

August 1993

Cave Research Foundation Newsletter, Volume 21, No. 3, August 1993

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CRF Newsletter

CHINA CAVES '93

Mick Sutton

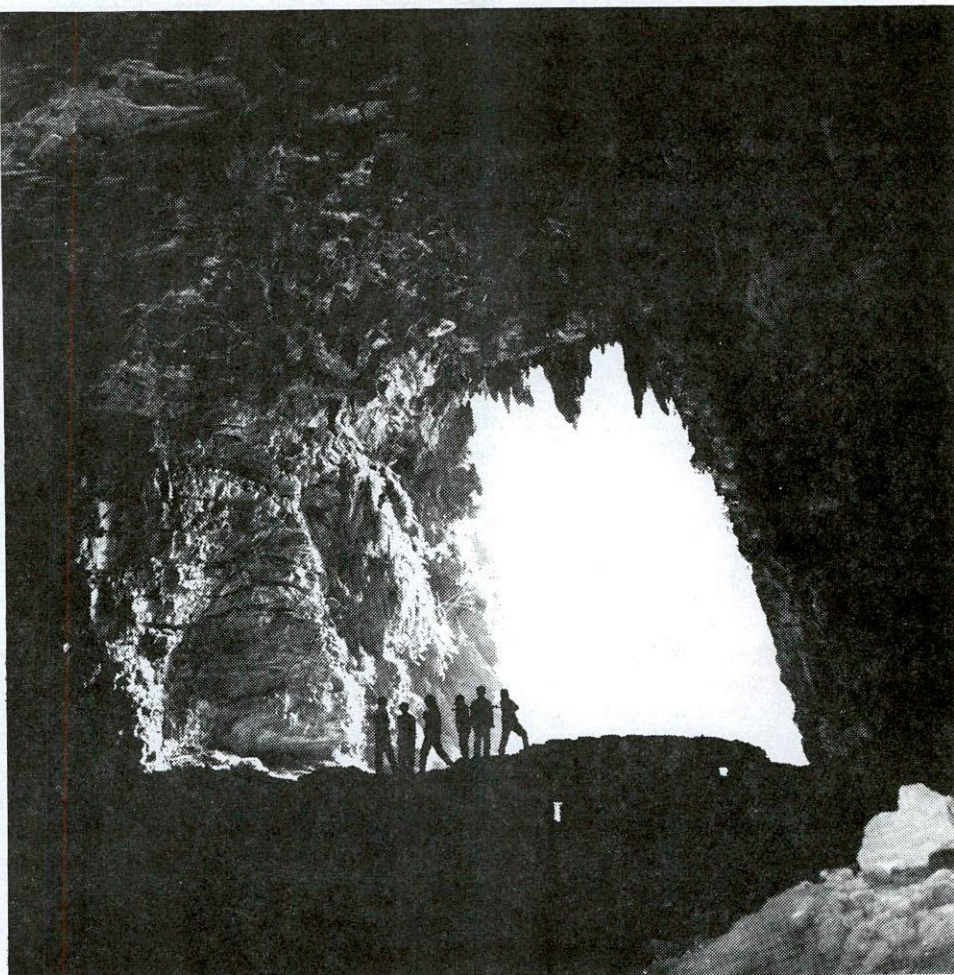
During the March-April CRF expedition to Guizhou Province, People's Republic of China, the 13 U.S. and 5 Chinese cavers, in addition to carrying out geological, hydrological, archeological, and biological assessments, racked up 17 km (>10 miles) of survey in 33 caves. The U.S. team consisted of Ian Baren (leader), Ron Bridgemon (deputy leader), Pat Kambesis (chief cartographer), Don Coons, Dwight Deal, John McLean, Don Morris, Mike Newsome, Chuck Pease, Janet Sowers, Tom Strong, Mick Sutton and Carol Vesely.

Guiyang "Difficulty at the beginning; it furthers one to cross the great water".

The third CRF China trip got off to a rocky start when the blizzard of March 12-13 grounded expedition leader Ian Baren's flight out of New York—as a result, he missed the only flight from Hong Kong to Guiyang for five days. Deputy leader Ron Bridgemon filled in for a few days.

Another surprise awaited us at Guizhou Normal University in Guiyang. The CRF plan was to spend the entire three weeks at Guadou, an area visited in 1991. That trip had left big leads, and it seemed that the area would easily absorb our attention for three weeks. But our Chinese hosts had other ideas, and had arranged for us to spend most of our time in Duyun County in the south of the province. We would have just four days to finish up our work in Guadou, though we could take an extra couple of days if leads were still going strong. We learned to apply lesson one in Chinese cave exploration—go with the flow. As it happened, the flow took us to some wild and fascinating places.

In Guiyang, we met GNU President He and his staff, and were introduced to the five Chinese cavers who would accompany us. Xiong Kangning would be in charge of the demanding task of logistics. Kangning, Liang Hong, and Zhu An were teachers at GNU and had taken part in the 1990-1 CRF trip. Zhou Pingming and Xiao Hongling were students with



*The imposing entrance of Xiao Lu Dong, with fortifications.
Photo by Ian Baren*

INSIDE—

CRF Land Purchase—an update on the Hamilton Valley Property by Red Watson.

Annual Meeting Details—plan to attend CRF's annual bash in Saint Louis, November 19-20.

'93 CRF Fellowship Awards by John Tinsley.

How not to poison your survey crews by Buz Grover.

Plus—expedition reports, NPS news, etc.

*** SUPPORT THE CRF NATIONAL
HEADQUARTERS BUILDING FUND***

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CRF NEWSLETTER Volume 21, No.3
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BULLETIN BOARD

Address Changes: Please send all address changes to Richard Zopf, 830 Xenia Avenue, Yellow Springs, OH 45387.

National Cave Management Symposium co-sponsored by CRF, will be held at Carlsbad, NM on October 27-30. The other sponsors are the Bureau of Land Management, National Park Service, U.S. Forest Service, and the Southwestern Region of the National Speleological Society. The symposium will emphasize cave management within federal agencies. A variety of field trips to Carlsbad Cavern and to back-country caves will be scheduled. The banquet speaker will be Tom Aley (Ozark Underground Lab., Missouri); there will also be a presentation by Merlin Tuttle, founder of Bat Conservation International.

The pre-registration fee of \$80 will be accepted until August 15; after that date the fee will be \$100. (The corresponding student fees are \$35 and \$40 respectively). The fee includes field trip transportation and lunches, banquet, guide book, and proceedings. Day passes will also be available. Registration fees should be sent to Roger McClure, 4700 Amberwood Drive, Dayton, OH 45424. Checks should be made out to *Cave Research Foundation 93 Symposium*. The symposium and banquet will be held in the Park Inn International, 3706 National Parks Highway, Carlsbad. Reservations can be made by calling 1-800-321-2861.

Bill Putnam has been appointed Safety Officer for CRF-East. Bill is experienced in cave rescue techniques.

CRF Mammoth Cave Field Headquarters fund raising drive: Help make the planned Mammoth Cave field headquarters a reality. Send your tax deductible donations to the treasurer, Roger McClure, 4700 Amberwood Drive, Dayton, OH 45424. Donations are also solicited for the International Exploration Fund.

Deadline for next issue is October 1. Please make sure your submissions for the next issue reach us by the above date. MS/SH.

Notes from Here and There

Born on April 25th to Buz and Jenny Grover a 9 lb 7 oz baby, **Henry William Grover**. Buz and Jenny also have a new address: 8643 Centerton Road, Manassas, VA 22111 703-361-3960.

JVs **Chuck Swedlund** and **Frances Loyd** were married on July 3, 1993, at their home in Carbondale, Illinois, in a ceremony attended by many JVs.

Richard Zopf was the featured speaker at this year's Kentucky Speleofest over Memorial Day. **Mel Park** talked with 60 Nashville Grotto members about CRF. Talks like Richard's and Mel's to active NSS groups are important in reaching those who want to do serious project caving.

Kevin Downs, with assistance from Mel Park, is working on a complete revision of the old CRF Personnel Manual.

Readers Write

Grund Trail—Connections and Corrections

I enjoyed the article about Grund Trail in the May Newsletter. It is a fascinating area of the cave. The whole story involves over thirty-five survey trips and several other visits. Most of Grund Trail lies below Mather Avenue and there are two access points from the floor of Mather. Several attempts to ascend the upstream dome were made, starting in 1968. Bolts and climbing poles failed, but use of the aluminum ladder first succeeded in 1972 when Roger Brucker, Ellen Brucker, and John Bridge used it to reach the lowest of the upstream leads. They found the passage too small, and it wasn't until 1977 that the climb was redone and survey begun.

The published diagram is a bit misleading; it only took two flights with the ladder to reach an opening still below the level of Mather and quite a distance from the trunk. The portion of Grund above Mather did not drain into Mather; the present connection is due to the collapse of the ceiling of Mather up into Grund. As the waters of Grund down cut, it did indeed intersect the trunk, but at points both north and south of the cairn.

