



# THE SPELEOGRAPH

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Scaggs Cave Spider Gate

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## **Bats Are Going Through a Rare Evolutionary Phenomenon**

Published Apr 23, 2024 at 12:03 PM EDT TYRONE LAVERY

**Bats have been found to evolve into bigger sizes in exactly the same way in separate locations, in a very rare example of parallel evolution.**

It's so rare that it is the first time [parallel evolution](#) has been seen in real-time in mammal species. And it has only been seen in action a few times before, according to a [paper in the journal \*Evolution\*](#).

**The findings come from a study of several bats—some very small in stature, and others large—living in the same forested habitats on the Solomon Islands, in the middle of the Pacific Ocean.**

Two groups of larger bats were assumed to be the same species—known as fierce leaf-nosed bats or *Hipposideros dinops*—while the smaller bats were thought to all belong to a different species (*Hipposideros diadema*).



The smaller bat species *Hipposideros diadema*. These bats have been seen to undergo parallel evolution in real-time. TYRONE LAVERY

"We have two very different looking bats, a smaller species (*H. diadema*) and a larger species (*H. dinops*). The sizes are vastly different (nobody has ever confused the two as being the same species," paper co-author Dr. Tyrone Lavery, a researcher at the University of Melbourne, told *Newsweek*. "But when we sequenced their DNA, we found the difference between the two was very small (we normally wouldn't recognize them as two different species on the basis of their DNA). Second, the big bat had evolved more than once. Again, nobody had ever suspected anything other than there being just one species of bigger bat."

Now, it turns out, the larger bats may have evolved from the smaller bats in parallel to each other, and are actually separate species from one another.

Parallel evolution is a process where two species that are not necessarily closely related independently develop similar traits or features. This usually happens because these species face similar environmental challenges and selective pressures, leading them to evolve analogous solutions to adapt to their environments.

"Parallel evolution is when organisms evolve independently to arrive at similar endpoints. For example, Australia's thylacine and dingo evolved independently to look more or less similar, and fill similar roles in the environment. We would call that particular example convergent evolution, and it is relatively common," Lavery said.

Another example of parallel evolution can be seen in the development of similar body shapes and adaptations in aquatic animals like dolphins and [ichthyosaurs](#), despite them coming from very different evolutionary backgrounds, with one being a mammal and the other a reptile.

"Our research suggests the rapid and repeated evolution of larger-bodied bats from smaller bats, each happening independently on separate islands," Lavery said in a statement. "When we created family trees using the bats' DNA, we found that what we thought was just one species of large bat in the Solomon Islands was actually a case where bigger bats had evolved from the smaller species multiple times across different islands."

"Something very strong is pushing or selecting for these big bats, and it is strong enough for it to happen multiple times on different islands. We think these larger bats might be evolving to take advantage of prey that the smaller bats aren't eating. Although they could probably interbreed, they don't for some reason."

The larger bats on all the islands use a [lower frequency of sonar](#), indicating they are better suited to hunting larger prey, such as big insects or even frogs.



A comparison of the body sizes of the smaller *Hipposideros diadema* bat (right) and the larger *H. dinops* (left). The larger bats appear to be evolving from the smaller ones. TYRONE LAVERY

"Over time larger body size may have been part of behavioral and physical adaptations needed to hunt larger prey. This might mean the bigger and smaller bats no longer recognize each other as mates, and so they live separate lives," Lavery added. "We may think of evolution as a very slow process, but it can happen rapidly when the conditions are right and two groups are separated and stop interbreeding. They can begin to evolve on different pathways."

The researchers hope to investigate further to find out if this same process is occurring on other islands too.

"We plan to do more work on this group. First, we would like to see if this has happened more than twice in the Solomon Islands. There are other islands where large and small bats occur together that we haven't sampled yet. We would also like to test our hypothesis that it is diet that is driving the repeated evolution of large bats. That will involve using a technique called metabarcoding—again using DNA to test if they're eating different sized insects, or the big bats are switching from hunting insects to hunting vertebrates," he said.

# BUNCH CAVE

FIELD TRIP ---- FRIDAY, AUGUST 25, 1972

Called a "powder puff cave trip" by the greater dragons of LOCC's beastly membership, the field trip was designed as a "guys, wives, and everyone else" trip into the cave's of Hahatonka. By meeting time (7:00 p.m. Friday evening) the destination had been changed to Bunch Cave near the Highway 54 Niangua Bridge.

