GUIDELINES FOR SAFE CAVING

1. Leave trip plans—destination, time of departure, expected time of return—with a responsible person at home.
2. Wear heavy shoes and hard hats. Hard hats protect cavers' heads from low ceilings and falling objects; hat mounted lamps leave the hands free for climbing.
3. Each explorer should carry at least two sources of light. Cavers often carry a third emergency light source such as a candle and waterproof matches.
4. Keep the group together.
5. Enjoy formations, artifacts or animals, but collect only litter.
6. Always go caving with at least one other person.

This brochure is yours to keep. However, there is a limited supply. If you do not wish to keep it, please return it or pass it on to someone who can use it.

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NATIONAL SPELEOLOGICAL SOCIETY

This brochure has been printed through the courtesy of the Oregon Grotto of the National Speleological Society, in cooperation with the USDA Forest Service. The society is dedicated to the conservation, exploration and study of caves. For information about the society, write to: Oregon Grotto of the National Speleological Society, 912 N.W. 50th Street, Vancouver, WA 98663.

APE CAVE

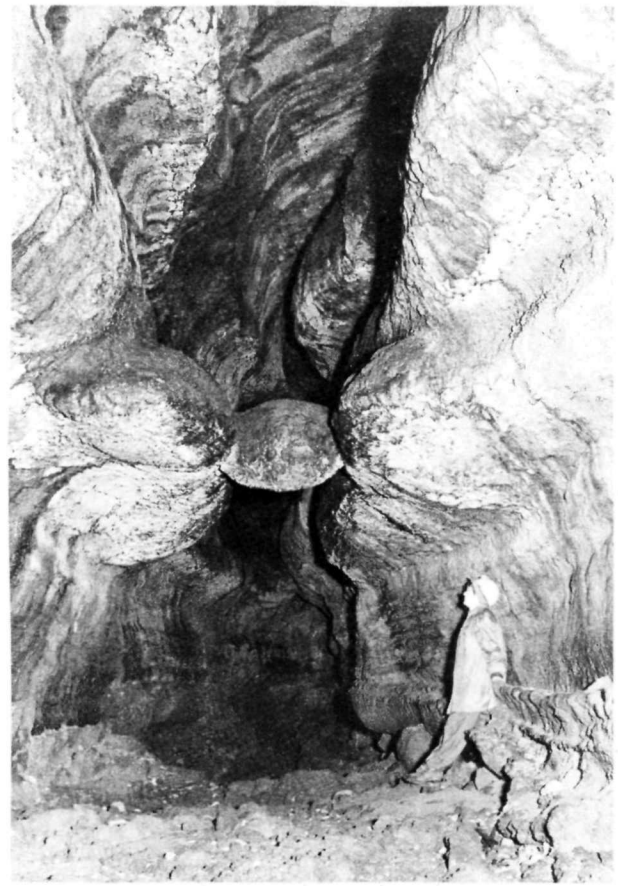


Photo by Charlie & Jo Larson

A GUIDE FOR EXPLORATION

MOUNT ST. HELENS NATIONAL VOLCANIC MONUMENT

GIFFORD PINCHOT NATIONAL FOREST

EQUIPMENT YOU WILL NEED

To safely explore the cave, you should carry at least three sources of light. A Coleman lantern provides ample light to view cave features and to watch your footing. A flashlight with strong batteries can be used to spotlight features and will provide a back-up light in case the lantern fails. The temperature in the cave stays near 42 degrees F *all* year. Wear a sweater or jacket. Sturdy shoes should be worn, since the lava floor is sharp and rough in many sections.

PROTECTING THE CAVE

Caves are delicate and must be used wisely to avoid damage. Unlike the surface environment, which in time can heal its wounds, a cave once damaged remains that way forever. For this reason, visitors are encouraged not to take food or beverages into the cave. Rock collecting, acts of vandalism, and littering are strictly forbidden. Residue from railroad flares, burning paper, or other impromptu torches leave a residue that is unsightly, damaging to cave life, and irritating to fellow explorers. Your cooperation in protecting the cave will ensure a quality experience for generations to come. Remember the cave explorer's motto: "Take nothing but pictures, leave nothing but footprints, kill nothing but time."

TO SAFELY EXPLORE APE CAVE YOU WILL NEED:

- Three Sources of Light
- Sturdy Shoes or Boots
- Warm Clothing

APE CAVE

Ape Cave is widely known as the longest intact lava tube in the continental United States and has a length of 12,810 feet. The cave was discovered in 1946 by Lawrence Johnson of Amboy, Washington while logging in the area. Following discovery, the cave was extensively explored by a local group of young outdoorsmen who called themselves the St. Helens Apes. The cave was named for the organization.

