

THE CASCADE CAVER is published ten times per year by the Cascade Grotto of the National Speleological Society. Subscription rate is \$6.00 per year. Full Grotto dues (voting membership) are \$7.50, and family memberships (not including subscription) \$1.50. Make payments to Grotto treasurer Alan Lundberg, 19221 38th Pl. NE, Seattle, WA 98155.

CONTRIBUTIONS to the Caver are welcome. Send articles, trip reports, trip plans, letters, clippings, etc. to Leonard Hargiss, 6151 S. 125 St., Seattle, WA 98178. If you would like your contribution returned, please include a stamped, self-addressed envelope, or give me a call before a regular meeting and I can bring it.

--ed.

Editor: Leonard Hargiss

Printer: Ed Crawford

COILING EVENTS:

Field Trip Coordinator: Geary Sanders, 763-0361

May 21-26, Memorial Day. Float trip down Pend Oreille River. Will include speleomusement. Contact Rod Crawford, Seattle 543-9853 aft/eve, or Bob Brown, Elbe (206) 569-2724.

June 7. Garage Sale. To be held at Andrew Foord's place, 5514 11th NE, Seattle. Call Andrew at 524-7512, Seattle.

June 13-15. Summit Steam Caves, Mt. Rainier. If we have any steam left, that is. Call Roger Matthews, Seattle 522-0801 (Roger works nights.)

REMEMBER, The Grotto Store rents and sells hard hats, lights and stuff, and rents some vertical gear as well. Call storekeeper Geary Sanders, 763-0361 Seattle, for info.

ADDRESS CHANGES, ETC.

New member:

Ray Cimino, Rt. 3 Box 60-E, Eatonville, WA 98328

Address changes:

Roy Chevalier, PO Box 55, Underwood, WA 98651

Steven McRorie, Box 482, Sudden Valley; Bellingham, WA 98225

Russell Harter, 5430 Kinston Ave., Culver City; CA 90230

ONE SPACE LEFT on the trip to the NSS Convention and International Congress of Speleology, Bowling Green, Kentucky. Contact Bob Brown, Elbe (206) 569-2724.

THE REGIONAL MEET is coming up Labor Day Weekend (Sep. 5-7) at Concrete, Washington. Let's get some trips going to the Windy Creek area--there's GOT to be more up there just WAITING to be discovered.

WHAT? You haven't played The Caving Game yet? Best buy now, because Quantities Are Limited! Special rates for members. Contact Bob Brown, Elbe (206) 569-2724. All proceeds go to the Grotto.

FEATURE ARTICLE:

CAVING IN THE AZORES
MARCH 28 - APRIL 14, 1980

by William R. Halliday, I.D.

It was our first time on TAP--the Portuguese airline, and we were impressed. The Boeing planes are big and comfortable, and the food and wines are excellent. My seatmate turned out to be going to Terceira to teach, and had a brother who is a doctor there, and our first experience with the Portuguese was being swept into their car and homes for a quick visit of that end of the island before we caught an interisland plane to Ponta Delgada on the island of Sao Miguel. It continued that way, with wonderful hospitality, everywhere we went in the Azores. Our base camp / hotel in Ponta Delgada was a huge old house crammed with antiques, extremely comfortable and with millionaire-style service at the cost of a U.S. motel. Right across the road from the ocean, too.

There are no cavers as such in Ponta Delgada, but the local tourist bureau referred me to the right people at the new university, then tracked down the tobacco factory where Robin Bryan's cave* is still enterable--even when nearly everyone thought it had been closed up long ago and was at a different factory. Nobody wanted to go with me, however, so I became an extremely cautious solo caver for a while. No problems; the "miles-long" lava tube paced out at about 4000 feet. The section about which Bryan wrote is about 80 meters long; the electric wiring now is falling to pieces and the floor is very muddy at this season. There is a low sandy crawl at this point, about 25 meters long, then the cave opens up into a spacious corridor with good flow features and occasional breakdown piles. Two other entrances have been plugged; one with cement, the other with trash containing a great deal of plastic which has washed down--tube dismayingly. The tube is unitary, although there are some short braided sections resulting from drained plugs. Near the upper end are some acicular lava stalactites unlike any I can remember seeing in the United States.

