Western Cave Conservancy

Protecting the West's Last Frontier

Vol 12 No 1 Winter 2018

Staff updates

Steven Johnson is our new Director of Communications and will be managing electronic communications and other IT tasks. Stephen grew up in Alabama and did not discover caving until he moved to California, which is a lot like growing up in Germany and not drinking beer until you've moved to Utah. Stephen has been caving with the Diablo Grotto since around 1999, when he saw the California Underground exhibit at the Oakland Museum, and also serves as the Diablo trustee for Windeler Cave.

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Windeler cave update

Windeler cave was discovered on May 31-June 1, 1946 by three miners working with Charles Windeler. They were blasting for gold when they broke into the cave. The cave was first explored by cavers from the Stanford Grotto in 1950. They mapped the cave and proclaimed that "…it proves to be one of the more outstanding caverns of northern California." Tragically, when the cave was visited by the Stanford grotto in 1952 they found that the ground surrounding the entrance to the cave had collapsed, covering the entire entrance area and the entrance tunnel. In the early 1970's, Ernie Coffman, Al Anderson, and others from Diablo Grotto endeavored to find the entrance to the cave. They spent many weekends digging in the area of the cave, finally breaking into the cave on July 1, 1972. The Grotto then gated the cave. In 1978 two men broke into the cave, damaging the gate and the cave. After some legal action, the two were fined $200 for repairs to the gate.

A MOU was signed in 1992 between the US Forest Service and the Diablo Grotto for managing the cave. However, in 1997 the cave was covered with another landslide. It wasn't until 2009 that the cave was re-opened for visitation and gated once again. At that time, the management of the cave was passed from Diablo Grotto to the Western Cave Conservancy.

In 2010 a trustee program was implemented for Windeler Cave. There are 6 trustees that each lead one trip per year. Trips into Windeler are limited to 6 people per trip. Although the trustees have certain grotto/group responsibilities, often trustees have open spaces on scheduled trips. If you are interested in attending a Windeler trip and are an experienced caver, contact the trustee that is responsible for your area first. If they are full on their trip for the year you may contact other trustees to see if they might have space. As part of our MOU for the Forest Service, we clear the grass on the road and keep the road in shape for fire fighting access and control. A Windeler committee was formed in 2009 in order to have more people comment on Windeler management and to help with

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road/land management. The committee is all volunteer. The committee membership consists of members of the WCC (you can be a member with a $25 or more donation) that are approved by the Windeler Committee chair, and the Stewardship director. At the writing of this article, Mark Bowers is the Windeler committee chair and Marianne Russo is the Stewardship director.

The winter of 2017 was harsh on the Italian Bar Road, causing rockslides and part of the road to collapse. A late spring work trip for road maintenance found that the Italian Bar Road is passable, but it does still have the collapse and rockslides as obstacles. We visted the entrance to the cave and found that it is still accessible. While working on the road, we did notice two resurgences downhill from the cave. It is possible that these are from a stream in the cave. We hope to dye trace this sometime in the future. Most of the trips that occurred in 2017 occurred late in the year after the water subsided

Windeler Trustee Program

A very important but complex area of discussion was how to allow reasonable visitation to the cave. The committee has decided on a trustee system inspired by those used by the National Park Service. Six trustees are selected by the committee, serving for two years. Each trustee is allowed to lead one trip to the cave per year provided they uphold the conduct agreement they made with the Windeler Committee when they became a trustee. Here are the current trustees and who they are expected to represent:

Steven Johnson (Diablo)

Mike Davies (San Francisco)

Dave Bunnell (unaffiliated cavers)

Ron Davis (out-of-area NSS grottoes)

Mark Bowers (Stanislaus and San Joaquin)

Martin Haye (Mother Lode Grotto)

The History of Windeler Cave

by Ernie Coffman

January 2000, Devil's Advocate

[Reprinted with permission from Diablo Grotto. We will be publishing portions of this in the next few newsletters]

The history of Windeler Cave really began when the lower Sierra Mountains were a low range of hills before the upheaval of the stress and strains of mountain building. Some portions of the cave even look like the rooms had been twisted around, like a giant twisting a paper-mache model of a cave. But when humans first became involved with the cave, it was unknown territory. Many caves are found by animals going into holes, others discovered by observing wind coming out of cracks, and a few entrances large enough that they were discovered and some used by early man.

