



THE CASCADE CAVER

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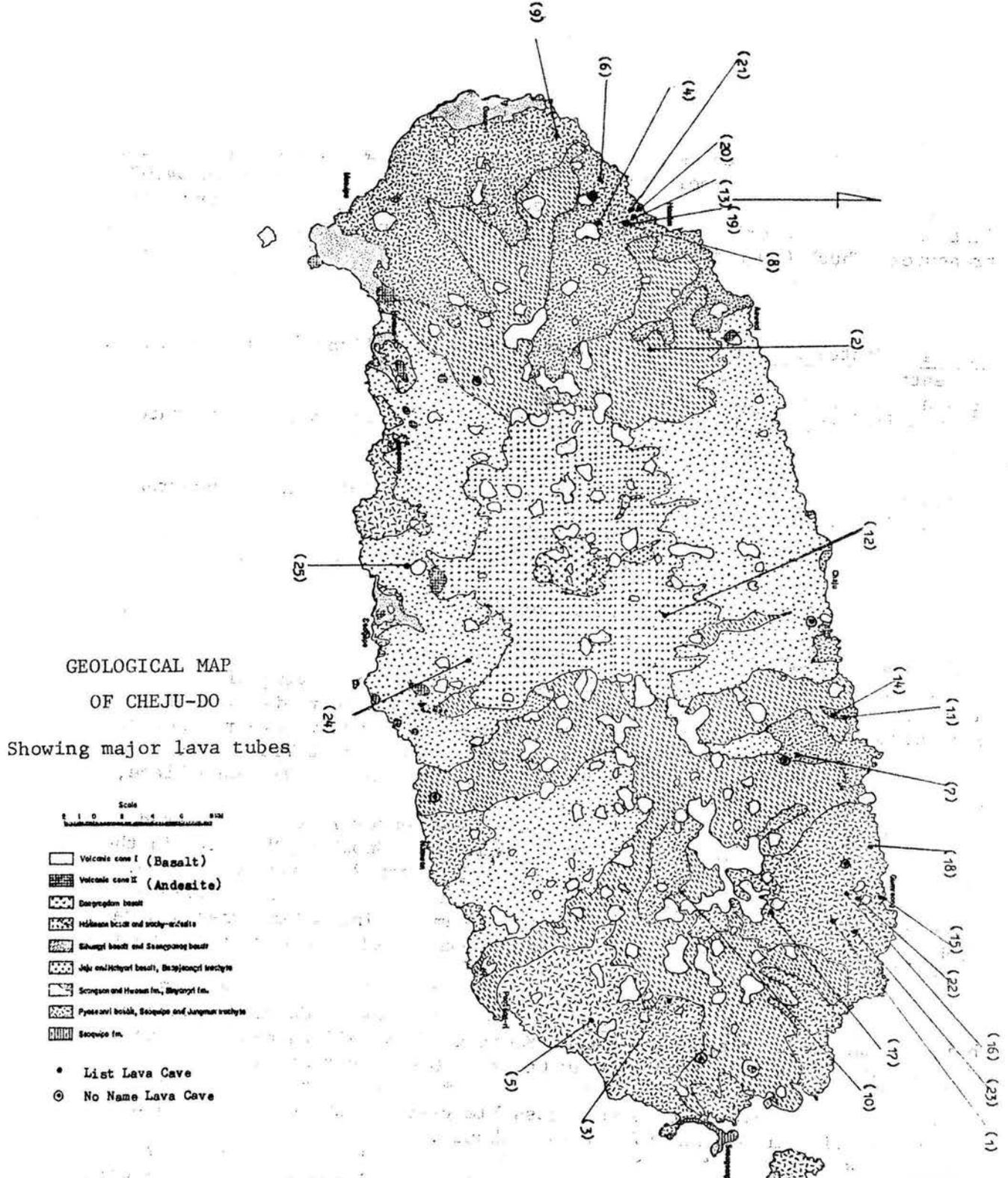


