

# INSIDE EARTH

## A NEWSLETTER OF THE NATIONAL PARK SERVICE CAVE & KARST PROGRAMS

*Edited by Dale L. Pate*

Vol. 1, No. 3

FALL 1998



### TABLE OF CONTENTS

<b>Geologic Resources Division Activities</b>	<b>1</b>
<b>Cave Park Updates</b>	
<b>Carlsbad Caverns</b>	<b>2</b>
<b>Great Basin</b>	<b>2</b>
<b>Timpanogos</b>	<b>3</b>
<b>Bat Friendly Mine Gates at Buffalo River</b>	<b>4</b>
<b>Contributors to this Issue</b>	<b>6</b>

#### Website Address:

<http://www.nature.nps.gov/grd/geology/index.htm>

**Webmaster:** Tim Connors

**Proofreading:** Paula Bauer

**Cover Photos:** *Jim Werker and Tom Madison repair a large, broken stalagmite in Slaughter Canyon Cave, Carlsbad Caverns National Park. (NPS Photos by Dale Pate)*

### GEOLOGIC RESOURCES DIVISION ACTIVITIES

*by Ronal Kerbo*

THE NATIONAL SPELEOLOGICAL SOCIETY CONVENTION (NSS) was held at the University of the

South in Sewanee, Tennessee. Twelve cave specialists from the NPS attended the Convention and participated in a variety of meetings and sessions. Bobby Camarra (HAVO) led a special session on current speleological work in HAVO. Joel Despaigne and Greg Stock (SEKI) were recipients of the NSS Cartographic Medal Award for their maps of **Crystal Cave**. Mike Wiles (JECA), Rod Horrocks (GRBA) and Stan Allison (CAVE) all presented speleological papers covering work from South Dakota to Mexico. A meeting was held for all NPS cave specialists in attendance and numerous of these were speakers at special sessions ranging from the National Cave Management Symposium Steering Committee to research and exploration in **Lechuguilla Cave** (CAVE). A number of NSS members expressed concern over the use of NPS caves in a proposed large format film.

THE PROPOSED NATIONAL CAVE AND KARST RESEARCH INSTITUTE was the subject of a meeting with Intermountain Regional Director John Cook. Ron Kerbo, GRD, Susan Garland and John KING IRM attended the meeting with Mr. Cook. The subject of the meeting was timeliness of a response to Congress on progress on the establishment of the Institute and discussion of the need to identify a partner for the Institute. At this time final legislation has been passed

directing the Service to establish and administer an Institute and is awaiting the President's signature.

THE 10<sup>TH</sup> ANNIVERSARY STEWARDSHIP SYMPOSIUM AT EL MALPAIS NATIONAL MONUMENT was attended by a group of about 60 scientists, researchers, friends of the park, and speleologists. The Symposium was a great success and will provide the focus for future research at the Monument and enhance the interpretive story with the visiting public. Topics of focus workshops and presentations covered a wide range of research and resource management topics. Of particular note was the microbiological work being conducted by researcher Diana Northup, a tree ring study by Dr. Henri Grissino-Mayer (recipient of the Monument's first Alton Lindsey Award for resource stewardship) and a paper about the over-all geologic structure of the Monument. The meat of the Symposium was the workshop sessions and stewardship panels, which charted the future course of research for the area.

## PARK UPDATES

### Carlsbad Caverns National Park

*by Dale Pate*

Progress is being made on the development of strategies for mitigating fluid-runoff from the maintenance yard, visitor center parking lots, roadways, and concessionaire loading dock area. Water from all paved areas will eventually drain through a water filtration system before being released. Parking in the Bat Flight Parking Lot has been restricted to handicapped parking only with unloading and loading of passenger buses allowed.

Restoration continues to be a major focus in **Carlsbad Cavern**, **Lechuguilla Cave** and **Slaughter Canyon Cave**. For example, in **Carlsbad Cavern**, a metal walkway in Left-hand Tunnel was recently replaced with one made of PVC and a hard, recycled plastic. This replacement was made to alleviate the problems caused by the old walkway. The metals from the walkway were corroding into the cave and because of its design, the sharp edges were gouging grooves in the flowstone that it rested upon. Also in **Carlsbad Cavern**, a series of stainless steel and recycled plastic walkways are being designed to better protect the Rookery area of Lower Cave. Approximately 3,000 people per year visit Lower Cave as part of ranger-led tours and where the trail goes through water, mud has become a serious problem. In **Slaughter Canyon Cave**, a large stalagmite that had obviously been broken in recent years, and not a natural occurrence, was repaired. The stalagmite is active and will cover all signs of its breaks over time. The photographs on the first page are from this repair job.

