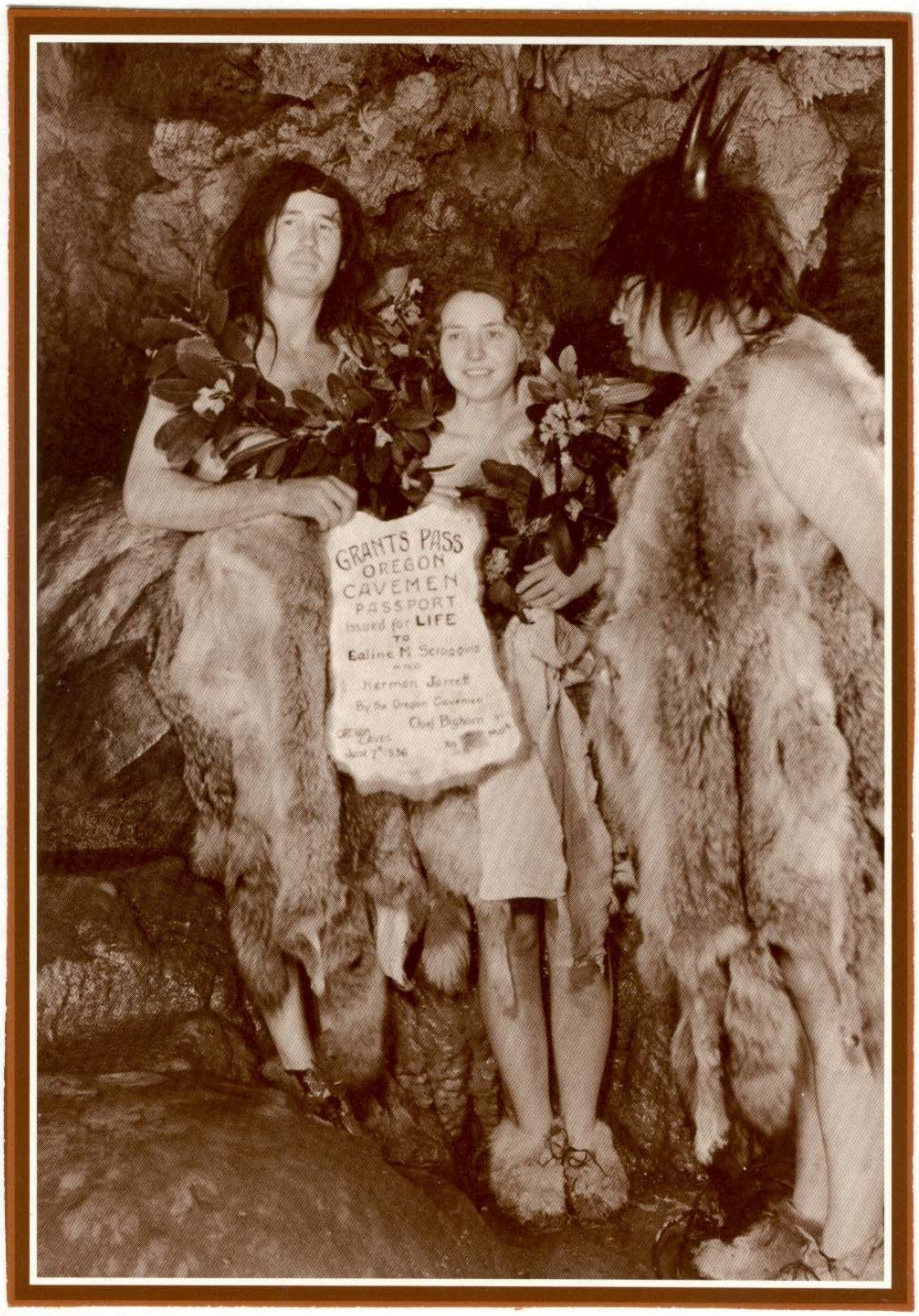
SAG BAG

VOL 11 NUM 1

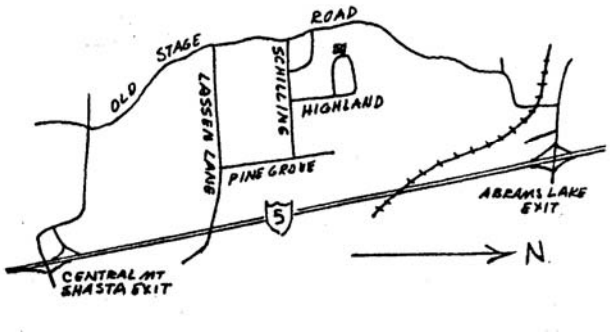


The SAG RAG is published bi-monthly by the Shasta Area Grotto of the National Speleological Society. Typist: Judy Broeckel, 524 Annie Street, Yreka, CA 96097-3015. Newsletter Review Editor: Dick LaForge, 450 Redmond Road, Eureka, CA 95501. Printing: Bill Broeckel. Grotto Meetings are held the second Friday of each month at 7:30 pm. Meeting locations are announced in the newsletter. Membership dues (including newsletter) are $6, due January 1, and prorated by quarter. Uncopyrighted material may be copied, with credit given to the author and the SAG RAG.

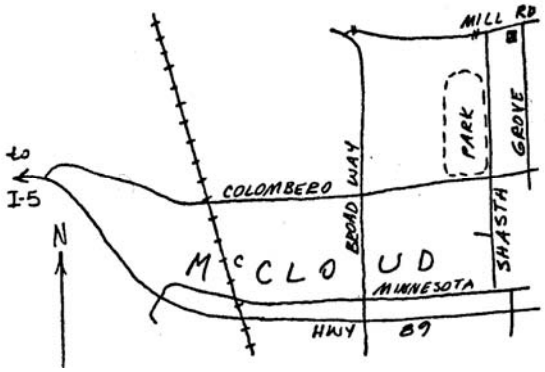
CALENDAR

Mar. 1	Barnum Cave clean-up. Come and help kids from Yreka remove trash from this cave starting at about 11:00 AM.
Mar. 13	Grotto meeting at 7:30 PM at Kottinger's. See map for directions.
Mar. 20-22	Oregon Caves Restoration Project Trip. If you missed the last trip, be sure and call Liz Wolff (916) 964-3123 right away to reserve a place. Everyone who wants to go needs to call Liz Wolff. See Oregon Caves articles in this issue to learn more.
Apr. 1	Molten lava float trip. Meet at midnight on the summit of Mount Shasta. Don't be late and bring your own canoe.
Apr. 10	Grotto meeting at 7:30 PM at Wolff's. See map for directions.
Aug. 3-7	1992 NSS Convention at Salem, Indiana.

March 13 SAG meeting at Kottinger's, 1922 Highland, Mt. Shasta 926-3975.



April 10 SAG meeting at Wolff's, 516 Mill Rd, McCloud 964-3123.



COVER: This postcard picture showg a traditional Caveman wedding located in Joaquin Miller's Chapel in Oregon Caves, and dated June 7, 1936

This issue of the SAG RAG is dedicated to all those caving-compatible couples and singles out there sensitive to the beauty of the caving life. We will take you back to Oregon Caves, and on a trip to Hawaii with Bruce Rogers. Some safety items are also featured and are certainly based on our love for our fellow caver. Whether it be lovely Valentine Cave, Lover's Leap where the doves nest, or some other subterranean place of quiet grace, our wish for you is the romance of the caves. Cover calligraphy by Mary Khalaf.

MINUTES from the SAG meeting, Jan. 10, 1992. Present were Jim and Liz Wolff (hosting), Bill and Judy B., & Neils Smith presiding. Old business: The January Oregon Caves Restoration trip was scheduled. A SAG RAG bill was presented and met. Election results were reported as follows: Chair – Jim Kottinger; Vice Chair – Jim Wolff; Treasurer – Liz Wolff; Secretary – Liz Wolff. Neils turned the meeting over to Jim W. Correspondence: Letter to Gary Robertson of Junction City in response to a membership request. Letter to USFS requesting permission to place a cave register in Jot Dean Cave. New business: A new membership list will be typed for the Mar-Apr SAG RAG; a lava tube video project was suggested with Neils in charge; and the date of the February meeting was changed.

MINUTES from the SAG meeting, Feb. 7, 1992. Present were Judy Broeckel (hostess), Jim and Bea Kottinger, Jim and Liz Wolff, Bill Kenney and Willie Onericek (Jefferson State Grotto), and Ben and Esther Sutton. Jim K. called the meeting to order, the minutes were accepted as read, and the treasurer's report showed a balance of $583.41. Correspondence: SAG is invited to attend a Northwest Cave Association Meet in Idaho over Memorial Day (contact Jim K. for more information). The Conservation Chair of the NSS calls for letters in response to the Federal Cave Resource Protection Act of 1988. Old business: The Marble Mtns. rescue planning was discussed with comments made for ideas and clarifications. New business: The Jan. Oregon Caves trip received some favorable review in the Illinois Valley News. The next restoration trip was planned, as well as the next two SAG meetings.

OREGON CAVES RESTORATION WEEKEND JAN 24-26

First view by Jim and Liz Wolff

Attending the festivities were Shasta Area Grotto members Mark Fritzke, Dick, Kathy and Evan LaForge, Bill McGahey, the Broeckel family, Jim and Liz Wolff, Neils Smith, and Al and PhylisHenderson; Kara and Jonathan Jorden of the Jefferson State Grotto; and unaffiliated cavers Mark Rosebrook, Cindy Wright John Bair, John Shipp, John Talley, and John Hastrom. John Roth of the monument set our schedule.

It was the new head guides' fault that we had so much fun!! Paul Rust, new addition to the staff of the Oregon Caves National Monument concessionaire must be complimented on all of his guides' friendliness, understanding, and generally speaking, good old-fashioned cavers' spirit! They have a good feel for what they are doing with the interpretive messages (each keyed to a particular topic or theme), in which they have several "spiels" which include info about the Cave Restoration Project.

Friday night we had no more than arrived than some were whisked off to a wild caving trip toward the Bone Room. Seven people set out, but two turned back at a too tight spot. Five continued on into the South Room to poke into holes. We tried a descending lead that no one could fit into, then some other holes that descended into a lower level stream passage and up through some chimneys into small rooms. Others poked into high leads without getting anywhere. When everyone regrouped it was decided to head toward the entrance poking into holes as we went. Climbing up into the Slab Crawl a group of crystal lined pools was found and admired.

Sure, we went caving that weekend, not enough for some, and just right for others. Jim went on a "Twenties Tour". We saw a lot of biota that night! Many varieties of spiders and crickets, with scat

OREGON CAVES RESTORATION WEEKEND JAN 24-26 First view (continued)

evidence of bats, rats and maybe other types were seen. We visited areas of the cave where the flowstone and dripstone wouldn't allow a caver to go by without touching the formations – there was just no way to avoid them without brushing against them. The formations through some areas were pretty clean, so we had a rare opportunity to see stuff that hadn't been viewed since the twenties. We were able to read some of the more legible hand-writing, some of which dated back to 1870s, while one turn-of-the-century inscription in the Ghost Room was an early-day constable's search for a lost man. (according to Jay Swofford's research into the incident, the guy apparently left the group he was with, exited the cave the same day he was missed and then didn't bother telling anyone about it). We were told many other interesting tidbits by our guides throughout the weekend, but I have personally forgotten most of it. I saw some of the cave before, but that was before the restoration, now the Banana Room isn't green anymore, just clean!

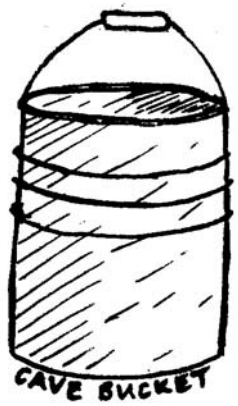
We did do our share of work. The crew Jim was on continued to dig in the South Canyon Passage, the same place we were in November '91. This time the original floor directed our rubble removal efforts towards and under the tourist path a few feet away. After working all day it was agreed upon by Ron, one of the Park Rangers that oversaw the rubble removal project that day, that if we were to dig any further, we would undermine the trail, making a potentially hazardous situation. The remainder of the rubble removal will be when they put in a new "tread" and all the asphalt is removed. There possibly will be a PVC bridge to span the canyon, right there at the beginning of the Exit Tunnel. Another thing that was noticed just a few feet into the tunnel, a blowing hole filled with rubble. Now, that one will have to be looked at in the future.

The other crew dug at the old trail in Kincaid's Dance Hall off the Ghost Room. A bucket brigade speeded up the rubble removal, with one caver calculating that we averaged 200 buckets per hour. A competition developed between the three diggers and one dumper to see who could keep ahead of the other. Many changes in the passing and dumping line-up kept anyone from being worn out at the spot where passing buckets turned to pure muscle power in a crawlway.

A survey crew was put together Saturday afternoon. They had several objectives to check. Two were surveyed, one wasn't found, and the rest were either done already or too small to get into.

They fed us very well, and spaghetti twice! They certainly went out of their way to keep us caving "after hours!?!?" Why, they took us on trips before working, during, and possibly even Sunday morning. Mark F. was trying to get together enough interested cavers to go that morning into the cave, but that's another story.

OREGON CAVES RESTORATION WEEKEND JAN 24-26
Second View by Bill and Judy Broeckel



Twenty cavers volunteered for restoration work at Oregon Caves. This proved to be a very popular outing, and some who wanted to go were turned away. Sorry about that, folks!

I arrived late Friday night. There were already people in the cave doing some preliminary reconnoiter. Chuck (Chaz) Davis and I went in the Exit Tunnel long enough to hang up an innocent booby-trap device intended to surprise and delight the outcoming cavers. This was a sound activated spook that would tremble, glow, and emit a spine-tingling wail. First we tried the airlock door, but it wasn't loud enough to activate the spook. The main door of the Exit Tunnel, however, makes a nice, loud clang when it closes, and thus served to facilitate some hijinks Friday night.

Saturday we got down to the business of restoration and formed teams of cavers working two shifts, one in the morning, and one in the afternoon. There were several objectives. I joined a group clearing mud and broken rock out of the South Canyon Passage. The tour route crosses over this

OREGON CAVES RESTORATION WEEKEND JAN 24-26 2nd View (continued)

canyon on its way to the Exit Tunnel. When the tunnel was originally blasted in 1931, some of the resulting fill material was pushed aside into the South Canyon. There it has remained for many years until July, 1990, when some of this rock was used in the construction of the airlock door. This door effectively seals off the Exit Tunnel in an effort to restore the historical patterns of airflow in the cave.

Our team set to work on the rubble remaining in the passage. The point men broke rock, filled buckets, and in some cases, scooped out mud barehanded. A bucket brigade lifted the buckets out of the canyon to "truckdrivers" who carted the material into the Exit Tunnel and piled it along the tourist trail, to be hauled out later by the government.

I think the ones down in the trenches had the hardest work. After a while, they didn't break the rock so much, and started moving out the large pieces wholesale, for fun. These were called BFRs, which meant "big funny rocks" or something like that. After awhile, we wanted to see how big we could go, and they became VBFRs. We would roll them up over our legs which were bridges across the canyon, just loads of fun you might say!

Brushes were used to clean off formations and flowstone as it was uncovered. It was <u>really</u> fun to see cave passage reappear right before our very eyes. This was a wet and drippy part of the cave. Micro-watersheds and patterns of drip and flow started to renew even as we watched. Next time you tour Oregon Caves, take a moment to glance down the South Canyon Passage, it's a pretty little place.

After supper, several parties went back in the cave with various objectives in mind. One group did some survey, and another followed an historical tour route. I joined a group headed for the Bone Room. A crawl called The Keyhole leads to a series of chambers that culminate in the South Room. West of this room is a network of passageways tilted at a steep angle, and shot through with pits and domes. Squirming up the inclined chimneys, one named the Rathole, made for some of the most physical caving I've ever done.

The Bone Room really has some bones, old brown bones they say once belonged inside a living bear or two. There were some modern artifacts kept in secret in this room as well. The spear and the club date back to the Cavemen of Grants Pass. Thanks to cave guides J.D. and Dave for helping us find this far corner of the cave. And congratulations to Bill McGahey and the successful achievement of his quest to reach the Bone Room.

There are other surface signs in the Bone Room besides the bones of the bears. A shell of a land snail sits on the fill. Harvestmen have been sighted as well. The airflow goes straight up toward the domed ceiling. Who Knows? Maybe one of those skunk oil air traces would be interesting. Mark Fritzke performed a human fly maneuver above the Fourth Well, & still we failed to find the "rumored 'secret' rear entrance" referred to by Bill Halliday.

Many thanks to the Monument people, who we found hospitable, personable and enthusiastic about Oregon Caves and the work being done there. 120 caver hours of restoration work were donated £or everyone's benefit. For me personally it was a wonderful mid-winter change of pace, with good food and a place to sleep and clean up all provided. Thank-you very much, Oregon Caves National Monument. Lets do it again sometime!

Afterthought: In keeping with a comprehensive concept of what makes a cave a cave, I for one would not be adverse to doing work for the Monument outside of the cave, if we ever run out of useful duty inside the cave. Think about it.

MARBLE MOUNTAINS RESCUE PREPAREDNESS COMMITTEE

By Dick LaForge

On one of the last trips to the Marble Mountains last summer we were sitting around considering the inadequacy of our planning and equipment for a serious rescue effort in the Marble Mountains. I think the difficulty of evacuation of a seriously injured or immobile person from any distance into a Marble Mountains cave is so great that we have been unconsciously reluctant to think about it. So we decided, prompted no doubt by the recent rescue of Emily Mobley-Davis from Lechuguilla (April, 1991), to make a plan of readiness for improving one's chances of surviving an accident in the Marble Mountains. Mark Fritzke and I "volunteered" to get this process started.

At the December 14 SAG meeting at Mark's house we brought up the subject and spent almost an hour outlining a plan of action. First we listed our resources: equipment kept in the caves, in the valley, and that cavers usually have. Local rescue groups, local cavers, the NSS rescue organization. Books, catalogues, and other sources of information. Then we imagined a typical serious cave accident – immobile person 1+ hours into Bigfoot Cave – and thought of what we would like to have on hand to deal with it. Needless to say, many items were thought of that are not now available.

I will write up our notes from this meeting and mail them to those present at the meeting. Since most of us live in the Arcata area we will have another meeting here to discuss in detail and make decisions about each point brought up. Bill Broeckel (Yreka) is willing to contribute MD type ideas, and Jim Wolff will coordinate with local organizations. If any of you who were not at this meeting want a copy of our notes and to contribute ideas etc., please write to me.

Dick LaForge
450 Redmond Road
Eureka, CA 95501
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GREAT MOMENTS IN CAVING LITERATURE

"After a moment's rest we attacked the first ice cascade. We got up after some difficulty, trailing our picks and heavy knapsacks. The perpendicular upper cascade was even more ticklish. Our combined heights were not enough, but I was ready to try anything, so I ungallantly put my ironshod feet on my wife's shoulders; I got hold of some projections in the ice, and hauled myself up. My valiant partner opportunely made a stirrup by driving a pick into a crack .With this help I reached a ledge, and then thence the top of the cascade. An instant later the other half of the expedition was vigorously hoisted to my side along with knapsacks and picks."

(From Ten Years Under The Earth by Norbert Casteret. Behind every good man ...)

6TH INTERNATIONAL VOLCANOSPELEOLOGICAL SYMPOSIUM: THE TEN MINUTE DOCTOR BILL SHOW!!

Hilo, Hawaii, August, 1991

By Bruce Rogers

Sunday, Aug.4: After a fun-filled ride to SFO, this bearded scribe and his faithful companion Mr. Bill scampered through the wallowing masses at United's ticket counter and shoe-horned themselves into the 737 which would take them to a far away paradise ... or some such drivel. Despite the best attempts by the Jet Stream to push us back to SFO, we arrived in Honolulu some five hours later. Amusement was provided by a book entitled "We the Navigators" – all about the indigenous Pacific people's non-magnetic compass navigation methods. The Pacific Ocean is very big when seen from 34,000 feet ... so big that a 400 foot long ship is barely visible among the foam-washed swells. Our post-exploding butter-packed-at-sea-level-for-lunch nap was fraught with dark glimpses of attempting to navigate an overloaded escape ramp with a digital watch and cloudy skies. Before the giant squid sucked us all under the frothing waves, however, we awoke and arrived in Honolulu. Upon deplaning, we were confronted with the Arrivals and Departures TV screen and noted Continental Air Mike's Flight 552 to Guam via Johnston, Majuro, Kwajalein, Kosrae, Pohn Pei, and Chuuk was to leave in an hour. The temptation to break into a run and stow-away in with the baggage, refrigerators, crates of cabbages, and such was nearly overwhelming. We restrained ourselves, however, and properly checked into the next leg of the journey. Several hours were consumed waiting for a connecting flight to Hilo. But the time was well spent. A visit to The Loading Palette Pineapple Stand proved fruitless as a new refrigerated stand with Officially Inspected and Approved Ananas comosus for exorbitant prices had been erected in its place (see Breadfruit Benny Rides Again, 1984). Aloha-ha-ha-ha Airlines soon whisked us (me and Mr. Bill) away from bustling, sweaty Honolulu to Hilo on the Big Island where we arrived at the same time as Libby & Jim Nieland and several others flying Hawaiian Air. The consensus was that while Hawaiian Air had the prettier terminal, Aloha-ha-ha-ha flew on time

Taking a taxi to the Sand and Sea Hukilau Hotel (which roughly translates as Fish Fry Hotel) we checked in and were met by Paul Travis from Ashland, Oregon, Hal Joerin from Dearborn, Mich., and a wall of humidity that made late August in Atlanta seem like Badwater in Death Valley. Being apprised that the party at Halliday's condo across Waiakea Fishpond was only to be attended in properly assigned shifts, we immediately made plans for a Marine Corps frontal assault and crashed the thing. The few locals present spent their time in the epitome of graciousness, even if it was very strained at times, the Europeans loud and exuberant when flushed with wine, and apparently everyone had a good time, including those self-propelled into the pool. A lone tail-less gecko was introduced to those not knowing of such things, but soon scurried into the bush as several persons, who will remain nameless, advanced on said gecko with spoonfuls of soy sauce. Several hours later, fortified with much raw fish, rice, and seafood stuff, we tottered back to the Fish Fry and crashed.

Monday, Aug. 5: Despite himself, Doctor Bill managed to hold the talks on course after a very lengthy breakfast session, a talk by the Guv'nor, and a few stray roaches ambling across the podium. The esteemed Ron Greely gave a preview talk on lava tubes in the outer solar system which was very interesting. The other talks concentrated on the lava tubes in the continental U.S. The two talks I gave were separated only by 20 minutes so I franticly tore out of the room, dumped the old slide show on the dining room table, hastily loaded the new talk in and calmly sauntered back into the

6TH INTERNATIONAL VOLCANOSPELEOLOGICAL SYMPOSIUM: THE TEN MINUTE DOCTOR BILL SHOW!! (continued)

hall. Both went well. The other talks were by and large interesting and informative although several were not only informative but innovatively interpretive of the ground truth as well. Late in the afternoon the sessions finally wore down and all and sundry roared off to the Lyman Museum across town. We arrived at length via an innovative route, stopping once to ask directions and becoming even more hopelessly lost. A tour of the missionary house (somewhat toasty as the place had been shut up tighter than a drum of toxic waste) and the museum (mercifully air conditioned) as well as a snacks and punch reception was enjoyed by all. Among the highlights were the various lava specimens, draining the punch bowl, obtaining a poetry book written in Korean (with one of the poems written about caves) from a Korean journalist, removing several slightly tipsy Germans from the middle of Haili St., successfully pumping a former Bahamas cave diver for reams of info about Palau caves, chatting at length with Takinori Ogawa-san about his latest exploits, and setting up a post-dinner Hearty Family Hike up onto the lava fields for the following evening.

Tuesday, Aug. 6: The presentations were largely foreign and included talks on lava tubes in Australia, Korea, the Azores, Canaries, Iceland, Hawaii, Japan, and Micronesian Islands. Another Foods-that-Are-Adequate lunch punctuated the day and immediately after festivities ceased, we arranged rides and convoyed to the end of Chain of Craters Road. Hiking across the now buried sea coast following the Frank and Fred Show (Frank Howarth of the Bishop Museum in Honolulu and Fred Stone of the University of Hawaii, Hilo), we stopped at the outflow for nearly a half hour of photographs, then as the rain began to pelt down again, commenced a 3 mile Hearty Family Hike up to the lowest overflow vent. In the middle of this black and tortured wilderness of basalt, we stopped to view a week-old, partially roofed over skylight. The heat was visible; an intense white hot 2,000°F in color – so hot that one could only glimpse for a few seconds the inner geometry of the underlying tube. The lava stream swirled away some 18" below our feet (!) toward the ocean ... a bit unnerving. Finally arriving at the vent, we spent over an hour enthralled with the slowly oozing lava covering the landscape. We also watched the formation of miniature lava tubes several meters long as the yellow, then orange, flow's surface cooled and crusted black. Among other highlights were dipping globs of cooling lava out and embedding coins in them as a souvenir of the trip. Out of respect for Pele, I refrained. I did, however, dabble in the sport of lava toe jumping. One merely selects a healthy sized lava toe approximately a meter in diameter. Wait until its temperature drops from approximately 2,000° F to 1,800°F – the color is dark pumpkin, then, after checking with lights to see that the surface is a medium light gray, step lightly on the pillow, wave with a flourish, and very smartly step off, leaving a pair of scorched footprints in the lavas of time. Hot stuff ! At length we returned, crossing the main tube three times. So big deal you say? Well, some months ago the not inconsiderably sized Frank Howarth crashed through one of these said tube ceilings into a shallow (lucky for him) incandescent gas pocket. A sheet of orange flame blew up in his face, leaving his hirsute visage intact, but setting fire to his trousers! Quick reacting and jumping out of the pocket saved the tattered remains of his pants.

(To be continued in a future issue)

NEWSLETTER REVIEW By Dick LaForge

Your erratic newsletter reviewer has gleaned several items of interest from the November-December newsletters of California and Oregon. It might interest you to know that we received different newsletters, most once a month, which makes two to review for each SAG RAG. I like reviewing them as it lets me know what is going on in the western caving world.

One interesting development not reported in a newsletter but illustrated by the December 14 SAG meeting at the new Mark Fritzke/Linda Villatore home in Arcata is that there has gotten to be a large (for here) group of young, competent, enthusiastic cavers in the Arcata area. I count 10, of whom all are active in the Marbles, and of whom 7 are Lechuguilla veterans. In addition, Derek Hoyle stopped in for the meeting, on his way from his (former) home in Mountain View to seek his fortune in Yreka. This bodes well for future discoveries in the Marbles and perhaps other Northern California possibilities.

THE EXPLORER, Southern California Grotto, reports in its Nov. and Dec. issues on two clean-ups they held in Church Gave, one of the better caves in the Kings Canyon area. They netted 25 lbs of spent carbide, which is a lot, when you consider it all spread out in a cave. This reminds me that the Shasta Area Grotto just held its (January) clean-up in Oregon Caves, which will no doubt be reported upon elsewhere in this issue. Be aware that signing up for clean-ups is a great way to see a new cave that might not otherwise be accessible, in addition to meeting a new group of cavers in a context flattering to yourself and being generally useful.

For those of you that don't know it, this is National Cave Accident Preparedness Winter. This winter you are supposed to check out your gear for safety and adequacy, and to help prepare for the possibility of rescue/evacuation. (See report on the Marble Mts. Flatrock Committee ((I mean Rescue Preparedness Committee)) elsewhere in this issue). To emphasize the relevance of these endeavors, we take note of the report in DEVIL'S ADVOCATE (Diablo Grotto, Walnut Creek, CA), September 1991, by Ernie Coffman of his leg injury on the surface near Heater Cave (Mother Lode). Though on the surface, it is a very steep surface. Ernie made it back to the vehicles on his own, with a lot of physical support from his companions. Diagnosis – ripped up quadriceps, cast for 3+ months.

As if that wasn't enough, the December DEVIL'S ADVOCATE has a trip report by Don Dunn, "I've fallen and can't get up". This literally titled article tells how he dislocated a knee fairly far into Onyx Cave, SE of Tucson AZ. He was almost completely out of action, and a major rescue effort was called out, involving the Southern Arizona Rescue Association, a Pima County Sheriff, and the local caver call-out list. Forty-two people were involved. The evacuation from the cave took about 11 hours from the time of the accident. Fortunately, Onyx is a warm cave.

It should be noted that in both these incidents the injury was not caused by a fall or other mistake, failure or equipment, or act of nature, but just by an unfortunate shifting of weight in a seemingly unthreatening situation.

The article I would like reprinted in the RAG is another of Cindy Heazlit's excellent series on caving/climbing equipment. This one is of fundamental importance – THE HARD HAT (San Francisco Bay Chapter Newsletter, August). So many people foolishly skimp with this item. Let's just say that cave evacuations are such a lot of work and anxiety that you shouldn't consider taking the risk of requiring your friends to perform one on you by neglecting to use a good helmet.

CAVE QUOTE: "The head can take a terrific beating as the caver rolls and bounces down the slope. ... Pick up one of these (construction type) helmets and squeeze the sides together. It is possible to move the sides inward at least an inch or so without all that much effort." Pisarowicz Caving Basics.

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From SFBC Newsletter, Vol. 34, No. 8, August 1991, pages 2-3

The Hard Hat

By Cindy Heazlit

Almost every caver wears a hard hat. Many think of this piece of equipment as a lamp hanger. Its true function is twofold: to protect your head from falling rocks and to keep it from getting damaged in a tumbling fall. If one thinks about it, one realizes that we as cavers are exposed to the same dangers as rock climbers. One should select a hard hat with this in mind.

Hard hats come in a variety of shapes, sizes, and designs. The best materials are ballistic nylon or polycarbonate. Fiberglass and metal are weaker, though acceptable. Don't settle for any other type of material. There are three basic categories for hard hats. The first is the construction hat, or bump cap. This should only be used in areas where there is no danger of rock fall. This type of helmet is not designed with caving in mind. The second type of hard hat is the helmet. This must conform to MSA (mining) standards, and at least is designed to go underground. The third type of hard hat is the climbers helmet. This must meet the highest of requirements. It is the best, though the most expensive.

There are many standards for judging the effectiveness of a hard hat. There will always be some falls for which there is absolutely no protection, but one may guard against other incidents by selecting a helmet that will protect you. All of the tests for hard hats focus on two things: Impact from above and impact from the side. If one receives an impact on the top of the head there is a possibility of fracture of the vertebrae. A side impact can induce severe brain trauma. There are several standards that test for these problems:

1) ANSI (American National Standards Institute) Z-89.1 . An 8 pound steel ball is dropped on the top of the helmet. The force on the head is not to exceed 850 pounds. This is to test for neck protection.

2) ANSI Z-90.1. The chin strap must be able to take 300 pounds of loading. A fall of 6 feet sideways is not to induce a force greater than 400Gs. For an 11 pound head, that's 4400 pounds! This is to test for brain protection.

3) UIAA (Union International des Associations d'Alpinism) has 5 tests, conducted at temperatures ranging from -20 degrees Celsius to +35 degrees Celsius. These consist of the following:

a) A 5 kg ball falling 2 meters shall not transmit a force greater than 10kN.

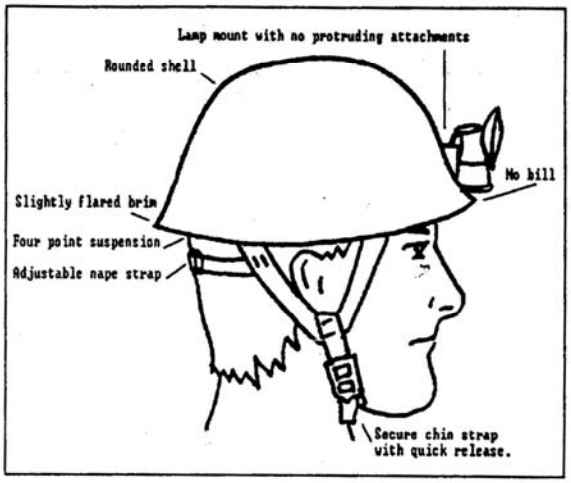
b) A 5 kg ball falling 1 meter shall not transmit a force greater than 6kN.

c) The front of the helmet shall not transmit a force greater than 10kN when hit by a 5 kg ball falling 1/2 meter.

d) A 1.5 kg pointed object falling from 1m5cm above does not penetrate the helmet.

e) The chin strap stretches less than 25mm with 500N of force on it.

Needless to say, the UIAA tests are the best and simulate caving conditions far more than the others. It should be noted that some caves in California REQUIRE UIAA approved hard hats. This is something to think about when making an equipment purchase.



Aside from meeting all those stuffy standards, what makes a good caving helmet? It should meet the following criteria:

1) It should have a 4 point suspension. This keeps the helmet securely on the head during a tumbling fall. Your helmet can't protect you if it falls off!

2) It should have an energy absorbing, water repellent liner.

3) It should not have a bill. This can get caught and snap the neck in a tumbling fall. If your helmet has a bill, take a saw and cut it off. It will also increase your ability to see.

4) It should be light weight. This is where motorcycle helmets fail the test.

Continued on the next page.

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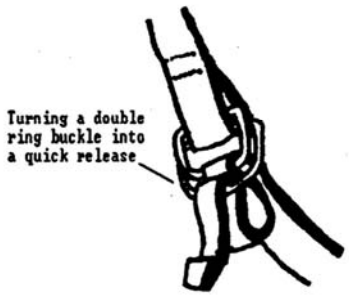
From SFBC Newsletter, (continued)

Continued from the previous page.

5) It should have a quick release chin strap. People have strangled themselves when their helmets lodged during a fall. The chin strap should also be secure. Again, you want the helmet to stay on your head during a tumbling fall. Get rid of those elastic chin straps!



6) It should have a slightly flared brim to shed water.

7) It should have a rounded top to deflect falling objects.

8) It should not have any holes in the side. These can catch falling objects and impart a force into the wearer.

9) It should have an adjustable nape strap. This keeps the helmet from flipping forward when a lamp is mounted on it.

10) It should have an adjustable headband.

11) It should not impair your ability to see and hear.

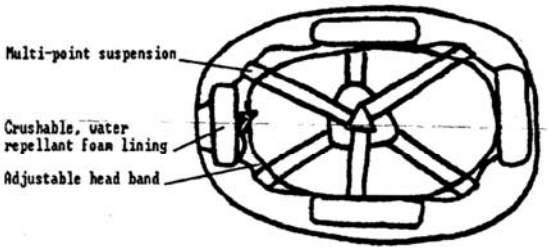
12) There should not be anything projecting into the helmet. Make sure that the lamp mounting bracket screws can't become brain drills if you are hit in the front of the head.

13) The sides should not deflect too much when the helmet is slowly squeezed. You want to protect the side of your head too!

These criteria are useless if the helmet is uncomfortable or does not fit. Make sure to try on your helmet before you buy it. Remember that you may be wearing a hat underneath it if you are going into any cold caves. With the chin strap slightly loose, grab the helmet and try to twist it off your head. It is worth risking the salesman's wrath and public embarrassment in order to get a helmet that works.

Once you have purchased your helmet, you should take care of it. Wash your helmet with clean water when it gets dirty. Do not use abrasive sponges or soaps. Avoid heat, paint, glues and chemicals. This includes stickers. Petzel makes the only helmet so far that is not weakened by the glue found on stickers. Retire your helmet if it receives a strong impact. Some manufacturers will actually replace helmets that have been damaged by rock fall.

A caving helmet is one of the most important purchases you will make. It protects your most valuable asset, your brain. It is not something you should skimp on! Don't take any chances-you are dealing with your life. In closing, I leave you with a quotation from Alan Warild:



"People who protect their head with a construction helmet to save money are making a definite statement about the value of its contents."

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