If anyone would like to learn more about this area of the cave, let me know. While the lion's share of survey was done in the late sixties by cavers you are not likely to meet at an expedition, many of us who worked in the seventies and eighties are around to talk about it and continue the exploration that is still not completed.

Richard Zopf

Editors' Respond: We'd like to learn more—how about a feature article, Richard? Incidentally, the diagram was partly our own (mis)doing based on a computer profile submitted by one of the authors. Thanks for setting the facts straight.

CRF's New Home—Hamilton Valley Update

Red Watson

We have begun work to bring a large part of CRF's Hamilton Valley back to relatively natural conditions. One major trash pile was cleared out of a ditch and taken off in a large wagon and a dump truck. We put a steel tank 5 ft. in diameter and 10 ft. long into the dump truck, prompting the guy who owned it to ask, "How in hell did you get that in there, and how in hell am I going to get it out?" We've also removed a lot of fence. But don't despair, there remain some spectacular trash dumps to be cleaned up, and miles of fences to be removed. There is something for everyone.

At the building site, we have drilled a well. It is 450 ft. deep and produces 7 1/2 gallons a minute. That is average for the region, and adequate for us. We have contracted for construction of a road into the building site and a parking lot. A small, test alfalfa field has been planted, the hay cut and bailed, and some bush hogging completed.

During the work weekend of 19-20 June, we cleaned up trash, tore down a couple of sheds, cut grass and bush hogged, and measured the length, width, and depth of the upper pond by body lengths.

But exciting things happened over the weekend, too. Our architect, Rod Henmi, came to the valley with his latest sketches and a model of the main building and the two dormitories. He made a presentation of the project to Tom Brucker, Alan Canon, Roger McClure, Mel Park, Red Watson, and Richard Zopf. After detailed discussion and some suggested changes, Mel Park signed off on the drawings, to take the second major step in the Hamilton Valley Project (the first was Roger McClure's completion of the detailed work required to acquire the valley). CRF has now contracted Rod Henmi for full architectural treatment. Rod will consult with an architect from Bowling Green, engage an engineer, look into building materials, and prepare complete architectural drawings for the three buildings. This fall he will negotiate with a local builder, and by late winter everything will be in place to build. Construction will start as soon as possible in the spring of 1994.

Mel Park's call for contributions has had some cheering results, but we need lots more money. We need contributions from every one of you. Please join us in this joint venture. We gratefully accept any sum, but we do need a few really major contributions. We've had two so far, one of \$30,000 and one of \$50,000—but we need several more big players. So here is my pitch. And for those of you who don't know me, let me remark that I operate in two extreme modes. I'll be blunt first, and then I'll be visionary to close.

If you can't part with it now, please leave it to CRF in your will. CRF is in my will, but actually I'm

trying to get rid of all my money before I die—and I urge you to do the same. Don't wait until you're dead. Give it to CRF now so you can see and use the beautiful buildings it will help build.

What puzzles me is that when I take this line with some of my friends, I find that they are holding onto their money for their children and grandchildren. This truly stuns me. I ask: What on earth for? Didn't

I'm trying to get rid of all my money before I die—and I urge you to do the same. Don't wait until you're dead. Give it to CRF now so you can see and use the beautiful buildings it will help build.

you give them a good education? Don't you have any faith that they can make it on their own? Let them grow up. Give your money to CRF. You've gotten some major joy out of CRF activities? OK, put your money where your pleasure is.

Well, blunt works better eye-to-eye. Let me move on to visionary. Here I can really fly. CRF now owns nearly an entire karst valley of some 200 acres, next door to Stan and Kay Sides' 200 acres where Sides' Cave has potential for entry into the main system. We are permanent in one of the greatest karst environments in the world.

Our challenge is that we are a small non-profit research organization setting out to build a world class karst field station. And we are thinking a hundred years ahead. It is a monument we can leave for speleology.

Here is the plan, in two phases. Buying the property, drilling the well, putting in the road, constructing the main building and the two dormitories may cost as much as \$500,000. We must raise most of this money within CRF because many foundations will not support building projects that are not underway. Well, the money is there. We just have to give it and get the construction underway. (By the way, if you know of any of the thousands of charitable foundations in the USA that might contribute to this project, please tell Mel Park, 1541 Peabody Avenue, Memphis, TN 38104-3831. Also, some of my non-caving friends and relatives are contributing. Some of yours will too if you ask them.)

After this base has been constructed, phase two is to apply to a number of foundations for money to complete our project by building a field laboratory and facilities for resident scientists. We are optimistic about getting foundation support for phase two.

CRF pioneered and developed project caving, for which we are admired by cavers all over the world, even the French. The Hamilton Valley Station will be the operating center for project caving and karst

research in the entire Central Kentucky Karst. Our housing, conference, and laboratory facilities will be used not just by CRF, but also by the ACCA, the CKKC, the NSS, the NPS, and various universities and karst scientists from all over the world.

The largest CRF project is cartography. Cartography is the foundation of all karst science because we have to know where the cave is and what it is like before we can do further work. You just know that there are at least 500 miles in the Mammoth System. I expect you'd like to discover some of it. Well, CRF also pioneered exploration survey, and all of you have the opportunity to explore and survey out on the frontiers of the longest cave. That is a wonderful opportunity. It engenders gratitude. You can't take it with you. Be generous in a grand romantic building project, and live to see and enjoy and use the results.

You are a part of CRF's great step forward. Here is what I say to you. Put a lot of money into this. Then when you look back through your life to see where you laid it on the line for something you really cared about, you'll be able to look at CRF's Hamilton Valley Station and say to yourself, "That's one thing I did right."

All contributions to CRF are tax deductible. Send contributions made out to The Cave Research Foundation to Roger McClure, CRF Treasurer, 4700 Amberwood Drive, Dayton, OH 45424.

Workers so far in Hamilton Valley: Bill Austin, Jim Borden, Tom Brucker, Alan Canon, Ken Carstens, Don Coons, Kevin Downs, Phil DiBlasi, Cheryl Early, Sue Ecklund, Jan Hemberger, Richard Hand, Rod Henmi, Joyce Hoffmaster, Walter Johnson, John Korabic, Nancy Korabic, Dick Maxey, Roger McClure, Rick Olson, Bob Osburn, Mel Park, Bob Parrish, Jennifer Sabie, Bob Salika, Kay Sides, Stan Sides, Gail Wagner, Red Watson, Richard Zopf, and someone whose name escapes me to whom I apologize and ask to write to tell me.

A list of contributors to the Building Fund will be published in the November Newsletter.

1993 CRF Fellowship Winners

John C. Tinsley,
CRF Science Committee

Each year, CRF sponsors a graduate Fellowship competition, supported by proceeds earned from the Endowment Fund. Applicants must be conducting graduate research leading to a degree in a karst-related field at an accredited institution of higher learning. This year, three grants of \$2000 each were awarded. The competition was unusually keen, and a majority of the reviewers were disappointed the Foundation's pockets were not deeper. The winners were:

Dean Bergstrom, Fisheries and Wildlife Program, University of Missouri, Columbia for his proposal,

*The phylogeny of Missouri populations of Ozark Cavefish (*Amblyopsis rosae*) and Southern Cavefish (*Typhlichthys subterraneus*).* Mr. Bergstrom's research in part seeks to delineate the phylogenetic relations between populations of Missouri's Ozark and southern cavefish throughout their ranges using mitochondrial DNA sequencing and a non-destructive sampling protocol.

Whether intraspecific genetic differences arise within Ozark and southern cavefish, and the degree to which they do so, is critical to their management as either independent, endemic entities or as a common pool with interchangeable populations. For example, the presence of substantial differences in the mtDNA sequences between populations in adjacent caves would provide evidence of extensive genetic isolation. Comparing western and eastern populations of the southern cavefish, which are regarded as having been isolated by the Mississippi River, would reveal the degree to which populations have diverged since their isolation.

Mr. Kevin Simon, Department of Biology, Virginia Polytechnic Institute, Blacksburg for his proposal *Structural and functional response of a cave aquatic community to organic enrichment*. Mr. Simon's research addresses the effects of organic enrichment via ground water pollution on a cave aquatic community with emphasis on the feeding ecology and trophic position of the troglobitic isopod *Caecidotea recurvata*. He will examine the role of biofilms in energy flow within the cave aquatic community.

Mr. Slawomir Tulaczyk, Department of Geology, Northern Illinois University, DeKalb, for his proposal *Influence of the K/T Chicxulub Impact Crater and the Holbox Fracture Zone on the karst geomorphology and hydrogeology of the northern Yucatan Peninsula, Mexico*. Mr. Tulaczyk will collect and interpret geoelectrical data, chiefly electrical resistivity profiles, to map the distribution of salt water intrusion and to model changes in bulk porosity within the layers comprising the carbonate aquifer of northern Yucatan Peninsula.

His preliminary data challenges the canonical view of the regional karst system, and his proposal should lead to an improved understanding of regional karst systems in tropical karst platforms and the degree of compartmentalization characterizing carbonate rock reservoirs. It should also provide additional insight into the influence of an impact structure on the development of secondary porosity in rocks that are younger than the impact.

