THE CASCADE CAVER

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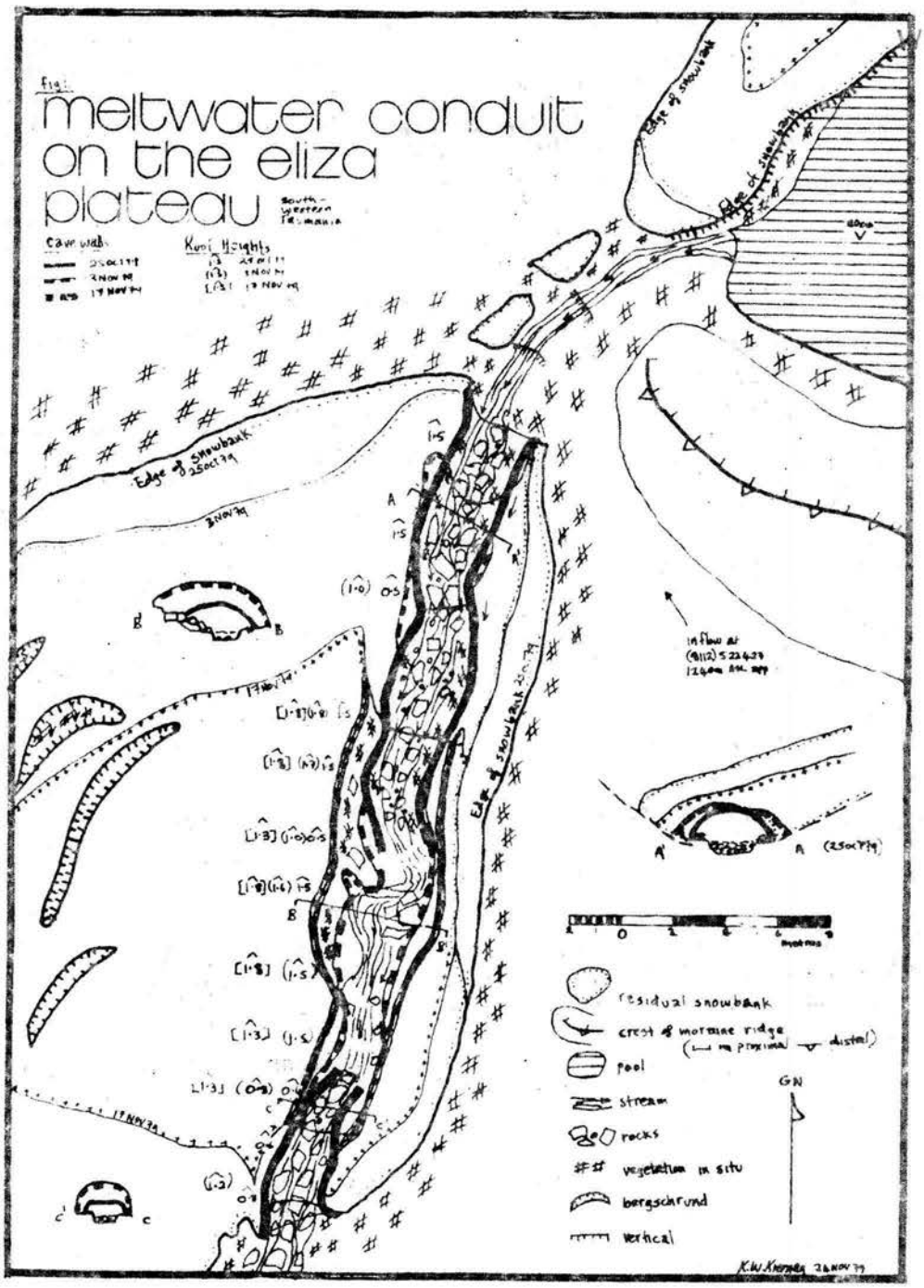

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EDITOR: Rod Crawford

PRINTER: Ed Crawford

MAILER: Frank Haynes

C O M I N G E V E N T S

Field Trip Coordinarot: Geary Sanders, 763-0361

Mt. St. Helens: Our long term permit finally came through, and trips will be arranged at various times between now and March 15. So be prepared to receive a call from Bill Halliday some dark night...

Late December. Trout Lake lava tubes to photograph ice formations. Contact Chris Erickson, 885-6883.

December 22, Monday. Eastern Washington Unit meeting, 8:00 PM, Kennedy Library of Eastern Washington University (it occurs to yr editor that the library might be closed the Monday before Christmas; better find out, and if so, contact Craig Hansen, 235-4649, for alternate meeting place.)

December 26. Hawaii trip leaves from Spokane airport; see last issue for details.

January sometime. Senger's Talus Cave, contact Chris Erickson.

January or February. McLoughlin Canyon Caves, eastern Washington; limestone scouting in Colville area, also E. Wash. Contact: Bob Brown, (206) 569-2724; Craig Hansen (as above); or Rod Crawford, 543-9853 afternoons or late night.

