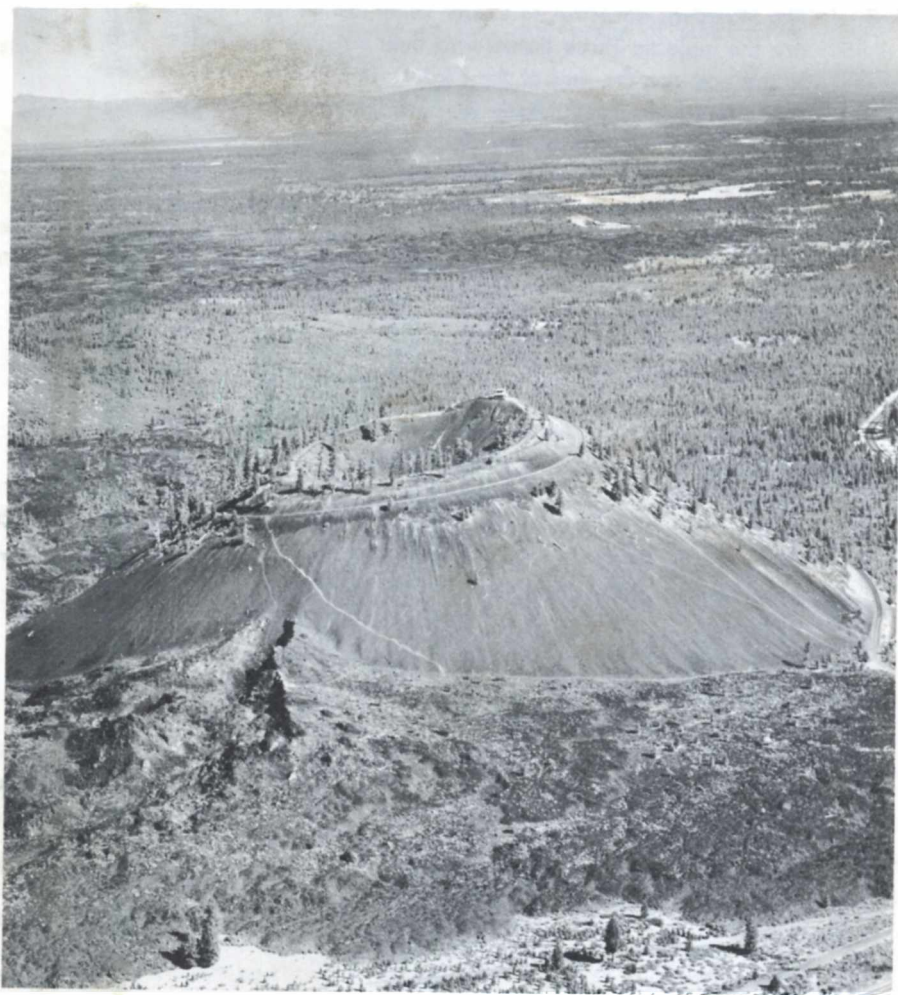


The Lava Butte Geological Area

Story by Phil F. Brogan, Chairman
Oregon Geographic Names Board



DESCHUTES NATIONAL FOREST

Pacific Northwest Region

U. S. Department of Agriculture

Forest Service



THE LAVA BUTTE STORY

Lava Butte, a cinder cone which rises about 500 feet above the adjacent forest-covered country, overlooks an area of spectacular volcanism.

To the south is Newberry Crater, a giant of ancient times which like Mazama, ancestral to Crater Lake, lost its top. To the west are the majestic Three Sisters and their satellite volcanoes. Off to the east are the rims of the High Desert and in the North are the photogenic Smith Rock pinnacles, remnants of Oregon's Dawn Age times.

But not all the spectacular features visible from the Lava Butte viewpoint are in the distance; some are virtually at the spectator's feet. Here is a volcanic crater, 150 feet deep, in which lava once boiled and bubbled. Stretching from the eastern lava apron of Lava Butte, off toward Newberry Crater, is a yawning fissure, some 20 miles long.

Reaching west and north from Lava Butte is one of western America's most awesome lava fields, spread over 6,117 acres. All of this lava spilled from a vent in the south wall of the Butte. Gutters, lava ridges, radiating flows and the ruptured cone tell the story of the escape of the lava and its spread west to the Deschutes River and north toward the present site of Bend.

