

that had accumulated when I took charge of this branch of the department in the beginning of January, 1877, and that were augmented by the heavy land sales of that and the following year. The details of the year's operations are as under:—

MINOR TRIANGULATION.

The impracticability of getting reliable sectional surveys done when, as under the Act, land may be selected in the most remote part of the district, has forced the extension of the minor triangulation to cover such purchases. I have thus had to include within my operations nearly the whole of the Mackenzie country. However, an exceptionally fine summer has enabled Mr. Maben and his assistant, Mr. Harper (contractors), to complete 489,842 acres, of which trigonometrical and topographical plans have been sent in. Mr. Maitland (staff) has reobserved 297,774 acres of Mr. Sealey's defective work, extending it to join that of Mr. Maben in the Mackenzie country, covering a further area of 97,280 acres; thus—with the exception of two small pieces of country, one between the Pukaki and Ohou Rivers, and the other at the head of Lake Wanaka—completing all the triangulation likely to be required for many years to come in the southern part of the district. Mr. Welch has sent in plans of 74,542 acres, to be followed in a fortnight by an additional 30,000 acres, when the whole of the Peninsula will be covered with small-sized triangles, on which can be based, and at any time properly checked, all the intricate sectional work. Mr. Brodrick has completed 115,474 acres in the Upper Ashley District, permitting land purchased some years since to be accurately surveyed, and Mr. Pickett has finished a small area on the coast near Christchurch. The total triangulation completed during the year being therefore 780,468 acres and 330,843 acres, with and without topography respectively.

The following table shows all the closures. The greatest mean discrepancy noted between any of the new work is under 1 link per mile, and the mean error of forty-two closures 0.78 links, or about three-quarters of a link in a mile; evincing great care and skill on the part of the surveyors employed.

SECTIONAL SURVEYS.

Under this heading the work done during the year is solely of land purchased from the Crown or reserves of which it was necessary to define the boundaries so that grants could issue. The progress made has been very satisfactory, the contract surveyors having completed 2,019 sections, equal to 281,740 acres, at a cost per acre of 9d.; and the staff 1,368 sections, equal to 122,986 acres, at 1s. 11d. per acre. Maps of the whole are in the office and in process of check prior to the issue of the grants.

I have in previous reports fully discussed the advantages the contractors have over the staff surveyors, and the consequent unfairness of a comparison of prices; but, in addition, the average cost of the staff work is greatly increased by the heavy expense of the Peninsula surveys, equal this year to 5s. 7d. an acre. Better progress has, however, been made than last year, 327 sections, equal to 17,624 acres, having been completed; and, as I am gradually getting the heaviest-timbered land surveyed, there is little doubt that, in another two years, the arrears will be brought up so that attention can be paid to the revision of the old work not yet Crown-granted.

Of the 404,726 acres sectional work completed, 380,069 are entirely new surveys, and 24,657 are revisions of unplotted work that could not be Crown-granted from the old plans. The sectional work completed by the staff is scattered in every part of the province, and caused much loss of time by unavoidable and frequent shiftings of camp.

INSPECTION.

All contracts in progress have been inspected, some of them three or four times, and, with two exceptions, every staff surveyor has been visited, his work checked, and diagrams of said checks, with the Inspector's reports, duly forwarded to Head Office.

THE ARREARS OF SURVEY

Were, on the 1st July, 1879, without taking into consideration any of the revisions that the former system will entail, over 600,000 acres; to which, however, the year's land sales have but added 17,193 acres. The large area of sectional work done during the year just ended has, therefore, reduced these arrears to 3,305 sections or reserves, containing 252,084 acres, which can be overtaken within a reasonable time by the present contractors and officers of the staff.

MAPPING.

During the year 235 large and 159 small plans have been received in the Christchurch office, and, as they are checked by Mr. Shanks, are entered on the block and Crown-grant record-maps. One hundred and two new block-sheets have been started, and more or less work entered on the others; in all 341 are completed or in progress. Twenty-three new Crown-grant record district maps have been commenced, and 6 for town lands, giving a total of 60 for Crown-grant record.

In the reduction office, under the charge of Mr. McCardell, 2 county maps have been constructed and tracings forwarded to head office; 8 new district maps made, and additions to others; 16 district maps traced and coloured for the Land Office; 3 district maps traced and sent to Wellington for lithography, and for the same purpose other 8 are ready, but waiting for new surveys to be checked and entered upon them.

Of the trigonometrical plans 27 have been traced for photo-lithography, giving a total of 40 districts issued for the use of sectional surveyors; in all, the plans of 59 districts are finished, and 18 are in progress and will shortly be ready for issue to the public. Considering, therefore, the arrears with which I had to contend, I think satisfactory progress has been made in getting the office plans into working order.

CROWN GRANTS.

Under this heading the arrears were very great, owing principally to the field surveys having been allowed to accumulate. In addition, however, to checking my own surveys as they came in, I have, as opportunity offered, had as much as I could of the old work plotted and Crown-granted. During the year 1,918 grants have been prepared, embracing 224 town, 2,634 rural sections, and 29 reserves,