

NATURE NOTES

~ FROM ~

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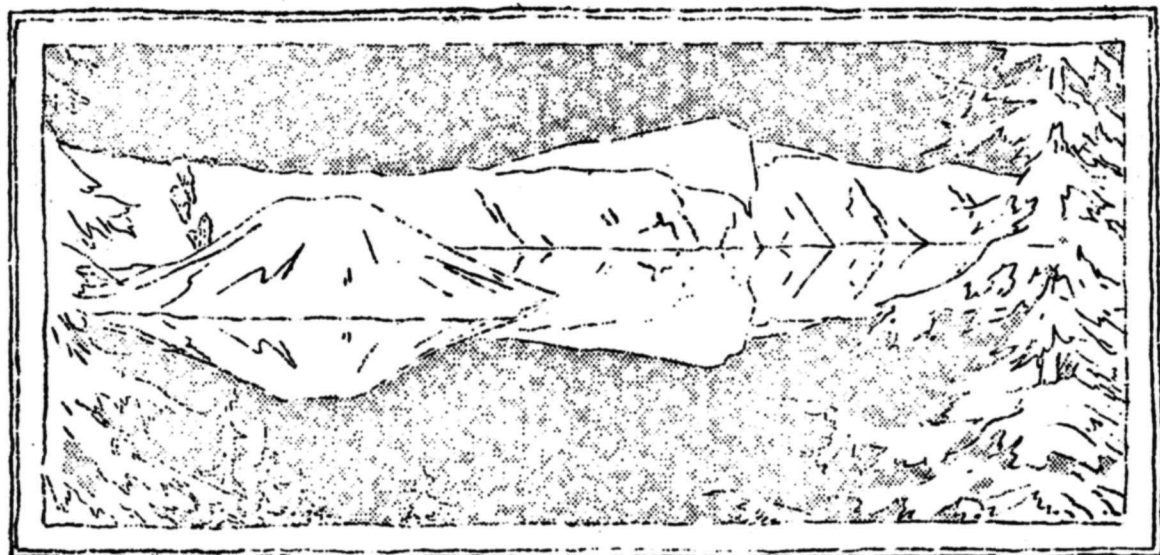
Cover and Sketches by L. Howard Crawford, Ranger-Naturalist.

A PREFATORY NOTE

Sometimes Spring arrives late at the Rim and the surrounding peaks of Crater Lake, and then early visitors to the Park, having come up from the warm valleys of Klamath and the Rogue, delight in the coolness of snowbanks and inspect with eager curiosity the flowers pushing up through the volcanic soil at the dwindling edges of the snow. Naturally to them the question arises, "What is this place like in winter when blizzards sweep the ridges, or, the storms ended, the sun strikes down upon the white stillness of great snowfields?"

To that question the present issue of *Nature Notes* is, at least in part, an answer. After a glance back at winter, we move on to a consideration of some of the phenomena of Spring, and in notes on flower, and rock-slide, and waterfall attempt to bring to those who have seen the lake in early July quickened memories of sights once witnessed, and revival of thoughts, once pleasant to the mind.

The Editors.



CRATER LAKE IN WINTER.

CRATER LAKE IN WINTER

L. Howard Crawford

With an annual precipitation of seventy inches of water, practically all of which falls as snow, Crater Lake National Park is transformed each year into a truly magnificent winter wonderland. To describe the magic transition wrought by a sixteen foot blanket of snow over rugged volcanic peaks would halt the pen of a Ruskin. To paint the silent sea, more silent, more luminously blue, the frowning walls, serene now, ermine clad, crowned by upward-pointing silver spires, and in reflection far below reaching down toward the peaceful depths where once was fire and hell, would still the brush of a Michaelangelo.

Exiled in such a world of beauty were five men, the winter crew, stationed at Government Headquarters, living and working together through the long winter, recording snowfall and temperatures, maintaining telephone and power lines, painting, repairing, caretaking, photographing, and shoveling snow. Shoveling tons of snow, and during the long winter evenings, reading, narrating, developing photographs, listening anxiously and intently to the news and weather reports at the radio, or perhaps later in the evening to music and gaiety from some distant spot where all was light and laughter.

