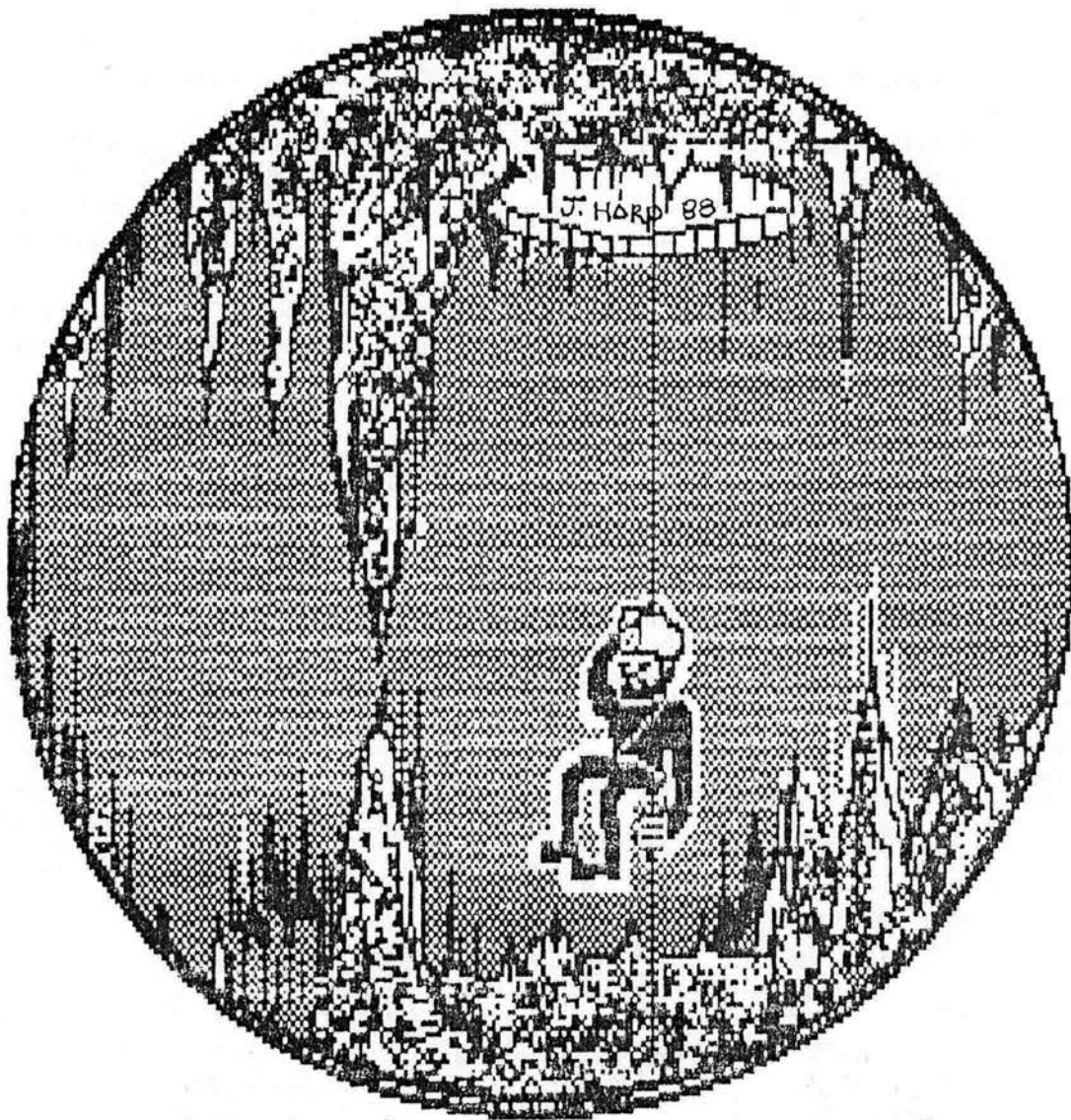


The Cascade Caver



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CASCADE CAVER

The *Cascade Caver* is published 10 times a year by the Cascade Grotto, a member of the National Speleological Society. All correspondence should be sent to: The Cascade Grotto, P.O. Box 75663, Seattle, WA 98125-0663.