The Science Committee and the Board of Directors of the Cave Research Foundation congratulate the recipients of the 1993 awards and wish each of them a speedy and successful quest with their outstanding karst-related research.

CRF ANNUAL MEETING '93

Red Watson

Please come to the Foundation's annual meeting. It gives you an opportunity to meet and talk to all the CRF Board members, and to have an influence on CRF affairs at a national level. But it is more than just a Board meeting, it is the main social event of the CRF year, where you can meet your friends, argue, see scientific presentations, and enjoy spectacular banquet entertainment. There is much to talk about this year.

The meeting will be held on Friday and Saturday, November 19-20 in St. Louis, Missouri on the Washington University Campus just west of Forest Park across Lindell Boulevard. All events are in the Women's Building on the north side of campus. Enter the campus from the north by turning south off Millbrook Boulevard (Forest Park Parkway) and park in the large parking structure there. The Women's Building is just up the hill—ask someone.

Our St. Louis hosts are Dennis and Mary Drum, Paul and Denise Hauck, Scooter and Louise Hildebolt, Scott and Patti House, Bob and Joanne Osburn, and Red and Pat Watson. They—and other JVs you might know in the vicinity—offer various kinds of accommodations, from attic beds to backyards. Get your reservations in early.

The Board meets on Friday. Saturday morning, the 20th, there will be an informal meeting of JVs for open discussion. The Hamilton Valley property will be displayed with drawings, slides, and a site model of the buildings. There will be several scientific presentations. Also, there will be a Cave Books sale including a large selection of used Antarctic, mountain, and cave books. Please buy all your Christmas presents here.

The Foundation's formal public meeting begins at 1:00 pm Saturday. Board members will discuss the events of the past year, summarize the results of the Board meeting, and tell about plans for coming years.

The banquet is Saturday night. There will be buffet choices for both omnivores and vegetarians, at a cost between \$10 and \$15 each. The highlight of the evening will be a presentation on the 1993 CRF China Expedition.

Please send your banquet reservations by November 10 to Red Watson, 756 Harvard Avenue, St. Louis, MO 63130. Phone: 314-862-7646 or 314-935-6670; FAX: 314-935-7349;

email: c34815rw@WUVM.D.WUSTL.EDU

Fatality on Kentucky Cave Tour

(JVs Participate in Call-Up)

A 27 year old man died May 31 in Buzzard's Roost Cave (formerly Rainbow Caverns) near Cave City, Kentucky. The victim, William John Coughlin, was nearing the end of a commercial wild cave tour when he fell 30 ft. from a cable and wooden rung ladder. The victim was not wearing a hard-hat. Despite a head injury, he was able to ascend the ladder but then became wedged, slanted head down, in a V-shaped crevice, trapping two other men behind him. Early reports suggest he died several hours later (approximately 5 am) from asphyxiation.

Initially the tour guide attempted to rescue the victim. The local fire department was then called, and they subsequently contacted rangers at Mammoth Cave National Park. CRF was holding an expedition in the park, but due to not having access to the Maple Springs phone, were not contacted until approximately 8 am. The Kentucky Speleofest, with many NCRC-trained cavers, was underway about 20 miles south of the cave and the cavers there were notified by 9 am. Several JVs contributed to the clean-up stages of the rescue, and others were kept on standby until noon. The body was eventually dislodged, releasing the trapped individuals, about 12:30 pm.

Love Bats?—Adopt!

Carlsbad Caverns National Park in cooperation with the Carlsbad Caverns-Guadalupe Mountains Association, is starting an Adopt-A-Bat program. For a five dollar donation, participants will receive an "Adoption" certificate, a bumper sticker, a postcard of a bat, and an information sheet on bats and bat conservation. Park Superintendent Frank J. Deckert expressed hope the Adopt-A-Bat program will be an effective means of providing factual information and inspire people of all ages to help bats survive. Funds generated will be used for the park's educational and research efforts relating to bats.

Further information about the Adopt-A-Bat program can be obtained by calling 505-785-2232.

(Source: NPS News Release)

Fire at Guadalupe Mountains NP

A major fire burned out of control at Guadalupe Mountains National Park in early May, burning 6510 acres. Fanned by wind gusts in excess of 60 mph, the human-caused fire started in the Pine Springs Campground and took two days to bring under control. There was only minimal damage to personal property and only one minor injury amongst the over 400 fire fighting personnel.

EXPEDITIONS

MAMMOTH CAVE

March 27-28, 1993

Leader, Jim Borden

The success of the March 1993 Expedition was a tribute to luck, 33 hard-working participants, and challenging but effective party construction. The week prior to the expedition, things began to not bode well when no less than three party leaders cancelled. Usually parties are put together after objectives are chosen. Friday night, as I sat trying to fit together the puzzle of productive parties, I realized I had many new JVs, an unusual skew towards strong cavers, few leaders, and no one who could lead into Mammoth or Flint Ridge. Making up parties involved assembling likely looking crews of the correct match of skills and motivations, then looking for objectives that would fit the party.

I am pleased to say there were no "bust" trips—everyone got done what they sought to do or adjusted objectives appropriately. Nearly 3100 ft. was surveyed, of which 2300 ft. was new.

Three parties worked in Roppel Cave. A crew descended the forty foot Wift and unraveled a series of canyons and domes that led several hundred feet to the southwest. Another crew slogged out to the the Cosmos Area at the upstream end of Upper Elysian Way and did some resketch of the complex Cosmodrome. On the way out to the objective, they tied in some odds and ends off the North Crouchway. Finally, a crew, which originally tried a push in Pighistle but ended up being thwarted by a tight spot, set off for another objective in Roppel to resketch Kris Krawl connecting North Crouchway to Death Canyon. At the Hole-in-the-floor, they surveyed 150 ft. of new crawl that still goes.

A return trip to Dennison Cave north of Dennison's Ferry added 270 ft., pretty much wrapping up the cave except for a short pit still undropped. The party noted a fairly large population of bats. The White Lightning Cave survey continued. Due to high water, the team did not push the downstream hot objective, but pushed an upper lead, climbing into a nice dry dome. The passage still goes. A crew surveyed a section of the Buffalo Creek Cave main stream that needed to be cleaned-up. Water was too high to attempt to extend the cave upstream.

Two crews worked in Salts Cave surveying the lower level that connects the Incredible Salts Dig to the hole in the bottom of Dismal Valley.

Lots happened on the new CRF land over the weekend. Roger McClure made an inspirational appeal for help and welcomed all to come take a look. A fairly good crowd worked on Saturday and Sunday morning accomplishing much clean-up and brush

clearing. Red Watson was his normal self, driving all to high levels of productivity.

Camp managing was masterful under the direction of Darlene Anthony. Everything ran smoothly and the food was excellent.

Survey Crews: *Roppel (The Wift)*—James Wells, Don Davis, Chris Warner; *Roppel (Cosmos)*—Kevin Downs, Sheila Sands, Norm Rogers, Russel Conner; *Roppel (Kris Krawl)*—Chris Groves, William Hunt, Steve Duncan; *White Lightning Cave*—Rick Olson, Peter Gray, Alan, Cannon; *Buffalo Creek Cave*—Stan Sides, Marty Ryan, Bill Baus, Jamie Riches; *Dennison Cave*—Walter Johnson, Wieslaw Klis, Ken Rogers, Maria Pimoniri; *Salts Cave*—1) Nancy Korabik, Mike Yocum, Jeremy Cooper, Doug Alderson; 2) Joyce Hoffmaster, LaJuana Wilcher, Mike Lawrence, John Korabik.

April 30-May 2

Leaders, Stan and Kay Sides

One focus of the Spring expedition was to complete the survey of leads necessary for drafting the Cathedral Domes sheet. One party completed the small leads in the Anna's Dome area near the old Cox Entrance, mapping 250 ft. of new passage. Another crew ascended Cathedral Domes to Denali Trail, where they mapped 200 ft. of small passages in Denali Heights, an area centered on an ascending inlet, and one of the highest passages in Mammoth Cave. There are still a few leads left here.

In the Roppel section, Frank Reid led a trip to radiolocate the OP junction, the Astrodome, and the Cosmodrome. The depths measured were larger than anticipated (250 ft. for the OP Junction, 140 ft. for the Astrodome, 210 ft. for the Cosmodrome).

The exploration of White Lightning Cave resumed, as a party mapped 385 ft. downstream in wet canyons. More than a half mile has now been surveyed in this physically demanding "small" cave. The survey of Dennison Cave, along the east boundary of the park, was completed. The crew used a cable ladder to descend a pit, but found only 15 ft. of passage beyond. They ridge-walked back to the car looking for new entrances and found several blowing holes in sandstone.

Finally, the Mammoth Caves Register project continued with a trip to record signatures along Blacksnake Avenue on the Historic tour. This area is very messy owing to the large amount of recent graffiti overlaying the historic names.

Several JVs worked on the Hamilton Valley property, filling garbage trucks with a truly incredible amount of roofing, fence wire, old appliances, and assorted trash.