Lava Butte came into existence centuries ago on the fissure which can be traced to the south and to the north. There is evidence that the initial eruption consisted of an outpouring of lava which now comprises older flows visible in the area.

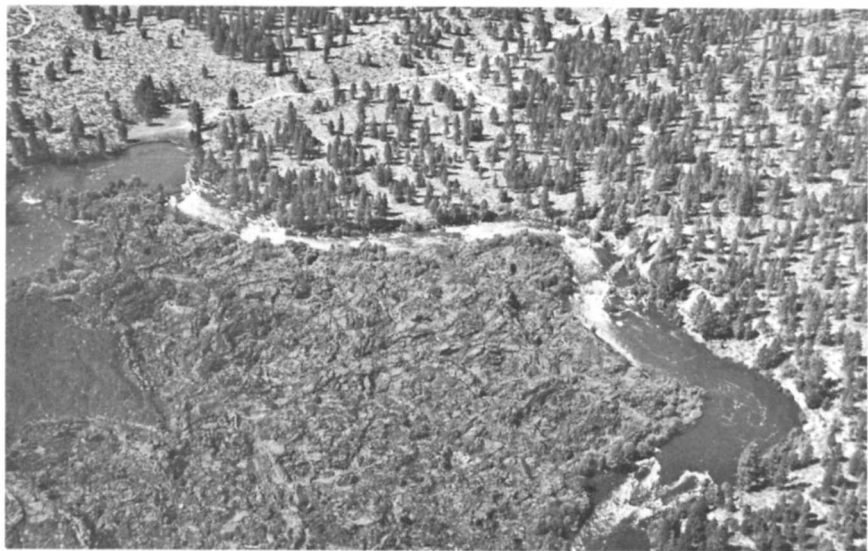
Eventually on a zone of earth weakness, cinders were erupted and in a short time they built up the present cone. In the final phase of the eruption, lava again poured up from the earth, through the volcano's central vent. This massive lava did not reach the top of the Butte to plug the crater, but it broke through the south wall of the cone. Explosions which tossed cinders from the crater ceased when the lava started flowing.

Lava escaped in a liquid condition and in a huge volume. In most areas, a surface crust was formed and was broken into slag and slabs by the energetic undertow.

The westward flow of the lava carried it to the old gorge of the Deschutes River. In several places, tongues of molten rock spilled into the ancestral channel, blocking the flow of the stream. Upriver, a big lake formed. Silt carried into the long-enduring lake built up the meadow country and areas of meandering streams found upstream.

Eventually, the Deschutes River cut a new channel across a spur of the old Cascade lavas. In this detour, the river formed two spectacular falls, Benham and Dillon, and created lava islands downstream.

Much of the spectacular volcanism of this area, scene of much wild earth unrest long ago, is visible from the Lava Butte viewpoint, visited this past season by some 40,000 persons. Other attractions of the area include the Lava Caves State Park, three miles to the south, and the strange lava cast forests of the Paulina foothills.



Deschutes River rapids created by lava flow.

LAVA BUTTE HISTORY

Nathaniel Wyeth and his trappers possibly were the first whites to see Lava Butte when, late in 1834, they passed upriver from the Bend site in search of beaver. Wyeth and his men, moving upstream toward Benham Falls, were on the west bank of the Deschutes at the time with Lava Butte off to the south against the dark hills of the Paulinas.

But Wyeth made no mention of Lava Butte, nor did John C. Fremont who followed in 1843. Members of the Williamson Survey party of 1855 also passed this way, headed north, but did not chart Lava Butte.

