An 1890's era Mammoth Cave tour poses for pioneer cave photographer Ben Haines as they exit the Corkscrew. The Corkscrew, discovered in 1870, forms a direct route from Bandit Hall to Broadway, bypassing the Bottomless Pit route. Many written accounts comment on the exertion required to ascend the narrow, twisting stairs on this very steep shortcut. Ben Haines' work and its place in the history of cave photography are discussed in detail in Chris Howes' *To Photograph Darkness*, reviewed on p.18.

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**CRF-East Moves To Maple Springs**

Mel Park

The weekend after the Thanksgiving Expedition, CRF-East will move its operations from Flint Ridge to Maple Springs, leaving our home and altering a tradition of over 30 years. We are moving not because we particularly want to but because it has been on the cards since 1972, when our landlords, the National Park Service, determined that our use of the Austin House could not be permanent.

We have grown on and into Flint Ridge. Our lore, verbal and published, link us with the vibrant and sometimes rambunctious life that preceded us on that Kentucky Ridge. For thirty years we (and for a long time, the Job Corps) were the sole regular users of Flint Ridge - two kinds of (excuse me) Yankees, imposing their priorities and requirements on a former community. Add the park to that - three kinds of outsiders, with the NPS being the pioneers.

We are the last tenants of Flint Ridge. As we leave, so will electricity, what remains of water service, and some part of the road system. The above-ground portion of Flint Ridge will return that much more to nature. The below-ground portion will continue to enjoy its protected status. The cave remains as it has been for years: closed, protected, an object of study and learning, endangered only by environmental hazards from outside the park.

*Where is Maple Springs?*

Our new base of operations is a former ranger station, residence, and base for special projects.

*Continued p.5...*
BULLETIN BOARD

Address Corrections: Moved? Missing some copies? (The Newsletter is not forwarded). Send address corrections to Richard Zopf, 830 Xenia Avenue, Yellow Springs, OH 45387, with $1.25 for each back issue requested.

Birth Announcement: Rachel Ann Hill, daughter of Larry and Andrea Hill, granddaughter of Alan and Carol Hill, was born September 20, 1990.

CRF Research Center fund raising drive: Please help make the planned Mammoth Cave research center a reality - send your tax-deductible donations to the treasurer, Roger McClure, 4700 Amberwood Drive, Dayton, OH 45424. Make checks payable to Cave Research Foundation. Funds are also solicited for the International Exploration Fund (another expedition to China is in the early planning stages).

CRF Annual Report: Submissions for the 1990 Annual Report are due. The deadline is December 31. The Annual Report is not for publication of full-length articles; we seek extended abstracts supported by a few key references and camera-ready illustrations, the whole not to exceed five double spaced 8.5" by 11" pages. A machine-readable disk with hard copy backup is preferred. Black and white photographs are also solicited - send glossy 8" by 10" prints. Please send your contributions on cave and karst research, CRF related activities, abstracts of papers, talks presented, etc. to the editor, Karen Lindsley, 12 Orchard Road, Lucas, TX 75002-8061.

1991 Karst Research Fellowship: CRF will award a graduate fellowship for thesis research in cave and karst related topics for the academic year 1990-1991. The Foundation can award a stipend up to $3500. Lesser sums may be awarded as grants. The study is to be supervised at the graduate school of the awardee's choice.

The Foundation can provide field support for work in central Kentucky, Guadalupe Escarpment (Texas and New Mexico), and Kings Canyon National Park and Lava Beds National Monument (California). Applicants needing field facilities in these areas should provide specifics in their proposal.

A panel of scientists reviews the proposals. At a minimum, the proposal must: present an overview of the research area and the scope and significance of the proposed research, demonstrate a command of the methodology, discuss proposed hypotheses and how you will test them, and present a proposed budget. A resume and academic record are required. Two letters evaluating your potential are also required; one of these should be from your thesis advisor. For more details, write to:

Dr John C. Tinsley
c/o U.S. Geological Survey
345 Middlefield Road MS-975
Menlo Park, CA 94025.

Applications (4 copies required) must be postmarked not later than January 31, 1991. Awards will be announced by April 15, 1991.

Notes from Here and There

The August expedition of the Lechuguilla Cave Project pushed the cave's mapped length past the 50 mile mark to 51.4 miles. Lechuguilla remains the fourth longest cave in the U.S.

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Patty Jo Watson was honored again recently, this time by the Society for American Archaeology, who awarded her the prestigious Fryxell Medal at their annual meeting in Las Vegas, Nevada, citing her "outstanding contributions to understanding the human past in the Americas." Patty Jo was elected to the National Academy of Sciences in 1988, and was made an honorary member of the National Speleological Society in 1989.

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CRF has signed a contract with the Roswell District (New Mexico) Bureau of Land Management to inventory caves and karst of the Chosa Draw area - more details in the next Newsletter.
RON KERBO HONORED AT NSS MEETING

At the July convention of the National Speleological Society in Yreka, California, Ron Kerbo, longtime CRF member and NPS employee, received an honorary life membership in the NSS, and was simultaneously made a Fellow of the Society. Kerbo was also the featured banquet speaker at the convention.

The award is one of the two highest honors that the Society bestows, and was given in recognition of Kerbo’s dedication to caves and outstanding contributions to speleology. Kerbo has been Cave Specialist at Carlsbad Caverns National Park since 1976, and is largely responsible for the excellent relations the caving community enjoys with CCNP. He has developed exemplary working relationships with both the CRF and the Azores. Kerbo has been Cave Specialist at Carlsbad Caverns National Park since 1976, and is largely responsible for the excellent relations the caving community enjoys with CCNP. He has developed exemplary working relationships with both the CRF and the Lechuguilla Cave Project, resulting in a wealth of productive survey and research activity within the world class caves of the park. He has also contributed to cave management, conservation, and exploration internationally, taking part in trips to China, the USSR, Mexico, and the Azores.

This is the third consecutive year that the honorary life membership has been awarded to a CRF member. The 1988 award went to Red Watson; Pat Watson was honored in 1989.

Other NSS Awards:

Peter Bosted and Karen Lindsley were awarded Certificates of Merit for their tremendous effort in producing the English language version of Atlas of the Great Caves of the World. Bosted translated the work from the French, updated it, greatly expanded the North American section, and drew a large number of maps. Lindsley was responsible for the typing and layout, and for production of the index.

Receiving Fellowship Awards (for continued service in exploration, research, and conservation), in addition to Ron Kerbo, were California JV’s Sandy Cowan, Bill Frantz, Michelle Richardson, and Pete Schifflett.

Chris Groves received the $1000 Ralph Stone Research Award for his proposal to study the early development of karst systems. Groves recently received a CRF research grant for the same project (August Newsletter).

In the Cartography salon, the overall Medal was won by Pat Kambesis for her map of Snowflower Pit, Alabama. Pat also won an Honorable Mention for Doug Green Cave, Alabama. George Veni won a Merit Award for his map of Naj Tunich, Peten, Guatemala, and an Honorable Mention for Las Cueva de San Josecito, Nuevo Leon, Mexico. Bob Richards won a merit award for his map of Carey’s Big Mud Cave, California. Other Honorable Mention awards went to Nancy Pistole for Buena Vista Cave, Oaxaca, Mexico, and to Peter Bosted for his Lilburn Cave entry. The Lilburn map, a CRF project, is an innovative computer-generated map using seven different tones of gray to denote different levels in this extremely mazy, multi-level cave. Bosted wrote the necessary computer programs.

JV’S were well represented in the Photo Salon. Peter and Ann Bosted received a Medal in the print division, in addition to Merit and Honorable Mention Awards for color prints and slides; Ron Simmons won the Medal for color slides (his photo of the Grim Crawl of Death in Columbine Crawl graces the cover of the August NSS News), in addition to Merit and Honorable Mention Awards; Dave Bunnell received Merit Awards and an Honorable Mention for color prints and slides; Bill Franz won an Honorable Mention for black & white prints.

*The Atlas, 350 pp with numerous maps, can be purchased from Cave Books, 5222 Eastland Drive, New Carlisle, OH, 45344 for $21.25 ppd.

WKU’S SPELEOLOGY COURSE COMPLETES 11th YEAR

Western Kentucky University’s Cave and Karst Institute has operated a field studies program since 1980 in Mammoth Cave National Park, and more recently, in Mexico. One course, offered from the beginning, is Speleology, taught by Roger W. Brucker. “An understanding of the interrelationships of all of the cave sciences is what I try to lead students to discover for themselves,” said Roger.

The course covers seven days of classroom lectures and cave trips, mostly into the undeveloped parts of Mammoth Cave. Students see vertical and horizontal drainage, learn to investigate tributaries and piracy routes, see the role of food import and cave animal ecology, and see such exotic sights as aboriginal feces.

“We examine the historical evolution of cave theory — Davis, Bretz, Swinnerton, White, Ewers, and others — because it illustrates how cave knowledge proceeds from some notions and ideas, how facts and patterns are discovered, and how researchers build upon the work of others. Controversy is vital to real science,” said Brucker.

Brucker said he is more interested in students understanding cave processes than in memorizing facts. Since each cave is unique, the speleologist must bring a set of rigorous questions to the cave. Only then will the cave yield answers through examination.

Students spend one day learning to survey and drafting a map of places such as Sandstone Avenue in Mammoth Cave. A day is spent examining the exterior karst features. “The missing landscape of the Sinkhole Plain is the 97% result of the karst processes, and the cave passages are the other 3%,” said Brucker.

Continued...
Sometimes, the most memorable trip is through one or more connections between caves. It shows the role of vertical shafts and low-level horizontal drains in integrating the truncated upper level passages. Getting muddy and wet is part of the joy of caving.

On one trip, in 1989, the party entered the Austin Entrance, traversed the connection from Unknown Cave to Salts Cave, and found the way blocked by high water at the Colossal Cave end. "We turned the tired party around, knowing the Austin gate was locked because Lynn [Brucker] had taken one member of the party out earlier. We anticipated a wait of many hours before help came," said Roger. Cool heads prevailed. The party organized to conserve energy and kept warm for the long wait, while the "engineers" worked on getting around the lock. They were successful, and they met Lynn coming to rescue the party. "Those students learned that cave exploring can be dangerous, and that we have to plan carefully and keep track of people," said Roger.