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Dues: Membership in the Cascade Grotto including subscription to the *Cascade Caver* is \$7.50 per year. Dues for additional family members is \$1.50. Subscription to the *Cascade Caver* only is \$7.50 per year.

Please note the date on your mailing label that indicates when your dues expire.

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Cover: Computer drawing by Jim Harp.

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Upcoming Events

Current trip list, planned and proposed. Anyone with other trip ideas or who would like to organize one of the proposed trips is welcome to contact Jim Harp, grotto trip coordinator, at 745-1010.

- | | | | |
|-----------|---|---------------|---|
| Apr 22-24 | Mt. St. Helens. Meet 10 am Saturday at the Lava Cast Picnic area. Plan to do Lake, Little Red River, and maybe Gremlin on Saturday. On Sunday Prince Albert and Dollar & Dime. An easy trip with no vertical experience required. Trip leader: Mark Wilson, 285-5724. | | cavers only but there are other caves in the area if other people want to go along. Contact Jerry Thompson at the grotto meetings or via Jim Harp for details. |
| | | Jun 17 | June Grotto Meeting |
| | | Jun 18 | Proposed trip to Windy Creek Cave. Anybody interested? |
| May 15 | Vertical practice. Dust off your vertical skills in anticipation of the Regional. Contact Jim Harp or Jerry Thompson. | Jun 27-Jul 1 | NSS Convention at Hot Springs, South Dakota. |
| May 20 | May Grotto Meeting. | Jul 2-9 | Northwest Cave Research Institute work week at Jewel Cave in South Dakota. Project Coordinator: Steve Sprague, 652-6489. |
| May 27-30 | Northwest Caving Association Regional meet on Vancouver Island. See details in this issue. | Jul 8-10 | Mt. St. Helens upper south-side caves and northern pyroclastic deposits. This access permit includes going to the top of the glaciers. You will need to sign a permit |
| Jun 10-12 | Jerry Thompson wants to get into the new stuff in Dynamited Cave near Trout Lake. This trip would be for experienced vertical | | |

form well in advance if you were not on a previous permit. Trip leader: Dr. Halliday, 324-7474.

**Jul 15 July Grotto Meeting.
Meeting Notes**

The march grotto meeting was attended by 16 people, including four new members and 3 guests. Mark Wilson opened the meeting with a summary of the issues voted on at a previous NSS Board of Governors meeting.

After a spirited debate, Rod Crawford was granted \$5.00 for materials to store and distribute the maps in the grotto map library.

Larry McTigue reported on a cave-hunting trip with Dick Garnick and Rob Lewis in the Chilliwack valley just north of the Canadian border. They found a couple of small phreatic caves with moonmilk and a few formations. One of them had a few pits in it and got down to the water table.

Jerry Thompson showed slides of his trip with Jim and Amanda Harp to Papoose Cave (Idaho) last Labor Day.

Jerry Thompson and Jim Harp announced a trip to McLaughlin Canyon in eastern Washington on April 8,9, and 10th. Bob Brown and Mark Wilson proposed a cross-country ski trip (or snowshoe) to Paradise Ice Caves on Mt. Rainier, basically a ski trip with the cave being open as a possible bonus.

Ken Nichols, visiting from New York, reported on his visit to Ape Cave and told of discovering the grotto through Mark Sherman's sister at AAA.

Looking back over the grotto list I see 14 new or returning grotto members in 1987 and 11 already in 1988. In 1987 we also added one complementary subscriber and two exchanges.

**Survey
Mark Wilson**

Included with this issue of the *Cascade Caver* is a short survey. As chairman I want to make the grotto as responsive as possible to the needs of you, the members. In order to do that I need to know what you think about the club and what areas you feel that improvement could be made.

I am asking that everyone please take a moment to fill out the survey and either mail it to me or bring it to the May grotto meeting. At the April meeting I intend to appoint a committee to review the results.

