not only by the contours of Dr. Reid's map, but also by the presence of ice masses, protected by moraine rubbish, on the mountain sides at fully one hundred feet above the present ice surface.

As the islands at, say, twenty miles below the glacier have been found covered with drift, and as Willoughby Island, about twelve miles below, shows well-marked striæ, it is easy to believe that, at no very long time ago, Muir and its neighbour in the other inlet were united and flowed down Glacier Bay, receiving as tributaries from the west the immense glaciers put down on the map as Hugh Miller and Geikie.

Before the glacier began its advance over the gravels, it was certainly much smaller than now. On the eastern side of the inlet, stumps of trees are seen at very low tide, while on the western, between two streams coming down from an old tributary of the Muir, now separated from it, is exposed a buried forest, well described by those who have explored this region. This, however, the writer did not see, as no opportunity was afforded for examination of that side. The gravel on the eastern side contains peat, which certainly is of very recent origin. The wood of the stumps, which is still sound, shows, according to Herrick, a structure closely resembling that of the Sitka spruce, the most common of the Alaska trees. Wright describes the trees on the western side as standing upright, the smaller ones preserving the normal conical appearance of a recently dead cedar. They grew one inch to two feet in diameter in a stiff clay, sometimes twenty feet thick and containing smooth boulders. The streams from the advancing ice must have unloaded their burden in this forest area, and the ice itself followed upon the gravel thus deposited. The date of the advance cannot be very ancient, for the wood still retains its soundness.

Whether the ice had advanced and retreated at any earlier period is difficult to determine from the data now known; but the conditions of the forest suggest that the trees came at least long after glacial action had begun; for, as Wright has shown, the trees grew on a boulder clay sometimes twenty feet thick. Such clay has but one origin, and such a mass required no little time for its accumulation.[1]

Leaving Muir glacier and returning down the bay, one sees the Pacific glacier in the western inlet, but the ice-choked channel makes navigation dangerous, and that glacier is not visited. The other glaciers on the western side are rarely seen by passengers on the steamers, as the bay is usually entered early in the morning, and left when the haze of twilight renders a distant view indistinct. The steamer soon reaches Icy Strait, out of which it passes into Chatham Strait, separating Admiralty Island on the east from Chickagoff and Baranoff Islands on the west. The latter islands are separated by the narrow Peril Strait, which deserves its name, for the channel is so tortuous that in one place the

[1] Detailed descriptions of the Muir glacier may be found in *The Ice Age in America*. G. F. Wright. New York, 1889. *Studies of Muir Glacier, Alaska*. H. F. Reid. *Nat. Geog. Mag.*, vol. vi. pp. 19-84. *Notes on Muir Glacier Region, Alaska, and its Geology*. H. P. Cushing. *American Geologist*, vol. viii. pp. 207-230.

The glaciers of the Mount St. Elias region have been described by Russell in the *Nat. Geog. Mag.*, vol. iii. pp. 53-203.