Windeler was discovered accidentally by three miners. The miners had sunk a shaft, hoping to find the main gold vein of the famous Mother Lode. Before retiring for the evening, they had set off six delayed dynamite charges on the evening of May 31, 1946. After hearing the blast and echoes, they went to sleep at their cabin for the night. The next morning, Zeke Goodman, the only experienced miner of the group, climbed on down the ladder and shouted up to the others on top, "Hey! There's something wrong! There's a hell of a hole down here. I just rolled a rock down here and it takes half an hour to hear where it goes!" As man has rumored over the years of his existence, tall tales surely were mouthed here. With this comment, the others descended down into the dark abyss of what was to become known as Windeler Cave. The three miners rigged ropes, made ladders, and explored this new found phenomenon of nature. They found one chamber 200 feet long, 70 feet wide, and 50 feet high. Dozens of other rooms had been carved in the rock by the acid-charged seeping water flowing for ages through the mountains. The three miners found dripping stalactites hung from the ceilings and stalagmites were built up from the floors. The land was claimed by Charles Windeler, and the miners were working for him, which is another story in itself. We're interested in the history of this natural wonder, so we'll push on. Windeler Cave was first en-

tered by speleologists in October, 1950. The Stanford Grotto reported in their findings that 'The caverns exhibited stream channelings and deposits, helectites, and vugs of dogtooth spar...." Also noted was "A mineral structure warranting study-pyrolusite and pailo-melane being suspected present in quantity" Then another visit by the Stanford Grotto was done and reported in their Stanford Grotto newsletter, in July, 1951, that they returned for another visit and fully explored the cave, proclaiming that "...it proves to be one of the more outstanding caverns of northern California.

Although most of the passages are not of large size, the abundance of untouched, beautiful, and delicate formations make the cave well worth visiting." They also made mention that "Mr. Charles Windeler, owner of the property where the cave is located, was most courteous in extending the speleologists use of his grounds for camping and permission to enter the cave. The party was composed of Ed Danehy, Douglas Kirkland, Douglas Price, and Robert Bemiss." Where are these folks, today, one wonders. They could tell us so much of the early history of Windeler Cave.