But it was not always so. Sometimes it was a tortuous hell, battling foot by foot, ski shod, through miles of newly fallen snow in black weather, when returning from the monthly leave, seeking a break in the phone or power-line, or patrolling the Headquarters area.

To the winter crew, all of whom had an appreciation for the beauty and wonders of our mountain fastness, the hardships which so often had to be met and endured, were mitigated and made bearable by Nature in her gentle moods. Skiing, and occasionally snow-shoeing, were our only means of locomotion for many months, principally between December and June. A hardship on long trips made necessary by emergencies which always occur during the course of a severe mountain winter, the blanket of light, the snow, was a never failing source of recreational diversion and sport on Sundays and during that silvery grey twilight which ushers in the winter night.

Pleasant memories linger with all of us, memories of the lake at twilight, of cheery warmth and companionship at the Lodge, mecca of our only social pilgrimages, to chat with Mr. and Mrs. Richardson, our only neighbors, and memories of adventurous moonlight ski-rides, after our visits, wind whistling and snow swishing, as we sailed from the rim down to Government Headquarters.

The winter of 1934-5 began in earnest around the middle of November. There had been snow and freezing nights and frosty mornings since the beginning of October, but not until the black bears had disappeared to their

sheltered dens and the agile martins had become bold enough to flaunt their lustrous new coats before the eyes of man, did we consider winter really under way. Even so early, the leaden skies had covered the earth with a white mantle to a depth of four feet, softening every contour, smoothing and rounding with gentle curves the rugged rocky places.

Of primary importance was the task of making an accurate record of temperatures and snowfall, and each day readings were made of the minimum, maximum, and set maximum (temperature at time of observations) temperatures, and the exact amount of snowfall in the past twenty-four hours was measured, both in inches of snow and for water content. As the snow fell, during the winter, layer by layer and foot by foot, it packed down and compressed of its own weight, becoming quite solid underneath. Then during warmer weather, the winter and spring thaws, the surface snow would melt and cause the inner mass to granulate, or change to tiny balls or blocks of ice, the process ascending downward as spring progressed. Except during the extremely cold periods, the ground underneath the snow would not be frozen, and the lower layers would melt from the ground up. By such settling or compression, and by some loss of snow and water content from the bottom, the winter's accumulated snowfall of some sixty feet made a blanket but sixteen feet deep, in March, deepest snow of the winter.

During January, and again in March, official tests were made to determine the exact amount of water (in the snow) covering the ground, the greatest, of course, being in March. Fifty-five and eight-tenths inches of water were in the 126½ inches of snow that covered the ground at Annie Spring, where the tests were made. The findings of these tests were forwarded to the Water Resources Department, State of Oregon, to aid in their prediction of the amount of water to be available for irrigation this summer.

During the stormy winter the snow would come down steadily for long intervals, sometimes two weeks in duration. When the storm finally stopped, it was very difficult to foretell, without a barometer, whether the clear air and blue patchwork between the clouds meant a mere lull of a few hours or the final passing of that particular sojourn of bad weather. Here we relied somewhat on the natural instincts of the lower animals, for if the martins and pine squirrels ventured out, nine chances to ten the storm was over, and on many mornings, upon looking out and seeing the tracks of these animals on the fresh snow, and spots of blue appearing above, we rejoiced at the prospect of good weather.

The red fox and the porcupine also were about, but were not particular about when they ventured abroad.

Unusual jobs turn up during the winter without warning, often with both tragic and humorous angles. Early one February afternoon, a telephone call came from Ft. Klamath. We were informed that while out skiing, two men

had seen an old man, poorly dressed, walking slowly up the Park road, over the snow. He had been observed early that morning and was then about a half mile inside the old entrance. The men tried to persuade him to turn about, but he was determined to continue his weary wandering. It was snowing at Government Camp, and in the upper regions of the Park, and though the snow was firm and afforded fairly good footing in the lower regions of the Park, and though the snow was firm and afforded fairly good footing in the lower regions, the old fellow, we knew, would find very tough going as soon as he encountered the soft newly fallen snow.

