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Physiographically, the Grand Coulee presents a story that is unique; scenically it is one of the little known but most impressive features of our country; geographically, it is a center of human life, human effort and human success, that thrills anyone who is familiar only with life in well watered regions where scenery is on a relatively small scale and agriculture in general is intensive rather than extensive.

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RICHARD ELWOOD DODGE.

MOUNT MAZAMA AND CRATER LAKE

THE line of splendid volcanoes of western United States, from Mt Shasta in California to Mt. Hood in Oregon and Mounts Rainier and Baker in Washington, includes also a volcano which is little known. Its name is Mt. Mazama and the reason for the unfamiliarity of the name is that most people think, not of the mountain, but of the body of water which

Upper figure—Mount Mazama Restored.

Lower figure—Cross section through Crater Lake. (After J. S. Diller).

occupies its top,—Crater Lake. The lake is nearly 2,000 feet deep and its surface is 6,177 feet above sea level. As one of the loftiest and one of the deepest lakes in the world, Crater Lake has a well-deserved popular fame. The mountain, however, is even more interesting than the lake; and as it is now a National Park and as travellers are going to the region every year in increasing numbers it seems desirable to know more about Mount Mazama itself and the history of the mountain which has preceded the formation of the lake basin.

Leaving the railway*, on the main line between Portland and San Francisco, either at Medford or Ashland, or at Klamath Falls, Oregon, you can drive out to Crater Lake by automobile, taking a day to drive each way and spending a day at the crater rim in a comfortable tent hotel, taking a forenoon for a launch trip on the lake. The drive from Medford to Mt. Mazama is a delightful one. You travel 85 miles and in this distance you ascend over a mile. The journey is in four contrasting portions. 1. Near Medford you pass through the apple and other fruit orchards of the Rogue River valley, where man has made the dry land into a veritable garden. 2. You pass into the rugged foothill region with its grazing industry. 3. After this you traverse a long, wooded valley with the road winding through a virgin forest of great sugar pines, Douglas firs, and cedars, where the ground is littered with pine cones a foot to eighteen inches in length. 4. Lastly the road ascends a steep slope, the base of the former volcano, now called Mt. Mazama.

Arriving at the crater rim you look into a vast caldera, occupied by an intensely-blue lake. The lake is 5 miles in diameter. Its walls rise precipitously 500 to 2,200 feet. Within the lake is a small volcanic cone, Wizard Island, which rises 763 feet above lake level and contains a small crater 150 feet deep.

Valleys cut by streams in the slopes of Mt. Mazama and heading in the air at the crater rim show that a lofty peak formerly rose on the site of the present caldera and lake. This conclusion is supported by the presence of glacial striae upon the crater rim. They can have been formed only by ice streams which flowed down from a former lofty mountain. The same thing is also proved by the lava flows, such as that of Liao Rock, which must have descended from the former mountain. The igneous rock of the crater rim and lava streams proves that this former mountain was a volcano. Some of these flows occupy ancient lava-filled valleys which must have headed on a lofty volcanic peak.

Having established the fact of a former lofty cone of Mt. Mazama, the question arises as to what has become of it. Two methods of destruction suggest themselves, (1) explosion or (2) engulfment. Diller, who described most of the features here summarized, concluded that it was engulfment, for the surrounding region is not littered with fragmental material as would be the case if the crest of the volcano had been destroyed by explosion.

Wizard Island, however, is not the tip of the engulfed cone, as was stated recently in a popular periodical whose circulation is 2,000,000 copies a week, and from which many teachers may gain an erroneous idea. If that were the case it would occupy the center of Crater Lake and not its extreme margin. The island is a more recent volcanic cone.

*The Southern Pacific.

The history of Mt. Mazama as an original volcano, fully as high as Mt. Shasta, and with slopes eroded by streams and glaciers, and of its destruction by the sinking down of the cone, is one of fascinating interest compared with the mere fact that there is a deep lake of mysterious origin upon a mountain peak.

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LAWRENCE MARTIN.

GLACIER NATIONAL PARK

AMONG the National Parks recently established in western United States none is more beautiful and interesting than the one in the front range of the Rocky Mountains in northern Montana. The writer bases this statement upon what he saw of the region eight years ago, before the roads, trails, and hotels were established in the region. Here one may see glaciers, as the name of the park suggests, and although they are not as large as those on Mount Rainier, which contains the largest ice streams in the United States, they are in no way inferior to the glaciers along the Canadian Pacific Railway a little farther north. They are smaller than the ice tongues of the Alps and are mere pigmies compared with the glaciers of Alaska, but the Blackfoot Glacier and its neighbors in Glacier National Park are perfectly typical and to Americans they are very accessible. The present glaciers, numbering some scores, are not, however, nearly as interesting as the features of former glaciation in this region.

Leaving the railway* at Glacier Park or Belton or Midvale, after two days' journey from Chicago or Kansas City, you can enter the park by automobile or stage, seeing a little of the Great Plains en route. Or if you start from the western side you have, first, a journey by lake steamer. In the park you travel by wagon or saddle horse or on foot, stopping at chalet hotels or at comfortable camps. You can see something of the park in a day or two, but 9 to 12 days constitute the standard tours.

You may visit the glaciers, but these are mere incidents in a wealth of

*Great Northern Railway.