

solar observations. The use of the stars for this purpose has been common for many years past. Its practical introduction was due to Mr. T. Humphries, Chief Surveyor of Nelson, whose paper on the subject has been reprinted lately, and distributed far and wide. It forms the first of a series of such professional papers which it is hoped may be issued from time to time, in which will be described the methods of survey most adapted to countries like this.

Considerable areas are under survey for settlement purposes at the present time in all parts of the colony, the largest being in Kawhia County, where is to be found a large extent of country suitable for holdings of some size. After the roading is completed an increase of pastoral settlement will certainly take place in this part.

NATIVE LAND COURT SURVEYS.

A somewhat larger output of this class of survey is shown for the year just passed, the total area dealt with for Court purposes being 330,576 acres in 319 divisions or blocks, nearly the whole of which are subdivisions of larger blocks, the title to which had previously been determined by the Native Land Court. As a rule, this class of work is performed by the authorised surveyors outside the Government staff, the cost being advanced by the Government and secured on the land, or is paid for direct by the Native owners; but in all cases the surveys are official, in the sense that the work is subject to check and record by the Survey Department, necessitated by the fact that the titles have to be issued by the Crown.

A very large decrease in this class of work has taken place during the last ten years, owing to the decreasing amount of land held by the Maoris. The area of *papatipu*, or land still held under Native customs, is now small, and much of it not of an attractive nature for settlement.

MINING SURVEYS.

Again, as in the previous report, a considerable decrease is shown in the year's transactions. The area surveyed was 17,642 acres, in 336 sections, being approximately half the figures for the previous year. The greatest number of claims surveyed was in Otago.

ROAD SURVEYS.

Under this heading are the roads surveyed outside the regular operations connected with the subdivision of county into farms, &c. It includes roads taken in exercise of rights reserved in the titles, and other similar cases. Altogether, 730 miles were so surveyed at a cost of £13·61 per mile.

MISCELLANEOUS WORK.

The cost of inspection in the field, special reports, engineering surveys, boundary-lines not connected with current section surveys, exploration, traverse surveys not returned in other tables, and generally all work performed by the field-staff that cannot be tabulated under other headings, are included there. The total cost of such services was £8,632 0s. 2d.

BOARD OF EXAMINERS FOR SURVEYORS.

During the year four Board meetings have been held. Twenty-three applications for certificates, and for permission to sit for examination, were disposed of. Two examinations have been held, eighteen candidates being examined. One of these, however, took part in both examinations, and five had made partial passes at previous examinations. The following are the names of candidates to whom certificates have been issued: Under Regulation 21 (c.)—A. C. Murray-Aynsley, W. Anstey, and C. Otway; under Regulation 9 (b)—H. F. Edgecumbe, F. J. Ledger, and F. J. Harrop; under Regulation 9 (c)—C. O. McKellar and G. A. M. Luff.

Two new regulations, to provide for the inclusion of mining surveys in the subjects for examination, were advertised in the *Gazette* of the 18th August, 1898. On the same date an additional regulation was also advertised dealing with the conditions preliminary to examination, with regard to cadets in the Public Works Department.

MAGNETIC SURVEY.

At the request of the Australasian Association for the Advancement of Science, a commencement has been made with the magnetic survey of this colony. The object aimed at is, by co-operating with similar observations in other parts of the world, to define the laws relating to magnetism. The matter is one of considerable importance to commerce and navigation, and consequently the scheme has the support of several public bodies and individuals connected therewith.

The operations, so far, have consisted in observations to determine—firstly, the best site for a magnetic observatory; secondly, the establishment of positions from which the secular variation can be subsequently determined; and, thirdly, to ascertain the present position of isomagnetic lines. Mr. C. Coleridge Farr, B.Sc., has undertaken the preliminary observations, assisted by Mr. W. T. Neill, of the Survey Department. They commenced on the 15th February, and up to date have made complete determinations of the declination, dip, and horizontal intensity of magnetic force at twenty-seven stations, extending from Orepuke in Southland to Ashburton in Canterbury, including Stewart's Island. Of these stations, eight are in the immediate vicinity of Dunedin, two near Invercargill, whilst the remainder are separated by intervals of about 20 miles, generally along the main line of railway.

It is premature to speak of results at present, until the survey has further advanced, and a determination has been come to as to the best site for the fixed observatory. It is essential that this should be done before the sailing of the Antarctic Expedition in 1901.

ROADS.

The amount authorised for expenditure for roads under the administration of the Hon. the Minister of Lands last year was £520,239, and consisted of 1,376 separate items for roads,