Feedback on the course is of two kinds. Students write evaluations, which are provided to the Superintendent of Mammoth Cave National Park, to Dr. Nick Crawford, who directs the Institute's work, and to the instructor. Brucker says the comments are universally positive (sometimes embarrassingly so) and often reveal a life-changing experience during the course. A second feedback is that some students have joined CRF work. Mel Park, CRF Operations Manager for Mammoth Cave, for example, was a student a few years back.

Asked why he continues to teach the course, Roger said, "I love to teach, and I love caves. Mammoth Cave is the most splendid laboratory I know for teaching. And the students are highly motivated and learn a lot. I like getting to know students and hearing from them over the years."

Speleology is only one of a full program of WKU summer field courses, most of them taught by individuals with strong CRF connections: Art and Peggy Palmer, Stan Sides, Richard Zopf, and many more. Roger credits Nick and Whit Crawford for their vision and dedication year after year in organizing the courses. "They are directly responsible for over 500 people coming to speleology with far more than just a sense of awe. They're prepared, enthusiastic, and go on to make lasting contributions."

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**FOREST SERVICE MEMO. OF UNDERSTANDING SIGNED**

The Cave Research Foundation has signed a Memorandum of Understanding with the U.S. Forest Service. The agreement, negotiated on behalf of CRF by Board member Jim Borden, will govern the broad framework within which specific local agreements between CRF operating units and individual National Forests will be framed. Borden represented the Foundation at a signing ceremony on July 18, in Washington, D.C.

The broad principles require two-way communication and consultation, on both a national and a local level, and the application of CRF expertise as appropriate. Assistance may take the form of mapping, locating and inventorying Forest Service caves, assisting in the development of cave management plans, reviewing research proposals, conducting education programs, conducting or sponsoring research, assessing and recommending solutions to environmental issues, etc. Information derived from CRF activities will be used to amend Forest plans (the basic management document for individual Forests) where appropriate, and may help guide policy on a National level.

CRF now has national agreements in effect with all federal land management agencies within the Interior and Agriculture Departments.

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**CARLSBAD CAVERN RESTORATION**

Dick Venters

"They're playing in the mud and sand". "So this is how the cave was made". "Are you using up our tax dollars to do this?" - These are just a few of the many comments made to the 29 volunteers who came to the 1990 Carlsbad Cavern restoration field camp, held the third weekend of June. Cavers from all over the country came to restore areas that were blasted or covered over as a result of trail building.

This year, our project area was very visible to Park visitors; it was on one of the busiest routes, at the junction of the Big Room and Lunch Room trails. We cleaned and restored an area opposite the old lunch room used in the 1920's and '30's. Chicken and steak bones, cigarettes, and assorted trash were found under a six inch layer of dirt and gypsum. We removed the cover material and used it to fill the three blasted out pits near the Chinese Theater (the same pits that were used in last year's restoration). The underlying trash was removed to the surface to be checked for historical significance. Other areas along the visitor's trail near the Trapdoor to Lower Cave were cleaned, de-linted, and restored. Other projects were: reflagging and cleaning the slope in the False Floor Room (on the Lake of the Clouds trail), reflagging the Rookery in Lower Cave, and replacing the lower rope on the Lake of the Clouds descent.

This year, we used a new and ingenious method of cleaning, using compressed air from dive tanks supplied Continued p.15...
Maple Springs: Continued from p.1...

Now dubbed the Maple Springs Research Center, it lies north of the Green River, in normal times just 15 minutes via the ferry from the Visitor’s Center.

Maple Springs has some tie to our traditions: Cleve Pinnix, the NPS Ranger who was a member of the Flint Ridge-Mammoth Cave connection trip on August 9, 1972, was then living at Maple Springs. After the trip, the party went to Flint Ridge for the famous photograph in front of the Collins House, then returned to Maple Springs for a breakfast of eggs and champagne!

Ferry Service

Maple Springs is north of the Green River and is, therefore, cut off from the cave and most of our work sites. Travel to and from the cave will be by ferry (normal operating hours 6 a.m. to 9:55 p.m.) or by a one hour drive via Brownsville over secondary and tertiary roads. Parties returning to Maple Springs after a caving trip will not want to miss the ferry. The Park Service has agreed to extend the service according to our requirements but this is not a privilege that we want to abuse. We will not, for example, request after-hours service on the first night of an expedition. Most of us arrive after 10 p.m. but it is almost as easy for people to leave I-65 early and proceed to the back of the Park. Consult the directions given below.

Because of ferry scheduling, party leaders will have to plan realistically and carry their plans through reliably. By the time you get to camp, the Expedition Leader and Operations Manager will have made a working schedule and requested appropriate after-hours ferry operation. Only in extraordinary circumstances would we ask for coverage of the full eight hours that the ferry is normally closed. Instead, I see two viable alternatives, one geared for short to medium trips and the other for days when there are longer trips.

In long-trip mode, we will request that the ferry be operated an extra half-shift starting at 2:00 a.m.; it will still close at 9:55 in the evening. Party leaders with a short to medium trip, who would normally sign out until 10 or 11 p.m., will now have to get into the cave early to get the same amount of work done. Fifteen hour and longer trips will be little impacted; you just have to content yourself with a return time after 2:00 a.m. In short-trip mode, the ferry would continue operating until 1:55 a.m. Parties signed out until 1 or 1:30 will have to be sure that they are not overdue. Also, there is the unhappy consequence that we will not be able to handle overdue parties safely. Thus, there will be no way for the Expedition Leader to send a party to the cave gate at 4:00 a.m. as is supposed to happen for an overdue party signed out until midnight. That party will be on its own until after 6:00 am, just two hours before the general call-out is scheduled. How we will modify our safety procedures to deal with this problem remains to be seen.

Principally because of the need to schedule ferry use ahead of time, we will have to return to stricter control of attendance. The rules laid down in the CRF Personnel Manual will be strictly followed: you must notify the Expedition Leader or Operations Manager of your attendance at least two weeks before the expedition. Space, while ample, is not unlimited. When capacity is reached, the Expedition Leader will not be able to take further reservations. No-shows will be billed.

The Facilities

There are four buildings at Maple Springs (see map). Most of our activities will take place in the meeting/food preparation building and in the bunkhouse. The former ranger’s residence contains additional sleeping quarters and a small kitchen. Small groups, particularly scientists, will lodge there. Our use of it during expeditions will be minor, except for its garage, which has been converted into two community shower/bathrooms. Finally, part of the barn has been modified for use as a storage area for items such as ropes and carbide. Other storage space will be located throughout the complex.

There is a pay telephone on the porch of the residence. In addition, CRF will have its own telephone so that we will once again be in touch with the rest of the world during expeditions.

Campground

Overflow camping is at the group campground, 1/4 mile away. I know that some of you will not appreciate being so isolated, and you will have to take extra measures to protect any property you might leave there. Others may welcome being that much farther from the
wake-up call at 7:00 am. Families with small children will not want to leave their children there unattended. They will also want to get them in bed and out from under foot early in the evening. The Expedition Leader might be able to arrange for that in the Ranger House.

Usage

In general, Maple Springs is a more public area than we are used to. On weekends, we have observed considerable traffic, particularly by people bringing their horses for day outings north of the river. Also, CRF does not have exclusive use of Maple Springs, as we had at Flint Ridge. Although the park will make every effort not to schedule other groups during our expeditions, we have to be prepared for some scheduling conflicts. On a trial basis, we are allowing other groups to use many of our cooking utensils and the microwave oven. Expensive or specialized items, such as our mixer and warming ovens, will be stored in locked cabinets.

Fees

There should be no change in the fees that you are used to paying ($9.00 for a full day). The $2.00 overnight fee that we have been charging will now go to the Park. This seems only fair, as the electricity, heating, and water charges will be borne by the Park.

Getting to Maple Springs

From the South

Go to Brownsville, either via Ky 101 at the Smith's Grove exit or through the Park on Ky 70 (Park City exit). Follow Ky 259 north out of Brownsville, toward Bee Spring. Six miles past the Brownsville bridge over the Green River, at an old drive-in theater between Sweeden and Bee Spring, turn right on Ky 728. After 2 miles, Ky 728 crosses Nolin Reservoir Dam. In about 6 1/2 miles more, turn right onto Ky 1827 at Demunbrun's Store. One mile farther is the right turn to Maple Springs (and also the Echo River Ferry). The turnout from this road to the Maple Springs loop road is well marked.

From the North

Go to Cub Run, by turning off at Rowletts (Ky 728) or at Munfordville (Ky 88). At Cub Run, take Ky 728 to Demunbrun's Store, turn back (left) on Ky 1827 and continue as if coming from the South. Alternatively, take Ky 1827 south from Cub Run. Three miles past Bee is the left (S) turn into the park.

From the West

The best route seems to be the Kentucky Parkway to Leitchfield. Turn South on Ky 259 through Bee Spring. One mile South of Bee Spring turn left on Ky 728. Follow the directions for coming from the South.

From the East

If you normally pass through Glasgow on the Cumberland Parkway, continue to Smiths Grove and then Brownsville, on either Ky 259 or Ky 101. Continue as if coming from the South.