Further history brought about by the Stanford Grotto was in their January 1952 issue of the Stanford Grotto newsletter, which pointed out that "...the party sought shelter from falling snow…" and was led by Raymond deSaussure, who further explored the completely new area which he had discovered on his previous trip to the cave. This new region is of unusual interest aside from its beauty, because of the multitude of fractured and displaced dripstone deposits. Although the appearance is that of catastrophic earthquake, close examination indicates the rock movement more likely continued slowly over a period of time. Members of this party were George Moore, Ed Danehy, Dick Weicker, Raymond deSaussure, Dorothy Campbell, and Glen Cushman." Quite a group of early speleologists wouldn't you say? The last article that was written about Windeler Cave, by this group was in their March 1952 Stanford Grotto newsletter, where a party of eleven set out to do some extensive scientific data gathering, only "...to find (the) vertical entrance shaft had been completely filled in by a slide of loose dirt from the bank-above, probably encouraged by the recent heavy rains. Hoping to possibly find another entrance to the caverns, the party devoted some time to reconnoitering the nearby stream and the hills around the lost entrance, but to no avail. It appears that these beautiful caverns will be denied to the eyes of all human for some time to come." Several parties of individuals, some as far away as Santa Barbara, had heard rumors of Windeler Cave and attempted to dig their way into this void in the earth. Some had permission and some were chased away by Charlie, before he started getting of ill health and moved back into the town of Columbia, where he met his demise of old age. Charlie is buried in the Columbia Cemetery, up on the hill, overlooking the town and Italian Bar Road, which led to the land where Windeler Cave was discovered. One of the seekers of this natural wonder almost met his own demise when a large boulder rolled upon him, but fortunately someone was there to dig him out, ending up only with a broken arm or shoulder. While I was a member of the San Francisco Bay Chapter, in the mid-60s-before we formed the Diablo Grotto, needless to say the name of Windeler Cave was brought up every so often, especially by George Moore, who was our NSS President. The conversations have since been forgotten, but imagine that George was trying to stir up some interest in a dig of his own, since it had been more than ten years that Windeler had been inundated with mud, boulders, and other a sundry debris, which buried it and as the Stanford Grotto reporter indicated in 1952, "these beautiful caverns will be denied to the eyes of all humans for some time to come." The Diablo Grotto was formed just after the mid-60s and an active group they were. There were trips going up and down the State of California, and some even reached to other nearby states. Everyone was an NSS member, each trip participant depended upon one another, for Single Rope Technique (SRT) was just in a budding stage, and doing vertical caves was accomplished by using pylon rope and oak rung ladders and a safety belay line. Needless to say, carrying rope ladders and belay lines to do Lost Soldiers, King Tut, Skull Cave, O'Neil's Cave, and Cave of the Quills (now the exit climb out of California Caverns) was a hefty challenge. We hadn't heard of the newer light weight cable ladders made out of airplane cable and aluminum rungs, for we were just finding out about SRT, thanks to the 1966 NSS Convention, in Sequoia, where the Eastern cavers really shined. But then, this is digressing from the subject, so let's go on with the history of Windeler and how Diablo folks got involved.

Look in our next newsletter for the continuation of this story

Ernie Coffman

It was a sad day when we heard that Ernie had passed late last year. Ernie contributed to much of our California caving history. Ernie was the lead person to re-open Windeler and to keep the cave preserved. Ernie read all of the Windeler trip reports to stay on top of current Windeler events and issues. He always wanted to make sure that the cave was handled with care. We will miss you Ernie.

Hierapolis Cave, Turkey – The Gate To Hell

Bruce Rogers

About 2,200 years ago, Greek priests amazed the local populace of this fairly well to do town in what is now southeastern Turkey by conducting rites at a small cave nicknamed the Gates To Hell. The cave does exist, has formed along the margin of a large deposit of calcite travertine (now dry due to over-pumping of ground water for adjacent hotels and such for tourists coming to see this formerly brilliant wonder), and has a rather deadly reputation.

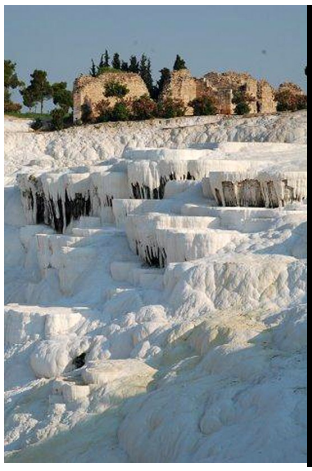
Hierapolis was founded as a trading and spa site in about 200 BCE by local King Antiochus, who resettled nearly 2,000 Jews from adjacent Babylonia and Mesopotamia to populate the

The entrance to the Gate to Hell Cave belies its deadly atmosphere. Located at the margin of the mound, it, too has formed in calcite travertine, but has enough soil above it to provide an enticing green mantle in invite deadly exploration

area. This community grew to an estimated 50,000 people in the following 140 years that had a large commercial presence along a major trade route. The lands were fertile and produced abundant crops of wine grapes, figs, and cucumbers. Indeed the city was renown as a delightful place to live where many residents spent their final years, being buried in the neighboring necropolis of Pamukkale.

