

SAGRAG

The Shasta Area Grotto's Newsletter

July-August 1993

Volume 12 Number 4



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To end the confusion once and for all, the Park Service has decided to paint all stalactites RED and stalagmites BLUE.

The SAG RAG is published by the Shasta Area Grotto of the National Speleological Society, Grotto meetings are held at different locations the fourth Friday of each month at 7:30 p.m. Meeting locations are announced in the SAG RAG, Membership dues are \$6 dollars per year and include newsletter subscription. Original material not otherwise noted is copyright to the SAG RAG. Such material may be copied with credit given to the author and the SAG RAG. For use outside of the caving community, please seek the permission of the author or editor first. Send material for publication any time to Ben Sutton, P.O. Box 1597, Mt. Shasta, CA 96067. Material must be in by the 10th of the month.

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NOTES FROM YOUR EDITOR

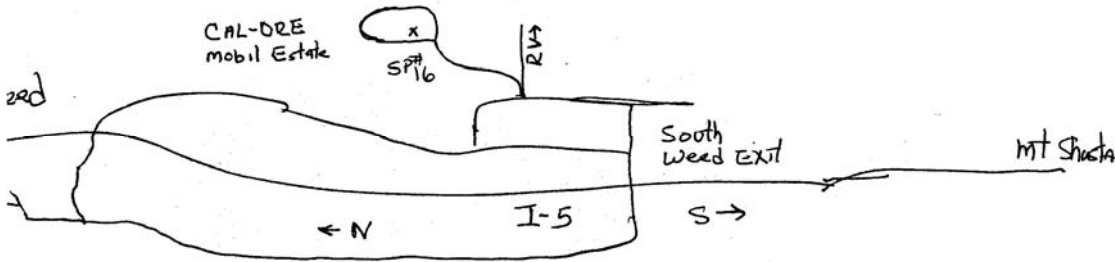
No minutes will be in this issue due to my getting this out early and a late meeting in August.

I will be taking classes at COS this fall. Don't know how this will effect getting the SAG out.

We have some good articles this issue so read on.

C A L E N D A R

September 11, SAG meeting at the Sutton's. 938-1845.



NEWSLETTER REVIEW, AUGUST 1993

By Dick LaForge

This month's review is very short, as your overcommitted reviewer has spent most of his available time helping plan the cave rescue practice for Labor Day Weekend, specifically Sunday, Sept 5, in the Marble Mts. Please refer to the Plan, printed separately (pages 13-16). I urge you all to take this seriously. We have tried to make this fun, easy, and safe, and I guarantee that you will have a new appreciation for the difficulties and techniques of cave rescue after a little practice with them. In case of an actual emergency, even this little practice will give you a fighting chance, and save a lot of valuable time.

There was going to be a caver information form for compiling a Cave Rescue Call-out List, but that is not yet done. It will be the next item to deal with.

A great abundance of newsletters has arrived since the last review, and to be honest I have not had time to read them all. So I have chosen, if there is room to print it, just one article, from the Devil's Advocate, June 1993. It is entitled "Janet's Trip Log from China, Part 1". I presume this is Janet Sowers.

You read in a recent NSS News of an earlier expedition led by Ron Bridgemon to China. This is from a more recent one, March 1993. It gives the experience in a more informal form, more the daily experience of being there. I was attracted to it as Ron B and 5 Chinese University-Geomorphology types stopped by at my house on their way to the Convention this summer. We had a Humboldt County-style pot-luck dinner and doubtless introduced them to many exotic and strange foods. In exchange they introduced us to the Drinking Game. It goes like this: two people play. At the same instant, each contestant puts forth 0 to 5 fingers, and also says a number (in Chinese, of course). The number is supposed to be a guess of the sum of your and your opponent's fingers. Whoever guesses closer wins, and doesn't have to take a drink. My wife Kathy knows of this game and has taught it to her third graders, but she didn't know about the drinking part. Now she will have something new to teach this year.

Dick LaForge

MAGIC SKYLIGHT CAVE

By Bill Broeckel

Some pray for rain, some pray for snow,
and some folks pray for waves.
But Gentle Reader, did you know
that cavers pray for caves?

The Good Lord answered my prayers on 5/14/93, allowing the discovery of Magic Skylight Cave. Ben Sutton joined in on a survey trip 5/27/93, gamely running the instruments and setting surface stations in a late spring ice storm. Conditions were better inside the cave.

Magic Skylight is located near Porcupine Butte, in the Double Hole Crater lava flow. It is downflow from the fault crack entrances to Porcupine Butte Cave and Sign Cave. Nearby is a large, deflated area of the surface of the lava flow.

A major feature inside the cave is a small skylight. The beam of light is split down the middle. The cave mist swirls in the beam as if contained in a glass cylinder. The swirling is caused by air turbulence flowing through the skylight.

Beyond the skylight chamber, the cave drops back down to original floor for several hundred feet of easy walk along passage. Bilateral curbing is well developed in this cave, with curbs as high as 4 5 feet in some sections.

Abruptly, the cave becomes a windy crawlway 3 feet high. After a couple of hopeful turns, the end is reached in a breakdown that blows cool air. On the surface, we find a collapse trench in this vicinity. At the far end of the trench is another cave that we left as a going crawlway. The next cave in line is mighty James Brothers Cave itself, with its metal marker disk identified as "C2".

We found no evidence of prior visits to Magic Skylight. The excellent speleogenic lava of the Double Crater flow continues to turn up lava tubes. There is still good potential for long tubes such as we see in Bat Cave, Porcupine Butte Cave, and James Brothers. And even the big obvious entrances have not all been checked. Pray for caves!



