

CENTRAL
OKLAHOMA
GROTTO
OF THE NATIONAL
SPELEOLOGICAL SOCIETY, INC

C.O.G.nizance

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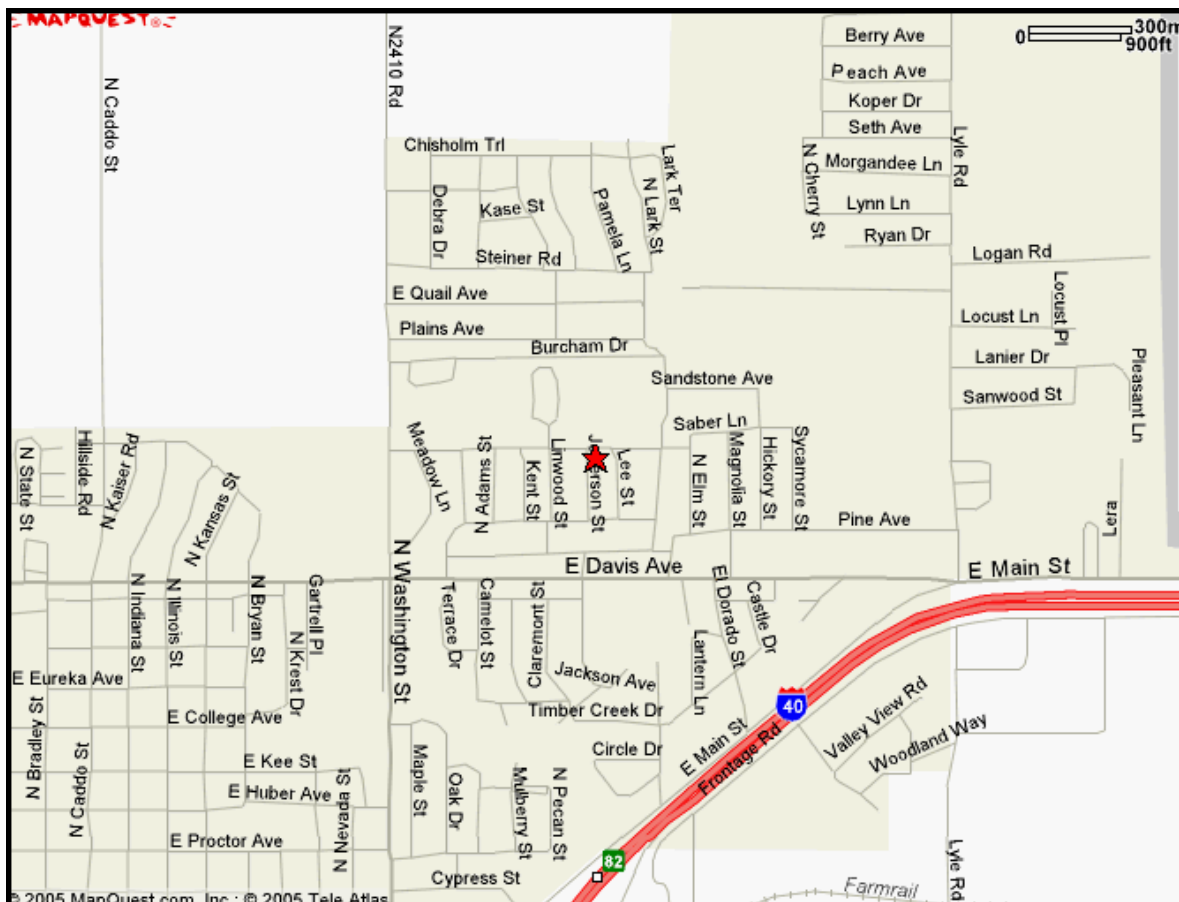
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The September Meeting of the Central Oklahoma Grotto will be at 7:30, Friday, September 9, 2005. at the home of Jon Woltz, 1312 Jefferson St., Weatherford, OK. This will be the first meeting since the last meeting, so be sure to come! Plans will be made for the fun Jester trip for visitors from Arkansas.

Directions: From I-40, take the East Main Street exit. At the light at the bottom of the exit turn right onto Washington. Go north on Washington to Davis St. Davis is a four-lane street with a stop light. Turn right onto Davis.