This cave is generally referred to as La Gruta del Fabrica de Tabaco "Micaelense". The situation is complicated by the existence of two tobacco factories of this name; the cave is at the lesser-known one, on Rua de Lisboa which I was told formerly was called Rua Formosa. The entrance of this factory lacks a street number but is on the north side of the street, opposite #75. It turned out that the next

* Robin Bryan's The Azores mentions what he considers the same cave described by Webster in 1821 (and presumably by Walker in 1886). It is in the yard of a tobacco factory, and the outer part of the cave is used as a storeroom, with electric lighting. Arrangements were made by a Mr. José Agnelo. Lava stalactites are mentioned, and the cave is said to extend for miles. There are legends of ancient carved stones having been found there.

Bryan, Robin. The Azores. London: Faber and Faber, 1963; pp. 84-86

street to the west technically is now called Rua Eng. José Frederico Ulrich, but the street sign still says Rua do Carvão, so we have Bryan's cave tied to that in the garden recently belonging to Mrs. Brander.

From the small, vertical entrance sink, the cave continues south, under the road, toward a sugar factory, and I picked up a rumor that there is or was another entrance there. However, at present the passage is blocked with silt a few meters down-tube from the tobacco factory and I failed to find anyone with definite knowledge of a lower entrance. The upper end of the cave is blocked by construction gravel.

It takes time to make arrangements and meet all the necessary people, even in a friendly, courteous place where most people speak English. Only as we were about to leave did I see photos of the other cave, reported by Webster and others, some 5 km upflow, and talk to a young dairyman who had led trips into it. It is near a well-known military camp north of the suburb of Arrifes. Also I think I was told of another entrance just west of Arrifes, perhaps connecting to the other. Also in Ponta Delgada are some small lava sinks with short lengths of cave extending from them in a city park or garden: "Antonio Borges." These have been heavily modified by man, but appear to be part of a distributary complex close to the thoroughway of the main cave. They are about 0.8 km northeast of the tobacco factory.

From some of the very courteous and kind people of São Miguel, I learned of other caves elsewhere on the island, which should be investigated. Also it turns out that there is speleoliferous chalk in considerable quantity in the center of the island of Santa Maria, and I have notes about caves there, some of them said to have numerous beautiful speleothems. Calcareous, that is.

The Gruta Arrifes near the military camp seems clearly to be the cave described by Webster and should be the highest priority of further studies here. However, further checking obviously will be needed to clarify the possible locations of other segments of the throughway cave farther south. The entrance near the military camp is said to involve a drop of two or three meters, with the cave going well over 1 km up-tube and about 1 km down-tube. The entrance clearly does not segment this part of the system. The next priority probably should be a cave northeast of Ponta Delgada, near Calderon, with a 20-foot entrance drop followed by a spacious corridor, then another drop which is believed unplumbed. Vertical gear is needed. Another at Fogo was intercepted by a water tunnel recently and carries a major flow of water. Still another on the road to Lago do Fogo is probably smaller.

When we returned to Terceira, we were greeted enthusiastically by the president, secretary, and treasurer of Os Montanheiros, all named Manuel. Manuel Aguiar de Silva is president; he is called Aguiar. José Manuel da Costa Cliveira (called Oliveira) is secretary, and José Sousa (called Sousa) is treasurer. We stayed at Aguiar's home just east of Angra do Heroísmo, overlooking the entrance or Gruta Briza Azul, a littoral cave on one of two islets about 1 km offshore. We got no closer to that one, but spent a tremendous weekend

