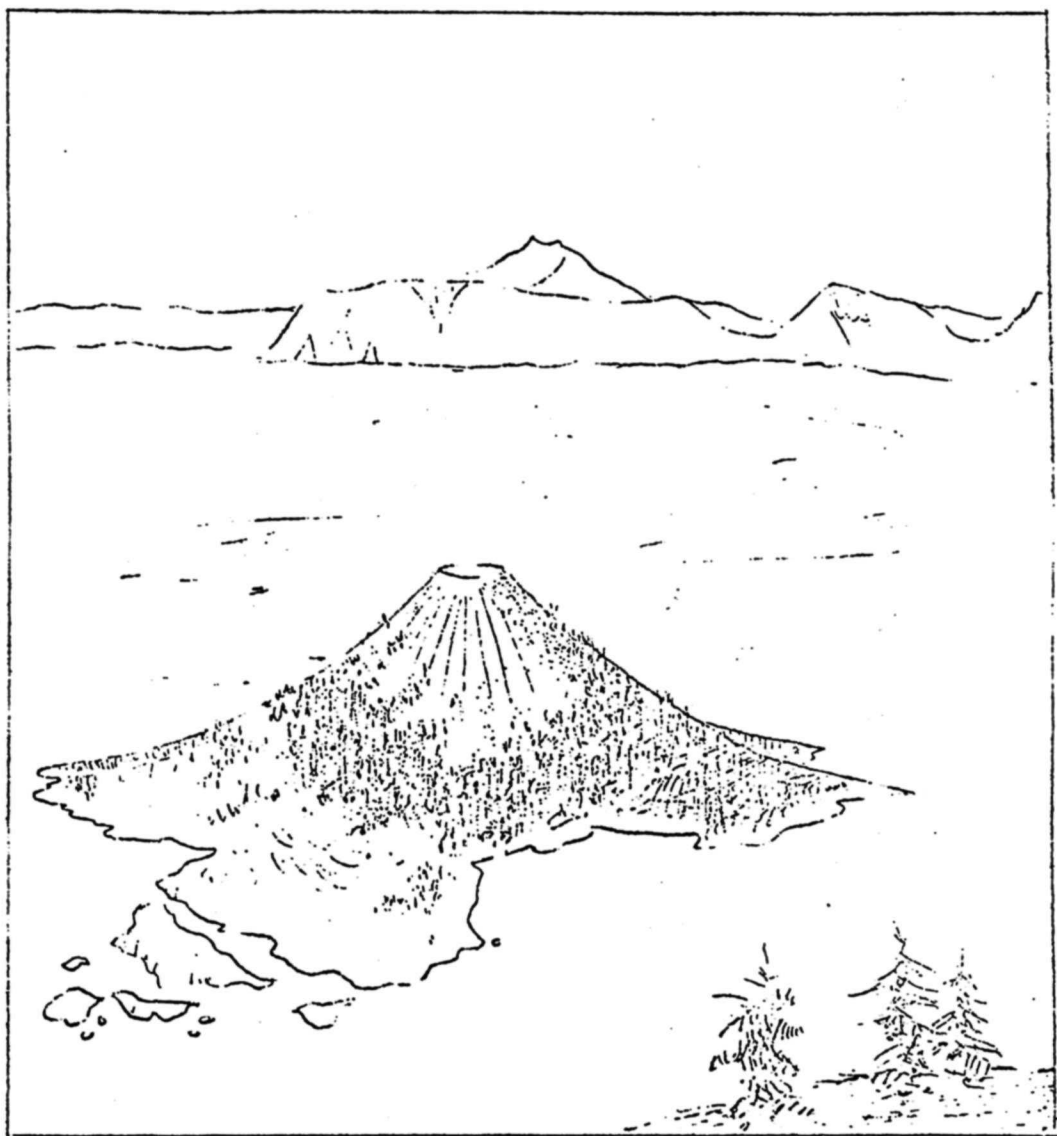


NATURE NOTES

CRATER LAKE NATIONAL PARK



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DEPARTMENT OF THE INTERIOR
OFFICE OF NATIONAL PARKS, BUILDINGS & RESERVATIONS
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Cover Design - Wizard Island and the Lake as seen from The Watchman in 1913

(Note higher water line and isolated islands as compared with the present).