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Volume 16 No. 11-12

Editor: Rod Crawford

"November-December 1977"
Published September 1978



GEOLOGICAL MAP
OF CHEJU-DO
Showing major lava tubes

- Scale
0 1 2 3 4 5 6 7 8 9 10 KM
- Volcanic cone I (Basalt)
 - Volcanic cone II (Andesite)
 - Congregation basalt
 - Halseon basalt and andy-azulite
 - Sihungri basalt and Saengsanog basalt
 - Juku and Hichang basalt, Baejeongri andyite
 - Seogwan and Husean fm., Binyangri fm.
 - Pyeonsan basalt, Seogwan and Jungmun andyite
 - Seogwan fm.
- List Lava Cave
 - ⊙ No Name Lava Cave

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COMING EVENTS

Tuesday, September 19th. Monthly meeting at the Hallidays', 1117 36th Ave. E, Seattle,

Tuesday, October 17th. Monthly meeting, ditto.

October 14-16th. Regional Meet at Hell's Canyon, sponsored by Gem State Grotto. Come to the meeting for more information.

Additional events for the current month were to be distributed concurrently in Vol. 17, No. 8.

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NEWS AND NOTES

A FEW NEW CAVE RUMORS:

1. Craig Proianello of Yakima recently reported a blowing sink in an area not checked for caves. This is in the Naches Ranger District of the Snoqualmie National Forest, along the Yakima-Lewis County border, sec. 2, T14N, R11E. The sink is 5 feet west of the Cascade Crest Trail, 128 paces south of the junction with trail 980. Craig's address is 915 Rose Place, Yakima, 98902.

2. Robert Erickson of the Northwest Kidney Center recently reported granite block caves (vertical) near the summit of Snowking Mountain in the North Cascades in which he dropped rocks which took 2 seconds to strike.

3. In a Seattle Times article, Tuesday Oct. 26, 1976, p. 2 col. 5-6, "Lookout of '20s remembers the chipmunks": Remembering a time when she was lookout on Sugarloaf Mountain near Leavenworth, Gladys West recalls storing provisions in a "cave".

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A recent issue of Northwest Science has two articles by Cascade Grotto members: on the Lost Creek Cave System (Montana) by Newell Campbell and on H₂S in the Mt. Rainier Summit Steam Caves by Gene Kiver et al.

* * * * *

Bill Halliday reports finding some possible glacier cave entrances in a Mt. Baker climb in August 1977 or thereabouts.

* * * * *

BAD NEWS: A comparison of the new Maple Falls 7 1/2' quadrangle (1972) with W.R. Danner's map of the Permanente quarry area indicates that both Sinkhole Cave and Big Sinkhole Grotto may be damaged or destroyed by recent expansion of the quarry. On the light side, however: the same quadrangle shows a new, and perhaps more passable, route to the Black Mountain Karst area. Yr editor would like to revisit this area at an early date.

* * * * *

OUR COVER: Geologic map of the Island of Cheju-do, South Korea, showing the approximate locations of lava tube caves. Numbers refer to caves in the list published in the last issue.

FEATURE ARTICLE

The Remapping of Ape Cave

by Dr. William R. Halliday

The remapping of Ape Cave was accomplished in March 1978 after nearly 20 years' intentions. Total length is 12,810 feet, so that Ape Cave returns to the top of the list of longest lava tube caves of continental North America.

The original mapping on December 27, 1958 was done primarily for the purpose of determining the slope length* of its main passage, originally guessed to be more than three miles. The 1958 survey yielded the length of 11,215 feet, far more than any other lava tube cave then known to speleology. This figure included the main corridor, the upper level passage at the main entrance, and the parts of the terminal crawlway which were readily accessible. From the beginning, it was considered only a hasty initial job and we intended a more leisurely re-survey as time permitted. At that time, however, few other caves were known in Washington, and we did not foresee the enormous amount of work required by new discoveries during the next few years. Inertia played a role, too, even after the Salt Lake Grotto's discovery that Duck Creek Lava Tube in Utah is 12,054 feet long.

The remapping finally got underway on March 11, 1978, with the plan to begin at the lower end of the cave and survey up-tube. Participating were Charley Anderson, Mike Dyas, Mark Vining, and myself. Mike Anderson celebrated his 9th birthday under the Meatball, with a cake, candles, and presents, and provided some logistic support in the M series (described below). We used a metal, then a cloth 100-foot tape, plus Mike Dyas' Suunto compass and pocket inclinometer.