Thank you for your help.

Utah Lava Tube

Duke Creek Cave is really Duck Creek Lava Tube, noted Dale Green in the December, 1987 *Inner Mountain News*. His short article appeared in response to the list of the world's longest lava tubes printed in the October, 1987 *Cascade Caver*. He also points out that there is a small ice cave in limestone called Duck Creek Cave and so the lava cave is referred to as Duck Creek Lava Tube to avoid confusion.

**The Role of Lava Tubes in Hawaiian Volcanoes
Abstract**

Greeley, Ronald. 1987. The Role of Lava Tubes in Hawaiian Volcanoes. U.S. Geological Survey Prof. Paper 1350, Chapter 59, pp. 1589-1602.

Greeley notes that 30% of the area of Mauna Loa is covered by flows spread at least partly by lava tubes. If related lava channels are included, the percentage rises to 83%. Based on Holcomb's map of Kilauea, 58% of Kilauea's surface resulted from tube-fed flow, and probably more. On Mt. Etna, by contrast, only 18% was emplaced even partly via lava tubes.

Greeley discussed the types of lava tubes found in several locales:

- 1) Near-vent tubes of several types.
- 2) Tubes developed along rift structures (Finch's "rift tubes").
- 3) "Lava tubes related to lava lakes, one type of which connects vents to lava lakes and another type drains lava lakes into long flows.
- 4) Tubes which function in the emplacement of long flows.
- 5) Lava toe tubes, "primary conduits".
- 6) Littoral lava tubes.

He noted two types of near-vent tubes: a) Active lava tubes interconnecting multiple vents in a single pit crater and b) Rapidly-roofed radial channels leading to lava lakes or directly feeding long flows.

He did not mention the small-diameter radial "toe tubes" of shelly pahoehoe lava which are a prominent feature of the 1986-88 Puu Oo flows.

The tube-related observations of many previous geologists are summarized in considerable detail and a

detailed discussion of roofing of lava channels is included. No evidence for lava tube development by internal shearing, as proposed by Ollier and Brown, was observed in any sizeable lava tube. Detailed evidence of erosion by lava tubes is given, including some from Ape Cave. Much other observational data are presented.

He concludes that lava tubes develop from eruptions that typically involve moderate rates of effusion, durations greater than one or two days with the implied exception of toe tubes, and effusion of fluid lava that has not been greatly degassed. In some respects lava tubes act as extensions of the magma-feeding conduit.

In this reviewer's opinion, this paper represents a quantum jump in the geological literature on lava tube caves, and should be studied in detail by all vulcanospeleologists. - William R. Halliday.

Red Hot Hawaiian Caving

W. R. Halliday, M.D.

Marcia and I were not able to get over to the Big Island for the usual December work with the NSS's Hawaii Caves Conservation Task Force, but I made it in January. Chartering a Hawaii Caves Conservancy is almost complete after this trip, and badly needed. Urbanization of "The Subdivisions" southwest of Hilo, overlying some of the world's most important lava tube caves, is continuing and perhaps accelerating, with all the spelean problems that urbanization brings.

On Hawaii the famous Mauna Ulu flows are a thing of the past but for many months the Puu Oo-C48 flows have been rolling along, occasionally engulfing another house west of Kalapana. On the evening I arrived, I went to have a look at their lower end just east of Hawaii National Park. Access through the park is illegal but on the other side of the flows people were walking all over them so my guide and I did the same, wandering down to the ocean where the lava and the waves were in constant conflict. The interaction was very impressive in the darkness, glowing pasty red lava oozing down the flow front and waves of different sizes having various affects on the hot rock. On occasion, the red hot lava fragments would even wash back and forth in the waves for a few seconds. It was certainly safer going at night so we could see where the hot lava was located and where the new tongues were emerging along the way.

On the following day, Fred Stone and I did some routine checking of a couple of caves in the lower part of the subdivisions and then had dinner with old

West Virginia caver Spike Werner and Carol. Spike has moved to Hilo fairly recently and will be a real asset to Hawaii speleology.

