

TABLE D.  
Mean Annual Values of the Magnetic Elements at Christchurch Observatory.

| Date.   | Declination<br>E. of N. | Annual<br>Change. | Horizontal<br>Force. | Annual<br>Change. | Vertical<br>Force. | Annual<br>Change. | Inclination<br>South. | Annual<br>Change. | Hourly Values<br>Published in<br>Annual Report. |
|---------|-------------------------|-------------------|----------------------|-------------------|--------------------|-------------------|-----------------------|-------------------|---|
|         | ° ' "                   | ' "               | C.G.S. Unit.         | γ                 | C.G.S. Unit.       | γ                 | ° ' "                 | ' "               |   |
| 1902 .. | 16 15.1                 | +3.2              | 0.22694              | —25               | 0.55277            | +9                | 67 40.8               | +1.50             | 1912-13   |
| 1903 .. | 16 18.3                 | +3.5              | 0.22669              | —25               | 0.55286            | +21               | 67 42.3               | +1.80             | 1912-13   |
| 1904 .. | 16 21.8                 | +3.6              | 0.22644              | —16               | 0.55307            | +41               | 67 44.1               | +1.70             | 1912-13   |
| 1905 .. | 16 25.4                 | +2.4              | 0.22628              | —23               | 0.55348            | +28               | 67 45.8               | +1.80             | 1919-20   |
| 1906 .. | ..                      | ..                | ..                   | ..                | ..                 | ..                | ..                    | ..                | ..  |
| 1907 .. | 16 31.1                 | ..                | ..                   | ..                | ..                 | ..                | ..                    | ..                | ..  |
| 1908 .. | ..                      | ..                | ..                   | ..                | ..                 | ..                | ..                    | ..                | ..  |
| 1909 .. | ..                      | ..                | ..                   | ..                | ..                 | ..                | ..                    | ..                | ..  |
| 1910 .. | 16 37.6                 | +1.4              | 0.22515              | —27               | 0.55485            | +12               | 67 54.8               | +1.40             | 1920-21   |
| 1911 .. | 16 39.0                 | +2.5              | 0.22494              | —23               | 0.55497            | —9                | 67 56.2               | +1.00             | ..  |
| 1912 .. | ..                      | ..                | ..                   | ..                | ..                 | ..                | ..                    | ..                | ..  |
| 1913 .. | 16 44.0                 | +0.8              | 0.22449              | —35               | 0.55478            | —13               | 67 58.2               | +1.60             | 1913-14   |
| 1914 .. | 16 44.8                 | +2.2              | 0.22414              | —27               | 0.55465            | +7                | 67 59.8               | +1.67             | 1914-15   |
| 1915 .. | 16 47.0                 | +2.8              | 0.22387              | —32               | ..                 | ..                | ..                    | ..                | *Sept., 1918                                    |
| 1916 .. | 16 49.8                 | +3.2              | 0.22355              | —27               | ..                 | ..                | ..                    | ..                | *Sept., 1918                                    |
| 1917 .. | 16 53.0                 | +2.7              | 0.22328              | —24               | 0.55486            | +30               | 68 04.8               | +1.90             | *Mar., 1921                                     |
| 1918 .. | 16 55.7                 | +2.9              | 0.22304              | —24               | 0.55516            | —9                | 68 06.7               | +1.10             | 1918-19   |
| 1919 .. | 16 58.6                 | +3.1              | 0.22280              | —19               | 0.55507            | +18               | 68 07.8               | +1.40             | 1919-20   |
| 1920 .. | 17 01.7                 | +2.9              | 0.22261              | —20               | 0.55525            | +03               | 68 09.2               | +1.10             | †1920-21  |
| 1921 .. | 17 04.6                 | +3.7              | 0.22241              | —24               | 0.55538            | —21               | 68 10.3               | +0.90             | †1921-22  |
| 1922 .. | 17 08.3                 | +3.4              | 0.22217              | —08               | 0.55507            | +19               | 68 11.2               | +0.80             | †1922-23  |
| 1923 .. | 17 11.7                 | ..                | 0.22209              | ..                | 0.55526            | ..                | 68 12.0               | ..                | †1923-24  |

\* Mean hourly values published in *New Zealand Journal of Science and Technology*.

† Special publication.

An account of the earthquake of the 25th December, 1922 (with map); a list of the earthquakes recorded at Christchurch by Milne seismograph No. 16; a discussion of the magnetic observations; Vector diagrams for the seasons; monthly and annual curves of declination and horizontal force, and tables of hourly values of the declination and horizontal force for 1923, are contained in Volume I of the Records of the Survey, a supplementary report to be published this year for the first time.

#### PROPOSED OPERATIONS FOR THE YEAR 1924-25.

*Geodetic Triangulation.*—The field-work of this survey will be conducted by Mr. H. M. Ross, surveyor. The observations will be continued by means of an 8 in. geodetic theodolite at the stations of the scheme on which signals have been erected.

*Standard Surveys.*—The proposed work for the year includes the extension of survey in progress at Auckland, Te Aroha, New Plymouth, and Invercargill by Messrs. Kensington, King, Haase, and Otway respectively. The commencement of the work at Whangarei, Hamilton, Blenheim, Christchurch, Dannevirke, and Dunedin is contemplated as soon as trained surveyors are available.

*Settlement Surveys.*—The work may be summarized as follows: 67 square miles of minor triangulation, 248,650 acres rural survey, 145,509 acres Native-land survey, 208 miles road survey, and 144 acres of town survey. The amount of work in each land district is shown in Table 4 below.

*Topographical Survey.*—Three parties will continue operations in the vicinity of Rotorua and survey the thermal region and the settled pumice area adjoining, and one party will continue the survey of the area in Nelson district over which the officers of the Cawthron Institute are conducting a soil survey.

*Miscellaneous.*—In addition to the above-mentioned works, there is the customary examination and checking of plans, the inspection of surveys, the work of computing the harmonic constant for the tidal predictions, measuring the curves of the magnetograph records, the preparation of various tables, and the drawing and compilation of the maps for publication.

#### GENERAL.

*Proclamation of Roads, &c.*—During the year under review twenty-three applications for the proclamation of road-lines laid off by the Native Land Court under sections 48, 49, 50, and 52 of the Native Land Amendment Act, 1913, were dealt with. Statutory notices of intention to proclaim the roads, together with plans showing the location of same, were forwarded to the local bodies of the districts affected, in terms of section 15 of the Native Land Amendment Act, 1914, to enable such local bodies to forward any objections or representations they might wish to make prior to the issue of the *Gazette* notices.

Under the Land for Settlements Act a number of unused and unformed road-lines intersecting estates acquired under the Act were closed, in terms of section 80 thereof, to enable the areas to be incorporated in the new subdivisions surveyed for closer settlement.

Under the Land Transfer Act 218 warrants for the issue of certificates of title were examined and certified in terms of section 13 of the Act.

In addition, several cases of overlaps and defective surveys arising out of land transactions carried forward from the early days were investigated and reported upon.

*Publication of Maps.*—For some years past the demands of the public and the Government Departments for maps has not been fully met, on account of the yearly volume of work produced by the draughtsman being too great for the Printing Department to cope with. A number of maps was therefore printed by a private firm in Auckland during the year, and it is proposed to print several survey-district maps next year privately, until such time as the staff of the Printing Department can