

# Cave Research Foundation

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## CRF NEWSLETTER

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The CRF Newsletter is a quarterly publication of the Cave Research Foundation, a non-profit organization incorporated in 1957 under the laws of Kentucky for the purpose of furthering research, conservation, and education about caves and karst.

Newsletter Submissions & Deadlines: Original articles and photographs are welcomed. If intending to jointly submit material to another publication, please inform the CRF editor. Publication cannot be guaranteed, especially if submitted elsewhere. All material is subject to editorial revision unless the author specifically requests otherwise. To assure timely publication, please adhere to the following deadlines:

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### Message From The Editor

I hope you enjoyed the last issue with the introduction of color. This is made possible by the cooperation with the Fullerton City College Printing Technology Department. The students work on the newsletter as part of their course work; which meant I did all the pre-press labor. The last issue was delayed in printing for about a week due to a sudden weather change that caused the paper to shrink, causing misalignment problems. Printing could not begin again until the paper stabilized. However, the completed newsletter was shipped to Ohio for distribution by Thanksgiving.

This issue features the proceedings of the CRF national meeting held in St. Louis in November 2000. Charles De Croix wrote an interesting article about a sign in Mammoth Cave with the letters D.O.K.K dating from the early 1900s. I encourage everyone to submit material for the newsletter.

Paul Nelson

### CRF's website is :

**[www.cave-research.org](http://www.cave-research.org)**

Contact your operations manager for the user id and password for the members only section

### New CRF Fellow

The CRF Board of Directors is proud to announce Elizabeth Winkler of Atlanta, GA as a CRF Fellow. She is currently the Hamilton Valley Manager and Operations Council member. You can contact Liz at [vulturechick@earthlink.net](mailto:vulturechick@earthlink.net), 706-221-7168

### About the Covers

Photos by Peter Bosted

**Front:** Paul Nelson traversing the river at Thanksgiving Hall in Lilburn Cave, California.

**Back:** Rick Toomey in Fisher Cave, Missouri.

# LILBURN CAVE

KINGS CANYON NATION PARK, CALIFORNIA

N<sub>M</sub>



THANKSGIVING HALL

UPSTREAM DIVE

SCHREIBER COMPLEX

PLAN VIEW

CLAY PALACE

SOUTHERN COMFORT

500 FEET

SCHREIBER COMPLEX

SOUTHERN COMFORT

CLAY PALACE

PROFILE VIEW

SOUTH SEAS

UPSTREAM DIVE

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## New Discoveries in Lilburn Cave

by Peter Bosted

### Discovery of Southern Comfort

"Aargh, I'm stuck again," Brad Hacker groaned as he tried to force himself into a narrow, twisting chimney passage. "No, wait, I think I'm through," was the news a few minutes later. Then he was gone. Meanwhile, Lynne Jesaitis and I checked other tight side leads in this tall canyon, just beyond the Mousetrack turn-off in the southern, downstream end of Lilburn Cave. About fifteen minutes later, Brad was back with the news that cavers dream of: "It goes!" We broke out the survey gear and started setting stations, quickly gaining about 40 feet in elevation to reach a complicated three-dimensional maze, so typical of Lilburn. Brad had earlier found a nice walking-size passage leading out of this labyrinth, but it took us quite a while to rediscover which of the many openings was the correct one. "Looks like we've headed away from known cave," I observed.

"Cool!" Lynne exclaimed. And not only was it cool, but cold, wet, and muddy, like most of the southern part of the cave. In a way we were glad to be stopped by an obstacle: a small hole dropping into a good-sized room, with the reverberations of a small waterfall audible below. As we squeezed our way back through some tight narrow bends, somebody remarked, "This has got to be some of the least comfortable passage I've been in!" Somehow the name was born: we called the new area Southern Comfort.

These adventures took place on the November 1997 CRF expedition to Lilburn Cave, whose 17.5 miles of intricate three-dimensional complexity are located under Redwood Canyon, in Kings Canyon National Park, California. The Park manages the cave as a research resource, and CRF's project is to make a complete map of the cave. We had a feeling that our recent 300-foot discovery might prove to be one of the most significant in extensions to the footprint of the cave in many years, and the next trips bore this out.

### Pushing Southern Comfort

Lynne Jesaitis was especially keen to drop the pit at the southern end of our discovery, so she and Charlie Hotz brought

along ropes and vertical gear on the July 4th, 1998 expedition. They found the top of the pit to be tight, narrow, and awkward, but then quickly belled into a wide, tall, canyon. They dropped down another pit below the first one, for a total of 120 feet of survey. A small waterfall enters the side of this pit, then disappears into large, unstable breakdown blocks. One of these moved, and gave Charlie quite a scare. Meanwhile, Mark Scott and I surveyed 220 feet in the rest of the upper level maze. At two points, crawlways came within a few feet of connecting to known cave, but became impenetrably tight. It occurred to us that much of the passage under Redwood Canyon might be inaccessible to humans.

Lynne and Charlie had passed through a drenching downpour in the Yellow Floored Domes and by now were too cold to survey the waterfall pit. Brad Hacker and I returned in October wearing PVC suits, accomplishing the survey and de-rigging the waterfall. We then took a look at the southern continuation at the middle level. It took a little bit of mud removal, and passing through some very awkward squeezes, but soon we discovered a continuing passage with a very deep hole in the floor, complete with loose, rumbling rocks. We elected to stay high, and with Brad in the lead, managed to squeeze through

*Paul Nelson surveying in Thanksgiving Hall Extension*



two more very tight constrictions joining larger muddy rooms. The final room was the muddiest, and rather intimidating as it features a lot of very slippery wet mud funneling down into a pit that appeared at least 50 feet deep. Brad forced an extremely tight squeeze into a continuing rift, while I sketched this 30 by 20-foot room; a respectable size for a California cave. Our total for the day was 300 feet in 25 stations. Brad's squeeze was too tight for me, so we departed to the surface and the warmth of the wood stove and fireplace in the cabin. The twelve hour trip had taken its toll on muscles and equipment, so we only too happy to take it easy on the five mile hike back up to parking lot, enjoying the sunshine dappling through the largest grove of Giant Sequoia trees remaining in the world.

### **The Way to South Seas**

On the next trip to Southern Comfort, in May, 1999, Brad Hacker, and Jeff Cheraz went back to our previous terminus, where they found a somewhat tricky climbing route to bypass the tight squeeze. A short breakdown crawl led back to the continuation of the large canyon, with pits in the floor dropping down more than 50 feet. At the very southern end, the floor dropped away completely, and thrown rocks revealed a large body of water far below. Their survey total was 380 feet.