Carlsbad Cavern Over 20 Miles Long

Carlsbad Cavern is again over 20 miles long, according to cartographer David Dell. The official length of the cave was reduced from 20.8 to 19.1 miles recently when Dell and Ron Lipinski excluded redundant survey shots (Newsletter, February 1990). Recent expeditions have increased the length to 20.1 miles. The most extensive areas of the cave are the New Section and Left Hand Tunnel. The full breakdown is:

<table>
<thead>
<tr>
<th>Area</th>
<th>Length</th>
</tr>
</thead>
<tbody>
<tr>
<td>New Section</td>
<td>4.9 miles</td>
</tr>
<tr>
<td>Left Hand Tunnel</td>
<td>4.6 miles</td>
</tr>
<tr>
<td>Lower Cave</td>
<td>3.2 miles</td>
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<tr>
<td>Main Corridor</td>
<td>2.6 miles</td>
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<tr>
<td>Big Room</td>
<td>2.4 miles</td>
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<tr>
<td>New Mexico Room</td>
<td>1.4 miles</td>
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<tr>
<td>Mystery Room</td>
<td>0.7 miles</td>
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<tr>
<td>Scenic Rooms</td>
<td>0.3 miles</td>
</tr>
</tbody>
</table>
FUN AND GAMES IN BEDQUILT CAVE

Mel Park

Adventure in Bedquilt

Tom Clancy’s best selling novel, *Patriot Games*, contains an obscure reference to Mammoth Cave. On page 325 of the paperback edition, Jack Ryan, all-capable main character, remembers the phrase “You are in a maze of twisty passages, all alike,” from one of his favorite computer games. Our’s too. That phrase comes from the game *Adventure*, the first computer adventure game. Readers of the *Newsletter* should remember that *Adventure* was written by Will Crowther in the 1970’s, during the time he figured prominently in Flint Ridge activities. The game is set in the real Bedquilt Cave. The maze of twisty narrow canyons is near the Hall of the Mountain King. In the cave, as in the game, the proper way to the Hall is through a flat entrance room; “You are crawling over cobbles in a low passage” through an “awkward sloping east/west canyon” to the room whose walls are “frozen rivers of orange stone”, and on to the “Hall of Mists” (1871 Passage), then down to the Hall of the Mountain King.

*Adventure* was written for a main-frame computer, but it has since been enhanced by others and ported to just about every model of computer there is. I have a version for my PDP-11 lab. computer and I was amazed to find it still a part of the Unix distribution for Sun workstations in 1990 - can’t get more modern than that.

I recently came across another text adventure game, with a lineage perhaps traceable to Flint Ridge. The game is introduced as being a logical sequel to Will Crowther’s game and has evidently been around for quite some time. The author wishes to remain anonymous. The game begins by informing you that you are part of the Crystal Cave Expedition, and you find yourself on a ridge-top much like our own field facilities. Traveling west to a barn (the Spelee Hut?) you pick up caving gear and return east to the Ticket Office. North down the ridge is a north-facing cave entrance with a friendly ranger whom you have to pay to enter the cave. From here, though, I don’t recognize the setting. The cave has a large river in it and formations near the entrance - not Crystal Cave at all. Does anybody know anything about this game?

Old and New Survey

Bedquilt and Colossal caves lie in southern Flint Ridge and have been the site of a fair amount of activity in the last two years. Three routes connect these two parts of Mammoth Cave. Two are in the lower levels - from New Year’s Junction either via Jones Shaft or the Z-survey off Ehman Trail. The third is via the turn-of-the-century tourist passage, the Bedquilt Route. Colossal and Bedquilt are, in turn, linked to the south end of Lehrburger Avenue via the Salts-Colossal Link, and to Austin Avenue by at least two routes around Jones Shaft. From the north end of Lehrberger you can get with some exertion through the Unknown-Salts Link to the Lower Crouchway and Pohl Avenue. The rest of the cave is out that way.

Colossal and Bedquilt caves were developed by the Louisville & Nashville Railroad to attract tourists, in a process that was tumultuous for a few Flint Ridge landowners. This was in the late 1890’s. What trade the managers could develop competed with Mammoth Cave and suffered as a result. The last caretaker of Colossal Cave left in 1930.

Railroad interest drove a lot of the exploration as well as a careful survey of Grand Avenue in Colossal and the Bedquilt Route to Bedquilt Cave. Unfortunately, we do not have this transit survey data, although we can speculate that it is still archived by the L&N railroad, as are all the records of the Mammoth Cave Association.

CRF put parties in force into Colossal and Bedquilt caves in the first half of the 1970’s. I don’t think anyone was satisfied with that effort, though, even then. The old problems of evolving standards riddle the data: no backsights, no vertical control, poor sketches. As in much of the rest of the system, CRF set out in the ‘80’s to correct these deficiencies and, as a result, a number of us have had the chance to learn about these two parts of the Mammoth Cave System.

Bedquilt cave is a maze of twisty passages, all different. The lower levels are reached by either the KA climb, a narrow chimney discovered by Stan Sides in 1964 (he was 21 then), or by a tricky belly traverse along the side of a pit. These two routes rejoin at the prominent chert nodule, “The Brain of the Cave”, which is in a complicated area from which passages lead to the North and West - Omega Survey, Wow Shaft, Gypsum Mine, to name a few - , to the South and West, to the lower end of the J-56 pit, and elsewhere. Modern survey now extends from the Colossal Entrance, down lower Colossal via the R-14 pit, and from New Year’s Junction to Bedquilt via two routes. The first is the old N’ survey trail past Jones Shaft (where Deike Trail begins), and then down Davidson Trail to the J-56 pit. The other is via the Boobie Trap to Ehman Trail, near the Salts-Colossal Link, and via the Z-survey to join Davidson Trail.

The upper level Bedquilt Route runs from the Dance Floor, an historic structure built in Grand Avenue, past the top of the J-56 pit and the top of the KA-climb, and out the Bedquilt Entrance via the Hall of the Mountain King and the 1871 Passage. Long loops of modern survey are almost complete through all of these routes. Another area of resurvey, just begun, is out Deike Trail. Deike Trail begins in the Jones Shaft Area and is interesting, not only because it is a beautiful example of a phreatic tube, dipping and weaving up and down and back and forth, but also because it is emerging from underneath a valley toward a large section of Flint Ridge with no known cave. We’ll see.
EXPEDITIONS

MAMMOTH CAVE

Independence Day, June 30 - July 7
Leader, Tim Schafstall

The areas of major focus during the week-long expedition were Logsdon River, the long loops in the mid-levels of Mammoth Cave Ridge formed by Stevenson’s Avenue, Sitgreaves’ Pass, and Burley’s Way, the Pohl Avenue area, and Marion Avenue and its side passages. On the first day, CRF crews were supplemented by participants from Richard Zopf’s Summer in the Park course in survey and cartography.

River & Roppel: Four trips went to Logsdon River. The first crew went out the T-Survey and continued mapping a drain downstream in a westerly direction, away from known cave. The tube started off in dry mud, but became progressively soupy. The next trip here will need a rope to drop a small dome-pit that interrupts the passage. Also off the T-Survey, a party checked leads in an 80 ft. high dome, part of a systematic effort to find a route into upper level trunk passages that must surely exist. Dick Market to climbed and traversed to an obvious passage, but found that it became too tight within ten feet. Other high leads in the dome ended in sandstone chokes. The dome puts out a lot of air, but it’s not clear where it comes from. Another group went downstream to the Logsdon/Hawkins connection area to finish mapping a series of large breakdown rooms. An attempt to investigate a lead in the Logsdon River L-Survey unfortunately fell victim to navigational error. One team went into Roppel’s Khan Entrance and surveyed in Thunder River.

Mammoth Cave Ridge: A passage off Fox Avenue near Big Break had been explored by Mammoth Cave guide Joe McGown and other NPS employees many years ago, but CRF only recently learned of its existence. A party mapped 1000 ft. up this canyon, ending at an area of large domes. The passage continues up a climb. Many leads were noted.

The Cocksbur Loop received another visit; the crew tied in floating surveys from the May expedition, and discovered a good lead in the floor. In the Music Room (named for the impromptu flute concert given by Russian visitor Stepan Orevkov on an earlier trip), a handline-assisted climb led to 300+ ft. of 20 ft. high canyon. Since only the party leader managed the climb, the crew retreated to McGown Avenue, where they mapped a cutaround and a low, sandy branch.

The masochistic leads in the Bransford Avenue chert maze were more or less finished, with 160 ft. of tight crawlway mapped. There’s a bit more that could be done here by extremely thin crews. There was tidy-up work in the Marble Canyon area: an upper loop was surveyed, and a lead off the newly discovered Marble Canyon-Lower Robertson link yielded 200 ft. of slimy crawlway. There was more tidy-up work for the Kentucky Avenue sheet in Lower Robertson and Woodbury Pass. On exiting, this party mapped an inconspicuous 70 ft. long canyon, never before entered though within view of the Kentucky Avenue tour trail.

There was a short trip to finish the main line survey in Marion Avenue, and three parties went to Dan’s Avenue, a major Marion Avenue side passage. Dan’s Avenue ends in a drafting choke a short distance from Joe’s Pit (which forms the eastern terminus of Silliman’s Avenue). An alternative route - a 2 ft. high gypsum crawl - from Dan’s Avenue back to Marion Avenue was started by one crew and finished by another. In the same general area, there was a trip to sort out some of the complicated upper levels of Boone Avenue.

The long south flank trunk resurvey was completed by two parties who mapped 3900 ft. along Stevenson’s Avenue, ending at Cascade Hall. Three crews completed the Emily’s/Thorpe’s/Sitelgreaves’s trunk for a total of 2300 ft., tying into the Stevenson’s Avenue survey at the Burley’s Way junction. The third crew had time to spare, and made a start on the resurvey of Burley’s Way north towards Silliman’s Avenue.

In the Historic section, there was an evening trip to sort out some named features for the gazetteer. Some obscurities, such as Little Pit and Newman’s Spine, were noted and described; other obscurities such as Shakespeare’s Face (along Echo River) remained elusive.

Flint Ridge: Work in Flint Ridge concentrated on the Pohl Avenue sheet. One trip went to Textbook Shaft, where the dome was climbed and a room at the top with some associated side passages mapped. Another party mapped 200 ft. of narrow canyon starting near the bottom of the Unknown Shaft series. They then climbed the shafts to Upper Crouchway and above to work on a better definition of this complicated junction. Directly off Pohl Avenue, a side passage was mapped which was expected to go to Union Shafts; instead, it ended up in nearby Malott Avenue.

Another party went to Colossal Cave’s Grand Avenue to continue the trunk resurvey. They mapped a short section from the end of the Twin Domes Loop to the Ruins of Carthage, and also did some descriptive work. In the Catacombs loop, they found a small colony of bats - presumably gray bats. Fortunately, they could bypass the colony on the return trip by sticking to the main passage.