January 10. New officers take office.

January 20, Tuesday. Regular meeting of the Grotto, 8:00 PM at the Hallidays', 1117 36th Ave. E., Seattle. Be sure not to arrive before 7:55, as the family eats at that time. Program: The Cascade Grotto in New Mexico.

January 26, Monday. Eastern Washington Unit Meeting, as above.

February 2. Registration fee due for International Congress of Speleology.

Feb. 14-16, Presidents' Day Weekend. NWRA Symposium on Cave Science and Technology, University of Washington, Seattle.

March (weekend of 1st or 7th). Caving in Nevada; contact Brown.

March 20-22. International Meeting on Tourist Caves, Borgio Verezzi, Italy.

April 14-17. Far West Cave Management Symposium, Portland, Oregon.

July 18-24 . NSS Convention and International Congress of Speleology, Bowling Green, Kentucky. Contact Brown.

NEW MEMBERS

Leonard Hargiss, R10-81, 6151 S. 125th St., Seattle WA 98178, 772-4346.
Andrew Foord, R10-81, 9261 46th Ave. S., Seattle WA 98118, 723-8475.
Joel Skok, 11-81, 4752 91st Ave. SE, Mercer Isl., WA 98040, 232-2656.

CHANGES OF ADDRESS

Frank Haynes, 234-B 107th SE, Bellevue WA 98004, 451-9021.
Kris Hurlburt, 2347 E. Pole Rd., Everson WA 98247, 966-5176.
Craig Hansen: same mailing address, new phone: 235-4649.

Chris Erickson announces the discovery of a significant new glacier cave in the Index area, similar to Big Four. Contact him for details. A report will be forthcoming.

OUR COVER is a map of the Tasmanian snow cave discussed in this month's feature article.

F E A T U R E A R T I C L E

A Meltwater Cave on the Eliza Plateau, Southwestern Tasmania*

by Kevin Kiernan

Although the lack of permanent snow in Australia precludes the possibilities of glacier caves as developed in alpine areas of New Zealand and elsewhere, caves in residual snow-banks have been reported from the Snowy Mountains in New South Wales, while the potential for similar features in Tasmania has gone untested.

The New South Wales cave reported by Halbert and Halbert (1972) occurred near Blue Lake and was 45 m long, 1 to 1.5 m high, with a gradient of some 30° and a pronounced wall scalloping. Other bergschrund-like entrances in the same area were not explored. More recently, a small system with three entrances was found in the same area in 1975, while in 1979 a cave 40 m long and 1 m high was discovered at Perisher Valley, others around Blue Lake, and a cave 4-6 m in diameter on the southeastern side of Mt. Carruthers (Halbert, pers. comm.). Other snow caves have been observed in Tasmania by the writer, related to variations in ablation rate due to preferential heating of darker colored dolerite boulders adjacent to the snow.

Snow Cave Development

Caves developed in temporary snow deposits are characterised by the short time available for their development and consequently often comparatively small size. Speleogenesis may result from flow of meltwater, flow of the host material or biogenic agencies (Kiernan 1978), with enlargement resulting from continuation of these processes and the initiation of air circulation.

Caves may also result from movement of the host material itself, as in bergschrund development due to settling or sub-nivial cavitation, the burial of bergschrunds or talus by snowfall or snow slumping, or by snow glide, a cavity of such origin being illustrated by Perla and Martinelli (1976, p. 57). The burrowing activities of man and other animals may also develop caves, and the differential heating of darker colored materials such as valley walls, talus, and rocks fallen onto the snow surface may also be significant through enhanced ablation and initiation of voids.

A further speleogenetic possibility lies in metamorphism occurring within the snow-pack which may produce small cavities in their own right or at least planes of discontinuity which provide less permeable strata deflecting and concentrating meltwater, air circulation, and biogenic agents. This may be only briefly extant, but could be significant in speleogenesis, and perhaps condition subsequent passage enlargement to a degree.

To date, we know little of the role of such discontinuities in speleogenesis, but can be certain at least that the ground surface itself provides a very significant one, where speleogenesis is enhanced by the warmer temperatures beneath the snow-pack, and water may remain unfrozen much of the time. Solifluction-like processes reported from under some glaciers (W.R. Halliday, pers. comm.) may also have relevance under snow banks in some situations.

A Tasmanian Meltwater Cave

A meltwater cave beneath a residual snow-bank on the Eliza Plateau in southwestern Tasmania was examined by the writer on 25th October, 1979, and again

*A much abridged reprint of the original article appearing in the Southern Caver, January 1980, pp. 2-8 + 2 plates without page numbers.

on 3rd November and 17th November, 1979.