Individuals participating included Gary and Bertie Zumwalt, Frank and Jane Hurley and their three daughters, Bill and Janet Hale, Jerry Leap, Jeff Leap and Randy Adams.

The entrance to Bunch cave is 20 feet high by about 25 feet wide. Walking passage extends for several hundred feet and then becomes a narrow stoopway along a man-made trench dug when the cave was open to the public in the summer of 1938.

Jane Hurley took exception to the trench which contained quite a bit of "mushy guano". Trying to straddle the dugway did her not good as she slipped and fell into the mess ankle deep anyway.

Beyond this point the cave enlarges, opening into a 35 foot high chamber called "The Chapel" which is well decorated with speleothems. Here Jane and Janet ended their exploration and while the two puffs took a powder, the beasts went on to see several domes extending to heights of 25 to 35 feet.

In the "Bat Room", located about 750 feet from the cave entrance the explorers split into two groups. Gary and Bertie along with Jerry

and Jeff and Randy, took the "high route" -a straddle canyon extending for 450 feet west from The Bat Room. Frank and daughters took the stream crawl which leads to "The Tower", one of Missouri's highest underground domes.

After a short time Bertie, Jeff and Randy returned from the canyon and made the long crawl to The Tower.

Gary and Jerry, lingering in the canyon, found a way down into the streambed below the canyon where they hoped to make a connection with the Bat Room to Tower crawlway. A connection was found but was surprising in its length and the explorers report that this section may lead to unexplored passage and deserves additional examination. The connection is unmapped and was named The Meat Grinder.

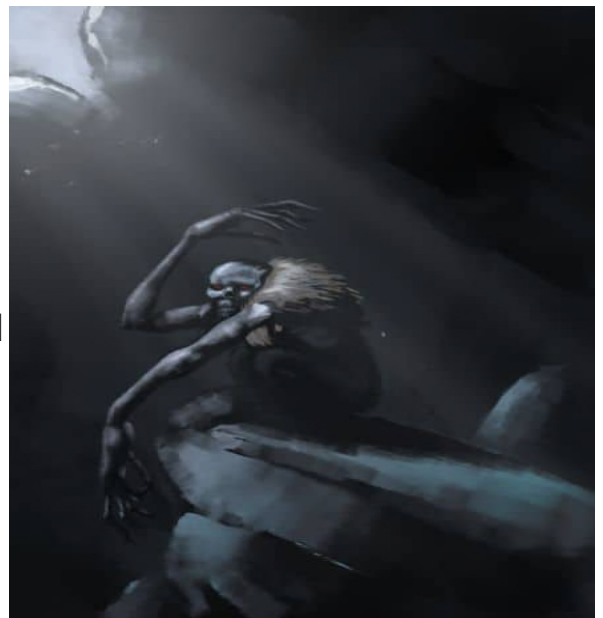
The Tower, an impressive dome 115 feet high with fluting, has magnificent formations including a flowstone falls.

-Dwight Weaver-

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## Is It Just Local Folklore?

I've always been fascinated by our Missouri legends — particularly eerie tales like the Hornet Spook Light near Joplin, the Blue Man of Spring Creek, and our very own bigfoot, Momo the Missouri Monster. But last year, I heard a story I'd never heard before, the story of a lesser-known mysterious creature of local



folklore — half man, half cave monster — who is said to have roamed the Camden County woods for decades, living in a cave just outside of a small graveyard at the end of Old Route 5 in Camdenton, and last seen not so long ago. This is the story of Silas Crowler, the cave crawler of Camden County.

One of the unique things about our wonderful state is that it's home to some 6,000 caves, many of which, particularly here in Camden County, are breathtakingly beautiful sites, safely visited by droves of locals and tourists each year. But others are tied to local legend and, in some cases, a dark history. Counterfeiters' Cave and Robbers' Cave in Ha Ha Tonka were said to be hideouts for criminals during the 1830s, while it's rumored that following the Civil War gunslinging outlaws Cole Younger and Jesse James hid out in caves throughout Missouri. And archeologists have been digging up artifacts of past civilizations in Missouri for decades, with many caves believed to hold the spirits of long-gone souls.