Survey Crews: *Anna's Dome*—Neil Hammond, Paul Cannaley, Irv Stirling; *Denali Trail*—Tom Brucker, Bill Putnam, Bob Osburn; *Roppel radiolocation*, surface crew—

Frank Reid, Jim Borden, Dave Weller; transmitter crew—Kevin Downs, Jenny Sabie, Russell Conner, Chris Cannaley; *White Lightning*—Rick Olson, Dick Maxey, Alan Canon; *Dennison Cave*—Walter Johnson, Cheryl Early, Richard Hand; *Blacksnake Ave. signatures*—Scott Foster, Randy Gresham. *Hamilton Valley*—Red Watson, Roger McClure, Richard Zopf, Stan Sides.

Memorial Day, May 29-30

Leader, Mel Park

There were no big breakthroughs on the Memorial Day Expedition, just steady progress, both underground and by work crews at Hamilton Valley.

When finishing a map, there remain all the small miserable places to survey that preceding parties have let go by. This was the duty for the party that ascended the 110 ft. fixed rope in Cathedral Domes. They spent a lot of time trying to push 1 ft. wide and less canyons and surveying what was possible to survey. This high-altitude area is full of sandstone rubble

When finishing a map, there remain all the small miserable places to survey that preceding parties have let go by.

and surface debris. This is probably the second-to-the-last party that needs to go up there. The rope is still in place. Similarly, one party had mopping up to do in the interesting areas around Martel and Bransford Avenues, and another took a short trip along the Half Day tour trail, where they surveyed cutarounds in the route to Felicia's Dome and looked into several interestingly miserable leads off Jeanne's Avenue and Rose's Pass. Another mop-up crew finished off a tight lead off Robertson Avenue.

A party returned from a trip off the tourist trail between Dante's Gateway and Great Relief Hall with 1000 ft. of survey, 205 ft. of which was new. They put a survey into the extension of Blacksnake Avenue between the Wooden Bowl Room and Ganter Avenue, surveyed Buchanan Way to its end at Pensacola Avenue, and mapped a crawlway from Fat Man's Misery leading to the pumping station behind the bathrooms in Great Relief Hall. From there, they had a confusing time reaching Ina's Hall and the top of William's Dome. This entire dome area needs to be surveyed with a clipboard. The pumping station, which has become a junk yard, needs to be surveyed as well. Because of magnetic interference, Scott House suggests a transit survey. Another party mapped the continuation of Lively's Pass beyond the Bottomless Pit overlook.

Surveying and carefully sketching the Historic Tour path continued both days. Mapping such big and well-known cave is an adventure, or at least an experience. The first party extended the survey of Broadway and began a resurvey of Cyclop's Gateway, a Broadway side passage.

The second group continued work on Cyclop's Gateway and, after the last tour of the day, began mapping Houchin's Narrows. While they did this, a thunderstorm rolled through, causing strong enough fluctuations in barometric pressure to stop and reverse the strong wind blowing out through the Narrows. The party noted a cemented wall along the north side of the passage—an active pit could be seen on the other side of it. Is this part of the passage accessible through the old ventilation shaft? The two trips resulted in almost 1000 ft. of resurvey.

A party tried to complete the nasty link between the Lucy's Dome drain and the recent survey into Lucy's Inlet in Mystic River. This is a complicated area, particularly since a lot of survey station markings have been washed out. They reached the drain but were defeated by a 12 ft. overhanging climb down. Next party here had better either bring vertical gear or approach from the Mystic River side. The party had a good secondary objective and put 840 ft. of survey from the drain back towards Silliman Avenue.

There was another trip in support of the Salts Trunk map—a party put in 1100 ft. of survey with detailed sketch into this area, including 200 ft. of previously unsurveyed crouchway.

Two wetsuit parties were sent together to Buffalo Creek Cave. Unfortunately, one member sprained an ankle near the end of the hot and humid trudge through the woods to the cave entrance, so the parties were recombined into one. Five people surveyed 520 ft., mostly in low stream passage, bringing the surveyed length of the cave to 7170 ft. with no end in sight, though low and wet ahead.

Ridge walking has shown up several small caves close to Cedar Sink that are not on any list. A party put 140 ft. of survey into a narrow canyon in one of these. Four small caves near Deer Park Hollow were located the next day. One of them, possibly Jones Cave #3, was mapped to a length of 110 ft. It is entirely in sandstone and features what may be parts of an old still.

Photographic parties doing NPS-sponsored documentation were active both days. Chuck Swedlund's "Names Without Faces" project is producing an accurate and stunningly beautiful record of the many signatures and graphics in Gothic Avenue and elsewhere. Larry Pursell is constructing the Mammoth Cave Register of historic names that attempts to give historical context to cave signatures. This time, he extended the project to Great Onyx Cave, collecting names mainly from around Signature Rock near the entrance. Harry Grover assisted an NPS employee on a prearranged project.

Jerry Lewis conducted aquatic biological censuses at Hidden River Cave, Echo River Spring, and at Echo River.

A crew disappeared into Roppel Cave for 28 hours; this was a non-CRF trip and no report or data are available.

During camp closing on Monday, NPS personnel delivered the message that a caving accident had occurred in a commercial cave outside the park. The NPS requested that six cavers from the CRF group be dispatched to the Mammoth Cave Ranger Station to wait on standby, one of whom was called upon to visit the scene. It turns out that the victim had died some four hours earlier. CRF was glad to be called upon. I want to thank the individuals who stood by knowing that it would be added hours, possibly days, before they got home, knowing, too, that they were potentially facing a very unpleasant task. Thanks also to those JVs who pitched in to finish the added work our reduced numbers had to do before closing camp.

Survey Crews: *Denali Peaks*—Bill Putnam, Mark Jones, Nate Collier; *Martel Ave.*—Phil Bodanza, Joyce Hoffmaster, Wieslaw Klis; *Rose's Pass*—Phil Bodanza, Jenny Sabie, Tom Grant; *Robertson Ave.*—Dick Maxey, Roger McClure, Cheryl Early; *Blacksnake Ave.*—Scott House, Steve Irvine, Jenny Sabie; *Lively's Pass*—Bill Putnam, Mark Jones, Shirley Sotano, Wieslaw Klis; *Broadway*—Doug Baker, Nancy Korabik, Dave Ecklund; *Houchins' Narrows*—Doug Baker, Scott House, Sue Ecklund; *Rhoda's Arcade*—Mick Sutton, Sue Hagan, Doug Alderman; *Salts*—Mick Sutton, Sue Hagan, Steve Irvine; *Buffalo Creek*—Stan Sides, Dave Sides, Tom Grant, Marty Ryan, Shirley Sotano; *Cedar Sink*—Walter Johnson, Mark Nardacci, John Korabik; *Deer Park Hollow*—Walter Johnson, Joyce Hoffmaster; *Names*—Chuck Swedlund, Frances Loyd; *MC Register*—Larry Pursell, Bob Parrish, Mike Nardacci, Charlie Pursell; *Biological Census*—Jerry Lewis, Marie Lewis, Tom Poulson; *Roppel*—Bill Koerchner, Jim Borden, Norm Rogers; *Maple Springs Support*—Maniola Klis, Susy Collier; *Hamilton Valley Surface Work*—Richard Zopf, Bob Salika, Richard Hand, Roger McClure, Red Watson, Kay Sides.

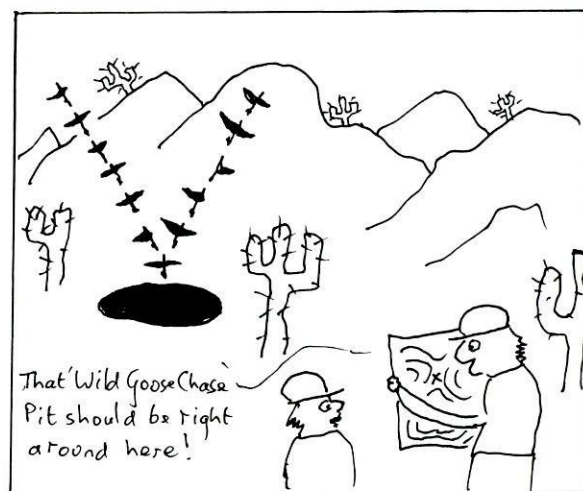
GUADALUPES

Guadalupe Mountains NP, March 20-21.

Leader, Tony Grieco

After a somewhat rocky start, the CRF crew set out for the high Guadalupe in the area above Ship on the Desert. Our goal was to locate a previously discovered deep pit, reportedly having a depth in the 400 ft. range. The location is in one of the most rugged areas in the Guadalupe Mountains, and the combination of the terrain and heavy vegetation made the task very difficult. We were unable to locate the pit despite several hours of searching. I have never seen a crew more worn out by ridgewalking!

This is the third time that crews have been sent to locate this elusive pit, which we have informally named Snipe or Wild Goose Cave. I believe that the report of the cave's existence is reliable, inasmuch as it was found by a GUMO ranger, but the terrain and



vegetation will make it very difficult to locate; someone is probably going to have to fall into it (figuratively speaking) to find it. If it is found, two control points have been established on the ridge top to facilitate locating the cave on the map.