Satellite Caves: One trip went to the best remaining lead in Smith Valley Cave, an inlet where the crew mapped 400 ft. of twisting, wet canyon. Beyond, the passage continued for about 1000 ft. and ended in a sump. There were no significant side leads. In Long Cave, a large crew mapped 1330 ft. to complete the main trunk resurvey.
Survey Crews: Logsdon T - 1) Bob Osburn, Norm Pace, Bill Baus; 2) Bob Osburn, Dick Market, Mike Lawrence; Downstream Logsdon - Bob Osburn, Scott House, Paul Rubin; L-Survey - LaJuana Wilcher, Peter Gray, B. Graham; Roppel - Jim Borden, Sheri Engler, Paul Rubin, Roland Vineyard; McGown Ave. - Scott House, Sue Hagan, Holly Irick, Sheila Sands; Cocklebur - Tom Brucker, Sheri Engler, Dave Wright, Tom Kellum; Bransford - Kevin Downs, James Sterbenz, Myrna Diaz, Gary Fisher, James Morrissey; Marble Canyon - Mick Sutton, Dave West, Karen Willmes; Lower Robertson, Gary Fisher, James Morrissey; Shaft - Paul Hauck, Jim Greer, Bob Osburn; Roland Vineyard; McGown Ave. - Jim Greer, Dan Raque, Mel Park, Jerry Davis; Colossal-Bedquilt - Mel Park, Jerry Davis, Steve Gentry, Steve Petruniak; Albert's Domes - Scott House, Tom Brucker, Jerry Davis, Steve Gentry; Colossal-Bedquilt - Mel Park, Jerry Davis, Geoff Park; Shrimp Pools - Ed Lisowski, Jeff Luoma; Stevenson's Ave. - 1) Mick Sutton, Loreta Godfrey, Dick Maxey, Richard Hand, Mark Ohms; 2) Scott House, Bob Osburn, Dave West, Karen Willmes, Dick Market; Sitgreaves's Pass - 1) Roberta Burnes, Pam Smith, J.R. Wheatley, Myrna Diaz; 2) Mick Sutton, Sue Hagan, Harry Grover; 3) Mick Sutton, Paul Rubin, Paul Hauck; Gazetteer - Sue Hagan, Mick Sutton; Textbook Shafts - Paul Hauck, Jim Greer, Bob Osburn; Unknown Pits - Paul Hauck, Sheri Engler, Chris Gerace, Pam Smith; Pohl Ave. - Paul Hauck, Jim Greer, Kevin Downs; Colossal - Jim Borden, Sue Hagan, Pam Smith, Roland Vineyard; Smith Valley - Tim Schafstall, Mick Sutton, Sheri Engler, Paul Rubin; Long Cave - Tim Schafstall, Paul Rubin, Roland Vineyard, Joe Kaffl, Dave Hanson.

Report compiled by the editors.

August 3-6

Leader, Dan Raque

The expedition was lightly attended, with seventeen participants. Five trips were fielded, with 3100 ft. of survey achieved, of which 630 ft. was new.

Two people from the Mammoth Cave Restoration Camp, Steve Gentry and Steve Petruniak, took part in CRF work trips, where they proved to be valuable additions to their parties. The other participants were taken on conducted tours of the old tour trails in Crystal and around Morrison's "grand loop" in Mammoth Cave.

One party continued the survey of McGown Avenue started last month. The crew continued up a climb and surveyed the large dome-pit complex at the end; several promising leads remain, but will require technical climbing equipment to reach. On the way out, they surveyed a cutaround and checked several of the many maze leads that branch off McGown Avenue, some of which were virgin. This area will keep more parties busy during upcoming expeditions.

Another party first corrected a compass blunder in Stevenson's Avenue, allowing the very long south flank trunk survey to be closed and drawn up, then completed the resurvey of Burley's Way, started during the July expedition. Using two sketchers to overcome burnout, they mapped 1500 ft. of this rather intricate passage, completing the loop from Stevenson's Avenue to Silliman's Avenue. They noted a large quantity of small bones (most of them chicken bones) near the hole up to Silliman's Avenue. Perhaps these are part of a dump from 19th century tours.

Work continued in the complicated area around Albert's Domes, with 240 ft. of resurvey and 320 ft. of new survey. Between Henry's Dome and Albert's Domes, there are at least six levels above Elmore's Pass, and one below. This area will require much more work and some good sketching to document the multi-level maze.

One trip went to Colossal Cave to resurvey nearly 700 ft. in Davidson Trail on the Colossal-Bedquilt link route. A logical survey plan needs to be developed to tackle the final maze section, one of the most confusing areas in the system. Earlier surveys seem to wander at random through the passages.

There was a biological inventory trip to Roaring River in Mammoth Cave. The party conducted a census of all fish and aquatic invertebrates in the Shrimp Pools area. They counted eight cave fish (Amblyopsis), one sculpin, 52 cave crayfish (Orconectes pellucidus), one surface crayfish, over 50 isopods, and 20+ amphipods. They found no Kentucky cave shrimp. [Although the Shrimp Pools are the type site for the endangered shrimp, their primary habitat is deep phreatic water. Populations sometimes persist in overflow pools such as the Shrimp Pools for some time following major floods - eds.].

Jan Hemberger, assisted by Phil DiBlasi, did a super job of running camp. Special thanks also to Nancy Wilkerson, who was a great help around camp.

Survey Crews: McGown Way - Jim Greer, Dan Raque, Steve Weinzapfel, Geoff Park; Burley's Way - Mel Park, Eric Compas, Roger McClure, Steve Petruniak; Albert's Domes - Scott House, Tom Brucker, Jerry Davis, Steve Gentry; Colossal-Bedquilt - Mel Park, Jerry Davis, Geoff Park; Shrimp Pools - Ed Lisowski, Jeff Luoma.

Labor Day, September 1-2

Leader, Jim Borden

The Labor Day expedition was a fitting end to the summer. Low water levels, hot weather, and the last expedition of the year that could enter through the Hazen Entrance reminded us that the fall was coming. Thirty four people attended, enabling thirteen parties to be fielded over the course of two days, with all but four surveying in Colossal Cave.

The Hazen Entrance Loop from the River Route to the entrance to Colossal's "New Discovery" was resurveyed in two trips, despite strong winds and complex cave. (The Hazen Entrance is an old, collapsed Cave...
entrance at the west end of Colossal Cave). One group went into Bedquilt Cave to continue the new line from Colossal towards Bedquilt. They were able to survey the complex J-56 pit and work the line yet closer to the Bedquilt Entrance, stopping just short of its major complexities.

Two parties continued the replacement survey of Grand Avenue from beyond the Ruins of Carthage all the way to the Dining Room. From the Dining Room, a third crew started the replacement survey of the Bedquilt Route, the other main route to the Bedquilt Entrance. They made it nearly to Hunt Trail, leaving just a small gap to join with the survey from the J-56 pit route.

Another party went to the Jones Shaft area to start the replacement survey into Deike Trail. This is an important passage as it forms part of a major loop to the Wow Shaft area and has been largely unvisited for many years. A significant amount of new passage seems to exist in the area.

Low water levels invited trips into the lower level Colossal River System. Effectively, no-one caving with CRF today had been to Colossal River, and the work done there was during a period when writing trip reports was not in vogue. Information is lacking. One party surveyed down Jones Shaft and into Colossal River. Upon reaching the river, they were defeated by low ceilings, wet passages, and cold cavers. A second attempt was also defeated by the water; evidently, wetsuits will be required for at least this section of the river. Fortunately, this second party caught up with the Deike Trail crew, and were able to survey side passages off Deike Trail that no-one in the past had bothered with. They uncovered several good leads.

Elsewhere in Mammoth Cave, a late trip went to Cutoff Way to assess the work that needs to be done in this area; they returned with a comprehensive do-list. There was another trip to McGown Avenue, reached via the New Entrance. The surveys revealed yet more leads and more work to do, including several promising climbs in domes.

In Logsdon River, a party went to the oft-attempted L-Survey to push leads and climb domes. Several promising domes that will require more effort were located, as well as several downstream trending passages that might lead to something decent. There was a trip to the far northwest of Roppel Cave to investigate potential low-level passages that might close the gap to Salts Cave. Although water levels were low, they were not quite low enough to open up the sumped passages in this area. Taxed by a five-mile trip each way, the crew only managed to survey a short loop.

A total of 8950 ft was surveyed over the weekend, of which 1450 ft. was new survey.

There was no camp manager for this expedition. Especially helpful in the kitchen were Matthew Walker, Loretta Godfrey, Mel Park, Tom Brucker, Rich Hoechstetter, and Bob Salika.


MISSOURI

July through September

Summer was a busy time for Missouri JV’s as our many long-term mapping projects continued, and we got down to some serious preparatory work for the Oregon County mapping and biological inventory project which starts officially in October (see August Newsletter).

In Allens Branch Cave, Shannon County, one trip extended the left fork by another 1100 ft. of wet crawling, without reaching an end. Another crew mapped the right fork for 1200 ft. of low, wet, featureless passage to a conclusion in a narrow collapse zone, apparently very close to the surface. Although Allens Branch Cave now has more than 9000 ft. mapped, it is basically a very simple cave, consisting of two forks of a single streamway. Project leader Doug Baker observes that it is probably the longest mapped cave in Missouri without a survey loop! Work continued in Powder Mill Creek Cave. Two parties extended the Hell Hole Series - the first crew added 500 ft. of twisting, well decorated canyon passage and found several good leads; the second mapped 550 ft. of fairly large, muddy, up-and-down passage with large speleothems. A third crew extended an inlet off the Third Watercraw for another 750 ft. of unentered passage, beautifully decorated with clean-washed rimstone dams and flowstone. The largest pool was 20 ft. in diameter and 12 ft. deep, with large submerged stalagmites. The party did a preliminary patch-up of a rimstone dam which was damaged on the one previous trip into this passage. A more permanent repair will be attempted next time.

