On the east side of the Kokatahi Plain granite again forms the outer western slopes of the higher mountains, and this is followed by the same sequence of rocks that have been mentioned in describing the middle and upper parts of the Arahura Valley.

On the south-west side of the Hokitika Valley, below the Gorge, lies Constitution Hill, which is in part composed of slate. Between this and the hilly country, along the road-line from Rimu to Ross, lies the Big Swamp, from which in times of flood a portion of the surplus waters of the Hokitika finds its way into Lake Mahinapua.

The hilly country between Rimu and Ross is densely covered with forest growth, and the details of the surface are for the most part unknown, or known only to a few explorers. Its general character is, however, quite evident from what can be seen along the ordinary route of travel, and it is warrantable to say that the whole is overspread with morainic heaps, that towards the Totara River only have been modified by the action of running water. Old river-gravels underly these morainic heaps, as seen at Back Creek and Seddon's Terrace, and towards the margins they may have been acted on by streams from, or the whole body of the Hokitika, as in the case of the Rimu Flat.

*Totara Watershed—Ross and Mount Greenland.*—The Totara River takes its rise from Mount Fraser and the Cedar Creek Saddle, leading into the Mikonui Watershed. The upper and middle parts of its course are along a mountain-valley between Mount Greenland and Constitution Hill, and the river is so confined till reaching and passing the outer spurs of Mount Greenland. Seaward of this the Totara receives Donnelly's Creek, and flows along the north side of Ross Flat to the Totara Lagoon.

Between the hills and the sea from the Mikonui to the Totara extends a tract of low, level country, having its greatest breadth to the north. From the lower slopes of the spurs of Mount Greenland gold has been traced into this flat, and the portion known as Ross Flat has in past time yielded a great amount of gold, and it is known that considerable areas of very rich ground await working, capital and machinery being required to do this.

East of the alluvial plain the ridge of front hills are composed of Pliocene gravels ("Old-man bottom"), and behind or on top of these, in Mont d'Or, there is a development of what appears to be a glacier deposit. Mount Greenland, like the bulk of Constitution Hill, is formed of sandstone and slates belonging to the Maitai series of the New Zealand Geological Survey classification, and thus corresponds in age with the auriferous rocks of Reefton. The Cedar Creek rocks are of the same age. Quartz reefs occur on both the east and west slopes of Mount Greenland, but, though a considerable amount of prospecting has been done on the Cedar Creek line, the prospects have not been such as were anticipated, and "reefing," as a form of gold-mining, is developing but slowly in this part of the district.

## DETAILED DESCRIPTION.

### Table of Formations.

*Sedimentary.*

I. Recent.
Glacier, river alluvia, littoral.

Ia. Pleistocene.
High-level old river-channels and terraces.

II. Pleistocene and Younger Pliocene.
Extended glacier deposits outside the limits of the mountains. River-deposits formed prior to the advance of the glaciers. Marine gravels, &c., containing black-sand leads.

III. Older Pliocene and Upper Miocene.
Humphrey's Gully Beds, "Old-man bottom," Brown sands.

IV. Lower Miocene (Marine Tertiary-beds).
Blue fossiliferous sands and marly clays.

VI. Cretaceo-tertiary and Cretaceous.
Upper, Middle, and Lower series.

X. Triassic (?).
Beds in the Upper Teremakau Valley, resembling the jasperoid and diabasic beds of the Selwyn Gorge, Canterbury.

XII. Carboniferous.
Maitai series—Westland formation of Haast.

XIII. Devonian.
(*a.*) Reefton series.
(*b.*) Slightly altered sub-metamorphic rocks.

*Metamorphic.*

Mica Schists.
Upper, middle, and lower mica-schists.

Gneissic schists.
Crystalline schists and metamorphic granite.

*Plutonic.*

Massive and intrusive granites, &c.