Mr. D. H. Canfield, our Superintendent, was at Government Headquarters at the time, having skied in the day before on an inspection trip. He instructed two of us to ski down and get the man out of the Park before he became exhausted or frozen, because it was inevitable that night would overtake him, and having no skis or snowshoes, he would be in a very bad way.

Rudy Lueck and I started immediately, and after skiing about eight miles in a light snow storm, found him between Pole Bridge Creek and the Ski Cabin, sitting on his pack underneath a tree. He had made about seven miles since last being seen, but was near exhaustion and his first call was for water. He undoubtedly had been across the Park before, and no doubt was trying to get to the Rogue River Valley, over the divide. We took him to be an East Indian, or perhaps an Algerian; he spoke but a half dozen words of English, neither could he understand German, Italian or French. Not until we had taken his pack and staff would he turn around, and then reluctantly. With frequent mention of Allah and the repetition of the word "Mazaam, Mazaam", he would point to the mountains above.

He needed food badly, had been staggering for several hundred yards before giving up, so we escorted him to the Ski-Cabin, where we filled him to capacity (a rather large capacity) with coffee, biscuits, beans and corned beef. After he had eaten and thawed out, his, to us, amazing vitality, returned. We were able to escort him out of the Park under his own power. We got him a berth for the night, and the following day turned him over to the Transient Bureau at Klamath Falls, who headed him to a warmer clime.

As a whole, the winter slipped away rapidly and now it is quite unbelievable to again see the earth uncovered.

WESTERN WINDFLOWERS

★ ANEMONES ★

Before the hills are confident with flowers,
Columbine, paint-brush, phlox - the bees' delight -
Come these, as silent as the silent hours,
Bridesmaids of Spring that fill her path with light.

Ernest G. Moll.

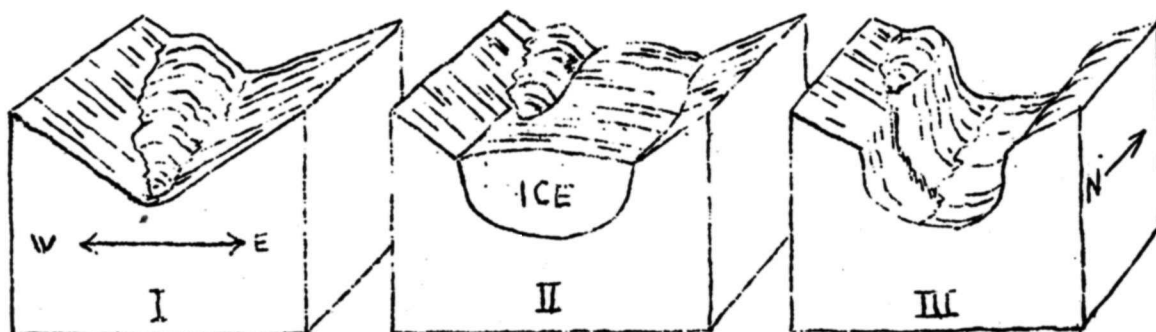


SOME WATERFALLS IN CRATER LAKE NATIONAL PARK

John Eliot Allen

Early in the season, when the snowdrifts still feed the innumerable small streams that at that time flow down the crater wall and the outer slopes of the mountain and augment the larger permanent streams, waterfalls of varying degrees of volume, height and loveliness may be seen at hundreds of places within the Park. A few of the most accessible and noteworthy of these were visited during the first two weeks in July, and the following discussion is designed to give the reader an idea of their characteristics, peculiar beauties, and origin.