MAGIC SKYLIGHT

MAGIC SKYLIGHT CAVE

SISKIYOU COUNTY CALIFORNIA

SUUNTOS AND TAPE SURVEY

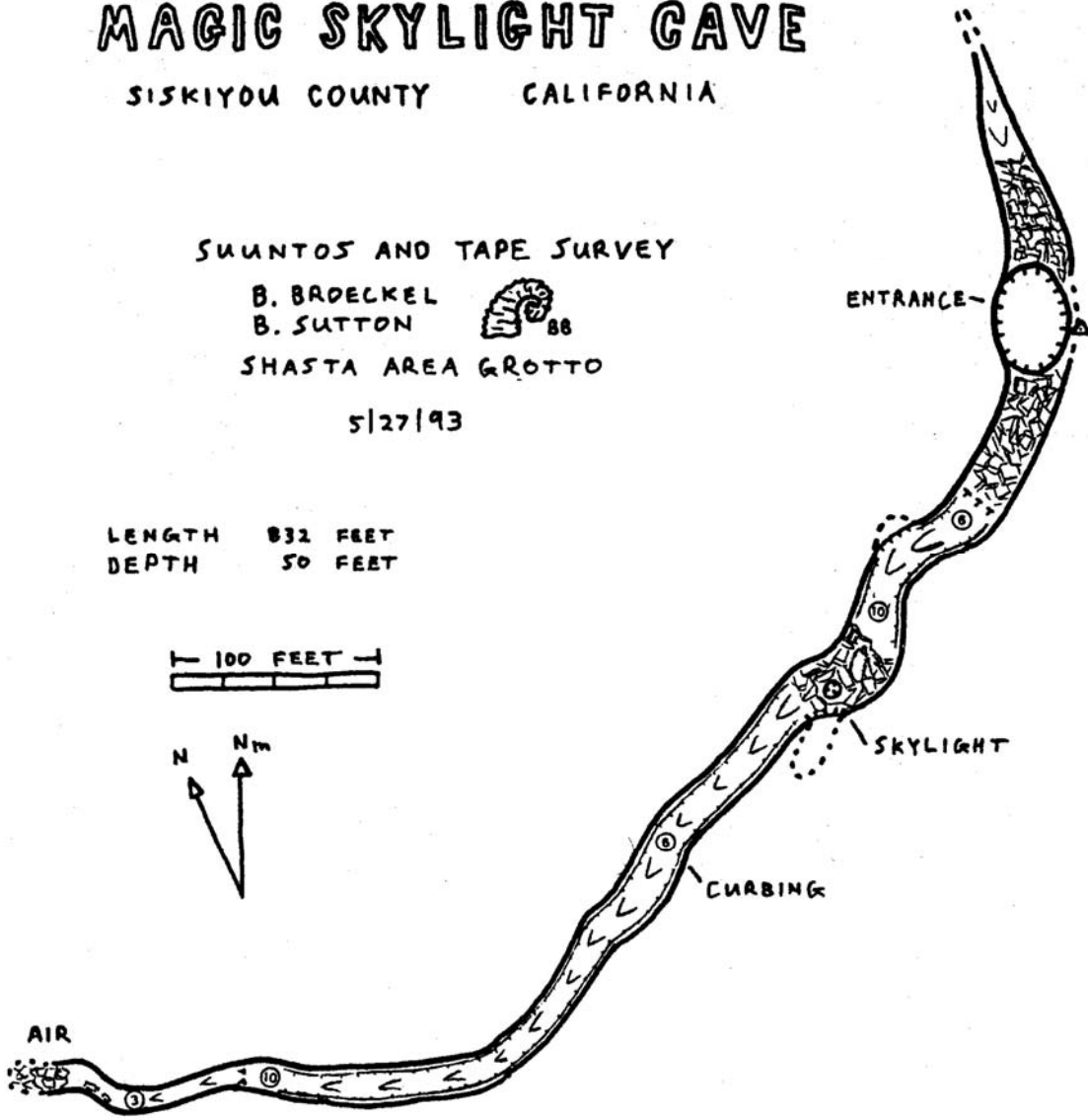
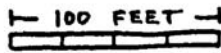
B. BROECKEL
B. SUTTON



SHASTA AREA GROTTO

5/27/93

LENGTH 832 FEET
DEPTH 50 FEET



Map: Magic Skylight Cave

Potter Creek Cave

by Liz Wolff

Introduction: Potter Creek Cave is located on Potter Creek about 900 vertical feet above Shasta Lake. At least two archaeological digs have left parts of the cave a shambles. The Shascade Caving Society (SCS) proposes to return the cave to its pre dig condition by filling the holes in the entrance chamber. Dave Pryor, SCS president, made that proposal to the USFS, outlining the steps to take to accomplish this and submitted it to them. It was accepted and Dave asked help from SAG in surveying. The next steps in the project will be to submit the map to the USFS, then pack tools to the cave to begin the filling of the three holes.

Description: Following the climb up to the cave, the entrance chamber of Potter Creek Cave is a pleasant place, aromatic with the bay trees hiding the entrance. Swallows build mud nests in the overhanging ledges 20 feet overhead. Total footage for Potter Creek Cave is 271 feet long and 53.6 feet deep.

The entrance chamber is 61 feet long by 40 feet wide by 25 feet high at the entrance, narrowing to 12 feet wide and 15 feet high at the back wall. A bridge is located at the bottom of a dome near the center of the room extending into the ceiling about 10 feet. The walls are decorated with white, black, gray and brown popcorn, and some dry flowstone. Some moss and ferns are present near the walls.

Three holes dug into the floor are reminders of the 1965 archaeological digs, with the deepest hole nearly 6 feet deep. The floor is dirt with piles of rubble remaining from the holes. Four brass disks with loops for attaching strings are nailed to the wall, 1 to 2 feet from the floor. One patch and nail hole were found where a marker is missing. Each disk is backed by colored flagging tape and all are marked with "4959 NSS" and an individual number.