The lowest crawlway was the first attacked. We called its survey points the C Series. Beyond the low room which was dug open some years ago, chief digger Charley Anderson dug and crawled to a point (point C-1) where digging became too slow to be worthwhile on this particular trip. This point is 13' 11" past a fork in the passage, in the righthand lead; that fork is a good landmark for surveying of future digs here. The lefthand fork was estimated to be 12 feet long. Current length of the C Series is 201.6 feet. Its final point (point C-5) is the drip point below the southernmost point in the notch in the lava diaphragm which ends the main corridor.

Next was the U Series (for Upper Crawlway). Point U-1 is 7' 8" above point C-5. The cave does not end at point U-6. A tantalizing breeze continues but the ceiling height here becomes just 3 inches and the floor is granular lava. Length of the U Series is 151.9 feet. Rather than 100 feet as commonly estimated, therefore, the total current length of the terminal crawlway area is about 364.5 feet.

Then we began the M Series (for Main Corridor). Five stations and 392 feet up-tube, we broke off to map the short upper level which we called the MU and MUX Series (Main Upper and Main Upper Extended). Point M-1 is 16.4 feet above point M-5, beneath the drip point of the northernmost point in

*Slope length is the diagonal length of a sloping passage as read from the tape, with no correction for slope. The lengths of Duck Creek and many other Western U.S. lava tubes are given in this form. In the case of Ape Cave, the slope length and corrected length differ by approximately 25 feet--The Editor.

the notch in the lava diaphragm here. Proceeding north, the MU Series (four stations) proved to be 150' 7" long. Going back around the pillar from MU-1 to the usual climbing point, MUX was found to be 74.2 feet long. Total for the MU-MUX Series thus was 224.8 feet.

The rest of the M Series was uneventful. Point M-44--the last in this series--was established at the drip point of the northernmost point in the notch in the lava diaphragm behind the metal stairs at the junction of the main entrance level with the main corridor. Total length of the M Series was found to be 3,811.7 feet.

The E Series (named for the main entrance) was also completed before a late lunch. Point E-1 is 18 feet above point M-44. We mapped straight through the entrance sink rather than curving to the west beneath the overhang (which would have given us a few more feet of cave). Point E-2 is the large rock on the south side of the base of the masonry stairs. E-3 is in breakdown at the far side of the north grotto, and E-4 is the lava seal at the end of the small room beyond. We did not map or include the ten-foot crawlway leading southwest between the wall and breakdown. Otherwise the length of the E Series was found to be 202 feet.

After lunch we returned to the N Series (N for northward-leading main corridor) which extends from the entrance level junction to the first red wall. N-1 is the same point as M-44.

Just beyond the Big Room Mark Vining spotted a floor level inflow passage we dubbed the V Series (V for Vining). I had not previously noticed it. Point V-1 is at the far end. Point V-4 is in the center of the side passage at the edge of the Big Room Breakdown; point V-5 is at the exit of the passage, on the shelf of the Big Room, between the wall and the breakdown. This is 100 feet from the sharp angle of the wall on the west side of the entrance narrows of the Big Room. Total length of the V Series is 163 feet.

Because of breakdown, the remainder of the N Series went more slowly than did the M Series. It totalled 3301.4 feet. Point N-40 (its last) is the top of the higher rock at the first major red wall. We quit for the night at this point, still wondering how the length would compare with that of Duck Creek Lava Tube.

Next morning we returned under some constraints of time and began the NN Series (northward repeated). Point NN-1 is the same as N-40. In the first hundred-odd feet we noted the openings of several adventitious passages in the granular red east wall but bypassed these and another between NN-11 and NN-12, about 900 feet up-tube from NN-1.

NN-14 (about 200 feet still farther north) is opposite and below the mouth of an upper level inflow tube containing red lavaballs and some major "railroad tracks". This we dubbed the NNX Series. NNX-1 is on the north wall five feet into the passage. NNX-7 is a lava seal. Total length of this passage is 236.2 feet.

