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SUNSET CRATER

National Monument

ARIZONA

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National Monument

United States Department of the Interior, Oscar L. Chapman, *Secretary*
National Park Service, Newton B. Drury, *Director*

A symmetrical cinder cone surrounded by lava fields, cinder dunes, and other spectacular evidences of volcanism, whose approximate eruption date has been determined from growth rings in ash-buried house timbers cut by prehistoric Indian farmers

Dominated by a massive, 1,000-foot-high volcanic cinder cone, its crater-pocked summit tinted with hues of dull red and orange, Sunset Crater National Monument is a reminder of the fiery devastation which once characterized this area. A rugged volcanic field presents splendid examples of lava squeeze-ups, spatter cones, inactive hot springs, and a lava cave containing ice at all seasons. Timbers taken from prehistoric pit houses excavated from the cinders and ash have furnished evidence by which this geologically recent eruption has been dated.

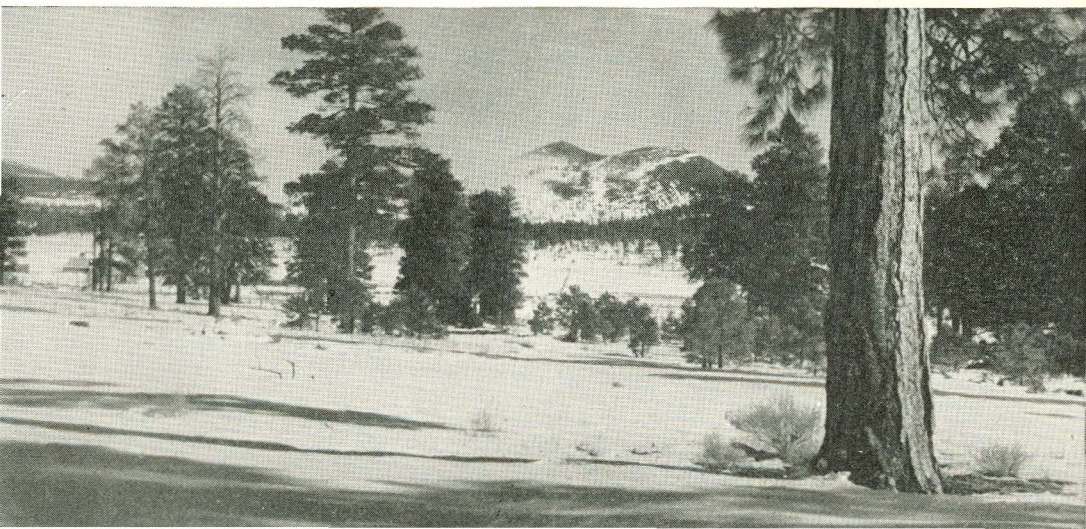
What Happened?

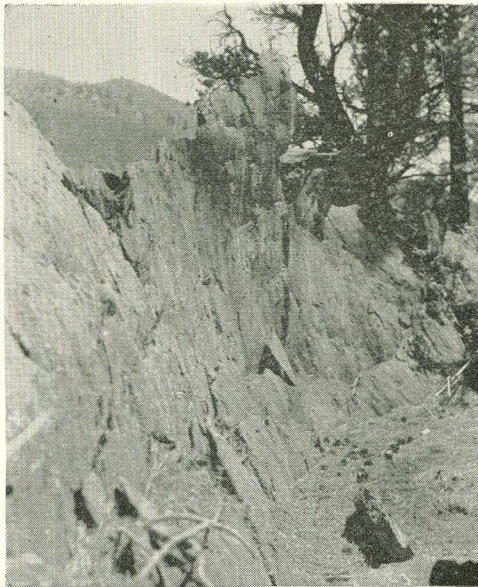
Prominent in north-central Arizona is the San Francisco Mountain volcanic field covering some 3,000 square miles. The area is

studied with volcanic peaks, cinder cones, and lava flows representing a long period of volcanic activity. Geologists find evidence to indicate that this disturbance began during Pliocene times and continued as a series of outbursts interrupted by long periods of inactivity. Some of these eruptions consisted of relatively quiet outpourings of molten lava, while others were of cataclysmic violence.