Personnel: Tony Grieco, Bill Greenlee, Julia Cronk, Virginia Sizer, Bob Wilson, Tom Rohrer, Vicki Grieco (acting food coordinator).

Guadalupe Mountains NP, April 24-25

Leader, Tony Grieco

On this expedition we concentrated our efforts in the Williams Ranch area of Guadalupe Mountains National Park, in particular, an area called Shirt Tail Canyon. Although the terrain was relatively level, it seemed as if every species of spiky and thorny plant in the southwest was represented in abundance, so the two of us covered much less ground than might be expected from such veteran hikers. Several interesting looking leads were checked, but none proved to be worthwhile, nor did the area look particularly promising speleologically. I feel, nonetheless, that more exploration should be concentrated in the western Guadalupe. Due to the remoteness and inaccessibility of this area, I can't believe that it has ever been adequately ridgewalked, and some fine caves are in all probability waiting to be found.

Personnel: Tony Grieco, Bill Bentley.

LILBURN

Memorial Day, May 29-31

Leader, Peter Bosted

Over twenty cavers participated in the Memorial Day expedition to Redwood Canyon. The weather was warm and sunny, except for a heavy rain that showed up as we were hiking out on Monday. Due to the wet spring and winter, water levels were high both in the cave and on the surface, with some of

Redwood Creek flowing all the way to Big Spring. About 570 ft. of new passage was surveyed in Lilburn, and sedimentology, phone wire installation, and restoration objectives were accomplished.

There were two survey trips on Saturday. The first team mapped about 300 ft. of mostly new passage in the Scumbag Dome area, finding alternating squeezes and fairly large canyons, one of which had a flowing stream and several waterfalls. Could this be May's Creek? Several more leads remain in this area. The second team first tried to climb three high leads without success, then got up a tight chimney into about 200 ft. of new passage above the Hex Room, which connected back to known cave via one of the climbs mentioned earlier. A large (for Lilburn) passage was noted across a 50 ft. fissure leading down to the Hex Room. A team returned on Sunday and following a bold lead by a climber discovered about 500 ft. of presumably new passage which they did not survey due to lack of time.

A team visited the sediment monitoring points in the north and middle parts of the cave, but did not get to the south end due to illness of one of the party. In spite of high water flow, the Hex Room apparently did not flood, and there was not a lot of sediment movement.

A surface trip on Sunday revealed that several small new sinkholes had opened up near May's Creek, and that the huge sinkhole that opened up several years ago in Pebble Pile Creek had filled in another five feet. A hike along Redwood Creek revealed no obvious sink points between the Meyer entrance and Big Spring.

Teams on both Saturday and Sunday tested techniques for cleaning formations in the Bacon Rind Room, the Great White Pillar, the Ice Formations, and the Canopy Area. They found that soft brushes worked well, but will need acid for the Great White Pillar, and next time plan to bring sponges to soak up muddied water more easily. Measurements were made for a twelve foot ladder on the main route near the Lilburn Entrance to avoid cavers climbing on a nice flowstone area.

Two trips were made to install a 1000 ft. section of 8-conductor cable parallel to the phone line from the Meyer Entrance to the Hex Room. Eventually this line will be used both as a new phone line, and to read out various scientific instruments (such as drip recorders) presently being developed.

An attempt was made on Saturday to dive at Big Spring to check the sediment conditions, but the water flow was so strong that the diver could only go a few feet. Dive gear was hauled to the Rise (where the main stream first appears in Lilburn), but the dive was aborted due to regulator failure. Instead, the party checked out the quadrangles for the area, making several improvements to the sketch and

surveying a few short side passages (about 50 ft. total).

Survey Crews: *Attic-Attic survey*—P. Bosted, J. Mosenfelder, J. Embree; *Hex Room traverse*—J. Mosenfelder, L. DeThomas, G. Hall (lead climber), J. Embree; *Sediments*—J. Tinsley, R. Bowersox, S. Harris, C. Reuter; *Surface Geology*—J. Tinsley, J. Despaign, R. Mortimer; *Cleaning 1*)—B. Frantz, P. Nelson, L. McKinnley, R. Mortimer; 2)—B. Frantz, P. Nelson, R. Bowersox, S. Harris. *Cable Laying 1*)—D. Bunnell, G. Hall, M. Bettencourt, R. Buford; 2)—D. Bunnell, C. Reuter, P. Bosted; *Dive 1*)—B. Farr, J. Frantz; *Dive/Survey 2*)—B. Farr, C. Vesely, H. Hurtt, J. Frantz, L. McKinnley.

MISSOURI

April through June, 1993

Report by Mick Sutton

There were three trips to advance the survey of Still Spring, the longest cave on the Mark Twain National Forest. The main upstream passage was completed, with an additional 1000 ft. or so of survey. Cartographer Doug Baker estimates that only two more mop-up trips will be needed to complete this time-consuming project. Baker's even larger project, Powder Mill Creek Cave, also progressed with two trips into the Hell Hole Series, a very complicated area of canyon mazes that has absorbed most of the work in Powder Mill in recent years. The trips added about 1000 ft. of multi-level canyons to the map, with no end in sight.

The US Forest Service mapping and bioinventory program continued with a multi-day float trip down the Eleven Point River. The party began the mapping and inventory of Sand Cave and Bliss Camp Cave, both opening directly along the river. Both caves will require wet-suit trips to complete their respective surveys. The most notable find was a previously unknown population of troglobitic crayfish in Sand Cave. Next day, the party mapped and inventoried Bliss Spring Cave in the Irish Wilderness, a 50 ft. long fragment of the Bliss Spring feeder channel. The cave has become a beaver hide-out. Regrettably, a member of Missouri's organized caving community was recently apprehended by a Forest Service ranger in the act of breaking speleothems in Bliss Camp Cave.

There was work on two other new mapping and inventory projects. One party continued work on the cluster of small caves on land recently acquired by the Missouri Department of Conservation in Pipestem Hollow, off the Jacks Fork River. The caves mapped were Pipestem, Pipestem Spring, Gaping Slot, Leg O'Briar's 1 and 2, and a previously unknown site called Anastamosis Cave. These caves, along with two other caves found and mapped last time, were checked for biological activity, which consisted mainly of typical twilight zone fauna.

Another party spent two trips examining Leatherwood Creek on the Pioneer Forest in Shannon County. CRF recently signed an agreement with Pioneer Forest, which is owned by noted Missouri conservationist Leo Drey and is the largest privately owned forest in Missouri, to map their known caves and do preliminary biological assessments. The party checked the location of a reported but unrecorded spring, which arose from talus and flowed at about 5 liters/sec., mapped and inventoried a small but complicated cave nearby (Boulder Cave), then hiked upstream to Leatherwood Arch where they mapped another small cave (Neighbor Cave). Next day, they returned to map Leatherwood Arch, which is one of the largest and most impressive arches in the Ozarks, and its associated cave.

Survey crews: *Still Spring*—1) Doug Baker, Steve Irvine, Roy Houdi; 2) Doug Baker, George Bilbrey, Steve Irvine, Terry Wehling; 3) Doug Baker, Steve Irvine, Fred Knight; *Powder Mill*—1) Doug Baker, George Bilbrey, Sue Hagan, Steve Irvine; 2) Steve Irvine, Fred Knight; 3) Doug

Baker, George Bilbrey, Mark Hudiberg; *Eleven Point caves*—Mick Sutton, Sue Hagan; *Pipestem Hollow*—Scott House, Sue Hagan, Mick Sutton; *Leatherwood Creek*—Scott House, Sue Hagan, Mick Sutton.

FITTON CAVE

Project Manager, Pete Lindsley

Danny Vann (501-848-3308) will be taking over the Fitton Cave Manager job from Jack Regal. Danny will act as our local contact and will help the expedition leaders in making plans, arranging for survey equipment and filling out the paperwork. Hopefully, Jack Regal will now have more time as the area cartographer for the New Maze area.

In 1993 we will be concentrating on the remainder of the stream in the lower East Passage plus numerous smaller passages yet unsurveyed. Emphasis will be placed on multi-level cross sections in some of the more complex areas of the cave.

Exploratory Drilling in Missouri Ozarks Halted

The Doe Run Company, which had won a lengthy legal battle for the right to drill 20 exploratory holes in a karstic area of the Mark Twain National Forest in southern Missouri, announced on June 22 that the company was halting the drilling program after completion of only six holes. A company spokesman blamed the continuing depressed market for lead as the primary reason for the decision. The spokesman stated that the test holes had found lead deposits, but not of a sufficiently high grade to justify mining. Lead prices on the world market are currently around 20 c a pound, down from 30 c less than a year ago.

The prospect of large scale mining within the watershed of Big Spring, the largest karstic spring in North America, and within the watershed of two National Scenic Rivers has alarmed speleologists and environmentalists. The American Rivers group recently added the Eleven Point to its list of the nation's most threatened waterways, citing the potential for damage if mining takes place. Doe Run's mineral exploration lease has no expiration date, according to Eleven Point District Ranger Art Wirtz, and if the price of lead recovers, exploration may resume.