Lynn and I returned in June to survey this drop. I rigged a rope and descended about 80 feet, stopping short of the bottom for two reasons: first, the rope didn't quite reach the water; and second, I recognized where I was! I had just descended Splash Down Dome, the southernmost point known in Lilburn Cave, and the point where the main stream in the cave sumps, to re-appear 2000 feet away in Big Spring. The name Splash Down Dome was given by early explorers who tried to free climb the near-vertical wall, only to splash back down into the water instead. Because there is a small duck-under at the far end of the South Seas Lake, access to Splash Down Dome is only possible from the bottom in very dry years. The only trip in the past 20 years was in about 1984, when Dave Trumm and I donned wetsuits to complete the survey.

We noted two leads near the top of Splash Down Dome. I was able to swing over to one of them on the rope, and made a quick solo survey. The more interesting lead was on the far, southern side of the pit. In the Summer of 2000, a strong group headed back with lots of ropes and aid climbing gear. Jed Mosenfelder led across the pit, but instead of giant bore-hole, instead found the contact between marble and insoluble rock. A chimney lead remained, which Jed climbed on the next trip, in September 2000, only to quickly reach a too-tight constriction. These were very long trips, with the teams averaging five hours each way to travel from the main entrance to the end of Southern Comfort. The new surveys in the Splash Down Dome added another 350 feet to the Southern Comfort total.

### **Mousetrack Connection**

Back in June 1999, Brad Hacker, Joel Despain, and Damian Grindley surveyed into a small side lead about halfway through Southern Comfort. They followed a nice passage with a strong, cold breeze for 290 feet to find themselves intersecting a pit with a thirty-year-old Goldline rope hanging in it. This was the

connection to Mud Heaven, one of the highest portions of the southern end of the cave. Twigs, leaves, strong breezes, and the tracks of mice and lizards attest to a surface connection. Indeed, Joel discovered a strongly blowing hole along the side of Pebble Pile creek early in 2000, and spent many hours trying to clear a way into Lilburn Cave. Efforts have been suspended due dangerously unstable configuration of the breakdown. About 200 feet separates the dig site from the closest known passage in Lilburn.

Including the 160 feet mapped by Lynne, Charlie, and Art Fortini in one of the many pits, the survey total for Southern Comfort has reached 1830 feet. Several leads remain to be checked off of the passage leading to Mud Heaven.

### **Thanksgiving Hall**

Thanksgiving Hall is one of the largest rooms/passages in Lilburn cave, averaging 20 feet wide and 60 feet tall. The main stream flows into the Hall from a breakdown choke, making its way to the Z room (famous for its beautiful banded marble), and on to the South Seas. Because of a massive inflow of sand when a gigantic 200-foot-wide sinkhole opened up in Pebble Pile Creek, which flows over this portion of Lilburn Cave, the passage leading to Thanksgiving Hall was flooded for many years. Finally, enough sand flushed through to allow trips again in 1999. Joel Despain recalled climbing into a narrow chimney and finding hundreds of feet of virgin cave many years back. This was never surveyed because he was the only one that could fit into the chimney. On a return trip in July 1999, he could not find the chimney again, but the team was able to extend the stream survey 190 feet further to the north. In August, a group led by Paul Nelson was checking the map of the area for side leads, and found their way to a steep chimney that I had marked as needing a bolt to climb. Damian Grindley and Paul Nelson ignored this advice and free climbed the 80-foot-tall chimney, partially filled with loose boulders that rattled down the pit at the slightest touch, to discover going, upper level passage! Damian scouted around, and estimated several hundred feet of virgin passage. Damian and Paul returned in September with Mick Fingleton to survey their new discovery, noting several interesting side leads. Their 310-foot survey made a large loop, circling back to the top of the 80-foot chimney, named Grindley's Chimney. Typical of Lilburn, tall canyon passages alternated with tricky climbs, loose breakdown, and areas of thick, wet, goopy mud.

There was some confusion about station labels, so in November 1999 when Carol Vesely, Mark Scott, Erin Lynch, and Jeff Cheraz returned they accidentally resurveyed some passage. They did survey one of the side leads to a blowing constriction. Both teams found it hard to survey for more than a few hours due the cold, wet, and muddy nature of the area. It doesn't help that you have to wade through waist-deep, 42F degree water to get from the Z Room to the base of Grindley's Chimney!

### **Extending the Thanksgiving Hall Discoveries**

Paul Nelson took Charlie Hotz and me back to the new area in September 2000. I was glad that Paul rigged a hand-line in the chimney; I'm not the crazy bold climber I was in my youth! At one point, the boulders I was using as a foothold suddenly

gave way and went plunging down the pit: without the rope I might have gone with them! Once we had determined what already had been surveyed, we started surveying into the first lead. After a short crawlway it opening up to a tall narrow canyon, with a steep and extremely muddy floor sloping down to a too-tight pinch. Our second lead was more promising. A short crawl, a climb-down, and we were back in good-sized passage. A sheer vertical pit to the left looked inviting, but we had no rope along. This pit is directly above Thanksgiving Hall, but 80 feet higher, and if rigged might provide a more convenient way in this near area. We found a second, much tighter pit nearby. Beyond this pit we followed a nice canyon to the east, away from any known cave. A series of breakdown filled rooms alternated with crawlways. It was pleasant to get away from the ubiquitous wet mud that characterizes the higher levels. In the last room, the floor dropped away and we found that we had intersected the upper level of a 50-foot-tall canyon with a small stream flowing at the bottom. Could this be the underground course of Pebble Pile Creek? Not liking the exposure, I stayed behind to sketch while Paul and Charlie chimneyed along the top of the canyon. Charlie was slightly disconcerted when his handhold broke loose and he almost dropped 43 feet into the flaring abyss. Paul reported the passage continued with no end in sight. This will certainly be high on the list of places to return to next year. With any luck, we'll be able to add considerably to the 1000 feet of new discoveries near Thanksgiving Hall.

### **Schreiber Complex and Clay Palace**

The Schreiber Complex is certainly one of the most complex and confusing areas in Lilburn Cave, already known for its confusing, three dimensional maze nature as there are over 1000 junctions. The availability of newly drawn quadrangle maps on several levels for the middle portion of the cave was a boon to exploration in this area. Without the maps, it was very hard to know what had been surveyed, and what had not. In May 1998, Merrilee Proffitt, Mark Scott, and I mopped up several hundred feet near the Bicycle Passage end of the Complex, including, most of it walking-sized passage. On a ski trip in February 1999, Merrilee and I were back again, this time with Bill Farr and Joe Rogers. A little bit of poking around revealed a network of crawlways that are parallel to the main route to the Jefferson Memorial. This totaled over 300 feet. In April, I returned with Damian and Ann Bosted to re-sketch the complicated area where the Schreiber Complex joins into the top of the 50-foot-tall Bicycle Passage. We found an overlooked narrow canyon here that went over 100 feet. We also took a look at the nearby Clay Palace, which had not been visited in over 10 years. We surveyed a tight lower level for a few hundred feet, and found a new upper level continuation after a few minutes of moving sand. Altogether, over 1000 feet of new survey was added in this portion of the cave. In addition, Roger Mortimer made new sketches of 500 feet of the most confusing sections of the Schreiber complex in two trips in 2000.