Drive about one block east and turn left onto Terrace Dr. Go two blocks north and turn right onto Mockingbird Ln. Drive four blocks east on Mockingbird to Jefferson St. Turn left onto Jefferson.

My house is on the east side of Jefferson. If you have any trouble call me at 580-774-2235.



ANNOUNCEMENTS

*Northwest trips are scheduled the third Saturday of every month. Contact Sue or John Bozeman for details.

*Southwest trips are scheduled the first Saturday of every month. Contact Lil Town for details.

*Roy is in the process of making plans for an exchange fun trip

with an Arkansas grotto. He will keep us informed. There is a September fun trip to Jester being planned as part of the exchange trip.

*The September meeting, will be at the home of Jon Woltz, Friday, September 9 at 7:30 in the evening.

MINUTES

CENTRAL OKLAHOMA GROTTO

Minutes of the Friday meeting on June 10, 2005

The meeting was held at the home of Duane DelVecchio. Duane, again, not only opened the door of his home to us but to his massive, well stocked beer refrigerator and kitchen. In the kitchen was an enormous amount of food he had prepared for us. Thank you so much, Duane!

Members and eaters present: Sue and John Bozeman; Jon Woltz; Lil and Dale Town; Nicholas and Dale Amlee; Nicole, Cassandra and Roy Diehl; John Talbot; John VanDyke; Anne Ault. (Hoping I didn't leave someone out. I forgot to send around a list.)

The meeting was chaired by Roy Diehl and began somewhere around 8:59 PM.

First on the agenda was reminiscing about Murray Looney. One of the founders of C.O.G. Murray passed away a few weeks ago. His services were attended by Sue and John Bozeman. Sue and John knew Murray well and told those of us who never got to know him, what a wonderful person he was. Not only was Murray a fine gentleman, but a fine caver. Tributes Murray Looney would have been proud of.

Old business and new business somehow got mixed together, so I will, as the emergency appointed minute's taker, just set down what was discussed and leave it to the reader to sort out to their satisfaction.

Equipment, such as clinometers, compasses suffered some damage during low, muddy crawls and needed

repairs. A vote to fund such repairs was unanimously approved.

There was a discussion about Grotto funds being used to pay entrance fees to commercial caves for members when on 'fun' trips. No vote was taken as the membership decided to consider doing this on an individual basis.

The annual 'fun' trip this year will need to be scheduled before August 12 since several public schools will be starting classes earlier this year. A canoe trip on the Illinois or Buffalo rivers around the third week of July was discussed. Chairman Roy volunteered to arrange with members via email.

As of this meeting, Chairman Roy had not heard from Boston Mountain Grotto concerning a trip to an Arkansas cave.

Per written request of Mr. Belev, since he could, again, not be at the meeting. He and Mr. Harrington have gone again into the wilderness to conquer something or another. Anyway, request from Belev for a vote to discontinue mailing out newsletters and have them come to each individuals computer was discussed. It was decided that no vote was required. Individual members could decide how they wanted theirs delivered. Just notify Sue Bozeman by email giving her your delivery preference.

Green's Cathedral is still in the process of being surveyed.

Treasurer's Report was given by John Talbot. Meeting adjourned somewhere around 9:38 PM. Minutes submitted by A. Ault

TREASURER'S REPORTS

INCOME

DIVIDEND \$.12
PUBLICATION SALES \$ 14.50

TOTALS \$ 14.62

CASH ON HAND \$ 36.30

CHECKING \$ 574.16

SAVINGS \$ 2,596.01

EXPENSES

NONE

PREPARED BY TREASURER
JOHN TALBOT
6/7/05

TRIP REPORTS

Trip report: "No Heat, No Ticks, No Possums" : The Hardcore Cavers of COG Visit Arkansas

Dates: August 5-7, 2005

Personnel: COG—Roy "Real Deal" Diehl, Jon "Born to Be Wild"

Woltz, Steve Beleu, The Skillful Ogre; Boston Mountain Grotto (sorry, have first names only)—Clif, David, Gary, Jeremy, Melissa and Tom, Mike, Terry

Location: Buffalo National River

Caves: Lynnhouse Cave, "Buffalo National River C54" Cave

When Lead Officer Diehl announced this trip several months ago at a grotto meeting, a great moan and cry went up that it would be too hot, we would end up covered with ticks, and that we would have to eat strange food. Here is what actually happened: it was cooler in Arkansas than it was in The Land of the Okies, it was tick-free, and we didn't have to eat any possums or squirrels. But only the three of us, the most manly men in COG who snack on danger and dine on death, made the trip.