Changes in the culvert area of **Lechuguilla Cave** are being considered. Jason Richards is preparing an Environmental Assessment to address the concerns we

have for this area. The culvert was placed in the cave in 1986 to provide access through a large rubble pile from the entrance area to the rest of the cave. The culvert and the metal ladder within it are showing signs of severe corrosion. A reworking of this area would address these problems as well as other safety related issues and the overall security of the cave.

Exploration and survey of **Lechuguilla Cave** and **Carlsbad Cavern** continues with **Lechuguilla** reaching a surveyed length of 98.73 miles (157.7 kilometers). With three more survey expeditions planned for 1998, the cave should easily pass the 100-mile mark. The re-survey of **Carlsbad Cavern** has brought the length of the cave to 25.22 miles (40.6 kilometers). The official length of Carlsbad is still 30.9 miles (49.35 kilometers), but over the next couple of years the re-survey should extend the length well beyond this.

### Great Basin National Park

*by Rod Horrocks*

Jon Jasper was recently hired as a term cave management assistant to Rod Horrocks at Great Basin National Park. Jon comes to the park from the Mammoth Cave area. One of Jon's primary responsibilities is working on the cave trail rehabilitation project in Lehman Caves.

Since the first issue of Inside Earth, we have completed six significant projects at the park.

**LINT CAMP:** Salt Lake Grotto caver, Dale Green, co-directed with Rod Horrocks the first lint cleaning camp in **Lehman Caves** on April 30 – May 2, 1998. Twenty cavers from five western states participated in this three-day camp. During this project, some of the worst lint in any National Park Service cave was removed from the ceiling of the Gothic Palace. All together, a very significant amount of lint was removed from the Gothic Palace to the Queens Room, roughly 1/3 of the tour route. The lint is currently being weighed and analyzed.

**CAVE PROTECTION EA:** After a public scoping period, an environmental assessment (EA) was written that proposed four alternatives to protecting cave resources in the park. The preferred alternative is to build zero-airflow restriction bat gates at nine sites that have bat roosts and are also open for permitted caving. During a 30-day public review period, six people commented on the EA. A FONSI was prepared and submitted for signature.

**LEHMAN ANNEX GATE:** First dug into and explored in 1959 by Salt Lake Grotto cavers, Earl Peterson and Dale Green, **Lehman Annex Cave** is a remote cave and is the most pristine cave known in the park. In order to keep it in that condition, the cave was recently gated by volunteer cavers from Utah and Nevada. The gate was designed and built by Timpanogos Grotto member Larry Martin. The gate took sixteen hours for a team of seven

to build. The size of the original opening was duplicated in the trap-door style gate. Before any decision is made on its future management, the cave will be surveyed and inventoried.

**NON-SLIP TRAILS:** After several visitors had slipped on the steeper slopes of the **Lehman Cave** trail, we recently applied a non-slip surface to nine sloping sections of the paved trail. This involved applying a grooved surface perpendicular to the slope of the cement trail. It is felt that this solution will eliminate most falls in the cave.

**REPATRIATION:** After 34 years of archaeological storage, the remains of 20 partial human skeletons was recently repatriated back into **Lehman Caves** during a ceremony attended by five western Native American tribes and a few park employees. The remains were reinterred in the natural entrance room where they had been removed in 1964. A National Park Service employee, who is a Native American, built a masonry wall across a side alcove of the natural entrance room to permanently protect the remains.

**CAVE MANAGEMENT PLAN:** We recently completed a rewrite of the Cave Management Plan. A final draft of the new plan was recently submitted for review by park management and will be available for public review shortly.

## **Timpanogos Cave National Monument**

*by Rod Horrocks*

Due to money received from the Fee Demo Project and special project funds, we were able to expand our cave management staff at Timpanogos Cave National Monument this summer. Eva Kristofik was hired as the lead seasonal assistant to Rod Horrocks and Quincy Bahr and Ben Maxwell were selected as additional team members. During the season, this group directed a couple of research projects and completed several significant cave management projects.

**AGE OF THE CAVES:** Since completing his thesis on the speleogenesis of the **Timpanogos Cave System**, graduate student Dave Herron has given additional thought and research to dating the caves. His best estimate for the date that the American Fork River invaded the caves is between 600,000 to 700,000 years ago. This is based on paleomagnetic dating; uplift rates for the Wasatch Front, composition and rounding of cave sediments and beryllium dating of quartzite cobbles from the cave fill. Of course, it must be remembered that the original dissolution of the cave predated that stream piracy event. We still do not know when the original cave was dissolved.