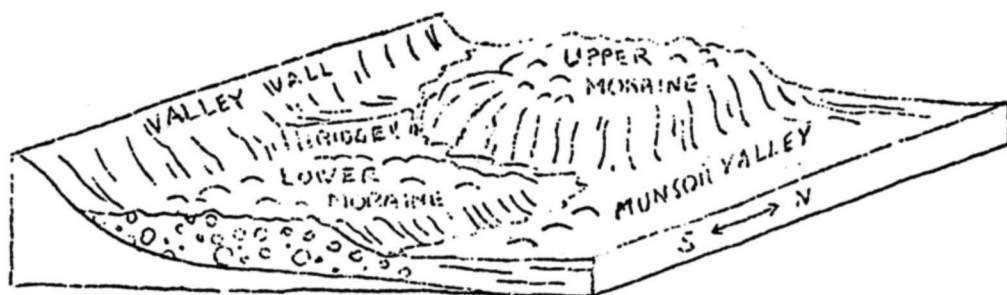
Widoe Falls, perhaps the loveliest and most accessible within the Park, may be seen from the east entrance road near the point where it crosses Sun Creek, about three miles from Government Headquarters. An easy trail also zigzags up the hill to a nearer viewpoint overlooking them. The two-hundred-foot cascade, cradled in a notch out in the grey cliff of lava, is edged with the brilliant green of the ever-moist vegetation, and overlooks a meadow and swale thronged with dog-tooth lily (*erythronium*) and forget-me-not (*lappula florabunda*). The cliff itself is covered with a large variety of wildflowers, the bleeding hearts (*dicentra formosa*), huckleberry bells (*vaccinium caespitosam*), false solomon seal (*smilosina amplexicaulus*), columbine (*aquilegia formosa*), rock penstemon (*penstemon rupicola*), service blooms (*amerlanchior florida*), sulphur flower (*eriogonum umbellatum*), and paint brush (*castelleia appelgatei*), all being prominently displayed. For a hundred feet above the top of the main falls the stream flows steeply down in a narrow chute bordered with a thick mat of various mosses, still further above the valley levels and flattens out as a bench on the west side of the main Sun Valley. This upper valley is of interest in considering the origin of the falls. The stream therein originally must have joined Sun Creek at its own level (I) and Sun glacier, filling the valley



(II) cut the cliff that resulted in the falls, (III). Since Sun Glacier must in order to cut the valley that is now present, at some time have covered the site of the falls with five hundred feet of ice, this must either have been during a very low stage of the ice stream, perhaps the last stage, or it is also possible that a more resistant ledge of lava may have been in part or wholly responsible for the level area and the falls.

Two other falls in Sun Creek itself may be seen further down the valley. Scarcely a quarter of a mile below the road, the stream, which is at this time of the year a sizeable torrent, drops over a mossy ledge for perhaps twenty feet, the angular blocky face of the rock breaking it into a hundred jets. Half a mile further down there is another steep drop in the stream bed, and in two hundred yards the creek falls over three hundred feet in a series of cascades.

A forty foot cascade may be found half a mile up the creek from the west end of the Government Camp mess hall. Immediately above these falls the southward-flowing stream is nearly choked with peaty sod, and for a hundred yards it repeatedly disappears below this springy mat and then boils up again a few feet further on. A few minutes inspection shows that the stream above the falls is bounded on the west by the wall of Munson Valley, which here is a high lava cliff, and on the east by a lower bouldery ridge parallel to the valley wall, which comes to an end at the falls and which is interpreted as an upper lateral moraine of Munson glacier. The water cascades over a minor lava ledge perhaps fifty feet high which juts out upstream from the lava cliff at an acute angle, the outer end being covered by the glacial deposit, thus effectually damming the stream and causing the level area above the falls. Below the falls the stream turns eastward around the end of the upper moraine over the surface of a lower and probably older deposit of a similar nature.



These falls are interesting in comparison to Vidao Falls, since they are both on the west side of south trending glacial valleys, but are of different origin.