The Eliza Plateau...has been subject to at least two glacial episodes in the Pleistocene...This activity...has left a spectacularly ice-moulded landscape of cirques and deep glacial lakes and sharp arretes. One cirque, on the southern rim of the plateau overlooking Lake Judd, is subject to nivation (i.e. snowbank building) processes along its northern and western rims and is bounded on the southern side by fresh moraine. Its present form is that of a broad bowl, some 300 m long and 150 m wide elongate at about 70°. It is fairly flat floored and at the western end a pool 60 m long, 15 m wide, and with a maximum depth of less than 20 cm, collects meltwater from the remnant snowbanks. The remainder of the basin floor and walls free of nivation are cloaked in low alpine vegetation such as cushion plants and Astelia alpina. The readily sun-warmed pool is drained from the western end where meltwater has cut through the moraine, and subsequently turns to a flow at 195° for 200 m at a mean gradient of perhaps 10° before cascading 600 m off the plateau edge toward Lake Judd.

Cave Description

On 25th October, 1979, the stream was found to encounter a further residual snow deposit lying on the west bank and barely covering the thalweg, where it sank into an entrance 2.5 m wide and 1.5 m high about 15 m from the pool.

The cave continued generally 2 to 2.5 m wide with the ceiling height averaging 1 m, but reaching a maximum width of 3.5 m and height of 2 m near a small waterfall. Toward the downstream end the passage became more constricted, and sanity interceded to halt a naked exploratory crawl up the outflow after only a short distance. Roof thickness varied between 1 and 3 meters, with the tunnel lying 1-4 metres inside the perimeter of the snow-bank (see map on cover).

The walls and ceiling were adorned by large scale scalloping, the passage cross section being flattened hemispherical. However, this profile appeared more irregular where more dense strata in the snowpacks offered greater resistance to removal. Subsequent examination proved these strata to comprise sequences of rounded, strongly bonded crystals frequently in excess of 1 mm in diameter, typical of melt-freeze metamorphism. Snow stratigraphy was readily observable within the cave, with some thin lines of darker colored snow probably representing dust and other material present in the atmosphere during snowfall or blown across the snow surface and buried subsequently.

Overall, the passage appeared to broaden where the stream bed broadened, and with one exception to be highest where the stream gradient was steep, accentuating air flows and splashing of the water. A particularly noteworthy feature was the warmth of the water entering the cave from the sun warmed pool, the air in the upstream portion of the cave being humid and steamy. Further downstream, however, both air and water were considerably colder, although the cave was only 30 m long. In the upstream section, the cave roof was dripping somewhat, but not profusely, despite the warm sunny conditions outside, while the dripping was almost nonexistant in the cooler downstream section.

Cave enlargement was clearly being accentuated by the warmth of the stream, with the cooling of both air wnd water responsible for the narrower dimensions downstream.

Airflow and Cave Enlargement

Once inside, cooling of the air is rapid but moderated by the warmer water. The air temperature differential existing between the ceiling and adjacent to the stream leads to convection and outflow of the comparatively warm but

nonetheless chilled air from the upper entrance, accounting for much of the reduction in air temperature between the pool and inflow sites. The upstream portion of the cave tended to become steamy at times, particularly with a person inside, and occasionally blew steam up to 3 m from the upstream entrance.

As cooling occurs, the air is less effective in passage enlargement, and hence conduit diameter tapers downstream. However, cooling is in large degree a function of the proximity of the cold walls and ceiling, and the air is more aggressive towards the snow nearer the stream. Hence, as the passage enlarges, warmer air and water is able to penetrate more deeply into the cave such that enlargement of the upstream section slows while that downstream is expedited, leading to the preferential development of the downstream section of cave noted between the first snd second visits.

The wall scalloping, while confused toward the downstream end, indicated clearly the outwards flow nearer the upper entrance, already described as being generated by processes occurring within the cave itself. Typically, the scallops were 30 cm long with a depth of perhaps 10 cm and considerable width, sometimes nested in larger scallops covering almost the full width of the passage.

Third Visit

The cave was still present when the plateau was visited on 17th November, 25 days after the initial entry. The upstream entrance lay 10 m beyond the initial inflow site, and the outflow entrance had retreated over 4 m upstream. The collapsed upper section had been only thinly roofed on the previous visit, and the remainder was roofed by generally less than 1 m of snow on the third visit, when the maximum thickness was just under 2 m. The passage had broadened somewhat in the central section, but with little increase in height. However, the final few metres to the outflow were more than double their original height.

The snowpatch had receded substantially from its previous position, retreating vertically by perhaps 1.5 m.

A wall pocket from which a small trickle had issued, promising a small side passage on the previous visit, had vanished due to broadening of the main passage, revealing the source of the water to be the burrow of a yabby or freshwater crayfish, Parastacoides. The water was fountaining up to a height of 5 cm under pressure, indicating another possible mechanism for void development at the base of the snowpack.

Light Intensity

Approximations were made by facing a Pentax Spotmatic camera upwards at the snow surface 10 cm from the ceilings. At 1/250th of a second, a reading of f16 was obtained under approximately 15 cm of snow declining to f11 under 20 cm and f2.8 under a roof 1 m thick. Under slightly less than 2 m of snow a reading of f2 at 1/60th second was obtained. Cloudless conditions prevailed.