At the back of the room a passage 12 feet up the wall leads to a 40 foot drop into the Golgotha Room. In 1984 a Shasta Salamander, an endangered species, was found in this narrow passage by a group of SAG cavers. From this ledge passage an upper level crawl leads back to daylight somewhere in the ceiling of the entrance chamber.

The mud floored Golgotha Room, entered via a 40 foot pit, is 90 feet long, 30 feet wide and 50 feet high, with a dome/pit at the east end of the room 65 to 70 feet in height. A formation called "the Altar" is at the bottom of the drop. The south wall overhangs with a huge gray and brown pendant formation reaching from the ceiling. Other smaller formations decorate the edge of the overhang. The dome pit with a rocky floor is the only part of the room that isn't muddy.

A lower cave is located 118 feet down the hill and slightly south of Potter Creek Cave. It is essentially one chamber with a dirt floor and two entrances; one a 6X6 foot walk-in entrance, the other a 10 foot drop. Some brown flowstone is on the walls. Archaeological digging, possibly in 1965, is evidenced by a 3 foot deep, 14 foot long trench in the floor. The lower cave is unnamed as far as we know. It is 80.4 feet long and 18 feet deep.

History: Potter Creek Cave had been used by the Indians long before white men entered California. Blackened ceilings attest to the presence of many fires. The cave was later discovered by J. A. Richardson in 1878. He sent fossilized bone specimens to Prof E. D. Cope. The bones were the remains of a previously unknown species of extinct bear.

During the years 1902 – 1904 the Golgotha room at the bottom of the pit yielded one of the largest collections of Pleistocene fossils of any cave in California; included were camel, elephant, mammoth, sloth and many others. It was reached via rope ladders (Halliday, 1962). In the Golgotha Room, excavations went to a depth of 25 feet where they hit "stalagmite covered boulders." Bones that had been broken, splintered and polished, possibly the work of early man, were also found, (Merriam). Passages that were uncovered in the Golgotha Room during the 1902 – 1904 excavations have been refilled, and the cave has changed little since. An old Stanford Grotto map indicates a now buried passage from the west end of the Golgotha Room (Halliday, 1962).

During 1965 Stanford University conducted an archaeological dig in the previously unexcavated entrance chamber and an upper level crawl space. In the chamber, a midden of basalt and obsidian cores, hammerstones and shells was found. The best finds of the dig

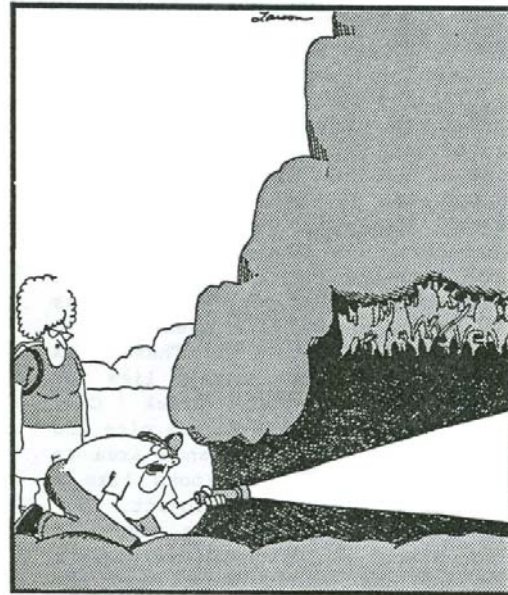
included dart fragments, obsidian points and an atlatl that were in the cache. The finding of the atlatl extended the area of the peoples known to have used them. The cache, which was found in a small hanging gallery with blackened walls just beyond and above the entrance chamber, included cordage, basketry, feather objects, shell ornaments and beads, basalt core tools and stream cobble hammerstones (Payen).

Project: To begin the project, on May 15 4 SAG cavers and 4 SCS cavers rented a boat, climbed the hill, and surveyed the caves. In the cool of the entrance chamber the group split up. One group began a detailed survey of the entrance chamber, with one person videotaping. Pits, rubble piles and ceiling features were all located.

Dave Pryor rigged the drop into the Golgotha room while the Ledge Passage was surveyed to the pit; an upper level passage was found that possibly contained the cached items uncovered during the 1965 dig. Nearly everyone had a hand in surveying the Golgotha Room.

Another group surveyed the lower cave and disturbed about 300 bats out of a high fissure in the cave; the bat filled fissure is still unsurveyed.

A note on bat etiquette: Do not visit a cave that has a known colony or large group of bats in the summertime. It is most likely a maternity colony, and disturbance may result in many of the mothers abandoning their young, causing a decline in the population. Most of our bats like to hang out as individuals in the summer daytime.



"C'mon, Arlene. Just a few feet in, and then we can stand."

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Potter Creek Cave trip

by Bill Broeckel

The Shascade Caving Society very kindly invited SAG to participate in a restoration project at Potter Creek cave on May 15-16, 1993. Eight cavers gathered at a boat and fish resort on Lake Shasta: John Abacherli, Tony SantaCruz, Dave and Ellen Pryor, Liz Wolff, Bill Kenney, Neils Smith, and Bill Broeckel.

First we needed to get across the lake. Assessing our group size, Tony was able to secure a boat that was able to carry all eight of us at once, and the payload of gear as well. Some were planning to stay overnight.

The boat was called a "Nordic Ascender", a powerboat with a telescopic pole used for waterski parasailing. The guy on Miami Vice might use a boat like this to relax with, you know, after his beauty contest girlfriend is brutally killed by depraved and murderous low lifes who walk away scott free due to big city corruption. It's in the final music scene of thick emotion as the credits come up. It was a boat like that.

It cost our group \$20 per trip. The driver promised to return and pick us up at 4:30 PM. That was the latest time he would allow because he had to get ready for his bachelor's party that night. With a time frame like that, we knew we would have to work fast.

