

NATURE NOTES
 FROM
CRATER LAKE NAT'L PARK

THE PINNACLES

"Solemn, clownish,
grotesque as gargoyles,
the Pinnacles rise, within the
Canyon walls."

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DEPARTMENT OF THE INTERIOR

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CRATER LAKE NATIONAL PARK

OREGON

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This is one of a series of bulletins issued monthly during the summer season, by the staff of the Educational Division to give information on subjects of interest concerning the Natural History of Crater Lake. It is supplemental to the lectures and field trips conducted by the staff.

"To him who in the love of Nature holds
Communion with her visible forms, she speaks
A various language; for his gayer hours
She has a voice of gladness, and a smile
And eloquence of beauty; and she glides
Into his darker musings with a mild
And gentle sympathy that steals away
Their sharpness ere he is aware."

--Bryant

THE PINNACLES

(The Geologist accounts for the deep
canyons in the Park.)

D. S. Libbey, Park Naturalist

The Pinnacles, located in the canyon of Wheeler Creek in the east part of the park, are a splendid illustration of the result of recent stream erosion and wind abrasion. These grotesque spires occur on the canyon walls and are worn out in the debris that in the geologic past was deposited in the outwash plain and valley train of the glaciers which came down off the slopes of Mount Mazama.

The valley floor resulting from the sorting activity in the melting of the ice masses is material of volcanic origin. The debris is somewhat sorted and portrays the combined glacial and water-laid characteristics. This semi-stratified rock material is termed glacio-fluvial. The marked accessibility of the Pinnacles, since they can be viewed as the visitor passes along the highway approaching the Lost Creek Ranger Station, the east entrance to the park, causes practically all who go that way to see the interesting features. Immediately the question is asked, "How did they happen to be?", "Of what are these spires composed?" They are located in the so-called "Box canyon" of Wheeler Creek just above its confluence with Sand Creek. The spectacular erosional features in other parts of the park, such as Godfrey Glen, Llao's Hallway and various other steep walled canyons are similar gorges out in the friable ash and pumice conglomerate.

It is apparent that the volcanic ejecta, ash, pumice, lapilli, bombs and larger volcanic blocks were gathered into the mass of ice during the time of glaciation. Much of the rock material has been ground into rock flour and then upon the melting of the ice the debris was sorted by the action of the water from the glacial wastage. This semi-sorted material was built up layer upon layer. The overburden consolidated it and thus the process of induration was achieved along the Wheeler Creek Canyon walls and in the very spires of the Pinnacles themselves.

The careful observer who has studied the inner rim of Mount Mazama finds evidence that the volcano was of the intermittently effusive and explosive type. The fragmental igneous material, solidified molten fragments, was hurled out and deposited on top of the previous lava flows which coursed down the mountain slopes. The old volcano in eruption thus poured out layer upon layer of lava successively on top of the explosive masses which were scattered by each intermittent episode in the history of Mount Mazama. One can

see from inside the Caldera walls successive layers upon layers separated by the slaggy red to buff colored pyro-clastics or fire fragmented particles. The crust of solidified, or frozen lava, which repeatedly formed in the crater or orifice of the volcano was blown to fragments by the renewal of explosive activity and as this volcanic ejecta came to rest an agglomerate was formed. The lapilli, small cindery fragments, from the size of peas to that of oranges, along with the infinitely small particles of dust and ash were scattered over a vast area.

The semi-sorting action of the rushing waters from the wasting glacial tongues or the glacio-fluvial deposition left sloping plains made up fragmental volcanic debris which has become partially indurated. The loose friable material appearing in well defined layers in places shows the characteristics of mud flows and in others the discoloration caused by escaping gasses. The tuff deposits partake more of the characteristics of sedimentary rocks and the resulting grotesque erosional forms result from the protection which a larger volcanic fragment, possibly bombs, offers to the disintegrating effects of water wear and wind abrasion.

As you stand on the banks of Wheeler Canyon it is highly probable that your feet may be resting immediately over what will be the topmost portion of the spire of a pinnacle in future lapses of time. It is quite evident that the canyon wall will move laterally and a much wider canyon floor will eventually develop in which beautiful flower gardens will bloom.

THE WHITE PINE TELLS HIS TALE.

Frank Solinsky - - Park Ranger

Forenote: Although the following is a story of Paul Bunyon, the mythical logger loved throughout the northwest, yet the facts regarding Nature herself are true.

Now many people have wondered and marveled at the deep canyons in the bottoms of the glacial-cut valleys which radiate from Crater Lake. Geologists tell us that they were formed by water and wind which found the pumice and ash, which prevails in these valleys and on the slopes, easily worn away. This pumice soil, you understand, is a light porous material and offers no great resistance to such persistent and powerful forces as wind and water. Believe those learned men if you will, and they are right to a certain extent, but as for me, I learned the real story from that venerable old white pine which stands in one of these very canyons and he saw it all. How this wise old fellow has a reputation for great age and that coupled with his intimidating size make of him a force that must be reckoned with. However, he and I are good friends and so one warm afternoon he told me the following story.