### **Pandora Area**

The Pandora area consists of a set of relatively tall, sandy-floored canyons near the lowest level of the cave, underlying the main entrance. Unlike much of the rest of the cave, there are relatively few intersections, and the walls are mostly free of mud.

Some nice flowstone formations adorn a good-sized room at the center of the area. Using the new quadrangles, a good deal of mop-up survey was done, starting with about 200 feet that I surveyed with Mark Scott in July 1998. Our second lead could be seen continuing on the other side of a deep canyon, but we could not get across without climbing gear. I returned in May 2000 with Brent Ort and Ken Urata, a cave geologist visiting from Japan, and we systematically mopped up about 300 feet in side leads in the southern branch of the complex. In our last lead, we followed a small stream to a too-tight constriction. This may well be the same stream that enters the main entrance sinkhole.

### Summary

Altogether, about one mile of new survey was added to Lilburn Cave in 1998-2000, bringing the length to just over 17.4 miles. About 680 feet was added to nearby Mays Cave, which now comes very close to connecting with the Penthouse section of Lilburn. Many leads remain in both Lilburn and Mays, and we look forward to more discoveries in the years ahead.

## CRF Annual Meeting in St. Louis

by Paul Nelson

The CRF Annual Meeting was held in St. Louis, Missouri during November 10-12. The meeting began on November 10 with closed sessions of the CRF Board and the Operations Council. The purpose of these meetings is to discuss operational decisions, award grants, certificates of merit and fellowships, and elect board members.

Saturday began by a 9 a.m. tour of the Anheuser Busch Brewery. The complex includes the Victorian-era stables and Clydesdales. The team was out on tour, but some of the younger horses were on display, including some Dalmatian puppies. Each horse has its own named space in this impressive stable that features a Tiffany Chandelier. The tour also showed the brewing process including the beech wood aging process where beech wood chips are spread at the bottom of the aging barrels.

The building and grounds are impressive and cared for immaculately. What impressed me, was that new buildings were built in the same historic red brick architecture so they blend in with the older buildings. The tour ended with a beer tasting of the various beers that they produce. Unfortunately, the ale that I wanted to taste was not available.

The open meeting was held on November 11 at the Powder Valley Nature Center. The meeting began with Pat Kambesis announcing the completion of the Hamilton Valley building, new

CRF Fellows, and Certificates of Merit recipients. (Please see the announcement elsewhere in the newsletter.)

The keynote speaker was Don Kurz from the Missouri Department of Conservation. Mr. Kurz gave a presentation on Missouri's diverse ecosystems.

Mr. Kurz showed slides of the five biomes, or zones, that exist in Missouri. They are:

- Northern Boreal Evergreen with its forests.
- Prairie, which is rapidly declining due to development, and the mystery of how prairie mounds were formed. Prairie State Park has 3700 acres with Bison and Elk.
- Southwest Desert
- Gulf Coast Swap which has mostly been drained by channels.
- Eastern Deciduous Forest

I never realized Missouri had such a diverse landscape.

Scott House delivered a presentation on the Ozark Operations and Cave Resources. He discussed the cave history and CRF participation of survey in the Ozark Scenic Waterways. A video on caving for kids was also shown.

Bill Elliot, of the Missouri Department of Conservation, thanked the CRF for its work at Powder Mill Creek. He reviewed the development of a Missouri bio-speleological database with 750 species and 800 caves. Reports can be generated by cave, county, or species. Mr. Elliot presented the Department's current cave conservation program, and shared with us

the relationship between temperature and differing bat colonies that inhabit caves. Pictures of a new species of cave crayfish, the first West of the Mississippi, were shown.

Don Coons gave a slide presentation of caving in Hawaii and the genesis of lava tubes and formations. The pictures showed some of the unique minerals that develop right after the tube is formed, but which are later dissolved by rainwater. Don also presented the results of the Mammoth Cave dataset combining 40,000 survey points over the history of CRF survey into a single database. He attempted to show a 3D presentation using compass, but equipment problems prevented the audience from seeing the effect. He later set-up his laptop during dinner for people to view the 3D maps.

Niel Babbit from the Mark Twain National Forrest thanked Scott House and the CRF for their work and survey, and discussed the management of caves with the endangered gray and Indian bats.

Janet Sowers gave an update of CRF progress to inventory the caves at Lava Beds in California. When a cave is found its location is placed into the inventory list at the park. Because of high deviation in the magnetic rock, global positioning satellite



*Decorations at the Anheuser Busch Brewery*



*The Board of Directors and Operations Council. Left to right: Dave West, Pete Lindsley, Rickard Toomey, Phil Diblasi, Janet Sowers, Paul Cannelly, John Tinsley, Pat Kamesis (front), Scott House (back), Dick Maxie Elizabeth Winkler, Charles (Chuck) Pease, Mick Sutton, and Peter Bosted.*

fixes are used in place of compass surveys. Many of the caves are mapped, and a few have received biological inventories. A few are then selected for special studies, such as the Merrill Ice Cave, featured in the last newsletter.

The meeting ended at about 6 p.m., and everyone proceeded to Rich and Charlie's restaurant for dinner and socializing. Bob Osbourne was given a plaque for his many years of service as a board member. Tom Poulson was also given a plaque on the occasion of his retirement and contribution to CRF.

On Sunday, those interested went to Fisher Cave for exploration and survey. Fisher Cave is a developed tourist cave with off-trail areas in need of survey. I was teamed with Bob Osborne and Liz Winkler to survey an area called Caver's Paradise. Getting there involved a long crawl on hands and knees. We surveyed some nice passage and chimney before departing to catch flights home. I was amazed at the stickiness of Missouri mud. Red mud attached to everything and my boots gained at least five pounds each. At the airport counter, the ticket agent asked what happened to my cave pack. I told her, you should have seen it before I scrapped the mud off.

The meeting was enjoyable and it was nice to see the people that I have only read about. I encourage everyone to attend the annual meeting and gain a better understanding of the valuable work that CRF performs. On behalf of everyone attending the meeting, I would like to thank Scott and Patty House for organizing the meeting, two dinners, and the cave trip. I also thank them for letting me use their couch!