The Oregon County project got underway with three visits to Barrett Spring Cave. The first crew mapped through the low, wet entrance crawl and up into large multi-level trunk passage for a total of 900 ft. A second party added 1100 ft. of complicated survey, including several disjointed sections of a high, meandering canyon; the third crew put in 800 ft. of miscellaneous
leads and loops. There was an attempt to map this cave several years ago by St. Louis area cavers, but no map was ever produced. Biologist Ron Oesch collected aquatic snails (probably cave adapted) from the Barrett Spring outlet, but failed to find snails in nearby Pipe Spring Cave or Walters Spring Cave.

Smaller caves mapped within the study area were Mine Hollow Cave, Bockman Spring, and Cascade Spring. Mine Hollow is a small tributary of the Eleven Point River, draining part of the proposed mineral lease area. The eponymous cave is close to the valley bottom, and consists of 350 ft. of irregular, spongework type passage with a dry stream bed. The passage continues downstream below the valley floor, but would require digging to continue. Bockman Spring contains 140 ft. of mostly walking high stream passage.

A group from the Missouri Speleological Survey, led by Jim Sherrell, has been doing reconnaissance and mapping of some interesting caves on the privately owned Eleven Point Ranch, part of which falls within the scenic easement boundaries of the Eleven Point National Scenic River. A CRF crew joined them, and mapped Cascade Spring Cave, consisting of 50 ft. of wet crawl and a tight, 50 ft. long tributary canyon. They also visited Posy Spring Cave for a preliminary biological assessment. Posy Spring contains a large stream with populations of southern cave fish and Salem cave crayfish.

Elsewhere on the Mark Twain National Forest, there was progress in Cave Hollow Cave, Iron County. The upstream trunk was extended for a further 500 ft. of complicated stream passage, with no end in sight. The surveyed length stands at 2840 ft. In Washington County, the troublesome survey of Hazel Creek Cave was finally completed for a total of 250 ft. Beaver activity (not clear-cutting as reported in the last issue) made this project difficult by partly blocking the secondary exit and backing up water into the cave. Brazil Pit Cave was halfway mapped, with 250 ft. of survey. Another crew finished off a lead in Still Spring Cave, mapping 800 ft. in a lowish tributary, which opened up into areas of breakdown before ending. Only one significant lead remains in this, the longest cave on the Mark Twain National Forest.

The annual trip to Great Scott Cave, an important bat sanctuary owned by the Missouri Department of Conservation, netted 1100 ft. of new and previously unsurveyed passage in two areas. One party added 450 ft. in the Bear Bed inlet, a long stream crawl. The passage enlarged into a walking height canyon, but closed down shortly beyond. A tidy up trip will be justified, but the chances for significant progress seem poor. The other crew completed work in rarely visited Greater Scott Hall, mapping 650 ft. in a complex breakdown zone. The Hall, a 1000 ft. long trunk section, ends only 80 ft. from the corresponding breakdown choke in the Mountain Room. A minor loop off the Mountain Room was mapped, and the 1200 ft. long Water Crawl was resketched. The length of Great Scott Cave stands at 14,524 ft. (2.75 miles).

**Survey Crews:**

GUADALUPES

Carlsbad Caverns NP, President's Day, Feb. 17-19
Leader, Dave Logan

The three day expedition was attended by 24 cavers. A total of 430 volunteer hours produced 400 ft. of survey in Spider Cave and 1350 ft. in Carlsbad Cavern. Spider Cave has been receiving a great deal of enthusiasm lately by a distinguished few (Moreland, Knapp, DeThomas, Eaton, and others), who have been pushing leads to complete the maps in areas where there were thought to be no leads left. It is good to see such dedication and a rekindling of pursuing the unknown.

Carlsbad Cavern has been giving up a few of its own hidden treasures (lost and new leads) to those willing to push them. Each expedition has found an area of boneyard, a fissure, etc., that while being pushed has produced a plethora of new possibilities for future exploration. Areas in Lower Cave, Mystery Room, Guadalupe Room, New Mexico Room, and others places are
showing new leads. This expedition covered all these areas and produced many new possibilities.

Scientific studies also continued, with emphasis on environmental and ecological studies (Northup and others) with the assistance of a few JVs (Ingham, Ziegler, et al.).


Report by Dick Venters

Carlsbad Cavern, August 4-5
Leader, Bill Ziegler

Sixteen cavers decided to beat the summer heat by spending a day at Carlsbad Cavern. They found many mysteries and even solved some. The day consisted of dropping pits, pushing a wall, finding a balcony, taking temperatures, and taming a lion.

The pits were the pits, because both Left Hand Tunnel and Mystery Room pits were accessible from their bottoms. But survey lines were drawn anyway. The lower north wall of the Mystery Room was pushed - no mysteries were solved here! Meanwhile, another group found a balcony at the entrance to the New Mexico Room and tried to survey it, but some pits got in the way.

A group wandered around Sand Passage and Left Hand Tunnel taking air temperatures for Diana Northup. Yes, she is still doing cricket work. The evening was spent by some in trying to reach the top of the Lions Tail. This time, the lion lost, but so did the cavers. Passage was found, but it was not virgin.

By day's end, 175 caver hours had been spent getting 1350 ft. of survey.

Carlsbad Caverns National Park, September 1-3
Leader, Bernie Szukalski

Most trips went into Carlsbad Cavern. One party continued to push leads along the lower north and west walls of the Mystery Room, but found no significant passage. High leads were noted just past the visitor trail drop-off. In the New Mexico Room, a search was made for a reported 20 ft deep pit. The party instead found a new pit, about 70 ft. deep, which was dropped and found to connect to the Lower Western Maze, beneath the New Mexico Room. All leads in the Sand Room, except high leads, were checked.

In the Furniture Room of Left Hand Tunnel, an area of boneyard was surveyed and revisions made for the map. The party noted many fossils, including one nautiloid. In the west end of Left Hand Tunnel, a group positioned themselves to observe the bat flight to check for high leads by noting where the bats exited. Unfortunately, the bats did not fly. Leads were pushed in Pickle Alley, but no significant passage was found. The crew did find a lot of garbage, c.1920, and found one high lead requiring a technical climb.

A party pushed and surveyed leads in Lower Cave, nearly connecting to the pool passage behind the Trap Door. They also examined the Basement Room, which overlies the Naturalist Room, and attempted to connect the two, but found no going leads. They noted lots of gray clay entering Lower Cave from ceiling passages. The same party searched for high leads near the Rock of Ages in the Big Room; later, a ladder was taken to a lead about 12 ft. off the floor. It didn’t go. The ladder party then looked at a small hole in the Big Room which might connect to Pickle Alley. Total survey in Carlsbad Cavern was 420 ft.

In Spider Cave, 120 ft. of new passage was surveyed. A 20 ft. fissure was dropped - there was some air movement and a tight but promising lead at the bottom.

Survey Crews: Mystery Room - Pat Helton, Noble Stidham, Kevin Harris, Gary Lau, John Sutter, Tom McPherson, Dave Kelton; New Mexico Room - Laura Reeves, Bernie Szukalski, Alvis Hill, Dawn Hill, Rich Scaefier; Furniture Room - Dave Dell, Tim Moreland, Wieslaw Klis, Karen Potter, John Silvestro; Left Hand Tunnel - Dave Dell, Dave Kelton, Laura Reeves, Tim Moreland; Pickle Alley - Pat Helton, Alvis Hill, Bernie Szukalski, Wieslaw Klis; Lower Cave - Dave Dell, Laura Reeves, Dave Kelton, Pat Helton; Big Room - Noble Stidham; Pat Helton, Dave Kelton, Dave Dell; Spider Cave - Tim Moreland, Wieslaw Klis, Bernie Szukalski.

Lechuguilla Precision Survey
Expedition Leader, Fritzi Hardy
July 28-Aug. 4

A five person crew finally completed the formidable task of taking the double line theodolite survey down Boulder Falls. On the first day, the two temporary stations at the overlook above Exposure Ledge were occupied. The theodolite was moved to Exposure Ledge and one station was completed, but discrepancies between direct and reverse sightings on the steep shot down to Pack's Peak led us to bring the instrument out for tests. The discrepancy was measured at one second per degree of downward angle. Jim Hardy said we could live with this. The station was completed next day, and the instrument moved to the bottom of Boulder Falls to do the two stations at Pack's Peak. On subsequent days, the survey continued through Glacier Bay into Sugarlands.

Each trip into Lechuguilla is getting longer and we are almost to the "camp in the cave" stage. We are also starting trips with training done on Saturday afternoon and evening, with the first trip into the cave on Sunday. This will allow more people to participate on a long
weekend without having to take an entire week off. We would like to thank Chris Watson for her excellent recruitment of people for this project.

Survey crew: Robbie Babb, Tim (Skids) Marks, Tony Greco, Doug Kent, Carl Love.

Labor Day, Sept. 1-8

Finally, we had enough people to have two full teams of surveyors working. After several false starts, we realized that alternating teams in the cave was the best use of the people we had, and the turtles really started trotting. During their rest days, those who were still mobile helped a volunteer in Carlsbad Cavern, and started getting through Sugarlands, and into the Rift. We are now headed towards the E-F junction, a major intersection of the arms of the cave. Two reconnaissance trips were taken to plan stations and get a good look at what the survey was going through.

Thirteen people were trained in the techniques used, and Chris Watson was fully trained as a new trip leader. A total of 1016 work hours were devoted to the project, both on the surface and in the cave.

Participants: Fritzi Hardy, Jim Hardy, Robert Babb, Chris Watson, Kevin Harris, John Sutter, John Silvestro, Karen Potter, Gary Lau, Richard Schaeffer, Tommy McPherson, Donna McPherson, Barry Loucks, Bill Rundle, Tom Madison, Rick Jackson, Bob Thompson, Rachel Hardy.

**LILBURN**

The 1990 NSS-CRF Post Convention Field Trip

In conjunction with the 1990 NSS Convention in Yreka, California, a 4-day post-convention field trip was convened July 15-18, featuring the karst of Redwood Canyon and Lilburn Cave. The affair was organized by CRF JV's and enabled the 26 participants to experience the essence of caving at 12-mile long Lilburn, one of the world's finest marble caves and one of the hubs of CRF's westernmost operations. Although many JV's had expressed interest in attending the field excursion, preference was given to those who were not from California (the idea being that those who were "local" - if a 6-hour drive means local - could attend regular expeditions). Adding some unusual spice, all research scientists currently conducting studies in Lilburn Cave were present. The Superintendent granted special permission to suspend the normal operating rules that restrict trips to those in support of NPS-approved research.