"Now it was this way" he sighed, his voice coming down to me from the branches high above my head. "This remarkable fellow, Paul Bunyon, had turned into a recluse. Yes he had. Along with the notoriety which attends fame came a clamoring public anxious to inspect him at close hand. Finally to gain peace, he left his logging operations and came up here to the lake to rest. All went well until word leaked out as to his whereabouts", and here the old fellow tossed his head in a gust of wind and mumbled something about the treachery of pine beetles. "Anyway", he continued, "it was not long before curious folk were seeking him out up here in the park. It is true that he could climb to some inaccessible part of the inside rim of the lake, but because of his size he would still be visible. It was an old badger, curse him, who finally told Paul of a way to save himself. Now there were gentle streams flowing through these valleys but because of trees like myself and mainly because of the carpet of sedge grasses and brush, these streams had not cut deeply into the ground. But, thanks to that badger who probably because of his burrows in the ground knows something of geology and the workings of erosion, this fellow Bunyon armed himself with a hoe and began to scrape out the brush and trees along the banks of the creeks. Why he spared me I don't know, unless it was because of my unusual beauty", and here this vain ancient smiled to himself, "but anyway, I was spared. With the protective vegetation gone" he went on in a more serious tone, "it was only a matter of time until these canyons were cut out. Now Bunyan could hide himself in peace. He would camp in some deep forest with a chasm between him and his pestering public". Here the story teller broke into such violent laughter that a cone dropped down on my head and sent me hurriedly up the canyon to Government Camp.

GLACIATION OF MOUNT MAZAMA

Dr. W. R. Atwood of Education Division, N. P. S.

In the past two issues of Nature Notes the Park Naturalist made reference to recent discoveries of carbonized wood in the vicinity of the Rogue River, west of the park. The logs which were found buried beneath layers of pumice were completely changed to charcoal. The discovery was of special significance for it aided the geologist in interpreting the history of Mount Mazama and Crater Lake.

This first discovery caused considerable excitement at the lake and the naturalists were anxious to locate similar deposits within the park boundaries. Their hopes were fulfilled on August 20, when during a geological investigation of Pumice Point a layer of soil was found buried deep beneath the loose pumice and containing numerous fragments of carbonized wood. This discovery inside of the rim of Crater Lake, directly across from the Sinnott Memorial, proved to be of still greater significance than the first one, for associated with the soil and pumice material was found evidence of repeated glaciation.

If we could picture the landscape in this region as it appeared some twenty or thirty thousand years ago we would see Mount Mazama a volcanic mountain covered with glaciers. It probably resembled Mount Hood and Mount Rainier as we know them today. The glaciers which occupied the valleys of this former mountain left the material marked "First Glacial Deposits" in the accompanying diagram. Suddenly, while glaciers still existed on the mountain, the volcano erupted and covered the glaciers with pumice and lava. This caused the ice to melt, but soon now glaciers grew and moved slowly down the slopes of Mount Mazama. This second group of glaciers left the material marked "Second Glacial Deposits" on the diagram. They also left glacial scratches or striae on the lava beneath. This time the glaciers were not immediately covered by pumice, but considerable time elapsed during which a layer of soil was formed and vegetation flourished on the slopes of the mountain. This is proven by the presence of carbonized plant remains in the soil layer indicated in the accompanying diagram. Again history repeated itself and Mazama erupted to cover this soil and vegetation with thick deposits of pumice. Glaciation occurred once again and possibly still a fourth time as is indicated by glacial material interbedded with the pumice and volcanic ash.

Thus, from the little section exhibited on Pumice Point, the geologist may read a portion of the story of Mount Mazama. The rocks are as leaves in a great book which records the history of our earth. Sometime perhaps we will locate all the pages of this geologic time table and be able to read more perfectly the romance of Mount Mazama and Crater Lake.

The following poem was written by William Alexander Godward of Sonoma, California. Mr. Godward has so effectively told the story of old Mount Mazama that we are printing it in Nature Notes.

AN ODE TO MAZAMA

He stood upon the world's most western rim,
A giant taller than his giant kind.
To north or south no titan equaled him
In youthful grandeur and sky-towering mind.
Below him gazed bright Shasta in the blue,
Who turned to him a wonder-beaming eye.
Mazama felt her presence smiling through
The deepening shadows of the evening sky;
But he had caught the gleam of a pale maid
Who beckoned him out of the early dawn,
With witchery so daring, yet afraid,
As once she beckoned charmed Endymion,
To follow her into a world of dreams;
To walk with her beside supernal streams.