One noteworthy feature of this and indeed most snow caves was the striking refractive effects, the walls and ceiling being colored a beautiful aqua color, darkening to a deep blue light which seemed to fill all the cave as the roof thickness increased. In addition, light from the upstream entrance area cast on some scallop rims a soft orangy-pink color. Coupled with the beautiful sculpted form of the roof and walls, this made for one of the most exquisitely beautiful caves imaginable, and a lot of time was spent just sitting in the warm water (in the upstream section at least!) entranced by it all. However, these effects were not strong in the much diminished cave on the third visit.

Concluding Comments

The extent to which glaciers are diminished by internal and basal processes through karst-like degradation has received inadequate attention, but the same may be even more emphatically stated for snow banks. Discontinuities in the snow stratigraphy, the ground surface, and darker colored materials may all be significant speleogenetic sites. To a degree, the sun warmed pool makes this particular atmospheric ablation cave unusual, but if it develops again, it may provide useful access to the snow/ground interface which is likely to be a profitable site for future attention. Although Perla and Martinelli (1975) note that absorption of incoming solar radiation occurs primarily in the top metre of the snowpack, it is probable that some penetrates a deal further--in photographing this cave, natural light was sufficient even beneath considerably more than a metre of snow.

The extraordinary beauty of this paricular cave; the development of an internally generated air circulation even within such a short length of passage and its effect on cave morphology; and the questions remaining with respect to speleogenesis and enlargement, all demonstrate the worth of glaciospeleological activity even in Tasmania.

Due to the topography of the site with its fairly substantial catchment area, cave development there is likely to be a fairly regular seasonal occurrence. The 1979 winter was one of comparatively warm temperatures and limited snowfall. It is probable that under conditions of heavier snowfall, deeper snow banks, and longer snow lie, and therefore longer period available for conduit enlargement, the meltwater cave developed at this site could attain even larger dimensions.

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[Editor's note: This report has been abridged from the original version by omitting the entire sections on temperature data and fauna, and major portions of other sections, for reasons of space.]

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VULCANOSPELEOLOGICAL ABSTRACTS

by W. R. Halliday

Starr, Linda, 1980. Twin Peaks Volcanic Vent (or Caja del Rito Pit). Southwestern Cavers, Vol. 18, no. 1, Jan.-Feb., pp. 8-10.

This is a basalt chimney cave near Santa Fe, said to be 130 to 150 feet deep with an oval mouth 12 by 20 feet, and a free rappel descent. The lip is a little difficult. The trip was by limeys, and no vulcanospeleological details were included (In Feb. 1968 Doug Rhodes mentioned a similar lava pit 120 feet deep, about 60 miles WNW of El Paso, near or at Aden Crater. He recalled a 50-foot cave at the bottom, from which guano had been mined.)

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FIELD TRIP REPORTS

Maple Falls Postscript
16 March 1980

by Clyde Senger

After a few problems in getting together, Stan, Roger, Kurt Omie and I got away for another trip to the quarry caves on 16 March 1980. The weather was pleasant when we left Bellingham, but was light rain when we got to the quarry. There was also four inches of wet snow on the ground.

I wanted to try the lower cave first, but was outvoted. We found things at the upper pit (Temporary 2) like they had been last week. We removed some of the loose rock at the lip of the pit, put a log in place, and tied on a rope. The younger generation seemed to be reluctant, so I tried my first vetrical caving. The 20 foot drop was no problem. The pit opened out to about 7 feet in diameter at the bottom, but there was no continuation in any direction. All the material in the bottom looked like it had fallen during blasting, and there was no way of knowing how deep it was. Further, the north wall of the pit was partially shattered by the blasting and several large pieces looked ready to fall. I was in a hurry to leave, but did not want to climb our rope, so I started up the back wall. There was no problem with footholds. Unfortunately, the best route was over the loose material and some of it came loose. I made the top without problem, and really do not remember how much I relied on the belay and how much was climbing at the last.

Since no one else seemed interested at that point, we packed up and proceeded on up to the top to look around some more. Stan and I went north along an older road. It sloped up more than I realized from our earlier trip. There was a pile of broken rock at the edge of the canyon, and Stan gave it a try. He reported a small apparently natural opening going down but too narrow to enter. Obviously, the area had been blasted, so we did not push the cracks. Around the corner was another cliff face, but no evidence of caves. We went back and then down the north edge of the quarry. A road crossed the creek, which soon disappeared into the rubble. Beyond was a small spring but no obvious opening. We could hear another creek to the north, but did not check it.

