

Now and again, as opportunity offered, a number of stream-measurements were made. During the dry spell in February and March, 1909, all the streams of the subdivision were very low, and the measurements then made may be considered to indicate almost the minimum flows.

The results obtained during the past season's work may be stated under the headings of (1) Physiography, (2) General Geology, (3) Economic Geology, (4) Miscellaneous Economic Resources.

*Physiography.*

The Greymouth Subdivision possesses a varied physiography closely connected with its geological structure and history. It may be said that unequal elevation of the land since the beginning of the Tertiary periods, the advance and retreat of the glaciers during Pliocene and later times, the diversion of drainage caused by ice damming and changes beneath the surface of the piedmont ice-sheet that once covered much of the low country, the abundant supply of débris afforded by the Southern Alps, and varying but always excessive rainfall and snowfall, are factors that have given rise to a complicated set of natural features that cannot be adequately described in a brief report. The description of the physiography will therefore be reserved for the detailed report on the area.

*General Geology.*

The geology of the Greymouth Subdivision is of an interesting character. The oldest rocks known are late Palæozoic or early Mesozoic grauwackes and slates, that may be correlated with the Greenland Series of Bulletin No. 6, and the Maitai Series of Hector and McKay. The granites of the Hohonu Range and Mount Te Kinga are probably next in order of age. These rocks are seamed by numerous basic dykes that, it is thought, are but slightly younger than the granites themselves. The Tertiary formations of New Zealand are represented by an immense thickness of strata ranging in age from probable Eocene to the present day.

The following table shows the geological formations represented in the Greymouth Subdivision, together with their provisional ages and estimated maximum thicknesses :—

Provisional Age.	Provisional Name.	Estimated Maximum Thickness.
Recent, Pleistocene, and Pliocene	Marine gravels .. .. .	Ft. 200
	Younger fluviatile gravels .. .. .	200
	Morainic and fluvio-glacial gravels.. .. .	100
	Other fluviatile gravels .. .. .	200
<i>Unconformity.</i>		
Miocene .. .. .	Blue Bottom .. .. .	1,000
	Cobden Beds .. .. .	750
	Blue mudstones .. .. .	750
	Mudstones with grit and pebble bands; sandstones and grits with fragments of coal; Kotuku conglomerate	1,100
<i>Moderate Unconformity.—Coal-measures.</i>		
Pre-Miocene (Eocene-Oligocene)	Dark-coloured mudstones (with minor sandstones) .. .. .	3,080
	Island sandstone .. .. .	500
	Grits and sandstones with coal-seams .. .. .	800
	Conglomerate .. .. .	500
<i>Strong Unconformity.</i>		
Late Palæozoic or Early Mesozoic	Greenland Series .. .. .	..
<i>Igneous Rocks.</i>		
Post-Greenland, Post-Tuhua .. .. .	Tuhua (Granite) formation .. .. .	..
	Basic dykes .. .. .	..

**GREENLAND SERIES.**—The rocks included under this heading may from their lithological character and mode of occurrence be considered as the equivalents of the Kanieri Series of Bulletin No. 1 and the Greenland Series of Bulletin No. 6. In the Grey Subdivision outcrops of Greenland rocks occur on the western flanks of the Hohonu Range, near Brunnerton, on the slopes of Mount Buckley, and as a narrow band along the eastern slope of the Paparoa Range northward from Battery Creek. This last area, which has not yet been fully investigated, extends beyond the boundaries of the subdivision, and, there widening out, occupies a large extent of country that contains numerous quartz reefs.

**COAL-MEASURES.**—The beds belonging to the coal-measures outcrop principally on the slopes of the Paparoa Range, but there is also a small area exposed on the south side of the Grey River. The estimated thickness of 4,880 ft. is probably under, rather than over the truth. The strike of the coal-measures is on the whole nearly north and south; but, in places owing to faults and “rolls” in the strata, may be almost east and west. The beds are arranged in a distinct anticline, having its axis roughly coincident with the crest of the Paparoa Range. The anticlinal axis is not level, but from Mount Davy to Brunnerton has a notable inclination or pitch to the south. Immediately south of Brunnerton