Nearly 900 years ago the last of this long series of eruptions occurred as the explosive outbreak which produced the symmetrical cinder cone and the rough black lava and cinder area now preserved as Sunset Crater National Monument. Amid constant rumbling and roaring, and accompanied by violent earthquakes, terrific subterranean pressure burst out through a volcanic vent.

Sunset Crater in winter.





Lava squeeze-up in "Mother of Squeeze-ups" section.

Thousands of tons of fiery rock, globules of molten lava, cinders, and fine particles of ash were blown thousands of feet into the air. Larger and heavier objects fell back around the vent, while the lighter materials were carried away by the wind or hung in the air as a dense cloud resembling heavy smoke before settling far afield.

Higher and higher grew the mass of smoking black rocks and cinders thrown out by the volcano. Ejected stones rolled down the steep slopes rapidly enlarging the circumference of the base of the growing cone. Prevailing southwesterly winds caused more of the ejected material to accumulate on the northeast side, building higher that portion of the conical pile. Cinders and ash, widely scattered by the wind, fell as a black blanket over the land for miles around.

Following this period of activity, the eruption slackened and explosive outbreaks were interspersed with pouring forth of liquid lava from vents near the base of the cinder cone. Amid steaming spatter cones and crusted lagoons of viscous lava, the still smoking cone towered above a land blackened with a widespread layer of cinders and ash. Sunset Crater, youngest child of the San Francisco Volcanic Field, had been born.



Cross section of a squeeze-up.

For years, gradually lessening activity continued in the form of hot springs and emission of vapors from fumaroles about the vent. These vapors deposited sulphur and other minerals around the crater rim and generated chemical activity which stained the cinders and other deposits producing colors that cause the summit to glow today with the hues of a perpetual sunset.

Indians Scattered by Eruption

Sharp earthquakes presaging the eruption terrified the few families of Indians dwelling in the neighborhood. These primitive farmers lived in rude shelters partly excavated from the rocky soil. With the first outbreak these people, carrying such of their possessions as they could, probably fled from the vicinity, leaving their pit houses to be buried under the cinders and ashes which soon began to fall.

After the eruption was over, and the lava flows and cinder cone had cooled, some of the Indians cautiously returned. They found that the layer of cinders which had engulfed their homes had also greatly improved the productivity of their farm lands. Previously restricted to small and favorably located

patches of land, the Indians discovered that the layer of cinders enabled water from summer rains and winter snows to soak into the soil. Land previously untillable, because of rapid run-off of precipitation, now would produce good crops of corn and beans.

Cinder Area Starts Prehistoric Land Rush

News traveled even in those days. Families of farmer Indians were attracted by the magnet of fertile, moisture-retaining soil. As years passed others came from more distant lands, bringing their customs and their arts. In general, the invasion was peaceful. Family pit houses were built; later, communal dwellings were erected. Archeologists estimate that by A. D. 1100, only a few years after the eruption, 4,000 Indians occupied the large area covered by the ash blanket.

Development of Farming Area Blighted

But the same winds which had spread the blanket of ash and cinders began to roll it up. First on the exposed ridges, then on the level lands, the moisture-retaining layer of cinders grew thin and threadbare or was piled too deeply. Whipped into dunes and blown into gullies to be washed away by freshets, the protective cover gradually disappeared. Yields of beans and corn decreased and were followed by crop failures. Fields and homes were deserted, and finally the land was once again tenanted by a few families who, in particularly favored spots, could raise sufficient food to sustain life. An epic cycle which began with the eruption of Sunset Crater had come to an end.

Monument Offers Much of Interest to the Visitor

Aside from the dunes of cinders and ash piled up by the wind and the trees and plants which have gained a foothold amid the cinders and lava, Sunset Crater probably appears much as it did after the eruption. Remains of the hot springs, spatter cones, and other spectacular evidences of volcanism look as if they had barely had time to cool. Spectacular black cinder dunes, large cinder fields, and the twisted, gnarled, and jagged "slag heaps" of the lava flows create an atmosphere of unreality.