I wanted to have a look at the lower cave, Temporary 1. I was sure it would lead somewhere. The rain was heavier now, so Roger and Kurt left. The upper entrance was now a three inch gap above wet mud. The lower entrance looked the same but I soon found that the dirt there was now a slick sticky mud. Fortunately, I had on coveralls and gloves. I found that Stan had been right--there was only the single room, 15 by 20 feet, 1 to 4 feet high. There was also no stalactite. Apparently I had seen a white spot on the ceiling. I also saw some rubble on the floor from the recent blasting, and some loose ceiling blocks. The ceiling and walls were scalloped, so I threw out a few loose pieces from the mud. The dirt had slumped in one place, and outside there was a short passage leading in that direction. Stan checked the face of the cliff to the east and found a seam of mud which must have been an extension of the cave. I strongly suspect that there is more cave to the north if one wanted to dig it out. There apparently had been more down and to the south, but that area is now loose rubble.

All in all, rather a disappointment. However, we want to get back into the area in the summer to look around for holes and perhaps if they have blasted

some more, another temporary cave.

There were two geometrid moths and some mosquito-like gnats in Temporary 1. Didn't look around in the pit.

The Karst and Northern Italy, March 26-27, 1980
by William R. Halliday, M.D.

Springtime in Italy! The International Union of Speleology couldn't have chosen a more beautiful time for its international symposium on uses of karstic areas. However, it also was Spring Vacation, and it seemed that half the college students of northern Europe were on the trains or milling around in Florence and Venice, and rooms were expensive and hard to find.

Not in Trieste, however; the local speleologists did themselves proud on the local arrangements for the symposium. It was delightful, of course, to see old friends like Tony Klingendrath, who went caving with the grotto a couple of years ago, and to meet new ones from all over Europe. And it is fun to practice the mixture of languages everybody finds themselves conversing in, since very few European speleologists speak each others' languages really well. Especially thanks to simultaneous translators and earphone radio sets, the symposium went very well and the hospitality was marvelous. After the formal final luncheon, the local cavers took me to a farmhouse on the slopes behind town, to drink local red wine and sing scurrilous and seditious songs far into the night. At least I suspect they were scurrilous and seditious; everybody was having a great time teaching me words I couldn't understand. Especially one that has a refrain: Ai luv eyoo, Jahnneee...

Next day, another old friend drove me to Postojna, about 30 miles farther east in the Karst, to the Institute of Speleology, then on to Predjama, the huge cave system opening on a cliff, with a first class castle built into its mouth. Commercially developed but not excessively. The castle extends right back into the cave. There is a much larger lower cave into which a sizable creek flows, with beautiful speleothems deep in the mountain, but this is not yet open to the public.

This area of Italy and Jugoslavia is The Karst (Il Carso in Italian), the area for which all other karsts are named. The limestone drops right down into the sea, and the area has great beauty. The unspoken theme of the symposium was the preservation of The Karst from industrial pollution, and it appeared that a significant step forward was achieved.

When I had last visited the Karst, I had done quite a bit of caving, so this time I concentrated more on the environment and the people. This included a stop in Venice (just beyond The Karst, around the curve of the upper end of the Adriatic Sea) and then Florence, a considerable distance farther west. Here I was bemused by the artificial Grotto of Buontalenti, right in the heart of the cultural center of the Renaissance in the gardens of the famous Pitti Palace. Built in 1583-88, it is a fantastic structure of stucco, speleothems robbed from local caves, and beautiful murals. The Medici family is world-famous for its love of art, but clearly someone in it also loved caves and wanted one right alongside their fabulous palace. Unfortunately, this Italian example also led to the robbing of British caves of their speleothems for similar artificial grottos during the later Age of the Grand Tour. From there, the idea of artificial grottos even spread to Miami, where there are two in the garden of the Viscaya estate. Fortunately, however, these have only artificial speleothems. At least three fancy gilt tables in the palace have cave onyx tabletops, but these are NeoClassic--much later than the grotto.

Milan is the international airport for northern Italy, and we returned there from Florence to fly to the Azores. We had just an hour in the airport in Lisbon, so I can't report on mainland Portugal. The Alps were mostly socked in, but we did get a good look at Barcelona and Madrid en route, and limestone canyons in southern France that really look great for a future field trip.

Grotto Trip Ashed Out
by William R. Halliday, M.D.

Usually, practice trips of the grotto's glaciospeleology group aren't reported in the Caver because no caving is involved. But the trip of May 18, 1980 wasn't a usual one. It was the first one in the history of the grotto that was ashed out.

Things started normally enough; leaving Paradise Ranger Station a bit late for crevasse practice on the Nisqually Glacier. At 8:30 (by my watch) we took a short breather at about the 5800-foot elevation, on the Skyline Trail alongside Alta Vista Ridge. It was a beautifully clear morning; Mt. Adams was visible to the southeast, and the upper few hundred feet of Mt. St. Helens had just come into view as we climbed. We remarked on how different it looked with the new crater on the north side, and grey snow and darker streaks. Then we turned and plodded on up the snowy slope.

