Creek, one of the tributaries of the Totara River, was made. Since then outcrops of quartz showing gold have been found in various places on the Mikonui and Totara slopes of the Greenland Range, which caused the usual feverish excitement amongst the population in the Totara and adjoining districts. The country where these reefs are situated is mountainous, broken and difficult of access, and it will be some time before the value of the discovery can be fairly tested. Meanwhile twenty-seven quartz-mining leases, ranging from seven to sixteen acres each, have been applied for; eighteen of these are already surveyed, and nine remain on hand. The receipts from mining surveys during the year amount to £328 3s. 6d.

Roads, Railways, and Water-races.—59½ miles, at £13 0s. 6d. per mile, comprising constructed-road traverses and surveys of new lines for construction. Amongst the latter are fifteen miles of which specifications, plans, and sections are prepared in triplicate ready for calling for tenders. The only railway survey was that of the Brunnerton line, ordered by you on the request of the Public Works Department. This survey was peculiar; it involved the pegging-off of centre line of rails with iron pegs at every chain, the survey of proposed deviations to take out curves, and the survey of the lands purchased from section-holders some ten years ago. The survey of the purchased lands was of all shapes and sizes, with areas rigidly fixed, and the position of their boundaries in many cases given in relation to works which were obliterated years ago. It gave a great deal of trouble, and proved expensive. In accordance with agreement entered into, the Public Works Department defray the greater part of the cost of this survey.

Office Work.—Attached hereto are miscellaneous returns giving particulars as to Crown grants and certificates of title prepared, Land Transfer work, and lithographs. The ordinary mapping work has kept pace fairly with the field-work completed. The block-maps are nearly up to date, but the triangulation maps and the topographical maps of many of the survey districts, as well as the preparation of a new set of application maps embodying the past two years' surveys, are in arrear. Plans of field-work done are furnished by every surveyor before he can take credit for it in his monthly returns, but, as you are aware, it is perfectly impossible for them to produce maps in their tents which can be accepted as standard record maps for the office. The damp climate, the dense bush, and the constant shifting about in districts generally devoid of roads or bridges, make it impossible to do so, and hence the greater part of what may be called the original mapping is thrown upon the few draughtsmen in the office. The plans the surveyors send in are little better than a guide to the draughtsman, who has to replot the whole from the traverse tabulations and the field-books.

General.—Field inspection has been attended to. Each of the field surveyors has been visited repeatedly, and on almost every occasion I remained a few days at their camp and applied checks upon their work. Diagrams and particulars of eight of these field checks I have forwarded to you. The road-construction works also had my personal supervision as occasion required. My absence from office during the year amounted to 120 days, seventy-two of which I spent in connection with the above duties, and forty-eight at a reconnaissance survey of the country between Cascade Plateau and Jackson's River on the north and Lake McKerrow and the Hollyford River on the south, upon which you find enclosed a separate report, and at the measurement of the base-line on Cascade Plateau. The latter, owing to the roughness of the ground and the bad weather at that time, has been a work of considerable difficulty; however, the result is satisfactory. The three measurements, after applying the corrections for temperature, reduction to sea-level, &c., are 16247·54, 16247·22, and 16247·26, the mean 16247·34 feet. The temperature was very variable: it ranged from 48° to 96° Fahr. during the measurements; and, as to the surface of the ground (the best line that could be found on the plateau), it was pretty rough, and a succession of "ups" and "downs" for a great part of its length. At one place the rise is 63ft. in 6 chains, at another 139ft. in 20 chains, and the difference in altitude between the east end and west end of base-line is 417ft., and the difference between the highest and lowest point in the base-line is 449ft. I note these circumstances in connection with the result of the measurements above given simply as an additional proof of the value of the appliances I make use of at this kind of work—neither cutting, grubbing, clearing, nor surface-levelling is necessary, the measurements are taken over every obstacle less than 4ft. high, and the result of the measurement of four different base-lines (Wataroa, Rakaia, Paringa, and Cascade Plateau) in that way has been uniformly satisfactory. I regret to say that Mr. Roberts found it impossible to close upon the Cascade base-line before the 30th of June, but he must have done so by this time, and I shall be able probably to inform you of the result in my next monthly report.

Proposed Operations, 1884–85.—The extension of the triangulation to Martin's Bay, even if for no other purpose than to rectify the errors which my late reconnaissance survey proves to exist in the coast-line on the old Canterbury maps, should be proceeded with. There must be a discrepancy of about a mile and a half between Cascade Head and Big Bay, and on the latest Admiralty chart some of the headlands of that part of the coast will be found from four to five miles out of position. However, as Mr. Roberts has now nearly overtaken the party employed at erecting the trig. stations, and as the country is getting more and more difficult, owing to the absolute want of anything in the shape of roads or tracks south of Cascade Plateau, I have decided upon giving the party erecting the stations a season's start, and employing Mr. Roberts instead at the triangulation of the north-east corner of Westland, to fill up the gap left between Arthur's Pass, Hurunui Saddle, and Lake Brunner, and in running the boundary between Nelson and Westland, the want of which work has repeatedly been felt in dealing with lands about the Crooked River. As for the rest of the surveyors, they will work up as far as possible and as found most pressing the arrears noted in my last abstract of surveyors' reports; and I am sure that the settlement surveys, at all events, unless a large amount of unforeseen work is thrown upon the department, will be brought up to date by the end of the current departmental year.

GERHARD MUELLER, Chief Surveyor.