

ice is imperceptible, the first indication of the latter being a crevasse, or the rumbling of an underground stream. But, at barely two miles¹ from the landing, one stands on ice and has from a certain spot a view of the several branches or tributaries, as well as of the main glacier itself which comes down from the north-west.

The ice appears to be less crevassed on the eastern side, and several of the passengers who examined the glacier for several miles in that direction reported no difficulty, which accords with the observation reported by Dr. Reid² and Mr. Cushing.³ But near the foot of the glacier and towards the north-west, the crevasses, as seen from a pinnacle, extend over a great area. Dr. Reid found these crevasses shallow.

The only systematic attempt at mapping this glacier and its tributaries was that made by Dr. Reid and his associates in 1890; they estimated the surface of the ice at three hundred and fifty square miles, and the drainage area at not far from eight hundred square miles. The geography of the region beyond this area is not known in detail; but there seems to be no reason for doubting that at least one of the eastern tributaries has its source close to that of Davidson glacier, while the main glacier must originate very near to the sources of the Pacific glacier, which enters the western inlet of Glacier Bay, and is said to be the finest of all the glaciers south of those of the Mount St. Elias range, recently described by Russell.⁴

The movement of the Muir glacier was determined by Wright⁵ to be from forty to seventy feet per diem; but his determinations were based on observations of pinnacles. Dr. Reid⁶ made more detailed and extended observations by means of stakes, and concluded that the maximum movement along the central line is not far from seven feet per diem. In spite of this rapid advance along the centre of the glacier, the ice front is retreating rapidly. From 1886 to 1890 it receded more than one thousand yards, as determined by a comparison of photographs taken by Wright and Reid in these years; and it was ascertained by Captain Carroll of the steamship *Queen* that the recession continues. More than this; at the line where the ice front of 1890 stood, Wright found the top of the ice, in 1886, to be 408 feet above the inlet, but when measured by Reid the height had diminished to 250 feet. The height of the wall is now approximately the same as when measured by Reid, though the front has receded many yards. The great loss along the front is sufficiently evident to the most careless observer, for immense falls of ice occur at brief intervals, and the formation of crevasses or the separation of masses is a common feature, as proved by the thunderlike noises heard within the ice at a short distance from the front. The rapid loss of mass at points removed from the inlet is shown,

¹ The distance as given may be too great, but it is thus reported by the officers of steamship *Queen*.

² *National Geographic Magazine*, vol. iv. pp. 30, 31.

³ *American Geologist*, vol. viii. p. 209.

National Geographic Magazine, vol. iii.

⁵ *American Journal of Science*, vol. xxxiii. p. 10.

⁶ *National Geographic Magazine*, vol. iv. pp. 43 et seq.