CRF has been involved in data collection for the US Forest Service with regard to the mineral exploration activity, and recently completed a report on caves and cave life in areas which may be affected if mining takes place. A second phase of cave mapping and biological inventory within the Eleven Point District has begun; field work is scheduled to run through October, 1994.

Forest Service Assumes Ownership of Greer Spring

On January 13, after negotiations lasting several years, the U.S. Forest Service attained title to the 7000 acre Greer Spring tract along the Eleven Point River in the Missouri Ozarks. Greer Spring with an average discharge of 8200 liters/sec., is the second largest spring in a state noted for its large springs, and is in a beautiful and pristine setting. The spring branch provides more than half the flow of the Eleven Point River at the point where it enters.

The tract had been owned by the Dennig family since 1919, and maintained in an unspoiled condition. Leo Drey, a leading Missouri conservationist, bought the tract in 1988 as an interim measure while the U.S. Forest Service pursued enabling legislation for the purchase. Drey and the Anheuser-Busch Company each provided \$500,000 towards the purchase cost, and Congress appropriated the remaining \$3.5 m in legislation that forged a compromise between conservationist and commercial interests. The compromise protects a core of 2500 acres which becomes part of the Eleven Point National Scenic River. The remaining 4500 acres forms a special management zone, where limited logging will be allowed, but clear-cutting and mineral prospecting will not.

Although the land around the spring now seems well protected, Drey and other conservationists are concerned that if lead mining is permitted within the Eleven Point District, it may well affect the flow and water quality of Greer Spring (see preceding story). The Forest Service is currently carrying out dye tracing studies to better delineate the large, ill-defined watershed of the spring.

How Not to Poison Your Survey Crews

Buz Grover

The worst cave rescue scenario I can imagine begins with a trip to the store. A camp manager purchases several dozen eggs, along with other supplies, tosses the supplies in the trunk, where the eggs end up perched above the car's muffler. Several hours later, the provisions are leisurely unloaded. The camp manager decides to make up the egg batter for the next day's French toast, then wedges the mixings in the fridge amongst other supplies.

Next morning the French toast is served. Parties are dispatched to the cave. Four hours thereafter everyone in every party doubles over with severe stomach cramps. As rescue parties are assembled, a camera crew catches a shot of the camp manager running bent double to the bathroom, the lead photo for the story that evening of the poisoned cavers. If this sounds like the kind of horror story you, as a camp manager, would just as soon avoid, you should acquaint yourself with the rudiments of safe food handling.

Safe food handlers try to do two things: 1) keep chemical and physical contaminants out of food and 2) keep harmful micro-organisms from growing in the food. Avoiding contaminants is fairly straight forward—don't spill the clorox in the soup and don't break glass above the salad. If chemicals must be stored near food keep them on the lowest shelf so that leaks cannot flow into food. Keep all chemicals well labeled; you don't want the unlabeled quart of bleach to be mistaken for white vinegar.

Avoiding micro-organisms is more complicated. Micro-organisms do harm to humans in two ways. They either excrete toxins that humans then ingest or they enter the human body and breed amok. No kitchen can be totally germ and virus free; there are too many critters in nooks, crannies and floating free in the air for that to be possible. Therefore, safe food handlers strive to make sure that micro-organisms and their toxins are not allowed to reach levels that overwhelm the body's natural defenses. There are several major techniques for doing so:

1. Keep hot food hot and cold food cold.

This is known in the cooking biz as time and temperature control. Most harmful bacteria thrive at human body temperature. Temperature control keeps food either too hot or too cold for microorganisms to prosper. The time element comes into play when something cold is made hot or visa versa. One of the most common mistakes in food service is to heat or cool food too slowly, leaving the food at dangerous temperatures for too long and allowing bacteria to prosper. Safe food handling temperatures are as follows: frozen foods should be kept between 0° and -10°F, cold foods between 35° and 40°, hot casseroles should be heated to 165° and then main-

tained at 145°, while soups and suchlike should be brought to 180° and maintained at 165°. Time and temperature control is probably the single most effective method for handling food safely.

2. Maintain good cold air circulation in refrigerators and freezers. If you pack the warm tuna salad amid 16 heads of lettuce it will stay warm for quite some time. Be sure that the cold air can reach what you want to cool.

3. Avoid cross contamination. A typical cross contamination scenario might involve preparing a salad atop a cutting board that had not been sanitized after raw chicken had been cut on it. Most everyone knows chicken has to be handled carefully but who worries about contaminated carrots? Cross contamination can best be battled by sanitizing work surfaces after each use and by washing your hands often. A capful of bleach in a gallon of water makes an effective sanitizing solution.

4. When in doubt throw it out. All sorts of interesting items can be found in a CRF refrigerator; I've found eight week old eggs and frozen cave crickets. If a food can't be easily identified, if it's age cannot be well-established, or if it's wholesomeness cannot be assured, toss it into the trash.

This is by no means a comprehensive list of safe food handling techniques; camp managers would be well advised to read a food service sanitation text. In lieu of that, the techniques outlined above along with some common sense should keep the camp manager's dyspeptic image off the evening news.

Buz is a professional food service manager, and has provided gourmet (and safe) feasts for CRF crews at both Mammoth Cave and Carlsbad Cavern.

China... continued from p. 1.

little or no caving experience. After a day of acute culture shock for the U.S. contingent in the austere industrial city, the cavers and a large support crew left on a day-long drive to rural Pingba County through a classical Chinese landscape of cones and depressions with every square meter of level ground pressed into service as a vegetable plot. Swaths of bright yellow rape-seed flower stretched to the horizon, and flowering cherry trees added to the color, which a constant overcast only heightened.

Most of the U.S. cavers already had coughs and colds, brought on by an atmosphere thick in sulfurous coal smoke and by the drizzly, 40° weather, exacerbated by the Chinese penchant for wide open doors and windows—dinner dress included down jackets and woolly hats. It was a full week before we saw sunshine. The food was strange, ranging from dog stew to crab with exotic mushrooms. Usually at least a dozen dishes were presented, so that the less adventurous could detour around dubious items.

Guadou. "One must go through the water; it goes over one's head."

Guadou is a pretty village of stone and timber houses amidst a spectacular karst landscape of cones and flat depressions. Most of the people are Miao ("mee-ow"), a minority race with a speech that the Chinese cavers often had trouble understanding. There is no mechanized agriculture; tilling, sowing, reaping, and most transportation are by ox, pony, or human power.



Cave safely. Chinese custom prescribes setting off fire-crackers at the entrance to ward off mischievous spirits.

The landscape and geology are complex, with numerous faults and folds, showing little direct correlation with the land surface. One interesting feature is the extensive exposure of dragon's tooth karst—small, closely clustered pinnacles. Dwight pointed out that the lower 30 cm or so of the rock was smoothly eroded, suggesting recent emergence from the sub-soil. We learned that there was extensive deforestation during the 1950s, probably leading to increased soil erosion. The caves contain massive amounts of fine sediment, though there is no telling how recent it may be.

A number of gorges slash deeply through the uplands, ending abruptly in headwalls where the streams disappear into large entrances. The stream caves trend towards a major resurgence, Dou Bin Dong (Hiding From Soldiers Cave), opening into the base-level San Cha River. Dou Bin Dong had been mapped in 1991 for 1200 m of wide, well-decorated passage. The trip to the business end took several hours and included plenty of scrambling and a few exposed spots. The cave was largely dry, with the stream running in a deep canyon. The 1991 survey had ended at deep water. Over the first three days, successive crews using wet suits and inner tubes extended the cave upstream for 600 m of wet canyon, much narrower than the passage up to that point—we seemed to have lost the wide upper levels. Progress was painfully slow; with six hours of round trip travel

time, an 8-9 hour trip just didn't leave much time for surveying. We convinced our support crew of the need for odd hours, and a few longer trips took place. This put a strain on the kitchen staff, who would stay up till well past midnight, but they coped cheerfully.

The nice 16° water in Dou Bin Dong did not prepare one for the downright nippy 10° of the deep pools in the resurgence caves. The stream level was at its yearly minimum (the reason for the timing of the expedition) but all the caves contain impressive amounts of flood debris, extending well up into the ceilings. Don C, Don M, and Dwight mapped Xiao Lu Dong ("shy loo dong") beyond the pit that ended the 1991 survey. The cave ended disappointingly in a sump. A lead 10 m up a flowstone wall above the sump would require a technical climb.

Hua Ta Dong (Magnificent Temple Cave) had been followed in 1991 for a kilometer of enormous stream passage to a tight sump; a potential bypass passage now proved to be merely a loop back upstream, albeit a large and impressive one. Three crews surveyed the third resurgence, You Cai Dong (Rapeseed Cave) past the deep water that ended the 1991 trip, down a 15 m pit and a 5 m pit to a wet, nicely decorated canyon leading for 100 m to a deep and definite sump. At least, the resurgences were behaving consistently. A slight complication awaited the last team, as the entrance handline had disappeared; the same thing had happened the previous day at Dou Bin Dong. Evidently our PMI rope proved too tempting to villagers who probably



Don Coons instructs Xiao Hongling in vertical technique.

couldn't see why we needed rope for these climbs anyway—indeed, we were able to extricate ourselves by free climbing.