The next task was to find the cave. To this end, we spread out over the hillside. There were... Bay tress, Bigleaf Maples, thickets of poison oak, exuberant grasses, brazen wild-flowers, patrolling mosquitoes, leaping lizards, imaginary rattlesnakes, and screaming redtail hawks. It was a real jungle out there.

The cave was hiding behind some trees. The entrance was a shady oasis of cool tranquility. The floor, however, was broken by several test pits opened by an archeology dig in July, 1965. These pits were never refilled, and therein lies the essence of the Potter Creek Cave restoration project to fill in the pits and restore the floor of the entrance area to the original appearance. It looks like a good, solid cave conservation project.

The first step was to document everything. Bill K. & I took off to begin a survey in another nearby cave down the slope a ways. It consisted of a single, inclined, and fairly sizable chamber, with two entrances. We suddenly found ourselves situated in a swirling cloud of disturbed bats. With lights out, we sat down

quietly and waited for things to calm down. Then we took two quick survey shots and retreated from the cave. Where is the red cellophane when you need it?

A surface survey brought us back to the main cave. It was a bit tricky trying to keep the tape off the poison oak. The others had been busy, taking detailed data from the entrance area and rigging the 40 foot pit in the back of the cave.

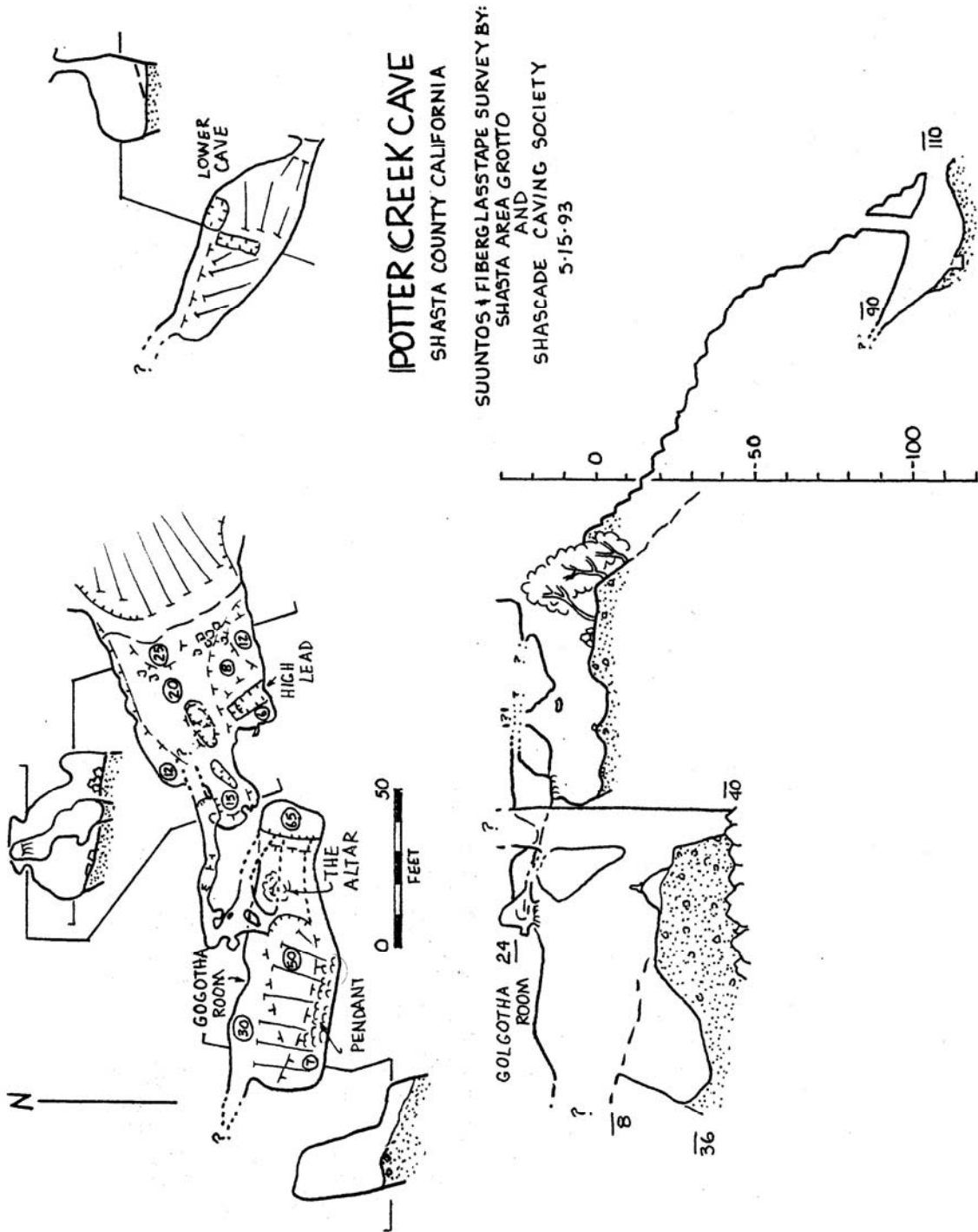
We grabbed a quick lunch, and then continued the survey down the Ledge Passage to the lip of the pit. 40 feet were measured down the pit in a vertical shot, counting the height of the survey station down below on the floor of the Golgotha Room. Dave Pryor said it had previously been measured at 42 feet. I guess it depends on how you happen to set it up.

Golgotha Room?! Now that is one grim name. Golgotha "the place of a skull, a Burial place, a place of agony or suffering, the place where Jesus was crucified (Mark 15:22)." I bet that name goes back to the University of California paleontology expeditions just after the turn of the century. They also left names in Samwel Cave. I wonder how they negotiated the pits back in those days?

