

CRATER LAKE

NATIONAL PARK

Oregon

UNITED STATES DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICE



Crater Lake

[OREGON]

National Park

United States Department of the Interior

Harold L. Ickes, Secretary

NATIONAL PARK SERVICE

Arno B. Cammerer, Director



UNITED STATES

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RULES AND REGULATIONS

• Briefed •

THE PARK REGULATIONS are designed for the protection of the natural beauties and scenery as well as for the comfort and convenience of visitors. The following synopsis is for the general guidance of visitors, who are requested to assist the administration by observing the rules. Full regulations may be seen at the office of the superintendent and ranger station.

Fires.—Light carefully and in designated places. Extinguish completely before leaving camp, even for temporary absence. Do not guess your fire is out—know it.

Camps.—Use designated campgrounds. Keep the campgrounds clean. Combustible rubbish shall be burned on camp fires, and all other garbage and refuse of all kinds shall be placed in garbage cans or pits provided for the purpose. Dead or fallen wood may be used for firewood. Camping is restricted to 30 days.

Trash.—Do not throw paper, lunch refuse, kodak cartons, chewing-gum paper, or other trash over the rim, on walks, trails, roads, or elsewhere. Carry until you can burn in camp or place in receptacle.

Trees, Flowers, and Animals.—The destruction, injury, or disturbance in any way of the trees, flowers, birds, or animals is prohibited.

Noises.—Be quiet in camp after others have gone to bed. Many people come here for rest.

Automobiles.—Careful driving is required at all times for protection of yourself and other visitors. Your car must be equipped with good brakes, horn, and lights. Passing on curves is prohibited. Obey traffic rules. A gasoline and oil station is maintained on the main highway at park headquarters. Gasoline and oil may also be secured at rim area. No other gasoline stations are available in the park. The fee for automobile permit is \$1.

Dogs.—Dogs are prohibited in the park overnight and are not permitted in the rim concentration area. When not in an automobile, dogs must be on a leash at all times.

Warning About Bears.—Do not feed the bears from the hand; they will not harm you if not fed at close range. Bears will enter or break into automobiles if food that they can smell is left inside. They will also rob your camp of unprotected food supplies.

Fishing.—A limit of 12 fish per person per day has been set for lake angling. A catch of 20 fish is permitted in park streams. No fishing license is necessary.

Park Rangers.—The rangers are here to help and advise you. When in doubt ask a ranger. Rangers at the Information Bureau, park headquarters, and the several stations will be glad to help you plan your activity while in Crater Lake and to explain the regulations.

Complete rules and regulations are available at park headquarters.

DO YOU KNOW YOUR NATIONAL PARKS?

ACADIA, MAINE.—Combination of mountain and seacoast scenery. Established 1919; 24.08 square miles.

BRYCE CANYON, UTAH.—Canyons filled with exquisitely colored pinnacles. Established 1928; 55.06 square miles.

CARLSBAD CAVERNS, N. MEX.—Beautifully decorated limestone caverns believed largest in the world. Established 1930; 15.56 square miles.

CRATER LAKE, OREG.—Astonishingly beautiful lake in crater of extinct volcano. Established 1902; 250.52 square miles.

GENERAL GRANT, CALIF.—Celebrated General Grant Tree and grove of Big Trees. Established 1890; 3.96 square miles.

GLACIER, MONT.—Unsurpassed alpine scenery; 200 lakes; 60 glaciers. Established 1910; 1,533.88 square miles.

GRAND CANYON, ARIZ.—World's greatest example of erosion. Established 1919; 1,009.08 square miles.

GRAND TETON, WYO.—Most spectacular portion of Teton Mountains. Established 1929; 150 square miles.

GREAT SMOKY MOUNTAINS, N. C.-TENN.—Massive mountain uplift covered with magnificent forests. Established for protection 1930; 617 square miles.

HAWAII: ISLANDS OF HAWAII AND MAUI.—Interesting volcanic areas, including Kilauea, famous for frequent spectacular outbursts. Established 1916; 245 square miles.

HOT SPRINGS, ARK.—Forty-seven hot springs reserved by the Federal Government in 1832 to prevent exploitation of waters. Made national park in 1921; 1.58 square miles.

LASSEN VOLCANIC, CALIF.—Only recently active volcano in continental United States. Established 1916; 163.32 square miles.

MAMMOTH CAVE, KY.—Interesting caverns, including spectacular onyx cave formation. Established for protection 1936; 38.34 square miles.

MESA VERDE, COLO.—Most notable cliff dwellings in United States. Established 1906; 80.21 square miles.

MOUNT MCKINLEY, ALASKA.—Highest mountain in North America. Established 1917; 3,030.46 square miles.

MOUNT RAINIER, WASH.—Largest accessible single-peak glacier system. Third highest mountain in United States outside Alaska. Established 1899; 377.78 square miles.

PLATT, OKLA.—Sulphur and other springs. Established 1902; 1.33 square miles.

ROCKY MOUNTAIN, COLO.—Peaks from 11,000 to 14,255 feet in heart of Rockies. Established 1915; 405.33 square miles.

SEQUOIA, CALIF.—General Sherman, largest and perhaps oldest tree in the world; outstanding groves of Sequoia gigantea. Established 1890; 604 square miles.

SHENANDOAH, VA.—Outstanding scenic area in Virginia section of Blue Ridge. Established 1935; 275.81 square miles.

WIND CAVE, S. DAK.—Beautiful cavern of peculiar formations. No stalactites or stalagmites. Established 1903; 18.47 square miles.

YELLOWSTONE: WYO.-MONT.-IDAHO.—World's greatest geyser area, and an outstanding game preserve. Established 1872; 3,471.51 square miles.

YOSEMITE, CALIF.—Valley of world-famous beauty; spectacular waterfalls; magnificent High Sierra country. Established 1890; 1,176.16 square miles.

ZION, UTAH.—Beautiful Zion Canyon, 1,500 to 2,500 feet deep. Spectacular coloring. Established 1919; 148.26 square miles.

Events

OF HISTORICAL IMPORTANCE

1853	John Wesley Hillman and a group of prospectors discovered the lake and named it Deep Blue Lake.
1862	Chauncey Nye and party of prospectors, unaware of the previous discovery, accidentally visited the lake.
1865	Soldiers from Fort Klamath, without knowledge of previous discoveries, visited the lake and named it Lake Majesty.
1869	Jim Sutton, accompanied by David Linn and family, of Jacksonville, visited the lake and named it Crater Lake.
1873	First photograph, a daguerreotype, taken of Crater Lake by Peter Britt, southern Oregon pioneer.
1883	J. S. Diller, geologist, and Everett Hayden, of the United State Geological Survey, visited the lake.
1885	William Gladstone Steel, with Prof. Joseph Le Conte, Capt. Clarence E. Dutton, J. M. Breck, Jr., and others, visited Crater Lake. Mr. Steel suggested that a national park be established and a petition was sent to President Cleveland.
1886	The President issued a proclamation withdrawing 10 townships, including Crater Lake. Lake surveyed and sounded by the United States Geological Survey.
1888	First fish planted in Crater Lake by William Gladstone Steel.
1896	Mazamas visited Crater Lake and christened the ancestral mountain, of which only the caldera remains, Mount Mazama.
1902	Crater Lake National Park, created by congressional action, approved by President Theodore Roosevelt. First superintendent, W. F. Arant, appointed.
1907	First automobile driven to the rim of Crater Lake by Charles True, from Medford, Oreg. The <i>Wocus</i> , the first boat used in rendering a launch service to visitors, placed on the lake.
1912	Crater Lake Lodge, the oldest structure now existing in the rim area, was built.
1927	Crater Lake Ski Club organized. First annual ski races held.
1931	Sinnott Memorial completed and dedicated.
1932	The Watchman Observation Station completed.
1935	Park approach roads and highway to rim open for first time throughout winter.

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SINNOTT MEMORIAL OBSERVATION STATION

CRATER LAKE

National Park

• PARK ACCESSIBLE ENTIRE YEAR •

LOCATED in southern Oregon, on the crest of the lofty Cascade Range, Crater Lake National Park has a high place among the Nation's most scenic wonderlands. It is a gem of rare excellence, possessing unity of form and color. At Crater Lake visitors observe beauty in its truest sense and experience a profound inspirational appeal. Pervaded by an air of mystery, tranquillity now prevails where once unfathomable volcanic power was displayed.

It is a shrine before which all may, with an attitude of reverence, penetrate the veil of the unknown to meet the realities of nature. The park now embraces an area of 250.52 square miles, or 160,333 acres, and was established by act of Congress on May 22, 1902.

The lake rests in the very heart of a mighty mountain whose destruction resulted in the formation of a vast crater in which the waters accumulated. This body of bluest of waters in the world has no known inlets or outlets. It is dependent entirely on precipitation for its great depth. It is 6 miles wide, 2,000 feet deep, covers an area of 20 square miles, and has a circular shoreline of 26 miles, with multi-colored lava cliffs reaching out of mystic blue depths for another 2,000 feet.

Mountain trails lead to the summits of high points about the rim and down a thousand feet to the shores of a sea of silence. At the water's edge, motorboats and rowboats are available for those who wish to see more of the lake or try their hand at trout fishing. Regular boat trips are planned to Wizard Island, the perfect little crater rising above the surface of the lake. For those who do not descend the trail to the water's edge there is a motor drive around the rim of the lake. Every turn presents a different view. The constantly changing color and the contrasts of lava cliffs and blue water are beautiful beyond description.

