

MAGNETIC OBSERVATORY.

During the year under report the work of the Magnetic Observatory at Christchurch and the sub-station at Amberley has been efficiently carried on by the Director, Mr. H. F. Skey, B.Sc. His full report with diagrams, tables, and seismic records is published as an appendix hereto.

Two outstanding events in the history of the Observatory have occurred within the last year. The first is the discovery by Mr. Skey of a new period in the variation of the horizontal force, which repeats itself in about 329 days, and is almost exactly equal to twelve synodic rotations of the sun. This result was obtained from a preliminary mathematical discussion of the observations at Christchurch, the details of which are published in the appendix.

The second event of special importance was the visit of the survey yacht "Carnegie," of the department of terrestrial magnetism of the Carnegie Institute, Washington. This vessel, under the command of Captain J. P. Ault, arrived at Lyttelton in October, 1920. During the visit a valuable comparison was made between the Observatory standards and those of the Carnegie Institution by the scientific staff of the vessel, assisted by the Observatory staff. It is just five years since the last visit of the "Carnegie" to Lyttelton on her fourth cruise (1915-16). The object of the present cruise is to obtain information regarding the rate of change of the magnetic elements, in order to determine the extent and character of the corrections which the existing magnetic charts require to bring them up to date. In this connection a repeat observation at the principal magnetic stations of the Dominion is a pressing work, and should be undertaken as soon as possible.

In addition to the current work of the year the records for the year 1910 were also measured and the results published in the appendix. These comprise various diagrams, tables of the hourly values of the magnetic declination and horizontal force, also a list of the earthquakes recorded at Christchurch during 1920 by Milne seismograph No. 16. The mean annual values of the magnetic elements as far as they are available are given in Table C following:—

TABLE C.—MEAN ANNUAL VALUES OF THE MAGNETIC ELEMENTS AT CHRISTCHURCH OBSERVATORY.

Date.	Declination E. of N.	Annual Change.	Horizontal Force.	Annual Change.	Vertical Force.	Annual Change.	Inclination South.	Annual Change.	Published in 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 ..	..	..	..	..	..	..	..	..	..
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	..	0.22261	..	0.55525	..	68 09.2	..	1920-21

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PROPOSED OPERATIONS FOR 1921-22.

*Triangulation.*—This survey for the time being is discontinued, but it is anticipated that a start may be made during the coming year.

*Standard Surveys.*—Mr. C. A. Mountfort, District Surveyor, will complete the standard survey of Palmerston North. He will also complete the standard survey of a portion of the Borough of Hamilton, which was commenced in 1907 and left in an incomplete state, and continue the rural standard traverse work in Wellington District. Mr. A. C. Haase, surveyor, is attached to Mr. Mountfort's party in order to receive training and gain experience in this class of work. It is important that more surveyors should be trained to this work as soon as circumstances permit.

Mr. H. M. Kensington, District Surveyor, will be fully occupied with the standard survey of Gisborne.

Pressing demands for these surveys are being received from all parts of the Dominion, and it is essential that a staff be organized to conduct the standard survey so that in the near future the work may be undertaken in a more uniform and comprehensive manner.

*Topographical Survey.*—It is proposed to start this work as soon as it is sanctioned by the Government. There is now sufficient equipment on hand to provide at least one party with the necessary instruments for commencing the survey.