Night after night through all the circling years
Mazama reached and longed for that slim form,
In summer stillness and in winter storm,
Which lured and beckoned him with hopes and fears.
Within, Mazama glowed and burned with fire,
Outpouring all his ardent soul in vain,
To the green levels of the wondering plain
In rolling streams of scoriac desire
When spent, at last, with heaven-seeking quest,
Mazama bent his frame, now rent and scarred,

The skies consenting to his rash behest
Gave the bold titan more than love's reward;
For joys more dear, they give, and sweeter far
Than any titan's dreams of maiden are.

Thus, as Mazama lay in ashes cold,
And while his giant grave was hollowed deep,
The brooding skies their precious drops would weep
Till it was filled with waters manifold.
In this clear lake whose deepest blue could hold
Undimmed her white resplendent maidenhood,
Revealing her in many a lovely mood,
Diana visits him in spirit bold.

She strains the colors of the sun's broad glare
To make a harmony of blended light;
She shows him forms more exquisitely fair
Than naiads limned in the charmed groves of night.
Such loveliness enchants his every sense,
As only goddess gives in recompense.

For round the sapphire of this cratered sea
Forests had spread their deep mysterious shade.
Hemlocks and firs made many a wildering glade
That rang with songs of birds in harmony.
Clear waterfalls sang out in noisy glee
And raced through darkened caverns unafraid
To rest again in welcoming arcade
All floored in ferns and walled in wizardry.
And where the waters through the wooded rim
Of this sky-fostered lake find secret way,
There all the rarest blossoms in array
Put on their gayest hues to pleasure him.
Thus every charm of forest, flower, and stream
Were woven by Dian in Mazama's dream.

There columbine rears towers white and red;
There monkshood spreads its canopies of blue;
Anomones and hellebore and rue
Still grieve for hapless lovers long since dead.
The gaudy fireweed tosses flaming head
To dance in careless glee the long day through
Beside the week-eyed violets still true
To the bold titan in his flowery bed.
Here mimulus, Like Dian, in the shade
Reveals her purple loveliness unveiled;
The rosy orchid, queen of beauty hailed,
Stands gleaming, glowing like a gracious maid,
With humbler flowers delicately sweet
Bowing and blushing at her very feet.

Mazama sleeps in this enchanted spot.
What cares he how the endless cycles run,
Or for repeating orbits of the sun?
For time and fickle change disturb him not.
No longer rolls the lava seething hot;
No longer burns his heart for triumphs won,
Nor tells his weary soul when day is done
Tomorrow will with victory be fraught.
Beyond the heat of youthful hopes and fears
He sleeps and dreams the dream of cosmic peace,
Unmindful how hot torrents sought release
With vulcan rendings through volcanic years.
Long may his sleep be free from past alarms;
Awake him not from Dian's deepening charms.

SNOW PRESSURE BEND

Clyde E. Gilbert, Ranger-Naturalist.

The trees inside the rim of Crater Lake and on the steep slopes of the surrounding peaks show a distinct bend near the base. The bend might be accounted for by some as due to soil creep. "Soil creep" is the gradual downward slipping of the soil on the steep hillsides. This is usually caused by alternate freezing and thawing of the soil aided by the water table in the early spring. Since the soil on the slopes is quite shallow and many of the tree roots are anchored in solid rock, it is very improbable that soil creep is responsible for the bend. Also in the case of soil creep the base would have moved down slope and the tops tilted upward. If a resulting bend occurred it would be in the opposite direction to that found in Nature.

It appears more probable that snow pressure that snow pressure on the trees for six months or more of the year forces the tree out of the line of normal growth and causes a distinct crook that is called "snow bend". The tree is most affected while it is very small. Some times it is pressed flat on the ground beneath huge drifts of snow for several months. During the growing season the sun draws the tree back into an upright position but before it can completely straighten the snow falls and again presses the tree out of line. Every year the growing tree, aided by the sun, gains a bit in the battle, but even the larger trees show a distinct "snow bend" that is never outgrown.

ASSISTING NATURE

E. U. Blanchfield Ranger Naturalist

Visitors to the park this summer are extremely interested in the planting activity on the Rim from the entrance of the Rim Road to the Lodge. The rim walk winds through this planted area among native shrubs and flowers.

As the soil on the Rim is pumice and not favorable to plants, rich soil has been transplanted from bogs and stream banks and spread over the pumice.

At the head of the Lake Trail is an excellent planting layout of mountain ash, black twinberry, red twinberry, pink spirea, and native grass which forms an intersection of the lake and rim walks. In the shaded locations under the mountain hemlocks are planted western bleeding hearts, alpine phlox and mountain valerian. The false green hellebore, Coville's aster, fireweed and Crater Lake currant are all prominent at this season on the Rim edge. The Crater Lake currant is being used as a creeping plant to beautify the new Sinnott Memorial Building. In between the rocks of the building are planted a matted beard tongue, the lace fern, seedum, softening the lines of the architecture. These plants have been obtained from the rock crevices on the side of Garfield Peak.