According to folklore, many of Missouri's underground caves were once occupied by human-like creatures living in absolute darkness, feeding on the numerous animals, fish and bats known to inhabit Missouri caves. It's believed these monsters began as what the Missouri State Parks refers to as accidentals — animals that are normally surface dwelling but have accidentally wandered, washed or fallen into a cave.

Yet unlike most accidentals that can't survive long in the cave environment, it's believed these cave creatures began as a group of ancient explorers who either became trapped or actually settled in a large system of caves and — over time and several generations — adapted to their cave surroundings, developing characteristics of under-ground dweller such as non-functioning or poorly functioning eyes and extreme sensitivity to the ultraviolet light of the sun.





# And ...

## there IS evidence that these creatures existed.

One of the first recorded sightings of these reclusive cave-dwellers dates back to the Civil War. In a letter to his mother, a Union soldier reported that while on night watch he spotted a strange, man-like creature with alabaster skin that shone in the moonlight. In 1898, the owner of a local tavern in Old Linn Creek was heading home in the early morning hours after closing up, when he saw a similar-looking beast in the treeline along the northwest edge of the town. And in 1926 on a stretch of land outside Montreal, a



farm hand claimed that one summer night as he was sleeping under the stars, he awoke to find a man-sized, sickly-white, hairless beast crouched by a watering hole near him. The farmhand later told a local newspaper the creature “didn’t seem afraid, but instead appeared to be stalking its prey ... me.” It was this newspaper story that started locals whispering about the strange creatures inhabiting Missouri’s dark caves — creatures that came to be known as the Missouri cave crawlers.

After years of perplexing but harmless sightings, in the summer of 1931 — shortly after Bagnell Dam was completed and the reservoir area now known as Lake of the Ozarks flooded hundreds of the area’s low-lying caves — strange things began happening in Camden County.

### **"At first there were small signs that things were amiss."**

In the central part of the county, farmers were regularly awakened in the middle of the night by frightened livestock, kicking and whinnying in their stalls, and then seeing strange tracks — oversized, odd-looking footprints — around their property in the morning. Still others reported signs that large, unfamiliar animals had been sleeping in barns at night — flatted hay and disturbed feed supplies.

But the first truly alarming incidents occurred in Versailles when ranchers began finding mutilated cattle, pigs and horses. Soon livestock began disappearing in droves. As it is in many small

communities, locals speculated about what could be causing these strange occurrences ... traveling gypsies, devil worshippers, an escaped psychiatric patient ... aliens?

Unexplained grave robbings began in Camden County in the early-1940s centering around a cemetery at the end of Old Route 5, the Graveyard of Lost Souls. Authorities questioned the reclusive cemetery caretaker Mary Crowler and her young son, but they claimed to have neither seen nor heard anything unusual. The grave snatchings remained unsolved and continued for years, even spreading to neighboring counties.

## **There they found a cavern which appeared to be an animal's den.**

It was in the summer of 1976 as U.S. Bicentennial celebrations took place around the lake, that people began to notice an alarming spike

in missing persons reports. Victims of presumed drownings who never resurfaced, young people last seen at parties who disappeared and were presumed runaways. And others who disappeared without a trace from their homes, workplaces and shopping centers — never to be heard from by family or friends again.

Later that year a small group of unofficial spelunkers from the university who were exploring the nearby sinkhole and cave, located a keyhole with access to a dark zone and previously undiscovered chambers. There they found a cavern which appeared to be an animal's den. Bones were strewn about and the stench was horrendous, with a strong odor of decomposition. Upon closer examination, a medical student in the group confirmed evidence of human remains. The spelunkers passed through a keyhole passage to a lightly wooded area behind a small cemetery — the Graveyard of Lost Souls — where they found several of the graves freshly unearthed, the caretaker gone and the place abandoned.

