

as they were coming in to winter quarters at the Waiau. They were caught in a severe snow-storm in the early part of the day; but, in the expectation of finding less snow as they reached lower levels, they pushed on over Fowler's Pass into the Clarence Valley, only to find all tracks obliterated and the driving snow piled up in wreaths that rendered travelling either by man or horse at first difficult and soon almost impossible. Night came upon them, and at ten o'clock Mr. Paske died from cold and fatigue. At two in the morning Hugh Thompson also died, on horseback, in the arms of John Campbell, the leader of the succour-party from Macarthur's station, as he was being carried thither. Mr. Smith and Mr. Begley, who, with Hugh Thompson, remained with Mr. Paske, would most likely have shared his fate but for the sagacity of W. Mitchell, one of the survey-party, who, after battling for a time, with the other horsemen of the party, in the vain endeavour to make headway towards Macarthur's for help, rode into the Clarence River and worked his way down its channel for four or five miles to the station, and started back with the succour-party up the valley. Mr. Paske was an excellent young officer, of noble nature, who refused to ride on that fatal day because some of the others had to walk. Hugh Thompson was the head chainman, and is reported to have been a most respectable man.

In Canterbury Mr. Brodrick was engaged up the Waimakariri triangulating the country on the line of the projected Midland Railway. The topographical map will be of great service in connection with that enterprise.

In Southland the country on the southern shoulders of the Takitimo Mountains had never been mapped, except from reconnaissance survey, and practically there were no details of the upper courses of streams, of bushes, and other features, and great uncertainty as to run-boundaries. Mr. John Hay, District Surveyor, has extended a network of triangles over this country, and cleared up all uncertainties. A copy of his report and map are in the appendix.

For Westland, Mr. Mueller reports the heights above sea-level of three important mountain-passes on the main range, deduced from the Westland triangulation, and which show a near agreement with the heights of the same points derived from the triangulations brought up from the East Coast. Thus: Hurunui Saddle—height by Mr. W. S. Murray, 3,152·4ft.; by Mr. F. S. Smith, 3,141ft. Haast Pass—mean height by Mr. G. J. Roberts and Mr. T. W. Brodrick, 1847·4ft.; difference between the two determinations, 6·2ft. Arthur's Pass—height by Mr. G. J. Roberts, 3,015·2ft. These closures are very satisfactory when it is considered that they are the result, not of any special series of triangles carried on direct from each coast to the common meeting points, but of triangulations carried on over several years by a number of different surveyors, the general accuracy of whose work is thereby confirmed. In the case of the Hurunui Saddle the datum-points were the mean sea-level at Hokitika and Lyttelton, and in the case of Haast Pass, the mean sea-level at Jackson's Bay and Port Chalmers. As showing the accuracy attainable in trigonometrical levelling by a 6in. theodolite, Mr. G. J. Roberts's trigonometrical heights in Westland, based on mean sea-level at Okarito Jetty, showed a discrepancy of only 11in. when referred to mean sea-level at Jackson's Bay landing, ninety miles south along the coast from the starting-point. The trigonometrical height of Haast Pass—1,847ft.—is 131ft. higher than the height of 1,716ft. generally accepted hitherto, and which was the barometrical determination by Sir Julius von Haast in his exploration overland to the West Coast in 1863. For the future the height of the pass must be accepted as 1,847ft.

RECONNAISSANCE SURVEY.

The exploration of the extensive Tautuku Forest, Otago, was completed during the season by Mr. John Strauchon, District Surveyor. A perusal of his reports and maps, both of this and the previous year (see appendices in this and last annual report), shows that there is an area of forest-land of over a hundred thousand acres suitable for a settlement of cattle-farmers, saw-millers, and fishermen. To give the district a start, a road-clearing should be made through it, as suggested by Mr. Strauchon.

SETTLEMENT-SURVEYS OF RURAL AND SUBURBAN LANDS.

As this class of survey most immediately affects the occupation of the country, care was taken that the diminution of staff should operate as little as possible in lessening the out-turn of work. As a matter of fact, the area sectionally surveyed is considerably greater than in the previous year, while the average cost per acre is less. The tendency will, however, in