DISCOVERY AND HISTORY

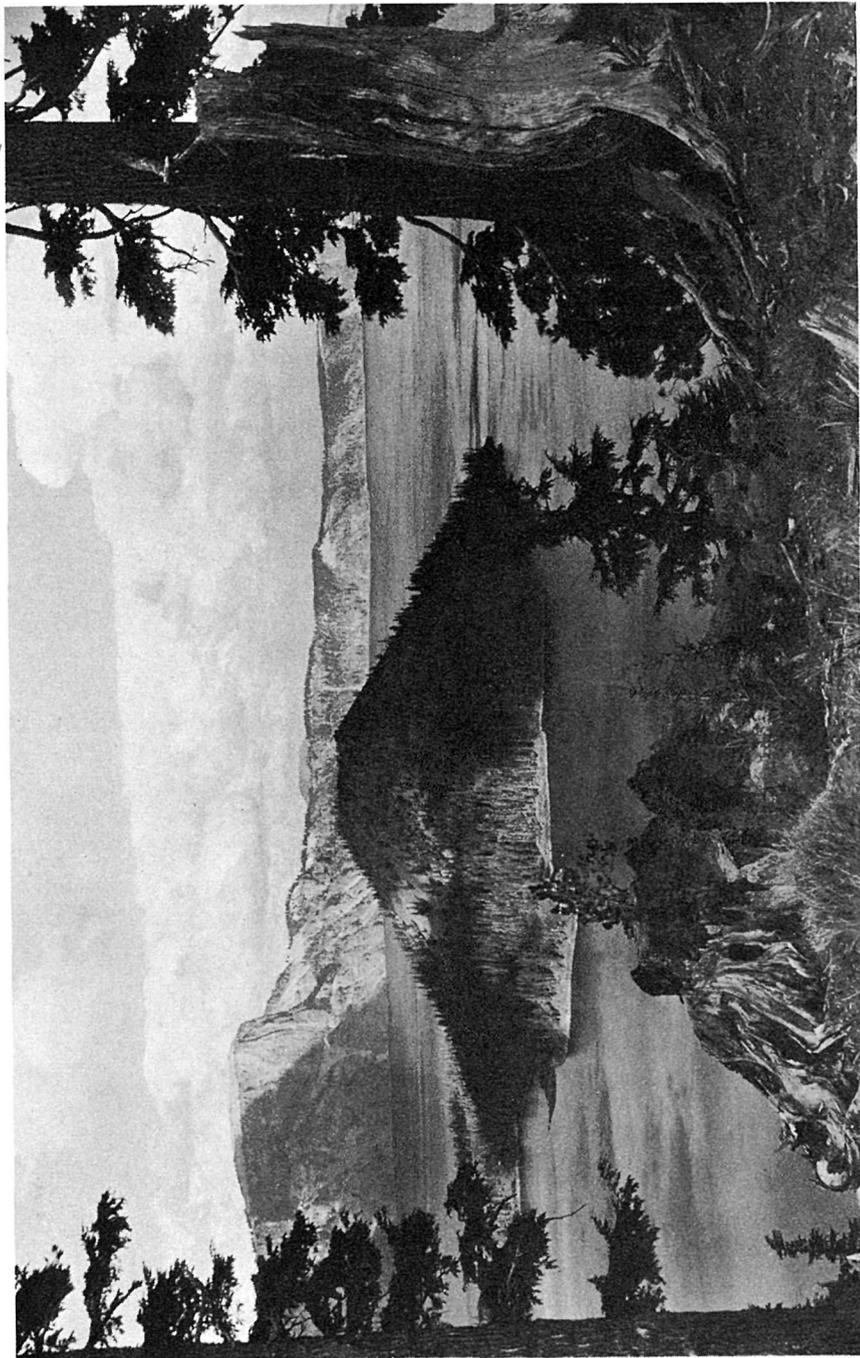
Legend says that the Klamath Indians believed Crater Lake was once a weird, ghostly amphitheater where the gods were forever embroiled in conflict, sporting in its blue waters and dwelling on its rocky heights and in its mystic depths.

Pioneers came slowly to southern Oregon, its sparse population in the early fifties living in constant dread of Indian wars. Miles of mountain region had never been explored when a party of California prospectors came to the mining village of Jacksonville. This was the only settlement in the region and owed its existence to the discovery of gold nearby. The Californians while preparing a journey into the mountains remained secretive regarding their mission. The purpose of their trip, however, was betrayed by a member of the party to a group of Oregon miners who learned that the strangers were searching for a "Lost Cabin Mine", believed to be near the head of the Rogue River. Without delay, the Oregon miners decided to follow the Californians into the wilds, despite persistent efforts of the latter to evade them. Later, when the food supplies of both parties were running low, John Wesley Hillman, leader of the Oregon party, succeeded in uniting the two forces, and the search for the mine was postponed in order to hunt for game.

Thus it was on June 12, 1853, that Hillman, who had gone on some distance ahead of the hunting group, happened to ride up a deep canyon which, judging from its depth and width, he thought would lead to a higher slope. Letting his mule pick its way upward, he kept peering through the woods for game. Then suddenly the animal stopped, halting at the very rim of a deep blue lake. As the rider looked down he beheld a scene of unsurpassed beauty. Other members of the party soon joined their leader, and they agreed to call the body of water Deep Blue Lake.

In the excitement of gold stories and Indian wars, Crater Lake was forgotten for several years. There were no more visits by white men until 1862 when a party of six unsuspecting miners, led by Chauncey Nye, happened upon the place while on a prospecting trip and believed they had made a new discovery, only to learn afterward of Hillman's visit. A third "discovery" was made in 1865 by a party of soldiers from Fort Klamath. They called the body of water Lake Majesty. This name was changed to Crater Lake in 1869 by visitors from Jacksonville.

Some years later, in 1872, William Gladstone Steel came to Oregon. The story is told that when Steel was a schoolboy in Kansas he had heard of the discovery of Crater Lake and had made a resolution that he would sometime see the western wonder. He spent 7 years in Oregon before he



Craterford photo.

WIZARD ISLAND

could find anyone who had heard of Crater Lake; two more passed before he found a person who had actually seen it. It was not until 1885 that he was able to visit the place which he found to be even more beautiful than he had anticipated. The result was that Judge Steel conceived the idea of setting aside the lake and the region thereabout as a national park. He began an immediate agitation for this. Though the task was not an easy one and there was much opposition from certain quarters, Steel was undaunted by the rebuffs and continued his efforts unselfishly and with personal sacrifice over a period of 17 years. Success crowned his work when the park was established by an act of Congress, approved May 22, 1902. Judge Steel thereafter devoted his life to the development of the park and became one of its first superintendents. Later he became park commissioner, holding this office until his death in 1934.

Soon after Steel's first visit, soundings were taken on the lake under the direction of Capt. C. E. Dutton of the United States Geological Survey. Over a month was spent in the work, with the deepest sounding recorded at 1,996 feet.

The first survey for a road system within the park was made in 1910 and 1911; 2 years later the entrance roads from Medford and Klamath Falls were built. Though these roads were very primitive when compared with those now developed, they served the needs of that time when travel was yet dependent principally on horses and wagons.

GEOLOGICAL STORY

Visitors to Crater Lake find that they have to ascend continuous pumice slopes, which rest on a vast lava plateau, in order to reach the rim of the marvelous lake. It is evident that a mighty mountain once stood where now rests a lake of unbelievable blue, 2,000 feet in depth, on all sides of which perpendicular lava cliff walls rise from 500 to 2,000 feet.

In 1896 the Mazama Club, a mountain-climbing group of Portland, Oreg., visited the lake, and with fitting christening ceremonies, gave to the hypothetical mountain, which no man ever saw, the name of Mount Mazama. It is evident that the former mountain, and in fact the entire Cascade Range extending from northern Washington far south into northern California, is part of a series of tremendous lava flows. In late geological ages molten rock poured out over an area of more than 300,000 square miles, extending into Oregon, Washington, Montana, Idaho, north-eastern California, and northwestern Nevada. This vast lava plateau, the most extensive on the North American Continent, resulted from extensive fissure flows. The dominant trend of the great fissures or cracks is north to

south, which accounted for the building of the Cascade Range on the plateau foundation along these lines. Those who have seen the Columbia River Gorge have noted the layer upon layer arrangement of the lava which forms the plateau base.

As the volcanic cones of the Cascade Range, which include Mount Rainier (14,408 feet), Mount Adams (12,326 feet), Mount Baker (10,750 feet), Mount Shasta (14,161 feet), Mount St. Helens (9,697 feet), and Mount Lassen (10,453 feet) were being built by the extrusive forces of vulcanism, the mountain in the remnant of which Crater Lake now rests was formed. The extrusive lava outpouring, piled layer upon layer, supplied a foundation upon which pumice, volcanic ash, agglomerate, and successive eruptions formed the high volcanic peak. The radiating slopes of this peak are covered with a huge mantle of debris, transported by glaciers and by running water. The adjacent gorges and canyons display spectacular exposures of mud flows, pumice, and tuff. Although the surface of the region has been changed by erosive forces, the cessation of vulcanism has been so recent that the remaining portion of the mountain and its radiating slopes must today appear similar to the general outlines prevailing prior to its destruction and the development of the lake.

Crater Lake should be considered in relation to the mighty volcanic cone which was built by alternate stages of explosive emanations and quiet extrusive flows during a long period of time. Upon examination of the cliffs bordering the lake we find layer upon layer of fragmental material. These walls with their bands of lava appear like sections of a layer cake. Although the layers seem to be roughly horizontal when viewed from the rim; they really slope gently away from the lake. This is true not only at one place but everywhere around the rim. The bands are neither uniform in thickness nor in character. One may be composed of andesitic lava, 5 to 10 feet thick, while the next one may be composed of pumice or volcanic agglomerate, 15 or more feet thick. These layers, 39 of which are visible at certain localities, represent successive periods of volcanic activity. Each accumulation means a new eruption.

Molten lava may be spilled out as broad flows of molten rock, or forced upward by deep-seated forces within the earth. These latter extrusions may cause the volcano to break forth in new places on the mountain side. That this has happened to the old Crater Lake mountain is evidenced by the lava filling of the cracks or fissures which have formed resistant bands of lava rock, called dikes, which cut across the previously formed bands or layers. Molten rock is forced upward and outward, and as it cools it solidifies and develops masses of rock harder and more resistant to

disintegration and decomposition than the surrounding rock material in which it discordantly rests. The forces of weathering and erosion attack the softer bordering material, leaving the resistant filling of the fissures as protruding ridges. There are many illustrations of such dikes to be seen within the rim of Crater Lake, the most spectacular of which is the Devil's Backbone. Removed from the rim of the lake, there are a number of adnate cones which grew upon the lower slopes of the old mountain. Timber Crater, Crater Peak, and Union Peak are a few of the more spectacular representatives.

With the exception of the dikes, the lava formations all slope gently from the rim of the lake. This indicates that there must have been a source for the material somewhere within the area now occupied by Crater Lake. The significance of this statement is paramount, for it suggests the existence of a volcano where Crater Lake now rests. The angle at which the layers of volcanic material slope away from the rim affords a method of estimating the former height of this mountain. By careful calculation geologists have arrived at a figure ranging from 12,000 to 15,000 feet for the elevation of Mount Mazama. This would indicate that the former mountain was on a par with the other mighty volcanic peaks of the Cascade Range.

WORK OF STREAMS AND GLACIERS

Students of earth history have found unmistakable evidence that streams and glaciers were present on the mighty mountain during the course of its building and also in subsequent time. In the layers forming the rim of the mountain there is evidence of wear by rushing water as shown by the cutting of valleys and by the accumulation of water-carried ash, pumice, bombs, and boulders.