Cover Design and Illustrations by Ranger-Naturalist Albert E. Long.

CRATER LAKE

Wesley La Violotte

Blue silence, O lake of silent blue, -
within your sapphired deeps the gods have fought
titanic battles. Now an azured peace
broods over your bestudded, jewelled breast;
a peace that only those can know who cease
to struggle after cataclysmic waves
engulf their burning, cratered hearts. The rush
of molten lava filled the fissures where
the crush of titans wracked your battle-tortured soul.
Yet here, today, beneath cerulean, nimbused sky,
you lie so still in turquised dreams, you lure
my mind to rest upon your sculptured levelness
and see your deep serenity become my constant goal.

WIZARD ISLAND: IT'S SUCCESSION OF LIFE

Dr. Wm. G. Vinal, Ranger-Naturalist

Wizard Island is never the same twice. At the same moment no two people see it the same and it is only by continuous observation and accretion of ideas that the complete story of its origin and life can be unfolded.

It is evident to an observer on the Watchman, Hillman Peak or Llap Rock, looking down on the island, that ^{it} is made up of three zones of volcanic contributions, namely blocks of rough andesitic lava at the base along the shore line, a coarse undulating lava flow along the intermediate slopes and the symmetrical conical slopes of ash and cinders above. Disintegration and decomposition have not contributed much to the breaking down of these lava slopes. The volcano is so young geologically that very little progress has been made in converting the raw slaggy slopes into a soil with humus. A slight covering of volcanic dust co-mingled with organic material has filled the more gentle slopes and irregular crevices at the base. It is evident that there is not sufficient soil nor is the humidity sufficient to invite the growth of such shade plants as the coral root, trailing raspberry and a host of other deep wood plants.

Darwin's classical earthworms have not arrived nor could they find any subsoil to bring up to the surface. The plants on Wizard Island, therefore, are limited to those forms whose structure allows them to suffer drought.

The stages in the vegetal conquest of Wizard Island may be the key to the many successive revegetations of the slopes of Mt. Mazama. What were the first plants to land and how did they come? After the last swirling flow of lava and the vanishing of steam there were, as always before, prevailing westerlies wafting spores of lichens, fungi, and eric mosses and perhaps the winged seeds of conifers from the Rim. The water currents undoubtedly floated seeds. Probably 99 % of these germs of life were born for naught as is the great mass of pollen that washes to and fro today. Many would-be colonizers were destined to land on such barren, sterile places that they were inevitably doomed to perish.

The only plants today that are succeeding in the glare of light on the lower rock blocks are the lichens. The golden lichen is a crustose form which can stand a certain amount of direct sun but must have shade a part of the day. The gray lichens could also have been early arrivals. It must have been eons before any crannied wall accumulated dust particles enough to encourage a moss plant. The lace fern (*Cheilanthes gracillima*) grows in pockets on the lower rock ledges, Woodsie (*Woodsia cregana*) pokes its rusty fronds from protected spots on the rocky summit, and the rock brake (*Cryptogramma acrostichoides*) is found in rock clefts in the crater.

Those are the only members of the fern tribe that have succeeded in mastering the situation. Untold ages had to follow before seed plants could anchor long enough to send their rootlets down to the water table.

In the meantime what could have been going on in the way of seed arrivals on the ash pile above the cone? It is a mile from the west rim across Skell Channel to the crater of Wizard Island. It must have been a strong west wind that enabled the first mono-planed seeds of the conifers and the ballooms of the composites and figworts to flutter from the rim of Crater Lake to the sides of the island cone. There had to be at least one from each conifer, the mountain hemlock (*Tsuga mertensia*), the white bark pine (*Pinus albicaulis*), the western white pine (*Pinus monticola*), the lodgepole pine (*Pinus contorta*), and the shasta red fir (*Abies magnifica shastensis*). It may not be sheer accident that the greatest growth of evergreens is on the west side of the island, that the largest and possibly oldest western white pines and Shasta red firs are at least five hundred feet above the lake, or that the best stand lodgepole and white bark pine is at the summit. In other words, did not the colonizers come by the air route and land as they would, hit or miss, but mostly miss? The seeds successful in landing were not necessarily those which were the most successful in growing. The ash cone proved to be the best of the three areas. It was these veterans that lived to perpetuate each its own kind. They remained to shake their seeds downward that the forest might grow upward to eventually cover the cone.

