

amount of the time of the office staff was taken up in attending to the work of the Crown Lands Office during the illness of Mr. White, clerk to the Crown Lands Office.

*Proposed Operations for the ensuing year.*—The main operations consist of the completion of the Village Settlement at Wakamarina; a land plan survey of about three miles (Dashwood section) of the Picton and Awatere Railway: section surveys as requisitions are sent in by the Land Board, and the revision and connection to trig. stations of detached surveys in Queen Charlotte Sound. Outside of the above, the present strength of the field staff will not permit much more being done. Of late, many persons have been enquiring as to suitable localities for carrying on Fish Curing works, it may therefore be expected that surveys will be required in this direction. In the Native Department I think it likely that surveys may be wanted of some of the Native Reserves in the district, of which there are a good number, that grants may be issued to the owners. Should it be required to complete this during the year, more field assistance will be necessary.

HENRY G. CLARK, Chief Surveyor.

WESTLAND.

*Major Triangulation.*—Area completed, 79,875 acres, at a cost of 0·93d. per acre. The whole of this work is situated within the Jackson's Bay Circuit, and was carried out by Mr. W. G. Murray. It brings the Westland triangulation to within twelve miles of the Otago boundary, and over the greater part of that area the trig. stations have already been erected, and one more season's work will effect the connection with the Martin's Bay triangulation. Mr. Murray had to contend with great difficulties in the execution of this triangulation, and deserves praise for the way in which he overcame them. While engaged at this survey he had an opportunity of fixing the principal peaks at the head of the Dart River; Gyroë, Ark, Gates, Tiber and others, and the dividing range between Otago and Westland can now be laid down with great accuracy. Calculations of certain closures in connection with the preceding years' triangulation not having been completed at the time my last annual report was furnished to you, I shall give results now:—

*1st.—Close of Hokitika Circuit and Amuri Circuit Triangulation at Hurunui Saddle.*—

Station A O to station H P by Smith's triangulation (Nelson department) =188424·3 links  
Station A O to station H P by Murray's triangulation (Westland department)=188400·2 links  
Difference 24·10 links in 23·5 miles, equal to 1·03 links per mile.

*Convergency.*—Mean observed difference between Smith's and Murray's triangulations ... .. = 17·1"

*Height of Hurunui Saddle.*—

Station H P by Murray's triangulation... .. = 3152·4 feet  
Station H P by Smith's triangulation ... .. = 3141·0 feet  
Difference 11·4 feet in 136 miles, equal to 1·0 inch per mile.

Murray's sea level datum was brought from Hokitika, distance 56 miles; and Smith's from Lyttelton via Isolated Hill Station (Waiau River), distance 81 miles. Eliminating error on these bases the true height of Hurunui saddle is 3147·8 feet or 139·8 feet higher than given on the old maps.

*2nd.—Close of Altitudes Jackson's Bay Circuit and Lindis Peak Circuit Triangulation at Haast Pass.*—The difference between Brodrick's (Canterbury department) and Roberts' (Westland department), triangulation is 6·2 feet. Eliminating that error in proportion to distance of the points at which the respective sea level data were obtained, the true height of Haast Pass is 1847·4 feet or 131·4 feet higher than that marked on former maps.

*3rd.—Height of Arthur's Pass.*—By Mr. Roberts' triangulation this is 3015·2 feet, or 22·8 feet lower than previous determination.

*4th.—Verification of Heights, Okarito Circuit and Jackson's Bay Circuit.*—The closures of these (Mr. Roberts' triangulation) show a difference of only 0·92 feet in a distance of 90 miles. Mean sea-level datum of the former was observed at Okarito jetty, that of the latter at Jackson's Bay landing.

*Minor Triangulation.*—Completed 116,910 acres at 1·42d. per acre, by Mr. W. G. Murray within the Jackson's Bay Circuit.

*Topographical and Trigonometrical Surveys.*—Area completed 62,400 acres at 1·4d. per acre; of these, 40,640 acres by Mr. Murray, and 21,760 acres by Mr. J. N. Smyth. The closures of the circuit traverses connected with these surveys are satisfactory, considering the heavily-timbered and broken nature of most of the ground included in them.

| Length of Traverse. |         | Total Error. | Error per Mile. |
|---------------------|---------|--------------|-----------------|
| Miles.              | Chains. | Links.       | Links.          |
| 2                   | 72      | 5·3          | 1·9             |
| 1                   | 73      | 4·7          | 2·4             |
| 4                   | 27      | 1·5          | 0·4             |
| 3                   | 15      | 8·5          | 2·6             |
| 3                   | 20      | 7·3          | 2·2             |
| 5                   | 27      | 12·5         | 2·3             |
| 2                   | 59      | 7·3          | 2·6             |
| 6                   | 28      | 6·3          | 1·0             |
| 7                   | 35      | 23·5         | 3·1             |

Mean Error per Mile =2·1 links.