By now we had very little time remaining. A minimum of survey data was collected. It was time to ascend. This rope stuff still terrifies me. Outside we took just a few minutes to shake off the nervous jitters and bid a fond farewell to our gracious hosts from the Shascade Caving Society. Finally, we scampered back through the jungle to the lakeshore, and just a few mosquito bites later, the powerboat appeared to retrieve us. Soon we were speeding at 40 MPH+ across the water, a cool wind on our faces and blowing back our hair. This was a pleasant moment indeed.

The last stop was to the Roundtable in Mt. Shasta, where Jim Wolff joined us for a pizza feast. Matt Wolff's fiancée was there with her friends, preparing a surprise birthday party for Matt. But that is another story...

This was an intense day of caving. It included the nice introduction to a nifty limestone cave, the unintentional harassment of a bat colony (sorry bats), getting down the survey, the heady spice of the vertical stuff, and best of all the chance to meet some cavers from the new grotto in Redding. Many thanks to the Shascade Caving Society, for making this trip possible, and for conceptualizing the good conservation project at Potter Creek Cave.



Map: Potter Creek Cave

LAVA TUBES IN MARCH*

by Bill Broeckel

With many Northern California cave areas deep in snow, at least two places have remained accessible: Shasta Valley and Hat Creek.

Two SAG members visited Teeter Rock Cave on 3/12/93 just before the Grotto meeting in McCloud. A new room was uncovered near the end of the cave. You never know just when a cave might decide to grow.

The grotto returned to Teeter Rock on 3/19 and surveyed the new bit of cave. For some of us this was a good chance to practice surveying. The new room represents a lower level development in the lava tube.

It turns out that the 1985 SAG of Teeter Rock Cave shows two leads down to another segment of the lower level. By adjusting the position of one big rock, we were able to connect these two leads, although you still have to squeeze through some portholes to do it.

Also, we identified a fourth way down to the lower level, another new segment. This appears to be a very nasty crawl that mayor may not lead to nicer passage. So there are some things remaining to be done in Teeter Rock before we can come up with some new profiles and maybe an article "Going Downstairs in Teeter Rock Cave."

Next we have a day of caving out at Hat Creek, just me and my 6 year old daughter. First we checked for trash in the Caved Caverns portion of Subway Cave. The gate on the road was closed, but we had permission to enter the cave from the Forest Service. We bagged 5 lb 3 oz of bottles, cans, and broken glass in about two hours. This job is not yet finished!

Never-the-less, in the afternoon we opted to hit the lava for a little cave hunting. And that is just what we found – little caves. The first one dropped below a small sinkhole. A 20 foot sand crawl led to a broad lava pool chamber only three feet high. We circumnavigated this "pancake room" and found no further passages. Becky really liked this cave.

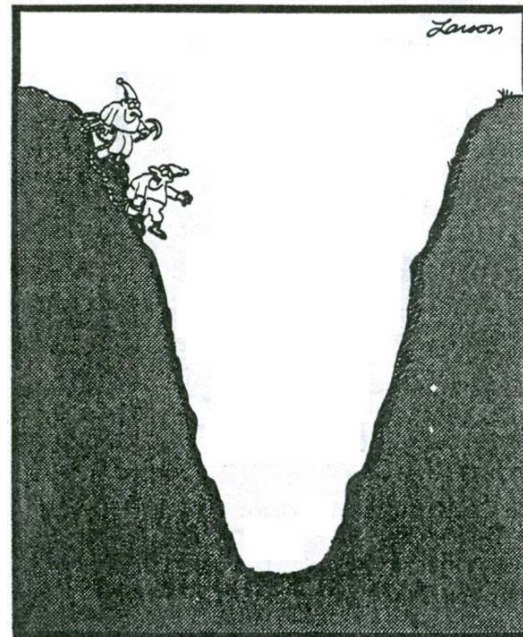
The other cave was entered behind a mountain mahogany bush. It began as a nice hopeful lava tube, but within 50 feet it had shrunk down to a dismal proportion. But the tube continued in a mean way, 1 foot high with a velcro floor, lavacicle ceiling, and no air flow.

Becky wanted to push on, but I explained how as a matter of principle it was important to check for an upper entrance before we pushed this passage, possibly damaging it...

When it was time to go home, we made our best find of the day. A deep sinkhole led to big caves down at the bottom of the lava. A massive entrance chamber was filled with ambient light. A regular lava tube leaves the chamber at right angle so sharp that I appeared to melt right into the wall, and Becky screamed. Next the cave seems to end at a big breakdown. But happy day! A narrow way sneaks around the left side, and the tube resumes its course beyond the breakdown. But then comes another pile of breakdown. Is there a way through?

We were getting nervous now, so we didn't even try the second pile. We are thinking that this cave might be Dogleg Cave. There were no signs of man except for one survey station. We saw maybe 300 feet of passage and it would be a fun survey trip some time. If you are interested in future trips to Teeter Rock or Dogleg? Caves, give me a call at 842-3917.

* This is the second and, so far, final printing of this trip report, for those who missed it in vol. 12 no. 2 – pdf ed.



"Because it's not there."

EQUIPMENT TIPS

"Layering" your cave clothes...
by J. Wolff

I've seen several "trends" in cavers' clothing over the years. Back in the 60's it was denim jacket and jeans, later in the 70's and 80's it was more practical with the layered look or the second skin look of the wet suited-caver. Now, a lot of cavers are seen not so much with the wet suits as with these new all-nylon or PVC suits that are made by cavers for cavers. Usually these suits are or can be accompanied with special (and expensive!) thermals underneath, but I'm not going to talk about them at this time, however I should touch upon the "Layered look" today, because of it's versatility and the cost to the caver.

Layering

The caver that chooses to go this route of using several well-chosen layers of clothing, should consider a few things like:

- 1) What kind of caving will be done? (i.e., hard-charging, or slow trips? wet or dry? etc...)
- 2) Do these layers transport moisture away from the body?
- 3) How thermally efficient are these pieces of clothing for holding the heat when wet?
- 4) How much water-retention do the fibers of your clothing have?
- 5) How strong and flexible are these fibers?

