

APPENDIX VI.

THE MAGNETIC OBSERVATORY AND THE MAGNETIC SURVEY.

THROUGHOUT the year the Magnetic Observatory has been maintained in continuous operation, and the usual routine work of obtaining magnetic, seismological, and meteorological records has been duly performed. The prearranged term-hour observations in connection with the Antarctic expeditions have been made as in the previous year. Copies of the records and observations obtained during term-hours are now being made for transmission to the authorities of the expeditions.

Towards the end of 1912 the new set of Eschenhagen-Toepler magnetographs arrived, and these were installed in an above-ground magnetograph house at Amberley, thirty-four miles north of Christchurch, so as to be beyond the disturbing influences of the electric-tramway currents. It was thus found possible to observe all the later term-hours with these instruments, and magnetograms of declination, horizontal force, and vertical force were obtained for all these term-hours, including those occurring in daylight-hours.

It is proposed to improve the installation of these magnetographs somewhat, chiefly with regard to temperature insulation, and providing an electric recording-light and time-marking arrangement, and then to keep them in continuous operation, and obtain undisturbed records from them.

Our thanks are due to Dr. Atkinson and Mr. Wright, of the scientific staff of Captain Scott's Expedition, for securing to the Observatory the gift of the valuable storage battery used by Dr. Simpson and Mr. Wright in the Antarctic in conjunction with their magnetographs. The only condition attached to the gift is that I persuade the Government to install and use them in the Amberley substation.

During the year, on the occasion of the several visits of the "Terra Nova" to Lyttelton, facilities were given to Lieutenant Pennell, R.N., and other officers of the "Terra Nova," for the standardization of their dip and total force circles, and the necessary information as to the simultaneous observatory values has been made out and given to Lieutenant Pennell.

The "Terra Nova" went south to the relief of Captain Scott's shore party early in the summer, and returned unexpectedly early in February with the news of the gallant and successful attempt made by Captain Scott, Dr. Wilson, Captain Oates, Lieutenant Bowers, and Petty-officer Evans to reach the South Pole over the difficult route by which Sir Ernest Shackleton had previously arrived within a hundred miles of the pole. Deep sympathy and sadness were, however, aroused by the news of the death of these brave men on their journey back from the pole. They died nobly, after undergoing incredible hardships, through the protracted continuance of a terrible blizzard. Magnetic science already owes a deep debt of gratitude to Captain Scott, a debt which will be increased many fold when the magnetic results of his last and glorious expedition have been published.

Upon the return of the "Terra Nova," Mr. Wright, physicist to the expedition, with other officers, lost no time in resorting to the Observatory to complete their necessary labours there in the comparison of instruments, &c. Mr. Wright was enabled to again swing the gravity pendulums of the expedition under conditions considerably improved, and direct telegraphic communication was made, by the courtesy of the Department of Telegraphs, with the Government Astronomical Observatory in Wellington for the transmission of time-signals here. In addition, and to guard against the possibility of bad weather preventing star-observations in Wellington, star transits for time were observed at the Magnetic Observatory with a smaller instrument. The ship and the shore magnetic instruments of the expedition were again compared with the Observatory standard by Lieutenant Pennell, R.N., Dr. Levick, and Mr. Wright, and letters since received here evince the satisfaction with which these gentlemen regard their work at the Observatory, and the great usefulness of the Observatory to the expedition.

Mention must also be made of the very successful magnetic work of the Antarctic Expedition (Australian) by and under the direction of Mr. Eric N. Webb. The weather experienced by the expedition was generally more severe than that experienced at Captain Scott's base; but, despite the conditions, I think that the magnetic results will be equally good, and the simultaneous operations of magnetographs on either side of the magnetic pole may be expected to yield very valuable scientific results. Dr. Mawson reports auroræ of unexampled brilliancy. During his enforced sojourn in the Antarctic this winter Dr. Mawson intends to continue the registration by the magnetographs, and now that his wireless telegraph is working so well, it is expected that he will arrange by telegraph for simultaneous open-scale runs at all observatories during some of the longer-continued aurora.