We traveled there via Tulsa, Siloam Springs, and Springdale, getting there after about five hours of driving. Our campground, "Lost Valley Canoe and Lodging" (www.lostvalleycanoe.com), featured mown tent sites, hot showers, and flush toilets. Getting there early, we had to wander around a bit before our hosts began arriving. So we went down to the river and splashed about. After our hosts arrived, we set up our tents and began to chew the spelunking fat with them, planning our next day of caving together.

When Saturday morning arrived we divided into two groups: some of the Boston Mountain Grotto (BMG) members went off to one cave, and some of them took us to Lynnhouse Cave. This is a limestone cave whose entrance we had to drive halfway up a hill and then hike further up to reach. We had to hand-and-knees crawl through most of it, with occasional standing, stooping, skooching, and stomachial-crawling. Our hosts were used to this cave being a cave filled with dry dirt, but on this day we found it to be mostly wet mud, and our hosts strongly suspected that mud has been washing into and filling up some passages in this cave (although the other group of cavers, who did this cave after finishing their first cave, went into another part of the cave via another entrance that included more walking passage). The length of Lynnhouse Cave that we went through was about 500 feet.

The second cave that we spelunked through was an unnamed cave known as "Buffalo National River C54 Cave". I suggested that they name it "Homestead Cave" since it is behind an old homestead and probably served the homesteaders as a refrigerator. But let us back up: after we had finished Lynnhouse Cave, which is not exactly an impressive cave, our hosts noted that there was another cave behind an old dilapidated homestead just up the very bad road we had scraped our two four-wheel drive vehicles over. We were just going to go and look at it, then join the first group of BMG cavers in their first cave that they should still have been in. What we found when we got to the cave

is that the homesteaders had poured a small rectangular concrete entrance around the natural cave entrance; at one time they may have had a door attached to it. Roy went into the cave about 10 to 15 feet with a flashlight, then came back. Then I went into the cave about 25 to 30 feet, began to see formations, and reported this back to everyone, suggesting that we suit up again to do this cave. My thinking at the time was that this cave would then be something new both for COG *and* for BMG. We were not disappointed.

After an initial narrow stoop walk through a passage with water flowing out of it and down the hillside, we ducked down below a shelf after about 25 feet and entered a cave passage that featured drapery, stalagmites, stalactites, pendants, curtains, rimstone dams, flowstone, and soda straws! About 6/10ths of the passages ahead required hand-and-knees crawling or stomachial crawling; about 4/10ths we could walk through. At one point we broke into two groups of three cavers each to explore two distinct branches of the cave. The group that I was in found a large, well decorated room at the end of a crawl that may or may not end this branch of the cave. Both groups found survey markers at or near the ends of their branches of this cave, although they were not BMG markers and our hosts were unsure whose markers they were. What a cave! It also impressed our BMG hosts.

That night we showered up and waited as appointed BMG Chef Clef prepared a mountain of Cajun gumbo for us. It began raining heavily while he was cooking, but our hosts set up two tarps over their field kitchen tables. We ate so much that we became incapable of movement. Clif cooked so much gumbo that we could have fed all the hungry people in Africa and had leftovers.

Some of our hosts had to leave that Saturday night; those who remained had to leave Sunday morning. We journeyed further east along the river that morning, rented two canoes, and floated down six miles of the Buffalo National River. Then we piled back into the DiehlMobile and drove back across the state line. The entire time that we were in Arkansas a rain front cooled temperatures down on our behalf. If our hosts enjoy visiting our gypsum caves in September, we will attempt to set this up as an annual event between our two grottoes. BMG seems willing to do this. It will become a great trip for the Central Oklahoma Grotto!