CIEE

GRUTA DO PAU VELHO

AÇORES

MISSÃO DE ESTUDO E LEVANTAMENTO
TOPOGRÁFICO DOS CANAIS LÁVICOS DE
PAU VELHO - AÇORES - 1966

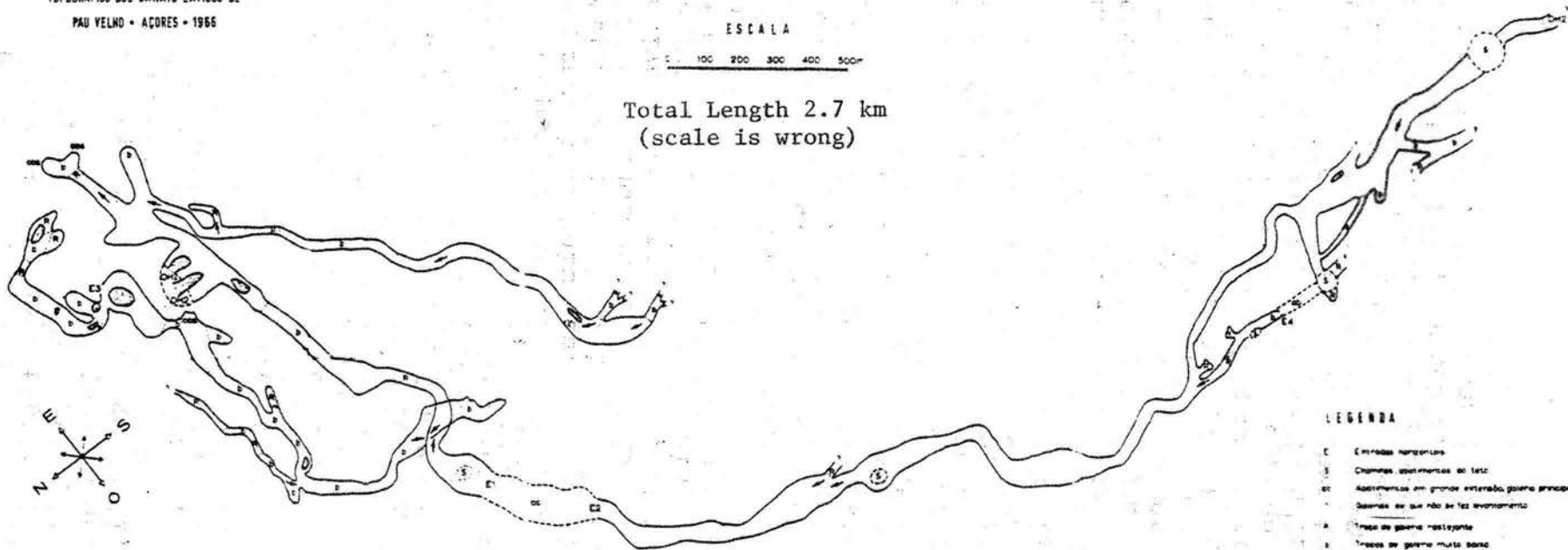
(Gruta Dos Balcões)

ILHA TERCEIRA

ESCALA

100 200 300 400 500m

Total Length 2.7 km
(scale is wrong)



LEGENDA

- E Entradas horizontais
- S Chimneys, depressions of ceiling
- ab Aberturas em grande extensão, galeria principal
- ? Passagens não levantadas
- R Trecho de galeria rastejante
- b Trecho de galeria muito baixa
- obs Galeria fechada por obstrução, queda de blocos
- Direção das correntes de lava
- H₂O Pequenas concentrações de água

ADELINO FONSECA
ARTUR PRAZERES
CARLOS BLECK
FERNANDO RODRIGUES
GONCALO A. SANTOS

TRANSLATION OF LEGEND

- E Horizontal entrances
- S Chimneys, depressions of ceiling
- ab Depressions of great extent, main passage
- ? Unsurveyed passages
- R Crawlway passage
- b Very low passages
- obs Passage closed by obstruction, breakdown
- Direction of lava currents
- H₂O Small pools of water

visiting most of the other caves of Terceira. We did not visit Gruta do Salga (Gruta de Agulhas) near the coast on the southeast end of the island because of lack of time and the comparative unpleasantness of the cave. Agulhas means needles and Aguiar says that there are plenty of them to crawl over. Also we did not visit Gruta Pico Alto, in a comparatively inaccessible area near the highest point on the island, nor the Algar de Funil, which is a small volcanic chimney about 20 m deep near the three Picos do Fogo in the middle of the island. Otherwise we covered all the major known caves of the island. The group has never been able to find the cave described by Fouque, however. And in passing, it should be mentioned that the Furnas de Enxofre is an active fumarole, but not spelean. Os Montanheiros point out that the term Furnas (meaning something like fumarole) is misused locally for caves, but can't do much about it.

Our first cave on Saturday was Gruta do Natal (Christmas Cave), formerly known as Gruta do Cavalo. A side road leads to its entrance, just south of the pond called Lagoa do Negro, which was dammed by the flow containing the cave. It is a complex, braided cave of spacious corridors and stoopways, totalling 250 to 300 m. Many small tubes are present but plugged. One small one is seen in cross section, high on the wall. An altar and dead Christmas trees are prominent in the cave. Os Montanheiros have a festive party here each year, with a bar set up just inside the entrance. Of unusual geological interest is a spiral chimney which apparently represents an overflow tube seen from below.