The five conifers had a most difficult time in establishing themselves. The remarkably few evergreen seedlings on the ash slope are mute testimony to the fate of most seeds which are unfortunate enough to cast their lot on such a dry, sterile environment. Those which succeeded in reaching a goodly size still had to fight. About 500 feet up the cone lava rocks from a fissure flow have imbedded themselves eighteen inches above the slope in the trunk of a Shasta red fir and at a still higher altitude a lava rock as large as a man's head has become wedged between the upright trunks of a white bark pine. Such land slides are denuding agents for seedlings and surely handicaps to veteran tree. In one of the larger gullies the larger trees have had their heads snapped off about twenty feet above ground. The fact that they held fast with their root systems indicates a deep root system, or that they were broken by a wind storm which whirled up the valley when the trees were braced by deep snow. Many a wind-blown tree has lost its main trunk to start again. The battle is with the elements and not with each other.

And what of the antecedent herbs? The shade-requiring plants of the deep forest are few indeed. The small-leaved penstemon, the pine-mat manzanita and the wintergreens represented by the one-sided pyrola, the toothed wintergreen and pipsissowa are practically the only arrivals. The representatives of the open woods are the white hawkweed and the elephants's head. The few herb and shrubs of the forest indicate that the stand must be young in its development.

The colonizers of the ash slope are the strong-stemmed, creeping perennials that are able to battle alone. The amount of heat on the slope

is much greater than on the wooded plateau below. Any plant growing there must be drought resistant, capable of anchoring tightly, and able to stand punishment when bombarded by pumicite or when buried alive by miniature sand dunes. There is a terrific punishment. The typical plants of this area are arenaria, chalice cup, white buckwheat, and Newberry's knotweed. All of these hardy pioneers send runners into the bare ash and are often exposed by the drift of the soil. Their offshoots, rhizomes, or stolons are controlled by gravity and swing like cables down the slope. This may be thought of as a linear migration (as opposed to radial migration) and new plants spring up just below the parent plant. As many as eight successive offspring were counted on one cable which had been sent out by white buckwheat (*Eriogonum ovalifolium*).

Interspersed with the "cable" growths are such hoary and stemless plants as the silver leafed senecio, and sulphur flower, and the root-storing carrot (*Cogswellia martindalei*). In protected spots the fireweed, Englemann's aster, the alpine, false dandelion, arnica, and wood rush have made appearance and stand ready to furnish the strands of crosswise vegetation as soon as the "cable" plants get stabilized. The vegetation on the ash slope has hardly reached the stage of being able to weave a mat or turf.

A third zone of herbaceous plants appears near the top of the island. Although the island does not reach into alpine heights it has a few plants which are typically montane in character. At the crater a few yellow mountain daisies (*Hulsea nana*) grow just outside the rim on the south side in loose red cinders. A few feet across the crest, but within the crater and on the north facing slope, is the heart-leafed arnica (*Arnica cordifolia*) and the more widely spread alpine saxifrage (*Saxifraga tolmei*). This little saxifrage starts as a tuft in back of a rock and in due time forms a dense mat. The silver-leafed senecio (*Raillardella argentea*) grows on the dry ash of the north slope outside the cone and pentstemons adorn the inner slope. While in the "cable" plant district it is largely ability to adapt to a small amount of moisture and shifting soil; around the crater it is a matter of little moisture and direct or indirect sunlight.

The trees and herbaceous plants listed are those whose seeds could have been brought by the wind. The shrub plants with berried fruits also came by the air route except that they borrowed their wings. Only two shrubs of red berried elder (*Sambucus racemosa*) were noted on the cone. One was at an altitude of 6650 feet and the other at the bottom of the crater. Four little offspring are growing near the base of the crater specimen. A solitary gooseberry bush was found at an altitude of 6250 feet in the forest. The scattered appearance of the many-stemmed mountain ash (*Sorbus sitchensis*) with its berry-like apple, the pine-mat manzanita, and the mazama currant have all appeared above the encroaching forest. The pine mistletoe (*Arcanobium*) could well have taken the bird express to the white bark and lodgepole pines on the rim of the crater.

