

Notes on the Geography of the Olympics

By HENRY LANDES

FROM British Columbia to Lower California there rises from the sea an almost continuous line of mountains which constitutes the coast ranges. In general they are much lower than the next great mountain bulwark to the east, from which they are separated by a long north-south trough or valley. The winding coastal ranges have different names in different places, and the Washington segment is known as the Olympic mountains. The Olympics extend from the Columbia river to the Straits of Juan de Fuca but it is only north of Gray's Harbor that they represent a conspicuous mountainous area. Between Columbia river and Gray's Harbor the mountains are characterized by low ridges which do not exceed 3000 feet in height. The northern Olympics alone, or that large triangular area bounded by the Pacific ocean, Strait of San Juan de Fuca, and Hood's canal, will be considered in this article.

With the exceptions of some portions of Alaska perhaps, the Olympic mountains represent the least known part of the United States. They are scarcely known at all from the standpoint of geography or geology, and their fauna and flora have been but little studied. They have been penetrated in certain directions by occasional small exploring parties and yearly a few hunters and prospectors make their way into the mountain wilds. The usual routes of entrance are by way of the larger valleys, usually the Elwha, Quilcene, Quinault, or Soleduck. All the routes of ingress are difficult because of the dense forest growth, the canyons along the streams, and the general ruggedness of the region. When well into the mountains the elk trails are generally followed by the explorer, and these must serve until an increasing interest in this little known region compels the construction of permanent roads.

From Hood's canal and de Fuca strait the Olympics rise abruptly from the sea, with a very narrow lowland margin. The only breaks in the solid rocky wall are the great chasms where the streams come from out the mountain interior to join the sea. Along the course of each stream, canyons alternate with wide valleys, according as the rocks vary from those highly resistant to erosion to those which are worn away with ease. Between the major valleys stand the high ridges which mark the stream divides. Capping the ridges are occasional lofty sentinels, such as Constance and The Brothers, usually in the form of great needles and spires and giving a marked sierra effect. When the interior of the mountains is gained, following up one of the larger valleys, there seems to be a very marked uniformity in the heights of the ridges or divides, indicating a general plateau character. In other words there are large numbers of high ridges and mountain peaks of heights approximately the same, giving in an extended panorama a rather even sky-line. It may be tentatively suggested that the Olympics represent a region once worn down nearly to a base level, and then uplifted to a height of about 8000 feet above the sea and subsequently eroded by streams of water and ice to their present rugged outlines. The higher peaks, such as Olympus, represent more resistant masses which in the former period of erosion did not reach a true base level. The forces of upheaval, it may be said, prepared a mighty block of rock, out of which

the forces of nature, represented by the weathering elements, running water and glaciers, have chiseled the mountains as we now know them.

Very little is now known regarding the nature of the rock formations in the Olympics. Along the ocean shores on the west and north coarse sedimentary rocks are most common. Sandstones and conglomerates predominate, with some shales, but no limestones. The rocks are all folded and faulted and show the work of mountain making forces on a grand scale. In some places seams of coal occur among sediments of the Eocene time showing the existence at that age of coal making swamps. Along the Hood's canal side of the Olympics are many outcrops of igneous rocks, indicating that flows of lava once came from out the mountains. In some places small bits of native copper are scattered through the lava and this discovery has been followed by extensive prospecting for commercial deposits of the copper-bearing rock. The few samples of rock which have been brought out from the heart of the mountains are largely of slate and schist types, indicating that metamorphic rocks prevail. From analogy with the northern Cascades, and with the coast mountains both north and south, a great series of metamorphic rocks with various intrusives would be the type of formation most expected. Prospectors have reported the occurrence of granite boulders in some of the stream beds and it is very likely that this formation occurs at several points. A large variety of metallic minerals have been found by prospectors in the Olympics, but no paying mines have been developed.

The amount of rainfall in the Olympics is notably high. This is to be expected from the fact that the mountains stand immediately facing a great body of water directly in the path of the ocean winds. The air coming from the ocean is heavily laden with moisture; the saturation point is reached the moment the shore is met, and hence the heaviest rainfall is along the coast. At Neah bay the usual rainfall is about 100 inches yearly; farther south at Clearwater it is 120 inches yearly; while at a new established station on Quinault lake it is 135 inches yearly. The rain occurs mostly in the winter season, the months of the year with minimum rainfall being July and August. In ascending the mountains from the west or ocean side the rainfall continues very heavy until a height of about 4000 feet is attained when it begins to decrease. At this point also the rain gives way largely to snow so that the higher Olympics are clothed each winter with a deep mantle of snow. Upon the highest of the mountain masses the snow fields merge into glaciers, indicating that the summer sun is not equal to the task of wholly removing the winter's snow. On the eastern slope of the Olympics the precipitation rapidly decreases until it amounts to about 25 inches only when the sea-level is reached, as at Port Townsend. The difference in rainfall between Clearwater at the western foot of the mountains, and Port Townsend at the eastern foot, is a classic example of the contrast in precipitation afforded by the windward and the leeward side of highlands which lie in the paths of moisture laden winds.

The forests of the Olympics are among the best to be found along the Pacific coast. The heavy rainfall contributes not only to a great tree growth but leads to an unusual development of shrubs and the smaller plants generally. From sea level to a height of about 2000 feet the plant growth has produced a tangled jungle which is almost wholly impenetrable except where trails have been made. In the heart of the mountains there are con-

siderable areas without timber where the low temperature and heavy snowfalls have prevented tree growth. Above timber line there are many small meadows and upland pasture is afforded. It has been estimated that the forests of the Olympics will yield on an average not less than 24,000 board feet of lumber per acre. The commercial trees in order of yield from the standpoint of quantity are hemlock, red fir, silver fir, cedar and spruce.

Since the maximum rainfall of the Olympics is on the western slope it is into the Pacific ocean directly that the largest rivers flow. The principal streams are the Soleduck, Hoh, Queets, and the Quinault. The chief rivers on the north are the Elwha and Dungeness, which empty into the Strait of Fuca. Into Hood's canal flow the Quilecene, Dosewallips, and Skokomish. About Mount Olympus the divides are very sharp and within a small radius are the headwaters of several of the master streams of the mountains. While the heads of all the large streams are torrential and abound in cascades and waterfalls, the lower courses of most have a velocity not so great but what they are navigated by Indians in canoes. Into the mouths of some of the streams the tide enters from the sea, indicating a submergence of the coast in recent times. The large number of independent streams along the northern slopes of the Olympics have evidently all been tributaries of the large westward flowing river which occupied the basin of Juan de Fuca strait previous to the general subsidence which profoundly affected our coastline and which brought into existence Vancouver and the numerous neighboring islands.

The difficulty of traveling through the Olympics is the chief reason why they are not visited by more people. Railway building has just begun upon the outskirts of the mountains, but steam roads must not be expected to ever penetrate them very far. Through the western foothills some wagon roads have been constructed and a state road has been surveyed from Montesano northward to the Strait. Trails must be depended upon by all who would go far into the mountains, and these are always more or less out of repair because no systematic work is done upon them. It is to be hoped that as a result of the expedition of the Mountaineers into the Olympics that one or more good trails leading into the heart of the mountains may be constructed and kept in good condition for future visitors.

The Olympic mountains attracted the attention of all the early explorers to our coast and it was Vancouver who applied the name Mount Olympus to the crowning peak. In the mythology of Greece Olympus was the home of Zeus and the other gods, who lived in a palace upon the summit. Upon and about our own Olympus the Mountaineers expect to find gods the equal of those of olden times. They will be the gods of comradeship, of good health, of the love of mountains, and of peace of mind and soul.