Both Fred and Spike were tied up on Friday so I headed for the national park to touch base with Jack Lockwood at the USGS, then checked out some promising-looking links in the lower part of the Mauna Ulu flow near the ocean. I didn't find anything more than anybody else has in the Mauna Ulu stuff but at least Pele showed me the color of her hair - which, contrary to many Hawaiian story-tellers, ain't red. I also had a chance to look at some buried surface tubes along the Chain of Craters road.

Fred was free on the following day but needed to check his cricket traps on the year-old lava of the Puu Oo-C48 flows. I was delighted to become his field assistant and by coincidence, his second location turned out to be the little cave in which I had photographed lava flowing in December, 1986. We then went up the flows while he collected crickets and looked for collecting points in more recent lava. At two points a mile or two farther up-flow we found red hot lava flowing quietly in throughway caves - comparatively small ones but much larger than the crawlway-sized surface tube I had photographed in 1986. Jack Lockwood had mentioned skylights in the main axis of the flow where flowing lava could be seen in caves. I think what we saw was a comparatively small branch tube with the skylights of which he spoke being perhaps 1/2 to 1 km farther west. We did not visit that part of the flow.

The variety of lava seen in these is very educational; theoretical vulcanospeleologist will find it fascinating. Near the crest of Vent C48 the entire surface is made up of very brittle, thin-walled, overlapping surface tubes of shelly pahoehoe, something I had never seen previously. It was very tricky going. It has very little tensile strength and, with the decrease in the level of the C48 lava lake, deep, wide cracks are appearing parallel to its panhandle, also tricky going.

In the area near C48 we found a sizeable lava tube that Fred had visited a year earlier but not entered because it was too hot. Now it could be entered although there had been much surface collapse. The cool main passage had only a few dozen meters of walking passage. A parallel passage of about equal size was unpleasantly warm and steamy.

Between this cave and C48 we climbed a low dome and admired three vertical pits on top having bizarre stalactites. Then we headed for a large lava trench over the course of the main lava tube draining C48. Fred had seen the trench a year earlier and it was still

there, fuming excessively. A few dozen meters down flow from its lower end I found a deep overhanging hole emitting a lot of heat and some acrid gas, but no fumes. It was perhaps 60 feet deep and belled out to about the same width. I could not get close enough to be certain, because of the swirling superheated winds, but I think that flowing lava would not be visible at the bottom of this collapse feature, be it a pit crater or collapse sink.

Fred got a surprise when we reached C48. The lava level was much lower and the main tube entrance that had drained it was now high and empty. We postponed exploration of this entrance at the down-flow end of the panhandle pending a further reduction in activity.

The entire panhandle was free of the lava lake. The lake was draining through a lower level tube extending beneath the evacuated panhandle and apparently beneath the mouth of the abandoned tube, the fuming lava trench, and the new collapse feature. The lake was quite active with miniature plate tectonics and intermittent fountains.

On the way back down we found another comparatively small throughway tube that was too hot to enter. Maybe in another year...

The upper part of these flows is no place for novices because of the trail-finding problems as well as the unpredictable reflows and special hazards of shelly lava. Clouds frequently closed in on us reducing visibility to a few dozen meters. Complete whiteouts have stranded parties here for many hours when no one remembered to bring a compass. The gentle, rolling upper slopes of the flows made it hard, even in good visibility, to determine the direction to the sea much less which tongue of the flow we were trying to follow.

Fred and I and Darryl Tanaka, a graduate student, bushwacked fruitlessly for a while on Sunday seeking a sink noted by Robin Holcomb in the upper subdivisions. Then in the lower part of Blair Cave, Fred moved some breakdown and paced off more than 700 feet of virgin cave so that it now has about 1-1/2 miles known.

Spike had Monday free so he and I headed for the south coast, east of Kalapana. After some searching we found locals carrying lanterns and followed them to Hot Cave. This cave is about 100 meters from the ocean and just inside was a natural hot tub 25 meters long and up to 2 meters deep. The tub was somewhere around 110°F, too hot for me to enjoy it.