VARIOUS NOTES:

- Fauna census: in C54 Cave—two juvenile Long-Tailed Salamanders, various Cave Salamanders; outside—one elk, a flock of turkeys.
- We noted sharks' teeth in some of the cave ceilings in "BNR C54" Cave.
- The place to eat "The Fried Chicken of God" is in Springdale at "A.J. Fried Chicken". The restaurant featured photos of President Clinton shaking everyone's hands. *(continued on page 4)*

Whilst canoeing Roy picked up a snake and dropped it into the boat Jon and I were sharing; he was almost sure that it wasn't poisonous.

- On Sunday morning we all heard the call of a Yeti in the hills that surround the campground. It was hungry for human flesh.
- Did you know that Jon Woltz drives a scooter? Let him henceforth be known as "Born to be Wild" Woltz.
- Never having canoed before in my life, I slipped on an algae-covered rock in the river and cut my knee open.

- We saw a bunch of fish in the river swimming around.
- Clif wore a chef's apron that read "Will Cook for Sex." We hope that he gets a lot of good cooking this year!

Thanks to our hosts, the Boston Mountain Grotto, for being such congenial hosts to us. We hope to be back next year. Hopefully COG's wussie-pie cavers will join "The Hardcore Cavers of COG" next year.

Who to blame for this trip report: S. Belev, who must now head for the hills and hide out for a while. 🐉

POTPOURRI

Mammoth, in Depth

By Ben Brazil

Copied from The Washington Post Company

CAVE DIVING STORY. Will be frightening, but a must-see. Bushman's Hole, 3rd deepest underwater cave known on the planet.

Exhalation causes the chest to contract.

Most people do not attach great importance to this fact. But imagine that you are belly-crawling through a 10-inch-tall opening in a cave passageway, 250 feet underground. Your face is flat against the clammy limestone floor, and your legs are frantically trying to force your rib cage through a space where it does not seem to fit.

In this context, the physiology of breathing seems quite important indeed.

I know. In this position during the Wild Cave Tour at Kentucky's Mammoth Cave National Park, I remembered the advice of my guide: Exhale. The extra centimeters allowed me to squirm forward and continue my crawling tour of the world's longest cave.

With about 365 miles of explored passageways -- and counting -- Mammoth Cave is one of the nation's oldest tourist attractions. It began luring visitors just after the War of 1812, when it was mined for saltpeter, one of the raw materials for gunpowder.

Its charms were obvious: passageways the width of boulevards, underground rivers, towering vertical shafts and concert-hall-size chambers. Often led by slaves, early tours attracted European adventurers, famous actors and even transcendentalist writer Ralph Waldo Emerson, who mentioned the cave in an essay. A national park since 1941, Mammoth ranks with New Mexico's Carlsbad Caverns and South Dakota's Jewel Cave among the country's most impressive underground attractions.

I visited the park for five days in early June, ready to rediscover my muscles and uncross my eyes after my last semester of graduate school. I'd never been to Mammoth and had only a murky sense that crawling through its tunnels might be cool.

But wait a second. Can't cave tours be a little, well, hokey? I think of cheesy advertisements on billboards in cow pastures. Fanny-packed families gawking at stalactites. Gift shops with geodes.

The drive to Mammoth does nothing to alleviate these concerns. The interstate exit for the park is guarded by a large, tiger-striped T. rex, an ad for an attraction featuring life-size depictions of dinosaurs. Drive farther toward the cave and you'll pass a variety of miniature golf courses, a wax museum and at least a couple souvenir rock shops -- offering geodes.

But the kitsch ends where the national park begins. Ranger-led tours offer nothing more gimmicky than history and geology, and many involve moderately long walks and hundreds of stairs.

And for those seeking a bit more adventure, there is another option still. But it involves crouching. Then crawling. Then slithering through muddy tunnels like an earthworm. In fact, a week after taking it, I still had the scabs and ruined jeans to prove it -- the park's Wild Cave Tour is no joke.

Mammoth Cave is spectacular, but the national park is more than a monumental hole in the ground.