In many places on the radiating slopes of the rim may be found exposures of polished rock, smoothed and planed by the scouring action of moving ice which carried with it sand, pebbles, and boulders. These evidences of glaciation are not to be confused with similar structures, produced by flow structure in the fast cooling molten masses. At Discovery Point the protruding rock is polished and scratched. Parallel grooves, resulting from glacial action, appear, and some 30 to 40 feet below there is another exposure of polished rock. The crest of the rim in many other places exhibits similar glacial characteristics. One who walks along the Path of Nature to Discovery Point has an excellent opportunity to read the story recorded in the rocks and to differentiate between the confusing structures. First, one sees glacial striae on the upper surfaces of many lava flows; next, a pseudostratification, produced by both flow banding and fracturing of the hot,

molten lava mass. Farther along the trail Mother Nature has placed these two confusing structures side by side. The glacial striae are seen at right angles to the flow banding of the lava, and elsewhere within the same lava flow the striae are seen parallel with the banding. By studying the inner wall one finds that glacial accumulation and the resulting scour occurred during the building process, and that after the maximum accumulation ice formed on the surface of the mountain and wore down the sides, forming typical glacial, U-shaped valleys.

The visitor, without examining the rocks in detail, may see clearly the effects of glaciation. From most points on the rim it is possible to look across the lake and observe the two giant, U-shaped notches which cut the rim between Garfield Peak and Cloudcap. Kerr Valley and Sun Valley, both over a thousand feet deep, are smooth sided and exhibit the typical characteristics of glacial channels. The notches do not represent the headwaters of streams. They are cross sections of valleys which once extended much farther up the slope of the former mountain, having had their beginning in glacial feeding grounds which disappeared with the destruction of the central portion of the mountain.

What is the significance of these evidences of glaciation both on the rim and buried beneath the successive flows of lava? What part do they play in the story of Crater Lake?

In the first place, they definitely establish the existence of the theoretical mountain, called Mount Mazama. There unquestionably was a mountain on which the glaciers formed and down whose slopes the ice moved, gouging out U-shaped valleys and polishing the lava rocks. Furthermore, this was an intermittently active volcanic cone. Periods of glaciation were interspersed with periods of vulcanism. Lava flows descended the ice slopes, melting the glaciers and filling the valleys. As proof of this sequence of events, we find at Llao Rock a well-developed U-shaped valley filled with lava. This is termed a "plugged valley" by students of vulcanism. It is believed that beneath the massive lava flow or plug, some 1,000 feet in thickness, will be found marks which a glacier always leaves, polished glacial boulders, and striated-rock surfaces.

RECORDS OF VEGETATION

In addition to the story of vulcanism and glaciation, the rocks of the inner rim and the radiating slopes disclose a record of former advances and retreats of vegetation. Some 20 miles both to the east and to the west of the rim of the lake, logs turned to charcoal have been discovered, buried under 60 to 70 feet of volcanic ash and pumice. Hundreds of these

charcoal specimens have been discovered buried in a prostrate position. Many display the presence of pitch and the cellular structure of the original living trees. The vegetation advanced up the side of the mountain during a period of volcanic inactivity when conditions existed favorable for vegetative growth. The most significant discovery which has been made at Crater Lake was the finding of such a stump of a pine tree, in an upright position, within the present rim of the lake, during the summer of 1933. The top portion of the stump was found to be carbonized, while the lower part and radiating roots were uncarbonized and partially decomposed. This find in place substantiates the concept that forests grew on the slopes of the old mountain and that the pumice and ash hurled from the fiery crater fell, while still hot, on the slopes and covered the standing trees and preserved portions of them in a carbonized condition. The tree was growing upon a glacial surface, its roots penetrating a glacial deposit. Cool ash, pumice, and bombs tumbled down the slope from above and covered the roots and the base of the tree. At a subsequent time, hot volcanic ejecta, pumice, ash, and dust settled around the tree so fast that air was excluded, combustion was prevented, and carbonization resulted. Afterward glaciers ground down over the mantle of volcanic debris which had covered and carbonized the tree. The huge crater was formed at a later date, and it was widened in all directions by the breaking away of the inner lava walls. The resulting erosion of the inner rim slope has shifted the rim crest outward so that now the specimen is located within the crater rim. This fascinating discovery will be preserved in place as an exhibit.

Further search for previous existence of vegetation has revealed a thick soil zone with fine fragments of charred vegetal materials underlying some 50 feet of pumice just beneath the crest of the rim at Pumice Point. Above Cleetwood Cove vegetal remains are covered to a still greater depth by pumice and lava. The evidence is at hand to establish the fact that the intermittent volcano recurrently was clothed with vegetation, and that vulcanism, glaciation, and the retreats and invasions of vegetation played their roles in the interesting drama.

DESTRUCTION OF THE MOUNTAIN

It is evident that a great catastrophe has occurred, and a mighty crater remains where the top of the mountain formerly stood. Three theories have been advanced to explain the destruction of the mighty mountain and the origin of the lake.

Many geologists believe that the top was blown off by a series of terrific explosions and that the land surface in all directions was covered with successive showers of fragmental material, pumice, and ash. The mountain slopes are covered with a thick mantle of pumice and semisorted fluvioglacial material which indicates that extrusive volcanic debris was moved and sorted by the action of glaciers and running water. Others contend that the absence of huge blocks of lava adjacent to the rim or scattered as erratics on the radiating slopes discounts the explosive concept. Adherents of the explosive concept present the idea that decomposition and disintegration have been very active and that much of the explosive material hurled down the radiating slopes has been broken down and removed. They contend that the present land surface shows evidence of excessive weathering and erosion of the mountain slope. Examination of new road cuts during recent field work has shown that in many places the pumice is only a veneer which masks a blocky horizon of large fragments beneath.

The second theory regarding the disappearance of the volcanic cone suggests that the mountain collapsed or was engulfed. This concept presupposes that the molten rock within the earth-magma sank, and, as it withdrew, the top of the mountain was remelted and a yawning, bowl-shaped depression some 4,000 feet deep was left. Those who propose the collapse theory hold that the volume of the mountain top which has disappeared amounts to some 17 cubic miles, and that such a great mass, if removed by explosion, would have thickly covered the radiating slopes and produced a symmetrical, conical base.

Closely associated with the collapse concept is the third theory which holds that the seething molten mass of lava in the crater of the volcano fused and undermined the walls and gradually produced the wide cauldronlike crater without tremendous explosions. In the volcanoes of the Hawaiian Islands huge craters are constantly being enlarged by a similar caving-in process, and the lava lakes rise and fall sometimes more than a thousand feet. The walls are undermined, causing huge spawls to tumble in and contributing to the widening of the bowl-like depressions or craters.

It is possible to conceive that one of the above forces may have prevailed in the formation of the crater at Crater Lake, or that a combination of these forces destroyed the ancestral mountain. In any event, the rock layers inside the crater wall are clearly exposed, and have been sharply broken around the entire rim area. This fracturing and falling in of huge spawls resulted in the widening of the crater. The precise details of the

story are not yet fully known and remain a challenge to scientists. This feature causes eminent students of earth history from all over the world to travel far in order to examine this most unique laboratory of vulcanism, glaciation, and vegetative adaptation.

Whatever the cause, a huge crater developed some 4,000 feet deep. Then, as the final gasp of vulcanism, the Wizard Island cinder cone grew in the base of the crater. The sounding of the lake in 1886 presented information which points to the existence of two lesser cinder cones which are now covered by water.

Shortly after the destruction of Mount Mazama and the formation of Wizard Island and the lesser cones, Crater Lake itself came into existence. The water of Crater Lake is derived from the rain and snow falling directly over the crater surface, and from snow blowing into the huge depression. The conditions of evaporation, seepage, and the precipitation are in a state of balance which make possible this deep basin of water and the maintenance of approximately a constant water level. A very fine adjustment of natural forces prevails, and the lake might never have been formed if any one of the significant events in the chain of circumstances had been materially different.

The mute display of power and the mystery concerning the origin tend to add an atmosphere of charm to the entire setting of the unbelievably blue water. Color is an outstanding characteristic of Crater Lake. Among spectacular lakes of the world no depth of color and brilliance of blue are more striking. The blue of the deeper water is brought out in contrast with the shades of green displayed in the narrow, shallow areas along the margin. The deep blue of the lake is believed to be caused chiefly by the scattering of light in water of exceptional depth and clearness. In addition, the water surface is walled around with sheer cliffs, rising from 500 to 2,000 feet above the water surface, and this prevents observation of the lake from a normal perspective. The color is thought to be due to the same cause that produces the blue of the sky.

The beauty of color and the unity of form possessed by Crater Lake present a vision which will never be forgotten. It is truly a place of tranquillity, born of the tumultuous forces of fire and explosion. But still the lake possesses its moods. One finds that the coloring and appearance change from hour to hour and from season to season as the angle of the sun's rays changes. To come to know this most marvelous lake is a cumulative experience. Its air of weird mystery and charm always prevails.