The pine mistletoe could not arrive before its host. The same is true of parasitic paint brushes. The aphids in the rolled red-leaves of manzanita had to wait for the hosts' arrival. The tiny craters of the "doodlebugs" (Ant Lions) found at such widely separated stations as the first trees above shoreline (6207 feet), the upper limit of the shady forest (6437 feet), the fissure flow at 6610 feet in altitude and the top of the rim (6940 feet) show that such barriers as Skell Channel, bare lava rocks, or ash deserts are not insurmountable. These carnivorous insects must have followed the advent of required food as was the case of the dozens of dragon flies hovering over the crater (August 10, 1933). And how about the toads sitting patiently in the crater waiting for food to pass by? Were they and the dragonflies and the mosquitoes crater-born or channel-born? Wizard Island may thus be compared to the House-That-Jack-Built, for this is the ant lion that ate the ant that lived in the tree that came from the seed that grew in the pumice that was blown out of the crater that Wizard Island built. Or, this is the egg, laid by the beetle that came from the grub, that infested the bar, that belonged to the lodgepole, that had the "tumor", caused by the spores, that came from the parasite that lived on the paintbrush (for four generations) that grew on the slope, beside the trail that Jack built. And so one may go on ad liberatum.

An abundant insect life readily invites bird inhabitants. The mountain blue bird family on the rim would indicate that a pair had nested thereabouts. The redbreasted nuthatches and Oregon Juncos appeared busy and happy. The Calliope humming-bird was observed sipping nectar from phacelia and fireweed, the Clark nutcracker probing the cones of the white bark pine on the rim, the marks of the sapsucker on a white bark pine, and the Cassin purple finch and audubon warbler feeding along the evergreened base, the toads near the snow bank, the coney making hay in the rock slide at the bottom of the crater, the three golden-mantled ground squirrels near the domicile of the coney were all dependent "on things" that must have come before.

THE POOLS OF WIZARD ISLAND

Ranger-Naturalist J. S. Brode

Wizard Island affords a great deal of interesting material for both geological and biological reflection. Many feet tread the trail up the extremely fascinating cinder cone of the island. Relatively few, aside from an occasional fisherman seeking the Skell Channel, tread the rock-piled ramifications of the island to the west of the cone. On this portion of the island erosion has made but little progress. Rough folds of lava rocks have cracked into innumerable jagged blocks of stone that have tumbled into loose jumbled masses. So sharp and angular are the blocks that the whole mass permits the water falling on it to drain readily through it down to the lake level.

This same condition permits the waters of the lake to flow through these rock masses at the level of the lake.

As a result of this water table or level, a level fluctuating with the level of the lake, there exist in the hollows between the jagged lava rock piles a number of pools, the size and especially the depth of these pools being determined by the extent to which the collapsed sputter cones developed depressions with a base below the present water level.



On looking at these pools from the Watchman or from the Rim Drive, one observes light green patches which would indicate to the observer the possibility of the existence of beds of algae such as Spirogyra. A visit to the pools, however, reveals a lack of green algae. The patches turn out to be an accumulation of a creamy white mud and ooze. Similar accumulations occur in Skell Channel and between the rocks off the shore of Wizard Island. A careful examination of samples from a number of these accumulations indicates that they are a highly diatomaceous pumicite sediment.

During the latter part of July the White bark pines (pinus albicaulis) throw off to the wind a vast amount of pollen. This pollen accumulates in floating bands of yellow which moved about the lake, eventually contacting the shore, where the pollen tended to adhere to the rocks at the shoreline. As the waters of the lake evaporate the pollen is left in rings on the shore rocks. A small amount of the pollen apparently becomes water-logged, or by wave action, gets entangled in the diatomaceous slime on the rocks as a microscopic examination of the rock scrapings indicates their occasional presence. Samples two or three feet down do not show the presence of pollen, hence the reasonable conclusion that the coloration in the shallow portions of the lake is the result of diatomaceous ooze or slime mingled with pumice dust.