Thence we proceeded east a few kilometers to the famous Algar do Carvão, which Os Montanheiros have almost finished commercializing. This is the most remarkable volcanic chimney of my knowledge, previously described in the Caver (Vol. 17, no. 5-6). It is much more spectacular than I had expected from that account and diagram, however, being much more vertical and impressive. The side chambers are comparatively short but contain stalactites of a waxy-feeling obsidian unlike anything I have ever encountered elsewhere. The great beauty of the cave, however, is in its abundant SiO_2 flowstone and dripstone, which is most profuse about halfway down, in the pitch which drops into the lake at the bottom. The cave is black and dripping, and bedecked with greenery in the upper part of its jug-shaped throat. It merits much more study than it has received to date. Those of you who have visited the Devil's Sinkhole in Texas can imagine it in half-scale, in dripping black lava, and with the lake barely offset from the initial drop: that's the Algar do Carvão. I was impressed.

Continuing through the Caldeira Guilherme Moniz a few more kilometers, we finished the afternoon with short visits to two more lava tube caves that were amazing to me in a different way: they serve as natural water catchment tubes, and extensive concrete and pipe aqueducts have been built in them. These are the Furnas do Cabrito and Furnas de Aqua. The latter is especially curious because

it has an effluent passage with its own manmade effluent aqueduct. It is on a fairly steep hillside and has several entrances. Road signs point out both caves.

Next morning, we hemicircumnavigated the west end of the island, ending up at the town of Biscoitos, behind a colorful religious parade of the Imperios, an ancient group of whom I need to learn more. Not far above the city water tanks, we entered the down-tube end of Gruta do Opal Branco to see why it is necessary to enter the up-tube end; there is a near-siphon between. The upper entrance is a floodwater ponor and there is much flood debris throughout the cave. It is a short, slightly braided cave primarily notable for thick deposits of SiO_2 below the level of flood waters. Roots and flood debris are incorporated into this. I was told that similar SiO_2 deposits are encountered in plowing and excavating farther downslope.

And finally we drove back toward the center of the island to its most important lava tube cave: Gruta dos Balcoes [see map, p. 119] in the Pau Velho flows. Part of this cave was mapped in 1966, but the cave is much larger and far more complex than indicated on the map. I saw only part of it and lacked time to make the full loop traverse in a low section not shown on the map. Several entrances are present, but do not segment the cave due to its braiding. Most are beautiful for their greenery. Complex flow features are outstanding; pasty tubes-in-tube are especially notable. There are several bright-red columns and stalagmites as well as some brown and white ones. The full size of the cave may not be known; I was told that several entrances downslope have been bulldozed. In any event, it deserves much study and was a fitting climax to a remarkable field trip.

From Os Montanheiros I obtained information about caves on other islands in the Azores which I will summarize in a more formal report as time permits. For the moment it should suffice to say that this is a fine area for caving and speleology, a beautiful countryside, with extremely courteous, friendly people. I hope to return soon.

[for more on the Azorean caves, see Vulcanospeleological Abstract, p.129.]



FIELD TRIP REPORTS

[Editor's note: There has been a dearth of information in the Caver about the effects of the eruption on the Mount St. Helens caves. Dr. Halliday has kindly given us several reports detailing the findings of his trips in the cave area. In this issue is the chronicle of the June, 1980 visit, made shortly after the major eruption May 18 (this page), and also there is a summary of several succeeding trips (page 123). Some of these later trips are described in more detail by Dr. Halliday in other reports in Caver files. These reports I have decided to publish at some later time, as space permits and as members demand. A report on the March 7-8 trip is forthcoming in the next issue.]

MOUNT ST. HELENS IN THE ASH -- JUNE, 1980

by William R. Halliday, D.D.

After an absolutely incredible amount of telephoning and letter writing, I was finally able to put together a party under permit #26 of the St. Helens Coordinating Committee and actually got a team into the Mount St. Helens cave area on June 22, 1980. If a staffperson of Senator Magnuson's office had not intervened when the Gifford Pinchot National Forest tried to say that research would not be allowed on weekends, we would never have made it. As it was, we did not make it in time to study the effects of the May 18 eruption and ashfall alone. Our findings were a mixture of the May 18 and June 12 ashfalls. And under the limitations imposed by the GPNF, we were not allowed to go more than 15 minutes from an escape vehicle, nor anywhere if we lost radio communication with a base station in Portland. We were much indebted to Dale Justice of the Tektronix Employees Radio Club who provided the field radio communications.

As we neared the mountain, the landscape became increasingly gray with ash. Cougar was a ghost town, with only the Cougar store open and doing no business. Ash was everywhere. Beyond a locked gate below the Swift Overlook, there had been much less traffic, but enough to break through crusts resulting from recent light rain, and cause annoying dust wherever we drove, even at very low speeds. Alders were bent to the ground, with a few broken. Evergreens drooped under the weight of the ash. Only a few green tips of new growth broke the monotonous gray.