Three or four minutes later I turned to say something to Chuck Coughlin, and noticed that there was a small greyish-brown cloud around the summit of Mt. St. Helens. "Hold up!" I hollered to the trio ahead. There was barely time to agree that it was interesting to see an eruption, even if it was a little one. Then it wasn't a little one any more. A column of dirty grey mushrooming smoke rose and rose and rose, then a hugely wider base followed upward for mile after mile as lightning played and thunder rolled. Two white cauliflowers appeared briefly near the right base, then were swallowed up in the brown. The base grew laterally, right and left of the main column, and continued to rise. Four or five miles up, it intersected a barely visible moisture plane in the atmosphere; instantly this turned milky and the air below gradually began to turn hazy--far beyond the column.

Fascinated, we halted the hike and watched; first from the trail, then from Alta Vista Point, for a better view: truly a grandstand seat. The mushrooming of the cauliflower-shaped heads of the vertical column of brown-grey ash continued upward and upward, perhaps for a vertical rise of ten miles. Then it began to broaden at the top and lose its cauliflowers and look more like a tremendous plume of just plain dirt curving toward the east. And it started to look like it was coming northeast rather than just east. And there we wuz, about 50 miles away and just a little more north than northeast.

At 9:30 we spotted what looked like heavy rain coming from the northwesterly end of the giant column: time to get off the mountain. By the time we reached the parking lot, the first grey ash and gravel already was staining the snow. By the time we had passed the Visitor Center, we were in a strange brown rain of dry cinders and the snow was black. Within a few more minutes, we couldn't see ten feet on the switchback curves. Occasionally a car passed, going uphill, and swirling dust blocked all visibility. At Longmire, more than an inch of cinders already covered the road. Fortunately, it wasn't slick, and we made good time where we could see the edges of the road. Here and there, it was as dark as in the eclipse in February 1979.

At Park Headquarters at 10:30, the ashfall was considerably less and we stopped to see if help was needed anywhere. What was wanted was for everybody

to get out of the area, so we did, heading for Chehalis via Tenino. Along the way, we saw that the lower atmosphere had become very hazy. Ash was falling within two or three miles of state highway 507 southeast of Rainier, Tenino, and Bucoda, which was getting awfully close to Puget Sound. The freeway was closed, but not the Jackson Highway, so we drove south to Ethel and Toledo in search of vantage points for up-wind photos.

In this whole area, the top of the column was lost above the cloud level we had seen form from Mt. Rainier and the lower part was lost in a greyish haze; the middle part wasn't visible very well because of bluish haze now evident everywhere in the southern and eastern sky. So we gave it up and headed back to Seattle on an empty freeway, considering ourselves really ashed out.

I might add that we washed the car in Centralia, and I washed it again in Seattle, and still can't get all the ash off. The larger gravel evidently penetrated the paint and chrome on impact, which was surprising as Chuck Coughlin and others were struck by bits of gravel several mm in diameter without even feeling pain because they were so light. And no, we didn't hear the eruption. We heard plenty of thunder later, though, and saw some really fantastic lightning effects with ball lightning and standing flashes. The most impressive thing, however, was the larger secondary column of ash and gas which evidently swept across the valley and up the mountains to the north, northeast, and northwest, then upward. Nothing could have lived in that seething cloud.

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R E C E N T L E T T E R S

From Tom Miller May 15, 1980

Got down to Belize with six others over Christmas. Mapped 4600 m, including 300 more in Petroglyph Cave. 3.4 km was in the new massive caves in southern Belize. Just returned from the 1980 Castleguard trip--an additional mile was found and mostly mapped, including a 500-foot pit series. Many leads still left, nothing major.

I'm to be working in the western U.S. this summer, probably the California Sierras. Can you put me in touch with some rabid cavers in the area, or send me a few leads and/or references to the caving there? I'm familiar only with Lava Beds Nat'l Monument. I would imagine Caves of California is a bit out of date. Is ther anything more recent? Cheers, Tom M.

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From Jay Rockwell September 2, 1979

The best cave in the Juneau area is apparently Lemon Cave which is the drain for a dumping lake in the Lemon Glacier. But perhaps Montserrat told you about that.

Our Chitistone II trip was postponed due to high water. We hope to have two legs, one with Richard Hall going in on Sept. 17, and coming out the following week, and another with me going in on the plane that takes them out. Bob Bastasg and another friend from Livermore, California will be with Rich and the Jacques from Fairbanks will be with me. As the plane we plan to use carries 4 passengers plus gear we have room for one more on each leg. If more want to come, call us anyway as it may be possible to work in other flights. There may be other activities in the area. Possibly some Cascade cavers would

be interested.

The steam caves on Mt. Wrangell are being watched by someone at the Geophysical Institute in Fairbanks. I hope to be able to check on this during the Alaska Science Conference being held there on the week of the 17th.

We would be interested to hear of your Hawaiian trip if you don't write before.

Tom Hallinen has been in some of those lava tubes that are said to be the world's longest. His address is in the Alaskan Caver vol. 3 #2. Best, Jay.