PLACES OF INTEREST

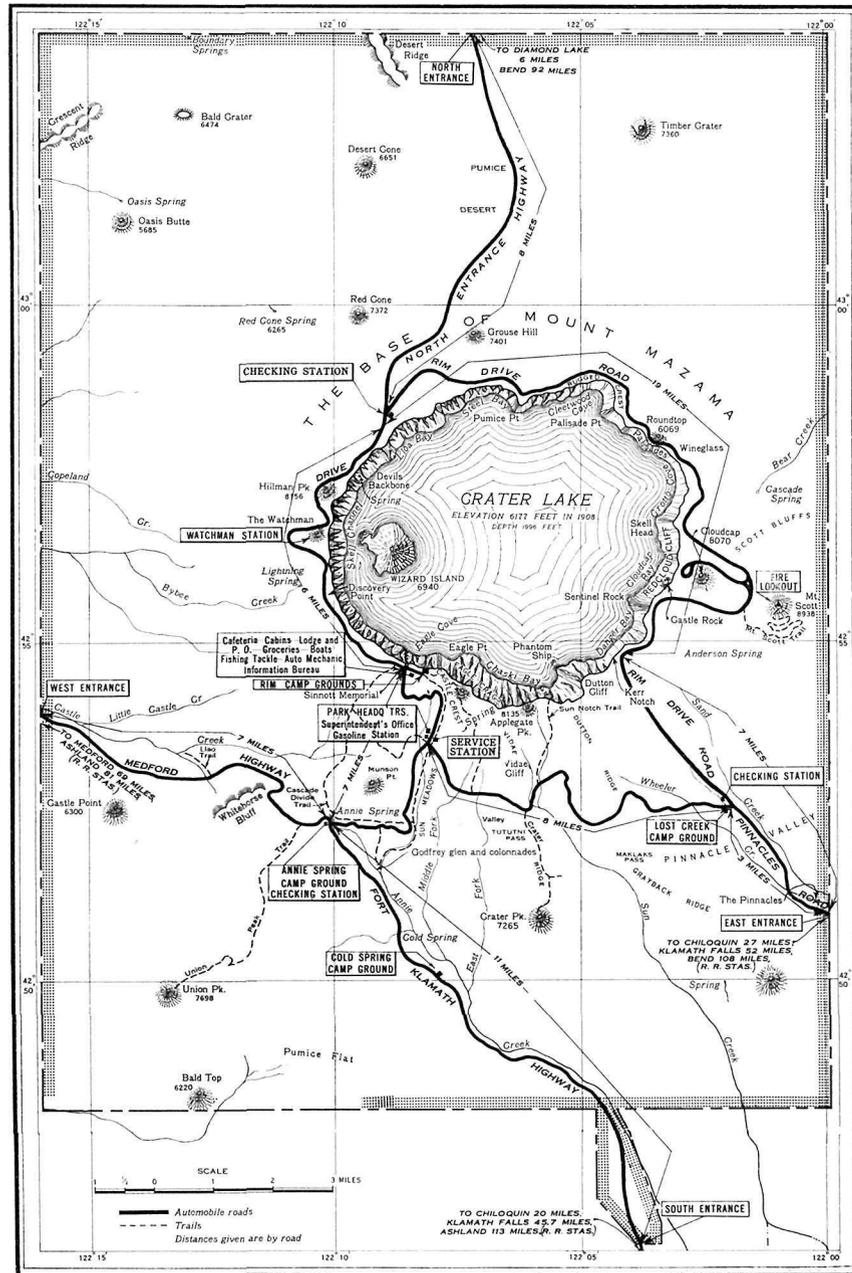
SINNOTT MEMORIAL

In recognition of great service to Crater Lake National Park and to the State of Oregon, Congress authorized by an act approved May 14, 1930, the construction of a memorial to Representative Nicholas J. Sinnott of Oregon. Following this recommendation an attractive stone building was constructed on Victor Rock, just inside the rim of Crater Lake. The structure, with its broad parapet looking over the lake, serves as an orientation point for all park visitors. High-powered field glasses are trained on the important features, helping the visitor to understand the geologic history of the lake and to appreciate the relationship between the scenic and scientific. Displays in the exhibit room, maintained in connection with the observation station, further aid the visitor to appreciate the beauties of the park and to interpret the moods of Crater Lake. A large relief map of the Crater Lake region is located on the parapet. This particular feature of the Sinnott Memorial display is extremely popular in that it helps the foot traveler, as well as the autoist, to locate the places of interest he wishes to see. All those who come to Crater Lake should visit the Sinnott Memorial as soon as possible after their arrival in the park. It is located close to the lodge and campground and may be reached in a 2-minute walk from the highway.



Grant photo.

NATURALIST GUIDING A PARTY OF VISITORS OVER THE RIM TRAIL



MAP OF CRATER LAKE NATIONAL PARK

RIM DRIVE

An interesting highway encircles the lake, and visitors in their own automobiles are invited to join the party conducted on the Rim Drive by a member of the park naturalist force. Stops are made at a number of observation points where ranger naturalists review the geologic history of the area and explain different features of the natural history. One of the stops is at Discovery Point, where John Wesley Hillman first saw Crater Lake, June 12, 1853. Other stops are at Llaol Rock, the Devil's Backbone, the Wine Glass, Cloud-cap, and Kerr Notch. The starting time for the trip is announced by the park naturalist and is posted on the Government bulletin boards. All trips leave from the Sinnott Memorial, located on Victor Rock near the lodge and campground. Approximately 3 hours are required to drive around the 35-mile circuit.

WIZARD ISLAND

This is a symmetrical cinder cone rising 763 feet above the surface of the lake. The island may be reached by boat. A trail leads from the shore to the crater, which is approximately 90 feet deep and 300 feet in diameter.

THE PHANTOM SHIP

Not far from Wizard Island is a formation called the Phantom Ship. It rises from the waters of the lake, a twisted and strangely formed mass of lava, which has been tossed up from the central fires that have died within the heart of the lake. Its shape strongly suggests a ship under sail. The illusion at dusk or in the moonlight is impressive. In certain lights, the phantom ship seems suddenly to disappear.

GARFIELD PEAK

With an altitude of 8,060 feet, this peak is easily reached by trail from the lodge. From the summit there is a magnificent view of the lake and of the range to the eastward.

LLAOL ROCK

This is an object of interest chiefly as the fabled dwelling place of the Spirit of Llaol. According to Indian legend, the shadow being of Llaol, who could never be killed, dwells in the rock. He looks out over the lake and at favorable moments, when other spirits dwelling in the air or water are careless or off guard, he comes out of the rock and causes great storms on the lake where he once ruled. Llaol Rock rises nearly 2,000 feet above the lake level. As mentioned in the geologic story of the lake, this rock was

formed by a lava flow which descended the slopes of Mount Mazama and filled one of the large U-shaped valleys once occupied by a glacier.

According to a legend of the Klamath and Modoc Indians the mystic land of the Gaywas was the home of the great god Llao. His throne in the infinite depths of the blue waters was surrounded by giant crawfish, his warriors, who were able to lift great claws out of the water and seize too venturesome enemies on the cliff tops.

War broke out with Skell, the god of the neighboring Klamath marshes. Skell was captured and his heart used for a ball by Llao's monsters. But an eagle, one of Skell's servants, captured it in flight, and a coyote, another of Skell's servants, escaped with it; and Skell's body grew again around his living heart. Once more he was powerful and once more he waged war against the god of the lake.

Then Llao was captured; but he was not so fortunate. Upon the highest cliff his body was quartered and cast into the lake and eaten by his own monsters under the belief that it was Skell's body. But when Llao's head was thrown in the monsters recognized it and would not eat it.

Llao's head still lies in the lake, and white men call it Wizard Island. The cliff where Llao was quartered is named Llao Rock.

THE WATCHMAN

On the rim, directly west of Wizard Island, is the Watchman. This peak, deriving its name from its use as one of the observation points during the sounding of the lake in 1886, is of interest not only because of its height, but because of the fire lookout and observation station on its summit. They may be reached after a 15-minute walk over a new trail from the rim road. A rare panorama of the park and surrounding country may be viewed from this point, which is 8,025 feet above the level of the sea and 2,000 feet above the lake.

CLOUD-CAP

Possibly the most comprehensive view of the lake may be obtained from Cloud-cap, on the east rim. Its summit rises over 8,000 feet above the level of the sea and 2,000 feet above the lake. To the east is Mount Scott, and to the north and west wide vistas of the summit of the range. On a clear day, the shining surface of Klamath Lake may be seen far to the south, bordered with vast marshlands and the dark timber at the foot of the range, while farther south is the crown of beautiful Mount Shasta. The strange coloring of Crater Lake is well observed from Cloud-cap. In the sunlight there is play of clouds and soft shadows upon the surface of the lake. Purple hues, delicate lavender with violet blue, and deep streaks of emerald

shading to a silvered green along the shores present a variation of color and beauty one may never hope to see elsewhere.

MOUNT SCOTT

East of Cloud-cap is Mount Scott, easily climbed and affording fine unobstructed views. The peak is the highest point within the park, reaching an altitude of nearly 9,000 feet. A fire lookout is located on the summit.

THE PINNACLES

Located in Wheeler Creek, near the east entrance of the park, are the slender spires of volcanic ash and fragmental material. Some of the needles are 200 feet in height. In Sand Creek Canyon and Godfrey's Glen in Annie Creek Canyon there are additional spires and fluted columns carved out of the soft volcanic material by the erosion of water. The Pinnacles continue to grow in height and new ones are slowly being formed.

During the summer of 1935, ranger naturalists discovered many small fumaroles near the top of the gray tuff and ash deposits of Wheeler Creek Canyon. Some of them are within the pinnacles themselves, regarded as proof that the deposits were once hot and of the nature of sand flows like those in the Valley of Ten Thousand Smokes in Alaska.

UNION PEAK

From the highway that mounts the Cascade Range from the west, one obtains a splendid view of Union Peak, 7 miles to the southwest of Crater Lake. It appears to have been placed on the top of the range to mark the burial place of a guide of Indian lore. This strange towering peak is the remaining neck of what was once an active volcano which played its part in the building of the Cascade Range. It is a landmark of unusual form among the peaks, rising 1,400 feet above the crest of the range and nearly 8,000 feet above sea level. Trail trips to Union Peak are among the finest offered in the Crater Lake area.

MOUNT THIELSEN

This great clifflike formation, rising to an elevation of 9,178 feet, is to the north of Crater Lake and outside of the park. It is a picturesque sight when seen from the heights surrounding the lake and is often referred to as the Matterhorn of the Cascade Range. It is the wreck remaining of a great mountain. The sharp summit of the peak has been shattered repeatedly by lightning, producing fused glassy surfaces and tortuous opening of the nature of fulgurite formations. To reach its sharp heights is difficult and

requires experience in mountain climbing. Near the foot of Thielsen lies Diamond Lake.

LLAO'S HALLWAY

The Hallway, a gorge 125 feet deep cut through pumice material by stream erosion, is located on a tributary to Castle Creek just north of the White Horse campground on the Medford Road. There are numerous cave amphitheatres and narrow passageways along the trail which follows the bottom of the gorge.

CASTLE CREST WILD FLOWER GARDEN

Ideal for the study and viewing of Crater Lake flora, this garden is near Park Headquarters, 3 miles from the rim area. A one-half mile trail winds through this area, alive with blooms throughout the summer season.

WILD ANIMALS

The park abounds with the smaller game species that are of great interest to the visitor because of their friendly inquisitiveness. Members of the squirrel family have learned that they will not be harmed and so are numerous along roads and trails and at any place where people congregate, knowing that in such surroundings they will find a wealth of tidbits.



Copyright, Kiser.

BRUIN CLIMBS A TREE

The larger mammals, with the possible exception of the bear, are fairly well represented but not numerous. Of the three deer species, the Columbia blacktail is most numerous. Also reported is the larger mule deer, and occasionally a band of whitetail deer will be discovered in one of the grassy, watered meadows. Elk have been noted along the eastern side of the park as far north as the base of Mount Scott, the park's loftiest peak.

Bears, while they may be seen by the keen observer in many parts

of the park, are most numerous around Park Headquarters and may be seen at almost any hour of the day foraging in the garbage pit nearby. Excepting a few brown individuals, they are the well-known black variety. The grizzly bear has become extinct in this section.