**PALEONTOLOGY PROJECT:** For his senior thesis project, Christian George, a geology student from Franklin Marshall College in PA, conducted excavations of woodrat middens in several caves in the monument.

Christian and the cave specialist spent a month excavating three sites, one in **Hansen Cave**, one in **Timpanogos Cave** and the third in **Hidden Mine Cave**. One half of each midden was removed. These middens ranged from relatively recent to very old middens that had no remaining organic debris (except bone) in them. Samples for carbon dating were also collected. All specimens were washed, cataloged and boxed according to NPS curatorial standards. In addition to his excavations, Christian borrowed all the specimens from the museum collections that had been previously collected. Christian will attempt to determine genus or species and minimum number of individuals for each species.

**PHOTOMONITORING:** The Canon USA corporation recently awarded Timpanogos Cave NM a grant to conduct a photomonitoring project at the caves. In preparation, we identified six subjects we wanted to monitor, including impact from visitation and changes from natural geological processes. We invited Val and Jim Werker, who are some of the most experienced cave photomonitors in the US, to install their system in the caves. After installing 70 recoverable points, they took a complete set of archival photographs. These photos will be repeated each year for the next three to five years and analyzed for changes.

**CAVE LIGHTING:** To complete the new low-voltage lighting system in the caves, several transformers, feature and trail lights were added to the system by Ben. We have now mapped the new system and are preparing a maintenance plan for its upkeep. This innovative new system has eliminated algae from the caves and impact from maintenance activities and reduced energy consumption by 2/3.

**HAND RAILS:** In an attempt to reduce impact from visitors touching the cave walls in low overhead or narrow areas, we have added several short sections of stainless steel hand rails in the caves. The project was successful as nearly all the visitors are now using these rails instead of touching the walls.

**INTRODUCTION TO CAVING TOURS:** A new five-person tour, called, "An Introduction to Caving Tour," into the undeveloped section of **Hansen Cave** was put together by the cave management staff. This hour and a half tour was the result of several months of planning and preparation by the cave management staff. It teaches the basics of cave conservation and ethics, caving equipment and techniques to visitors. The monument interpreters, who were trained by the resource management staff, are scheduled one day a week to give these tours.

**NEFFS CANYON CAVE:** The cave management staff recently made a site monitoring visit to **Neff's Canyon Cave**, a National Natural Landmark (NNL) site, which was known as the deepest cave in the U.S. for 20 years, at 1,165 feet (it is now 7th). This visit was required of

the National Park Service because it is responsible for administrative management of the NNL site even though it is located on U.S.F.S. land. The gate was checked and a photo project was conducted from the entrance sink to the top of the first rope drop in the Double Pit Room. The gate was found in good repair but it was noted that the stream has been diverted from entering the draw the cave is located. Because of the amount of work involved, it seems unlikely that it was cavers wanting to keep the rope drops dry, but more likely someone with interest in the water rights

## **BAT FRIENDLY MINE GATES AT BUFFALO NATIONAL RIVER**

*by Chuck Bitting*

The historic Rush mining district at Buffalo National River is riddled with at least seventy abandoned prospects, adits and shafts. Most of the mining in this area occurred between 1880 and 1920 with sporadic work into the 1950's. You might be asking what mines have to do with karst management. Most of the abandoned mines at Buffalo National River seem to be closely associated with cave passages. It appears that the earliest miners simply followed and enlarged cave passages, removing the free ore that was emplaced in these passages. Later mine operators began removing the country rock around the cave passages to recover the disseminated ore. The primary ores removed from the Rush district were sphalerite ((Zn, Fe) S), usually known as "jack" and smithsonite (ZnCO<sub>3</sub>), commonly called turkey fat for its usual globular form and cream to yellow color. The smithsonite was probably precipitated in cavities and vugs by meteoric waters that had leached the sphalerite.

Nearly all of the mines in this area are unstable or have unstable sections, but have long been popular mineral collecting localities. In 1993, Buffalo National River began using gates to close the mines in this area to protect the approximately thirty thousand people who visit the area annually, to protect the remaining cultural and mineral resources, and to provide protected habitat for bats and other cave dwelling organisms. The first three gates were built in the entrances to the Monte Cristo mine in 1993 using contract labor and NPS staff. Roy Powers supervised the gating. In 1995, NPS staff built three more gates on entrances to the Monte Cristo mine using the Powers' gates as a pattern. For construction ease, the door design was changed from a swinging door to a removable bar or bars similar to those used at Big Bend.

