

the shore-line is almost straight, but it ends at little more than two miles on the eastern, where the width of the gravels diminishes rapidly. Argillite forms the mountain overlooking the terminus of the glacier, but, as shown by Mr. Cushing, this argillite is overlaid by a limestone, which forms the shore, as well as the islands, of Glacier Bay. The "Dirt glacier" or first eastern tributary of the Muir must head up against an outcrop of this limestone, for one of the passengers on our vessel picked up a form like *Acervularia*, which, taken in connection with some *Leperditia* obtained by Mr. Cushing¹ in 1890, tends to show that the limestone is not younger than Middle Devonian. No clew to the age of the argillite has been obtained.

The main stream of the Muir glacier comes down directly into the inlet, where its wall is 250 feet high, or almost 300 feet to the top of the highest pinnacles. The depth of the water at one hundred yards from the ice, as measured by Captain Carroll of the steamship *Queen*, is 720 feet, so that the thickness of the ice sheet at the terminus is not far from 1000 feet. The ice wall is not uniform in tint; the upper portion, where the surface is irregular, having been thawed and refrozen many times, is milky white, but the lower portion, where contact with the water keeps the surface smooth and solid, is of a beautiful blue. Many of the fragments seen floating in the bay exhibit the same contrast. No enormous bergs were seen, the largest being not more than 300 feet long and 25 feet high; the water is not deep enough to float large bergs. Of those which do break away, the larger are soon stranded, for the bay seems to be shallower than the inlet, and only the smaller pieces reach Icy Strait.

The Muir glacier sends out wings on each side; perhaps it would be better to say that, as the waste of ice is more rapid in the water, the glacier extends further along the shore than it does in the inlet. The western side was not examined by the writer, but the prolongation of ice on the eastern side is very distinct, and projects certainly a third of a mile beyond the main body; Mr. Cushing² photographed it and described it in his discussion of the glacier. This prolongation rests on gravels in which peat occurs and which enclose a buried forest, the stumps of the trees being visible on this side of the inlet only at very low tide.

The tourist reaches the ice from a landing on the east side, near the cabin which has been occupied by the several exploring parties who have visited the glacier. The trail rises quickly to the top of the bluff overlooking the inlet, and follows its crest; for between this crest and the argillite mountain is the valley of a glacier stream, which enters the inlet about a mile below the foot of the glacier. As the moraine material is coarse and the rocks sharp, the journey is difficult, but yielding to the temptation to seek an easier path, the pedestrian invariably comes upon a quicksand. Hereafter, this laborious tramp of nearly two miles will be greatly shortened by a board walk—another illustration of the modern methods whereby science is made easy. The passage from moraine to

¹ *National Geographic Magazine*, vol. iv. p. 59. 1892.

² *American Geologist*, vol. viii. p. 220, pl. III. 1891.