

so much so as regards road construction, but difficult for selecting the best line obtainable on account of its broken nature, steep sidelings, &c., and to do this satisfactorily, miles of prospecting and trial lines had often to be cut. A lengthened experience in road construction has taught me to be particular to a degree in selecting the line; a few pounds judiciously spent in trial lines and systematic exploring will effect great saving in construction. In a densely timbered and broken district like the West Coast, more especially, there is need for caution in this particular; instances are not wanting where the anxiety to effect the survey of roads, at least possible cost, has led to heavy cuttings and embankments being made, which might have been avoided, and to "ups and downs" quite unnecessary.

Office Work.—Land transfer, certificates of title, &c., as per Return. The mapping has not progressed as satisfactorily as could be wished. Triangulation and block map plotting of the last six months has fallen in arrear. The causes are—1st. The loss of one draughtsman, Mr. Federli, transferred to Christchurch in the beginning of the year; and, 2nd. The prolonged illness of Mr. Willberg, draughtsman and lithographer. However, all the surveys completed have been plotted, the section surveys, &c., on the forms for filing in the guard-books, and the triangulation and other surveys on ordinary working plans. Only one map was lithographed at Hokitika office during the year. This, the triangulation of the northern half of Hokitika meridional circuit on a scale of two miles to an inch.

General.—Little has been done toward the survey of roads through lands sold prior to 1878; the right of taking which, without paying compensation, expires five years after the issue of the Crown grant. The pressure of other surveys prevented this being done, but in not a single case where a reservation for road has been really necessary, has the time been allowed to lapse. Within Greymouth and Okarito, and to some extent within Kumara and Ross municipalities, iron tubes, held by trigonometrically fixed points, have been sunk at the street corners and connected with the town surveys. This work requires still to be done within Hokitika municipality and some of the small townships. Field inspection has been attended to. With each of the surveyors I spent a number of days at camp, going through their work and applying checks. Besides this the road works under construction have been regularly visited—in all the survey and works inspection—during the year, necessitating my absence from Hokitika office for 121 days. Having been so much pinched for office assistance, I have not yet been able to complete the calculations of the true position and heights of the principal mountains in the Dividing Range—many of these were observed to during 1880 to 1881.

Proposed Operations 1882 to 1883.—Continue major and minor triangulation to Jackson's Bay. Already five major (iron) and nineteen minor (wooden) triangulation stations have been erected within the northern part of the Jackson's Bay circuit. Of section surveys 49,266 acres are still in arrear. These, together with the incorporation into present system of the remainder of the old provincial surveys, the laying off of roads, attending to mining and other surveys, will keep the staff surveyors fully employed.

GERHARD MULLER,
Chief Surveyor.

CANTERBURY.

I am glad to be able to report very satisfactory progress in the operations of this branch of the survey department, for the year ended 30th June, ultimo, practically the whole of the work during this period has been done by the permanent staff, or by officers temporarily engaged to assist in the completion of special surveys, under the village settlement clauses of the Land Amendment Act, of 1879, or in the survey of pastoral land proposed to be dealt with under the deferred payment clauses of the Land Act of 1877, and the cost, as shown under the respective headings of the return forwarded to you, will not, I think, be found to exceed the average for similar work in other parts of the colony, except, perhaps, in one or two cases hereafter explained, and I deem that the advantages of having the surveys done by staff officers who generally remain in the provincial district, and know that they will be held responsible for errors disclosed during the progress of the work or subsequently, more than counterbalance any cheapening of the rates by contract, to which, nevertheless, the pressure of overwhelming arrears, and the necessity of putting purchasers in possession of their boundaries with as little delay as practicable, compelled resort to, in former years. In making these remarks, I am far from desiring to throw discredit on all contract surveys, for I am sensible that I have had contractors who have executed their work with as much care and fidelity as could well be exercised by any staff officer, but it is none the less true, that when tenders are called, and the lowest usually accepted, it is not always practicable to obtain men who will give to the smallest details of the field operations, &c., that careful attention which is vital to the accuracy the department rightly strives to maintain.

Minor Triangulation and Topography.—Mr. C. W. Adams has finished the plans of 24,960 acres, executed in the field during the year, and the survey of 67,911 acres beyond Porter's Pass, in the back Waimakariri country, the average height of the stations selected being about 3,500 feet from sea level; some being over 5,000 feet. Mr. Adams states that the difficult nature of the country, the proportionately large number of stations, their height, the clearing of bush and the unfavorable weather, have all conspired to prevent greater progress. Mr. Broderick has completed 120,488 acres of triangulation without topography, in the Oxford district, 87,080 acres with topography on the Hunter Range in the Waimate country, the stations averaging 3,100 feet above sea level, and has executed a topographical survey of 104,525 acres, mostly over high and rough hilly country in the south portion of Canterbury, the plans of this work have been completed, and duly transmitted to this office before the end of June, but he commenced the triangulation in May, 1881, which would apparently show that it had occupied 14 months; were it not that out of that time he was engaged for 4 months on sectional surveys mostly in the Oxford Bush. I think it but fair, therefore, to call your attention to this officer, whose energy this amount of work amply illustrates. The total area added this year to the triangulation of the Canterbury district, is, therefore, 250,389 acres, and 104,525 acres of topography over country previously triangulated. The closure made by Mr. C. W. Adams, from base line measured by