Also, you must consider the factors of freedom of movement when you have a lot of layers on, plus the cost.

Now, the cost to you can be very little, considering most cavers already have some kind of thermals to wear (the synthetics are the best), plus these cavers probably have wool clothing too – maybe even a tight weave (or coated) nylon wind breaker. All of these are (potentially) your ticket to dry (relatively so) and warm caving – but the secret of this whole exercise is when you suit up for the cave trip you have to put on the right amount, kind and all in the right order...! Now, this is where "layering" becomes a science in itself, and a whole lot of experimenting on your part.

Remember that I mentioned that these layers must include moisture transporting (water-hating) fibers and others which are layers that have very little water-retention and insulative-when-wet abilities. Your outer layer can be supplemented with a vapor-barrier underneath the last layer or on the outside, depending on whether or not you want to trash it or not.

Here's how it is done...

To start with, put on the most efficient water transporting layer next to your skin, where your perspiration is passed through and away from your skin, making you feel dryer and warmer – where you don't feel that chill from the wet of your sweat when you stop for inactive periods.

The next layer should be another like layer or the water loving (but warm-when-wet-layer). I use two layers of wool, with one a sweater vest that allows freedom of movement in my arms, yet adds heat to the trunk of the body.

Finally, add the water or vapor barrier layer that helps hold in the heat. Also, don't forget your poly hood, the one important item that keeps your head and neck warm..., That lil' item can be stowed in your helmet liner when not in use.

Stay warm and have fun!

NATIONAL CAVE MANAGEMENT SYMPOSIUM

"CAVE MANAGEMENT INTO THE TWENTY-FIRST CENTURY"

The 1993 National Cave Management Symposium will be held in Carlsbad, New Mexico, October 27 30, 1993. The theme for the symposium is "Cave Management into the Twenty First Century". Hosts for the event are: the National Speleological Society, the Cave Research Foundation, the Bureau of Land Management, the National Park Service and the Forest Service.

The purpose of the symposium is for cave managers from across the United States to exchange new information and techniques used in cave management. Managers of private commercial caves, Federal agencies, and others involved in managing cave resources will attend.

The basic format for the symposium will consist of the presentation of papers, guest speakers, several different field trips, evening workshops and a banquet. The Organizing committee consists of the Bureau of Land Management, the National Park Service and the Forest Service. For more information please contact Richard L. Carlson, Recreation Staff, or Ransom Turner, Cave Technician of the Guadalupe Ranger District, by D.G. or by phone at (505) 885 4181.

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**PLAN FOR CAVE RESCUE PRACTICE
MARBLE VALLEY
SUNDAY, SEPT 5, 1993**

by Dick LaForge
Mark Fritzke
8/17/93

Here is presented a proposed plan of rescue practice activities to be carried out in one day. This revises a previous plan which was criticized as being too ambitious.

The main idea is to have two or three "stations", each with its own set of activities. The number would depend on the number of persons present, with 4-8 per station. There would be one station for stretcher handling, and one or two for rigging and haul systems. The activities would be fairly basic, the idea being to give participants a physical feel for the difficulties of a rescue, and some experience with stretcher handling, haul systems, etc. We would not include a lot of detail or much actual difficulty. Most of the practice would take place outdoors, on the cliffs and on the karst above the cabin, where everyone can see and not be distracted by hypothermia. Some hauling practice would be done in Skunk Cave, which would give in-cave flavor (and temperature).

Instructors: We do not have any "certified" cave rescue instructors. Mark is quite proficient with rigging and would probably supervise the haul system stations. Dick has three days of experience carrying EMD out of Lechuguilla, so would supervise the stretcher handling. There are several other persons with more experience who may be present, and if so we would use them appropriately. We will avoid simulations that actually pose risk to anyone.

The day would go like this:

- 1/ Meet at a set time in the AM. Count participants and form groups. Equipment and stations will be prepared the day before, ready to use.
- 2/ Brief discussion of the general problems of rescue in the Marble Mts. and our general approach to them. This will not be a lengthy discussion of the future plans of the Marble Mts. Rescue Committee, though that would be a good idea at another time.
- 3/ Brief medical presentation (by Bill Broeckel) on hypothermia and then a demonstration on packaging a patient in a litter.

The above all together should take an hour or less. Then groups would go to their first stations. Time at each station would be according to schedule. At lunch break our progress can be assessed and plans for the afternoon can be altered if desired. The practice would end at a set time in the evening. After dinner there would be a debriefing/discussion around the campfire.

Stations:

- 1/ Litter handling: This group would have to have 6+ participants. We would begin with the group repeating the packaging of a patient. We would then carry this patient over increasingly rough ground and slopes, but not vertical, using the various carrying/stretchers passing techniques. We would try a few simple rope-haul assist techniques on slopes. Then (maybe in a separate session, e.g., afternoon) we would try these same procedures in Skunk Cave, which offers slopes, large breakdown, a tight entrance, etc.

2/ Rigging Station #1: This would cover simple 2:1 lifting systems, as illustrated on Page 166 of Manual of US Cave Rescue Techniques (see next page). This would be done on the cliffs behind the cabin. There will be an emphasis on simple assist systems, by which an injured but partially functional person can be assisted up a drop.

3/ Rigging Station #2: This would cover 3:1 (Z-rig) and 4:1 (pig -rig) systems (see page 16).

In these two stations the group would be presented with a completed system. The group examines it, uses it, dismantles it, and rebuilds it, then constructs the next system. This group would probably not use stretchers and would not get involved with stretcher spiders, etc. Hauling a person standing in a loop in the rope, or a large rock, should suffice.

At each station there will be a notebook, and the group will make notes as to problems, suggestions, ideas, etc. as they come up. Also there may be some videotaping.

