APPENDIX III.

THE MAGNETIC OBSERVATORY, CHRISTCHURCH.

Annual Report of the Director (H. F. Skey, B.Sc.).

During the year the magnetographs at Christchurch and Amberley have been kept in operation, and there are published herewith the tables of hourly values of magnetic declination and of the magnetic horizontal force resulting from the measurement of instantaneous hourly ordinates on the magnetograms obtained. There are also published the corresponding tables of hourly values of declination for the year 1907.

The mean values of the magnetic elements for the year 1921 are as follows :—

	Mean Values, 1921.	Change since 1920.	Change from 1919 to 1920.
Magnetic declination (east)	17° 04·6′	+ 2·9′	+ 3·1′
Magnetic horizontal force	0·22241	— 20γ	— 19γ
Magnetic inclination (south)	68° 10·3′	+ 1·1′	+ 1·4′
Northerly component	0·21260	— 24γ	— 25γ
Easterly component	0·06531	+ 13γ	+ 13γ
Vertical component	0·55528	+ 03γ	+ 18γ
Total magnetic force	0·59816	— 04γ	+ 08γ

The mean value of the magnetic declination for the year's hourly values for 1907 was 16° 31·1′ east.

From the 13th to the 17th May great magnetic storms were experienced on the Earth. Christchurch data in connection with these storms and reproductions of the magnetograms have been printed in the *New Zealand Journal of Science and Technology*, 1921. The storms were connected with the central passage over the Sun's disc of a great sun-spot disturbance. Reprints of the combined publication, which includes magnetic data from Christchurch and Apia, and a good account of the earth-current effects, may be obtained from the office of the *Journal*, Wellington.

Some work was undertaken on the periodical variations of H.F. at Christchurch during the year. It early became evident that the periodicities obtained were resultant from tidal action of the planets upon the revolution of the Sun—or, rather, upon the revolution of his more mobile particles. The remarkable configurations of the solar system in years of complementary H change—1905, 1910, and 1914–19—are shown diagrammatically for the 21st March below. The effect was a maximum about the 21st March.

During the year many valuable publications were received by the Observatory, for which thanks are returned.

The results of the intercomparison of standards with the Carnegie Institution are published in "Land Magnetic Observations, 1914 to 1920," issued by the Department of Terrestrial Magnetism of that institution. The results are very satisfactory. The general conclusion is that the Christchurch standards require the following small corrections to reduce them to I.M.S. (International Magnetic Standard) during the years indicated :—

Declination (I.M.S.) — Christchurch (magnetometer No. 1) = + 0·4′ (1906–1920).
Horizontal force (I.M.S.) — Christchurch (magnetometer No. 1) = + 0·00073 H (1906–1920).
Inclination (I.M.S.) — Christchurch (dip. circle No. 147, needles 1, 2, 3) = — 1·1′ (1906–1908).
Inclination (I.M.S.) — Christchurch (Toepfer inductor No. 109) = — 0·1′ (1915–1920).

The usual monthly diagrams and seasonal vector diagrams are published herewith for the year 1921, and declination curves for 1907.

Milne Seismograph No. 16.

This seismograph has been kept in operation throughout the year. A number of the registrations have been published, but the records are not comparable in value with those of a properly damped pendulum. A list for the year is appended.

Meteorological Observations.

These have been taken as in past years, and have proved of great value for official and public reference. A monthly epitome is published in the *Journal of Science and Technology*.

I have to express my thanks to my assistant, Mr. H. F. Baird, for his valuable services throughout the year.

The Venus-Sun Effect in the Horizontal Magnetic Field at Christchurch.

In the annual report for 1919–20 there were published two diagrams showing the averaged annual march of H.F. at Christchurch during the four years 1902 to 1905, and during the eight years 1913 to 1920. It should be remarked that the averaged march for 1913 to 1920 differs only very slightly