## CRF Certificates of Merit

The CRF Board awarded Certificates of Merit to the following persons:

**Mike Yocum**--GIS Program and Educational Programs

**Bernie Szukalski**--GIS Program

**John Fry**--Liason between CRF and park management at Mammoth

**Karen Willmes**--Eastern Operations Personnel Manual

**Bill Devereaux**--Lava Beds

**Hamilton Valley Building Committee:** Cheryl Early, Dave Hanson, Richard Zopf, Dick Maxey, Daniel Greger, Sheila Sands, Joyce Hoffmaster, and Elizabeth Winkler

## Applying For CRF Grants and Fellowships

Each academic year, the Cave Research Foundation sponsors a Karst Fellowship competition, which is supported by the CRF Endowment Fund. The Foundation may award as much as \$10,000 distributed among one or more Karst Research Fellowships and as one or more Grants for graduate research in karst-related fields of study. The truly exceptional proposal may receive Karst Research Fellowship (limit \$3,500.00); meritorious proposals that do not receive a Karst Research Fellowship may receive a Karst Research Grants, typically in

*Don Coons, Phil Diblasi, and Dick Maxey viewing the 3-D maps*



amounts less than \$2,000.00, awarded to qualified students in the natural or social sciences. Work at either the Masters or Ph.D. level is eligible for the awards.

In 2000, \$7,000 in grants was awarded to fund eight projects. These projects are described in the accompanying article on this year's awards.

To apply for a Karst Research Fellowship you must submit the following materials:

- Four copies of a proposal describing the study to be supported;
- One copy each of two letters of reference (one must be from your project supervisor/advisor);
- One copy of transcripts of undergraduate and graduate work.

The application material must be received no later than April 2, 2001, at the address listed below. The body of the proposal is to be no more than 15 pages in length and should discuss the problem to be addressed, background, significance of the research, methods to be used, schedule for research, and budget. Proposals and letters of reference can be submitted electronically (via email text or as attachments); for details on formats that are acceptable, contact me.

In preparing the proposal it is important to remember several things. Proposals will be evaluated by several karst scientists. These scientists may include geologists, biologists, hydrologists, archaeologists, and other karst scientists. Also, CRF is more likely to fund research that has broad significance to karst studies.

The Foundation attaches two conditions to these awards. First, the Cave Research Foundation is acknowledged as a supporter of the research in any publications deriving from the research. Second, the awardee will prepare a summary report of the research for publication in the CRF Annual Report. If the project will extend more than two years from the award, annual progress reports for the CRF Annual Report are required.

For further information, please contact:

Rick Toomey.  
Illinois State Museum - RCC  
1011 E Ash St  
Springfield, IL 62703  
toomey@museum.state.il.us  
217-524-7980

Please pass this announcement on to any students you know who might be interested.

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## **Karst Research Grant Awards**

In 2000, CRF awarded eight grants totaling \$7,000 dollars under the Karst Research Fellowships and Grants program. No single proposal stood clearly above the rest, so no Karst Research Fellowship was awarded.

The following projects were awarded Karst Research Grants:

### **The Caves and Rockshelters of the East Obey River Basin, Tennessee: An Archaeological Survey**

Mr. Jay Franklin, University of Tennessee, Knoxville

Grant award: \$500

The caves and rockshelters of the East Fork Obey River Basin possess a rich archaeological record, one that reflects several thousand years of human prehistory. I am conducting a systematic archaeological survey of these caves and rockshelters and adjacent uplands in Fentress County, Tennessee. The purpose of the survey is to locate important sites that will define the culture history of this karst region and elucidate unique prehistoric human-land relations there. This survey is the focus of my doctoral dissertation research at The University of Tennessee, Knoxville. This prehistory remains obscure because this area has never been systematically surveyed. Culture histories applied to this region, however, were developed in other physiographic regions and primarily from large cultural resource management projects conducted under contract with the Tennessee Valley Authority (TVA), for example. As such, these projects were focused in large river valleys and floodplains. The culture histories of karst regions have never been directly assessed. The proposed project represents a significant and unprecedented departure from mainstream regional archaeological survey practices. It is expected that existing culture histories are inadequate for the East Fork Basin and the Upper Cumberland Plateau (UCP) generally, and that the UCP possesses its own unique culture history, one that will contribute new, original, and important information concerning prehistoric human history. My doctoral research centers on the unique culture history of this karst region.

### **Environmental Disturbance of Oligotrophic Bacteria and Effects on Water Quality in a Deep Karstic Ecosystem**

Ms Andrea Hunter, University of New Mexico

Grant award: \$750

The human population is at risk of losing its water supply due to contamination of surface and ground water resources. This problem extends to remote areas such as the Lechuguilla Cave system where coliform bacteria populations are endangering the health of its visitors. My work in the Water Resource Program at The University of New Mexico specifically addresses those materials used in Lechuguilla Cave which exacerbate the growth of harmful microbes.

Currently, Lechuguilla Cave uses Tygon tubing that supports high levels of slime which in turn promote pathogenic coliform colonies. This overabundance of microbial activity, particularly E. coli, threatens Lechuguilla's drinking water supply. My research aims to identify alternative plastics such as Teflon, vinyl, Nalgene, and rubber products which do not support excessive coliform development. Hosing improvements coupled with visitor impact reduction will alleviate further water contamination problems. In addition, the identification of safer plastics will prevent contamination in other cave systems worldwide.

### **Role of Suspended Sediments in the Transport and Fate of the Pesticide Atrazine in the Hawkins and Logsdon Rivers, Mammoth Cave, Kentucky**

Mr. Michael Anderson, Western Kentucky University

Grant award: \$750

The project is a study of the effects of adsorption/desorption reactions on the transport of Atrazine, a commonly used triazine herbicide, in karst environments. Atrazine has been detected in quantities exceeding EPA's Maximum Contaminant Level (MCL) in several of Mammoth Cave's rivers. The focus of the study will be determining if some Atrazine is "piggy-backing" on the sediments that are flushed into the system during storm events. Determining the nature of the relationship between Atrazine and these sediments will be useful in determining methods of reducing the threat posed by the pesticide to the parks delicate ecosystems.

### **Foraging Strategies of Cave Crickets, Mammoth Cave, KY**

Mr. Kurt Helf, University of Illinois, Chicago

Grant award: \$1000

CRF funds will be used to focus on two aspects of predation rates on *Hadenococcus subterraneus*. I will examine the effect of crop fullness on predation rates on *H. subterraneus* by the white-footed mouse (*Peromyscus leucopus*). I predict crop full crickets will suffer increased predation rates relative to crop empty crickets due to their decreased escape ability. I will carry out experiments in 2m x 2m x .6m plexiglass enclosures of my design. An experimental run will consist of two different treatments: 1) 2 arenas with a mouse and 20 crop full crickets; 2) 2 arenas with a mouse and 20 crop empty crickets. After a few hours I will remove the mice and gather the remaining crickets and determine the rates of predation in the two treatments. I will perform at least 5 iterations of the two treatments. I will compare predation rates between the treatments using a t-test.