C R A T E R O D D I T I E S

Geese Rest on Crater Lake

Ranger Dwight A. French

On the last day of August a great flock of geese was observed on the surface of Crater Lake. The next morning they resumed their flight south. The geese were Canadian Honkers which migrate with the changes in seasons. This particular species breed and hatch their young in northern Canada each summer and when the weather gets cold in the fall they migrate to a warmer clime.

Water fowl never stay long on Crater Lake because there is lack of adequate food and their presence here occurs either in early fall or spring. When geese start south in August and early September old timers shake their heads and predict an early and hard winter.

A WARNING

Ranger John S. Day

"Wa'll, she's goin' to be a hard winter," mused old Sour Dough Pete, as he squinted a pair of pale blue, watery eyes towards the sky. "See them thar Honkers, wall, they're way head of schedule".

And sure enough, far up in the blue, the old familiar wedge-shaped line was moving silently southward. Now and then an eerie call would drift down to us, but for the most part they winged quietly and relentlessly on their way toward warmer climes.

The great Canadian Gray Geese migrate with the seasons, going north in the spring and south in the fall; and they are expected visitors over the park during April and October. But why should they be moving south in September? For several days, now, flock after flock of the great Honkers have been passing over; some flying so low that they have to climb higher when going over the Cascade Divide, and others so high that they are barely visible.

Maybe that infallible instinct which graces all wild life has told of early storms and cold weather in the north, and they have followed Nature's warning by migrating early. Probably old Sour Dough Pete was right when he prophesied a hard winter.

A FADING CLOUD

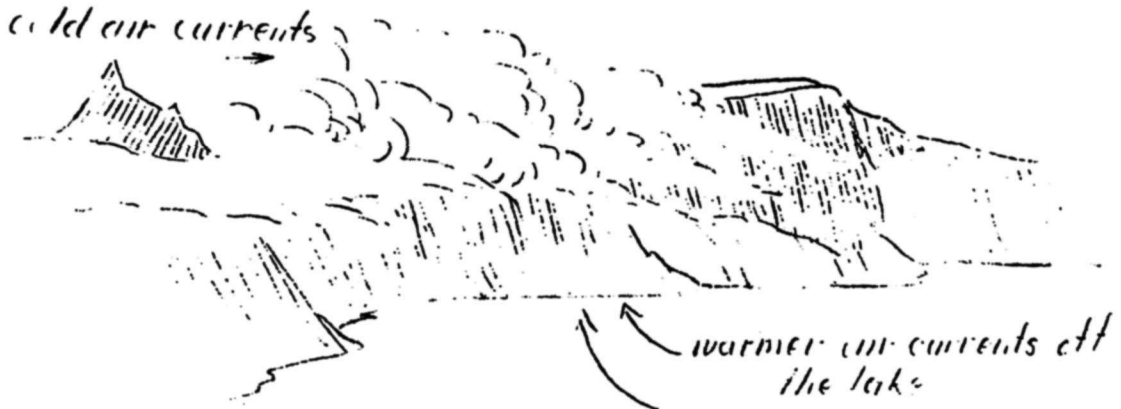
Ranger-Naturalist A. E. Long

Despite the uninviting appearance of the tumbling cloud mass about the summit of the Watchman the evening of August 19 a few hardy or perhaps stubborn individuals with tightly buttoned coats ascended the slopes to the viewpoint station. Arriving on top they found themselves to be above a jumbled blanket of clouds instead of among them. On the right were the topmost crags of Hillman Peak, Llao Rock, Mt. Bailey, Mt. Thielsen and Diamond Peak; to the left all the peaks were covered but behind them the lake remained clear of clouds.

One of the most striking features of the many beautiful cloud structures was the mass between Hillman Peak and Llao Rock. Here a

great blanket of clouds seemed about to pour into the crater and yet, though it moved rapidly toward the lake, the lakeward portion of the cloud mass disappeared as quickly as it drifted over the brink of the rim.

The cloud blanket was in a colder mass of swiftly moving air but when it reached the rim to pour over into the lakeward side warmer currents of air streaming up from the lake absorbed the water vapor and therefore



the cloud seemed to be evaporating. Warmer air can hold, in an invisible state, more water vapor than can colder air, hence the disappearance of the cloud masses as they drifted across the rim.

