Dixon Glacier in some manner pushes the ice up. The crevasses marked by blue lines where the the clear ice ends are drawn in their correct positions. The current of the glacier sets towards the east, and has caused the large land-slip shown on plan. The rocks on the glacier, especially on the eastern side, are grooved and scratched in all directions; this is uncommon on New Zealand glaciers. Many of the marks are deep and at right angles to the grain, if I may use such an expression. I saw some rocks wedged in between the ice and fixed rocks in the lateral moraine. The marks on them were very newly made, and were evidently caused by grinding against the latter.

1 saw some rocks wedged in between the ice and fixed rocks in the lateral morane. The marks on them were very newly made, and were evidently caused by grinding against the latter. The tributary glaciers differ from each other materially; the Onslow, nearest to the terminal face of the Murchison, is apparently stationary at present; the Cascade and Wheeler contribute nothing to the general stream, and have the appearance of dying out. The Baker and Dixon are advancing without any question, especially the former. The Mannering, Harper, and Aida have much the same look as the main glacier. There are one or two small glaciers on the west side of Mount Hutton, which, however, are dying away, and are only worth mentioning because they have complete lateral and terminal moraines, which is unusual for such small glaciers at their altitude. The Classen also is only a rough sketch; the length is about right, but the distances are estimated. The Classen also is only a sketch, except between (91) and Mount Mannering, where it is fairly correct. The Baker and Dixon Glaciers have a peculiar ice formation, which I have not seen elsewhere; the dark-blue lines on them represent lateral ridges of ice about 40ft. higher than the rest of the glacier; these ridges are not more thickly covered with moraine than the ice between them, and their outside faces are free from stones, and very steep. At Station 71, on the south side of the Baker, is the best illustration of what I mean (71) is on the ice ridge; about 70ft. below it is a new lateral moraine in course of formation; this gradually sloping up merges in the ice ridge; below this is a hollow, and then at the bottom of the spur and following it round comes another small grasswhile three old moraines parallel to the glacier on the spur to the north point to the fact that it has also been much higher. The same signs of constant change may be seen near many of the other glaciers, but the Baker is the best example.

Mueller Glacier.—The map attached hereto shows the positions on the 29th March, 1889, and the 14th November, 1890, of the numbered stones on the above glacier, also the terminal face for the same dates. The stones were found again without any trouble; in many cases they had been carried down without displacing the rods which I put on them in 1889; and as they were only supported on the rocks by piling stones around them, it speaks volumes for the steadiness of the motion. Rock No. 4 has been split by the frost, and each piece has a number on it. No. 7 has slipped down into a large hollow, formerly it was on a ridge of ice; this accounts for its rather erratic motion, and of course it must not be used in estimating the rate of the glacier. The average daily rate of the stones is: No. 1,  $4 \cdot 8in$ ; No. 2,  $5 \cdot 5in$ ; No. 4,  $5 \cdot 3in$ ; No. 5,  $7 \cdot 3in$ ; No. 6,  $8 \cdot 0in$ ; No. 7,  $12 \cdot 3in$ ; No. 8,  $10 \cdot 2in$ ; No. 9,  $8 \cdot 2in$ ; No. 10,  $7 \cdot 8in$ ; No. 11,  $2 \cdot 9in$ .

I think the relative motions merely confirm what has been already found out by experiments elsewhere, although I do not know whether marks have ever been placed on ice, and their positions fixed in the same way that these have been; if not I would draw attention to the manner in which this method shows the direction as well as the speed of the current. Every care was taken in fixing the positions; different coloured flags were used when the number was invisible from the observing station ; in some cases the same distance was calculated from two separate bases and each triangle checked by reducing the stations to the meridian and perpendicular of the trig. station. The changes at the terminal face are principally owing to the Hooker River, which continually alters its course; sometimes running under the ice, as it did in 1889, but more often simply following it round; whichever way it runs the effect is the same—the ice is eaten away underneath, especially in flood time, the upper part falls and great blocks of ice are carried away by the river : I have found them stranded 7 miles lower down. I draw your attention to this, for otherwise it would be difficult to account for the great and constant changes which take place. No doubt a larger amount of snow than usual falling in any particular year would eventually find its way to the terminal face and cause an advance, but the Mueller Glacier, on account of the river, is unsuitable for any experiments at its terminal face; it is also rough and difficult to traverse, but I have carried out your instructions and traversed it as closely as I was able. While on this subject I may remark that, accepting the mean annual rate of all the stones at a fair basis for determining the speed of the glacier (that is twenty-six years to a mile), and allowing that the snow which falls nearer the terminal face than four miles is either melted by the heat or wasted away by surface streams, and that Mount Sefton contributes nothing to the general stream within three miles of the face, then the snow which forms the most northerly portion of the terminal ice fell eighty years ago; that at the middle might vary between one hundred and two hundred years, but none of it would be under one hundred years old. The most southerly portion would be between one hundred and one hundred thirty years of age. I believe I am correct in this, because I take it that, when two glaciers meet, although they join together and form one stream, they never mingle. I do not know whether this fact would be disputed; I am too far away to be able to refer to a library, but a glance at the tracing of the Murchison Glacier and a perusal of my description of its moraines will convince any one that such is the case. As an instance of the magnitude of the ancient glaciers and the time they must have occupied this valley, it will suffice to say that, at the same rate of speed as the Mueller, the glacier which formed the moraine south of the Pukaki Lake took eight hundred years to carry a stone from the present terminal face of the Tasman to that place. I should say that the average thickness of the moraine lying on the Mueller is about 18in., it would be possible to calculate approximately how long it took this glacier to build up the large moraines between which it now flows,