*. Pet vaccination from rabies is first and primary. Secondly, grounded bats, or those lying out in open areas, are far more likely to be sick than hidden ones. One should leave grounded bats alone. In addition, those who are not educated in bat handling should not pick up a sick bat, because a sick bat could have rabies (21-22). Bats are shy creatures and do not ask for trouble. Humans should not pick up bats since a bat will bite in self-defense, similar to a scared dog.

Of all the reasons for misunderstanding bats, ignorance is the key component. Advice columnist, Ann Landers, illustrates such ignorance in a response to one of her readers. The reader wrote that he had been attacked by a fruit bat in Austin, Texas. As a result of his own panic and ignorance, he received tetanus and rabies shots, which led to an allergic reaction, leaving him blind and hearing-impaired ("BCI" 19). Although unfortunate, the event points to the widespread ignorance of people towards bats. Merlin Tuttle, in addition to other BCI members, has written Landers to explain the truth. They state that fruit bats have not existed in North America for at least 10,000 years and that it is likely that this "bat attack" is a misunderstanding taken to extremes. Landers continued writing incorrect information to the public in another response to a reader. The reaction from BCI was tremendous. Some members wrote her, giving her a free membership and deluging her in brochures about bats. She answered back that she had "no interest in joining a bat club" and that bats were still "not high on my hit parade." In reaction to the pamphlets, she simply said, "no more!" ("BCI" 19).

Daniel Lunney, author of "A Case for Bat Conservation," believes that ignorance of the importance of bats continues due to a lack of people interested in studying bats. He states: "Consequently, the lives of bats are less well known than are those of other mammals, and priorities for their conservation have not been established" (12). Lunney surveyed other researchers' and the public's opinions of dealing with bat conservation issues. The survey showed that scientists and the public valued the creation of a higher public profile through education over other

solutions. Lunney concludes: "We simply don't know enough about many bat species to make informed decisions on how best to protect them" (13). Through increased public awareness, perhaps bat popularity could increase.

WHAT CAN BE DONE FOR THE BAT?

Bats are the only true predators of night-flying insects. They pollinate flowers and disperse seeds in ecosystems from rain forests to deserts. Nearly one thousand different bat species, amounting to almost one fourth of all mammals, inhabit the earth. Bats also form the largest and most vulnerable colonies of any warm-blooded animal. Referring to an article in *Bats*, a quarterly BCI publication, the best example of a huge colony is the Eckert James River Bat Cave near Mason, Texas, where an estimated four million Mexican free-tails live (Morton 17).

The defenseless bats, whether at Eckert James or elsewhere need protection. If bats are not safeguarded, the entire global ecosystem could be greatly affected. Without bats, an overpopulation of insects would result in a great ecological disturbance. For example, North America's most abundant species, the Little Brown Bat is capable of capturing 600 mosquitoes in an hour. A colony of free-tails, such as the Eckert James' bats, can consume nearly a million pounds of mosquitoes in one night ("They carry" n.p.). If bats are destroyed, what will happen to all the insects?

The author of "A Home for Bats," examines the role of bats in preventing a mosquito population increase: Mosquitoes [suck our blood] . . . all the time. We retaliate by spraying the hell out of them, meanwhile suffering the toxic indignity of chemical residue leaching into the environment and eventually into our own tissues. Bats keep mosquitoes away . . . [s]o it makes terrific sense to let them do their thing, even to encourage it . . . ("A Home" 88). Bats, in other areas around the world, are the only seed dispersers and pollinators of many important fruits and tropical plants. BCI estimates that there are over 300 species of plants in developing countries that require bats for reproduction ("They carry" n.p.). Over 450 commercial products come from these plants; therefore, bats are crucial to economic systems. Some examples of these dependent plants are avocados, cashews, guavas, peaches, bananas, Tequila, Kapok for life preservers, and medicines.

Since bats are so essential to the human race, we should be fighting desperately for the protection of these creatures. Tuttle believes that "[w]e can no longer afford to neglect animals of vital ecological importance just because they don't initially appeal to our emotions. If people only understood bats, they would appreciate them as gentle and essential allies" ("They carry" n.p.).

Many things are being done for the bats around the world, but more work is needed. Since its founding in 1982, BCI has been alarmed at the severe decline of bat populations, despite its struggle for bat protection. BCI has implemented numerous programs to encourage bat conservation. Some of these programs include funding biological research, initiating conservation programs, sponsoring protective legislation, protecting bat populated

caves, banning pesticides, establishing land preservation for the purpose flying foxes, and instituting major educational campaigns. Despite these accomplishments of BCI, bats are continually killed due to ignorance, misunderstandings, and superstitious myths. More involvement in bat conservation is needed to prevent the destruction of bats.

CONCLUSION

Beliefs and ideas that affect the public's opinion of bat, seem endless. The bat's appearance, old and new vampire myths, superstitions formed in the Middle Ages, misconceptions about rabies, and ignorance are commonly held beliefs. Bats have evolved into the wonderful, gentle, essential creatures of flight. I only hope the world will soon appreciate them for their importance in our lives and the entire global community.

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I would like to thank the members of the Wittenberg University Speleological Society for their help in trying an educational campaign here at Wittenberg. We set aside the last week of February as an annual "Bat Awareness Week," hoping to inform the student body about bats. I felt we did get a small, but still significant response. People stopped at our information table in the Student Center to ask questions about what to do, or just to speak their mind about bats. We also hung bat houses on various trees around the campus. Hopefully, these houses will draw bats out of attics, where they are not wanted. Personally, I hope that even this little bit will drive away false perceptions and give the bats a better chance for survival.

For more information on bats and Bat Conservation International, write to: Bat Conservation International, P.O. Box 162603, Austin, TX 78716, or Bat Conservation Subcommittee, National Speleological Society, Inc., Cave Avenue, Huntsville, AL 35810.