Equipment: Individuals should have a seat harness and a cows-tail – meaning an ascender (preferably jumar-type) on a short line attached to the seat harness. This is to clip into a safety line for safety when working at the top of a drop or slope. All other equipment will be provided, probably on loan from the North American Wilderness Academy, kindly arranged by the Shascade Grotto.

But the pull must be exerted over twice the distance the load is to be raised, which means the same amount of work is done in both cases.

It is easier to pull with the traveling pulley system because the same work is now spread over a longer distance (and time, in the real world). Add a ratchet cam, and you have the system shown in Fig. 8-36b.

Fig. 8-36c shows how a short hauling

system can be used to haul a much longer main line. It is obvious that with such a system you would have to use 200 feet of rope for a 100-foot lift. But by using a cam (called the *Haul Cam*) on the main line, with a ratchet cam, the rescuers can pull up on the main line, shift the load to the ratchet cam and anchor, and reposition (reset) the hauling system for another "bite" of the main line.

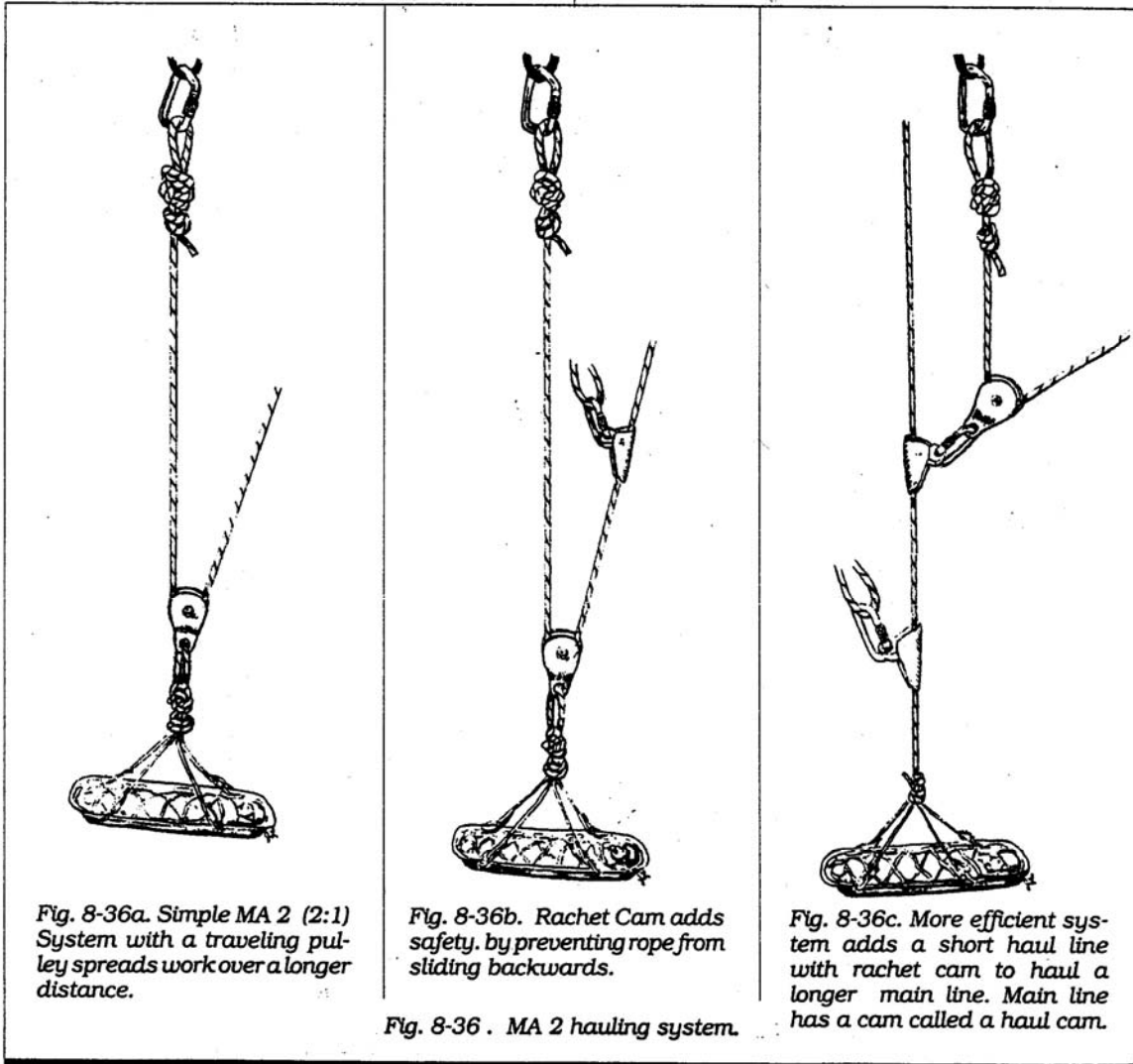


Fig. 8-36a. Simple MA 2 (2:1) System with a traveling pulley spreads work over a longer distance.

Fig. 8-36b. Ratchet Cam adds safety, by preventing rope from sliding backwards.

Fig. 8-36c. More efficient system adds a short haul line with ratchet cam to haul a longer main line. Main line has a cam called a haul cam.

Fig. 8-36 . MA 2 hauling system.

8 Vertical

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An MA 3 System: The Z Rig

The Z Rig (MA 3:1) derives its name from the shape of the rope as it goes through the system. Once again, the main line and haul line are the same piece of rope. This is the simplest system which will provide a reasonable mechanical advantage using

only one rope.

Imagine the system in Fig. 8-37 in operation: the pulleys will creep closer and closer together as the haul line is pulled. When the pulleys meet, the safety cam must be set and the hauling system returned to its original position for another bite of rope;

all mechanical advantage is lost without the Z shape to the system.

An MA 4 System: The Piggyback

The Piggyback system (nicknamed "the Pig") is essentially an MA 2 system hauled with another MA 2 system, for a total TMA of 4:1.