In addition to the cave itself, Mammoth offers 52,830 acres of above-ground activities, including hiking, paddling and fishing. In particular, the north part of the park is crisscrossed by more than 70 miles of backcountry trails, all of them lined with oaks, maples, poplars and other residents of the Eastern deciduous forest. The Green and Nolin rivers also wind through the park for 31 collective miles of waterway.

Paddling the Green in June, my girlfriend, Laura, and I could sometimes spot low-hanging fog at water's edge, a marker of where cool cave water joined warmer surface water. Laura pointed out one such patch early in our trip, and we followed it into the mouth of a small, dead-end cave. Our dog, a liver-spotted Dalmatian named Bella, was on her first canoe trip. She began shivering in terror as we entered the cave, but the little kid in me felt the excitement of discovering a river hide-out. We looked out from the darkness onto the river flowing past,

(continued on page 5)

our voices echoing in the dank, chilly air.

Outside again, we paddled past cigar-shaped islands jutting out of the river like battleships. Around us, a handful of people fished from kayaks or drifted aimlessly. I lay back against the canoe's gunwale in a light mist, alternately closing my eyes and gazing at the enormous sycamores arching over the water. It was a lazy, easy, beautiful paddle.

Laura and I were already somewhat familiar with the Green, having pitched our tent in Houchins Ferry Campground on the river's banks. One of three car-accessible campgrounds in the park, Houchins Ferry attracts families wanting to car-camp and fish. When not fishing, their children ran along the grassy riverbank, often playing with Bella, who pranced around them.

But Mammoth's surface activities do not all involve water. Laura, Bella and I also spent a day on the deserted trails looping through the park's northern half, hiking through the shafts of sunlight that penetrated the canopy of maples, oaks and beeches. We saw a grand total of one other person. And even on the ridges, there were hints of the realm below. We paused beside a spring that emerged from the hillside, then trickled over a small, moss-draped waterfall.

Then we looked into the damp pit of a sinkhole, wondering what worlds lay beneath our feet.

Prehistoric tribes first ventured inside the cave about 4,000 years ago, and it is easy to imagine how they might have found the entrance. On a sweltering summer day, the cool underground air pouring out of the "historic entrance" feels like a blast from an enormous air conditioner.

Following the cool draft inside, modern visitors quickly find the ruins of the old saltpeter mines. A bit deeper lie small huts that once belonged to a tuberculosis hospital - a 19th-century venture that proved better at killing patients than curing them. Another chamber once hosted lantern-light church services.

Along with the sheer size and extent of its chambers, this rich history sets Mammoth apart from other tourist caves. Rather than merely holding forth on geology, guides tell of the African American slaves who served as early tour guides and who rank among the cave's most intrepid explorers. They mention the discovery of ancient mummies, as well as entrepreneurs who searched for new cave entrances by setting off underground charges of dynamite.

For geological reasons, Mammoth has relatively few classic cave formations -- stalactites, stalagmites and the like. But it does have some, and its history and scale easily make up for their scarcity.

Of course, no one tour can include more than a sliver of the world's longest cave. Besides the Wild Cave Tour (which begins miles from the historic entrance), I took the Historic Tour, which covers part of the early tourist route. The trip included mining ruins, a half-acre-size chamber and 440 stairs ascending a 200-foot-tall underground shaft, where water from an outside thunderstorm gave me a quick shower.

Although I sometimes had to crouch on this tour, often I could luxuriate in chambers the size of airplane han-

gars. Of course, some people won't consider a cave chamber, no matter how spacious, as grounds for luxuriating. I can only say that these people have never been on the Wild Cave Tour. Think of an enormous performing arts center -- grand halls, beautiful auditoriums and some good artwork on the walls. Now imagine exploring it via the air conditioning ducts. This should give you an idea of what Mammoth's Wild Cave Tour is all about.

Several caves around the country offer such tours, and I had taken an earlier -- and much easier -- one in Arkansas a year before visiting Mammoth. Both were fun, and they probably qualified me as a spelunker. But not as a caver.

"Cavers" are a relatively small group of skilled adventurers, somewhat akin to serious mountain climbers, though not nearly as celebrated. They explore the most remote parts of caves, sometimes mapping what they find.

Spelunkers?

"Cavers rescue spelunkers," smirked Kevin Neff, our wry 62-year-old guide.