Participants could choose among research-based tours emphasizing sedimentology, mineralogy, and hydrology; photographic tours featuring the banded marble, the water passages, and principal speleothem areas; or caving tours featuring the ambiance of the place, or all of the above. Several folks found time to wander among the giant sequoia groves and the trails of Redwood Canyon, including the resurgence of the Redwood Canyon karst at Big Spring, which features numerous breeding colonies of ladybug beetles.

A good time was had by all. Much film was expended, wetsuits were dipped in the Enchanted River, and I suspect that all objectives of the field camp were achieved, in that participants left having become acquainted with a jewel of a karst area.

**Participants:** CRF guides - Peter and Ann Bosted, Bill Frantz, Jack Hess, Mike Spiess, John Tinsley; NPS staff - Mike Murray (Kings River District Ranger, on his virgin voyage into Lilburn), Bruce Edmonston (Cave Management Specialist), Allison Robb, Tami Tall. Cavers - Hans Michelstein and Rene Scherrer (Switzerland), Kirk MacGregor (Canada); the USA mustered the remainder, among whom were Art and Peg Palmer, Tom Kellem, Rick Olson, Frank Creager, Dan Smith, Robert Smith, Walter Olenick, Jon Mulder, Seth Laforge, Jon Hafstrom, Roy Barton.

report by John Tinsley

**August 18-19**

Leaders, Carol Vesely & Bill Farr

Twelve cavers attended the August expedition. Upon arriving at the cabin late Saturday morning, we discovered that water levels were even lower than expected. There was no water flowing from the tap outside the cabin and May's Stream was dry except for a few small, stagnant pools. Normally, the stream flows all year, but the fourth consecutive year of drought had taken its toll. We were able to obtain about six gallons of water from the holding tanks behind the cabin.

We divided into four survey teams. Two groups composed of a total of five people headed in the Old Entrance to survey leads off the Enchanted River Passage. Another three person team also went in the Old Entrance and headed for a lead off the Lake Room that they knew went at least 50 ft. A final group of four rigged the Meyer Entrance and went to survey in the MesoAmerica area.

The first Enchanted River team surveyed two side leads heading in a promising direction away from known cave. The first lead, a narrow fissure, became too tight after about 200 ft., although a very slender person might get through to a dome room seen beyond. The second lead made a loop and rejoined known cave. A tight chimney remains to be pushed. Their total survey was 320 ft.

The two-person Enchanted River team surveyed and pushed three other tight canyon passages in the same area. All were headed away from known cave but became too tight or looped back to the river passage. One loop of approximately 150 ft. still needs to be surveyed.

Meanwhile, the Lake group discovered that their lead had been inundated with silt, and was therefore too tight. They checked other leads in the vicinity of Curl Passage and found most to be either too tight or blocked by sediment. A tight canyon was surveyed for ten sta-
tions (80 ft.) and another lead went for 20 ft. before being abandoned due to tightness. The group then checked the Do Once Dome passage but found only an unstable breakdown hole.

The fourth team discovered an unmarked climb right along the main route to their intended area of survey. One person led the 15 ft. climb and rigged a handline for the others. They surveyed 100 ft. through a narrow, twisty canyon with several overhangs, including a previous survey passageway. The canyon opened into comfortable walking passage with no survey stations! After surveying another 100 ft., they found a station marked only 'FE', with no number. Next, they surveyed down a side lead to the main passage near the Hex Room, making a 300 ft. loop.

Next, the team headed for their original lead, a crawlway marked "goes" on the map, located near the end of the East Stream. This cobble floored crawl went only 40 ft. before becoming too tight. Pushing the large cobbles to the side might enable a small person to get through. Airflow was noted. While searching for the "goes" crawl, one person stumbled across the incredible crawl and followed it to its end at an overhanging climb 15 ft. above the floor at White Rapids. As luck would have it, she arrived just as the other three groups were passing this point on their scenic through trip out of the cave; the others lent their assistance so that she could reach the floor. She then went around the long way to rejoin her party.

All four parties headed out of the cave at the same time, arriving at the bottom of the cable ladder together. Total survey footage was less than 1000 ft. It is getting harder to find major leads to survey, but there are still unexpected discoveries to be made by field checking the map.

The following morning, one person tried to restore the water system, but was attacked by yellow-jackets and had to retreat in self-defense.

Survey crews: Lake Room - Glen Mallie, Laurie Nordby, Rick Fellows; Enchanted River - Dave Bunnell, Ward Foeller, Joel Desmier, Bill Farr, Ronna Chezem, Royce Chezem.

Carlsbad Restoration... Continued from p.4

by Dave Ecklund and Mike Nelson. This worked extremely well to clean debris from between flowstone and small pool areas. A video on "How to Clean and Restore a Cave" has been started, and is now being edited. We hope to have this available for use by NSS Grottos and other organizations interested in restoration.

Seven hundred cubic yards of material were used to fill the three debris pits and 6300 square feet of floor was restored during the five days of the camp.

I wish to thank the NPS for their gracious assistance and all the volunteers for their diligence and for the supreme effort they put forward.

There are 25 slots available for next year's project, which will take place June 17 - June 21. For an information packet, write to Dick Venters, 410 Stallion Road, Rio Rancho, NM 87124-2326

Participants: Michael Bednorz (AZ), Dawn Burnrow-Hill (TX), John Cochran (NM), Pat Copeland (TX), Dorothy, John, and Gavin Corcoran (NM), Dave, Susan, and Cathi Ecklund (NE), Shirley Ecklund (CA), Dave EK (NM), Tony Grisco (NM), Fritz Hardy (NM), Jan Harper (NM), Dennis Helfenstein (TX), Andy Johnston (OK), Damian Kerbo (NM), Nick Krizky (TX), Mike Mansur (VT), Jim Nasz (TX), Delores and Mike Nelson (IA), Warren Pruess (TX), Bari Rapp (MO), Dick Venters (NM), Kate Weiclaw (TX), Jim White (OK), Bill Ziegler (NM)

Restoration patches are now available from Bill Ziegler, 1601 Rita Drive, Albuquerque, NM 87106. The patches are $4.00 each. Please mail your requests, noting the year you attended.
MAMMOTH CAVE RESTORATION
Norm Rogers

Forty-one cave enthusiasts from all over the country took part in the week long clean-up last July, cosponsored by the NPS, NSS, CRF and ACCA. The volunteers represented eleven states and Canada, and ranged in age from 11 to 72.

One project was to line the Half-day Tour trail along Cleaveland Avenue using rock from the elevator shaft rubble pile near the Snowball Room. The two-fold purpose was to reduce the size of the unsightly pile and to encourage tourists to stay on the trail. Work progressed quickly at first, but as the dump sites got farther from the loading area things began to slow - workers had to push wheelbarrows in relays to avoid fatigue and the resulting mutinees. By the end of the week, half the trail had been lined with rock. The passage on either side was then groomed to remove footprints and make the passage appear as natural as possible.

A large pile of rotting wood was removed from the floor of Cathedral Domes. The wood was hauled by hand to the elevator, where it was taken to an awaiting dumpster. In the Frozen Niagara area, a vertical crew cleaned the bottom of the 90 ft. deep pit on the far side of Crystal Lake. Large timbers and haul bags full of trash were pulled up the pit, boated across the lake, and carried up to the tour trail to be taken out. Since tours came through this area every 45 minutes, many tourists were made aware of this impressive piece of restoration.

There were evening slide shows and several trips to other caves in the Park. Everyone had a great time, and expressed a desire to come back next year. The park plans to hold several weekend camps each year in addition to the annual week-long camp, now in its third year.

Thanks to Dan Raque and Kevin Downs for their assistance, and to PMI for supplying rope.

SOVIETS VISIT MAMMOTH CAVE
Mel Park

Some of you may remember Alexander Klimchouck, who visited the Ridge last year. That first visit had been in the works for several years and the organizers, Jeanne and Russ Gurnee, labored hard at a time when it was nearly impossible for Soviet citizens to travel abroad. This year, the NSS was able to organize a coast to coast trip for six visitors from the Ukraine, running six weeks from August 16 to October 4, without any of the postponements and difficulties of times past.

This was a fairly accomplished group. Alexander is completing his doctoral work on gypsum karst hydrology. He is from Kiev and has received a Soviet medal for discovering a cave over 1000 meters deep. Eugenij Sinenko was the doyen of the group. He is an important conservationist and vice-president of the 18 million strong Ukraine Society for the Protection of Nature. Eugenij is not a caver, but as head of the Soviet delegation and as a legislator involved with resource management, he had much interaction with the Park Service, both here and in Washington. Josef Zimel, about 40, is a professional engineer and dedicated caver. Miron Savchin is in his 50's and has been the major force in exploring Optimisticeskaja, the second longest cave in the world. As we have learned in recent months, these people have to work hard: Optimisticeskaja is a single entrance cave and exploration of this gypsum maze requires 2-3 week long underground bivouacs. Konstantin Tsirikov and Dimitrij Bukinenko were two young strong cavers that completed the group.

Alan Padget, president of the NSS Vertical Section, brought the visitors to Mammoth Cave on Tuesday August 24. Wednesday was given over to visiting the public portions of the cave and to presentations by Dave Mihalic, MCNP Superintendent, and by the Office of Science and Resource Management. This latter office is the one CRF works most closely with and its duties were the ones that the Soviet conservationists were the most interested in.