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Everything You Want To Know On The Evolution Of Bat Flight, But Didn't Know What To Ask.

by
Timothy L. Lewis

Thewissen, J. G. M. and S.K. Babcock. 1992. The Origin of Flight in Bats. BioScience 42(5): 340-345.

Frequently the only nonhuman animals many of us observe in caves are bats. We all marvel at their ability to echo-locate, and who can't appreciate their incredible maneuverability in flight? But have you ever wondered about the evolution of those characteristics? Have you ever wondered whether you were more closely related to the larger fruit, flower, and nectar eating bats (the megabats) or to the smaller, generally insectivorous microbats? If so, don't miss "The origin of flight in bats" in the May issue of *BioScience* (Vol. 42 No. 5, pages 340-345) by J. G. M. Thewissen and S. K. Babcock. In their article, they review the arguments regarding the evolution of flight in bats, and the implications this has on bat taxonomy.

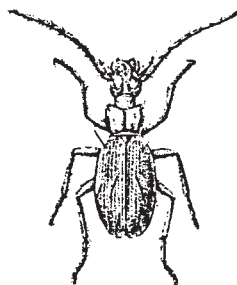
This rather technical article begins by explaining that, like birds, bats are poorly represented in the fossil record. Their fragile, lightweight bones do not often survive the rigors of fossilization. Therefore we cannot easily trace the ancestry of modern bats, and do not know if bats evolved flight just once and all bats came from this ancestor, or if they evolved at two separate times and are only superficially one group. This later option would require two independent evolutions of flight in bats.

Biologists currently recognize two major groups of bats, based on size, food habits, geographic distribution, and body shape or morphology. The microbats tend to eat

insects, use echo-location to secure prey, and inhabit the tropical and temperate regions. The megabats tend to locate food with their eyes, rely on plants for food, and live in the tropics. The megabat brains, especially their visual centers, are more similar to those of primates, leading some to suggest that the megabats evolved from a very early primate, quite apart from the microbats. This scenario would require that flight in the two groups of bats evolved independently, with gross similarities in their bodies the result of convergent evolution caused by the exacting demands placed on any organism that flies.

The article reviews several lines of morphological evidence. Flight muscle attachments in the megabats are compared to the microbats. The similarities would seem to indicate one common ancestor for all bats. Location of blood vessels and nerves in relation to the muscles also seem to indicate a common ancestor for all bats, perhaps the flying lemurs. The authors conclude that these similarities outweigh the differences in brain structure related to sight. This would imply a single evolutionary line for all bats.

I'll admit that I never considered this aspect of bat evolution before. It does illustrate how poorly we understand bats, and how closely related to us they may be. The definitive answer to this question will probably have to wait for DNA testing similar to that used by police to determine identity. Until then, this article should serve to further your knowledge of bats and their history.



Under Earth Day III

by

Mike K. Hood, NSS 24166L

The Indiana Karst Conservancy's (IKC) Under Earth Day III was held at Sullivan Cave, Indiana, on April 26, 1992. Representing W.U.S.S. were Scott Engle, Annette Summers, Jessica Hoane, Lynne Hay, and I. Each year, the IKC holds this event in conjunction with Earth Day. While many organizations are busy on Earth Day cleaning up the surface, cavers from throughout the midwest are busy removing trash and graffiti from the cave. We met the folks from C.I.G. at the Bloomington McDonalds and had a quick breakfast before following Scott Fee to the cave and gathering our cleaning supplies. After the majority of the cavers had arrived, we split up into many small groups and spread out to various parts of the cave.

Sullivan Cave is the third longest cave in Indiana with just under ten miles of surveyed passage and for many years was open to exploration. The cave has suffered many years of abuse and will take a number of years to clean thoroughly. The cave is now gated and controlled by the IKC. This has virtually stopped any further vandalism and the cave is slowly beginning to heal itself.

We entered the cave around 10:30 a.m. and went with Scott Fee and three others up the North Passage to the Quarry Room—stopping to mud paint graffiti along the way. We found that wire brushes didn't remove all the

spray paint and carbide, so we "mud-painted" by using paint brushes to spread mud over the writing. This technique works well and makes most vandalized areas look somewhat natural. It only took us 1 1/2 hours to reach the Quarry Room, where we found the cleanup from the year before was still in tact. It was decided that after a short lunch break, we would return to the Mountain Room and help clean there.

We arrived at the Mountain Room, where several groups were busily working and all of us staked out areas to clean. We gradually worked our way back up the entrance canyon to the Mountain Room and out into the main passage leading from the Back Breaker. Again, we staked out our little areas to work and finally called it quits a little way into the Back Breaker passage. We made a leisurely stroll down the Back Breaker and exited the cave around 3:00 PM.

While very little trash remained in Sullivan Cave, there were still many miles of passages with graffiti to clean—enough to keep volunteers busy for years to come. Sullivan is a fun cave to spend a day or two exploring; that's what makes its restoration worthwhile. I encourage everyone to lend a hand at Under Earth Day IV.



Evolution of a Caver

by

Annette Summers, NSS 31319

The world of hidden treasures,
Buried deep in secret darkness.
Ancient history of a place forgotten,
Modern progression,
Human development,
The finding.
Growing, learning, discovering;
A separate entity is ours.
To the entire world, unseen.
Our presence arrives,
Light and color beyond blackness.
Memories overspill,
Timeless, ageless, infinite;
We are one.
Exploration, salutation,
Existences forged.
Married becomes the beauty,
Combinations newly born;
We are one.
Art and music never knew,
The masters of our day;
A life, a force greater,
Truly more powerful in comparison.
Laughter, joy unveiled;
The cave,
The people;
We are one.