Near the foot of the cone, a small lava cave contains ice the year round. Visitors are asked not to remove ice as removal raises the temperature of the cave during summer and causes the remaining ice to disappear.

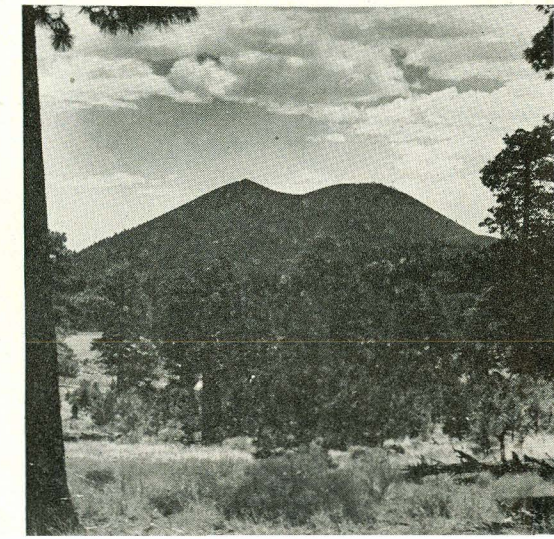
Scientists investigating the numerous geological features of the monument discovered remains of buried pit houses. Careful excavation of these houses revealed beams cut by prehistoric builders. By means of growth rings these beams have been dated, thus establishing the eruption of Sunset Crater as probably between A. D. 1046 and 1071. As far as is known, it is the only eruption of a volcano dated by combination of tree ring and archeological data.

The region covered by cinders from the eruption is dotted with remains of buildings constructed by the Indians who settled in the area and whose progeny eventually were forced to abandon their homes and fields. In Walnut Canyon and Wupatki National Monuments in Arizona, which also are part of the National Park System, representative structures left by these farmers have been preserved.

Remarkable View from Crater Rim

Difficult of access because of the loose cinders covering its slopes, Sunset Crater's summit not only affords a fine example of an unbreached crater 400 feet deep and a quarter of a mile in diameter, but provides a breathtaking view of the craters, lava flows, and forests on the eastern slopes of the San

Sunset Crater from the west.



Francisco Mountains. To the northeast is spread the colorful Painted Desert.

Probably because of its fiery origin, Sunset Crater is believed by the Hopi Indians living on mesas in the Painted Desert to be the home of a group of friendly supernatural beings called Kana-a Kachinas. There are numerous fascinating Indian legends pertaining to the cone and its mythical inhabitants.

Administration

Sunset Crater National Monument, containing 3,040 acres, was established by Presidential proclamation of May 26, 1930. The monument is administered by the United States Department of the Interior, through the National Park Service. A park ranger is on duty May 15 through October 15, but all communications should be addressed to The Superintendent, Wupatki National Monument, Tuba Star Route, Flagstaff, Ariz.

How to Reach the Monument

Approach to Sunset Crater National Monument from Flagstaff, Ariz., is via United States Highway No. 89, which is a paved road, and thence by a 4-mile graded entrance road which leads across an arm of the Bonita Lava Flow to the parking area near the base

of the cone. The road then continues across 18 miles of lava flows and cinder to Wupatki National Monument on the edge of the Painted Desert. While this road is no boulevard, it is an interesting drive and one the visitor will enjoy if accustomed to "back country" driving. Drivers should remain on the road; any attempt to drive on the cinders is dangerous. The entrance road is closed by snow during the winter months.

Facilities

There are no buildings in the monument and no facilities for visitors, except a small interpretive exhibit at the register stand near the ice cave. Road signs have been erected, but occasionally they are destroyed or rendered illegible by vandals. No drinking water is available.