Twelve stations and 785 feet farther up-tube, we ran a tape 53.3 feet into a sloping adventitious lead (point NNY-2) in a dead-end chimney. The first 8 feet of this was in the main corridor. From NNY-2 another low lead sloped down dip for about 25 feet, and still other short leads formed a minor 3-dimensional maze. Total length of the NNY series actually is more than the 70 feet we recorded for it.

Otherwise the NN Series was uneventful except for point NN-19 where I chose the point high on a breakdown slab in the misapprehension that the next station would have to be equally high. This added an unnecessary five

feet or so to the survey length which was deducted later, leaving the NN Series length at 2359.3 feet. Its end at point NN-34 is the top root of a stump, near the left wall of the cave, just down-tube from the skylight.

Initial tabulations of all these figures gave a total of about 9,700 feet, which was worrisome. Upon returning home, however, I found an error so that our initial tentative calculation of the total surveyed was a fraction over 10,700 feet. Our previous survey and the NASA longitudinal profile agreed that the rest of the main corridor was about 1,600 feet long. This indicated a tentative minimum length for Ape Cave of 12,300 feet. The length of Duck Creek Lava Tube was clearly surpassed. At the strong urging of the editor of the Speleograph, I threw together a hasty preliminary report for the Oregon Grotto, then began rechecking data and preparing for the return trip the following weekend. On Saturday March 18, during the NSS Board meeting in Vancouver, our team consisted of Patricia and myself from the Cascade Grotto, Roger Silver from the Oregon Grotto, and Ray Beach from the San Francisco Bay Grotto. Mike Dyas decided he'd better attend the meeting, but lent us his inclinometer.

First target this time was the tie-in of the V Series with point N-1; this was easy and quick. Then we hurried up-tube to check out and map the main adventitious passages on the east side of the cave near the start of the NN Series. Crawling up through a succession of squeezes and small rooms from a point about 50 feet up-tube from NN-1, Roger soon announced that he had reached the Dug Entrance. Point D-1 is 6' 5" below its lowest point. I found a shorter way out, leading to a point opposite and 3 feet up-tube from NN-2. The D Series slopes steeply downward to point D-5. D-6 is at the east edge of the tube wall, 56.2 feet from D-1 along the floor. We estimated the length of the route we had taken earlier as about 60 feet, giving a total slope length for the D Series of about 116 feet.

Next was the R Series, also in red autobrecciated lava. This is another steeply sloping adventitious passage, between NN-11 and NN-12, mostly up to and across a sloping room 30 x 35 x 4 feet. Total slope length of the series is 50.5 feet. Just up tube from the NNX Series side passage, we climbed into a superposed upper level (between points NN-14 and NN-16) and found it to be 55 feet long. This is the ST Series.

At the Skylight, the seeming westward-leading upper passage (which we called the FU Series) turned out to be only a cutaround which measured just 27 feet long plus a 5-foot terminal crawlway (which was only estimated) leading back toward the midline of the main corridor.

The F (for final) Series began at the stump point which ended the NN Series, just down-tube from the Skylight. It terminates at the lava seal at the upper end of the cave. We found it to be 1,660.2 feet long. The upper entrance is 5 feet down-tube from point F-15; slope length from this entrance to the upper end is a few inches more than 500 feet.

In the F Series are two superposed upper levels and one inflow passage high on the west wall. The first upper level (which we called F2L Series) is at point F-2, about 30 feet up-tube from the Skylight. It is only about 25 feet long. That at point F-6 (F6L) is 48.5 feet long. The inflow or entrant upper level passage (WS Series) opens high on the wall about 180 feet farther up-tube but is best entered at the southwest margin of the large breakdown room just beyond. It consists mostly of a smooth-floored room in the lee of a lava obstruction or tumulus, plus a very tight intermediate level crawlway running roughly parallel to the main passage. The length of this crawlway was estimated by body lengths. Total length of the WS Series is

about 69 feet. After a stroll in the sun outside the upper entrance, we returned through the cave, checking a few minor leads, for example noting a short upper level near point N-38, estimated to be about 20 feet long [N38I]. Then we returned to Seattle and the calculating and recalculating began in earnest.

The slope lengths of Ape Cave emerged as follows:

Total length: 12,810 feet (3,904 meters). Length measured: 12,668 feet
Estimated: 142 feet (7 passages).