Sometimes as many as three cubs, attended by their mother, make their appearance. Visitors never tire of watching the antics of these little balls of fur as they frolic and play. An occasional disciplinary cuff administered by a watchful mother always causes much merriment among the spectators.

In the interest of safety, it is prohibited to feed the bears by hand. Too many persons have been painfully clawed doing so. Also it is well to see that one does not get between the mother and her cubs.

Others of the larger animals extant in the park, but seldom seen by the casual observer, are the cougar or mountain lion, the wolf, the coyote, and the red fox.

Most common and approachable are the friendly and gluttonous little golden-mantled ground squirrels. They stuff their cheeks with peanuts from the hands of visitors until they can hold no more, then scurry away, hurriedly cache the supply for future use, and come back for more. Numerous also, but not quite so trusting, are the tiny chipmunks, easily distinguished from the golden-mantled squirrel. These little fellows seem charged with electric energy, darting to and fro, seemingly never quiet.

Basking on a warm rock or stoddily making his way among them, one will frequently see the marmot, whose kind is plentiful along all the roads and trails.

The hiker is constantly having his way challenged by the alert and exceedingly saucy little pine squirrel, who may be recognized by his very audacity. The porcupine is frequently observed as he waddles clumsily in his search for food, which consists chiefly of succulent bark from young pine trees.

His shrill note often heard on rocky slopes, but almost impossible to discover, because of his wonderful protective coloration, unless he moves, is the cony or pika. These tiny animals are commonly seen at the foot of the Crater Wall Trail.

Not quite as interesting perhaps, but often seen, are badgers, gray squirrels, and rabbits of both the snowshoe and cottontail variety. Other furry little denizens not so frequently seen are the mink, mountain weasel, flying squirrel, and marten.

In only one place in the park, and that far off the beaten paths, lives a colony of beaver. These are of the bank-beaver type and do not build the big lodge familiarly associated with the name.

In all, nearly 50 species of mammals have been classified in the park. Due to the general elevation of the area, there is a surprising absence of reptiles and not many amphibians, such as frogs and salamanders.

BIRD LIFE

Great numbers of birds of many varieties have discovered that Crater Lake National Park is a sanctuary for them. There are now more than 70 varieties in the park. Bird notes are heard continuously, and the little creatures, especially the brilliantly colored ones, are often observed as they flit about amid the dark foliage of pine, fir, and hemlock.

The Eagle Crags have furnished nesting places for the golden eagle and the American bald eagle; Llaio Rock is the home of falcons. Ospreys have been seen, and the horned owl forages nightly. California gulls visit the park and black cormorants are known to have nested and raised their young on the lake. There are ravens and half a dozen varieties of hawks. Canvasback and golden-eyed ducks frequent the lake, and the Sierra grouse the timberlands. Clark's crow, the camp robber, and California, crested, and gray jays make their presence known on the trails and around the campgrounds.

Smaller birds frequently seen are the mountain bluebird, Townsend solitaire, Sierra junco, pine siskin, creeper nuthatch, chickadee, and grosbeak. There are golden and ruby-crowned kinglets, robins, wrens, wood and green-tailed towhees, purple and rosy finches, chipping and other sparrows, several varieties of thrushes, and five varieties of warblers. Occasionally a humming bird is seen.

The most noticeable of the small birds of the park is the western tanager, a brilliant streak of gold as he darts and flits in the dark foliage, and equally remarkable in coloring when he rests on twig or branch, where his red head, yellow body, and black wings with yellow bars are unmistakable. The sweetest singer in the park is the hermit thrush—shy, difficult to locate, but making his presence known by his beautiful song.

During migratory seasons, thousands of geese, including the Canadian, snow and white-fronted varieties, fly over the park, taking advantage of a low pass over the Cascade mountains near Annie Spring. These birds make their flights in daylight hours, while numerous other varieties of waterfowl fly over at night.

FISHING

Angling amid scenes of towering, multicolored cliffs in heavily trout-stocked waters of deepest blue, fishermen are provided with an experience

unknown to any other spot, though search may be made in the far corners of the earth. Trout bite readily in Crater Lake and are caught in such numbers that even the most inexperienced of anglers are seldom disappointed.

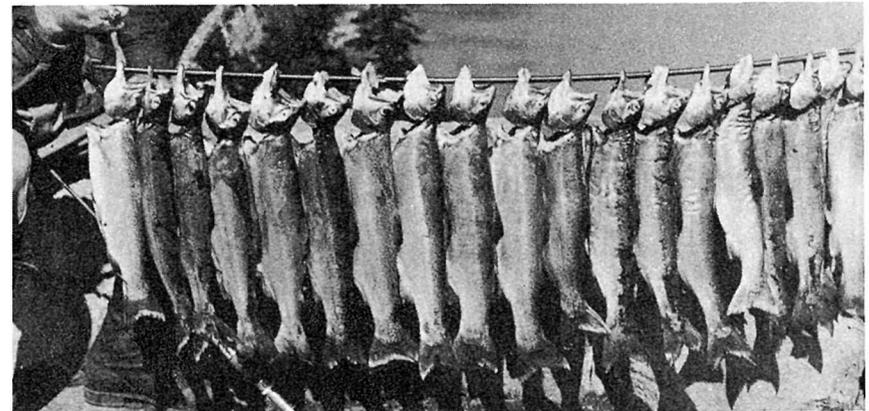
Crater Lake trout are not small nor do they submit easily after they are hooked. They battle desperately to regain their lost liberty, their struggles echoing in singing lines and whirring reels, as fishermen labor to land these coveted prizes. Trout as long as 36 inches have been caught. The average is around 2 pounds each.

The crystal-clear waters of the lake provide good fly fishing and experienced fly casters have reported success many times, using a wide assortment of lures. During certain hours of the day, fish jump lustily along the shore line, and here flies are placed to effective use. Trolling, however, is the popular method, with results satisfactory in most sections of the lake. Spoons or spinners are principally used, although plugs are occasionally a part of the tackle.

The limit of a day's catch is 12 per person, extending during the summer season. No fishing license is necessary.

Although today Crater Lake literally teems with rainbow and steelhead trout, in addition to a lesser number of silversides, German brown, and speckled trout, less than 50 years ago the lake was devoid of piscatorial life of any kind.

The first fish were planted September 1, 1888, by Judge William Gladstone Steel after a long and arduous task. While en route on one of his early visits to the lake, he stopped at a farmhouse along the way near the Rogue River. There two farm boys supplied him with minnows, 600 of



Crawford photo.

FISHERMEN DISPLAY THEIR AFTERNOON CATCH

which he placed in a bucket, which he planned to take to the lake by wagon, but rough road made it necessary for him to carry it by hand. He walked 47 miles, changing water repeatedly in the container at every mountain stream he passed. The fish appeared in good condition, and it was thought they would be transported safely; but when the lake was reached and the bucket was set down for a short time, most of the fingerlings were in a dying condition.

After another change of water had apparently revived them, Mr. Steel hurriedly descended the steep crater wall and at the lake shore released them. Out of the 600 only 37 were able to swim away. A few years later a California minister succeeded in planting 200, but after that plantings were rare for many years.

Since the park was established in 1902, fish have been systematically planted, especially during the past decade. So well has this work been done that the lake is now abundantly stocked and care is being taken not to overstock this body of water, which has developed an enviable reputation in the angling world. Visitors are surprised and enthusiastic over the large size of the trout and their consistently prime condition.

The trout are largely dependent for food on an abundance of crustaceans in the lake. Research carried on in 1935-36 revealed that while 67.5 percent of the food came from crustaceans, 62.8 percent of this classification was confined to *Daphnia pulex* (water fleas). The figures were determined after the examination of 50 trout stomachs. The water fleas are most commonly found at a depth of 75 feet and are the most abundant of several types of food found in the lake depths.

WINTER SPORTS

The 12 months accessibility of Crater Lake National Park has made possible the enjoyment of winter sports in rare settings of wintry splendor. Steep and gradual slopes, according to speeds desired, are numerous in the park and are ideal for skiing and tobogganing, the source of many thrills for amateur winter recreationists.

Professional snow meets in the park are not encouraged, but special attention is paid to amateur sports, making it possible for entire families to enjoy a day in the snow. Snowplows keep approach roads effectively cleared for comfortable motor travel between banks from 10 to 20 feet high in mid-winter. Rangers are on constant duty during the winter season to render service to visitors. Lodging and food accommodations are within 20 miles of either side of the park.

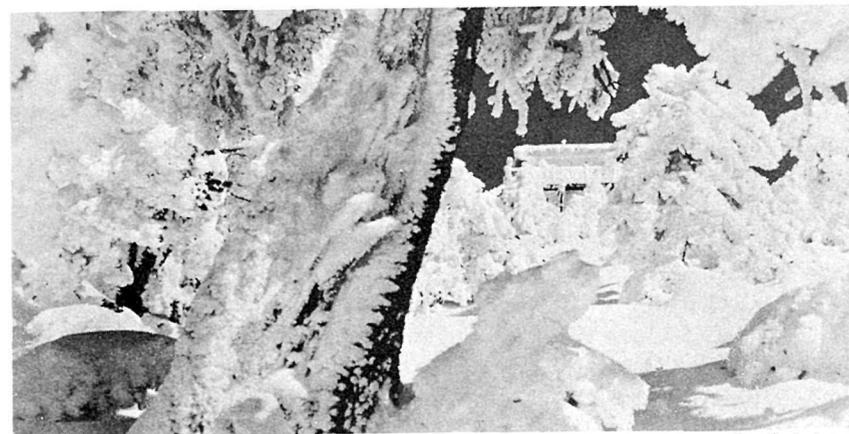
In addition to snow sports, visitors have the opportunity of viewing Crater Lake in a raiment of white, accentuating the mystic beauty of its unbelievably blue waters and its encircling, towering cliffs of multitudinous colors in close harmony with the pristine appeal of the mountain wonder.

Inspiring to behold in the greenery of summer, Crater Lake robed in the white silences of winter is a magic scene of color, vastness, and mystery never to be forgotten.

THE FORESTS

Untouched by the hand of man and carefully guarded against the ravages of fire, the forests of Crater Lake form one of the park's principal attractions. This is true not only from a scenic standpoint and a never-failing interest for tree lovers, but also because of the vast acres of magnificent stands. Visitors never tire of the melody of breezes which float through the branches far above, nor of the lure of the solitude of woodlands rich in luxuriant undergrowth of shrubs and flowering herbs. Without its forests Crater Lake would be devoid of an important quality as a vacation spot and scenic attraction. There would be few wild animals and almost no birds.