Dowie Falls, at the head of Godfrey's Glen, may be easily reached by the road that turns off at the east end of the bridge, just a mile above Annie Spring junction. These cascades drop over a hundred feet into the glen, after flowing for a quarter of a mile through a narrow twenty-foot gorge, cut fifty feet down into the agglomerate rock of the area. The falls are thus unapproachable from above, and only with difficulty may they be closely approached by climbing up from the Glen, but a short trail has been built which leads down from the road to a viewpoint high above them. Dowie Falls are unique in their setting, lying deep in a gorge with walls made up of giant columns of agglomerate, and though their greatest single drop is perhaps only twenty feet, they fall a total of over five times that far. They are the result of varying resistance to wear of the rock layers, as the stream cuts its way down through the volcanic material.

A small falls, probably intermittent, but nevertheless noteworthy, is located two hundred yards north of a bend in the east entrance road just one mile from Government Headquarters. It is of particular interest in that it slides down over a smooth dipping surface of a peculiarly platy lava (andesite). The water cascades over this slope for twenty-five feet before taking a fifteen-foot final drop.

Waterfalls within the rim of the lake are of comparatively small volume, and with only a few exceptions are intermittent in nature, depending upon small snow-fields for their supply. They exceed all other falls in the Park in height, however, and the delicate filaments of a few of them as seen from the lake present a lovely sight. Those noted during the first week of July are listed as follows:

1. 1/4 mile northeast of Llao. A thin 60 foot cataract with a 30 foot vertical drop, over 200 feet above lake level. Probably intermittent.

2-4. 1/2 to 3/4 mile north of Sentinel Rock. Three gullies in the steep cliff are occupied by small temporary cascades dropping perhaps 200 feet down the wall to the water.

5-7. 1/2 mile southeast of Sentinel Rock. At the base of the massive lava flow, 200 feet above the water, two small but possibly permanent streams flow out to fall in several 20 foot drops before cascading to the water's edge. Around the point to the southeast comes another small cascade, of such location as to suggest falls hidden above.

8. North Side of Dutton Cliff. Here, another slight stream issues at the base of a massive flow, 400 feet or so above the water, and drops 150 feet, then cascades to the water's edge.

9-12. 1/2 mile Southeast of Eagle Point. Four cascades, fed by waters from snow on the shaded slopes of Garfield and Applegate are of considerable size although probably temporary, and fall 200 feet with 20 foot to 40 foot falls near the water's edge.

Monkey-Flowers of Crater Lake

Elmer I. Applegate

Among the more handsome and conspicuous flowers of Crater Lake National Park, are the Monkey-flowers which belong to the genus Mimulus. The technical name is derived from the Greek word mimo, an ape, and was suggested by the masked or grinning corolla common to most of the species. They are conveniently separated by color into two groups, the yellows and the reds; and are characterized by having funnel-to bell-shaped, more or less irregular two-lipped flowers. In size of plant and flower, they vary greatly, running the full gamut within our limits, from the tiniest monkey to the giant simian. Six species are known to occur in the park area, one half in each color group.

The largest and most attractive species is Lewis's Monkey-flower (M. Lewisii Pursh), common along streams and lake shore, especially abundant about the boat landing. The plant usually forms large clumps with many strikingly beautiful flowers of rose-pink color, about an inch and a half in length. The name was given by the German botanist Pursh in honor of Meriweather Lewis for the Lewis and Clark expedition, who collected the type on the return trip in 1806.

The most common of the yellow forms is M. Guttatus DC. This also is a water-loving plant. Many of the streaks of yellow to be seen on the inner wall of the crater are due to their presence, marking the course of streamlets; and massed on mossy fallen logs within the stream, their golden-yellow lends much to the beauty of Boundary Spring.

Not so showy, and less frequently seen, is the Musky Monkey-flower (M. moschatus Dougl.), so named by David Douglas, the greatest of all our early botanical explorers of the north-west. The flowers are about the same size but of a paler yellow, and with weak stems, often prostrate. They are found rather sparingly in moist places, especially at lower levels. The common name is in allusion to the strong musky scent. The whole plant is moistly viscid.