Further, I will examine the effect of moonlight on predation rates on *H. subterraneus* in the field. I predict predation rates on *H. subterraneus* will decrease on moonlit nights relative to moonless nights. I will attach cave crickets to large spikes in the ground using 2 lb. test monofilament with 50cm of slack and leave them out overnight. I will check the crickets every 3 hours and note any missing individuals. Individual crickets will be secured with a noose in a 50cm piece of 2 lb. monofilament with the free end anchored by a nail in the ground. Twenty tethered crickets will be placed along a transect line and spaced 1m apart. Transects will begin just outside the cave entrance because this is where GUFs were lower and where use of baits decreased at the population level. Tethering locations will be examined several times each night and presence/absence of all individuals will be recorded; any missing individuals will be replaced. In addition, any observed predator-prey interactions will be recorded. Experiments will be run on moonless and moonlit nights at three cave entrances (i.e. Great Onyx, White, Frozen Niagara). We will attempt to identify predator type based on available evidence at the tether site. For instance, mice usually

leave feces and discarded body parts after preying on crickets and salamanders might be 'hooked' to the monofilament. We will use chi-square analysis to test for significant differences in predation rates between moonless and moonlit nights.

### **Local Landscape Evolution and the Emergence of Cultural Complexity in the Central Mississippi Valley: A Case Study in the Mid-Holocene History of the Midwestern Uplands**

Ms. Kristen Arntzen, Washington University, St. Louis

Grant award: \$1000

Funding from the Cave Research Foundation will support a detailed geoarchaeological study of the robust mid-Holocene deposits at the Allscheid Rockshelter in southwestern Illinois. The shelter preserves a rare, long post-glacial upland depositional sequence in the broader American Bottom region. Due to a limited sediment catchment, sedimentological and radiocarbon analyses will enable a fine-scale reconstruction of the history of sediment regimes. With its proximity to the well-studied, bluff base Modoc Rock Shelter, the Allscheid Rockshelter presents an excellent comparative study for Modoc's long sequence of post-glacial riverine deposition. Furthermore, like Modoc, the Allscheid shelter shows evidence of long-term use by prehistoric human groups through the mid-Holocene. This time period is known to be critical for understanding subsequent developments in social and economic complexity, but archaeological work has so far emphasized the importance of human adaptations to the evolving configuration of large interior river floodplain settings. Thus, the fine-scale evaluation of sources and timing of the Allscheid deposits, along with comparison to the Modoc deposits, will mark an important contribution to both the study of post-glacial geologic history in the Midwestern uplands, and the exploration of mid-Holocene cultural change and landscape evolution in a generally poorly understood setting.

### **The Karst Hydrology of Boiling Spring, Mill Creek, and Surrounding Basins, Phelps and Pulaski Counties, Missouri**

Mr. Jim Kaufmann, University of Missouri, Rolla

Grant award: \$1000

Although Boiling Spring along the Gasconade River in Pulaski County, Missouri, is one of the largest springs on the north flank of the Ozarks, very little is known about its recharge area. A large karst upland to the south and east of Boiling Spring supplies recharge to Boiling as well as several other second and third magnitude springs located in the Mill Creek, Spring Creek, and Little Piney watersheds. Dye tracing and flow measurements will be used to delineate the recharge areas for several of the larger springs. Initial results indicate that the karst hydrology of the region is very complex with Boiling Spring sharing recharge areas with most, if not all, of the other large springs. Previous flow measurements of Boiling Spring have been taken at extremely low flows. The discharge of the spring has been reported as 65 cubic feet per second (cfs) which is an

underestimate of its actual average discharge. A more realistic estimate of the average discharge will be calculated using a combination of long-term flow measurements, flow duration curves, and precipitation events for other large second magnitude and first magnitude springs and surface rivers in the Ozarks, and comparing them to previous Boiling Spring and Gasconade River measurements.

### **The Effects of Timber Harvest upon Sedimentation in Caves and Karst in Southeastern Alaska**

Mr. William Curry, Western Kentucky University

Grant award: \$1000

Sediment samples collected from caves in Prince of Wales Island Alaska during the months of July and August are being prepared and analyzed for Cesium 137 at the WKU Applied Physics Institute. Cesium 137 is not natural to soils or caves but it was added to soils around the Northern Hemisphere as a result of the atmospheric nuclear testing beginning in the late 1940's and early 1950's. The cesium 137 is useful as a tracer in soil erosion studies involving recent erosion and sedimentation, thus it is being used to trace soil transport into caves and sinkholes in Central Kentucky and Southeastern Alaska where recent timber harvesting and development has taken place and caused erosion. If the soil samples are positive for Cesium 137, this indicates that the layers were deposited as a result of post 1954 erosion (likely resulting from timber harvest or development). Negative results could mean that the soils in the caves are older than 1954. Additionally, carbon dates of wood fragments or sediments can be used as controls in this study.

### **Genesis, Paleoenvironment, and Paleogeomorphology of the Mississippian Redwall Limestone Paleokarst, Hualapai Indian Reservation, Grand Canyon Area**

Mr. Tony Troutman, University of Texas at Austin

Grant award: \$1000

The top of the Mississippian Redwall limestone in the Grand Canyon area was subject to extensive karstification during a period of about 30 million years from the late Meramagian to early Morrowan time. This hiatus has recently been shown to be much shorter, possibly only 5 million years, in the western Grand Canyon where tidal and deltaic channels draining westward toward the retreating sea are eroded into the Redwall surface. These channels have average depths of about 107 m (350 ft). The recently recognized Surprise Canyon Formation, deposited in the paleovalleys and karst depressions of the Redwall was probably deposited near the end of the paleokarst development in the Redwall. This paleokarst represents a second order stratigraphic sequence boundary generally correlating with the Amsden Formation, and Madison Limestone paleokarst of the Wyoming area. The Redwall paleokarst is characterized by numerous groups of vertically-oriented breccia pipes, which are believed to have stopped upwards through more than one-thousand feet of overlying deposits, as high as the Triassic Chinle Formation. An outcrop study of this paleokarst will give insight into the origin, environment of creation, spatial

distribution, and geologic evolution of a major Mississippian age cave system.

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## **Science Conference at Mammoth Cave**

by Sue Hagan and Mick Sutton

The Mammoth Cave National Park Science Conference held October 5-6, was a huge success. Cosponsored by CRF and the National Park Service, this was the eighth annual symposium to provide a forum for presentation and discussion of karst research in the Mammoth Cave biosphere region. Superintendent Ron Switzer and CRF President Pat Kambesis gave the welcoming remarks.

Stan Sides provided an update of new information pertaining to the 18th Century tuberculosis treatment experiments conducted in Mammoth Cave, including recent new identifications of individuals associated with the underground patient colony. Rick Toomey discussed his ongoing paleontological inventory which has, amongst other finds, revealed former colonies of free-tailed bats (*Tadarida* sp) during past interglacial episodes. A very significant find this past year was the high diversity of fauna at the Frozen Niagara Entrance dating from the last interglacial episode. Patty Jo Watson presented Ken Carsten's paper on archeological research over the past 200 years in the Mammoth Cave Area, then followed with a discussion of her own rethinking of several concepts based on recent finds by colleagues (especially those of George Crothers and Phil DiBlasi). One intriguing example--resulting from hormonal analysis of paleo-fecal specimens which positively identified all specimens collected as male--is the speculation that in-cave activity may have involved sex-linked rituals.