Of the considerable number of trees within the park, nearly all are cone-bearers. Most of them extend down the western slope well outside the boundary. The lower species meet and mingle with such broad-leaved trees as oak, maple, and madrona. Of these, Brewer's Oak (*Quercus breweri*) enters the park in the southwest corner. On the other hand, on the lower levels of the eastern slope are extensive stands of magnificent ponderosa pines (*Pinus ponderosa*).



Crawford photo.

WATCHMAN LOOKOUT IN WINTER

The mountain hemlock (*Tsuga mertensiana*) is characteristic of the Crater Lake region, its stately trunks, drooping limbs, and feathery foliage providing woodland beauty that is never forgotten. It is common to the inner wall of the lake and seeks high altitudes on mountain peaks, where its growth is stunted and its limbs beaten down by storms. An imposing stand greets the visitor at Annie Spring, continuing on both sides of the highway to the rim, their large trunks suggestive of the hundreds of years they have been growing undisturbed in their mountain fastness. Here, indeed, is the forest in all of its pristine glory. It occurs in heavy stands along the road around the lake, enhancing the beauty of the Rim Drive. The great trunks crowd each other for space beneath the shade of their lofty crowns.

An outstanding tree of the park is the white-bark pine (*Pinus albicaulis*), often short and stunted and grotesquely twisted, fringing the rim and crowning the highest crests. It illustrates best among trees the stern struggle for existence. The lodgepole pine (*Pinus contorta*), most prolific of the park's conifers, covers thousands of acres of dense stand and extends down the cool canyons to and beyond the park area. The shasta red fir (*Abies magnifica shastensis*), a stately tree with its regularly meshed branches and large bract-covered cones, is an abundant tree scattered throughout the hemlock forest.

The western white pine (*Pinus monticola*), while usually a middle-sized tree, furnishes the largest individual in the park, having a diameter of approximately 8 feet. More abundant along water courses and about wet meadows, can be seen the slender spires of the alpine fir (*Abies lasiocarpa*). In some places this tree continues over the rim to the inner wall of the crater. Engelmann spruce (*Picea engelmannii*) is usually confined to the bottoms of deep canyons. Other trees include the white fir (*Abies concolor*), Douglas fir (*Pseudotsuga taxifolia*), and sugar pine (*Pinus lambertiana*), all companions of the ponderosa pine.

Another species in the park is the incense cedar (*Libocedrus decurrens*). While this tree is not common, it is not hard to find, one prominent group being on the motorway 3 miles west of Hillman Peak. Several of the specimens are as large as 4½ feet in diameter.

Further enhancing the beauty of the park woodlands are a few broad-leaved trees and a large variety of attractive shrubs and undergrowth. No less than nine willows, two alders, and a maple are among the more abundant and conspicuous shrubs which fringe the streams and clothe the meadows. The timid aspens (*Populus tremuloides*) grow beside the larger trees of the cone-bearing species, their small roundish leaves trembling

in mountain breezes. The black cottonwoods (*Populus trichocarpa*) also mingle with the evergreen trees in the deep canyons. Huckleberry bushes are not uncommon, and in their season are laden with toothsome fruit.

Many travelers visit Crater Lake, view the majestic splendor of the world-famed scenic wonder, and leave without realizing the beauties of the forest lands about them. A visit to the park is assuredly most complete after pleasant summer nights spent encamped under the spreading limbs of its stately hemlocks, pines, and firs. The sweet aroma of the woods, their carpeted floors and rustling leaves add much to the joy and inspiration of a visit.

WILD FLOWERS

With a list of over 500 flowering plants and ferns, Crater Lake's richness in species and individuals compares favorably with other national parks. This is not at first apparent to the visitor. If he enters by the usual gateways and travels the beaten paths, he may even be disappointed in the flowers. Over much of the region, all of which is volcanic, the soil is made up chiefly of fine pumice sand, and for most of the growing season is lacking in moisture. So perforce the plant life must be limited to those forms whose peculiar structure adapt them to such environment. To many, however, this situation only lends variety and adds peculiar interest. Pleasing to the eye are the massed color effects in the open spaces and the dryer forest areas. Wherever the highway enters the regions of the streams, these massed effects increase, and one is gladdened by the transformation due to water's magic touch. If the visitor travels the many byroads and winding trails to the mountain meadows beside the singing brooks, or by boat along the rocky shore of the lake, he will find gardens of transcendent beauty. No more enchanting ones can be found than Castle Crest Gardens at park headquarters and Talus Garden under the towering walls of Cloud-cap, or lovelier spots than Boundary Springs and Copeland Creek along the western slope of old Mount Mazama.

Soon after entering the park, the attention is caught by bright flashes of the scarlet trumpets of the mountain gilia (*G. aggregata*), the pineland paintbrush (*Castilleja pinetorum*), and the abundant white sprays of the snowbrush (*Ceanothus velutinus*). Sheltered by the denser and more somber forests farther along are noteworthy representatives of the heath family, such as prince's pine (*Chimaphila umbellata*) and several species of *Pyrola*, some of the latter with the usual green leaves, yet others without such foliage. Several near relatives belong to this class of leafless saprophites which obtain their food by feeding on decaying vegetation, as, for examples, the

tall brownish pine drops (*Pterospora andromedea*) and the snow-white phantom orchid (*Cephalanthera austinae*).

Responding to the influence of the diversity of topography and soil and moisture conditions, various types of flowers are abundantly represented around park headquarters. Near at hand on the first bare spots among the snowdrifts, cheerful harbingers of spring, come the lovely wind-flowers (*Anemone occidentalis*) with cups of white, and the strikingly beautiful yellow lamb's tongue (*Erythronium grandiflorum pallidum*). Stone crop (*Gormania watsonii*) covers the rock ledges, and finest of the rock-loving plants, the pink pentstemon (*P. rupicola*) drapes the rock walls in company with the lace fern (*Cheilanthes gracillima*). Delicate bog orchids (*Lemnorchis*), elephant heads (*Pedicularis groenlandica*), masses of yellow and pink monkey-flowers (*Mimulus*), banks of daisy-like fleabane (*Erigeron salsuginosus*), giant ragwort (*Senecio triangularis*), and a host of others fill the wet meadows and line the streams. On the talus slopes are long strips of Arnica (*A. longifolia*). In openings in the hemlock forest the ever abundant narrow-leaved aster (*A. ledophyllus*) presents a field of purple with intermingled pink fireweed (*Epilobium angustifolium*) and the tall corn lily or false hellebore (*Veratrum viride*), while the surrounding forest floor is carpeted with the grasslike turf of the smooth wood-rush (*Juncoides glabratrum*), the most abundant herbaceous plant of the upper forests. In the open pumice fields of the rim area, Douglas phlox (*Phlox douglasii*), sulphur flower (*Eriogonum umbellatum*), and the low desert lupine (*Lupinus aridus*) contribute to the varied color scheme, later transformed into red and gold by the autumnal foliage of Newberry's knotweed (*Polygonum newberryi*).

Over the crater's rim, down the trail to the lake, one is attracted to the trailing raspberry (*Rubus lasiococcus*), clothing the steep banks, and the spiny currant (*Ribes lacustre*), prostrate on the rock walls. Abundant on the lower part of the trail and rocky shore of the lake, the large rose-pink flowers of Lewis' monkey-flower (*Mimulus lewisii*) are the most conspicuous and striking features of the vegetation.

Across the blue water, even in the more forbidding lavas of Wizard Island, one is greeted at the boat landing by many fine clumps of bleeding heart (*Dicentra formosa*). A little distance along the trail leading up the island cone, the parrot's beak (*Pedicularis racemosa*) is seen under the spreading hemlocks. At the summit, crowning the rim of the miniature crater, emulating the volcanic fires of old, grow the flaming paintbrushes (*Castilleja applegatei*), mainly restricted to the Crater Lake region. Other plants less showy, sending their long roots deep into the cinders and pumice, reach for moisture and struggle for a foothold in the unstable rock material of the precipitous slope.

HOW TO REACH THE PARK

BY RAILROAD

The Southern Pacific Railroad serves Crater Lake National Park. The company runs its finest trains over the Cascade route passing through Klamath Falls and also operates regular service over the Siskiyou route passing through Medford, west of the park. The Cascade route comes within a few miles east of the park boundary. Connections with Crater Lake automobile stages are made daily at Medford and Klamath Falls from July 1 to September 20.

BY AUTOMOBILE

The automobile approaches to the park are exceptionally fine. The Pacific Highway, well-known route of travel, passes through California, Oregon, and Washington, extending from border to border of the United States. Motorists using this route while en route north have the choice of turning off at Weed in northern California, proceeding to Klamath Falls and then to Crater Lake over The Dalles-California Highway, or proceeding on to Medford over the Pacific Highway and then to Crater Lake, 80 miles distant. Southbound visitors on the Pacific Highway turn off at Medford, as well as motorists arriving from California by way of the Redwoods Highway, which has its junction with the Pacific Highway at Grants Pass.

Travelers to the park from Medford arrive by way of the west entrance and from Klamath Falls by way of the south entrance. Those from Bend, Oreg., 106 miles from Crater Lake, use the well-improved approach via the north entrance, bringing motorists near Diamond Lake while en route to the park. This route is rapidly growing in importance. The east entrance also provides for travel from Bend and The Dalles-California Highway and is usually open earlier in the season due to less snowfall.

En route from Medford, motorists travel through great forest areas, along the banks of rushing streams, along the edges of picturesque canyons and through attractive mountain country. Of particular interest is the Rogue River, well known for its steelhead and cutthroat trout, and salmon fishing.

Motorists entering the park by way of Medford often leave by way of the south entrance to Klamath Falls, 62 miles, or arrive that way and leave over the Medford route. On this trip, motorists pass along the Annie Creek Canyon, through the Klamath Indian Reservation, and along the edge of upper Klamath Lake, the largest inland body of water west of the Rocky Mountains.

Through the use of powerful snowplows, Crater Lake National Park has been made accessible throughout the year over the Klamath and Medford approach roads. This is possible through the cooperation of the State highway commission. Even during midwinter, when snow attains a depth of 12 to 15 feet on the level, motorists can drive to the very rim of the lake.

Park highways are now continuously open, barring the exception of excessively heavy storms; however, the north and east entrances are open only from spring until late fall.

BY AIRPLANE

High-speed, de luxe airplane service from all points in the United States to Medford is now available through the United Air Lines, which operates direct service to 19 States. For persons of limited time, this service affords a splendid opportunity to see the park. For example, passengers may leave Los Angeles after breakfast, land at Medford, take a bus for the 80-mile drive to the park, and arrive in the afternoon. Leaving New York at noon, one may arrive in Medford in time for breakfast the next morning and drive to the park before lunch.