My group of five -- Bella stayed behind in a kennel -- included no one better than a spelunker. Still, Neff knew we hadn't come to dodder along the tourist trail. Just after entering the cave, he gave us a moment to adjust our hard hats and strap on our kneepads. Then he looked down his nose and feigned a cave connoisseur's disdain for us dilettantes.

"I'm assuming you're ready," he said dryly. "Because we're leaving."

The crawling began almost immediately. As we veered off the main tourist trail, the shrinking passages forced us to our knees. Our hands smacked the clammy cave floor, then sank into soft powder and finally clawed at the edges of the Bare Hole, the tiny cataract where I had to exhale.

This was a test, Neff explained. Although we could all physically fit through the hole (people with chest or hip measurements larger than 42 inches cannot take the tour), the squeeze is more than some people can stomach mentally. Closet claustrophobics will be outed.

But we all passed, and the tour continued in a blur of crawling. I lurched and gasped through passages with names like Birth Canal, all while listening to the nonstop monologue of the man behind me, who repeated things like "That was easy!" and "Piece o' cake! Piece o' cake!"

I crawl like an ostrich, so I was pleased that the second half of the tour involved upright walking, as well as a bit of free climbing down tall crevices and cave walls. The highlight, though, came when Neff began to make eerie "Star Trek"-style "oohing" noises, which disappeared into the vastness of a room called Cathedral Domes.

Here, the cave's ceiling soared some 100 feet above our heads, forming a vaulted chamber maybe 40 yards long. The white light of our headlamps sliced through the blackness to the ceiling, lighting the clouds of our breath as they drifted upward.

Eventually, though, the passageways shrank and, alas, crawling resumed.

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It wasn't pretty. I struggled over the sharp, irregular rocks that jutted from the floor of the Cheese Grater. I tried to straddle the puddles at the bottom of the Sewer Pipe. Then we came to Shotgun, which Neff said would certify us as real cavers.

Others navigated this tunnel by wedging their elbows against its edges and splaying their legs over the orange water at its base. They then crawled forward, bellies hovering over the water.

Right.

I collapsed and splashed straight through, sending a torrent gushing out the tunnel's end. After I emerged, Neff commented that he'd gotten the edge of his bag wet. My T-shirt plastered to my chest, I said I felt really, truly sorry for him.

Finally, the cave spit us back onto the main tourist trail, and we started walking toward the exit. Just before hitting daylight, we passed a regular tour group, stopped for a ranger talk in one of the cave's biggest passageways.

Undoubtedly they were impressed by such geological wonders. But walking by, I wondered what they thought of me -- wearing a hard hat, sopping wet and covered in cave dirt. Maybe, just maybe, they thought something flattering but completely untrue.

Maybe they thought they'd just seen a real caver.

Atlanta freelancer Ben Brazil last wrote for Travel about his short-lived modeling career in Argentina.

Details: Mammoth Cave National Park

GETTING THERE: The closest major airports to the Kentucky park are in Louisville and Nashville, both about 1 1/2 hours away by car. Many major airlines fly from Washington to both cities, but you'll need a rental car to get to the park. Restricted round-trip fares to Nashville and Louisville begin around \$125.

CAVE TOURS: The Wild Cave Tour, the most difficult and most expensive offering of the park's 12 tours, lasts six to 6 1/2 hours and costs \$46 per person. Open only to ages 16 and older, the trip requires over-the-ankle boots and chest or hip measurements 42 inches or smaller; bigger people won't fit. Additionally, people who fear heights or close spaces should not take this tour.

Walking-only tours range from brief self-guided trips inside the "historic entrance" to 4 1/2 -hour tours through major passageways; prices are \$4 to \$21. (See Information below.)

CANOEING: Six miles of the Nolin River and 25 miles of the Green River lie within park boundaries. Both rivers can be paddled. Rentals and transport to/from some river sections are available from Mammoth Cave Canoe & Kayak (1240 Old Mammoth Cave Rd., Cave City, 877-592-2663, <http://www.mammothcavecanoe-k.com>). Canoes are \$45 for a half-day, \$55 for a full day, \$100 for two days.