Nick Crawford began the karst hydrogeology session with showing the effectiveness of using microgravity measurement for locating shallow caves. One practical application of this technique was its use to formulate solutions for urban storm water runoff in a flood-prone parking lot. He followed with several startling examples of highly dangerous chemical vapors rising from karst aquifers into houses, schools and a church, and concluded with a wake-up call concerning the proposed air-park and related developments in an area near Mammoth Cave National Park. In the two sessions devoted to GIS, Rhonda Pfaff began with discussing GIS as a tool for karst protection through the development of an Arc View database. David Ek discussed the GIS database being developed depicting oil well location data, karst features, hydrogeology, and roadways which can be used to respond to surface and karst groundwater threats from the oil fields.

The final hydrogeology session began with Chris Groves discussing very broad-scale implications of the fact that more inorganic carbon leaves a typical karst aquifer than would be expected from models based on simple carbonate kinetics, owing to such factors as the dissolution of calcite in water and the production of organic acids. This was borne out for the central Kentucky karst in a year's worth of water chemistry data from Logsdon River. Jeff Timmons reported preliminary data showing that organic acids from bogs enhance bedrock dissolution. Johnny Meredith talked about short-term fluctuations in the water chemistry of a typical active dome pit,

Showerbath Spring at Frozen Niagara. The incoming water was always undersaturated in calcite, but CO<sub>2</sub> pressures were low.

Starting the ecology and biology sessions, Kurt Helf overviewed recent gleanings regarding the interaction between Mammoth Cave crickets and their white-footed mouse predators. Tricia Coakley discussed the microbiology of stream sediments, potentially important in bedrock dissolution. Rick Olson discussed satellite-assisted vegetation maps of Mammoth Cave National Park and their uses for development of fire management prescriptions.

The cave management session began with Pat Kambesis presenting the Mammoth Cave digital data base project Don Coons is developing utilizing decades of CRF and other surveys. Next, CRF is Chief Cartographer Bob Osburn reviewed the history of CRF mapping standards, the current status of map production, and developments in computer drafting techniques. Joe Ray and Joe Meiman gave a captivating discussion on dye-tracing efforts at Mammoth Cave. Recent small-scale efforts have solved some puzzles and created others.

Joe Meiman of the National Park Service deserves special thanks for organizing the conference and for providing attendees with the full Proceedings. The Friday evening banquet at CRF's new Hamilton Valley Research Center brought the event to a fitting conclusion. The heart and substance of the conference was reflected in the numerous informal discussions going on while overlooking a magnificent example of karst landscape.

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## Is That Old Guy Still Alive?!

By Don F. Black, NSS 116 L FE

I have been told that such was the comment made about me at the NSS Convention at Sewanee, Tennessee, several years ago. I am pleased to state that I am very much alive, however, my active caving days are behind me.

In view of my longevity, and perhaps senility, I have allowed myself to be conned by Red Watson into writing a fund raising article for CRF, using my caving career as a basis for an impassioned plea for financial support.

My first caving experience was a commercial trip through Endless Caverns of Virginia in 1928 when I was 6 years old. At the urging of Ralph Stone, I joined the NSS in 1941 and became a life member in 1946 after serving in the Air Force during World War II. Since then I have been active in caving and speleo-politics on local, regional, and national levels. I organized, and was first Chairman, of the Chattanooga Grotto; was one of the founders of Southeastern Regional Association; was member of the By-Laws Re-organization Committee under Joe Lawrence; Chair of two national NSS conventions, two terms as national VP, and other related positions. I have been caving in 15 states, as well as Puerto Rico and Costa Rica. I was elected a Fellow of the NSS in 1968.

In the late 1950's I was bemused by the blandishments of Roger Brucker (another master con artist!) into a visit to Flint Ridge, and I was hopelessly hooked. I was appointed Safety Officer, during which time we conducted a full scale practice stretcher rescue from deep within Crystal Cave at the bottom of the Brucker Breakdown.

By today's standards, the life of an expedition caver in those days was rather primitive. A hot shower was sometimes available at the old Ticket Office, but during winter months towels would freeze stiff as a board before we got back to the bunk house. Drinking water flowed across the fields through a black plastic pipe. During a hot summer day this imparted a unique flavor to the water that not even "Tang" could disguise. Cooking was accomplished on a two-burner gas hot plate, fueled by a small LP tank. A small potbelly coal stove provided heat in the Speleo Hut during cold weather. Perishable food stuffs were stored in two idiosyncratic refrigerators appropriately labeled "slam" and "don't slam." Sanitary facilities were also quite basic - a 2 holer with no back wall, and a unique chime system for early warning. During warm weather the dining area was sheltered by a lean-to constructed from an Antarctic sled tarp brought by Phil Smith.

The cavers who made it all possible were also a unique breed of adventurer cum scientist. Some were internationally famous in various fields of endeavor, and others were merely hardy souls who followed each nook and cranny of Flint Ridge to see where it went.

Dave Huber comes to mind. He was a mechanical genius with a special method of making coffee in the morning that was stout enough to resurrect Floyd from his coffin. One day when Dave was making a pot of his famous brew for Mickey Storts at her remote campsite, an unlucky copperhead wandered on the scene. Grabbing the full coffee pot in one hand and a machete in the other, Dave charged off into the woods to dispatch the intruder..

Roger Brucker was the favorite of all the numerous children included in the camp family. Evenings would find him draped with a dozen small fry as he read their favorite bedtime story. Roger was also the proud owner of a VW bus with a powerful Porsche engine. One cold winter night he earned the undying gratitude of 10 chilled and muddy exhausted cavers as he backed down the ruts that passed for a road to the Austin Entrance, and hauled us all back to camp.

Red Watson returned for an expedition one year after an absence of several years. In the meantime, a new gate was installed on the road into camp. Red and his family arrived in the wee hours of the morning and drove his VW bus smack into the center of the gate.

One year somebody forgot to bring coal from Yellow Springs for a winter expedition. Phil Smith solved the problem with the aid of the rental car he had driven from the Bowling Green Airport. Taking several of us with him, he drove in town to the Cave City Coal Co., where we shoveled chunk soft coal until the trunk of the car was full, and brought it back to camp. What a mess!

Jack Freeman earned my heartfelt thanks when he retraced a long crawlway to retrieve one of my caving packs I had left behind, and was determined to leave the sumbitch there for another trip.

The most amazing part of the entire operation is that the complete world wide scope of activity that is CRF has been done without any paid staff members and without the ownership of any real estate.