A cultural group known as the Magnesians inhabited the next-door Greek city of Ionia. No one knows where their name came from, but it appears they most probably emigrated north across the Mediterranean Sea from Crete (and has little to do with the commercial product Milk of Magnesia). The Ionia-Hierapolis neighborhood is also the site of the Battle of Magnesia that took place in 190 BCE. There, the Roman-aligned King Eumenes' 50,000 troops with 54 war elephants defeated Antiochus' 50,000 troops with their 16 war elephants, thus ending one of the first Syrian Wars. Eumenes then absorbed the city into his empire. Antiochus wasn't so lucky, fleeing to Crete, reputedly exploring the numerous caves there, and was finally was caught and "removed" by the Romans.

Now back to the caves. Adjacent volcanic activity has allowed large amounts of carbon dioxide gas to seep up through the overlying calcareous rocks along seismically opened cracks. Initially the gas dissolved the calcic rocks of the surrounding karst and then precipitated the calcite in warm water-filled, white-colored travertine terraces and pools with temperature



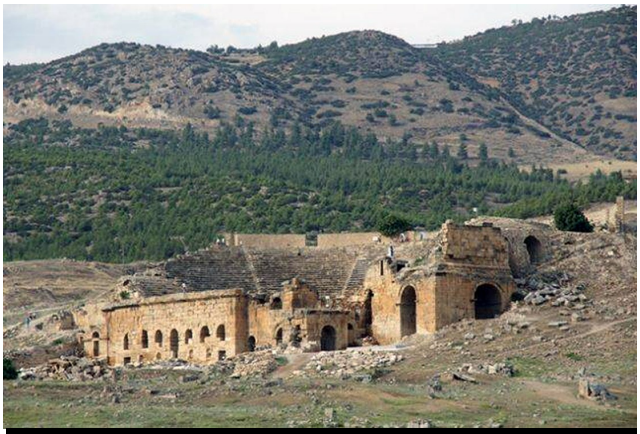
Ruined Greek-era buildings still stand atop the travertine mound at Hierapolis

between 35°C and 100°C (95°F and 212°F). These picturesque, white-colored terraces and cascades, resemble huge deposits of cave flowstone, are nearly 230 feet long and 100 feet wide. The mound is locally called the Cotton Castle due to its sparkling white color. The terraces and adjacent karst is laced with many short grottos that are partly filled with carbon dioxide gas. The Mammoth Hot Springs Terraces in Yellowstone National Park has a similar setting (but those caves are now closed due to several explorer's deaths in the past 50 years or so). The carbon dioxide gas, being heavier than "normal air," collects in the lower parts of these caves and grottos, snuffing out anything that unfortunately makes the journey into these Stygian alcoves.

The learned Greek historian and natural philosopher Strabo commented sometime between 64 BCE and 24 CE that:

> "This space is full of a vapor so misty and dense that one can scarcely see the ground. Any animal that passes inside meets instant death. I threw in sparrows and they immediately breathed their last and fell."

Indeed, the carbon dioxide gas forms a misty layer along the grotto and cave floors that looks mysterious and frightening.



The ruins of the Hierapolis Greek theater are only one of many buildings at the site. Photo by: Broken-In-A-Glory.

The Greek priests threw small animals into these caves to the astonishment of crowds; even leading bulls into them, only to have them meet a fairly quick and deadly end. Thus, the

Greeks said, this must be the Gateway to Hell.

In a slightly less gruesome tale said a poor, less than beautiful girl, despairing ever getting married, hurled herself into one of the pools to end her life. Instead she emerged as a beautiful young woman. Rescued by a local lord who fell in love with her, she was spirited her away to a long and happy marriage. This is certainly one of the better ending cave legends I've heard.

Another view of the lower slopes of the travertine mound. Note the small caves at top and middle of the mound. Because of accelerated wear and tear, visitors are no longer allowed to wander across the delicate travertine. Photo by: Broken-In-A-Glory.