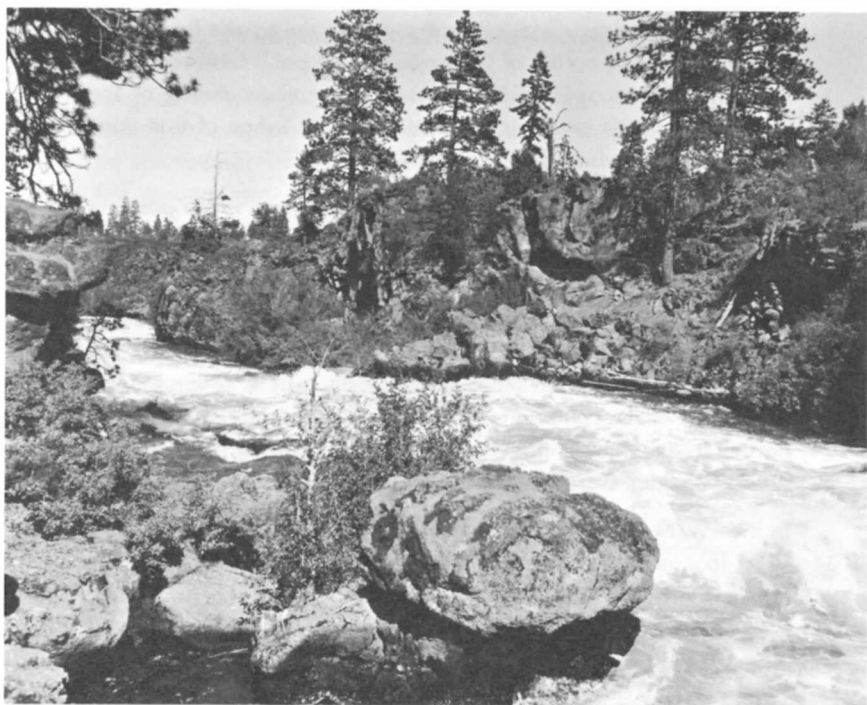
Tired members of the Elliott cutoff, lost immigrants of 1853, drove their oxen and horses along the rocky apron of Lava Butte as they moved their wagons south to a crossing of the Cascades, near Diamond Peak, and must have noted the cinder cone.

No one knows who named the Butte, but obviously it could have only one name — Lava Butte. The name was applied because of the extensive lava field that spreads from the base of the cone. The Butte itself is composed of cinders, not lava.

Pioneer stockmen, en route to range on the upper Deschutes, found Lava Butte astride their trail. Rather than move their herds off to the dry country to the east, they forded the river and used westside trails.

Road builders also recognized Lava Butte as a control point. Roads skirted the lava at the east base of the Butte. That was the line eventually followed by fast, modern U. S. Highway 97. Some of the lava apron was blasted to prepare the grade for the road.

Railroad builders did not detour Lava Butte. They constructed a grade (Great Northern) over the lava fields.



Dillon Falls near pioneer crossing.

AGE OF LAVA BUTTE

How old is Lava Butte ?

Old timers believed that the lavas cooled only yesterday. This is true, but it is the geologic yesterday, not man's measurement of time.

The first geologist to study Lava Butte, I. C. Russell of the U. S. Geological Survey, in 1903 estimated that Lava Butte possibly was in eruption as recently as 150 years ago. Dr. Howel Williams in his treatise, "The Ancient Volcanoes of Oregon", speculated that the eruptions occurred less than 1,000 years ago. This would account for the present excellent state of preservation of the cone with its steep outer slopes and its 150-foot deep crater.

The present tendency is to place the age of the cone's final eruptions and the outpouring of the lava at some point between 1,500 and 2,000 years ago. This is based on a carbon dating of the last cone to erupt in nearby Newberry Crater. Age of that cone was placed at about 2,000 years.

On the slopes of Lava Butte are found dead trees which possibly had reached the age of over 300 years. They may be second or third generation trees.

First ranchers in the area, in the early 1870's, found Lava Butte very much as it appears today, with animal trails spiraling the cone. When Bend, ten miles to the north, was a range village at the turn of the century, Lava Butte was an attractive viewpoint. Parties frequently climbed the cone, over a zigzag trail, to view the spectacular Cascades to the west.

In the 1930's, the cone was designated by the U. S. Forest Service as a lookout point, and a spiral road was constructed to the high crater.



Gnarled trees struggle to survive.

FIRE CURTAINS LEAVE CONES

Long ago, geologists agree, volcanic activity in the upper Deschutes country of Oregon directly east of the Three Sisters was as spectacular as any in the Pacific Northwest land of giant fire mountains.

