Area of Country examined.

The area of country completely surveyed during the year was small, for reasons the chief of which it may be advisable to enumerate: (1.) The work was done as thoroughly as possible, and hence slowly. (2.) Heavy rainfall, especially in the mountain districts; the greater part of the year was unusually wet, even for Westland. (3.) Rugged and mountainous nature of much of the district. (4.) Absence of roads and tracks in back country. (5.) Dense bush covering lowlands and mountain-slopes up to altitudes of 3,500 ft. to 4,000 ft.

The accompanying map shows the districts in which work was carried on, together with the chief geographical features.

Maps of the Area.

Before a detailed geological survey of any district can be made it is necessary to obtain a good map, showing topography, roads, tracks, trigonometrical stations, &c. Few people outside the ranks of professional surveyors are aware of the immense amount of labour involved in the production of an accurate topographical map. The Lands and Survey Department of New Zealand since its foundation has done an enormous amount of work, yet much still remains to be done. It is to be regretted that in recent years the Survey Department has been compelled to confine itself chiefly to "settlement" work, so that little topographical or trigonometrical surveying has been undertaken, and much valuable information in its possession lost for the time being, owing to lack of means for publication. The Department, however, has published an excellent lithograph of the Totara Survey District, on the inch-to-the-mile scale, and Mr. G. J. Roberts, Commissioner of Crown Lands and Chief Surveyor for Westland, furnished me with a tracing of the Upper Hokitika and Whitcombe Rivers, as well as with much valuable information regarding the district generally. I obtained also through the Hokitika Survey Office a tracing of the Toaroha Survey District, which was of great assistance. Nevertheless, much additional information was required in the Mikonui subdivision, and during the greater part of the year Mr. R. P. Greville, Topographer, was occupied in surveying and mapping the Toaroha District. Mr. Greville has from time to time supplied me with tracings of his work.

General Geology and Physiography.

The general geology and physiography of the Mikonui subdivision are similar to those of the Hokitika subdivision, fully described in Bulletin No. 1. For this reason, and because the survey of the district has not yet been completed, I think it advisable to pass over these features for the present. It may be mentioned, however, that much information concerning the district may be obtained from Mr. Alexander McKay's "Report on the Geology of North Westland," published in Geological Report No. 22, 1894, and also, with some alterations and additions, in the Mines Report for 1893.

Economic Geology.

It will be fitting to give a fairly full account of the economic branch of my work during 1906 under the headings of "Alluvial Gold," "Auriferous Quartz Reefs," "Copper and Minor Metals," "Asbestos," "Coal," "Building and Ornamental Stones," "Pounamu Formation," "Water-power," "River-gauging," &c.

(1.) *Alluvial Gold.*—The most important area to be considered under this head is Ross Flat. This is a gently sloping, triangular piece of land lying at the foot of Mount Greenland, in the valley of Donnelly Creek. It is partly enclosed by ancient gravel terraces, and westward merges into a narrow coastal plain. The apex of the triangle is about 100 ft. above sea-level, and in the early days of Ross yielded gold to the value of about £300,000. The history of the flat need not be retold here, for full information may be obtained from various Mines Reports and from the Mining Handbook lately published by the New Zealand Government.

Geologically considered, Ross Flat consists of a number of layers of modern gravel, derived mainly from ancient auriferous river-gravels (pre-glacial)—"the old-man bottom" of Mr. McKay. There is also a certain amount of material brought down from the slopes of Mount Greenland. The gravels lie unconformably on soft brown sandstone of Miocene age. Undoubtedly a high degree of concentration has been effected through the agency of water, and there is good reason for believing that the unworked portion of the flat will prove to be payably auriferous, provided that a pumping plant adequate to deal with the water is installed.

Close to Ross is the Mont d'Or Claim, where for many years hydraulic sluicing has been successfully carried on in coarse gravels, apparently of fluvio-glacial origin. On the south side of the Mikonui River the McLeod's Terrace Sluicing Company is operating in similar material, but so far has failed to yield an adequate return to the owners.

A few alluvial miners are still at work in Donnelly Creek, and in the various streams flowing into the Totara River from the eastern side of Malfroy Spur; but the rich ground was long ago exhausted, and, with the exception of one small party, it is doubtful if any of the men now working make more than a bare living.

There are various other localities not far from Ross where more or less alluvial gold has been obtained, as, for example, from Constitution Hill, Totara Forks, the Alpine Claim near the top of Mount Greenland, and the eastern slopes of Mount Rangitoto. The last-mentioned locality appears to be decidedly promising. Here members of my party obtained good prospects of coarse gold in a heavy granite wash.

During the dredging boom of a few years back six or seven dredges were built near Ross, but only one of these is now carrying on operations. The others failed to pay even a moiety of the working-expenses, and have been dismantled.

The only other localities that need be mentioned as likely to produce alluvial gold are the beaches and terraces of the Hokitika River, and its branches from Hokitika Gorge upwards. At various times good wages have been made by small parties working on the river-beaches, especially