Thursday, Mel Park and Dan Raque conducted all but Eugenij on a ten-hour trip from Crystal Cave to the Austin Entrance. The first half of the trip, through Floyd’s Lost Passage, was along the route described in chapter six of The Caves Beyond, “The Doctor Takes a Trip.” After Suraddle Canyon, instead of rejoining the Z survey, this route detours past Ebb & Flow Falls for some more canyon straddling until just before the Dining Room. After lunch in Floyd’s Lost Passage, we proceeded out the B-Trail. There are several alternatives one could pick there - we took the Lehrberger Link, a gypsum-lined tube whose floor is inches deep in fine gypsum powder. At its end, you climb down the Bogardus Formation to reach Fishhook Crawl. On our first attempt, we missed the small passage to the left which is Tom Brucker’s shortcut, and crawled the extra 12 wet stations to the window overlooking Black Onyx Pit. I didn’t want to get lost in the maze of passages below the Overlook, so we backtrack and eventually found our way to Junction Pit, Camp Pit, and the Overlook. From there, the route out the Storm Sewer to Columbian and Pohl Avenues is straightforward, and we moved fast.

Next morning Tom Ray, former NSS President, and Don Shofstall took over as hosts for the second phase of the journey, to major cave areas west of the Mississippi. The intent in visiting so many areas is not just to see a lot of cave but to introduce as many groups as possible to the idea of international exchange. The hope is that the individual groups will learn they can arrange their own exchanges with Soviet cavers.
Interview with Chris Howes

We met with Chris Howes on October 17 at his home in Cardiff, Wales. Joining us for the interview was his companion and writing collaborator, Judith CaJford.

Chris' recently published book on the history of cave photography, To Photograph Darkness (reviewed on p.18), is just one of his many endeavors. For the past two years he has been editor of Descent, a commercial magazine oriented primarily toward the British caving scene. As an avid caver photographer, he has published a manual on techniques of cave photography and has achieved a considerable reputation for his work. He is currently working on a cumulative index of Descent covering its 21 years. He is also involved in open water diving, in natural history photography, and in various writing endeavors.

Sue and Mick

What is involved in the production of Descent?

Chris: I do the basic planning of it, designing it, preparing all the pictures. Judith does the filing, proofing and everything else that goes into it. I'm paid for what I do, but clearly the money doesn't cover the work input.

Descent comes out every two months. As far as I know, it's the only commercial caving magazine in the world. There've been one or two in the past. Descent is 21 years old now; it's been going on a while. Most of British caving history for the last 21 years is in there. I treat it as a historical reference in a way; I try to put in something about anything that occurs.

It is British biased; with an international bias, I think it would lose a lot of home sales. But there's an opening in the market for an international, like Caving International was. We produce about 4,000 of each issue.

Judith: They all get sold. We keep them and eventually they all go, often within the same year.

One of the reasons we particularly wanted to interview you is because we are running a review of your book, To Photograph Darkness, in the next issue. How did you come to write a history of cave photography? Obviously you're a photographer, but the book clearly shows you did a whole lot of research.

Chris: I noticed you reviewed Harry Savory's book in the last issue. I get the Newsletter - I'm not sure who sends it to me, but it helps keep me informed about what's happening over there.

I'd seen other books on history, like Martin Farr's The Darkness Beckons, on the history of cave diving. It just made me start to wonder how people used to take pictures. So I thought I'd just go down to the Cardiff library here and have a look in some of the old journals. I hit lucky 'cause I started immediately coming into references to Mammoth Cave. It was all linked into the development of artificial lighting for photography. That just started it off, really.

We were impressed with the section on Mammoth Cave. We learned quite a few things.

Chris: Well, good. Tell you what; Art and Peggy Palmer were a terrific help. They are really lovely people. We went over to Carlsbad three years ago because I kept on hitting stops - there were bits I couldn't find out about. I finally said. 'The hell with this; let's go over there. I need to get in a newspaper office. I need to do some more research.' We met Art and Peggy there. They really went out of their way to help with some of the Mammoth things. I still had open questions on Mammoth Cave and no time to go there. They helped quite a bit.

Ron Kerbo was very helpful at Carlsbad. And Red Watson was instrumental in helping get the book published. He'd seen a draft of it, not early on but nine years into the project. At one point he was wondering if Cave Books could handle it, but it was just too big. He showed it to Southern Illinois University Press and they were interested. In the meantime, I found Suttons over here and they were very keen, right from the start. In fact, they accepted the book on seeing half of a draft. Because Suttons and SIU Press were both interested, they could do a combined thing; it's an identical book apart from the title page.

It was written as a continuous thing through the years. I just kept pottering and picking up new bits and collecting more pictures to illustrate it. I'd go back to the word processor and say, 'I can do this bit better' and chop it away. The final version was about a month of really hard work. It taught me a lot. I was very fussy about trying to get it right.

Judith: The one thing we didn't spend as much time as we would have liked - and we worked right through the night a couple of nights - was the index, but I haven't found any faults in it so far.

Chris: I haven't found any faults but I'm sure there's a few things that I'd have liked to get in that weren't.

Still, it's a pretty good index. I use it as a research tool. As I come across more information, I can look at the book, find out what I've written already and start making notes in the margin, updating my own copy as it were.

It sounds as if you're still actively researching the history of photography.

Chris: Not as actively as I was, but I've still got the interest there.

Ann Basted's review is very positive. One of her few criticisms was that you had failed to give much coverage to a woman photographer....

Chris: Frances Johnston. Actually, I knew a hell of a lot more about her, but most of her work was nothing to do with cave photography. Virtually all of it was working for society magazines. She was a terrific...
photographer, but the work she did in Mammoth Cave was not that unusual compared to what other people were doing. One of the reviewers over here said, "Why didn't you get anything in about this guy John Willy? He doesn't appear at all." The answer was that he did it very well, but he didn't do a single thing that was new. We're talking now about the fifties.

By the time the 1950's came along, the basic themes were worked out. There's been no real advance since then other than refining; we've got better cameras.

Some people seem to have this idea that if it's underground it's worth conserving but they kind of forget about the surface. The water input counts. Don't put sheep carcasses in shakeholes. We've got better film, slave units and so on, but I wasn't going to spend lots of pages saying 'We've got this bit and we can do it easier'. We're still using the same camera angles, the same lighting angles. We're getting a bit more action...

Judith: That's been the most frequent criticism - why didn't we use more recent material? Those are people they know about and expect to be in the book.

Chris: If I was going to start handling 'Who's doing it now' I was going to end up with a list of names and I would miss people out. I can handle the British end, no problem, but I don't know all the American people, or the Australians and so on. I thought that history could handle its own accounting of post Second World War when it's far enough removed - and 1990 is not far enough removed.

Red Watson has commented that one of the failings he sees in American cavers is they generally can't write. That seems to be less of a problem over here.

Chris: A comment I've had since doing Descent is that the quality of writing is well above the quality expected from other commercial specialist magazines. Many cavers are very capable writers, certainly in Britain.

Judith: The number cavers in Britain who are academics, accountants, that sort of thing, seems to be increasing. Caving seems to attract a lot of intelligent people.

Chris: The only thing I'd say from Descent's end of it is that people write too much. They don't have the discipline to write to a word limit. I edit very hard. People don't seem to be able to say what they want to say in a viable space.

Would you briefly discuss some of the major caving issues in Britain?

Chris: Personally, I'm keen on conservation in surface work - recycling and all the rest. Descent has just gone to recycled paper, which I'm really pleased about. Some people seem to have this idea that if it's underground it's worth conserving but they kind of forget about the surface. The water input counts. Access to the moor-

land counts. That's as much to do with underground conservation as the cave passage. People miss that out. They get into an uptight mess because something happened to protect the surface, and has maybe slightly curtailed their caving. As far as I'm concerned, if it restricts the caving a little bit, at least the cave is still there. For example, we've had a lot of hassles with an area of South Wales called the Black Mountain. Increasing controls may come in because of what is perceived to be danger by a mineral water bottling company. What's likely to come about is some control on caving, but with continued access. Cavers will be a little bit more aware and that much more careful; that's no bad thing.

I'm keen on keeping the karst landscape clean. Don't put sheep carcasses in shakeholes. They're going to rot away and go down into the water.

Underground, probably we've got greater pressures on our caves over here than you have - the density of cavers is quite high. I don't know how it is in the States, but there's a feeling that you shouldn't encourage people to come into caving. Not a closed shop, but if someone wants to come into caving, let them find their own way.

There's a movement to stop professional caving as such, which I think is unrealistic. It's very well to say let's stop having big parties of school kids being taken into the cave whether they want to go or not, or young executives having their personality tested by being stuck down a hole. There's a distinction between taking kids underground who haven't expressed an interest and the professional caver who is training other cavers. But the professional caver is being discriminated against by some of the caving organizations.

We get some of that over Descent. It's a money making project. I get paid. Someone who writes an article gets paid; not very much - 10 pounds [$20] a page. But that is bugger all, it's minimal money. If I was doing it for the money I wouldn't do it. If someone is contributing for the money, they can go write for someone else 'cause they're not getting that much. All I'm doing is establishing the principal that if someone puts something in they get something out.

How did you get started caving?

My father always let me do what I wanted; if I wanted to go rock climbing or canoeing, he'd say fine. But I wasn't permitted to go caving because my grandfather was a coal miner and going underground was dangerous. So caving was banned. I was in school and I was supposed to be on a biology field trip but there was a caving trip going on as well. That's how I ended up sneaking off on a caving trip and for years afterwards telling everyone I was going rock climbing when I was dropping down a hole instead.

I'm a bit single minded; I've been caving for 22 years now, and I've never been underground without taking a camera.
As we struggle for that elusive “perfect cave photo”, it is hard to imagine the dark ages when even the worst image of a cave was hailed as miraculous. This fascinating time, and the events leading to the relative ease of cave photography today, are chronicled in great detail by Chris Howes. To Photograph Darkness has left me with a clearer, but by no means simpler, picture of leading cave photographers throughout history. On many levels, they are a masochistic, compulsive breed, but on other levels they are pioneering, innovative, courageous and extremely clever, consistently making the impossible a reality. This history of underground and flash photography documents a repeating scenario - as each “impossible” hurdle is overcome, the cave photographer pits his wits and resources against the next until it, too, is overcome.

Chris Howes is an extremely diligent researcher who tells his story through character sketches, anecdotes and technical descriptions. Personally, I was less interested in the technical side of the development of camera, film and flashes - but I realize the story could not be told without these chapters. However, do not expect any tips on how to take great cave photos. For me, the best parts of the book were the stories about the photographers.