Great peaks of the Oregon Cascades had been built up long before Lava Butte appeared on the Deschutes scene, but there were many contemporaneous volcanic events. One of these apparently was cinder and lava eruptions that created symmetrical Bachelor Butte, 9,060-foot high Fujiyama-like cone on the western skyline.

Lava Butte would have attained a height close to that of Bachelor if the lava that now covers 6,117 acres, 30 to 40 feet deep in places, had not ruptured the cone in the mountain-building process.

In the era when Lava Butte was created, this cinder-belching, lava-spewing cone was not the only fire mountain in its area. Nearby were scores of other cones, all in violent eruption and some spilling rivers of lava into timber. Blazing forests merged with earth fires in creating an area inferno.

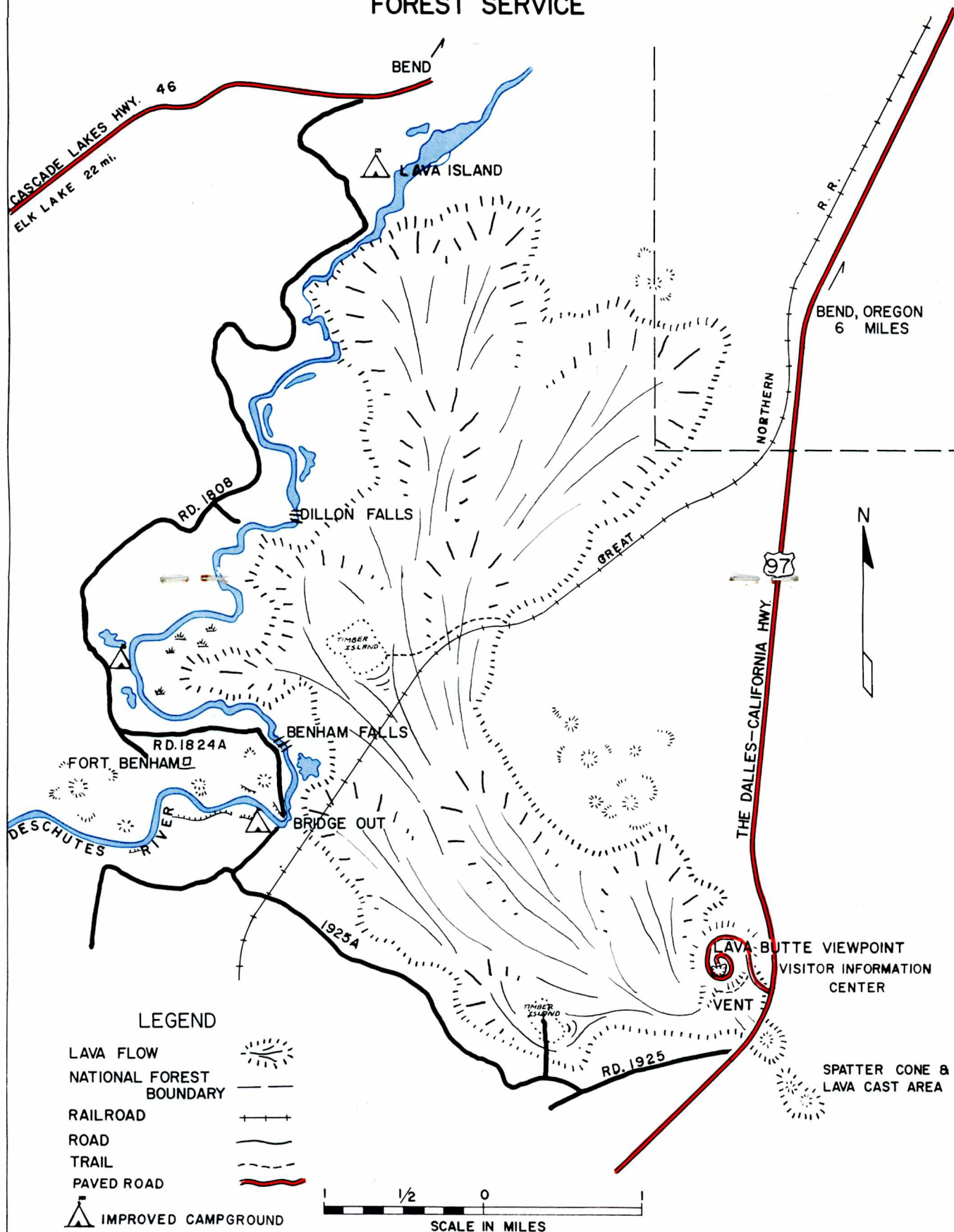
Within a stone's throw of Lava Butte, spatter cones formed a curtain of fire. Liquid rock tossed into the sky fell to the earth to build up ridges that still exist. There is considerable evidence that rock spilling from the lava fountains was highly liquid. It ran down steep slopes in gutters, splashed into groves of pines to form stone trees and built up imposing ridges.