We went first to Ape Cave, where there was about one inch of ash, in two layers, evidently from the May 18 and June 12 eruptions. A few larger pieces of pumice, some more than 1"x1"x1 1/2" in size, evidently had come from the mountain. The ash had come straight down, and hardly even eddied into the main entrance of Ape Cave. The only thing of interest we found inside was a U.S. Geological Survey tiltmeter about fifty feet into the cave. After making measurements along the steps and just inside the entrance, we went on into the cave

a few hundred feet and installed several stations for measurement of the depth of any ash that washes into the cave, as it did during or after some previous eruptions. Also we placed an emergency cache in the Big Room: drinking water and warm, waterproof clothes, just in case.

Next we had a look at the entrance of Hopeless Cave. There we found a small pond of quicksand-like mud in the entrance sink, half-filling the crawlway entrance. Nobody wanted to crawl in. Nearby were some larger ponds of mud, and at the hairpin turn of road N816, quite a bit of mud was dammed by the road.

Farther north, toward the volcano, things were a lot more dramatic. Just past the junction of N818A, about 200 yards of road N818 were eroded and aggraded by a posteruption mudflow, much of which had come from the old open-pit cinder quarry just north of the road. It appeared to be heading for Little People's and Flow caves, but we decided to check out the Utterstrom's Caves instead, and check Little People's and Flow next time.

Utterstrom's Caves are about 3 1/2 miles from the new summit. We found the mudflow much less here, and only in one gully east of the caves. Additional U.S.G.S. instruments were present in Breakdown Cave and we did not enter it. The ash here was about twice as thick as at Ape Cave, and much coarser. Some of it had slid into various cave entrances, but otherwise the caves appeared unchanged from their preeruption appearance.

A few plants had started to come up through the ash and there were lots of elk tracks and a few insects and birds. Rod Crawford made numerous biological observations and will report on them later.

Participating from the Cascade Grotto were Bob Brown, Rod Crawford, Chris Burdge, Frank Haynes, Gary Herron, and from the Oregon Grotto, Wayne Schoonover (who handled the arrangements for the radio) and Ed and Kathy Block.

THE MOUNT ST. HELENS CAVE AREA SINCE THE ERUPTION: THE FIRST THREE SPELEOLOGICAL VISITS

by William R. Halliday, F.D.

The difficulty of access to the Mount St. Helens cave area since the eruption of May 18, 1980, now is well known. Under permits issued to me as Director of the Western Speleological Survey, teams consisting of members of the Cascade and Oregon Grottos of the N.S.S. were able to enter the general area in June and in August 1980, and on November 10, 1980 Clyde Senger and I accompanied a U.S. Forest Service "Task Force" for a four-hour reconnaissance. At no time have we been able to obtain a waiver of the restrictions imposed by the administration of the Gifford Pinchot National Forest, such as being within 15 minutes' walk of an escape vehicle at all times [for a recent lightening of restrictions by the Forest Service, see p. 127 -- ed.]. Nevertheless, some significant observations have been possible.

On June 22, 1980 a 9-person team visited Ape, Hopeless,

and the Utterstrom's caves. Because of light rain followed by dryness, a crust about a third of an inch thick had formed on the recent ashfall. Where this was unbroken, little or no dust was present but where it had been broken by recent traffic, annoying dust problems resulted from walking or from driving, even at low speed. This began to be a problem below Swift Dam.

At the Ape Cave parking lot, the ash had a distinctly sulfurous odor. Slight drifting had occurred before the crust formed. Irregularly rounded fragments of pumice up to about 1"x1"x2" were found partially covered by ashfall. No one appeared to have trod the Ape Cave trail since the May 18 eruption but U.S. Geological Survey instruments were observed about fifty feet inside the entrance passage. Presumably these were tiltmeters and a transmitter; a large aerial was present near the south side of the sink. Ash was about 3/4 of an inch thick on the surface here. It consisted of two distinct layers, about equal in thickness. Measurements showed that almost no ash entered the cave at the time of the eruptions. It seemed to have fallen straight down, with surprisingly little drift of dust.

The team installed an emergency cache of water and warm, waterproof clothing on the prominent ledge in the Big Room up-slope from the base of the metal ladder. It also installed five stations to measure later accumulations of ash which might wash into the cave as had occurred in the past. All speleologists entering Ape Cave are requested to measure the distance from the ground surface to the underside of the hook at the top of the metal stakes. Two stations are up-tube from the base of the metal ladder; three are down-tube. Stations 3 and 5 have two stakes, the others only one.