WHERE TO STAY: Mammoth has three options for car camping. Maple Springs Group Campground, near the heads of Mammoth's backcountry trails, has sites suitable for groups of up to 24 for \$30 per night. The other campgrounds are by the visitors center and on the Green River, near the Houchins Ferry crossing. They cost \$16 and \$12 per night, respectively.

Reservations: 800-967-2283.

The Mammoth Cave Hotel (270-758-2225, <http://www.mammothcavehotel.com>) is near the park visitors center and offers options ranging from hotel rooms to cottages. The "hotel cottages" -- small, white buildings with heat and window air-conditioning units -- run \$63 for a double and are available from mid-March to mid-October. Though they lack AC or heat, the "woodland cottages" have ceiling fans, wood floors and more charm. They're \$48 for two people and are open from mid-May through September. The main hotel offers two types of accommodations: Heritage Trail rooms are \$68 or \$75 for a double, depending on whether the room is remodeled; Sunset Terrace rooms, in a low, ranch-style building nearby, are somewhat nicer and go for \$78.


The owners of Mammoth Cave Canoe & Kayak run the Wayfarer B&B (270-773-3366, <http://www.bbonline.com/ky/wayfarer>) on its grounds. The inn has wood floors and a relaxed country decor, and no TVs in bedrooms. Doubles begin at \$85.

For more basic accommodations, Cave City, a few miles from the national park, has a number of chain hotels. One of the newer ones is the Comfort Inn (801 Mammoth Cave St., 800-228-5150, <http://www.mammothcave.com/comfinncavecty.htm>). Doubles start at about \$85.

WHERE TO EAT: Mammoth Cave's underground cafeteria is accessible only to tour groups on certain routes, so most eating will be done above ground. The Mammoth Cave Hotel (see above) houses the Travertine Restaurant and the Crystal Lake Coffee Shop. The Travertine, decorated with old photos of local life, has a hearty menu heavy on meats of various sorts. Entrees are \$5 to \$16. The coffee shop has soups and sandwiches, with prices in the \$3 to \$7 range.

If you want to venture outside the park, locals say the Sahara Steakhouse (413 E. Happy Valley Rd., 270-773-3450) is Cave City's best restaurant. The decor is nothing flashy, but the menu has plenty of meat and seafood. Entrees \$10 to \$29.

Closer to the park is Joe's Diner (1004 Mammoth Cave Rd., Cave City, 270-773-3700), with a jukebox and a lunch counter. Burgers, sandwiches, and other diner fare will run you \$3 to \$7.

INFORMATION: Mammoth Cave National Park, 270-758-2180, <http://www.nps.gov/macac> 

CAVES SPRAWL

By Steve Beleu

Caves sprawl, arms growing away from us in every direction

Over, around, and beneath these hills like the branches

Of a gnarled Joshua Tree. We are the leaves scattered

Up and down the trunk of this horizon above its deep caves

That are buried as far beneath us as the stars floating overhead.

Urine Battery Turns Pee Into Power

John Roach for National Geographic News
August 18, 2005

Before you next flush the toilet, consider this: Scientists in Singapore have developed a battery powered by urine.

Researchers at the Institute of Bioengineering and Nanotechnology created the credit card-size battery as a disposable power source for medical test kits.

Scientists have been scrambling to create smaller, more efficient, and less expensive "biochips" to test for diseases such as diabetes. Until now, however, similarly small batteries to power the devices remained elusive.

Diagnostic test kits commonly analyze the chemical composition of a person's urine to detect a malady. Ki Bang Lee and his colleagues realized that the substance being tested—urine—could also power the test.

"In order to address this problem, we have designed a disposable battery on a chip, which is activated by biofluids such as urine," Lee wrote in an e-mail to National Geographic News.

The research team describes the battery in the current issue of the *Journal of Micromechanics and Microengineering*.

Daniel Kammen, director of the Renewable and Appropriate Energy Laboratory at the University of California, Berkeley, said the technology is a welcome innovation in a time of rising energy prices.

"All jokes [about] urine aside, what is needed are low-cost batteries. ..." he said. "The other neat thing about this is the fact that it's basically a biodegradable battery."