The lava-fountain and spatter-cone area is visible from the Lava Butte summit, directly to the southeast and less than a mile distant. The area can be reached in a short hike over a rugged lava terrain.

There is no evidence that erupting Lava Butte threw material to any great distance, but lava bombs were ejected from the crater.

LAVA BUTTE GEOLOGICAL AREA

U.S. DEPARTMENT OF AGRICULTURE
FOREST SERVICE



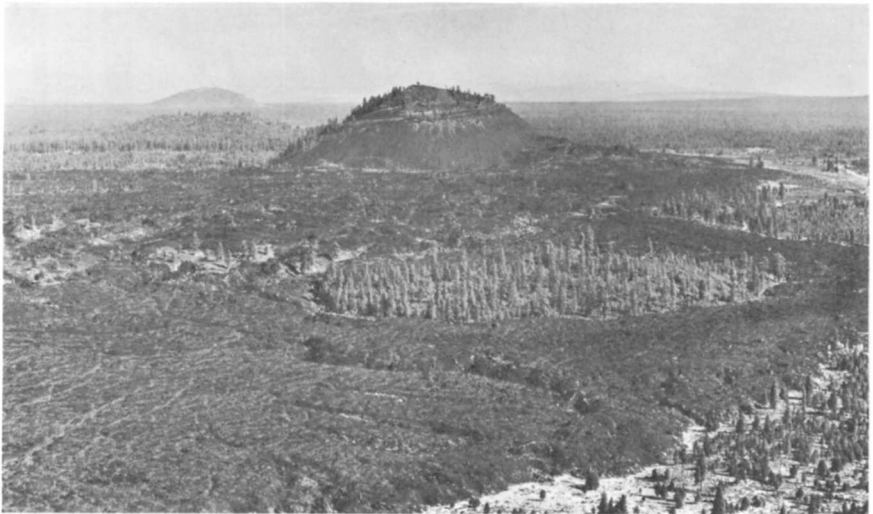
These were globs of molten rock which formed into bombs of various types after chilling in the air. Apparently most of these fell back into the crater or dropped on the rim where they can be seen in the grade of the spiral road to the top.

It will be noted that the northeast rim of Lava Butte is considerably higher than the southwest wall of the crater. A glance of volcanic cones in the distance will reveal a similar formation. Geologists have an explanation for the high northeast rims and the low southeast crater walls:

The prevailing wind of the area in the ancient past, as at present, was from the southwest. Wind blowing out of the southwest caused lighter material to fall on the northeast rims. Gradually, the leeward rims became higher, and now form a striking feature of the region.

Visitors will be interested in a deep fissure that leads to the south from Lava Butte and extends into the Paulina foothills. This same fissure can be traced to the north. It was on this fissure that Lava Butte formed.

The fissure reaches along a small but long fault line.



Lava Butte, a typical cinder cone.

OREGON'S THREE SISTERS

Proud and stately on the western skyline, their white aprons touching the green of the Deschutes National Forest, are three of America's most beautiful mountains, the Three Sisters.

Nature has provided in Lava Butte a grand observatory from which the old volcanoes can be viewed in the pink of sunrise or in the glow of the dying day.

All three of the Sisters are more than 10,000 feet high. There are only two higher mountains, Jefferson and Hood, in the state. With nearby Broken Top, the Sisters comprise the most inspiring alpine group in the Cascades of Oregon.

First mention of these mountains, so far as known, was by the botanist, David Douglas, on October 5, 1826. From his position west of Mt. Jefferson, he could see only two of the mountains. He noted they were covered with snow.