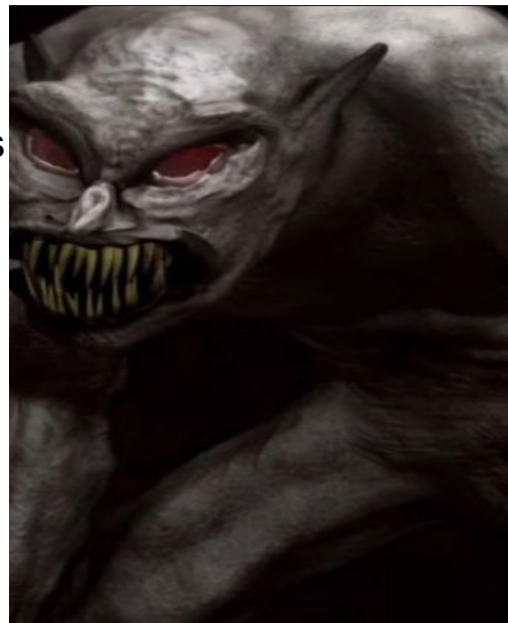
It's rumored that the lair belonged to Silas Crowler, the little-known middle aged son of the now deceased caretaker, Mary. Silas is believed to have been part human, part cave crawler, born in the mid-to late-1930s and when his mother died, he took over as caretaker of Lost Souls. As the story goes, when the Bagnell Dam flooded land to form the reservoir, most of the cave crawlers in those low-lying areas

either died or found their way to caves in higher ground — and one or more are believed to have settled in the cave near the tiny cemetery. Some believe that one of these beasts fathered Silas. And Silas has never been found.

Much of this story took place well before the internet, but thanks to a few visits to the Camden County Museum & Historical Society (and many discussions over coffee with some local old timers!) I was able to verify bits and pieces of this fascinating bit of local folklore.

### **Is Silas real?**

**We can't know for sure. But if he is out there and still roaming the woods and caves of Camden County, we've imagined what his lair might look like. We invite you to come experience it for**



**yourself...if you dare.**

## Robert Bob Gitchell 1942 – 2022

Bob's obituary says he passed away peacefully on Friday, December 23rd, 3 days prior to his 80th birthday. His wife Jo Anne, the patron saint of the universe, took care of Bob in his final days and did her best to make sure he was taken care of in the best way possible.

Bob was a long-time member of Lake Ozarks Grotto. All those years that I knew Bob, there was a lot that I didn't know about him. It has taken me a long time to write this. I didn't know where to start, so went through a lot of old LOG records.

I am not sure what year he joined the grotto but in 1988, Bob, along with Jim Leck, Mike Whisman and Ken Olive (all members of LOG) did a cave rescue at Whispering Dell Sinks at HaHaTonka State Park. The victim was in a restricted area with no permit. Bob, Jim, Ken, Billy Tyler and Tom Atkisson performed a cave rescue in Indian Burial Cave in Waynesville. The Grotto voted to adopt the Boy Scouts in Camdenton as an annual project with Bob, Billy and John Lindquist in charge of the project.



In 1989, Bob, Ken and Billy coordinated cave rescue training at Perkins Cave. Southwestern Bell donated 3,000 ft. of telephone wire to the safety fund for cave rescue. Bob and Ken took the Camdenton Boy Scouts to River Cave. They had meetings with the Scouts on ecology, conservation and equipment, followed by a trip to Perkins with sixteen Scouts. Bob and Jim, along with Steve Leck, took a group from Camp Pehetsi (where Bob & Jim worked) to Perkins Cave for a cleanup. Bob, Ken, Jim and Steve went beyond the commercial tour of Bridal Cave, Camdenton.

In 1990, Bob & Jim attended the Cave Science course given by DNR. Bob, Ken & Jim participated in the Dept. of Conservation's "Day in the Cave," along with some other LOG members. Bob & Jim made several trips with their youth group to White's Creek Cave on the Eleven Point River. Bob, Ken, Jim, Steven Leck and Bobby Seaton visited White Caves #1 and #2. Bob, Jim & Steve checked out a room in a cave on A Road, Stevie's Axehead Cave. Bob was on a trip to Berry Cave with other LOG members. Bob & Jim coordinated some of the trips to the back of Bridal Cave.

## The Speleograph

The Fall 1991 MVOR featured Bob, Jim and Ken in charge of the Speleo Olympics, something that they were very good at. Unlike in 1997, when Bob & Jim had agreed to do the Speleo Olympics for the NSS Convention and failed to show up. It was a great disappointment because I knew they would do an awesome job!  
In 1992, Bob & Ken took explorers sponsored by the MO Conservation Dept. to Perkins Cave.

In 1993, a rescue was performed in a Camden County cave by Bob, Jim & Ken. During the year, Bob took a group to a cave near Round Spring and hiked 10 miles with Boy Scouts in New Mexico.

In 1994, Bob attended a whitewater rescue course in Arkansas. He also did a workshop on basic cave rescue. He spent five days on the Eleven Point River and checked out White's Creek Cave, what turned out to be one of his favorite caves which he would visit many times over the years.

