

## MAGNETIC OBSERVATORY.

During the year 1928 the work of the Magnetic Observatory at Christchurch, with its substation at Amberley, has been carried on as usual. From the hourly measurements of the magnetograms of the magnetic declination, magnetic horizontal force, and magnetic vertical force there have been found mean hourly values of these elements, and tables of hourly values will be published, as previously, in the *Records of the Survey of New Zealand*, along with the customary seasonal and other curves.

The mean annual values of the magnetic elements for 1928 (Christchurch values) are as under :—

			Mean Value, 1928.	Change since 1927.	Change, 1926-27.
Magnetic declination (east)	..	..	17° 37'·4	+ 6'·1	+ 5'·3.
Magnetic horizontal force	..	..	0·22126	— 9 $\gamma$	— 6 $\gamma$ .
Magnetic inclination (south = —)	..	..	— 68° 17'·3	— 1'·1	— 0'·6.
Northerly component	..	..	0·21088	— 20 $\gamma$	— 16 $\gamma$ .
Easterly component	..	..	0·06699	+ 35 $\gamma$	+ 31 $\gamma$ .
Vertical component	..	..	0·55566	+ 28 $\gamma$	— 13 $\gamma$ .
Total magnetic force	..	..	0·59809	+ 21 $\gamma$	+ 10 $\gamma$ .

Towards the end of the year absolute observations were made at Amberley to establish the value of the difference Christchurch-Amberley, with a view to ultimately making all absolute observations at Amberley. So far the observations show—

Christchurch-Amberley :—In declination, — 1'·5 ; in horizontal force, — 242 $\gamma$  ; in vertical force, + 323 $\gamma$ .

It was mentioned in last year's report that the rate of secular change in magnetic declination has been accelerated of late years. This increase has again been found, and is somewhat enhanced. Also the annual mean value of the magnetic horizontal force is again small, being only — 9 $\gamma$  from 1927 to 1928, as compared with — 6 $\gamma$  from 1926 to 1927. In the inclination the change from 1927 to 1928 has been — 1'·0, the same as the average annual change for the two years 1925-27.

The new electrograph-house, in which the Benndorf electrometer is now working, was not ready in 1928. Observations were continued in the temporary shelter in the Observatory grounds. The difficulties of operation in winter-time were large there, but some valuable records were obtained.

Electrically calm days appear to be rare here, and the records obtained had to be severely culled, but in the new house failure of record is the exception instead of the rule. The reduction factor is also reduced from 3·3 to very closely unity, a great advantage, arising chiefly from the absence of the tall trees.

All the electrograms have been measured and reduced, and the tabulated results will be published in *Records of the Survey of New Zealand*. The incidence of natural "storminess" of the electrical field here is large, and no record here as yet approaches fully the regularity of a "quiet day" in the magnetic field. The normal diurnal variation is not clearly shown by the curves, and only the systematic tabulation of the hourly values for a fairly long interval can be expected to show it accurately. As in other places, the occurrence of negative potential is comparatively rare, and it seldom persists, so that it occasionally happens that when both positive and negative excursions are large the average potential over an hour does not greatly differ from zero. The negative potential for such short intervals can hardly be due to a temporary superabundance of positive ions in the air: it is more probably due to movements of electricity in the higher regions, where the velocities are greater as a rule.

Details of the pilot-balloon flights obtained in the past few years will be published in the report for 1927-28.