Early-day residents of Oregon said the three peaks were known as Faith, Hope and Charity.

The Three Sisters have long intrigued geologists. Different theories as to their origin have been advanced. In earlier years, a geologist suggested that the three mountains are remnants of a giant, vanished volcano of ancient days, Multnomah. This theory has generally been abandoned.

Howel Williams, author of the booklet, "Volcanoes of the Three Sisters Region," believes each of the Sisters has its own story. Eldest of the trio is apparently the North Sister, which lost about one-fourth of its bulk to glaciers of the Ice Age. Next in age is the Middle Sister. Scarcely touched by glaciers, aside from those that still cling to its high slopes, the South Sister is the youngest of the imposing mountains that are astride the Cascades.

Early explorers and trappers noted the Three Sisters but made little mention of them in their diaries. It remained for a large group of lost immigrants, members of the Elliott cutoff party of 1853, to pay particular attention to the white trio.

The Elliott party crossed the High Desert from the east, seeking a new wagon road over the Cascades south of Diamond Peak. Some members of the party mistook the Three Sisters for Diamond Peak and directed their wagons to the Deschutes River at the present site of Bend. There they ran up against barriers — the river and the Cascades.

Parties of young men had been sent ahead in an attempt to reach the Willamette Valley for help. Some of these youths, who abandoned their horses in the high country, crossed the divide between two of the high, storm-swept Sisters.

Glacier bearing, but friendly mountains, the Three Sisters seasonally are climbed by many parties. The McKenzie Highway crosses the Cascades, over high lava fields, north of the Three Sisters.

The Oregon Skyline Trail, a segment of the Pacific Crest Trail System, skirts the Sisters to the west.



The Three Sisters Mountains from Highway 97.

Photo — Wm. L. Van Allen

THE MT. NEWBERRY STORY

Giant Mt. Newberry of the Deschutes country disappeared from the Oregon scene long before the first whites arrived, but in its stump it left one of the most awesome stories in geologic history.

Newberry was a huge fire mountain, with a basal diameter of some 25 miles. It was a massive shield volcano, built up much in the same manner as was Kilauea in the Hawaiian Islands. Eventually the big mountain lost its summit, through collapse. From the Lava Butte observatory, the rim of the old volcano can be seen on the southern skyline, above the green Deschutes timber.

This old mountain of the Ice Age was built up on the Deschutes plateau close to the eastern foothills of the Cascades. Almost entirely constructed by alternating flows of basalt and rhyolite, it was a huge mountain prior to the summit collapse. Its elevation above sea level apparently was around 12,000 feet.

Fissures, cones and faults drained lava from the magma chamber under the restless mountain. As a result of the loss of lava, support of the broad shield dome was weakened. Downfaulting occurred, resulting in a summit depression from 4 to 5 miles in diameter, hemmed in on all but the western side by cliffs that rise to a maximum height of 1,500 feet above the caldera floor. Paulina Peak, overlooking the caldera, and accessible to motorists in the summer, is a remnant of the once-high dome.

After collapse of the summit of the old mountain occurred, activity was renewed both within the crater and on the outer slopes. Many small cones were built up within the caldera, dividing the crater into two parts. One part holds beautiful East Lake, the other cradles Paulina Lake.

Secondary volcanism also resulted in the creation of the Big Obsidian Flow within the crater. Here is one of the most extensive fields of volcanic glass on the continent. It is spectacularly visible from Paulina Peak.

Volcanic activity within the crater, accessible over a surfaced road, continued until around 2,000 years ago, as determined by radio carbon dating. That final volcanism built up Cinder Cone. Pumice from the explosion buried trees in the area. It was carbon from those trees that made possible the dating of the volcanic activity.

Outlet of Paulina Lake is to the west, through Paulina Creek, where the water tumbles into the canyon in picturesque fall close by the roadside.

First white men to visit Newberry Crater were Peter Skene Ogden and his trappers, in 1826.



East and Paulina Lakes — Newberry Crater.

HUNTING GROUND OF INDIANS

Prehistoric Americans possibly witnessed Lava Butte in eruption, and watched its molten rock spill westward to the Deschutes.

