

|                             | Acres.    |                                                                      |
|-----------------------------|-----------|----------------------------------------------------------------------|
| Major triangulation ...     | 3,500,000 | Referred both to true and magnetic meridian, mathematically reduced. |
| Minor triangulation ...     | 3,000,000 | Ditto.                                                               |
| Block section survey ...    | 1,446,954 | Mathematically reduced.                                              |
| Ditto ...                   | 30,000    | Old surveys not yet reduced.                                         |
| Section surveys in hand ... | 112,341   | Unsurveyed applications.                                             |
| Ditto ...                   | 216,000   | Old surveys requiring re-adjustment.                                 |

Both above, in 362 localities, spread over the province.

Though the provinces had now been abolished, I did not think it necessary to the expense of a voyage to Otago, being myself, from my long connection with the Survey Department personally, well acquainted with it in all its details. I therefore contented myself with writing to Mr. James McKerrow, the present Chief Surveyor, for returns of work made up to the present date, a synopsis of which is given below, taking it upon myself to give a description of the state of the office and a short account of the survey system.

#### OTAGO SURVEYS.

New Zealand Company's surveys were carried out (commencing in the year 1847) in this district to the extent of about 150,000 acres. They were in different districts, each survey in its separate range, which, in some, were magnetic, and in the others on natural features. There was no initial point, nor was true meridian, latitude, and longitude observed in connection therewith. Latitude and longitude, however, were observed at Observation Point, Port Chalmers, by the Admiralty Surveyors, about the year 1851, and which has since been selected as the initial point of all the provincial surveys.

These early or, as they are locally termed, "foundation surveys" were rectangular, and, in the more intricate harbour blocks, were based on unreduced triangulation. As this system forms the simplest species of major traverse circuit, they, where rectangular, proved themselves by mere measurement; where not rectangular, they fronted the shores of the harbour and ocean; and, being backed by right lines, have since been covered, closed, and proved by mathematically reduced minor triangulation. All the New Zealand surveys here, with slight exceptions, have been found to be faithfully executed, and they now form, by trigonometrical connection, an integral portion of more recent operations.

On the dissolution of the New Zealand Company, little was done, excepting some "spotting" surveys in different parts of the country, and which subsequent work absorbed.

In 1856 the principles of survey, which have since and now control the operations, were initiated. In this year true meridian was observed at Observation Spot, Bluff, and standard bearings were carried from thence to several localities where settlement and section survey were being executed. Triangulation mathematically calculated on the meridian and perpendicular was also commenced. In the year 1857 similar operations were cast over the central and northern districts. Though the land laws at this time permitted selection before survey, yet, by pushing forward uniformly or nearly uniformly surveyed blocks under triangulation, the wants of all selectors were systematically and correctly attended to; the Commissioner of the Waste Land Board arranging boundaries with the persons interested, after the plans were forwarded to his office.

But, in the years 1861 and 1862, an enormous influx of population took place, owing to the discovery of rich gold fields. The people now spread themselves in all directions over every corner of the province, taking up gold mining as well as agricultural claims, for which they demanded surveys in order to obtain titles. To temporize with this state of things, and allow the section or minute claim survey to go on haphazard without efficient standard control, would have been to sow discord and trouble amongst the settlers. Comprehensive measures had therefore to be considered, and immediate action taken. On this contingency the present meridional circuit system was decided on as the standard operation of the province. The slow-moving major triangulation, which had been commenced, was abandoned; and, in the course of thirty months, an officer (Mr. James McKerrow) placed 10,560,000 acres of territory under true bearing, whereby all triangular and sectional survey was put under mathematical control, by reduction on the meridian and perpendicular; and however various the localities, or minute or intricate the claims, however tortuous or un-uniform the boundaries, the exact method has been successfully adhered to, bringing out (what otherwise would be a medley of confusion) all details in a clear and intelligible manner.

A general system having been adopted, it became possible to have a regular method of plans and office record. The province was divided into circuits of about 60 to 100 miles in length or breadth, good natural features being selected as boundaries. Circuits were again divided into survey districts of 12 miles square, which again were divided into blocks of about 3 miles square. These again were divided into sections of such sizes as might be required. The scales of plans were respectively 320, 40, and 10 chains to an inch, which enabled all working plans to be put into sheets 30 inches square, which, being of similar size, went into folios of equal size. Thus the most valuable part of the survey records were in the Otago offices kept flat, well preserved, and free from dust. The New Zealand Company's maps, though of all sizes, were folded and kept in the same manner; and thus the old, as well as the new, records remain in good order, showing no signs of deterioration.

It will be unnecessary for me to touch on the system of astronomical and geodesical observations for the determination of the initial points of circuits, nor on the mode of reconnaissance, by which the pastoral pioneers were put originally in possession of their leases, as these are fully gone into in other reports and papers.\*

The survey records are kept in a fire-proof safe. This is the case at the sub-office at Invercargill, as well as at Dunedin.

\* Outline of Otago Survey, 1861. Exposition ditto, 1875. Standard Survey ditto, 1876.