The times they are a changing, and we find ourselves to be the proud owners of some prime caving acreage in the heart of

the Kentucky karst country. The pressing need for a permanent headquarters free of "other" landowners has been apparent for years, and finally the Hamilton Valley property was purchased.

Of course, all of this required a substantial cash outlay, sometimes with the sacrificial giving of faithful members. One has issued a matching challenge up to \$10,000 for new contributors. [See "Make Freeman Pay" in the previous newsletter.] Many others have given as they were able, not only cash but of their time and service as well. We now have a world-class headquarters for our worldwide activities, as well as a focal point for our Eastern Operations.

Your support will help make all of this a reality. If you have already made a generous gift in the past, double it this year. Check with your tax advisor on how to incorporate CRF into your present and future estate planning. If you are new to CRF or have never given before, get out your checkbook now while your enthusiasm is still fresh. All contributions (and any questions) should be sent to:

CRF Treasurer Paul Cannaley 4253 Senour Road  
Indianapolis, IN 46239-9437

## Dramatic Order Knights of Khorassan

By: Charles J. DeCroix

A rather strange and curious metal sign has stood alone in the darkness of Mammoth Cave for almost an entire century. Located along the southwestern wall of Gothic Avenue, approximately 30 ft. before the Blacksmith's Shop, the shield-shaped sign has puzzled visitors, guides, and explorers for years. The soot-covered sign is slightly hard to read, but upon careful examination one can make out the initials "D.O.K.K." and the image of a tiger surrounded by a crescent moon. Individual names with intriguing titles such as "Imperial Prince," and "Imperial Adool," add to the mystery.

Jack Hock, from Columbus, Ohio, became intrigued with the sign while visiting Mammoth Cave in 1984. The mysterious sign must have made an impact on Mr. Hock, because he took it upon himself to start conducting research on its origin. In a letter to Mammoth Cave National Park, dated February 26, 1984, he explained:

*"The reason I am writing is because near the end of Gothic Avenue ... you pointed out a sign that said, "D.O.K.K.," and had several names with an Imperial somebody mentioned, and a date of approximately 1904 or 5. At the time you had said no one seemed to know what the abbreviation stood for. Being a person employed as an investigator (Police Sgt.) I couldn't resist trying to find out what the letters stood for. I think I have the answer and wanted to share the information with you in case someone like myself should ask. As the included sheet will show the initials D.O.K.K. stand for "Dramatic Order Knights of Khorassan" which was established in 1895 and is still active. This was the only reference to D.O.K.K. that was found." (Hock 1984)*

The hand-painted shield is approximately 36" high by 25" wide and is attached to an 18" metal post. The inscription is as follows: "Erected and Dedicated Aug 20<sup>th</sup> 1904 by W. D



The D.O.K.K. sign in Mammoth Cave

Photo: Charles DeCroix

Hadfield (Imperial Prince), F.E. Duncan (Past Imperial Prince), C.V. Stansburg (Imperial Adool), J.H. Marshall, W.F. Grosser, John Hendricks, A. Lee Brown, T.H. Long, R.F. Lange, W.T. Staver, D.W. Saylor, Irving H. Wilson, C.W. Shafer, W.S. Donahey, E.G. Cook, N. Malick, and H. Shaffner." In smaller letters at the bottom right corner is the name "J.A. Bush, Peoria, ILL." Bush may have been the artist who designed and/or painted the sign.

### Background on D.O.K.K.

In ancient times, Khorassan (which means, "where the sun rises") represented a large tract of country including lands now lying within the Soviet Union and Afghanistan. The Dramatic Order Knights of Khorassan is commonly referred to as the "playground" of the Knights of Pythias. Only Pythian Knights are allowed to join the D.O.K.K., and there are currently 2,237 members across the United States and Canada. A minimum of 25 Pythians are required to submit an application to the Imperial Palace to establish a new Temple.

The Knights of Pythias, founded by Justus H. Rathbone in 1864, remain one of the oldest fraternal organizations in North America. The group is based on the story of friendship between Damon and Pythias, historical figures who were members of a school founded by the famous Greek philosopher, Pythagoras. Pythians are dedicated to universal peace and goodwill revolving around the practice of Friendship, Charity, and Benevolence. The letters "F," "C," and "B" are proudly displayed within the Pythian symbol.

*“We believe that men, meeting in a spirit of goodwill, in an honest effort of understanding, can live together on this earth in peace and harmony.*

*We seek those who agree with this belief, and have a belief in a personal Supreme Being, to join our ranks in an effort to reach ‘Peace through Understanding.’”* (Fraternal Order Knights of Pythias WebPage)

Martin F. Koehler, Imperial Secretary of the Dramatic Order Knights of Khorassan, was kind enough to provide information from the organizations Constitution and Statutes:

*“The Imperial Palace, Dramatic Order Knights of Khorassan, a corporation existing by virtue of an Act of the Congress of the United States, approved February twenty-fifth, nineteen hundred and nine, possessing original and appellate jurisdiction, is the source of all authority in the Dramatic Order Knights of Khorassan, and does hereby ordain and establish this Imperial Constitution, to be full force and effect from and after its enactment, except as to those provisions therein otherwise provided.*

*“The Dramatic Order Knights of Khorassan is, and shall be, a secret, benevolent, patriotic, and fraternal organization, composed of persons legally admitted to membership in any legally existing Temple of the Order, and in good standing therein, as by law provided.”* (Koehler 2000)

The D.O.K.K., like all fraternal organizations, have secret initiation rituals that cannot be discussed openly with non-members. In the past, these rituals have involved blindfolded candidates kneeling before a skeleton in an open coffin while answering questions and taking a vow of secrecy.



*The logo of the D.O.K.K from a certificate Photo: Charles DeCroix*

An original D.O.K.K. certificate from 1914 provides a brief insight into the formalities of membership. It bears the following inscription: *“To all Princes and Votaries: This Is To Certify that C.W. Barnes Whose proper signature appears in the margin hereof, was regularly Initiated and Admitted a Votary of the DRAMATIC ORDER KNIGHTS OF KHORASSAN in Delhi Temple No. 109, located in the Oasis of Hastings Plain of Adams Desert of Nebraska on the 10th day of Rajah being the 7th month, A.H., 1332, corresponding to the 10th day of June A.D., 1914, and that he has been regularly enrolled as such on the records of the Imperial Palace. In Testimony Whereof we have caused this to be signed by the proper Officers and the Great Seal of the Imperial Palace to be affixed.”* The Imperial Secretary, Imperial Prince, and Royal Vizier signed the document.