End-to-end length: 11,334 feet
(C, M, N, NN, and F Series).

Length of throughway corridor: 11,132 feet
(M, N, NN, and F Series).

Terminal crawlways: 364.5 feet
(C, U, and fork in C Series).

Superposed passages: 727.1 feet
(U, E, MU-MUX, N38I, ST, F2L, F6L Series. Less main entrance passage 202 feet long, 525.1 feet).

Adventitious passages: 236.5 feet
(D, R, NNY Series; others exist).

Inflow tubes: 229.2 feet
(V and NNX Series).

Unclassified side passages: 101 feet
(FU and WS Series. These passages have little or no superposed portion but otherwise resemble the MU-MUX Series).

Length from main entrance to lower end of main corridor: 4013 feet
(E and M Series).

Length from junction of main entrance passage to lower end of main corridor: 3811.7 feet (M Series).

Length from junction of main entrance passage to upper entrance: 6820 feet.

Length from junction of main entrance passage to upper end of cave: 7320.9 feet.

As for the vertical extent of the cave (I still am reluctant to use the word "depth" for a lava tube cave except insofar as it refers to the depth of the tube below the surface), it turned out that we forgot to take a key measurement: the depth of the upper skylight, alongside the upper entrance, which is the highest point in the cave. The vertical extent according to our survey will be 664.5 feet plus the height of the upper skylight less five feet, the height of our survey line. From the longitudinal profile made by Hyde and Greeley for NASA some years ago, this height appears to be about 36 feet, which would give a vertical extent of 685.5 feet, but it didn't look that high to me. The Hyde-Greeley longitudinal profile, incidentally, shows a vertical extent from the top of the skylight to point C-1 of about 648 feet and I am inclined to suspect a small systematic error in our inclinometer readings.

Obviously, this was not the definitive mapping of Ape Cave. Its parameters clearly were within the bounds of "quick and dirty" figures. Its accuracy clearly is sufficient to determine that Ape Cave is longer than Duck Creek Lava Tube, but its limitations should be properly considered in future studies of the cave:

A. The cave may be somewhat longer:

1. Further digging is possible at the lower end of the lower terminal crawlway.
2. There may be additional upper level superposed passages, and breakdown

or ledges may hide additional confluent or effluent lower level passages.

3. We did not map in the midline of the passages.

4. We bypassed some small adventitious passages.

B. The cave may be somewhat shorter:

1. Slight slackness in the tape was inevitable at most stations.

C. The cave may be either slightly longer or shorter:

1. We estimated approximately 142 feet of the 12,810 foot total.

D. The course of the cave probably is not exactly as plotted:

1. No backsights were taken.

2. Many stations were read very close to the passage wall.

3. No testing was done for magnetic variations in the lava flow.

Copies of the typed version of the survey notes will be filed with the Cascade and Oregon Grottos, so that cavers wishing to update parts or all of it can readily do so. Personally, I would like to see someone conduct a grade 7 survey of at least the main throughway corridor, and that of all the other record-holding lava tube caves of the world. Any volunteers?

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PARADISE ICE CAVES

BY RANGER, MOUNT RAINIER
NATIONAL PARK

A low snow year and warm sunshine have caused great interest this year in the Paradise Ice Caves at Mount Rainier. Record snowfalls have kept the famous caves closed for almost six years. With low snowfall this year, however, many people appear to be speculating about the long-awaited melting out.

It has been reported that the Ice Caves are open, but upon close study by local ranger teams, the only entrances now open are several rather hazardous snow tunnels which may be subject to collapse.

Rangers report that they have been able to enter the main cave by crawling through some dangerous tunnels. They report that the main caverns are still covered by deep snow and that the famous blue light is not getting through.

They also report that the main entrance, the only one that permits safe entry, is not open and will probably not melt out until September, if at all.

In the meantime, there is almost a frenzy among Park visitors to get into the caves. Park officials point out the very real dangers of trying to enter then under

the present conditions - ice fall and snow collapse are continuous in the present hot weather - and some of the snow tunnels wander for several miles under the glacier, which could lead the unwary cave explorer to much trouble. Also, water poses a threat if one becomes wet and cold. Rangers ask that visitors use caution, restraint and patience.