One of my favorite characters was the Frenchman, Felix Nadar, a flamboyant extrovert who in 1862 was the first to take photos underground - his subject was the piles of human bones stacked artistically in the catacombs of Paris. He used arc lights which he had patented in 1861. His exposures lasted 18 minutes. If you wonder how he got models to sit still that long, you are forgetting that this book is the story of photographers who don’t know the meaning of failure. He used life-size dummies, dressed them like sewer workers and posed them to look like real people! He wrote, "The world underground offered an infinite field of activity where one was less interesting than that of the top surface. We were going into it to reveal the mysteries of its deepest, most secret caverns."

Those words, written in 1900, are as true today as they were then - and probably will be for the next 90 years.

Charles Piazzi Smyth was an astronomer from Scotland who invented a miniature wet-plate camera to photograph the interior of the great pyramid. The system was an incredible innovation. Success was not easy - at first, each exposure was a failure because smoke from the light obscured his picture. By the end of his visit, he was able to burn magnesium fast enough to produce a few plates. His fellow scientists had ridiculed the notion, but on his return to Britain, he was hailed by photographers as a genius.

Modern explorers of Mammoth Cave will delight in the chapter on Charles Waldack, a chemist who took stereo photos there in 1866. These were the first high quality photos intended to illustrate a cave. The story behind his 120 pounds of gear is inspiring, even though his first trip produced only twelve plates, of which seven were made into stereo cards to publicize the cave. The editor of the Philadelphia Photographer wrote: "...these pictures...are the most wonderful ones we have ever seen. We can scarcely remove our eyes from the instrument, or lay them down to write, for perfect wonder. Is not photography a great power? What else could creep into the bowels of the earth and bring forth such pictures therefrom, as these?"

Waldack’s second expedition, with modified gear, involved trips of up to 35 hours. Each exposure needed as many as 120 tapers and it is estimated that he spent as much as $500 on magnesium alone. He spent three months and got 80 to 100 negatives of which 40 scenes were copyrighted. The chapter is peppered with his descriptions of the miserable conditions:

"...if to all the inconveniences mentioned...you add the bodily discomfort to which one is exposed in the climbing, creeping, and squeezing through all kinds of uncomfortable places, the fatigue of the march over rocky and slippery roads, loaded as one is with the implements of the profession, and, in some cases, the danger to life incurred in placing instruments and reflectors in the most suitable spots, you will agree with me that photographing in a cave is photographing under the worst conditions...

Some things never change!

The Frenchman, Edouard Alfred Martel was a premier cave explorer who turned to photography as a way to document his discoveries. His efforts and those of his colleagues proved that photos could be taken on exploration trips. He is credited with beginning the popular technique of “bracketing” - only he used two-plate cameras and stereo cameras. In 1903, he wrote the first book on underground photography. Caving as a science had begun and cave photographic techniques, at last, seemed to be on a firm footing. Martel had strong views on multiple flash photography and opined that, "...one produced with this system only inertistic and sometimes incomprehensible pictures. This was because the multiplication and staggering of lights completely destroyed the perspective and removed all real relief...the use of a single, powerful, prolonged and fixed source produces more satisfying results..."

The debate still continues, though it would appear that multiple flash photography is the more popular.

Explorers of Carlsbad will enjoy the charntp on photographing in Carlsbad Cavern. A local photographer, Ray Davis, began as a supplier of flashpowder and evolved into an accomplished cave photographer whose photos publicized the Cavern, attracted tourists and
resulted in the establishment of Carlsbad Caverns National Monument on October 25, 1923. He was the first to photograph the Big Room, producing "The Largest Black and White Photo Ever Made". Davis sent this, and others, to National Geographic, but they were rejected because they were thought to be fakes.

In 1952, Tex Helm took his "Big Shot" of the Big Room using 2,400 flashbulbs. Helm wrote of his delight,

The tears blurred my eyes. It was too much...if you understand...a dream absolutely coming true. The picture is beautiful beyond all words.

The light was equivalent to three million sixty-watt light bulbs. Cave photography had come a long way since 18-minute exposures in the catacombs of Paris.

The book comes close to being encyclopedic. It has some very useful appendices: a chronology, a glossary, some interesting notes on dating cave photographs, chemical names, and Units of Measurement. There are notes on the references used, and a good index.

No book of this scope could be perfect, and I had a few minor criticisms. The book does not detail the development of the electronic strobe at MIT by Harold Edgerton et al. in 1931. Nor does it mention that last year Sylvania dismantled its equipment to make flash bulbs, so that now cave photographers face a future without those blue-dot friends.

Howes presents his material chronologically, and at times this is confusing. For example, he tells us the first part of the Smyth story then, while Smyth is journeying to Egypt, he tells a few anecdotes that occurred in the interim, then jumps back to Smyth to conclude the story. There are no sub-headings or breaks to warn the reader when one anecdote is concluded and another begins. This is not a book you can read on the bus.

One margin on each page is extra wide which, in my opinion, is a waste of space. I would have liked to see the paper used for more photos, or else a shortened book to reduce its rather high retail price.

In his Chronology of Important Dates, Howes mentions some interesting events which he does not deal with in the main text. For example, he takes a mere eight lines to mention that the first woman press photographer, Frances Benjamin Johnston, used flashpowder to produce a set of photographs of Mammoth Cave. Her photos were published in a magazine and, in 1893, in a Mammoth Cave guide book. I would also have liked to see mention of the Floyd Collins story as a breakthrough in photojournalism, and the story of photographing the Sarawak Chamber, the largest cave room in the world.

When quoting Americans, the author writes the term "[sic]" behind American spellings; this makes it appear Americans can't spell, a slight which may annoy some readers this side of the Atlantic. He also uses terms Americans may not be familiar with - do you know that "Boxing Day" is December 26?

But these are minor criticisms of an excellent book that ably covers a subject of great interest to anyone who appreciates cave photographs.

Reading in brief: The January-March, 1990 issue of Journal of Speleology contains an interesting account of an 1857 visit to Mammoth Cave by a German visitor, Johann Georg Kohl, who took several trips guided by "Stevens". Kohl has an unusually broad perspective, being familiar with the classical Karst and its famous cavern of Adelsberg (present-day Postojna). Mammoth Cave is seen as typical of the "primitive" American landscape - on a huge scale, but structurally simple:

Long, high, uniform boxlike rectangular galleries run for miles... One recognizes, in the orderly stratification here, the simple structure of the American crust. ... There is nothing miniature in America; all is Mammoth...

The account was translated by George W. Zopf, Jr.

The same issue contains an article by Angelo George on earthquake damage to the Mammoth Cave Saltpeter works, extending the findings summarized by George and Gary O'Dell in the August, 1989 Newsletter. The Rotunda pump tower sank three feet during the New Madrid earthquake of December 1811, presumably due to soil liquefaction during the quake, and no longer drained to the entrance. George has reinterpreted some of the wooden remains in the Rotunda to suggest that the situation was remedied by building a supplementary holding tank above the level of the first.

Journal of Speleology is published by the American Speleology History Association; annual membership dues are $8.00 per year from Fred Grady, Apt. 123, 1201 South Scott St., Arlington, VA 22204. Back issues are available. NB - JSH welcomes articles (especially well-researched ones).

Submissions should be sent to the editor, Marion O. Smith, P.O. Box 8276, UT Station, Knoxville, TN 37996.

Cavers will be interested in the September-October, 1990 issue of Aramco World, (a publication of Aramco Oil Co., with an emphasis on geography) which includes a well-illustrated story by Don Davidson, Jr. of the exploration of Majlis al-Jinn in Oman. This enormous chamber, the second largest known, is entered via a free-hanging drop of 380 ft.
**MAMMOTH CAVE**

Thanksgiving, November 21-25. Phil DiBlasi 502-588-6724 (office - 0730-1500 Eastern); 502-551-6920 (mobile - 1500-2000 Eastern); 502-589-2340 (Jan Hemberger)

New Year, Dec. 28-Jan. 1. Kevin Downs 502-933-4406

President's Day, Feb. 15-18. Mel Park 901-272-9393


Spring, April 19-22. Stan Sides 314-335-1469

Memorial Day, May 24-27. Jim Borden 301-869-9141

Independence Day, June 28-July 7. Tom Brucker 615-331-3568

Summer, August 2-5. Scott House 314-287-4356


Columbus Day, October 11-14. Dan Raque 502-459-9456

First and last dates are arrival and departure dates. Notify the expedition leader or Operations Manager (Mel Park, 901-272-9393) two weeks in advance.

**GUADALUPES**

Thanksgiving, Nov. 22-Dec. 1. Carlsbad Caverns NP.

Expedition leaders to be announced. Notify the area manager (Dick Venters, 505-892-7370), or the supplies coordinator (Bill Ziegler, 505-262-0602) at least one week in advance.

Lechuguilla Precision Cave Survey, 1990-Nov. 17-25; 1991-March 10-16; July 28-Aug. 4; Aug. 31-Sept. 7; Nov. 24-Dec. 1. Call Fritzi Hardy 505-345-1709 (H). Please give at least one week's notice.

NB The November, 1990 expedition is currently filled, but last minute vacancies may open. Call for information.

**MISSOURI**

Nov. 17-18; Dec. 15-16; Jan. 19-20; Feb. 16-17.

Most trips are based at the Ozark National Scenic Riverways. Notify Scott House (314-287-4356) or Doug Baker (314-878-8831). Frequent additional trips will be scheduled for the National Forest cave inventory project - call Scott House or Mick Sutton (314-546-2864).

**CALIFORNIA**

Lilburn:

January 19, 1300hrs. Organizational meeting at chez Spiess; Mike Spiess, 12215 N. Friant Road, Fresno, CA. 209-443-3321.

Lava Beds:

Thanksgiving, Nov. 22-25. Janet Sowers, 415-528-6585

In addition to the scheduled expeditions, principle investigators schedule whatever extra trips are needed. To attend one of the above expeditions, make arrangements with the expedition leader. For other trips, call the investigator of the project you are interested in.