

ELEVENTH MEETING. 9th October, 1872.

Dr. Hector, F.R.S., President, in the chair.

1. The Hon. W. Fox gave an account of his travels on the West Coast of the South Island. A large number of sketches illustrative of the scenery which Mr. Fox had witnessed during his travels in Switzerland, as well as on the West Coast, were exhibited on the walls of the building, and these, by the aid of the very fine light, showed to considerable advantage, and were admired as much for the grandeur of the scenery depicted as for the excellence of the sketching. The author made no attempt to treat the subject of glaciers in a scientific manner, but merely from what might be termed a picturesque point of view. A glacier may be described as a mass of ice occupying a deep gorge in the mountains, resembling the letter U in shape, its dimensions being many hundred feet in thickness, and from one to fifty miles long. This mass of ice does not remain, as might be supposed by unscientific observers, in a state of repose, but is in a constant state of forward progression. The rate of advance had, however, long been a subject of dispute, and various theories were propounded on the subject, the first being that the cause of motion is due to gravity and dilatation—from the melted waters pouring into the rents and crevices upon the ice becoming frozen and by expansion moving the mass forward. A more satisfactory theory, however, has been promulgated, which is that the great body attains the forward motion on account of its viscosity, the ice not being, as is generally supposed, a hard mass, but rather of a flowing or lava-like consistency, which the ladies of the auditory might better understand by drawing upon the homely article "dough" for comparison. This theory would better account for the fact that in glacier vallies it was often found that they had narrow mouths, wide above and narrow at the bottom, which overcame the difficulty of explaining how what was generally supposed to be a hard mass obtained egress through the mouth. Mr. Fox then explained the limitation of the glacier formation upwards, and the strange conjuncture of the *névé* with the lower portion, where the snow assumes a frosted condition, or, as the Germans call it, *firner*. The extraordinary depth of the crevasses and the danger to travellers formed a point in the subject which was explained in an interesting manner, Mr. Fox stating that the existence of these crevasses explained how the glacier vallies became the sources of rivers, the melting of the ice and snow percolating through the great body collecting in the bottom of the valley, and forming a tunnel before escaping into the open day. The causes and origination of moraines was the next point made clear, after which Mr. Fox alluded to the curious circumstance of the glaciers at their termini advancing and retiring at particular seasons, which accounted for the appearance of moraine hills at considerable

distances below the present termination of the glaciers. In remarking on the features connected with the New Zealand glaciers, Mr. Fox alluded to the remarkable fact that on the eastern slopes the New Zealand Alps terminated at a much higher altitude than on the western slopes, and that the glaciers on the east carried downward large masses of rocks, while the slopes of those of the west were composed of clear blue ice, from which little refuse or *débris* was carried down. Mr. Fox next made an interesting comparison between the glaciers of New Zealand and Europe, pointing out that while in the case of the latter no vegetation other than the common fir-tree was to be seen in their vallies, those of the West Coast of New Zealand were invariably beautified by a most luxuriant semi-tropical vegetation of flowering plants and tree-ferns.

An interesting discussion ensued upon a point to which Mr. Fox made allusion in his concluding remarks, that of the peculiarity of the glaciers always remaining at the same temperature of 32°, a fact which was rendered more peculiar by the circumstance that if a mass of ice were brought from any other place it would speedily melt in the heat of the sun, while the composition of the glacier would remain in its frozen state.

The President said that New Zealand presented a fine field for alpine exploration, and described four different groups of the Southern Alps from which glaciers radiate, showing that the glaciers are not now of the greatest magnitude in the furthest south, although they evidently had been so formerly. He considered that the reduction of the area of mountain top above the snow line by the cutting back of the glaciers was one of the chief causes of their disappearance. He pointed out that it was hardly correct to say a glacier retired from its moraine, as is frequently done. The fact is that in some years it melts more rapidly than in others, and on the West Coast these years of greatest waste would always, owing to the same causes, be the years when there would be least supply, but there could be no retraction of the mass of ice.

This led to some discussion, in which Capt. Hutton, Rev. Mr. Andrew, Bishop Hadfield, the Hon. Mr. Hart, and the Hon. Capt. Fraser took part, at the conclusion of which a vote of thanks was unanimously voted to Mr. Fox.

2. "On New Zealand Lake Pas," by the Rev. Richard Taylor, F.G.S. (See *Transactions*, p. 101.)

3. "On the Life and Times of Te Rauparaha," Chapter V., by W. T. L. Travers, F.L.S. (See *Transactions*, p. 62.)