Almost daily surveys are being carried out and when and if the Paradise Ice Caves can be safely entered, the public will be notified.

Walking on top of the Paradise Glacier is hazardous at this time, too. Melting has caused a number of hollows which can collapse and drop a hiker 15 to 30 feet.

SIGNPOST August 25, 1977

Enterprise Science News

Isolation

When Milutin Veljkovic emerges from the Bogovinski Cave in Yugoslavia in July 1979, he may not even know what season or year it is. After two years of isolation 3,200 feet below the earth's surface - if indeed he can stay below that long - he will have provided Yugoslav researchers with data on the functioning of biorhythms in an enclosed sunless environment.

When he descends into the cave in July this year,

he will not be equipped with any clocks, animals or telephones. Instead, a computer terminal will serve as Veljkovic's only connection to the team of researchers above ground. In the cave, he will check urine samples, air temperature, humidity, blood pressure, skin temperature and other factors.

The researchers want to test the stability of his language structure during Veljkovic's isolation, according to Science News. Records also will be made of his sleep-awake cycle. The researchers want to isolate and identify the factors controlling human adjustment to a new environment.

Six years ago, Veljkovic had spent 15 months tending a small number of ducks and chickens for an experiment testing the animals' reproductive behavior in the cave's dark, uniform environment.

Sealed within the extensive caverns cut by an underground river, Veljkovic reported that he suffered from intense feelings of monotony, punctuated by infrequent hallucinations. A clock and a telephone to researchers above ground provided Veljkovic with his only link with the daily movements of time and seasons.

←
Contributed
by W.R.H.

Contributed
by Ed Crawford
(source not
given)
→

TRIP REPORT SECTION

Trip Report

Anderson Mountain Caves March-April 1978

By Clyde Senger

We did make the trips mentioned in our earlier report on this area (Cascade Caver 16(9-10) "September-October 1977"). North of the original finds, Penny, Stan and I located two caves on the same ridge. One that we called Blowdown System (because of the trees covering the entrances) seemed to be very recent as tree roots seemed to be torn by rock slippage downslope. Like the others they were N-S cracks in the rock 10 feet or so deep. Penny came up with the most exciting prospect, a small hole leading into the ridge on a steep slope. The 20 inch diameter passage dipped at about 45° for 9 feet to a squeeze between two flat rocks. We could see a wider crack beyond going down and further into the ridge for about 20 feet. It didn't look safe without a rope so we went on. On the next trip, Roger Pressentin, Stan Senger and I managed to get thru the squeeze and found that there was a small crack filled with rubble leading up and to the south from the very end but not the continuing deep crack we had hoped for. With difficulty I managed to get back thru the squeeze only to discover that the knot in the rope was caught on rocks in the cave below. Fortunately Roger volunteered to rescue the rope. We called this one Penny's Cave.

Near the face of the cliff in the area, we located several other filled cracks and some small openings. On the north face of the ridge there were some cracks between large blocks of rock but only one, Roger's Cave that we considered significant. It dipped southward into the ridge at an angle of -52° for 30 feet. It was just about big enough to get into.

There is another knob with an exposed cliff further north but I could find no cracks on any of it or on another mound to the north and east. However, on the way back, I noticed a very large (10 feet across) dark spot between two rock masses across a small drainage below Blowdown Caves. I practically ran to the spot but found there was floor just a few feet below the surrounding ground.

It appears to me that much of the mountain top has been fractured and moved by either faulting and slippage downslope or by glacial movement at the very end of coverage of the area. I am sure that there are a few more similar caves in the area but I don't think there are any much deeper than we have found. However for those who want to search, the forest on top is fairly open and the clearcuts are about what one would expect. There are some other cliffy areas to the west and southwest that we did not check and a long rather straight trench on the way up which has some cliffs in the timber above it. There is a report of a cave used as a home for a number of years by a hermit on the north face of the mountain, I assume near the base. The timber in the area is getting big enough that it might not be too hard to get around there if one wanted to look. I think I will try elsewhere for the moment.