Long-time Mammoth Cave guide/explorer John Nelson (Nelson’s Domes) was a member of the Knights of Pythias and it is quite possible that he was involved with the placement of the sign in Gothic Avenue. There are several photographs of the

Knights of Pythias in the Nelson family collection as well as a unique leather postcard with the inscription: “From Mammoth Cave, KY. First Pin Worn By The Knights Of Pythias.” (Nelson family collection)

The identity of the individuals that placed the sign in Gothic Avenue still remains a mystery today. Without a Temple name or number, Martin Koehler (Imperial Secretary, D.O.K.K.) replied that it would *“be too much of an undertaking to review all the historical data to find these people.”* (Koehler 2000) The importance and significance of the D.O.K.K. shield and other obscure monuments located throughout the cave is extremely hard to determine. It is true that this particular shield could have been found in an old shed or garage and would have no connection to Mammoth Cave at all. But, the fact that the shield was properly placed by a group of visitors almost 100 years ago certainly deserves our attention. Perhaps by learning more about those who visited the cave before us, we can actually learn a little more about ourselves. Everyone loves a good mystery!

## References

D.O.K.K. membership document, 1914

Fraternal Order Knights of Pythias WebPage ([www.pythias.org](http://www.pythias.org))

Hock, Jack. Letter to Mammoth Cave National Park, February 26, 1984 (Mammoth Cave National Park manuscript collection)

Koehler, Martin. Personal communication, 2000

Nelson, John R. (Nelson family collection)

## Special Thanks To:

Arthur Bonnot (Past Imperial Prince, D.O.K.K.), Martin F. Koehler (Imperial Secretary, D.O.K.K.), and John R. Nelson.



## Wedding Announcement

Rick Olson and Colleen O’Conner were married August 4, 2000. Rick has been a CRF JV for decades and is employed by Mammoth Cave National Park as an ecologist. Colleen, an interpreter at MCNP, is a newer CRF participant and is the co-author of a forthcoming book on Mammoth Cave ghost legends.

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# 2001 EXPEDITION CALENDAR

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Before attending any expedition, you must contact the expedition leader as trip sizes may be limited. Failure to contact the leader may prevent you from attending the expedition as the trip may be full.

## MAMMOTH CAVE

**April 20-22**, Elizabeth Winkler,  
706-221-7168, vulturechick@earthlink.net  
**Memorial Day, May 25-28**, Rick Toomey,  
toomey@museum.state.il.us, 217-698-8914  
**Independence Day Week, June 29-July 8**,  
Scott House, 314-282-3246, rshcrf@aol.com,  
Dave West <d270@bellatlantic.net> and Karen Willmes  
<kver@bellatlantic.net>, 410-366-5038  
**August, 10-12**, Pat Kambesis, 770-491-8587,  
Kambesis@bigfoot.com  
**Labor Day, August 31-September 3**, Bob Osburn,  
314-984-8453, Osburn@levee.wustl.edu  
**Columbus Day, October 5-8**, Chris Groves,  
270-777-1891, Chris.Groves@wku.edu  
**Thanksgiving Day**, James Borden, JimBorden@attglobal.net  
**New Years, December 28-31**, Paul and Monica Cannalley,  
317-862-5618, Cannaley1@home.com

All Eastern Operations CRF members who have not attended an expedition safety orientation must do so before participating in expedition activities. The safety orientation is scheduled at the beginning of each expedition after the morning meeting. Those who have attended one safety orientation are not required to participate in another. New members should arrange to be at the expedition early enough to attend the orientation. Those who do not attend will not be allowed to participate in expedition activities. Contact expedition leader for more details about the orientation.

## OZARKS

Please contact: Scott House, 314-282-3246, rshcrf@aol.com for caving in the Ozarks. Fitton trips are limited to 16 persons.  
**March 10-12**, Fitton Cave, Buffalo National River, Arkansas  
**March 24-25**, Mark Twain N. F., Barry Co., Missouri  
**April 7-8**, Ozark N.S.R.  
**April 28-29**, Fitton Cave, Buffalo National River, Arkansas  
**May 5**, Fisher Cave, Meramec State. Park., Missouri  
**June 9-10**, Ozark N. S. R.  
**June 16-17**, Fitton Cave, Buffalo National River, Arkansas  
**August 18-19**, Ozark N.S.R.

## CKKC - Roppel Cave, Kentucky

As a result of the partnership between CRF and Central Kentucky Karst Coalition (CKKC), CRF cavers are welcome to participate in Roppel Cave Project trips. For more information on trip schedule contact Jim Borden at jimborden@attglobal.net

## Lincoln National Forest/ Capitan Peak Study Area

Contact Dick Venters, Expedition Leader for schedule,  
505-892-6121, rventers@aol.com

## CALIFORNIA Lilburn / Mineral King

**April 21-22**, Lilburn, John Tinsley, (h) 650-327-2368,  
(w) 650-329-4928, jtinsley@usgs.gov  
**Memorial Day Weekend, May 26-28**, Lilburn, Bill & Peri  
Franz, 408-356-8506, frantz@pwpconsult.com  
**June 23-24**, Lilburn, Lynne Jesaitis, 650-314-0453,  
lynnej@reconstructive.com  
**July 7-8**, Lilburn, Mark Scott, 650-967-6861,  
mark.i.scott@lmco.com  
**August 4-5**, Mineral King, Jeff Cheraz, 626-359-2050,  
gephc@loop.com  
**August 11-12**, Lilburn, Damion Grindley, 707-433-5643,  
cavin\_pom@yahoo.com  
**Labor Day Weekend, September 1-3**, Mineral King, Jeff  
Cheraz, 626-359-2050, gephc@loop.com  
**September 22-23 OR 29-30**, Mineral King, Bill Frantz,  
408-356-8506, frantz@pwpconsult.com. **Check with  
leader for which dates the weather permits.**  
**October 6-8**, Lilburn, Peter Bosted, 650-234-9966,  
bosted@slac.stanford.edu  
**Veterans Day Weekend, November 10-12**, Lilburn,  
John Tinsley, 650-329-4928, jtinsley@usgs.gov, and  
Paul Nelson, 909-869-7623, california\_caver@yahoo.com

## Lava Beds

**September 1-3**, Bill Devereaux, 541-594-2211 x166,  
devereauxw@yahoo.com  
**October 6-8**, Bill Devereaux, 541-594-2211 x166,  
devereauxw@yahoo.com & Cindy Heazlit  
**November 22-25**, Janet Sowers, 510-236-3009,  
lmsowers@aol.com

## CRF Sequoia & Kings Canyon Annual Planning Meeting

**January, 5, 2002**, site to be announced, Mike Spiess,  
559-434-3321, mikes@caver.com

## HSS/CRF Hawaii Caving - Big Island

For more information., contact Pat Kambesis, 815-863-5184,  
kambesis@bigfoot.com

## China Caves Project - Guizhou Province

Four-to-six-week trips are run every other year. Contact Ian  
Baren, Project Coordinator, 914-478-5133, chinacave@aol.com

## GUADALUPES

Contact Barbe Barker, Area Manager, cavers@gte.net



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