With the possible exception of one solitary fragment of breakdown about two inches thick, no one perceived any changes in comparison with pre-eruption conditions.

Hopeless Cave was not entered because of a muddy quicksand which half-filled its crawlway entrance. This appeared to be about six inches deep, and mostly or entirely arose from the ash in the entrance sink.

In the Utterstrom's Caves area, about twice as much tephra was present as at Ape Cave, and it was much more granular. Aside from cinder slides in the entrances of Loss and Surprise caves, the caves appeared unaffected by the eruptions. U.S. Geological Survey instruments were noted in and near Breakdown Cave but this cave was not entered.

Much concern arose out of a very large mudflow which had devastated much of road N818 just northwest of the start of N818A. While headward erosion up a gully had cut the Breakdown Cave road, most of the mudflow debris appeared to have arisen from other headward erosion in the old cinder mining operation north of N818. It had flowed in the general direction of Flow and Little People's caves, and concern also was expressed about Gremlin and Spider caves. The entrance of Little Red River Cave also was in this general direction. Because of restricted time of access, none of this area could be checked at this time.

A lesser mudflow also was noted to be partially dammed by road N816 at the hairpin turn upslope from the main entrance of Ape Cave. Perhaps two inches of hard mud were present on the road, and this flow extended a few dozen yards past the road, along its western side. This road (like the Ape Cave parking lot) was constructed in the streambed this flow was attempting to follow.

On August 23, 1980 the team proceeded to the part of the cave area just south of road N818 which was considered at high risk. Much more erosion and deposition had occurred in the area where the mudflow had been found in June, and additional mudflows had crossed the road farther northwest.

Under the terms of the permit, only the entrances of most of the caves could be entered in most cases, and studies could not be systematic.

Little Red River Cave was studied as far as the base of the entrance pit. Gravity was funnelling tephra into the cave, but none had passed the lip of the entrance pit and only a thin film was present at the lip itself.

Little People's Cave was found to be in the path of a comparatively small tongue of mud which was mainly entering the cave through the "false entrance" in the rubble at the north end of the entrance sink. A maximum of about a quarter of an inch had accumulated near the entrance.

Flow Cave had a few small mudpuddles beneath the edges of the entrance. Otherwise it appeared unaffected.

Spider Cave appeared unaffected. A dusting of ash was noted a few inches inside.

Matters were different at Gremlin Cave. A large, enlarging mudflow was observed arising from melt high on the side of the mountain, with a major tongue extending down the Gremlin Cave logging road. A comparatively small amount of this flow had spilled laterally into the lower entrance of the cave, but this had resulted in accumulation of several inches of tephra in the main axis of the cave passage here. Three stations were installed, of which the lowest was double. The lower part of this cave appeared to be in grave danger of being engulfed, and Spider Cave also was in the direct line of flow.

The upper entrance of Gremlin Cave and nearby Manhole Cave appeared unaffected except for funnelling of tephra by the vertical entrances.

As for caves of the Ape Cave area, Hopeless Cave was found to have been completely engulfed by what appeared to be local mudflows arising in flats within about 100 feet of the sink. About three inches of the eastern wall of the entrance sink and a bit more of the western wall were all that was visible here. This represented an accumulation of more than one foot of mud since June 22, 1980. Farther north, on the Ape Cave trail, the unnamed system of shallow sinks and short caves was being invaded by a larger mudflow which, in retrospect, was a tongue of the flow dammed by road N816 (mentioned above). An attempt was made to enter middle Ape Cave through the dun entrance, but this could not be accomplished within the fifteen-minute limitation.



Small amounts of mud were found to be entering the parts of lower Ape Cave which could be entered, in the form of ceiling spatter points and paratubal trickle channels. The greatest accumulation was less than half an inch.

On August 24, the Utterstrom's Caves area was revisited, with special attention to Railroad Tracks Cave which appeared unaffected except for tephra sliding down the entrance slope. Extensive erosion and deposition had occurred in stream gullies east of the upper group of caves. A tongue of mud from these gullies was noted to be headed in the direction of Breakdown Cave which again was not entered.

In general, the cave area had changed very little since the June trip except for the gullying and mudflows.

The November 10 trip was after the weekend of the first heavy autumn rain, and changes were dramatic. The gray-brown snowlike appearance had virtually disappeared, with most of the trees now appearing essentially normal if they had not been broken by the ashfalls. The ash was almost completely gone from the roads and trails, which now looked like they had been washed clean. Alders which previously were bent almost to the ground now were in almost their normal shape.