ADMINISTRATION

The park is administered by the National Park Service of the Department of the Interior, with a superintendent, David H. Canfield, in immediate charge. A force of rangers and ranger-naturalists assists this official.

Also under the jurisdiction of Crater Lake National Park administrative offices are the Oregon Caves National Monument, 50 miles from Grants Pass in southern Oregon, and the Lava Beds National Monument in northern California, 45 miles south of Klamath Falls, Oreg. Both of these areas are popular attractions for visitors.

At Crater Lake long-distance telephone and telegraph services are available at the lodge, at park headquarters, and at various ranger stations. At Oregon Caves such services are available at the Chateau, and at the Lava Beds telephone service is available at Indian Well, monument headquarters.

RIM VILLAGE

A large majority of visitors first reach the rim of the lake at the Rim Village. This is the focal point of park activities. Here are the lodge, post office, cafeteria, general store, studios, a rental cabin group, auto service, emergency mechanical service, and information bureau. From the Rim Village a number of the most important trails in the park take off, including the spectacular trail down the crater wall to the lake shore,

where launches and rowboats are available for pleasure trips and fishing excursions. This fine trail is 6 feet wide and on a holding grade of 12 percent, permitting use by people unaccustomed to much physical effort. Its length of 1½ miles can be covered on the down trip in 30 minutes, while the return trip requires approximately 45 minutes. The trail to the summit of Garfield Peak, directly overlooking the lake and giving a magnificent panorama of the Cascades, takes off from the Rim Village, as does a 4-mile trail to The Watchman, a trail to Annie Spring, and to park headquarters.

CAMPING

There are four campgrounds within Crater Lake National Park, all of them free to the public.

The Rim Campground is located in close proximity to the rim, at the terminus of the highway. The camp is on a slight elevation, in the shelter of a fine stand of mountain hemlock, reminding the visitor that the altitude is over 7,000 feet. Eagle Crags, the jagged pinnacles of Garfield Peak, and Castle Crest tower above to the east. The designation of camp sites by logs, with a table, stove, and fireplace at each site, makes camping possible in a natural setting without detracting from the general beauty.



Rostel photo.

LODGE ON THE RIM OF CRATER LAKE

Firewood is available at the camp. The water is pure, and there are sanitary conveniences, including hot water and hot and cold showers. The popularity of this campground has increased to such an extent that it has become necessary to limit camping to 30 days in this area.

Located near the Rim Campground is the community house, with its great stone fireplace, where campers and visitors gather at night for recreation. It is open at all times for the pleasure and convenience of the public. Programs of an entertaining and instructive character are provided here every evening during the summer season.

The post office is at the lodge, and mail addressed to Crater Lake will reach its destination during the park season. Rental cabins may be secured at the housekeeping-accommodation office. A cafeteria and general store are maintained convenient to the camp.

The lower campground is situated near the Annie Spring checking station, on the highway 6 miles south of the Rim Camp. This is a beautiful, well-sheltered, shaded site, and at a considerably lower altitude than the grounds near the rim. The camp has modern sanitation, with running water and wood available. A camping place is located at Lost Creek,



A TYPICAL RIM CAMPGROUND

Lange photo.

3½ miles inside the east entrance of the park, at the junction of the highway entering the park and the Rim Road, not far from Wheeler Creek with its strange pinnacles—an uncanny crowd of spectral spires. These campgrounds are located 11 miles from the Rim Village, the road skirting the great heights south of the lake, and 2½ miles from Kerr Notch, offering a spectacular view of Crater Lake from the east rim.

For those visitors coming to the park by the south entrance, there is Cold Spring Camp, 3 miles south of the Annie Spring checking station, 7 miles north of the entrance, and 9 miles from the lake rim. The camp is near the scenic Annie Creek Canyon, and is one of the earliest regular camping places used by explorers of the Crater Lake region. Godfrey's Glen, with its colonnades and beautiful scenery, is located deep in the mysterious canyon not far from Cold Spring.

The officers and members of the National Park Service are glad to render any and all assistance and service possible to those who avail themselves of park privileges to encourage maximum pleasure from a park visit. The park cannot be seen in the limits of a 60-minute visit or of a day. Many days can be spent traversing its numerous trails, climbing mountain peaks, exploring canyons, and visiting places of scenic grandeur over park roads.

ACCOMMODATIONS AND EXPENSES

The Crater Lake National Park Co. offers all pay accommodations for visitors in the park. Rooms may be obtained at the Crater Lake Lodge, a large hotel on the rim of the lake, under American and European plans. Under the latter plan rates range from \$3 for two in a room to \$5.50 for one person. The American plan is \$3 per person higher. Children under 8 years receive half-rates. Housekeeping cabins in the Rim Area rent for \$2 per night, without bedding, and \$2.75 with bedding. A large stone building, containing the cafeteria, store, novelties, pictures, and photographic supplies, is nearby.

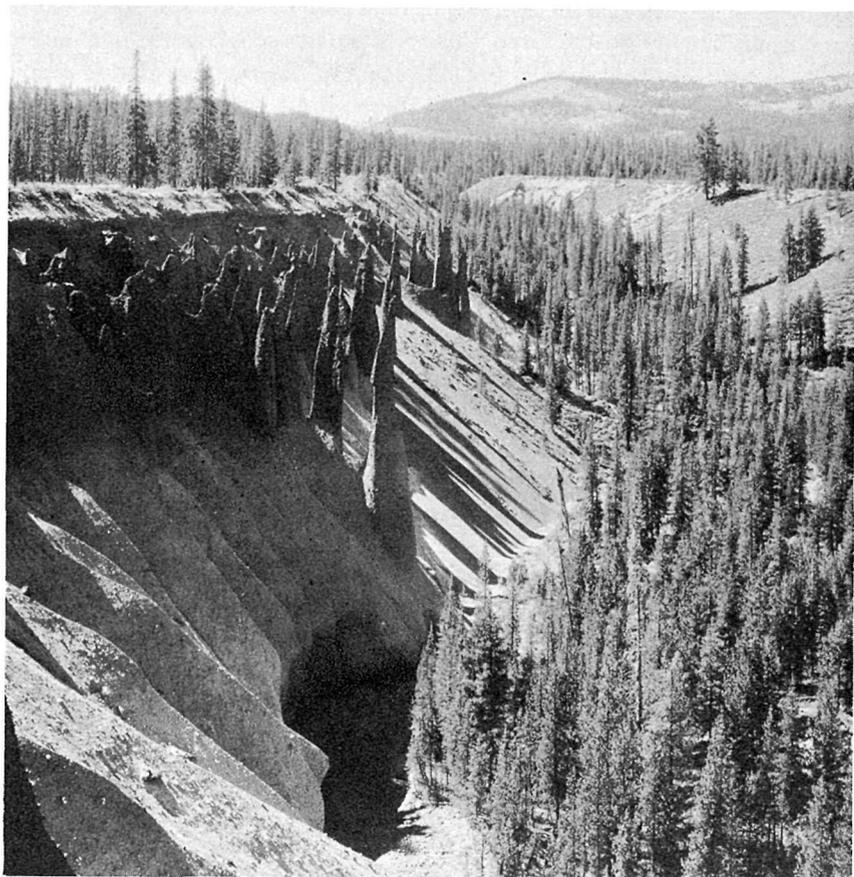
Motor transportation.—Daily automobile service from Medford and Klamath Falls to Crater Lake Lodge is maintained by the Crater Lake National Park Co. from July 1 to September 20. The round-trip cost is \$8 per person and only round-trip tickets are sold. A visitor may enter by way of Medford and leave by way of Klamath Falls. The trip requires 2½ hours from the latter place and 3 hours from the former.

Launches and rowboats.—Rowboats may be hired for 50 cents per hour for one person and 25 cents for each additional person. Regularly scheduled trips are made daily by launch to the Phantom Ship and Wizard Island,

about 15 miles, at a cost of \$2 per person. Hourly trips are made to Wizard Island for \$1 per person. Fishing tackle may be rented at the boat landing.

One of the popular attractions is a launch trip around the lake, leaving the boat landing at 9 o'clock each morning and 1:30 each afternoon during the travel season. This trip follows the shore line of Crater Lake for a distance of 26 miles. A ranger-naturalist describes to the launch passengers the points of geologic and historical interest. The trip has been carefully planned and is available at the cost of \$2 per person.

This booklet is issued once a year and the rates mentioned herein may have changed slightly since issuance, but the latest rates approved by the Secretary of the Interior are on file with the superintendent and park operator.



PINNACLE FORMATIONS IN WHEELER CREEK CANYON

Grant photo.

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- YARD, ROBERT STERLING. The Top of the Continent. 1917. 244 pp., illustrated. Crater Lake on pp. 140-160.
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OREGON CAVES

National Monument

LOCATED 160 miles southwest of Crater Lake, the Oregon Caves National Monument in Josephine County, administered by the superintendent and staff of the Crater Lake National Park, is one of the most popular scenic attractions of Oregon. The caves, occurring at an elevation of 4,000 feet in the heart of the Siskiyou Mountains, are easily reached over hard-surfaced highways.

The monument is 20 miles distant from the famous Redwood Highway, between Crescent City, Calif., and Grants Pass, Oreg. Motorists to the monument turn off at Caves Junction, a small settlement at the junction of the Redwood and Caves Highways.

The caverns, also known as the "Marble Halls of Oregon", were discovered by a pioneer bear hunter, Elijah Davidson, in 1874 when a bruin sought refuge in their darkness. Davidson, intent on a kill, followed close behind, aided by a flickering pitch torch. He made a cursory exploration, followed by others in later years, but he never viewed the many wonders of their interior as seen today by the visiting public. There are several miles of winding passageways, large rooms, and scores of fantastic formations weird in their eerie beauty.

The monument, covering 480 acres, was established by proclamation of President Taft on July 12, 1909. During recent years numerous improvements, such as new trails, steel ladders, illumination, and removal of obstructions, have been completed to make the caves more accessible and visits more enjoyable.

A limestone, long ago altered to marble, is the soluble rock in which the passageways were formed. The caves offer outstanding underground beauty along a route which brings visitors past their most attractive formations, the result of constant water action for many thousands of years. These formations assume odd, grotesque, and fantastic shapes resembling draperies, flowers, fruits, palaces, and gargoyles.

The rocks of the region are complexly folded, faulted, and metamorphosed shales, sandstones, and minor bodies of limestone, intruded by vast amounts of basic igneous rock, most of which is now serpentine. The whole is crushed and squeezed into intricate and apparently hopeless confusion, from the structural and stratigraphic viewpoint.