In 1996, Bob, along with Steve Dalton, Tom Heffelfinger and the Zumwalts, mapped Downen Cave in the Stover area. During the year, Bob was re-certified for Wilderness First Responder.

In 1997, Bob, along with Jim, took troubled youth from Camp Hawthorn at Lake of the Ozarks into Perkins Cave. It was his 50th trip into Perkins since 1981. Bob checked out HaHaTonka, Island & River Cave. He donated eleven helmets on loan to LOG for use with an Explorer Post for students interested in caving.

In 1998, Bob made numerous trips into Perkins Cave with youth groups. He also took a group through White's Creek Cave.

In 2001, he participated in a grotto work trip to Jacob's Cave in Versailles, which included radio work, witching and ridge-walking trips.

In 2003, Bob was on a Grotto trip into Rattlesnake Cave, Camden Co. Bob did a program for the Grotto on the history of the Justrite Lamp Co.

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Bob retired from the State of Missouri, Division of Youth Services, as an Outdoor Rehabilitation Counselor. He was very good at that job.

He took the youths on a lot of cave trips into Perkins Cave. I remember one story he told. He had gone in with a group.

One boy decided to kill a bat. So, Bob made him dig a hole 6 feet deep to bury it. That was Bob's way of teaching that when you do something wrong, there are consequences..... Undoubtedly, he saved a lot of young boys from ending up in prison.

Bob was an expert in training law enforcement and fire personnel in rescue techniques of various kinds, including cave rescue. He was a collector of canoes and knew how to use them.

Bob Gitchell was definitely one of a kind. As for his military years, he never talked about it but he did have two purple hearts. We are all better off for having known him. He will not be forgotten. – Alberta Zumwalt



Bob Gitchell



## Investigating the Effectiveness of Ferrofluids for Removal of LDPE and PVC Microplastics from Water

Plastics are man-made polymers that can be molded for numerous uses. Over time, mismanaged plastics in the environment break apart and create microplastics. Microplastics can be found in oceans, rivers, ponds, groundwater, and can even reach caves that people have not entered due to plastics being found in the runoff water. The microplastics can carry harmful contaminants and cause physical damage when ingested by aquatic organisms and humans. Some studies have suggested the use of ferrofluids to remove microplastics.

Ferrofluids are suspensions of iron oxide nanoparticles within liquids. The purpose of my study was to determine the effectiveness of using high and low concentrations of ferrofluid to remove low density polyethylene (LDPE) and polyvinyl chloride (PVC) microplastics from water.

To conduct my study, batch reactors were made. Each batch reactor contained 15mL of water. Twenty-four of the batch reactors contained 0.075g of LDPE and the other 24 contained 0.075g of PVC. For both groups of plastics, eight batch reactors had 0.2mL of ferrofluid, 8 batch reactors had 0.5mL of ferrofluid, and eight batch reactors did not have any ferrofluid and acted as the control group. The batch reactors were placed on a rotator for five hours. After treatment, the mass of plastics removed from the water was found.

For LDPE, on average, 93% of the plastics at low concentration of ferrofluid was removed and 96% was removed at the high concentration of ferrofluid. For PVC, on average, 96% of the plastics at low concentration of ferrofluid was removed and 94% was removed at the high concentration of ferrofluid.

Because the microplastics were effectively removed, more research should be conducted on finding a way to apply the use of ferrofluid in wastewater treatment plants to remove microplastics before they reach the environment.

Article submitted by

Jonah Visser



Microplastics

## LOG Picnic – June 2<sup>nd</sup>, 2024

The grotto picnic was held at the Stark Caverns picnic area on a beautiful Sunday. Gary & I arrived early, setting up the gas grill. Karen Weaver brought 2 tables to put the food on and tablecloths. There were 3 wooden picnic tables under the shelter which worked out perfectly. In attendance were: Buzz Caldwell, Burke & Christen Easter, Ken & Monica Long with Grandson Wyatt, Don & Caroline Toole, Rosie & Karen Weaver, Travis & Kathy Zumwalt with Derek & Brandon, and Gary & Alberta Zumwalt. Stark Caverns general manager, Matt Naughton and his wife Lizz, who also works at the cave, were also in attendance.