Urine Power

To make the battery, Lee and his colleagues soaked a piece of paper in a solution of copper chloride and sandwiched it between strips of magnesium and copper. This sandwich was then laminated between two sheets of transparent plastic.

When a drop of urine is added to the paper through a slit in the plastic, a chemical reaction takes place that produces electricity, Lee said.

The prototype battery produced about 1.5 volts, the same as a standard AA battery, and runs for about 90 minutes. Researchers said the power, voltage, and life-time of the battery can be improved by Urine contains many ions (electrically charged atoms), which allows the electricity-producing chemical reaction to take place in the urine battery, said Berkeley's Kammen. Other bodily fluids, such as tears, blood, and semen, would work easily as well to activate the battery.

"Little bags of urine may generate chuckles," Kammen said. "But really urine is just a nice example [of] a whole variety of compounds that do this stuff." Even

children's lunch-box fruit-juice packets are sufficient, he added.

Alternative Energy

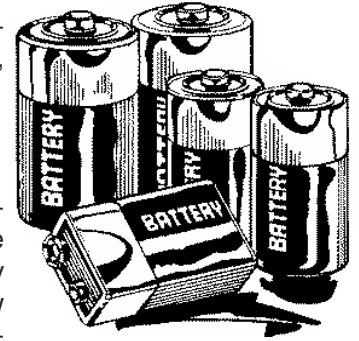
While medical devices inspired the urine battery, it can activate any electric device with low power consumption, according to Lee, the battery's co-inventor.

"For example, we can integrate a small cell phone and our battery on a plastic card. This can be activated by body fluids, such as saliva, during an emergency," he said.

According to Kammen the technology could even be applied to laptop computers, mp3 players, televisions, and cars. Body-fluid-powered batteries "can do all kinds of things. The issue is how they scale up" to produce more power, he said.

One approach is to simply build larger batteries. Another method is to link lots of little battery cells side by side, which is how the batteries in laptop computers work, Kammen explained.

Kammen, who advocates government funding for alternative energy research, says the wide number of applications for cheap and efficient biofluid-powered batteries illustrates the value of research. "Investigation leads to innovation," he said.



Terms used in mining that are applicable to cave digging


Steve Beleu

With thanks to our fellow travelers in mining, we have appropriated these terms from mining to our use in cave digging—

- Slope Sinking – any digging that is sideways or diagonal
- Shaft Sinking – any digging that is primarily vertical
- Muck – any substances that are removed by digging, including rock, mud, dirt, and gravel
- Mucking – the process of removing muck from the site of the cave dig
- Initial excavation – within the scope of cave digging only, this is the initial digging that removes loose rock, mud, dirt, or gravel
- Excavation – within the scope of cave digging only, this is the digging that occurs after the initial excavation
- Collar section – within the scope of cave digging only, this is the area of the initial excavation and beginning of the excavation.

Major source: U.S. Mine Safety and Health Administration, *Coal Slope and Shaft Sinking Training Program*, 2005. S. Beleu, July 13, 2005

Central Oklahoma Grotto is a non-profit organization and a chapter of the NSS (National Speleological Society), Cave Avenue, Huntsville, AL., 35810. Dedicated to cave conservation and safety, C.O.G. published general information in a monthly newsletter (\$6.00/year) and detailed cave surveys and related Speleological items in a yearly publication, *The Oklahoma Underground* (\$3-\$8/issue) Membership is by sponsor and is \$12 per year for adults, \$6 for spouses and students, and \$3 if under 18. Central Oklahoma Grotto meets once a month on the second Friday of each month. For information, write 3208 Gettysburg Dr., Altus, Oklahoma, 73521. All submissions to the newsletter should be sent to the editor: Lil or Dale Town, 3208 Gettysburg Dr., Altus, OK 73521: Telephone: (580)477-4027: E-mail: oklmt@cablone.net. The deadline for submissions for any particular month's issue is the 20th day of the previous month. If you wish material returned. Please include a SASE with submission. All materials in this newsletter is available for reproduction, provided proper credit is given with the article when you print it. Trade publications are welcomed. *Cave softly and safely!*



*The September meeting will be at Jon Woltz's home,
Friday, September 9, at 7:30.
Hope everyone had a great summer!*



**Central Oklahoma Grotto
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