Oregon Caves National Monument—Oregon

Here and there in sparkling beauty are exquisite miniatures of Niagaras, Gardens of Eden, cotton blossoms, forests, and castles. A number of the unusual features carry such strange names as Music Room, River Styx, Ghost Room, Dante's Inferno, Paradise Lost, and Joaquin Miller's Chapel. Paradise Lost is the most beautiful exhibit of the caves with its flowerlike stalactitic pendants adorning the walls of a room 60 feet high.

Countless stalagmites and stalactites telling the story of the patience of the ages are seen by visitors during the 2-hour guided trips through the caves. Especially is this true of one of the columns, which is a foot in diameter and was formed by the joining of a stalagmite and stalactite.

Monument visitors are offered hotel accommodations at the Oregon Caves Chateau near the caves entrance. Lodging and dining-room service is provided. From the floor of a canyon, the bark-covered six stories of the Chateau attain complete harmony with the thick forests and moss-covered rock ledges of the surrounding country.

Cottages are available at the caves, as well as a store where novelties and pictures can be procured. Picnic grounds are maintained in the monument.

During the summer months from June 15 to September 1 frequent guided trips are offered. Guide service on more flexible schedules is available throughout the year. This service is furnished by the operator.

During the summer season, evening campfire programs are offered in the open air near the chateau, presenting talent from the Oregon colleges employed in the monument. Park rangers give short talks on the monument in conjunction with the musical programs.



THE OREGON CAVES CHATEAU

LAVA BEDS

National Monument

LOCATED in northern California, 105 miles south of Crater Lake, the Lava Beds National Monument, administered by the Crater Lake National Park staff since 1933, covers an area of 45,967 acres, noteworthy for volcanic, historical, and archeological features of distinctive importance.

The monument is usually open to travel the entire year, although winter storms are liable to make dirt roads in and approaching the area difficult to travel. The Lava Beds are 70 miles from Alturas, Calif., and 45 miles from Klamath Falls, Oreg., with the last few miles of each route served by passable dirt roads. It can also be reached over unimproved roads from Bieber, Calif., on the Redding-Alturas Highway, and Bartle via Medicine Lake.

A vast field for geologic study is included in this area where at intervals over a period of thousands of years volcanic activity seethed in lava rivers of liquid fire issuing forth from fissures scattered over the entire section. Geologically, the region is considered young, the age of the last lava flows and the last cinder cones being estimated at 500 years or slightly less.

Viewed from a distance, the monument appears as a fairly level terrain, with a northeasterly slope interspersed with symmetrical cinder cones. The lava rocks of the area are so porous and broken with shrinkage cracks that water from scant rainfall passes immediately underground, hence causing no erosion and leaving the monument features in the same condition as they were when first constructed. While volcanic activity has continued until modern times, the oldest formations are believed to date back some 20,000 to 60,000 years.

Except in the southern third of the monument where cindery pumice covers the surface, the visitor walks on solid lava. The small recent flows of billowy lava, or the pahoehoe type, have spread out like thick molasses or tar. It is in this type of lava that the caves and tunnels of the monument are found. These were formed by the hardening of the surface and walls of lava flows, becoming tubes when the molten lava core drained out. They range from a few feet to several miles in length and from 10 to 75 feet in height. Collapsed portions form long serpentlike trenches of broken rock 20 to 100 feet deep and from 50 to 250 feet wide, while narrow unbroken roof strips serve as natural bridges.

The caves being of volcanic origin, lava stalactites are in evidence in some of them. Ice formations, the result of constantly freezing temperatures and presence of moisture, are found in others. Over 300 caves have been located in the monument but of this number, only 130 have been explored. A small number of the more interesting caves are open to the public. In exploring these caverns, visitors are given the services of guides without cost during the summer months.

Two types of symbolic Indian writings add a touch of mystery to the monument, suggesting the presence of ancient aborigines many centuries ago. One type is made up of paintings (pictographs) on the walls of a number of the caves and sides of natural bridges. The other type is composed of carvings (petroglyphs) confined entirely to rocky bluffs where the material was sufficiently soft to be cut out by stone tools. The petroglyphs, located in an isolated portion of the monument, are deeply carved and have successfully withstood the ravages of time.

Historical features of the monument recall the only major Indian war ever fought on California soil and one of the most costly of its kind in United States history. In 1872-73 a small band of Modoc Indians under the leadership of Keintpoos, commonly known as Captain Jack, clashed with a body of United States cavalry just north of the California line following a rampage during which several settlers were killed. A short time later, the Modocs established themselves in a natural lava fortress in the northern part of the monument where they withstood a superior force of soldiers for 5 months.

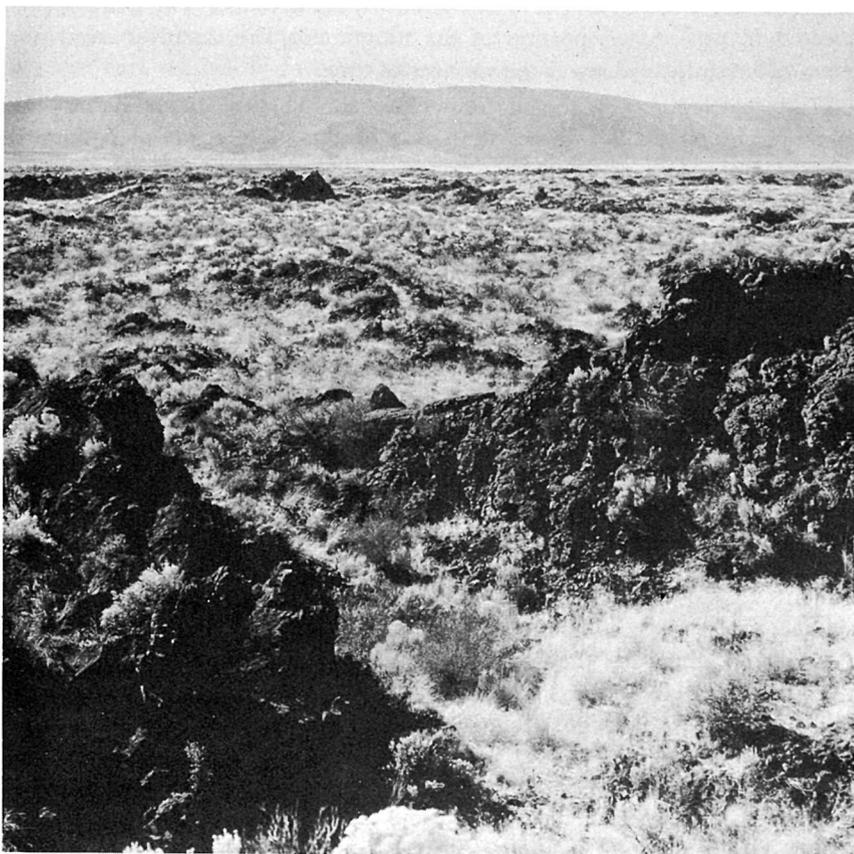
During this time several peace negotiations were attempted, reaching their climax in an ill-fated peace parley a short distance from the Indian stronghold. A number of Indians, including Captain Jack, gathered with a peace commission, headed by General R. E. S. Canby, Commander of the besieging soldiers. During the truce parley, the Indians without warning killed General Canby and two members of the Commission, after which the Modocs fled to their stronghold. A cross, erected by Canby's soldiers on the spot, still stands.

It was not long after the killings that the Indians were subdued, marking the end of Indian warfare in this section. The stronghold today is much as it was over 60 years ago. Points of interest are plainly marked; bleaching bones and rotting bits of leather are reminiscent of the last stand of the Modocs.

Interesting to monument visitors also is the presence of wildlife. During winter and spring seasons, mule deer can be seen in large numbers, with 20 to 30 individual herds remaining in the area until the arrival of warmer

summer weather. Hundreds of birds are observed, particularly valley quail and an abundance of raptors. Large numbers of small mammals are seen throughout the year. Lava Beds Bighorn formerly roamed the monument but were exterminated by unrestricted hunting and competition for the range by sheep and cattle 20 years ago. However, their trails are still visible.

Administrative headquarters of the monument are maintained at Indian Well, where a park ranger is in charge. A small museum of old war relics and volcanic specimens is maintained here. A campground is nearby. No gasoline, food, or other accommodations are available in the monument but these can be procured within 20 miles of the area at Merrill, Oreg., or Tule Lake, Calif.



NATURAL LAVA FORTRESSES WERE CAPTAIN JACK'S STRONGHOLD

GOVERNMENT PUBLICATIONS

Glimpses of Our National Parks. An illustrated booklet, containing descriptions of the principal national parks. Address the Director, National Park Service, Washington, D. C. Free.

Recreational Map. Shows both Federal and State reservations with recreational opportunities throughout the United States. Brief descriptions of principal ones. Address as above. Free.

Forests of Crater Lake National Park. By J. F. Pernot. 40 pages. 26 illustrations Superintendent of Documents, Washington, D. C. 20 cents. (Always send the Superintendent of Documents cash or money order.)

National Parks Portfolio. By Robert Sterling Yard. Cloth bound and illustrated with more than 300 beautiful photographs of the national parks. Superintendent of Documents, Washington, D. C. Price, \$1.50.

Fauna of the National Parks. Series No. 1. By G. M. Wright, J. S. Dixon, and B. H. Thompson. Survey of wildlife conditions in the national parks. Illustrated. Superintendent of Documents, Washington, D. C. 20 cents.

Fauna of the National Parks. Series No. 2. By G. M. Wright and B. H. Thompson. Wildlife management in the national parks. 142 pages, illustrated. Superintendent of Documents, Washington, D. C. 20 cents.

Panoramic View of Crater Lake National Park. 16½ by 18 inches; scale, 1 mile to the inch. Gives excellent idea of configuration of surface as seen from the air. Superintendent of Documents, Washington, D. C. 25 cents.

Map of Crater Lake National Park. About 14 by 19 inches; scale, 1 mile to inch. United States Geological Survey, Washington, D. C. 10 cents.

Booklets about the national parks listed below may be obtained free of charge by writing to the Director, National Park Service, Washington, D. C.

Acadia, Maine.

Carlsbad Caverns, N. Mex.

General Grant, Calif.

Glacier, Mont.

Grand Canyon, Ariz.

Grant Teton, Wyo.

Great Smoky Mountains, N. C.—Tenn.

Hawaii, Hawaii.

Hot Springs, Ark.

Lassen Volcanic, Calif.

Mesa Verde, Colo.

Mount McKinley, Alaska.

Mount Rainier, Wash.

National Capital Parks, Washington,
D. C.

Platt, Okla.

Rocky Mountain, Colo.

Sequoia, Calif.

Wind Cave, S. Dak.

Yellowstone, Wyo.—Mont.—Idaho.

Yosemite, Calif.

Zion and Bryce Canyon, Utah.