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*Note: due to the recent delays in publishing, there has been some confusion as to exactly when dues should be paid. I retain on this list certain people who are nominally expired, but who will presumably soon renew their dues.

The Editor

ADDITIONAL NOTES ON CAVES OF TAIWAN

by T. L. Hsu
(in a letter to W.R.H.)

Although I have not personally visited the localities of the caves mentioned in the book "Taiwan the Beautiful", I can tell you a little more about them from information in Chinese here. The caves in this book are chiefly of interest from the viewpoint of the tourist, and most are small in size. They are as follows:

The Yinho Cave--literally a cave near a silvery streaming waterfall. It is developed from weathering of a wek zone in sandstone.

Lingyen Cave at Shihtoushan--also developed in sandstone by weathering.

Hsienjen Cave--a cave of God. Formed by littoral marine action on agglomerate. There are dozens of caves like this, several meters to 150 meters above present sea level.

The Shuilien Cave--another cave formed by weathering of sandstone, near a waterfall.

Cave on pages 62-63--contains Buddhist idols, Has some small calcitic stalactites.

Shuihoutungyuan in Kuantzuling--is not a cave, but a mud volcano. [The photo looks cavernous--W.R.H.]

Cave on page 86--cave at Lutao is littoral, in agglomerate.

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GLACIOSPELEOLOGICAL ABSTRACT

Benedict, Ellen M., 1976. Cave Ecology: third and final week. Speleograph 12 (9): 156-158. Abstr. by editor.

P. 158 notes that there is a small glacier cave in the glacier on Steens Mountain, Harney County, Oregon. A photograph on p. 157 was evidently taken from about 50' inside.

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VULCANOSPELEOLOGICAL ABSTRACT

Newcomb, R.C., 1959. Some preliminary notes on ground water in the Columbia River basalt. Northwest Science 33 (1) 1-18. Abstr. by editor.

P. 4: "At some places the interflow zones [of the Columbia River Basalt] are vuggy, but cavernous conditions rarely are found. Of the several hundred well logs collected from drillers, only a few show that even small caverns were encountered in the Columbia River Basalt."

This is intriguing, being the first published notice yr editor knows of indicating the presence of even small caverns below the surface of the Columbia River Basalt. Perhaps the cavities referred to by the well logs were casts in pillow lava.

CASCADE GROTTO STORE

Bill Capron, Keeper: Phone 784-8497.
Price List, March 1978

| | |
|---------------------------|--------|
| Cave Packs | \$1.50 |
| Carbide | 50¢/lb |
| Judson kneepads, pair | 4.50 |
| Helmets | * |
| Chin straps | .85 |
| Premier Carbide Lamps | 9.25 |
| Lamp brackets | 1.00 |
| Lamp felts | 2/25¢ |
| Lamp tips | .20 |
| Lamp flints | 3/25¢ |
| Lamp gaskets | 2/25¢ |
| MSA Edison Cell Headlamps | * |
| Gibbs ascenders (spring) | 8.50 |
| Gibbs (quick release) | 10.50 |
| Bonaiti D carabiners | 2.50 |
| Bonaiti Locking D | 3.25 |
| Cascade Grotto patches | 1.50 |
| NWRA patches | 1.50 |
| Cascade Grotto decals | .25 |
| NSS decals | .20 |

*Contact keeper for information.

Editor's note: Bill never comes to meetings, so if you want anything from the store you will have to call him.

APRIL AND MAY, 1978 MEETINGS

Attendance at the April meeting was 13; Chuck Coughlin announced that we have a whopping \$200.98 in our treasury. At the May meeting Russ Turner was elected Congress of Grottos representative for the NSS Convention. It was moved by Bill Halliday, and passed, that the grotto formally go on record in asking the Forest Service to acquire the Cave Ridge mining claims to include Cave Ridge in the Alpine Lakes Wilderness. Bob Brown announced that the Hells Canyon NWRA Meet is definitely on for Oct. 14-15-(16), hosted by the Gem State Grotto. The June meeting was moved to the second Tuesday because of the convention.

I have no minutes for the June, July, and August meetings. Could someone please supply some?

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Take
Nothing
But
Pictures
Leave
Nothing
But
Footprints