Indians lived in caves not far to the south some 9,000 years ago, and left their sage sandals in Cow Cave, facing now-vanished Fort Rock Lake. They lived in the Odell Lake country and saw glaciers moving over their old camp sites. Their artifacts have been found under Crater Lake pumice upriver at the Wickiup Reservoir.

In the summer of 1961, gas pipeline crews excavating a deep trench for a 36-inch main just east of Lava Butte found evidence of early Indian habitation. Hundreds of artifacts were found adjacent to the fissure which reaches south from Lava Butte.

The old camp site was excavated and studied by Washington State University anthropologists.

Apparently the camp was in a deer-stalking area. Deer coming in from the dry country to the east followed a trail southwest past Lava Butte to detour the lava. The trail led to the Deschutes River.

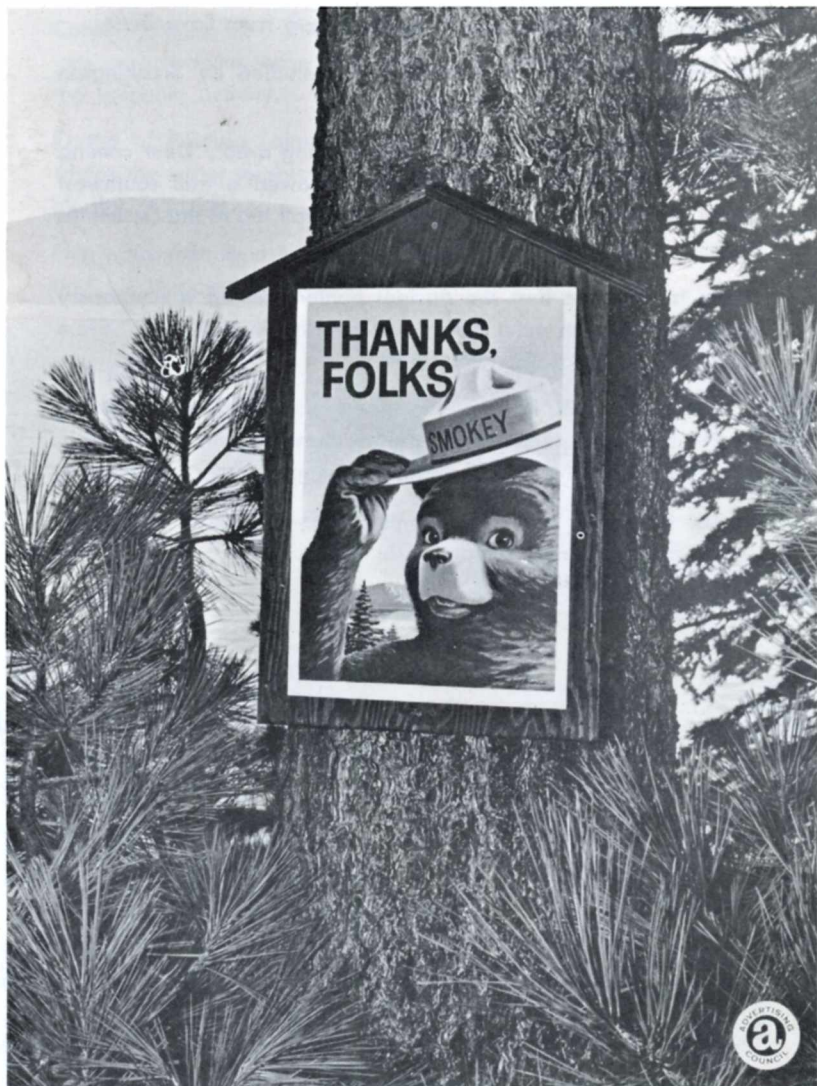
There is evidence that the ancient hunters set up a temporary camp each season on a lava ridge, overlooking the trail. From that point, they stalked the deer.

While waiting for the deer, the tribesmen apparently fashioned arrowheads and spear points from obsidian (volcanic glass). They tossed obsidian chips and broken points into a lava crevasse.

In the bottom of that crevasse, under deep dirt, the anthropologists found the artifacts of the ancient craftsmen.



Lava crevasse at old Indian camp near Lava Butte.



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