In 2017, researchers from the University of Duisburg in Essen, Germany, explored the caves and made detailed measurements of the travertine mound. They calculated the dissolved carbon dioxide fell from an initial concentration of 725 ppm (parts per million) to 145 ppm as it emerged from the 17 warm and hot springs. The dissolved calcite in the spring water fell from 1200 ppm to about 400 ppm as it was deposited as a soft, white ooze that later consolidated into hard travertine upon losing part of the accompanying water. This roughly means about a quart of water deposits about a pound of calcite a day, enough to theoretically cover the almost acre-sized mound each day with a thin shell of sparkling white calcite about as thick as credit card.

Meanwhile back at the cave, the researchers found the deadly gas layer usually built up to a depth of about 16 inches on the cave's floor. Thus smaller animals entering the cave were literally poisoned and suffocated while larger animals might suffer the same outcome should the gas layer be thicker than average. There are several large rocks on the floor of the cave and it is speculated that the priests stood upon these rocks with their heads just above the deadly gas layer. Thus these priests appeared to have a divine/magical resistance to the deadly mists while non-believers and animals would perish. Thus it was all a grand display of showmanship exploiting a natural phenomenon.

Fossil found in Nevada cave holds clues of ancient horse

JANUARY 5, 2018 BY THE ELY TIMES

In this Tuesday, Dec. 19, 2017 photo, archaeologist Justin DeMaio speaks while visiting Gypsum Cave near Las Vegas. A well-preserved horse skull collected more than 86 years ago from the cave near Las Vegas is helping scientists identify a new type of extinct, stilt-legged horse that died out during the last ice age. A team of researchers led by famed archaeologist Mark Harrington discovered the bone in the 1930's inside the Gypsum Cave. (photo: Erik Verduzco/Las Vegas Review-Journal via AP)

LAS VEGAS (AP) — A well-preserved horse skull collected more than 86 years ago from a cave near Las Vegas is helping scientists identify a new type of extinct, stilt-legged horse that died out during the last ice age.

Scientists are naming it *Haringtonhippus francisci* after Richard Harington, an accomplished paleontologist who spent his career studying the ice age fossils of northern Canada and first described the stilt-legged horses in the early 1970s, the Las Vegas Review-Journal reported Tuesday.

A team of researchers led by famed archaeologist Mark Harrington discovered the bone in the 1930's inside Gypsum Cave near Las Vegas. The fossil was initially mistaken for a modern specimen because it looked so fresh, said paleontologist Eric Scott. "It looked like last week's lunch," he said. It turns out the horse skull is actually 13,000 years old. It was put away in museum collections, and was not revisited until recently. Scott tracked down the skull on a shelf at the Natural History Museum of Los Angeles County. He found it mislabeled. "Someone had even written in pencil across the top of the skull: 'modern sample, wild horse or burro,'" he said.

The new genus of horse was a lightly built horse with long, thin leg bones, according to a study by an international team of researchers including Scott published Nov. 28 in the journal eLife.

Using the skull found in the Nevada cave and other fossils found in Wyoming and Canada, researchers determined that the extinct horses were not closely related to any living population. "The evolutionary distance between the extinct stilt-legged horses and all living horses took us by surprise, but it presented us with an exciting opportunity to name a new genus of horse," said the study's senior author, Beth Shapiro, a professor of ecology and evolutionary biology at the University of California, Santa Cruz.

Mark Harrington's expedition into Gypsum Cave almost 90 years ago also uncovered evidence of the extinct Shasta ground sloth. After finding so many sloth skulls, backbones, claws and even reddish-brown hair, Harrington concluded that the cave probably served as an ice age den for the animal. From a thick layer of sloth dung that covered the cave floor, scientists were able to identify what the sloth liked to eat and what was growing in the area at the time.

The cave's historical importance was recognized in 2010 when it was added to the National Register of Historic Places.

Information from: Las Vegas Review-Journal, http://www.lvrj.com

Giant Extinct Burrowing Bat Discovered in New Zealand

GEOLOGY-IN Magazine January 2018

Giant extinct bat walked on four legs through New Zealand's prehistoric forests millions of years ago.

Teeth and bones of the extinct bat - which was about three times the size of an average bat today - were recovered from 19 to 16-million-year-old sediments near the town of St. Bathans in Central Otago on the South Island.