N816 (the Ape Cave road) showed marked changes beginning near the Lava Cast Picnic Area. Here, the road had dammed a small amount of mud, which had begun to spread across its lowest point. Going up the hill to the main entrance of Ape Cave, running water and mud ponds were seen intermittently on each side of the road, and about 100 yards below the entrance, stream debris showed flow across the road from west to east. A clear stream was running along the west edge of the parking lot, spreading out across the lower quarter of the lot itself. Debris showed that the entire width of the lot had been flooded recently. A lesser amount of flood waters also may have entered the Ape Cave sink, but the clearance of ash may have been due entirely to the heavy rains instead. All the ash was gone from the steps and path. Time did not allow measurements at the stations in Ape Cave, but the part visited (from the Narrows below the Big Room to a point about 200 feet below the metal ladder) showed very little new mud -- an estimated maximum of half an inch in one or two places only.

Farther up N816, matters were startlingly different. More and more alluvium and rocks were encountered en route to the hairpin curve. There an estimated two feet of mud covered the road. Off to the east, a new, wide mud plain had developed, diagonally crossing the midportion of Ape Cave and burying the unnamed sinks and cavelets and Hopeless Cave four to six feet deep.

Proceeding to the upper caves area, enormous changes were found along and near N818. Headward erosion along the north edge of N818 had cut off the major feeders of the Gremlin Cave mudflow, which did not appear larger than in August. However, new gullies had appeared, leading into the Gremlin Cave sink. All three stations had been swept away, and the tephra fill was different in consistency from that observed in August. It appeared that much tephra had been carried into the deeper part of the cave where we were not permitted to go.

Spider Cave again appeared unaffected. More than a dozen hibernating bats were present -- the first seen anywhere in the entire cave area since the eruptions. Flow and Little Red River caves had taken a little more mud, but were not much changed from August. However, they are near the edge of the main trunk of the N818 mudflow, which was impressively larger than in August.

Little Red River Cave and the Utterstrom's Caves could not be visited because of lack of time. A quick visit to the upper entrance of Ape Cave (without entering it) showed that there was no mudflow anywhere nearby.

A great deal of activity has resulted from these observations. Very recently (December 15) I have been able to obtain a new permit, valid until March 31, 1981. Although the nonsensical restrictions make its use very difficult, hopefully we will be able to make further periodic observations through the winter. All members of the Oregon and Cascade Grottoes wishing to help provide field support should sign the liability waiver immediately so that they will be listed for possible selection -- possibly on very short notice. [Concerning the loosening of a few of these restrictions, see the following article.]

NEWS BRIEFS:

FOREST SERVICE EASES RESTRICTIONS IN RED ZONE

Following is the full text of a letter dated March 5, 1981 to Dr. William R. Halliday, director of the Western Speleological Survey, from the Forest Supervisor of the Gifford Pinchot National Forest, Robert D. Tokarczyk:

Dear Mr. Halliday:

We have carefully considered and evaluated your letters of February 22 and 23, 1981, stating the time considerations and the type of volcanic and non-volcanic risks you, Robert Stitt, and other speleologists participating in your studies are willing to accept.

After consultation with U.S. Geological Survey scientists, evaluation of the locations of the caves, and in reviewing our experiences since May 18, i.e., the reliability of scientific monitoring equipment and communications, we are willing to make some concessions in Red Zone rules to your organization so that you can obtain the scientific data you need. We are willing to let you enter the Red Zone to do research under the conditions outlined below. The first six conditions conform with your recommendations outlined in recent correspondence. Item number 7, concerning radio communication, remains an essential need.

1. Entry to the Red Zone will be permitted on

those days when the mountain is not visible, provided, seismic equipment is functioning properly and, provided, a volcanic alert has not been declared.

2. Night work will be permitted.
3. Members of your party must be no further than 30 minutes away from a vehicle, cave entrance, or the Red Zone boundary.
4. Your organization must have an evacuation plan which specifies escape routes; approximate time you plan to be in the closed area; names of individuals; and vehicle make, year, model, color, and license number.
5. You must have essential survival equipment, first aid equipment, and enough food and water to last several days.
6. You must stop when requested by forest officers for a permit compliance check.
7. Maintain a manned 2-way radio system at all times to a manned base station that we can contact in an emergency. A person is to be placed at the mouth of the cave with the 2-way radio so that he can have one of your members alert others in the cave if an emergency occurs. A CB radio system meeting the above conditions would also be acceptable.

Upon notification of your acceptance of the above seven items, we will add them to your existing permit.

