

mountains, the Kakanui mountains, and West Coast, while it has greatly affected the ordinary section surveys in the Mataura district. Notwithstanding this, a very fair amount of work has been accomplished, and which I propose now to pass under review.

*Minor Triangulation and Topography.*—The principal work of the year has been triangulation, The object kept in view by me in directing this triangulation (as also of last year) has been, as you are aware, mainly to determine the topographical features of those Otago runs the leases of which expire in March, 1883, and of which the new leases were sold by public auction in February, 1882. In attaining this, as most of the country is purely pastoral, the triangles have been kept large—that is, from four to six miles side—but, owing to the peculiar configuration of the surface and the extreme difficulty of working in the trig. stations on adjoining old triangulations, this has not in every case been possible. I have also been careful to get all altitudes, fences, yards, and huts laid down on the maps sent in, so as to make these maps as useful and complete as possible for the public use. In this way the area of 675,454 acres of pastoral country has been surveyed, so that run boundaries can be laid down or identified without much difficulty. The value of, and necessity for this work is already manifest, as the new leaseholders are now applying for their leases. The cost of this work has been 0·72d per acre. The officers of the staff who have been engaged on this triangulation are District Surveyor Mackay and Assistant Surveyors Murray and Wilmot, supplemented by Messrs. Dennison and Grant as contract surveyors. Mr. Mackay's work has lain between the Clutha and Manuherikia rivers, near Alexandra on the west and the top of the Rough Ridge on the east. It is all rough, broken country, and rises from 500 feet to about 4,000 feet in height above sea level, covering runs 261, 262, 220, and 256. The total area overtaken by Mr. Mackay is 222,454 acres, at a cost of 0·92 per acre. The bearings observed by 5 inch theodolite are based on the geodesical bearings of Lindis Peak circuit, and close with the bearings of the old Gimmerburn triangulation, making allowance for the differences of meridian to 23" the least, difference being 14' and the greatest 30". The linkages are taken from the base of Blackstone district and close on Gimmerburn district, with a mean difference of 5·7 links per mile. This indicates the necessity for a revision of the old bases. Assistant Surveyor Murray has triangulated 175,000 acres, at a cost of 0·59d. per acre. The work has been mostly on the Lamerlaw, and Rock and Pillar Mountains, and covered portions of runs 186, 254, and 260. The bearings, which are on the meridian of trig A., north Taieri, close with those of the Serpentine triangulation, with a difference of 1' 35", allowing for convergence of meridians. The linkages are based on those of the Sutton district, and close on the Long Valley and Serpentine triangulations, but not so well as is desirable. As, however, there is some doubt regarding the accuracy of the base line in the Sutton district, I must defer reporting further at present on this point, until that base has been remeasured. This I have instructed Mr. Langmuir to do before finishing his present survey on run 254. Assistant Surveyor Wilmot has overtaken 118,000 acres, at a cost of 0·57d per acre, lying in the Nevis valley, covering the numerous old gold diggings there, also the celebrated antimony lode, the first smelting from which is now on exhibition in Dunedin. Portions of runs 380, 389, and 345, are included in this survey. The topographical map of this work is neatly executed, and supplies a blank of long standing in our records. The other work on which Mr. Wilmot's party has been engaged, besides laying off some gold mining leases, has been the building and flagging of the trig stations in the Hollyford Valley. This was all successfully done by the party under the direction of Cadet Burns, and considering the dangerous nature of the country, and its rugged and alpine character, reflects credit on so young a surveyor. It was on Mr. Burns' return towards the Wakitipu, after completing this work, to meet Mr. Wilmot, who proposed then to begin his observations with the theodolite, that young Mr. Raymond was unfortunately lost as already reported to you at the time. The weather from the end of December to the end of May, was unusually wet, even for so watery a region, so that during the latter month, when Mr. Wilmot attempted to begin his readings, it was impossible to do anything; and he had to leave it over for another season. He was then sent to push on with sectional work, on run 289, Lake Wanaka—the "Fork Run." The remaining trig work for the year, is that done by Messrs. Dennison & Grant, under contract. It lies mostly in the Kakanui and Waihemo survey districts, and embraces runs 11, 134, 209, 217, 300, and 301. The area triangulated in all extends to 207,795 acres, but, I have only included in this year's returns 160,000, which has cost 0·6d. per acre, the balance will go into next year's returns. The reports received by me during the progress of this work, showed that it was a much more difficult triangulation than would be supposed, this is due not only to the ruggedness and inaccessibility of the ranges, but also to the constant presence of mist and fogs, alternating with sleet and wind, so that the surveyors were much hindered in their operations. The bearings were taken from the geodesical readings, Highlay Hill to Swinburn Hill, and carried over the Kakanui Mountains, closing on Otepopo, Kauroo, and Domet Districts, with a mean difference of 46". The linkages were also based on the calculated length, between the same two geodesical stations, and closed on the above districts with a mean difference of 3·2 links per mile.

*Run Surveys.*—Of runs subdivided by survey for re-leasing, Mr. Barron has surveyed 12,150 acres of run 205, Mr. Armstrong 26,508 acres of run 224, and Mr. Farquhar 25,046 acres of runs 236 and 240a, pegging off the boundaries where necessary.

*Rural Section Surveys.*—Nine surveyors of the staff have been more or less occupied with sectional survey during the year, but only seven of them have been confined to that class of work, and of these some have been at work for six months only; the area therefore overtaken, viz., 80,159 acres, is satisfactory, and the cost—10½d. per acre—moderate. The character of the work has varied between two extremes, the costly survey of the small sections in different localities involving travelling long distances, and the cheap survey of the largest class of sections, the pastoral deferred-payment, lying in blocks together. Curiously enough the former class is what the public seem always to expect should be most easily and cheaply overtaken, while experience proves the opposite to be the case. Mr. Strauchon's and Mr. Mackenzie's surveys have been of small sections, many of these being in bush, and so necessitating much bush clearing. Very bad weather in the case of the former's work, and