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From Robert W. Carroll, Jr., Potsdam, New York: Sept. 17, 1980

Another grueling vacation in Maine and Vermont is at last past, and a new area has been added to my list of promising talus areas. The "last third" of New England, and especially points north of the 45th parallel, are now wide open, though on a once-a-year basis because of the driving distance. Somerset Co. in Maine yielded a 250-footer, but Baxter Park--an area of spectacular terrain and good granite--yielded the best stuff. Leading the list so far is Pathfinder Cave, a 1000+ foot granite talus system that is a 10 mile hike each way (or 8 mile, if one wants to climb 3200 feet and descend 2600 feet), and is further north than Montreal, Minneapolis, or Portland (Oregon, that is!) [Editor's note: somehow, from my vantage point, that doesn't seem very far north...] Lesser finds included a 400+ footer and 300+ footer, and an abundance of unchecked talus fans could take decades to examine. For some strange reason, the area so far failed to yield any "coral" speleothem displays that occur in similar talus further west. Fragmented areas of possible tectonic significance also exist there. Meanwhile, hope you and Cascade Grotto have had a good summer caving.

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PRESENT EXTENT OF PARADISE GLACIER CAVE
Two Differing Accounts

1. The sensational newspaper account: AP report, "Rainier Park ice caves may be dying from same forces that formed them," Seattle Times, Aug. 14 1980 B10.

The Paradise Ice Caves, formed near one of the most popular park visitor centers in the country, may have made their last appearance, national park officials fear. The caves--once recognized as the longest glacial caves known--are distinguished by their sparkling blue hues. They are being destroyed by the same forces that built them--time, wind, and water. The tunnels are sculpted by air currents moving through a water-cut channel beneath the ice of Paradise Glacier. Tunnels range from small ones that require an explorer to stoop, to magnificent chambers as large as 50 feet across and half that high.

This summer's warm weather already has melted enough of winter's annual snow deposits to bring some of the caves near Paradise Lodge into view. It is the first time in about a decade that the caves have opened to allow entrance this early. But the caves that are accessible this summer may not be the same caves that have made Mount Rainier and Paradise famous among spelunkers. Larry Henderson, park public-information officer, said the "Old Paradise Caves" are closed and may never open again because of the mountain's changes. The caves that have been explored this summer are smaller caves, averaging about 15 to 20 feet wide with ceilings about 12 to 20 feet high, located about three miles

up the Paradise River system on marked trails.

Last summer, the old caves were accessible for about three weeks, from late September to mid-October, park officials said. That was the first summer in several that the caves were accessible at all. During the winter of 1971-72, a record amount of snow--1,122 inches--fell at Paradise, and other heavy snowfalls followed. And, while some feared the ice caves never would be seen again, annual snow melts gradually outpaced snowfall. Some observers say the caves were not the same as prior to the big snowfall, leading to the speculation that they slowly are deteriorating.

2. Report of an experienced glaciospeleologist:

Paradise Ice Caves Shrank in 1980

by William R. Halliday, M.D.

On Saturday, September 28, I took advantage of some of our rare 1980 good weekend weather, and ran up to the Paradise Ice Caves for some photography. They were the most beautiful I had ever seen them.

However, the system has shrunken a great deal. Every bit of the névé accumulated in the record snowfalls of the early 1970s now has ablated from the Paradise River drainage, and most of it also has gone from the Stevens Creek side. The glacier is thinner than I have ever seen it before, and retreating up the basin. In some ways, the cave is rather like it was in 1968, although what should be the Pillar Passage is now a separate, partially collapsed outlier and I didn't see any remnant of the Big Room passage at all. What then was Misery Crawl Passage is especially beautiful. And to my surprise, Cornice Cave is still present and of impressive size.

I made no attempt to go beyond the spectacularly illuminated lower corridors, but visitors were going up the stream passage despite NPS warning signs and raging water. I did not see any speleothems, but moulins were prominent; one best heard from the top of the glacier was making the classical grinding noise that caused the French to call them "mills" in their language.

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VULCANOSPELEOLOGICAL ABSTRACT
by Craig Skinner

Heyden, Doris, 1975. An interpretation of the cave underneath the Pyramid of the Sun in Teotihuacan, Mexico. American Antiquity, 40 (2): 131-147.

This is a fascinating journal article describing the late 1971 discovery of a 338-foot long lava cave that lies directly beneath the Pyramid of the Sun in Teotihuacan, the largest prehistoric site in the New World.

This pyramid, located in the Mesoamerican highland near Mexico City, is one of two massive stepped pyramids in the area (the other, appropriately, is named the Pyramid of the Moon). The Teotihuacan site, which includes the pyramids and much more, covers about 20 km^2 and was estimated to have had a population of from 50,000 to 100,000 inhabitants. It collapsed as major center of power in about the 7th century AD. The Pyramid of the Sun, one of the largest structures ever created by American Indians, measures 64 meters (210 feet) high and 210 meters (689 feet) square at the base.