In 1998 the park received funding from the Geologic Resources Division of the NPS to build an additional three gates on the abandoned mine openings. The entrances slated to be gated were Monte Cristo #1, White Eagle #1, and the Lower McIntosh. The mine entrances are located on the side of Rush Mountain. All three mines are located next to roads or trails, which makes

them susceptible to visitation. The narrow roads and trails facilitated getting equipment and material close to the mines, but most of the transport work was still arduous. Members of the resources management staff built the gates.

If we get funding for mine gating in 1999, we may host a small gating workshop for NPS cave and mine managers. If you would be interested, contact [Chuck\\_Bitting@nps.gov](mailto:Chuck_Bitting@nps.gov).



Monte Cristo #1 before gating



Monte Cristo #1 after gating



White Eagle #1 during early stages of gating.



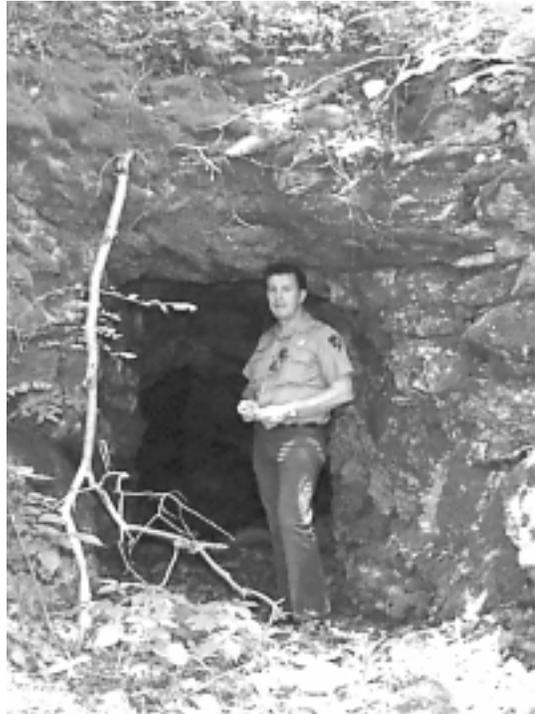
White Eagle #1 nearing completion



White Eagle #1, materials and equipment.



White Eagle #1 at completion



The entrance to the Lower McIntosh before gating.



Lower McIntosh the afternoon of August 12.



Lower McIntosh by the end of August



Lower McIntosh with completed gate.

## CONTRIBUTORS TO THIS ISSUE

Chuck Bitting  
Buffalo National River  
P.O. Box 1173  
Harrison, Arkansas 72601  
Phone: 501/741-5443, ext. 117  
Email: [chuck\\_bitting@nps.gov](mailto:chuck_bitting@nps.gov)

Ronal Kerbo  
National Park Service  
Geologic Resources Division  
P.O. Box 25287  
Denver, Colorado 80225-0287  
Phone: 303/969-2097  
Email: [ron\\_kerbo@nps.gov](mailto:ron_kerbo@nps.gov)

Rod Horrocks  
Timpanogos Cave National Monument  
R.R.3, Box 200  
American Fork, Utah 84003-5238  
Phone: 801/756-5239  
Email: [rod\\_horrocks@nps.gov](mailto:rod_horrocks@nps.gov)

Dale Pate  
Carlsbad Caverns National Park  
3225 National Parks Hwy.  
Carlsbad, New Mexico 88220  
Phone: 505/785-2232, ext. 368  
Email: [dale\\_pate@nps.gov](mailto:dale_pate@nps.gov)

### A Message from the Editor Dale L. Pate

Caves and their contents are fragile places. This becomes more evident with each passing day. Even just the breath of a caver entering a previously unknown area can change the environment and thus, the microbial ecosystems found in that area forever. Conservation of caves and their features should go hand in hand with the careful, deliberate physical exploration of the cave passages. Research in a number of fields, most notably in biology and geology, is continually giving us more knowledge than ever before concerning caves. With this knowledge has come the responsibility to take care of these fragile places. Everyone entering them must understand the consequences of their actions while there and must do everything possible to minimize their impacts. If we fail in our task to educate managers, employees, and cavers about our responsibilities to the caves, then the losses we face are enormous.