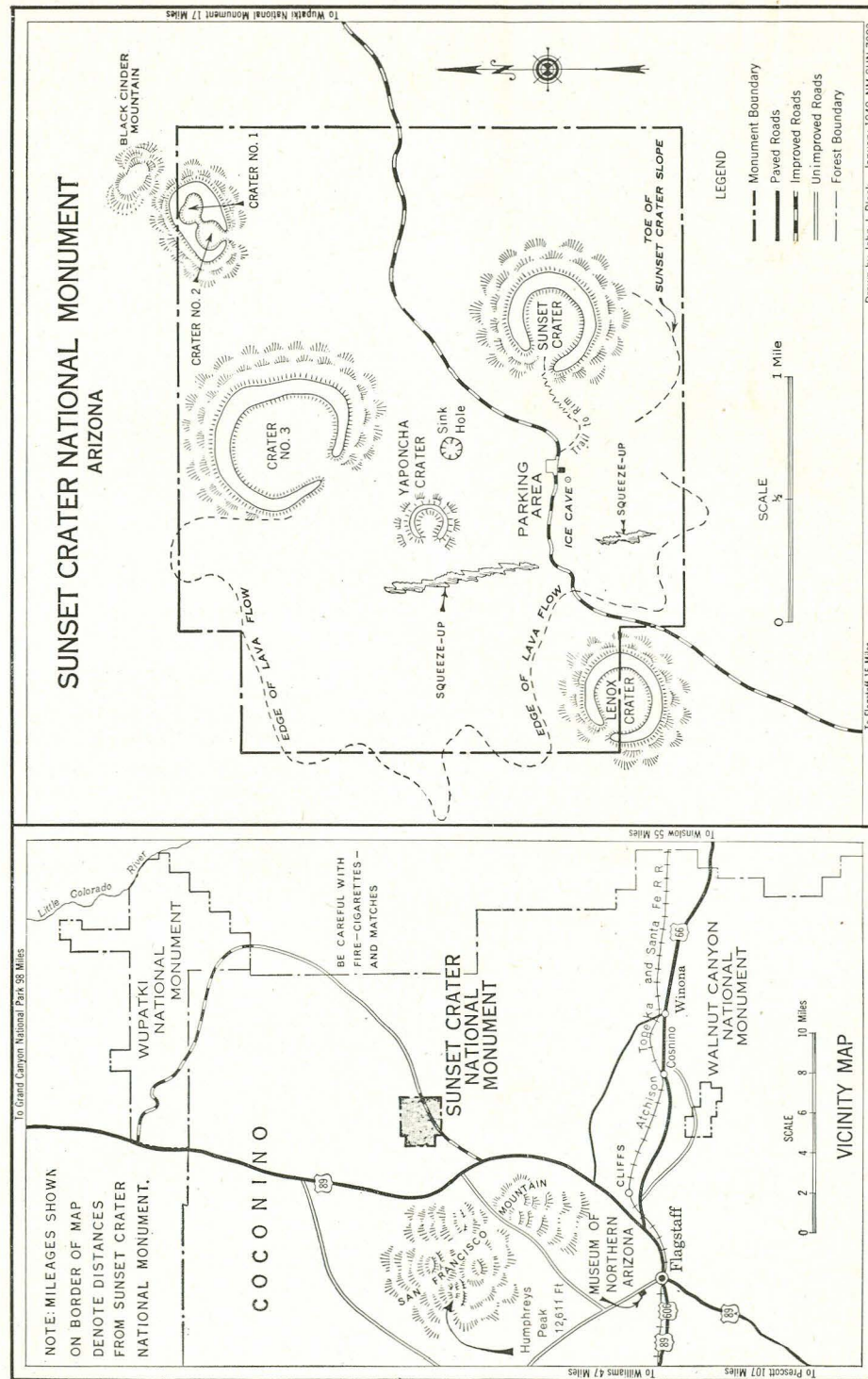
Be careful with fire and in disposing of cigarettes and matches.

Visitors are warned not to remove or deface any of the features of the monument, not only because such action is illegal but because such removal or defacement makes the monument less interesting to future monument visitors.

Visitors study a spatter cone.



Cover: Sliding cinder slopes of Sunset Crater. Photo by Joseph Muench



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