The following is excerpted from the article:

"Toward the end of 1971, a depression at the foot of the main stairway of the Pyramid of the Sun in Teotihuacan was examined by Ernesto Taboada, then in charge of the archaeological zone, who found the entrance to a seven-meter

deep pit that had been filled in with rocks and rubble many centuries ago. When cleared, it revealed an ancient, semi-destroyed stairway cut out of bedrock, leading down the pit. This man-made stairway led to a natural cave-tunnel penetrating the bedrock underneath the pyramid and ending in a series of chambers in the form of a cloverleaf.

"Frederico Mooser, a geologist of the Mexican National University's Institute of Geology and consultant to the Institute of Anthropology, examined the cave. In his opinion it is a natural formation, the result of a lava flow that occurred more than a million years ago. As it flowed into the Teotihuacan Valley, bubbles were formed, and when new lava flowed over them, the bubbles remained as subterranean caves and often served as outlets for springs. The tunnel and four end chambers were formed this way, although the latter show man-made modifications. In addition, two other chambers branch off on either side of the tunnel about midway. Ancient Teotihuacan man also plastered the walls with mud and roofed parts of it with basalt slabs. Some of these slabs are in situ on part of the ceiling.

"The existence of this cave must have been known when the Pyramid of the Sun was built, inasmuch as the entrance to the 103 meter long tunnel coincides with the middle of the pyramid's original central stairway...and the tunnel itself ends in a series of chambers almost directly under the center of the pyramid.

"Although no remains of mural painting or decoration are visible, the cave-tunnel once was partitioned by a series of walls that crossed from one side to the other. These walls indicate that parts of the grotto were closed off at different times. Originally 25 to 30 chambers were formed this way. Walls in situ when the archeologists penetrated the cave contained openings in the upper half that from all indicathions were made long ago by vandals. The cloverleaf, or four-petaled flower, at the far end of the tunnel is formed of four chambers. If different sections were sealed off one by one, this natural cloverleaf would have been the first to be closed. This suggests an early cult to caves in which these end chambers would have constituted the sanctum sanctorum." Mooser's explanation of speleogenesis here is, in my experience, rather a unique one. [Editor's note: although Teotihuacan is a lava tube area (see article in Cascade Caver v. 17 no. 11-12 pp. 58-60), I have doubts that this particular tunnel is a lava tube. The original map--of which the article here cited gives an undetailed reproduction--shows that all the walls are composed of artificial materials. This map was reproduced in the same Cascade Caver article.]

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VULCANOSPELEOLOGICAL ABSTRACT
by William R. Halliday, M.D.

Montoriol-Pous, Joaquin, and Oleguer Ecola, 1975. Contribucion al conocimento vulcano-espeleologico de la isla Floreana (Galapagos, Equador). Speleon: Monografia I., V. Symposium de Espeleologia, pp. 57-67.

The caves of Floreana are the smallest of those on the three Galapagos islands found to have lava tube caves by Montoriol's "Galapagos 75" expedition. The caves of Bahia de las Cuevas are small epigenetic shelters in pyroclastics and not lava tubes. Cueva de Post Office, near the northern tip of the island, actually consists of two caves two meters apart. The upper cave is 38 m long and the lower 202 m. The intervening obstruction consists of pyroclastics. The lower part of the lower cave continues below sea level; its lake is tidal.

RECENT MEETINGS

18 attended the JUNE MEETING. The following monies were appropriated: $20 for petty cash to the Treasurer; $20 to the Membership Committee; $35 to the Register Program; $35 to the Cascade Caver; and $35 to the production of the Cascade Grotto Handbook. (This last never occurred, and yr editor wonders where the money went). It was announced that the Issaquah Alps Trails Club had rediscovered long-lost Don's Cave and were willing to lead us to it (this subsequently occurred).

At the JULY MEETING 19 attendees voted $30 more for the Cascade Caver and $21 for magazine advertising. Of the $65 voted to the Caver at these two meetings, $40 was actually received by the editor-----new treasurer take note.

15 attended in AUGUST. It was announced that former member Bruce Unger was recently killed in a caving accident in Colo. A new section in Operating Policy H about Caving Game Certificates was approved. The editor was directed to request members to consider the possibility of a change in meeting date. Any members with preferences in this matter please contact the Chairman with your ideas.

In SEPTEMBER, 16 members voted $40 to the Program Committee. None of this has been received as of this writing (December 19) and that is why we have not had any programs at recent meetings. The previous $21 magazine ad appropriation was amended to $29. The Chairman announced that Geary Sanders is the new storekeeper and that next year's Regional Meet will be sponsored by us at Concrete.

At the OCTOBER MEETING 13 members voted $15 to new mailer Frank Haynes for mailing labels. Bill Halliday announced that he will have no New Years party this year. Geary Sanders (Sales and Publications) and Chris Erickson (Accommodations) were appointed to the Symposium Committee.

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