By this time, Ian had found his way to Guadou, bringing the team to full strength—almost. On the third day, Tom slipped and put a nasty gash in his leg. Though he did not need immediate medical attention, the wound swelled up and stayed swelled, putting a bad cramp in Tom's style; he was forced to avoid wet or very long trips for the rest of the stay.

While the insurgences fizzled, a series of trips to another big lead from 1991 had more luck. Chui Feng Dong ("chew-fung-dong"; Blowing Cave) has a high-level entrance where a gale blasts out of a small slot. The cave had been mapped for 700 m down four pits to the brink of a fifth drop. On successive days, Don C and Pat, then Carol, Ian, and Janet extended the survey in large passage that continued to descend towards Dou Bin Dong. Meanwhile, Pat led a long trip to extend Dou Bin Dong beyond the deep water to a hiatus at an awkward up-climb.

"The army retreats. No blame."

On the last day at Guadou (we had cashed in our option for the two extra days), Don C., Mike, and Carol performed an acrobatic climb in Dou Bin Dong and found they had reentered the wide upper levels of the cave. Big trunk passage continued ahead, back towards the entrance, and up towards Chui Feng Dong. At the same time, Ian, Ron, Pat, and Liang Hong found major continuing passage in the latter. When the dust had cleared, only a few hundred m separated the two surveys, but we were out of time—the ropes were pulled from Chui Feng Dong and the inner tubes from Dou Bin Dong.

My quick assessment of the underground wildlife had interestingly mixed results. The streams and pools contained a zoo of strange creatures—shrimp, crabs (apparently the same species that appeared in the markets and on the dinner table), dragonfly larvae, pigmented flatworms, and at least three species of small fish. None of this looked remotely cave adapted, and could all be best accounted for by wash-in of surface creatures. Terrestrial life was a different story. Among the many troglomorphs were at least three species of pale millipedes, an equal diversity of white spiders, plus springtails, troglobitic flies that resembled their eastern US counterparts, a blind beetle that would have looked at home in Kentucky, and a large pale crane fly, common as deep as we went into the caves. Horseshoe bats were widespread but not numerous. There is tremendous potential for more detailed studies. Cave biology has received little attention in China in general and in Guizhou in particular, and little taxonomic work has been done.

Mochong *"Waiting means not advancing; one does not become perplexed or bewildered."*

Mochong, a small town *en route* from the city of Duyun to Kai Kou was another scheduling surprise. In Duyun we had stayed at a brand new hotel and were

treated to hot water and flush toilets (though the tanks were left conveniently open for the guests to adjust the plumbing as needed). On this trip, geology professors Yang Mingde and Chen Jengang from GNU accompanied us into the field.

The Mochong diversion was to assess some local caves for show cave potential. This was the overriding concern of almost all the local officials whom we met. We did not have time to survey, (except for Don, Ian, Mike, Zhu An and Xiao Hongling who dropped and mapped a 30 m pit), but we did use the opportunity to look at some geology and biology from a different area. The caves did not seem ideal candidates for tourist development. Next morning, we were taken to another cave which is in fact being developed; it was pretty enough, but the tour features obstacles which would be considered unorthodox for U.S. tourists, such as a muddy hands and knees crawl lit by bare light bulbs.

Kai-You *"In small matters there is success."*

We travelled on into an area never visited by Westerners. This too was a minority region; most of the inhabitants are Bui, speaking a dialect akin to Thai. The land surface was even more rugged and impressive than Guadou. Our arrival in the small town of Kai Kou caused considerable interest. The inevitable meeting produced another surprise. We were scheduled to spend only four days here, the place we had been drooling over on the topo maps; the first four days would be at Kai You, 10 km up the road. Negotiations led to a compromise—we would stay two nights in Kai You, do one full day of caving there, and return to Kai Kou for the remaining time.

The 10 km stretched to 15 km of rocky going through awesome scenery. This was truly the end of the road, a delightful small village of timber frame and brick houses with tiled roofs. It sits at the edge of a large, flat doline surrounded by steep, wooded cones. The floor of the doline is given over to a rectangular pattern of rape-seed and wheat fields. Other villages and hamlets, reached by footpaths across the fields, lie along the far edge. There were odd touches of civilization—the house we were guests in had a color TV in the living room, but also two pigs, a cow and a horse in the room below the sleeping loft. The evening developed into a long cultural exchange session—songs of welcome from the Bui women and patriotic songs from the schoolchildren; group singing and Mike's ever popular travelling disco show from the U.S. cavers.

Qi Xin Dong ("chee shin dong"; Seven Stars Cave) is a big, high and dry trunk fragment. Janet, Liang Hong and I mapped it, accompanied by "Connie" the Chinese TV person, a tourism bureau official, Professor Yeng, a reporter, a food supply person, and a cast of 150+ villagers. Preferred light sources were flashlights (usually someone else's),

burning straw, and bamboo stalks filled with motor oil. Spacious as it was, the passage soon had a very thick atmosphere. Survey stations, if left for a second, disappeared under a crowd of spectators. The horde dissipated around dinner time, leaving us the evening to finish in peace, accompanied only by a faithful porter who brought us an evening snack and stayed around to the bitter end to escort us home around midnight. The passage was 50 m wide, and usually neither wall could be seen for a forest of drip-stone. Up until now, I had lucked out and gotten to sketch only relatively narrow canyons, but this one was work—I had not quite acquired Pat and Carol's speed in sketching mega-trunk. Of the other caves mapped that day, the most promising, an insurgence, fizzled out quickly, but Double Dragon Cave and Tian Ba Dong (Field Cave) were too large to be completed.

Kai Kou. "Small things may be done; perseverance furthers."

After three days back at Kai Kou I felt fit enough, barely, to do some appreciable caving after a few short, easy trips. Almost everyone suffered at one time or another from dysentery and fever. The snake bile medicine I periodically scrounged off Mike or Ian (recommended for "reducing crudum and sputum") served only to postpone the onset. Thankfully, people took turns at getting laid low by crudum and sputum so we were never seriously understrength.

Kai Kou was not quite living up to our high expectations. A big wall of limestone behind the town swallowed a series of sinks fed by drainages larger than those around Guadou, and a resurgence was situated in a likely place to receive the flow from them. But the sinks all quickly led via wetsuit and inner tube passage to festerous sumps, and the resurgence was off limits within a military reserve. Still, there was enough work in a collection of overflow caves and trunk fragments to keep everyone busy. Hong Ye Jing Dong (Red Stone Cave) was a mazy series of small to middling canyons with two entrances. Kai Lie Dong (Fissure Cave) was at the back of a remarkable open-air fissure where a 80 m high block of the bluff has partly peeled away. The cave paralleled the fissure as an awkwardly narrow canyon, but a roomier passage also headed into the hillside. Both of these caves had leads remaining. Further up the hillside, Hai Ma Dong (Seahorse Cave) was an impressive trunk fragment, 50 m wide and several hundred meters long. Thirty km from town was He Dong (River Cave) a 750 m section of active stream trunk with some nice speleothems. And there were plenty of other smaller caves.

The biological story was similar to Guadou; a great diversity of aquatic creatures all seemed to be washed-in surface forms, while there was a fascinating assortment of cave-adapted terrestrial inverte-

brates. The most interesting difference from Guadou was the presence of a pale cave cricket with extremely long antennae and an absence of eyes. These were common, with large populations in some caves. There was also a second species of eyeless beetle, the usual assortment of spiders, millipedes, etc., and an awe-inspiring entrance zone centipede 20 cm in length.

"It is well to remain below. Great good fortune."

On the third day at Kai Kou, a guide took Chuck, Don M, Kangning, Zhou Pingming, and Professors Yang and Chen to look at an upland sinkhole called Wang Son Tai. Some sinkhole—the void was 250 m across and 100 m deep. A steep trail led into the sink, where large entrances were partly obscured by dense vegetation. There seemed an excellent chance that any passage would be thoroughly blocked by talus, but when the crew walked into the 60 m wide lowest entrance, they kept on strolling for more than a kilometer. Lacking a sketcher, they wisely postponed the survey. Meanwhile, Carol, Janet, Mike, and Liang Hong were shown another upland cave, Wan Yin Chan Dong (Thousand Pieces of Silver

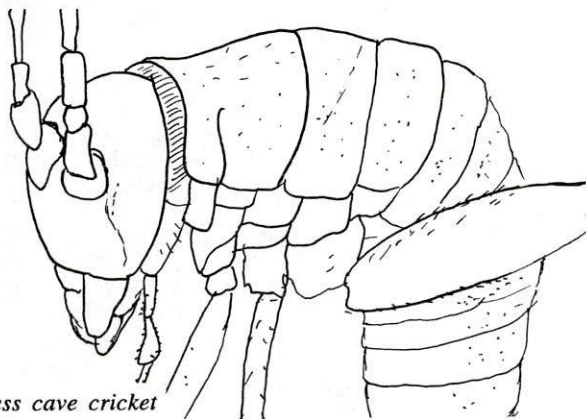
There seemed an excellent chance that any passage would be thoroughly blocked by talus, but when the crew walked into the 60 m wide entrance, they kept on strolling for more than a kilometer.