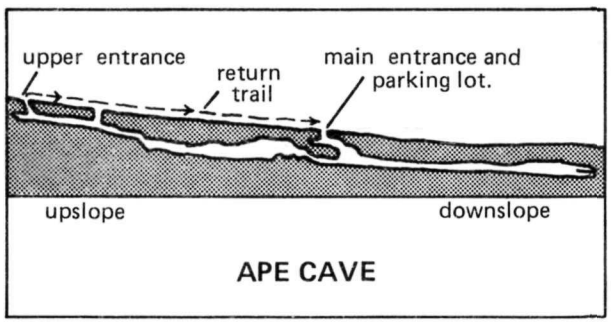
In 1979, Ape Cave was designated a National Recreation Trail due to the unusual recreation experience it offers and in 1981, was declared part of the Mount St. Helens National Volcanic Monument in recognition of its unusual geologic interest.

LOWER CAVE

The cave is divided into two portions, upslope and downslope, from the main entrance. The downslope portion of the cave extends for approximately 4,000 feet before ending in a sand fill. Easily traveled, it is recommended for most visitors.

UPPER CAVE

Upslope from the main entrance travel is difficult, involving nearly 7,000 feet of passage floored mostly by breakdown. Breakdown is the rock rubble caused by collapse of the passage walls and ceiling. The upslope portion is suggested only for *well-equipped* explorers. For those who explore upslope, it is possible to exit from the cave's upper entrance, where a return trail on the surface leads back to the parking lot.



GEOLOGY

Mount St. Helens is one of the most active volcanoes in the Cascade Range. The most recent eruptive episode began on March 20, 1980, with an earthquake measuring 4.1 on the Richter Scale. After almost two months of small steam and ash eruptions, a magnitude 5.0 earthquake on the morning of May 18, 1980 caused the bulging north side of the mountain to give way, creating an avalanche of rock, mud and ice which traveled 15 miles down the North Fork of the Toutle River Valley. The avalanche was followed by explosions directed laterally and vertically which killed nearly everything in their path. The eruption moved approximately three cubic kilometers of the mountain sending an ash cloud 14 miles (20 km) into the atmosphere. Smaller eruptions have since built lava domes on the crater floor, blown them away and built them again. A series of non-explosive dome building eruptions starting late in 1981 produced a composite lava dome 600 feet high by 1982.

The eruption which produced Ape Cave 1,900 years ago was less explosive in nature than those experienced recently.

FORMATION OF THE CAVE AND ITS FEATURES

Lava tubes, such as Ape Cave, form in flows of ropy pahoehoe basalt when the flow crusts over with cooling lava. At the end of the eruption, lava drains from the tube leaving an open tunnel.

Lava is an excellent insulator, so once the lava stream is roofed over it is possible for the lava to flow through the tube for many miles with little loss of heat. In the case of Ape Cave and other caves in the area which carried lava for long periods of time, the lava stream was able to erode downward, cutting into the pre-flow land surface. The cutting activity caused many portions of the cave to have passages with a high. narrow cross-section. Where sections of wall lining have fallen away, it is possible to see hard reddish soil which was baked red by the heat of the overlying lava.

Once the eruption ceased and lava drained from the tube, the cave was left as we see it today. As the lava level dropped, hot gases caused melting of wall surfaces (much like a very hot oven) forming a dark shiny glaze. In places the glaze slumped while still molten to form a pleated pattern of ripples.

During this period, lava stalactites formed on the ceiling and stalagmites formed on the floor where globules of dripping lava fell from stalactites. Lava formations are not common in the cave and where they do occur are small and *very fragile*. The few formations which existed in the cave have been largely removed as souvenirs by early explorers and are no longer here for you to enjoy. This points out the need for everyone to help protect the few remaining formations so future generations can thrill to the same discoveries you make today.

Lateral "flow marks" (minor ledges) along the walls mark stages of lava decline in the tube. When the lava level dropped then stabilized for a period of time, a flow mark was produced along the wall, much like a ring is produced in a bathtub.

In the lower portion of the cave, is the Lava Ball, a block of solidified lava which was carried along in the lava stream only to become wedged in a narrow portion of the passage twelve feet above the floor as the flow receded.

The sandy floors found in the lower cave formed when volcanic ash, pumice, and other debris were washed into the cave through the lower entrance following an eruptive episode geologists call the Early Kalama Period, 450 years ago. Flooding has carried fresh ash and sediment from the recent eruptions across the lava flow above Ape Cave. The sediment was diverted away from the cave but can be seen along the road several hundred feet upslope from the parking lot.

At the lower end of the cave the passage is divided by a lava diaphram with both an upper and lower level. The lower level is blocked by sand which is being re-worked by a seasonal stream. In the upper level are a series of holes extending downward to the level below and surrounded by bubble-rings. These were caused by molten lava surging up from below, then retreating.

Once the cave started to cool, breakdown of the walls and ceiling began to occur. This breakdown was mostly caused by contraction-cracking of the cooling tube walls. Where breakdown has extended to the surface, entrances or skylights were formed. Seldom is the cave roof more than 20-30 feet thick. No collapse has taken place in recent times.

The cave wind you feel is nearly always present and is sometimes as great as seven miles per hour. This is caused by differences in air temperature inside and outside the cave. During the winter, warm cave air rises like warm smoke in a chimney and pours out the upper entrance. This chimney effect reverses during the summer when cool cave air drains down-slope through the cave and pours out the lower main entrance.