The haul line is divided in the middle with an anchored Figure-8 (or equivalent) knot. One half is used to set up an MA 2 system with the haul cam. The end of this half is connected to another pulley, and the second half of the rope is used to set up another MA 2 system.

It is possible to set up a Pig with one rope, but it requires an extra knot or two.

The Pig offers a greater mechanical advantage than the Z Rig, with the same amount of hardware. But the Z Rig is easier to build with a single rope. Having learned just these two systems, rescuers can set up a haul with a reasonable mechanical advantage regardless of whether one or two ropes are available.

Comments on the Ratchet or Safety Cam

The ratchet cam should be located beyond the furthest extent of the hauling system. It will be the safety should the hauling system fail. A separate belay should be used on the entire load whenever possible.

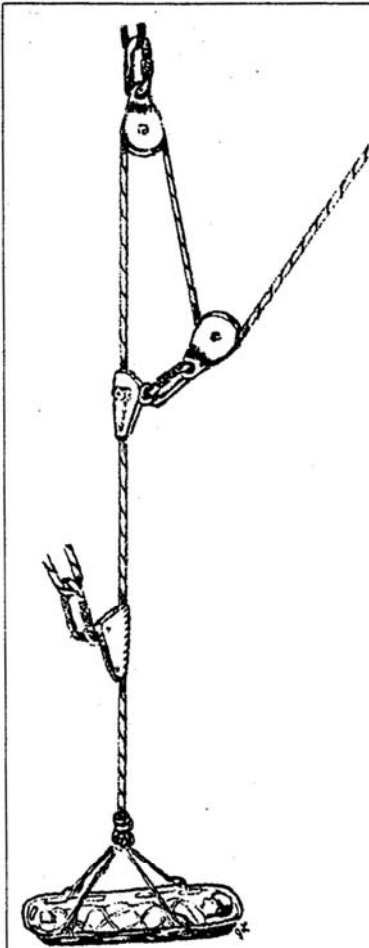


Fig. 8-37. The Z-Rig (MA 3) is the simplest one-rope system to offer a reasonable mechanical advantage.

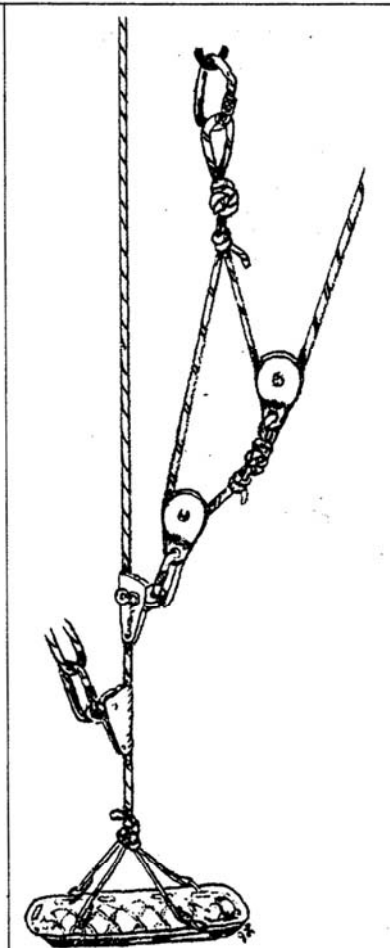


Fig. 8-38. The Piggyback system (MA 4) is an MA 2 system hauled with another MA 2 system.

SUPPORTER OF :

THE LECHUGUILLA CAVE PROTECTION ACT OF 1993

BILL # 698

Lechuguilla Cave, and other caves and views in the Dark Canyon and along the northern escarpment of Carlsbad Caverns National Park are presently vulnerable to oil, gas, and mineral development under existing law. Currently, the Bureau of Land Management is supporting an immediate plan to permit gas drilling operations in Dark Canyon near Lechuguilla Cave (and others). This poses a direct threat to the caves and will destroy the aesthetics, peace and beauty of one of the nation's most prized National Parks.

Potential hazards that can damage the caves include hydrocarbon gases and poisonous hydrogen sulfide, as well as saline water from deeper formations, that could leak into the cave system through improperly-sealed wellbores. Drilling fluids and chemicals, lost circulation materials, cement, and gravel can be introduced into cave passages during drilling. On the surface, roads, pipelines, drillpads, separators, tank batteries and mud pits are potential sources of contaminants that can be transported into the system by surface water. There is added concern that pollutants carried into the ground by surface waters could eventually reach the water table.

It is possible for toxic gases from leaking wellbores to reach caves such as Lechuguilla by migrating through joints. Hydrogen sulfide gas is a particular hazard because it is heavier than air and tends to accumulate in low-lying areas, such as caves. The Bureau of Land Management's Dark Canyon Environmental Impact Statement summarizes data from 61 wells that encountered voids or lost circulation zones in the vicinity of the Park. These data strongly suggest a pervasive cave system within the Capitan-Goat Seep Rock Package.

If caves such as Lechuguilla are to be protected from oil and gas related contamination, it is important that there be no drilling on the crest of flanks of the Guadalupe Ridge anticline. The best way to protect these unique cave resources is to recognize that the cave complex is distributed throughout the package of soluble limestones above the water table within the Capitan-Goat Seep Reef complex. This package extends from the edge of the reef escarpment on the south to where the water table pinches out against the northern edge of the Goat-Seep and Capitan Reefs on the north. To the east, the limit of cavernous rock package is located where the water table intersects the top of the Capitan Limestone. To the west, the package extends to Guadalupe Peak.

Congressman Vento, Chairman of the House Subcommittee on National Parks and Public Lands, has introduced a bill (H.R. 698) before congress entitled "The Lechuguilla Cave Protection Act".

I support this bill, and would like your support also.

THANK YOU ! !

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TO: