



# THE CASCADE CAVER

Official Publication of the  
CASCADE GROTTTO N. S. S.

14 #2-3

V. 14 #2-3



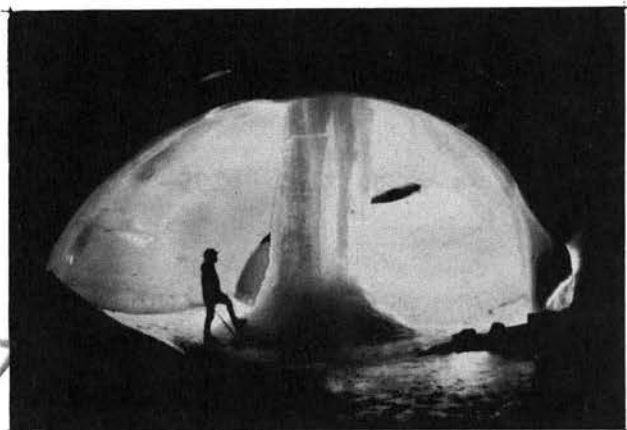
PROPERTY OF  
WINDY CITY GROTTTO  
LIBRARY



## The PARADISE ICE CAVES

Mount Rainier National Park Washington

PHOTOGRAPHS BY  
Charles H. Anderson



THE CASCADE CAVER

Vol. 14 no. 2 & 3 Editor: Curt Black February & March 1975

Please try and forgive me for another of these double issues; time is short, money is shorter, and there isn't really that much going on. Of course after a statement like that you'll expect me to say something about time, money, and what's going on. As for time: it's finals week, and all my problems will soon be solved (I will once again be able to set a good example and go caving every so often, YEA!!). About money: We've been somewhat short recently mainly because for the past 15 months we haven't been collecting dues. Chuck Coughlin (suprise!! our new Secretary/Treasurer) tells me that that should be changing soon, so expect a dues notice in the near future and remember what an excellent cause your funds go to. As for what's going on, this is really your department; the sun is shining, the snow is melting, the rain has gone and N816 is open as far as Ape Cave -- WHAT MORE COULD YOU WANT!!

As far as earth shaking developments go, I know of only two: First, the Cascade Grotto elections - so long prolonged - have finally resulted in some officers!

Chairman: Curt Black  
Vice Chairman: Robert Tower  
Secretary / Treasurer: Chuck Coughlin

Positions Appointed by the Chairman:  
Safety Chairman: Bob Brown  
Committee for the impeachment of the  
Chairman: Rod Crawford & Hank Ramsey

(It should be noted that Robert Richardson, originally voted Vice-Chairman has been called to Germany by his ailing Uncle Sam. Could this be the same uncle that called away Alex Sproul?)

Second, the business meeting the evening of the banquet, yielded some surprising developments, including the resignation of our regional chairman, Phil Whitfield, and his replacement by Chuck Coughlin.

CB

*Coming Events*

Robert Tower is planning a trip to Cheeze Cave. Call him at 323-1460, days.

Over the Easter Weekend there will be a trip to Papoose Cave, Id. Call Black 522-9817

Memorial Day weekend. 8th annual Papoose cave Mini-regional convention, and 3rd annual international culvert crawl. Call Black

If you want to go somewhere - call somebody - trips are presently being planned independently (that is people aren't telling me where they are going.).

*New Member*

Colleen Tada S 12-75 9827 N.E. 14th St., Bellevue Wa. 98004  
Bruce Unger S 12-75 Computer Sci. Dpt. FC-10, Univ. of Wa., Seattle, 98195  
Clyde Senger S 11-76 1103 Yew St., Bellingham Wa. 98225

NEW ADDRESSES

Bob Brown 12-75 R P.O. Box 447, Eatonville Wa. 98328 Ph. (206) 832-6349  
Chuck Coughlin 12-75 R 6433 S. 127th Pl., Seattle Wa. 98178  
Jim & Libby Nieland Box 9, St. Helens R.S., Cougar Wa. 98616 R.S. Ph. = 238-5244

## PARADISE AND STEVENS GLACIER CAVE SYSTEM

By Charles H. Anderson Jr. Director IGS

### Introduction

The inside of the Paradise and Stevens Glacier Cave is more beautiful, and more impressive by far than any of its surface sculptures. Every year subglacial passages are produced in the frontal glacier margins by one of the many streams which flow within the glacier. In the course of the summer the main cave develops a glorious archway, ten to thirty feet in height, leading into a system that can be explored for approximately 14 miles. Nothing more entrancing could be imagined; the play of the light from the outside on the fantastically scalloped and fluted walls, and the chromatic range of shading from delicate green to deepest ultramarine produce the effect of a fairy land of sparkling precious stones.

Wonder is often expressed at the height of the archway, which seems out of proportion to the streamlet a few inches deep flowing among the rocks under foot. The stream has done little more than initiate the course of the cave's main tunnel. Once the opening is made, circulating currents of balmy summer air gradually enlarge the cave upward into the body of the glacier. Sculpturing continues until winter sets in and freezing temperatures call a halt to the enlargement.

### EXPLORATION OF THE PARADISE & STEVENS GLACIER CAVES SYSTEMS

Exploration of the cave systems involves the standard techniques of spelunking with additional techniques necessitated by the occurrence of these caves beneath and within the glacier system, with a temperature just about freezing.

"Itchy-scratchies", the heavy, single-piece wool underwear sold by Seattle arctic suppliers have been found ideal inside the caves. Multiple layers of outer woolen clothing permit adjustment from overheating during strenuous activities. Carbide, or electric headlamps mounted on narrow brim helmets are standard in the more remote parts of the cave system. Crampons are often used, and ice axes (and knowledge of how to use them) are essential. Mountain boots with wool socks are routine, as are the packs every caver carries. Extra clothing is standard in view of the frequency of soakings, and on winter trips, standard survival gear includes sleeping bags, emergency shelters, stoves and food for several days.

A special hazard of glacier cave exploration is "Flake-Fall". Flakes are long thin slabs of ice which separate from the cave's wall as the result of glacier flow and other pressures within the ice. When ablation excessively reduces their bases, they fall from their own weight; a spectacular event since they often weigh many tons. Because they are virtually invisible from the direction of their base, very careful observation is essential to safely avoid them.

Prior arrangements must be made with the National Park Service by anyone desiring to visit the glacier systems beyond the normal tourist areas. If anyone is interested in exploring the remote parts of the caves, they may contact the International Glacio-speleological Survey, P.O. Box 12659, Seattle Wa., 98111.

### General History

For decades, the heartier breed of summer visitor to Mt. Rainier National Park have delighted in the Paradise and Stevens Glacier Cave System. A present 3 mile hike from the Paradise Valley Visitor Center, this famous glacier cave has provided an opportunity for countless thousands to experience the enthralling beauty of the inside of a glacier. Especially toward the close of each summer, the beauty of the blue light filtering through the thinner portions of often seemingly white glacier ice

is overwhelming.

It was obvious that more cave existed beyond the portions visited by the tourists, but an icy torrent which filled the inner corridor from bank to bank discouraged further investigations. Furthermore, speleologists and ordinary visitors alike seem to have assumed that glacier caves were small cavities, and thus hazardous struggles with subglacial streams were not worthwhile.

Beginning in 1967, however, I and other members of the Cascade Grotto began to doubt this concept. In 1972 the I.G.S. took over the project, and on Dec. 16, 1972 six glacier cavers from B.C. and Washington gathered to attempt to organize their efforts and plant a seed which could just possibly send its roots to all glaciated parts of the world; and it did. Today it is clear that the Paradise and Stevens Glacier Cave System is a surprisingly large, beautiful and complex cavern system which forms a honeycomb throughout the calcier lobes. About  $14\frac{1}{2}$  miles of the system have been mapped to date. Approximately another mile has been explored, but not mapped because of lack of time and the unique problems of conducting studies inside a glacier cave. The NPS is careful to permit visitors only in those portions of the cave system which are safe.

#### Location and Topography

The Paradise and Stevens Glacier Caves are located at an elevation of 6,000 feet on the southeast side of Mount Rainier, a dormant volcano with an elevation of 14,410 feet. Leaving from the Paradise Ranger Station the caves are located directly above Sluiskin Falls. The Glacier Caves start on the Paradise river not more than  $\frac{1}{4}$  mile from the Stevens and Van Trump Monument on the crest of Mazama Ridge.

#### Formations

The ice pillars are the greatest glories of the cave system. Unfortunately these pillars usually melt by mid-July, although if the summer is mild they may persist until the autumn freeze. Other formations like the stalactites, stalagmites, and other formations of limestone caverns also form seasonally in Paradise. Some of the seasonal ice formations seem to ignore the law of gravity and assume contorted or angular patterns. These helictites occur along fissures deep within the cavern and also at the entrance where they are short-lived. The largest pillars are found in the Pillar Passage; smaller ones of unusual beauty form seasonally in the Big Room, and other passages.

#### Glacier Features of the Caves

A few sections are floored by glacier ice, but most of the cave system is beneath the glacier and thus floored with rock debris. The ice exposed in the cave walls is far from homogeneous but mostly is glistening white, or blue white. Numerous internal glacier flow structures and some impurities are visible. The cave follows the course of subglacial streams which unite to form a common trunk downstream. Almost all the streams enter the cave system from the west head-wall. Surface seasonal streams enter the cave through crevasses (two of which are large enough to be impressive features of the more remote parts of the cavern) and rounded, well like structures called moulins. The magnificent ice columns of the cave generally form below the moulins. Beside the fluting of the cave walls seen throughout the glacier, and lower temporary fern caves, the moulins show vertical grooves melted by descending water.

#### PAST PLANS AND WORK DONE ON THE PARADISE-STEVEN'S GLACIER CAVES.

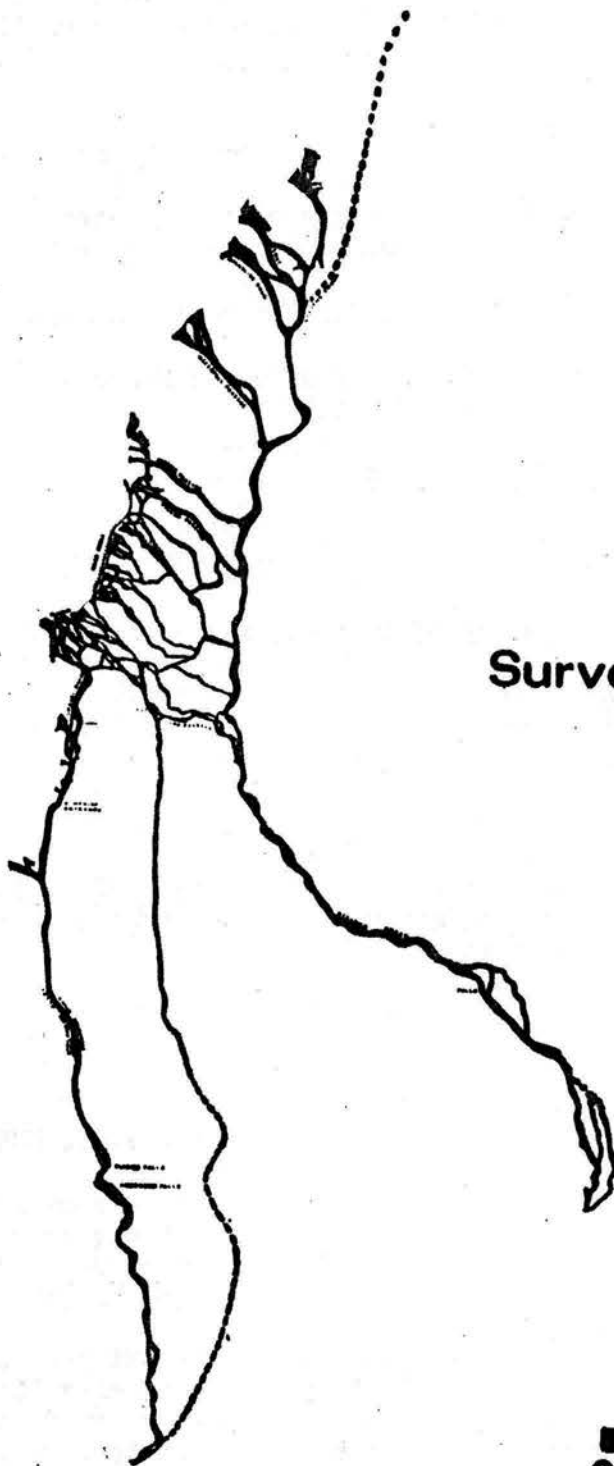
The remainder of this report will be in outline form.

Work done on the caves.

# Paradise Glacier Caves

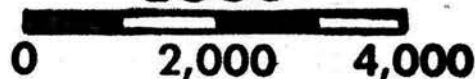
## Mt. Rainer National Park

### Dec. 1973



Survey By IGS

**feet**



- A. 1967 I began work on the Paradise Glacier Caves.
  - 1. Objectives: Study the cave, map it, observe changes in to through time, photograph it, and begin publishing material on the system.
  - 2. From 1967 to 1970.
    - (A) Mapped, not completely, but yielding nearly 2½ miles.
    - (B) Extensive series of photographs correlating the cave and glacier in time.
- B. 1972, I.G.S. begins work.
  - 1. Objectives: Similar to mine, but more complete, and detailed, including the other nearby glaciers, and with the specific purpose of formulating a theory on the formation and evolution of the caves.
  - 2.2. From 1972 to 1974.
    - (A) Discovery of the firn section.
    - (B) Mapping of approximately 14 miles of glacier and firn cave (all within the Stevens basin)
    - (C) Continued careful and complete photography of the glacier and cave.
    - (D) The most concentrated effort yet known on a glacier cave (the Sept. 1973 expedition)
    - (E) Aerial photoreconnaissance of Stevens Glacier Basin (simultaneous with the expedition)
    - (F) Recieve a grant for the study of the Paradise and Stevens Glacier Caves. The amount of the grant was \$1,000 for 1974

#### FUTURE PLANS

- A. Work with the N.P.S.
  - 1. Collecting permit.
  - 2. Use of special park service equipment.
- B. Continued, and yet more detailed study of the cave and glacier features, specifically recording them in time and space.
  - 1. Coordinated temperature readings.
  - 2. Coordinated ice density readings.
  - 3. Coordinated wind direction and velocity measurments.
  - 4. Study of Flakes.
  - 5. Study of flow in glacial ice and crevalle systems.
  - 6. Study of surface morphology.
  - 7. Increased use of aerial reconnaissance and the library of USGS aerial photos.
  - 8. Continued extensive photo, mapping and descriptive work on glaciological, speleological, and biological features.

\*    \*\*    \*                            \*                            \*    \*\*    \*

#### SUMMER WIND

by Tom Miller, NSS 10183

Within a radius of 20 miles around Custer, South Dakota, are over 80 mapped miles of cave passage. Of these, perhaps only 3 or 4 at most are open to the public. In addition to the typical cave tour, Wind Cave Nat'l Park, and Jewel Cave Nat'l Monument offer three others - the Historical, the Candlelight, and the Spelunking tours, all given only in the summer.

The Historical tour is offered at Jewel Cave, being primarily a tour through the "old" section of the cave. Before the present visitor center, elevator, and new tour area were developed, tours entered through the natural opening, over wooden stairs, through tight passages, carrying Coleman lanterns for illumination. These three hour tours still go twice a day into the original discovery area. Sadly, due to forty years of private ownership and vandalism, the name Jewel is a misnomer, and the major attraction is simply the experience of a semi-primitive excursion. The six inch dog-tooth spar crystal coating that once covered the cave has long since been

stripped away.

At wind cave is a new type of tour that was initiated only in the past summer. Previously, the candlelight tour consisted of being led by a uniformed ranger through a lit part of the cavedown to a section where the lights were off. Here they were given candles to be hand held, and conducted through a paved section of the cave, where numerous light fixtures were visible. The major difference from the traditional tour lay primarily in the use of candles rather than electric lights.

Then, last year one of the original lighting systems was rediscovered- an old lard bucket, with a wire for a handle, and a hole large enough for the insertion of a candle punched into the bottom. These had the advantages of being more immune to dropping, could be lain down, and kept the direct light from the explorer's eyes. After a brief testing period they were incorporated into a new tour - the Historical Candlelight Tour, which I pioneered.

Today, the unsuspecting visitors are conducted into the cave by a uniformed ranger, as before, but after an initial geology tour in the lit section, the ranger walks off and leaves them in the dark with their unlit candle lanterns. For fifteen or twenty seconds they stand there wondering just what is going on, before they hear a voice shouting in the distance for "Elmer!" or "Alvin!" - two original 1890's guides. And then, from a small hole pops out a strange figure clad in garb from the 1890's possibly soem old, holey pants and suspenders, a beat-up hat, and a white shirt and vest. He introduces himself as Charley Roe, or either of the above two, or if a girl as Katie Stabler, then for the next forty-five minutes to an hour transports the surprised tourists back to the "Gay 90's". He tells of the girl who was married in the cave because of a promise to her mother never to marry any man on the face of the earth; of the fellow stuck in a hole for three hours who reviewed every sinful act of his life before rescue, only to be told by his friends that he would have really needed three weeks to do all that; and of the geysers that boiled away the limestone to create over "100 miles of cave tunnels, more magnificent than Mammoth!" In addition to the costume change, he leads through an unpaved area, tight and dusty, with wooden or piled rock stairs, and the overall effect is probably one of the most unique "living history" cave tours anywhere.

Last, but not least, are the tours dear to every caver's heart; the spelunking tours, usually the only opportunity for the public to see any of the vast wild portions of the two caves. Jewel's tour is certainly the more spectacular, six hours following a guide through huge rooms sporting crystals of dogtooth and nailhead spar, gypsum flowers, needles, hollow stalagmites eight feet or more high, and a number of difficult pitches, one requiring a handline. They also have a three hour tour that reatures the rare "hydro-magnesite balloons".

Wind Caves, though not so beautiful perhaps, showing primarily boxwork, have an added feature that to my knowledge is not offered anywhere else. Like Jewel's, all hardhats, kneepads, (a definite necessity) and electric lamps are provided by the park service, and limited to ten; but this is a cave crawling experience, rather than scenic, and a whole hour is offered to explore the cave without the ranger. The first  $\frac{1}{4}$  hour of the four hour tour is used in signing legal waivers (for use in the event of bodily damage), orientation, and some explanation of the basic tenets of the sport of spelunking. After two hours of crawling the quigees are turned loose with ten strips of colored plastic survey tape, and told to "get lost", while the guide waits behind in the event of an emergency and either takes a nap, or reads a book. Usually, within an hour the groups of three and four trickle back, some of whom have hardly been out of ear shot. Then, there are those who suprise with a natural ability and liking for it, and those who become "hopelessly" lost in the first  $\frac{1}{4}$  hour and are rescued within five minutes by the ranger.

Cave touring through a commercial cavern doesn't have to be a mundane trip on a lighted walkway with a geologic and/or historical lecture. These two caves are proof that a visit with a guide can almost aproch the real thing.

## THE BIOLOGIST'S CHAMBER: LAVA TUBE SLIME

by Dr. James T. Staley and Rod Crawford

The following is a somewhat expanded version of Dr. Staley's notes for his lecture at the Regional Seminar.

I first became interested in lava tube slime in 1973 after reading a number of references to it as an "unidentified gelatinous material", a "peculiar mold or yeast", or an "unidentified algaelike material" that coated the walls and ceiling of some lava tubes. Considering that it would be nice to know what it really was, I brought back from a late September Trout Lake trip samples of slime in formalin from Slime Cave, New Cave, Dry Creek Cave, and Stairwell Cave, and took them to Dr. Staley's lab in the U.W. Health Sciences Complex. His interest was thereby whetted, and a year later, last September 11th and 12th, I guided Dr. Staley, his student Pat Stanley, and three others to Trout Lake. Slime collecting and other studies were done in Slime Cave and New Cave. Slime samples were collected with a cork borer. Some were immediately preserved in a staining solution called Lugol's Iodine; others were iced (with loose ice from the floor of Ice Cave) for later examination; and still others, before being preserved, were incubated to determine their uptake of chemicals "labeled" with radioactive isotopes. Most of the work was done by Pat. After this, I mischievously led them--a motly assemblage with motorcycle helmets and Coleman lanterns--through the New Cave crawlway, but they apparently enjoyed it just the same.

The results, while leaving much yet to be discovered, provide considerable solid information. It has long been known that there are two main color varieties of Washington cave slime--silver and orange. Core sampling revealed (fig. 1) that orange slime is always present and is sometimes overlain by a silvery layer. Other occasional color varieties, such as black or green, may result from mineralization or local abundance of some other organism. In Slime and New Caves, the silvery layer is absent chiefly toward the lower end of the cave, and this corresponds to a distinct drop in slime temperature. For instance, halfway into Slime Cave the temperature was 7°C (44.6°F), and at the end of the cave it was 4.5°C (40.1°F). The silvery coating may be a different organism or just the fruiting (spore-producing) structures of an organism present in the orange slime which cannot produce spores at the lower temperatures. The silvery substance is very hydrophobic (water-repelling) and so could not be studied microscopically.

Microscopic examination of the stained and iced samples showed the presence of several distinct species of bacteria. No fungi were noted; all microorganisms present were bacteria of one sort or another. Figs. 2, 3, and 4 are taken from photomicrographs of three of the species. Fig. 1 shows cells of a fairly ordinary-looking bacteria. The cells in fig. 4 are interesting for their unusual transparency. Fig. 3 shows a filament of an "actinomycete". Actinomycetes form filaments, spores, and fruiting bodies like fungi but are really bacteria. They are probably responsible for the silvery layer. The slime contains more dead material than live bacteria, and there is also a considerable proportion of water.

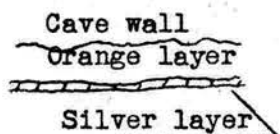


Fig. 1



Fig. 2  
x3000

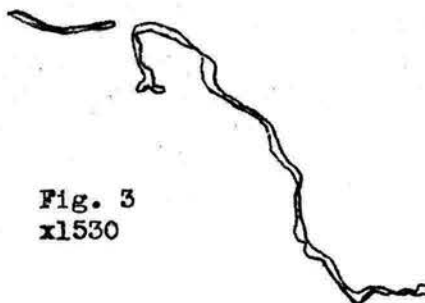


Fig. 3  
x1530

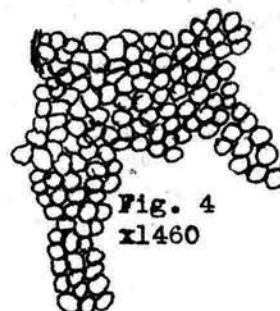


Fig. 4  
x1460



Individual bacteria were counted in small samples cultured in the lab. They were most numerous in New Cave slime, with 42 million per gram dry weight. Half-way down Slime Cave they numbered 35 million, and at the end 29 million, per gram dry weight. The growth rate is very slow. When tested in the laboratory, a generation of typical slime bacteria (i.e. the period between cell divisions) took about 12 hours. For normal bacteria generation time is measured in minutes. Graffiti in the slime dates back to the mid-1960s without being much overgrown.

The known energy sources of cave bacteria separate them into two categories. The first are called chemosynthetic. They derive chemical energy from oxidizing inorganic compounds such as ammonia or sulfides, present in the cave minerals. They then utilize this energy to produce their own organic compounds from carbon dioxide and water. This mechanism is the only possible one in very deep caves where no organic matter is present. However, in shallower caves these bacteria tend to be replaced by those which are called heterotrophic. These derive their energy and organic compounds from breaking down organic materials already present.

Several experiments were performed to determine to which category slime bacteria belonged. First, smears from the iced samples were put on: 1) a regular bacterial medium and 2) one containing only inorganic compounds. Only the first produced any growth. Other samples were "incubated" while in the caves with a mixture of cave water and certain radioactively "labeled" chemicals. They were bicarbonate (to test for chemosynthesis) labeled with carbon-14, and acetate, an organic chemical favored by heterotrophs, labeled with tritium (Hydrogen-3). The samples were then preserved, and later exposed to film so that any radioactive substances they had absorbed would produce an "autoradiogram". Nothing resulted from the bicarbonate. Fig. 3 is drawn from the autoradiogram of an actinomycete filament incubated with the labeled acetate, proving it to be heterotrophic. The sources of the organic material used by the slime organisms probably include dissolved substances in the cave water and the roots that hang from the ceiling.

A sample of a very different kind of lava tube wall deposit was collected in "T" Cave during the convention at Craters of the Moon, Idaho, at the beginning of September. This substance was white and fluffy, and covered only the lower half of the cave walls. I gave this sample to Dr. Staley, who was able to culture three species of actinomycetes from it, all belonging to the genus Streptomyces, the source of the antibiotic Streptomycin (no wonder cavers are so healthy). More interesting still was the result of an "ignition" test, designed to burn away all organic material. This revealed that the "T" Cave substance was only 24% organic, 76% inorganic. The inorganic portion bubbled in hydrochloric acid, indicating that it may be a carbonate.

Lava tube slime occurs in most lava tubes of Washington, and is also reported from Hawaii and various other places. It probably supports a wide variety of cave animals, but very few have so far been associated with it. In several Washington lava tubes I have found fly larvae, of the gnatlike family Mycetophilidae, inhabiting the slime and undoubtedly eating it. Overwintering harvestmen congregate on the slime deposits in Slime Cave and others, and doubtless derive moisture from this source—possibly also food. In addition, I have found a Polyzooid milliped probably living on the slime in Spider Cave, Mt. St. Helens area. The troglobitic harvestman Speleonychia is always found in contact with slime.

Cavers wishing to make microscopic studies of the slime in their "own" lava tubes will find it easy to both stain and preserve it with Lugol's Iodine solution. To make the stock solution, dissolve 5 grams iodine crystals with 10 gm Potassium iodide in 100 milliliters water. Preserve slime with about  $\frac{1}{2}$  ml of this per 100 ml cave water. The iodine will disappear in time, and to sustain preservation enough stock solution must be added to keep a distinct brown tinge in the water. Interesting photomicrographs may be made of slime organisms stained in this manner.

## ACCESS POLICY FOR AJAX MINE

by Bruce Unger

(This is being reprinted from the Zanadu Quarterly (semi-annually?) Vol.5, no.2)

The Ajax Mine, located in eastern Oregon, has recently come to the attention of cavers (See a recent Huntsville Grotto Newsletter). Its deposits of moonmilk extensive orange rimstone, and soda straws in white, black and red make it much prettier than any cave in Washington, and a rarity in Oregon.

The beauty of Ajax, is however, exceedingly delicate, and an uncertified individual could in a thoughtless moment destroy formations which have taken forty years to form. A small colony of Neotoma cinerea, a species which may someday approach extinction, lives in the entrance. And of course we must not overlook the dangerous nature of Ajax, where even a minor cave-in could prove fatal to the uncertified.

For all of the above reasons, and also to retard claim-jumpers, Ajax has been gated. A controlled-access policy has been developed to allow access to all those worthy of seeing Ajax while keeping out the incompetent or undesirable. Persons not complying with the following guidelines will be assumed to be claim jumpers, and will be shot on sight.

1. A trip shall consist of not less than one nor more than five persons, and shall be led by a Certified Trip Leader (CTL).
2. All members of the party must hold either a Certified Trip Leader (CTL), Certified Backup Trip Leader (CBUTL), or Certified Trip Follower (CTF) status.
3. Persons not appearing on the accompanying list may attain the required status by:
  - a. CTF -- Having previously visited the ~~mine~~ mine as a CTF on two occasions.
  - b. CBUTL -- May be designated at the CTL's discretion from among the Certified Trip Followers.
  - c. CTL -- You can't get there from here - The mine is reportedly for sale.
4. The following persons are currently qualified as stated:

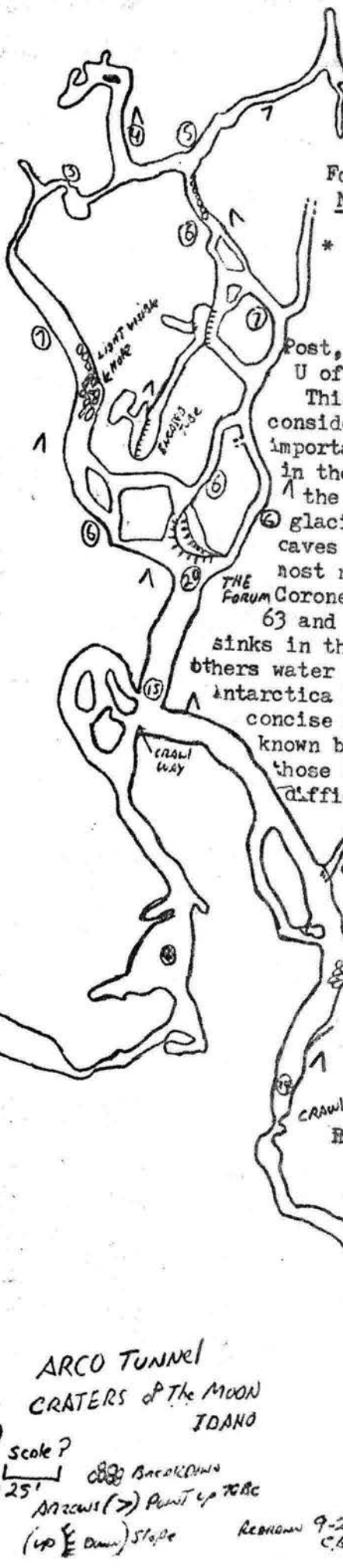
|                      |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|----------------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Fred Spicker (CTL)   | + | * | + | * | + | * | + | * | + | * | + | * | + | * | + |
| Moni Spicker (CBUTL) | * |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| Alex Sproul (CTF)    | + |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| Bruce Unger (CTF)    | * |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|                      | + |   |   |   |   |   |   |   |   |   |   |   |   |   |   |

The following is a song to the  
tune of, "Somewhere over the Rainbow"

Somewhere over the guano,  
Bats do Fly,  
Bats fly over the guano,  
Why then, oh why can't I

(salvaged from some dark mouldy  
file of Phil Whitfields -- ed.)

Eventhough I failed to write a report on the Craters of the Moon Convention I went ahead and reduced the map -- so, here is the map for ARCO TUNNEL, one of the major convention attractions. For the trip report which accompanies this map see NW Caving V. 5, no. 4.



GLACIOSPELEOLOGICAL ABSTRACT

-- W.R.H

Post, Austin and LaChapelle, Edward R. 1971. Seattle U of W. press.

This magnificent book is largely deficient in considerations of glacio-speleology, but does contain important items. Pages 25 and 26 depict Muller's Cave in the Pumori South Glacier near Mt. Everest, one of the worlds few deformation caves. Grooves in the glacier sole are magnificent. The openings of Glacier caves are shown in several photos taken for other purposes most notably on page 28, in an avalanche-fed glacier on Coronet Peak in the Canadian Rockies. Moulins are covered 63 and 64; on page 64 and 65 are some magnificent glacier sinks in the Black Rapids Glacier, some of them moulin tapped, others water filled. It is mentioned that much larger ones in Antarctica have been called "ice dolines". Pages 83-4 give a concise description of glacial tor rents, now technically known by the icelandic term of "jökluhlaup", including those of Mt. Rainier, yet the authors state that, "it is difficult to concieve how such large englacial or sub-glacial cavities can exist in actively flowing ice." Finally on p 94 is shown the finest photo of an esker, or cast of a glacier cave, that this reviewer has ever seen. The learning glacio-speleologist can profit greatly by studying the features pictured and discussed in this book, despite its specific spelean weaknesses.

VULCANOSPELEOLOGICAL SEMI-ABSTRACT

Greely, Ronald (ed.) 1974. Guidebook to the Hawaiian Planetology Conference. NASA/Ames Research Center, August, 256 pp.

This well-illustrated geologic guidebook was prepared for the meeting of Mars geologic mappers, held in Hilo October 1974. Because of the significance of the tubes in vulcanism of the Hawaiian and Martian types, frequent references are made to vulcanospeleology and especially its surficial manifestations. The text reveals such great advances in incorporation of vulcanospeleogenic concepts into vulcanology that someone with more time than I needs to do a thorough abstract for this 'ere journal.

-- W.R.H.

ARCO TUNNEL  
CRATERS OF THE MOON  
IDANO

MAP BY  
POAK STAFF  
CEILING HEIGHTS  
BY MENDRY  
C.B.

Scale ?

ARROWS (→) POINT UP TO BE  
(UP ↓ DOWN) Slope

REARROWN 9-20  
C.B.

## SPELEAN HISTORY NOTE

The article below is quoted in its entirety from the Washington Standard (Olympia), August 10 1867, p. 2 col. 4.--RLC

"AN ICE CAVE -- The Salem Unionist has the following remarkable item:

"It is not generally known, but is nevertheless true, that nearly all the ice used in this State is procured from a subterranean cavern where from time immemorial, through all changes of season, the winter king has asserted his dominion and holds everything tangible locked in his cold embrace. This cave is located on a stream called White Salmon, which empties into the Columbia River on the Washington Territory side, about thirty miles below The Dalles. The entrance to this icy chamber is near the base of Mount Adams, which stands twenty miles from the Columbia, and whose melting snows constitute the source of White Salmon. The scenery within this gloomy prison house is said to be sublimely grand. The dimensions are vast, extending under the snowy mountains perhaps for miles. The ice is found in columns or pillars, formed by water dripping from above and congealing as it falls. These columns are cut out in blocks and conveyed to the Columbia on pack animals, and thence shipped to Portland and other markets, where it is selling at present for eight cents per pound."

### VULCANOSPELEOLOGICAL ABSTRACT -- W.R.H.

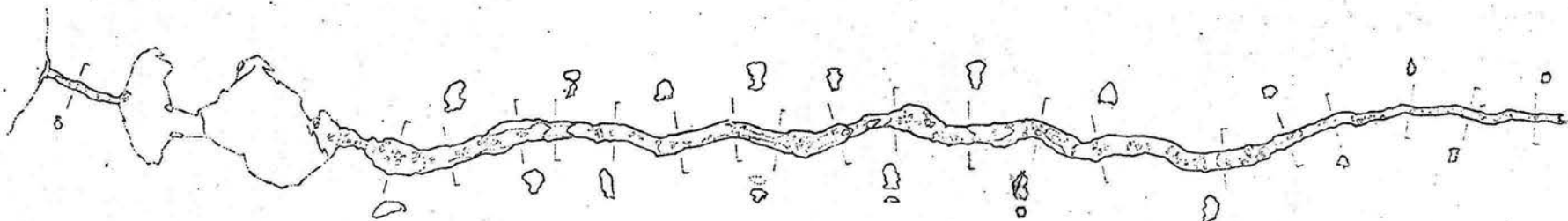
Reddell, James & Elliot, William. 1974. (Untitled field trip report, 21 Dec. - 12 Jan. 1974) AMCS Newsletter Vol. 5 No. 1, Spt. p. 11-13.

These stalwarts of the AMCS report what appears to be potentially a very large and important lava tube cave, Cueva del Volcancillo, 4 km South of Las Vigas (reached via Jalapa). The entrance is about 15 feet from the lip of the crater; 100 feet in as a large collapsed segment of tube, whence a slope leads down into the main passage, said to be almost entirely breakdown floored. A fine picture shows a ladder drop with fascinating speleogenetic features. The team explored and mapped 1800 feet to a breakdown choke, with a descent of about 450 feet. This breakdown choke is locally said to be very hairy ("feo"), but passible, with the cave continuing a long distance to a point where trucks may be heard passing overhead. Distances were not stated, but the impression is left that the informant is reliable, and that such a length might well put this cave among the big four currently in contention as the world's longest. The map is very intriguing and may be republished here. (Yep, see next page -- ed.)

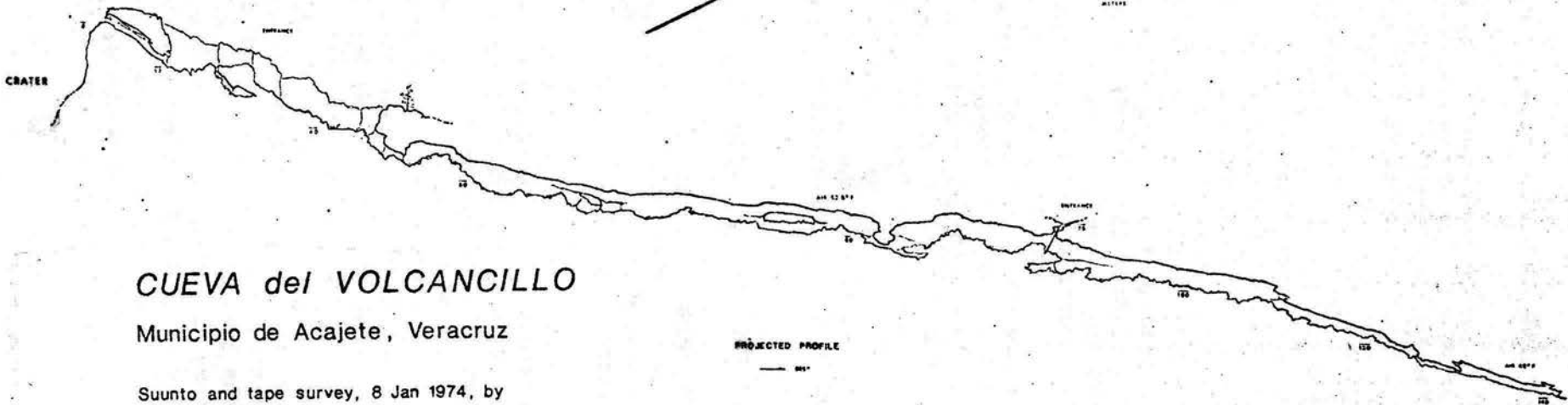
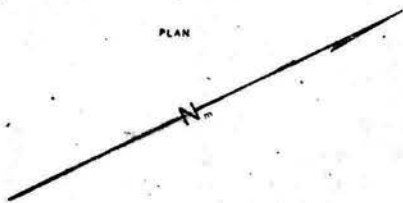
Another potentially very extensive cave, Cueva del Larco, was partially checked. An upper level throughway passage "about 50 feet above the cave floor" could not be reached although this is said to be the long one. A ladder is said to have been emplaced here in past years.

Don't miss your chance to judge the new regional patch at the next meeting. Three patches were chosen from the thirteen submitted.

25



PLAN



## CUEVA del VOLCANCILLO

Municipio de Acajete, Veracruz

Suunto and tape survey, 8 Jan 1974, by  
W. Elliott, R. Jameson, D. McKenzie, J. Reddell  
Drawn by D. McKenzie

NOTE: Upper entrance of lava tube in wall of a crater approx. 200 x 80m deep  
located 15 km NE of Cofre de Perote.  
Surveyed length: 590m horiz. Depth: 140m.

#### VULCANOSPELEOLOGICAL ABSTRACT

Lyman, William D., and Horace S. Lyman, 1886.

The Caves and Glaciers of Mt. Adams.

The West Shore (Portland) 12 (10) 312-317.

U.W. Library Northwest Collection: N/979.505/WE

On pp. 313-14, "These caves around Mt. Adams are almost numberless. New ones are constantly being discovered. The ice cave, six miles from Trout Lake, has been so many times described that further account is almost unnecessary. Though only a few rods in length it is of marvelous beauty, with its great pavements of ice below, and huge stalactites and stalagmites betwixt floor and roof, covered with delicate tracery and flashing back rainbow tints from the well-like entrance or the torch of the explorer. There are other caves of large size, though none of so perfect finish. Surveyors traced one across three sections. Another near Trout Lake has been followed a mile without discovering the end.

"To explain these caves we must suppose that a stratum of lava, gathering slag and impediments on the edge, was thereby caused to rise, and crest over like a breaker on the sand, making a cave with a roof strong enough to remain. Others were formed by byproducts; a tongue of lava, cooling on the edges and sides, top and bottom, would still be liquid inside; this might run out, leaving a long cavity. If the upper end of the cave were high up on the mountain side, in regions of frosty air, the cave might conduct cold breezes from above, freezing the water that leaked into the cave, even at the lower end. This explanation of the ice in some of the caves, suggested by one well versed in geological sciences, is only lacking experimental verification."-RLC

#### VULCANOSPELEOLOGICAL ABSTRACT

Howard, Randall R., 1911.

Volcanic Cave Wonders of the Northwest.

The Pacific Monthly. 25 (6) 632-644.

U.W. Library Northwest Collection: N/979.506/PM

A series of historical anecdotes about Central Oregon lava tubes is followed by an account of the author's own visit to Dillman Cave. There are notes of a cave register in a mason jar inside. The following theory of vulcanospeleogenesis is presented: "A lava stream flowing out across the land cools on the surface and on the bottom, since lava is a very poor conductor of heat. These surface crusts most often break up, which is one of the causes of the extreme ragged appearance of a lava field. Under the most favorable conditions the bottom and the top crusts, forty or fifty feet thick, will become a long shell, and the still molten interior lava will flow on. The result is a Dillman Cave, or a Horse Cave, or one of the hundreds of other caves of the volcanic regions of the Northwest. Perchance surface moisture also enters into the formation of some of these caves, creating steam that fashions the larger caverns and produces the "blow-out" surface openings that some of them have." An interesting account of the history of Arnold Ice Cave is given. Photographs of speleohistorical interest include two of Arnold Ice Cave, one of ice speleothems in Ice Cave, Washington, and one of the old ladder in Cheese Cave, apparently the same picture as that published as the cover of a recent Speleograph.---RLC

## Guatemalan Speleocoincidences and Yucatan Histoplasmosis

by Tom Miller (in a letter to W.R.H.)

Thanks for trying to contact Mike Shawcross for me (before Tom left for points south - W.R.H.). He told me about it when I met him quite accidentally a little over a week ago. I happened to be walking down the street to find out where C.J. (Rushin) was when I got into a conversation with a red-bearded fellow I had spoken with briefly a half-hour before. The subject of caves came up and come to find out, here we were, two cavers meeting on an obscure side street in Guatemala, thousands of miles from home, and C.J. had been staying in his hotel and neither one knew it!

Unfortunately, we haven't been able to meet again and I probably won't go caving with him before I leave.

Another coincidence (?) - C.J. and I were sitting in a restaurant reading the N.S.S. News (your analysis of the Glaciospeleological Survey, I believe - I didn't have to turn the page to see who wrote it) when a fellow walks up and asks if we're cavers. He turned out to be Daniel Dreux, a French caver, here with two others to work on a 10-km river cave in central Guatemala. (more coincidences: I had sent Dreux a copy of the Cascade Cavers with Belizean reports and he wrote me back to get in touch with Mike Shawcross & Co.; wonder if he remembered Tom's name from the Cavers??? - W.R.H.) Some other French cavers are also coming. Plus the French Canadians already here, and C.J., it seems as though things will be really jumping here for a few months. Alas, I've got to get to South America.

CJ and I went last week to the caves at Lanquin and to the natural bridge, Semuc-Champey over the Rio Cahabon just south. Nothing too impressive, but then I went alone to the Seamay caves near Senahat. Lots and lots of karst, many disappearing streams, and caves with streams, easily an area that a team could spend a lot of time in. I'm beginning to think Guatemala may be even better than Belize.

Jim Peck had to return north, which is the reason I sent to Seamay alone. While in the Yucatan we visited Cueva de Xtucambilxunan at Bolonchen, really a fine cave, but we weren't aware of a case of histoplasmosis that had been contracted there some time ago. Apparently that's what Jim and I came down with 8 days later in Belize - chills, fever, sweating, shortness of breath, lassitude - the whole bit. I recovered in four days, but Jim was still out after over two weeks so he flew back to the states.

I shall be in Venezuela in 2-3 weeks and will keep you posted if I make any astonishing discoveries.

Underthrow the overground!

We would like to thank those people who helped make the seminar last month the success that everyone agrees it turned out to be. Special thanks go to the speakers for the time and energy that obviously went into the preparation, and expert presentation of all of the papers; ~~well done!~~ Additional thanks are made for help received in housing people, (esp. Chuck Coughlin) in loaning, and arranging to loan audio-visual equipment, and to the people themselves, some of whom drove as far as 400 miles to make this whole thing happen; your help was very much appreciated.

Caves of Taiwan, Republic of China

-- William R. Halliday, M.D.

A few months ago I encountered two short references to a cave at the southern tip of Taiwan. Not having any other information on caves of Taiwan and adjacent islands, I contacted the Consulate of the Republic of China in Seattle. Its courteous staff confirmed that Kenting Cave was something of a tourist attraction and kindly obtained the following information from professor T. L. Hsu of the Department of Geography of National Taiwan University at Taipei. Various other references to the island mention and picture beautiful marble deposits in central Taiwan but apparently caves in that area are not currently known to exist. It would not be surprising to learn of major future discoveries in this part of the world which apparently is virtually untouched by speleology.

A Note on Caves of Taiwan

-- T. L. Hsu

Although natural caves are not uncommon in Taiwan, there is little mention of them in literature. Through extensive travelling in the course of field work, this writer has had the opportunity of visiting large numbers of cave localities. This note is prepared from my own knowledge, however it should be noted that the numerical information is only approximate.

Three types of caves have been distinguished in Taiwan: Sea Caves, Solution Caves, and those developed through subaerial erosion.

Sea caves are common on the northern and eastern coasts where wave erosion is vigorous upon the rocky coast. They are found in sedimentary, metamorphic, and volcanic rocks, developing readily on joints or bedding openings. As a result of recent upheaval in parts of the island, the littoral zone has been elevated locally a few meters or as much as 50 meters above sea level.

Solution caves are developed in southern Taiwan where reef limestone is widely distributed. Three caves are present in the Kenting area, Hengchun. Various forms of calcareous deposits are seen there.

Caves formed by weathering and erosion are mostly in sedimentary rock, especially massive sandstones with shale interbedding. They form through gradual widening of joints and bedding planes through weathering and erosion.