We assume the above action results in the withdrawal of the appeal you mention in your letters of February 7 and 22. If this is incorrect, you must submit a statement of reasons supporting the appeal within 15 days of filing the notice of appeal.

Sincerely,
ROBERT D. TOKARCZYK
Forest Supervisor

[The following members of the Cascade Grotto are qualified to lead expeditions into the Red Zone: William R. Halliday, Seattle; Eugene Kiver, Cheney; Newell Campbell, Yakima; Clyde Senger, Bellingham. These members of the Oregon Grotto also are qualified: Patricia Silver, Rick Pope, and Jim Nieland. Those wishing to lead trips into the Red Zone on Dr. Halliday's permit must check with Dr. Halliday first, and must carry a rather extensive amount of equipment.]

BATS IN TROUBLE

The gray bats of Kentucky have been disturbed in their cave roosts over the years by tourists, mining operations, spelunkers, and -- perhaps most destructively -- by local residents who have put large clusters of the bats (*Myotis grisescens*) to the torch or have blasted away at them with shot-guns. Several scientists consider the gray bat one of Kentucky's most rapidly disappearing animals, destined to become extinct in that state -- the northern limit of its range.

Surprisingly, then, it wasn't until 1979 that the first attempt was made to assess the dimensions of the decline. Since there were no previous statistics, the two scientists who made the survey, Alan Rabinowitz of the University of Tennessee and Merlin D. Tuttle of the Milwaukee Public Museum, had to estimate past populations. They did this by extrapolation, using the size of old guano deposits or of ceiling roost areas.

The two researchers found twenty caves that had been used by bats, but the mammals had disappeared from all but eight of them. The eight contained a total of 61,000 bats, compared with the scientist's estimate of a one-time total of 515,400 -- an 88 per cent decline.

...Roxanna Gayre, Audubon 83(2), 22 (1981)

SPELEOLOGICAL ABSTRACTS

Arruda, Luis I. 1972. Contribuição para o Estudo Espeleológico da Ilha do Pico (Açores), Publ. Especial no. 5, Soc. Portuguesa de Espeleol. 12 pp plus unnumbered map page.

This concise publication briefly describes the speleogeology of the island of Pico in the Azores. One of the maps shows flows of 1562-64, 1718, and 1720, plus some other geological details. Described are two lava tube caves and two lava pits. Maps are included for the two pits, Algar da Furna Abrigo and Algar Alto do Larais, and for one of the tube caves, Furna Manuel Jose de Lima. The pits are 39 and 10 m deep, respectively. Furna de Henrique Maciel II extends 235 m up-slope and 290 m downslope (I presume justante means downslope); the entrance is 1.5 x 0.7 m; presumably it does not segment the cave. The other Furna is only 52 m long. Other caves are mentioned.

Ollier and Brown is the only vulcanospeleogenetic paper cited. A 1963 paper by A. Rittman is mentioned but not included in the bibliography. Another 1963 paper, by Forjaz in the Bol. Soc. Portuguesa Ciencias Naturales, on the Furna de Henrique Maciel should be investigated.

-- William R. Halliday, D.D.

Lyroie, John E. 1980. Caves and Karst of El Salvador. Forthcoming chapter in field guide to San Salvador Island, West Indies, Donald Gerace, ed.; San Salvador Field Station of the College Center of the Finger Lakes. 14 pp plus maps and figures. Speleogenesis is complex on the island of San Salvador,

(Speleological Abstracts, cont'd)

with water table control of "traditional" limestone solution caverns from 400 feet below sea level to 22 feet above it. Some caves are associated with the island's freshwater lens that floats on salt water; tidal flow is present in some. Littoral caves are also present, as well as paleosol caves. These are the equivalent of gigantic boxwork. Bat guano locally supports a complex ecosystem.

-- William R. Halliday, I.D.

17 MARCH MEETING

After and between eating and carousing, the Grotto appropriated \$20 to the editor in order to put out this issue. The treasurer was granted discretion to collect unspent funds that were lying around. Finally, Bill Halliday gave a colorful (if monochromatic) pictorial history of the Grotto.

IMPORTANT!

The Caver needs material from you spelunkers, particularly trip reports. Remember, if you are reporting on or planning a trip, you can reach far more people through the Caver than you can at a monthly meeting. Please send trip reports and information on planned trips, etc. to: Leonard Hargiss, 6151 S. 125 St.; Seattle, WA 98178.

THE CASCADE CAVER
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Seattle, WA 98195

MEETING MAY 19!