The study, by researchers from Australia, New Zealand, the UK and USA, is published in the journal Scientific Reports.

Burrowing bats are only found now in New Zealand, but they once also lived in Australia. Burrowing bats are peculiar because they not only fly; they also scurry about on all fours, over the forest floor, under leaf litter and along tree branches, while foraging for both animal and plant food.

With an estimated weight of about 40 grams, the newly found fossil bat was the biggest burrowing bat yet known. It also represents the first new bat genus to be added to New Zealand's fauna in more than 150 years

It has been named *Vulcanops jennyworthyae*, after team member Jenny Worthy who found the bat fossils, and after Vulcan, the mythological Roman god of fire and volcanoes, in reference to New Zealand's tectonic nature, but also to the historic Vulcan Hotel in the mining town St. Bathans.

Other research team members include scientists from UNSW Sydney, University of Salford, Flinders University, Queensland University, Canterbury Museum, Museum of New Zealand Te Papa Tongarewa, the American Museum of Natural History, and Duke University.

"Burrowing bats are more closely related to bats living in South America than to others in the southwest Pacific," says study first author and UNSW Professor Sue Hand.

"They are related to vampire bats, ghost-faced bats, fishing and frog-eating bats, and nectar-feeding bats, and belong to a bat superfamily that once spanned the southern landmasses of Australia, New Zealand, South America and possibly Antarctica."

Around 50 million years ago, these landmasses were connected as the last vestiges of the southern supercontinent Gondwana. Global temperatures were up to 12 degrees Celsius higher than today and Antarctica was forested and frost-free. With subsequent fragmentation of Gondwana, cooling climates and the growth of ice-sheets in Antarctica, Australasia's burrowing bats became isolated from their South American relatives.

"New Zealand's burrowing bats are also renowned for their extremely broad diet. They eat insects and other invertebrates such as weta and spiders, which they catch on the wing or chase by foot. And they also regularly consume fruit, flowers and nectar," says Professor Hand, who is Director of the PANGEA Research Centre at UNSW.

"However, Vulcanops's specialized teeth and large size suggest it had a different diet, capable of eating even more plant food as well as small vertebrates - a diet more like some of its South American cousins. We don't see this in Australasian bats today," she says.

Study co-author, Associate Professor Trevor Worthy of Flinders University says: "The fossils of this spectacular bat and several others in the St. Bathans Fauna show that the prehistoric aviary that was New Zealand also included a surprising diversity of furry critters alongside the birds."

Study co-author Professor Paul Scofield of Canterbury Museum says: "These bats, along with land turtles and crocodiles, show that major groups of animals have been lost from New Zealand. They show that the iconic survivors of this lost fauna - the tuataras, moas, kiwi, acanthisittid ("Perching bird-relatives") wrens, and leiopelmatid (very primitive) frogs - evolved in a far more complex community that hitherto thought."

This diverse fauna lived in or around a 5600-square-km prehistoric Lake Manuherikia that once covered much of the Manioto-to region of the South Island. When they lived, in the early Miocene, temperatures in New Zealand were warmer than today and semitropical to warm temperate forests and ferns edged the vast palaeolake.

Vulcanops provides new insight into the original diversity of bats in Australasia. Its lineage became extinct sometime after the early Miocene, as did a number of other lineages present in the St. Bathans assemblage. These include crocodiles, terrestrial turtles, flamingo-like palaelodids (extinct, swimming flamingoes), swiftlets, several pigeon, parrot and shorebird lineages and non-flying mammals. Most of these were probably warm-adapted species. After the middle Miocene, global climate change brought colder and drier conditions to New Zealand, with significant changes to vegetation and environments.

It is likely that this general cooling and drying trend drove overall loss in bat diversity in New Zealand, where just two bat species today comprise the entire native land mammal fauna. All other modern land mammals in New Zealand have been introduced by people within the last 800 years.

The above story is based on information provided by University of New South Wales.