OLD OR YOUNG, A RODENT IS A RODENT

Ranger Warren G. Moody

As it frequently happens the boys had drifted together for some kind of a session. This particular night the subject of contention was wild animals and the gang was at it to see if they knew their animal offspring. Elk, deer, antelope, bear, cougars, coyotes all have little ones which are called something or other. The review was going fine until someone got to wondering what the young of a porcupine was called. There being no authority present to refer to, some of the names already given were again recited. It certainly couldn't be a calf, or a fawn, or a kid; and it surely didn't look like a cub or a kitten, or a whelp. So the head scratching became general.

On such a propitious occasion someone is bound to hit upon a way to solve the difficulty. And so it was that the bright member broke out with these words, "Let's call him 'Junior'".

HISTORY REPEATS ITSELF

Chief Ranger David H. Canfield

The famous influx of gulls that stemmed the grasshopper plague in the early days of Salt Lake City has its counterpart in the vicinity of the park.

In the famous Wood River Valley lush pastures grow scarcely above the level of the water table during the summer; and during the melting of snows the entire area is in mild flood condition.

Flocks of gulls were noted busy at work and intently interested. Investigation revealed that mice which had been snugly ensconced in woven grass homes underneath the winter's snow blanket were being forced to abandon their nests due to encroaching water. As they appeared from beneath the shallow snow, sharp eyes discerned them. A flop of wings, the sharp strike of a beak, and another mouse had completed his life cycle.

BENEATH CASTLE CREST'S CRAGS

Ranger-Naturalist C. Andresen Hubbard

It is below the towering crags of Castle Crest that our bears romp and play. These bears are the largest animals in our park, and many are tame. Among the many roaming in the park there are three black mothers. Charity has three cubs, and the others have one and two. In so far as these mothers must supply their babies with milk, they eat almost continually at the Park Headquarters food waste pit, the bear feeding grounds. Each of the bears coming to feed has its own individuality. Charity is by far the tamest. She will make friends with anyone, allow her babies to romp over the person of any visitor, and climb without hesitation into any standing automobile. This rather slight individual is boss of the bears. All flee before her. Feeding three is a big job - she must have her food.

The other bears, subjected to the terrible onslaughts of Charity, the mother of three, are not so tame and are restless. They will approach one, ask for a tidbit, but their babies generally remain in the trees. The slightest rustle of feet causes these individuals to race for the woods, leaving their babies behind. The youngsters seem safe in the trees. The mothers soon return, call their offspring down and the family shuffles off, to return when more favorable feeding conditions prevail.

Visit the bears, enjoy them, and remember the bears will be courteous to you only if you are courteous to them.

PACK RATS SORT CABIN SUPPLIES

Permanent Ranger Chas. H. Simson

On a visit to the Pinnacles cabin on the East Entrance Road, during the stormy months of early spring of 1933, I found it inhabited by woodrats, their usual work being in evidence by a large nest in a corner of the building. A rat's choice of material was used.

However, this particular rat, the builder of the nest, was more select in his material chosen and the manner in which it was placed. This was shown by the method nails had been sorted by size. Each size was in a little pile of its own. Straight and bent nails were also separated.

The rat was apparently expectant of a ranger's visit, as knives, forks and spoons were piled together in the center of the floor where under subdued light of mid-winter, they could be easily found. Since we must have rats, some of us would appreciate this higher intellectual type as they do facilitate labors in gathering cooking utensils together upon visiting a patrol cabin.

THE BEAR'S ICE HOUSE

Ranger-Naturalist W. G. Vinal

Early in the spring the bears were pawing old stumps for timber ants, grubs, and other proteins. When photographing one of these piles of chips and sawdust in September I kicked the cone and discovered that there was snow underneath. Did the white man learn from the bear the art of preserving ice with sawdust?

A COLD AND SNOWY SEPTEMBER

Summer visitors frequently inquire concerning when snow will come in the fall. This September has been particularly cold and rainy, with several flurries of snow. On the 24th over four inches of snow fell with a drift three feet deep accumulating on top of Cloud Cap. It appears that the prophecy of an early fall made by the "old timers" and the early appearance of the flocks of wild geese was not idle.