Cave), reached by a long, steep hike. The entrance looked impressively enormous from a full kilometer away. Inside, a huge breakdown slope plunged down to a trunk passage. The crew stopped the survey at deep water.

Next day, we put three parties in Wang Son Tai. Carol, Ron, John, Chuck, and Hongling set off down the big trunk, while Pat, Don C, Don M, Dwight, and Zhu An headed into a side passage just inside the entrance where Chuck had walked at least 600 m the previous day. I led a third, semi-invalid, crew into a higher entrance which Kangning had glanced at briefly yesterday. Janet, Kangning and I eventually got up enough energy to wander down to the entrance, while Ian and Mike peeled off to photograph the cave. We measured the entrance width—80 meters. Da Mama Ban Ta Dong (Big Mother Cave Full of Rocks) plunged downwards at 35°, maintaining the same width over a floor of wildly jumbled blocks the size of small apartment buildings. This was by far the largest passage I had ever mapped. I tried to visualize two Salts Trunks side by side with room to stack another two on top. It was not a trivial matter to reach the walls, and we resorted to a lot of triangulation. Three hundred meters later, and still within twilight, Mike and Kangning headed off to reconnoiter while the rest of us finished up for the day; the scoop team returned with reports of a deep-water stream passage.

Meanwhile, at the bottom of the sink, Pat sketched a kilometer of nice, walking high passage in the side cave, and Carol put in, incredibly, a full mile of detailed sketch in the larger cave, which turned out to be quite complicated. Following Da Mama Dong, the cave and its long side passage inevitably became Da Papa Dong and Da Baba Dong.

It took another trip to get down to the water in Da Mama, barely getting out of sight of daylight, before a wetsuit crew took over. The stream arose from the bottom of the talus pile and the passage pinched down to a claustrophobic 10 m wide. Although we



Eyeless cave cricket

were out of the talus, the going did not become easier. We floundered and stumbled down a clean-washed 30m high canyon where deep pools alternated with highly eroded bedrock floors. John and Carol picked up a large upper lead, which took most of the ceiling height with it, and shortly beyond, the main line sumped out. A bypass may exist, but there was no time to check thoroughly, nor to survey the upper level lead.

Don C had noticed a third huge entrance in Wan Song Tai; the sink was so big and densely vegetated that this gaping hole was not immediately obvious. Inside Mist Cave, Don, Pat, Tom, Don M, and Kangning mapped yet another large trunk to an impasse at a drop off. Next day, Don, Pat, Janet, and Liang Hong dropped the pit, finding more huge trunk with a scenic skylight. An entrance alongside the trail directly above Mist Cave soon connected with the latter, dropping in through the ceiling. Mist Cave was by far the best decorated cave in the big sink. The centerpiece was a spectacular tall, thin calcite column. There was no sign of recent entry, but Don C noticed charcoal torch fragments which reminded him of the aboriginal remains in Salts Cave. Don M took a small sample for a radiocarbon date. Altogether, Wang Son Tai sink yielded more than 6 km of large trunk.

Wan Yin Chang Dong had been somewhat neglected in the mapping frenzy at the big sink, but two crews went back there, extending the survey to the

edge of deep water along one line, and to a drop into a flowing stream passage in another. The cave is far from played out, and another conspicuous entrance in the bottom of the sink wasn't even looked at. With our time already up, a villager offered to show us another sink with cave entrances, said to be as big as Wan Song Tai!

"No going not followed by a return."

We began a leisurely return to civilization. The return trip had not a few memorable moments, such as arriving at the Duyun hotel in our filthy field attire and walking straight into what appeared to be a major party congress featuring the mayor, the party boss for the entire province, University President He, etc., with our unwashed selves the central attraction. The last few days were devoted to presenting reports of our findings to Professor He and his staff, and to a little touring. Kangning led us on a tour of GNU's geomorphology study area in the beautiful Long-Gong karst. We took a boat tour in nearby Dragon Palace Cave (where eight largish westerners succeeded in grounding out the boat), and finished up with a look at Guizhou's premiere tourist attraction, Huangguoshu Falls, said to be the largest in China.

Our departure from China was not the end of the 1993 project; a second phase is currently taking place. Five members of GNU are visiting the U.S., where they plan to attend the NSS Convention in Oregon, and visit karst areas of the West Coast.

This trip could not have succeeded without the enthusiastic help of the staff from Guizhou Normal University. We are indebted to Professor He and his staff, and to the large number of support people they provided—drivers, cooks, and translators. We are also grateful for the enthusiastic participation of the Chinese cavers, and to Xiong Kangning, who smoothed our path and navigated us through the maze of logistics. We are indebted to Chuck Pease and Cynthia Vann for major funding, and to Japan Air Lines, PMI, Bob and Bob, and the Missouri Speleological Survey.

Quotations are from the *I Ching*.

BUY CAVE BOOKS

Christmas is coming (really!) and all your caving family and friends will appreciate your thoughtfulness in buying them vicarious thrills from the extensive Cave Books collection of the finest speleological literature. Cave Books is the publishing arm of CRF, and profits on book sales contribute, among other things, to your free quarterly copy of the *Newsletter*. So help CRF and yourself by acting now, and avoid tiresome last-minute shopping hassles. (We hope to include a current Cave Books listing with this *Newsletter* mailing; otherwise you will receive a copy in a separate mailing, along with an updated CRF address list).

CALENDAR

CRF Annual Meeting, November 19-20,
Washington University, Saint Louis, MO. For details
see p. 5.

MAMMOTH CAVE

Summer, Aug. 6-8. Tom Brucker, 615-331-3568.
Labor Day, Sept. 3-6. Bob Osburn, 314-772-5813.
Columbus Day, Oct. 8-11. Neil and Terri Hammond,
317-786-2092.
Thanksgiving, Nov. 24-28. Phil DiBlasi & Jan
Hemberger, 502-637-2030 (H); 502-588-6724 (W).
New Year, Dec. 30-Jan 2, 1994. Kevin Downs, 502-
933-4406.

First and last dates are arrival and departure dates. Notify the expedition leader or Operations Manager, Jim Borden, 606-223-2677 two weeks in advance. Some of the one-day expeditions may be extended to a second day at the discretion of the expedition leader.

GUADALUPES

Summer, Aug. 7-8. Fort Stanton Cave. Gavin Corcoran.
Labor Day, Sept. 4-6. Carlsbad Caverns NP. Randy Cabeen.
Columbus Day, Oct. 9-16. Lincoln NF. Dick Venters.
Thanksgiving, Nov. 24-28. Carlsbad Caverns NP. Dick DesJardins.
Late Fall, Dec. 18-19. Carlsbad Caverns NP.

To sign up for an expedition, notify the Personnel Officer, Dick DesJardins 505-344-7053 (7-9 pm MDT) or the food coordinator, Fritz Hardy 505-345-1709 at least one week in advance.

FITTON CAVE

The following dates are provisional—call Pete Lindsley (214-727-2497) or Danny Vann (501-848-3308) to confirm the dates and to register for an expedition

August 5-8; September 11-12; October 23-24.

CAVE RESEARCH FOUNDATION
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MISSOURI

Aug. 21-22, Sept. 18-19, Oct. 23-24, Nov. 6-7,
Dec. 11-12.

Most trips originate from Alley Center in the Ozark National Scenic Riverways but others may be held at Forest Service campgrounds. Additional survey and bio-inventory trips take place at frequent intervals, and scheduling is usually flexible enough to accommodate the schedule of out-of-state JVs who wish to sample some Ozark caving. Please call Scott House (314-287-4356), Doug Baker (314-878-8831) or Mick Sutton (314-546-2864).

CALIFORNIA

Aug. 21-22. Mineral King—mapping, hydrology. Glen Malliet, 209-754-6674 (W).
Sept. 4-6. Lava Beds—inventory & monitoring, mapping. Bill Devereaux, 503-363-3831 (H).
Sept. 4-6. Lilburn—mapping. Rich Fellows, 510-462-8953 (H); 415-964-9628 (W).
Oct. 9-11. Mineral King—mapping. Glen Malliet, 209-754-6674 (W).
Oct. 9-11. Lilburn—mapping. Paul Nelson, 818-302-8453 (W).
Oct. 30-Nov. 1. Lilburn—hydrology. Mike Spiess, 209-434-3321 (H); 209-431-8100 x322 (W).
Nov. 25-28. Lava Beds—inventory & monitoring, mapping, reconnaissance. Bill Devereaux, 503-363-3831 (H).
Jan 22, 1994. Fresno—annual meeting. Mike Spiess, 209-434-3321 (H); 209-431-8100 x322 (W).

MEETINGS

Cave Management Symposium, October 27-30,
Carlsbad, NM. See p.2 for details

CRF Annual Meeting, November 19-20, Washington
University, Saint Louis, MO. See p.5

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