Gary grilled the hamburgers and hot dogs. There was a nice breeze most of the time. We had plenty of food and all was good. There was a Hook and ring game hooked to the shelter. It seemed to fascinate everyone. Several people tried it. Wyatt was up to 18 successful attempts. Monica tried many times, with instructions from Wyatt and finally scored! Derek tried one time and got it – obviously, beginner's luck. I guess it doesn't take much to entertain us..... I even looked it up on the internet when I got home. There are several versions of it. I didn't even know it existed....

There were lots of laughs and good times, just sitting around and talking. Ken suggested that we skip the June meeting and everyone agreed that it was a good idea. People gathered up their stuff and we all headed home. It was a very good day. –Alberta Zumwalt



## Meetings

### April 8<sup>th</sup>, 2024

The April meeting of Lake Ozarks Grotto was called to order by Ken Long, Chairman, in the meeting room at Stark Caverns, Eldon, MO.

Roll Call: Six members present – Buzz Caldwell, Ken Long, Karen Weaver, Rosie Weaver, Gary & Alberta Zumwalt. We had one guest, Jonah Visser, Buzz's nephew.

The minutes of the November meeting were read and approved. Treasury report: Checking Acct - November checking balance \$3,414.50; Income: dues \$105.00; Expenses: Xmas turkey & ham- \$36.48; *Speleograph* - \$37.30; April checking balance \$3,445.72.

Chairman Long reported that former LOG member, Darren Donley would be starting dialysis since his kidneys have almost completely shut down. He is on the list for a kidney but may not get one in time to make a difference.

Grotto picnic. Chairman Long checked with HahaTonka and it would be a fee for using their pavilion so it was decided to have the picnic at Stark Caverns. Hamburgers and hot dogs would be grilled and members bring a dish to share. Plans will be finalized at the May meeting. Date set for Sunday, June 2<sup>nd</sup>, beginning at 1 p.m. Gary volunteered to bring his grill.

Goodwin. Chairman Long made a trip there on March 19<sup>th</sup>. He said Liz Sutherland and Bradley Meyer have been working there but Liz will be moving to Texas. Liz had been able to get farther back into the cave.

Chairman Long received an invitation from former member, Eric Hertzler who is now head of maintenance at Bridal Cave. He invited LOG to have a meeting at their new meeting room. Our members declined the invitation.

It was reported that the brother of Gary Braman, long-time LOG member, has passed away while working in South Africa.

Jonah Visser gave an excellent and informative presentation on removing microplastics from the water, a science project which he will be taking to State.

Meeting adjourned. —respectfully submitted, Alberta Zumwalt

### May 14<sup>th</sup>, 2024

The May meeting of Lake Ozarks Grotto was called to order by Ken Long, Chairman, in the meeting room at Stark Caverns, Eldon, MO.

Roll Call: Seven members present – Buzz Caldwell, Christen Easter, Ken Long, Karen Weaver, Rosie Weaver, Gary & Alberta Zumwalt.

The minutes of the April meeting were read and approved.

Goodwin. Chairman Long reported that Klaus & Jean had checked out the sinkhole and it seems to be draining better.

Grotto Picnic. The picnic will be Sunday, June 2<sup>nd</sup>, at Stark Caverns picnic area, starting at 1 pm, eating at 2 pm. Gary will bring his grill. Gary & Ken will grill hamburgers and hot dogs. Everyone will be asked to bring a dish. Ken – green bean salad & baked beans; Christen – Cole Slaw & pickles; Buzz

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– chips; Karen – dessert & condiments; G & A – potato salad & more pickles; Manager Matt – water.  
The secretary will send out a flyer.

Speleograph deadline is middle of June.  
Meeting adjourned. – Respectfully submitted, Alberta Zumwalt

Program: Karen Weaver brought an album of old pictures to share.

**June** – No meeting. Had a grotto picnic instead.

## **LOG Breakdown – 2024**

Ken Long – Those little hairs in your ears.....they just pucker up.....

Christen Easter – Tea is just dirty water....hot tea only meant to be drank when sick.... Cold tea – never!

Ken Long – My phone ate my email.....

Derek Zumwalt to Monica Long – Are you butting in line, again????

Ken Long to Derek – You’re pushing the wrong button.... Even I don’t touch that button.....

Ken Long – My mind doesn’t go that far....

(Stark Caverns General Manager) Matt Naughton – Everybody’s quiet.

Ken Long – My wife told me to shut up....

Ken Long – I’ll do odd-ball jobs.....