Sizeable, well decorated caves at Chilung, Changpin, and Kenting are an attraction to tourists. Fragments of prehistoric tools have been found in cave deposits at Changpin. This has become a site of archeological study and is being excavated by Academia Sinica.

The following is an incomplete list of caves in Taiwan:

| LOCALITY                 | TYPE          | ROCK TYPE      | DIMENSIONS (MTRS.) |    | PART OF ISLAND       |
|--------------------------|---------------|----------------|--------------------|----|----------------------|
| Yehliu                   | Sea Cave      | sandstone      | 10                 | 5  | north coast, w. end  |
| Chilung                  | sea cave      | sandstone      | 30                 | 10 | north coast, W. ctr. |
| Pitouchaio               | sea cave      | sandstone      | 20                 | 5  | north coast, E. ctr. |
| Suao                     | sea cave      | schist         | 15                 | 5  | east coast, N. end   |
| Changpin                 | sea cave      | agglomerate    | 20                 | 20 | east coast, S. ctr.  |
| Wulai                    | erosion cave  | agillite       | 50                 | 30 | N. end, central      |
| Chingmei<br>(Mucha Cave) | erosion cave  | sandstone      | 15                 | 10 | N. of Wulai          |
| Kenting                  | solution cave | reef limestone | 30                 | 10 | S. tip of island     |

(enclosed were several slides, one black and white, and a xerox of illustrations from an anthropological publication in Chinese, probably Proceedings of the Academia Sinica, which indicate there are at least six caves at Loham, Changpin. These are "the caves of the Eight Fairies".)



## GORY, GORY CAVE EXPLORERS

(A Ballad of Cavers & Caving to the tune of the Battle Hymn of the Republic)

CHORUS: Gory, gory what a hell-of-a-way to die,  
Gory, gory what a hell-of-a-way to die,  
Gory, gory what a hell-of-a-way to die,  
And they ain't gonna cave no more.

- (1) In a dark and dreary cavern  
On a cold winters day  
He made the great mistake  
That took his life away  
He should have been more careful,  
But instead he choose to play,  
And he ain't gonna cave no more  
(Chorus)
- (2) "Can you make it to the high ledge?"  
Called the belayer, from below  
Our hero answered feebly "Yes"  
And inched his way up slow  
He was trying to drive a piton  
When his foothold began to go  
And he ain't gonna cave no more  
(Chorus)
- (3) He slid right down the chimney  
And he quickly gathered speed  
He shot past the belayer  
Who'd forgotten the caver's creed  
An anchor to a piton  
Would've been all he'd ever need  
And he ain't gonna cave no more  
(Chorus)
- (4) The belayer felt the rope pull taut  
And tried to let it run  
But it jerked him from position  
And he knew his time had come.  
He left the ledge behind him  
And the long descent had begun.  
And he ain't gonna cave no more  
(Chorus)
- (5) The days they'd lived and loved and laughed  
Kept running through their minds  
They thought about the girls back home  
The ones they'd left behind.  
They thought of their companins too  
And wondered what they'd find.  
And they ain't gonna cave no more.  
(Chorus)
- (6) They hit the side, their lights went out,  
Darkness closed in all around  
They sped on toward their destiny  
The ever nearing ground.  
Their impact echoed through the shaft  
And then came not a sound.  
And they ain't gonna cave no more  
(Chorus)
- (7) They hit the floor, the sound was SPLAT!  
The blood went spurting high  
Their comrads, they were heard to say  
"What a colorful way to die"  
And as they lay there one was heard to  
make his final sigh...  
And they ain't gonna cave no more  
(Chorus)
- (8) There was blood upon the rucksacks  
There were brains upon the rope  
Intestines were entwined across the  
Rough and rocky slope.  
We poured them in a "Gurnee Can"  
while coiling up the rope.  
And WE AIN'T GONNA CAVE NO MORE!

### AN EARLITORIAL by Earl Neller

One of the sacred rules of caving is: "Don't go caving." A safer rule would be: "Always go caving alone!" Undeniable, people are responsible for caving accidents. Everytime somebody gets hurt in a cave, somebody goofed.

For instance, one time four guys went into a well-known but secret cave in southern Missouri. After several hours of carefree exploration, they decided to leave the cave, only to discover that they were running out of light. Each of them had neglected to bring enough carbide, expecting to borrow what they needed from somebody else. Flashlights were left in the cars. They had plenty of matches, but no candles. They didn't make it out. They had to sit and wait for a rescue team. After sitting through ten hours of Polack jokes, they learned their lesson. Never go caving with others. If each of them had gone alone, assuming all responsibilities himself, instead of depending on others; nothing would have happened. The point is -- people cause accidents. If you go caving - go alone.

Most people feel safer in a cave, if they aren't alone, however. They feel that if something happens and somebody is along, there's always a couple of extra

people around to help out, or compound the dilemma, as the case may be. This is treating cave accidents the same way the U.S. handles wars -- they keep a big pile of guns on hand so if a war ever starts, they can take care of themselves, but spend little effort trying to figure out how to stop wars. As Wayne Finch would put it -- their answer to the leaky pen problem is to buy rubber gloves, not a new pen. I think cavers should stop havin' accidents, rather than making a lot of rules which only help them out after an accident has happened. If cavers would just think when they're in a cave, come prepared and learn how to do things right, then they wouldn't have to worry about accidents when they go into a cave.

Right now your probably thinking to yourself: "You don't fool me Earl Neller, you dunderpate, you 14-karat clotpoll. You never go caving alone. Everytime I see you in a cave, your always with others." A shrewd observation, but let me explain. Of course I go caving with others, but not for safety reasons. (Just like you dont use prophlactics for the noble purpose of preventing disease.) Going caving with others is half the fun. (I'll go with anyone, eight or eighty, crippled, blind, or crazy.) I just think it's foolish to think that caving alone is like committing suicide. On the whole caves are safe. People cause accidents, not caves. I reccommend responsible caving as a preventative, rather than a lot of crippling, ironclad rules as a cumbersome cure. Sometimes, it's OK to go alone.

From FORESIGHT Vol. IX, no. 1 pp. 2-3.

#### SUBSCRIBE TO NORTHWEST CAVING

Quarterly publication of the N.W.R.A.,  
Subscription rate \$2.50/yr. to individuals  
Bulk Rate (through your gratto) \$2.00/yr.  
Regular Cascade Members recieve it automatically  
Caver subscribers may pay \$2.00 and use our  
Bulk Subscription (Mailed with your Caver)

Material, and new subscriptions are both  
being actively solicited! Send either to  
the address listed below.



**THE CASCADE CAVER**  
3530 Greenwood Av.  
Tacoma, Wa. 98466

"Earth... This is God.  
I want all you people  
to clear-out by the end  
of the month... I have a  
client who's interested  
in the property....."