Abundant in wet meadows and mossy stream margins, is the beautiful smaller yellow Primrose Monkey-flower (M. primuloides Benth.). Unlike the other forms, the flowers are borne on leafless stems which arise from the clustered basal leaves.

Growing only in dry situations is the dwarf Monkey-flower (M. nanus H. & A.). As suggested by the specific name, the plant is small, being from about an inch to three or four inches high with flowers usually little over half an inch in length. Widely distributed over the upper areas of the Park, attractive colonies are found in the pumice sand, especially noticeable in some places on Cloud Cap where deep red patches are frequent along the rim road.

Last, as well as least, we have Brewer's Monkey-flower (M. Breweri Gray). This pigmy of the lot is also a drylander, and most often found on precipitous, ledgy slopes, springing up and flowering immediately following the disappearance of the snow. Dense colonies are to be found among the ledges near and westward from Government Camp. Many of the plants are less than an inch high, and few exceed two or three inches. Glandular-viscid throughout, the simple slender stem bears commonly one or two rose-pink flowers which average perhaps a quarter of an inch in length, with a corolla spread of not more than half that. With a nearly regular corolla, this little fellow presents a countenance of a more serious mien than that of his grinning relatives. Some of his associates are also diminutive plants. Among them are the Little Knotweed (Polygonum minimum Wats.) often only one half to an inch high with exceedingly small flowers; the Small-flowered Collinsia (Collinsia parviflora Dougl.), and the Little Willow Herb (Epilobium minimum Lindl.). The name was given by Dr. Gray in honor of its discoverer, W. H. Brewer, who was the first to make any considerable plant collections in the high Sierras of California. Several other Crater Lake plants bear his name, including Brewer's Sedge (Carex Breweri Boot.) and Brewer's Mitella (Mitella Breweri Gray).

UNUSUAL RIDGES OF ROCK FRAGMENTS

Carl E. Dutton

After most of the snow inside the Rim has melted away, there remains an almost continuous accumulation below The Watchman and Hillman Peak. These snowbanks are separated from the lake by a very definite border of rather large rock fragments. When finally the warmth of summer has completely or partially melted these snowbanks, there exist depressions where the snow was formerly present. In the latter season of the year, the trough is conspicuous but might not be accorded its true origin.

The manner in which the ridge and trough are formed is revealed by the processes which are especially active while the snowbanks are present. Occasionally a rock fragment, from the cliffs or slopes above, tumbles toward the lake and in doing so is carried across the snow. This process has been repeated until the accumulation finally became so great that it was built above the water and the ridge character was developed. The predominance of large size fragments in the ridge is noteworthy and is due to the high velocity attained by the falling rocks. As a result of this inertia, the large fragments are propelled across the snow whereas the smaller fragments are stopped by the snow.

Thus the sorting and accumulation of such loose material into these shore ridges is principally a geological feature whose origin is associated with the season of snow at Crater Lake.

THE CRUMBLING RIM

Ernest G. Moll

The first boat trip around the lake in Spring has, for those of us familiar with the lake from of old, a twofold interest. There is the renewed contact with scenes wistfully remembered at quiet moments through long winter; there is the curiosity concerning how the rim has weathered to winter storms and the tug and thrust of ice and snow.

Observations made on the boat trip of July, the first, would indicate that the past winter produced relatively few changes in the features of the rim. However, at a spot precisely halfway between Palisade Point and the Palisades, a new scar in the out-jutting lava bore witness that a large mass of rock had split off and fallen away to the lake. Huge freshly-broken fragments, mixed with splintery remnants of tree trunks, lie scattered along the shore-line.

Thus goes on record another skirmish in the battle of the rim against the forces of weather and erosion.

That which seemed strong as Time lies broken here,
A fearful discord of tempestuous stone;
And o'er that field still linger, sharp and clear,
The echoes of the wild earth-bugle blown.