A natural bridge and the entrances of at least two other lava tube caves were easily seen from the same road. One is a crawlway full of roots, which are the energy source for cave life in this area, and should be

left alone as a biological reserve. Unfortunately, it is only a short distance from another cave which is being used as a refuse dump and it may suffer the same fate.

The university of Hawaii at Hilo is well along in planning an underground biological laboratory in one of the lava tubes in the lower subdivisions. The Hawaii Cave Conservancy will soon be asking for your help in protecting other caves in this critical area. Please help.

Another List of Maps

In January we printed a list of the maps in the grotto map library. In March we printed a list of recent additions to the map library. Unfortunately, the tail end of the March list was inadvertently omitted so it is printed this month.

There is also a list of maps that are currently on order. By now you have surely figured out that this is an insidious plot to numb your brains until more caves open up, and fill up the lean winter issues of the *Cascade Caver*. Fortunately for you, the new maps have come so this should be the last foreseeable list of maps that you will be subjected to this year.

Historic 30' Topo maps. These are flat and not for field use.

WA:	Mount Aix	1902
	Mount Adams	1904
	Mount Stuart	1897
	Ellensburg	1899
	White Swan	1937
OR:	Mt. Jefferson	1927
	Bend	1929
	Maiden Peak	1930
	Newberry Crater	1931

Historic Forest Service Maps. Note that these are rolled and not for field use.

BC:	M-B Shawnigan Division	1966
WA:	Shelton R.D.	1976
	Quinalt R.D.	1970
	Quilcene R.D.	1970
	Hoodsport R.D.	1970
	Tieton R.D.	1963
	Tieton R.D.	1967
	Naches R.D.	1967
	Skykomish R.D.	1963
	Skykomish R.D.	1967

White River R.D.	1967	46/122 Cougar	1983
North Bend R.D.	1963	47/120 Mt. Stuart (15')	1961
North Bend R.D.	1967	47/121 Monte Cristo	1965
Gifford Pinchot National Forest	1958	47/121 Labyrinth Mtn	1965
Colville National Forest	1953	47/121 Big Snow Mtn	1965
		47/121 Cumberland	1973
New Washington Topo Quadrangles, all 7.5' unless marked otherwise:		47/121 Eagle Gorge	1968
		47/122 Uncas	1985
		47/122 Center	1973
45/120 Biggs Junction	1977	47/122 Mt Walker	1985
45/120 Goldendale	1983	47/122 Quilcene	1953
45/120 Indian Rock	1983	47/124 La Push	1983
45/120 White Pine Buttes	1983	48/117 Jared	1986
45/120 Centerville	1983	48/117 Pass Creek	1986
45/121 Camas Prairie	1983	48/119 Keystone	1980
45/121 Quigley Butte	1983	48/119 Omak Mtn	1980
45/121 Husum	1983	48/119 Aeneas Lake	1980
45/121 Guler Mtn.	1983	48/121 Ross Dam	1963
45/121 Northwestern Lake	1983	48/121 Snowking Mtn	1982
45/121 Little Huckleberry Mtn.	1983	48/121 Darrington	1982
45/121 Gifford Peak	1983	48/122 Gardiner	1985
45/121 Big Huckleberry Mtn	1983	48/123 Sequim	1985
45/121 Termination Point	1983		
45/121 Stabler	1983		
45/122 Amboy	1972		
45/122 Lookout Mtn	1986		
46/120 Manastash Creek	1984		
46/121 Steamboat Mtn	1970		
46/121 Mount Wow	1971		
46/122 Cedar Flat	1983		
46/122 Mt. Mitchell	1983		
46/122 Mount St. Helens	1983		

And Finally... Some maps up for grabs. The library has neither the use or the space for them:

- 2 ea: Kroll map of Alaska and Western Canada; rolled, 4 ft. long.
- 4 ea: Draft blueprint geologic map of Vancouver Island, no legend, rolled, each almost 7 ft. long.

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