

thirty miles in diameter, belted on all sides by the Blue Mountains, was subsequently the site of a huge volcano. The Blue Mountains were then a system of islands, growing up from the water into a range of mountains. The upheavals, whether secular (by the century) or paroxysmal, together with the volcanic disturbances, caused deep canyons and a most rugged surface. But all this unevenness was converted into a level plain by the flowing down of the lava during the time of eruptions, and this has been converted into the smiling valley we see to-day.

In all probability this ancient volcano was the highest peak of the Blue Mountains, and therefore the first to rear its head above the vast expanse of waters. What a field for the play of the imagination! Let us imagine a million of years condensed into the space of an hour. We are hovering in mid-air above the heaving ocean. We see a dark speck slowly rising amid the white-capped waves. Higher and still higher it rises. The sea gulls gather about it and their screams echo along the rolling billows. Millions of acres of land, rough and broken, surround the base of this majestic peak. Shell fish of every species are clinging to the rugged rocks which form the outer wall of defence against the aggressive waves. Here the sea fowl lay their eggs and hatch their young. The seal and walrus climb up the rugged cliffs to bask in the glorious sunlight. "But hark! a deep sound strikes like a rising knell!" The whole island seems convulsed. The walrus and seal glide into their natural element. The birds shriek and cleave the air with frantic wing. The rocks are rent in twain, and, with the roar of ten thousand cannon, the molten lava bursts forth from the summit of this lofty peak, pours down its sides, rolling far out over the uneven surface, licking up the waters in the urns of the reft rocks with the tongue of a vampire and the hiss of a dragon. As the water seeks its level so does the liquid fire, and we witness the formation of a plain more than a hundred miles in circumference. Time rolls on, and the lofty peak melts away until level with the plain, which is guarded on all sides by the lofty cliffs that are to form spurs of the Blue Mountains. It was thus great Nature spoke, not in words but deeds, and Grande Ronde Valley sprang from chaos.

In support of this theory of formation Nature has everywhere stamped her hieroglyphics on the summits, the flanks and at the bases of the Blue and Cascade ranges, in fossils, in shells and in marine deposits, in the secondary formations, in the shales and sandstones, in the washed gravel, all visible in the present day, and in the ripple marks, on which the Eastern tourist gazes with wonder. These are her witnesses, speaking as no tongue spake, forever telling us of the grandeur of her works.

These ripple marks, like those found on the Potsdam sandstone of New York and Canada, were made by the wavelets, as we see them to-day on some sandy beach. These are obliterated at every flow of the tide and new ones formed at every ebb; those formed by an ancient ebb have been preserved by an upheaval that followed before they could be washed out by the rising tide.

When the mountain systems had been perfected, encircling the waters between the Rocky Mountains and Cascade Range, forming a great inland sea, the tide no longer ebbed and flowed there "twice in twenty-four hours." But when the alarm of the storm was sounded; when the thick clouds were mustered for the black tempest, and the winds burst forth in their mad fury, then the waves dashed up the steep sides of the sand cliffs and each left its ripple marks as it receded. In the process of time the sand was changed to stone, the wave lines still remained—mementoes of a past epoch.

As the upheaval of the bed of the imprisoned waters continued, their surface gradually rose until far above the level of the ocean, unable to escape the mountain chain that formed an impenetrable barrier to their egress. If there was a diminution from evaporation, it was more than compensated by the rainfall during the rainy season. Then as now, the sea breeze carried eastward the ocean-formed clouds, when the moisture was condensed by the cold and the rainfall was general. Streams and rivers were formed, all flowing into the imprisoned waters, which were thus constantly increasing. Leaving this great basin to fill up, we now turn our eyes toward the setting sun.

See! the Coast Range is beginning to emerge. The elevating force is greater at the south than the north, for at this day the mountains decrease in height as they approach the Columbia River. Passing the northern boundary of Washington Territory, the Coast Range dwindles into a system of islands which can be traced to Alaska. After the Coast Range Mountains had emerged as far north as Puget Sound, the Cascades, previously the eastern shore of the Pacific, were cut off from communion with the ocean, and the Coast Range became the eastern boundary. Then another great inland sea of imprisoned waters was formed, bounded on the east by the Cascades and on the west by the Coast Range. All of Willamette Valley was then calmly reposing beneath the waters.

We return to the great sea lying between the Rocky Mountains and Cascades. During the lapse of ages, since we last gazed upon it, the imprisoned waters have reached the summit of the Cascades. A storm arises. Great waves are rolling across its surface. See! what a monster billow approaches! It would overwhelm a whole fleet! Now it breaks with the force of a million tons against the rocky barrier interposed between two lofty peaks. Look! a part of the mountain is moved out of its place and borne irresistibly forward. Before it yawns an awful precipice; but, as if exhausted by the gigantic struggle, the waters retire and the loosened mass of rock is once more at rest. Again and again the waters roll forward, like the phalanx of an army, when a third wave, towering like a giant, dashes upon the shattered mass, bearing it grandly on, then hurling it headlong thousands of feet below. The breach has been made, and now the imprisoned waters rush madly on—reeling, falling, foaming—carrying everything before them, wearing their passage through the solid rock, as they cut a channel for the grand old Columbia.

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