VII. REPORT OF THE GOVERNMENT ASTRONOMER.

Hector Observatory, Wellington, New Zealand, 19th June, 1920.

The Time Service.

The usual duties in connection with the time service have been attended to throughout the year. The equipment is considerably out of date, as reported on in previous reports, and should be improved as soon as possible. It has been necessary to suspend the time service fairly frequently whenever the errors of the clocks became too great to allow accurate time signals to be supplied.

Radio Time Signals.

Reception of radio time signals: As stated in my last report, an order has been placed for the purchase of a modern high-power outfit for receiving radio time signals at the Observatory. This is urgently required, and it is expected that the difficulties of obtaining it will soon be overcome.

Transmission of radio time signals: This matter has received further attention, and a direct circuit has been erected between the Observatory and the Wellington radio station on the Tinakori Hills. The Observatory clock, through this circuit, automatically sends the time signals from the Wellington radio station. The service is provisional until the rest of the apparatus can be obtained and installed, and will be in operation on Tuesdays and Fridays unless bad weather prevents the necessary observations from being obtained.

Seismology.

An order has been placed for a new Milne-Shaw seismograph to be installed at this Observatory. This will provide for one horizontal component. To complete the installation another Milne-Shaw seismograph for the other horizontal component, and a vertical component seismograph, are required.

An improvement has been made in the time control of the seismograph by putting in a switch on the lighting circuit. The seismograph light is cut off by hand by this switch five times a day, so that these accurate signals on the seismogram are used to check the time on the record. The signals are made from the standard clock, and are always accurate to the nearest second of time. The new seismograph-detector* has been photographed on glass, and is used on the records to assist in the identification of the various earth-waves. Its use has already proved a great economy in these investigations, and has materially reduced the time formerly taken to interpret the records. The tilt of the ground is frequently recorded on the seismograms, and to obtain an independent check of this sensitive spirit-levels have been mounted east and west and north and south on the seismograph table, and are read daily. Already many evidences of tilt have been obtained.

Publications and Library.

The following bulletins of the Observatory have been published and distributed:—

Bulletin 24.—Tables of Mathematical Functions, by C. E. Adams; Harmonic Analysis of Tidal Observations and the Prediction of Tides, by C. E. Adams; Photographs of the Solar Corona, by C. E. Adams; Determination of the Position of the Moon by Photography, by C. E. Adams; Daylight-saving, by C. E. Adams.

Bulletin 25.—Annual Report of the Government Astronomer, 1st July, 1919.

Bulletin 26.—Astronomical Notes: The Origin of New Stars, by A. C. Gifford.

Bulletin 27.—The Origin of New Stars: the Dynamics of Celestial Encounters, by A. C. Gifford.

Bulletin 28.—The Interpretation of a Typical Seismogram, by George Hogben; Astronomical Notes: The Absorption of Spectra of the Novæ, by A. C. Gifford; Occultations of a Star by the Planet Jupiter in 1920, by Arthur Burnet.

Bulletin 29.—A Graphical Solution of one Case of Spherical Triangles; also, a New Method of Solving some Spherical Triangles by Plane Trigonometry, by C. W. Adams.

It is again a pleasing duty to acknowledge the gifts of many valuable publications from other observatories. Some of these are sent in exchange for the Observatory bulletins.

Staff.

Government Seismologist: The Observatory suffered a severe loss in the death on the 26th April, 1920, of George Hogben, C.M.G., M.A., F.G.S., F.N.Z.Inst., who was the Government Seismologist for many years. It was to Mr. Hogben that the inception of the seismological service of New Zealand was due, and in his advocacy for the establishment of this important service he was ably supported by the late Sir James Hector, F.R.S., and the late Professor F. W. Hutton, F.R.S. In 1888 two Milne seismographs were obtained by the Government; one of these was in charge of Mr. Hogben at Timaru, and the other was in charge of Sir James Hector in Wellington. Later on when Mr. Hogben moved to Wellington he brought the Milne seismograph with him, and the other one was lent to the Magnetic Observatory at Christchurch. For some years Mr. Hogben had the seismograph installed at his residence in Tinakori Road, but on his retirement from his position as Director of Education in 1915 the seismograph was installed at the Hector Observatory, and is in charge of the Observatory.

Mr. C. E. Adams, D.Sc., F.R.A.S., was appointed Government Seismologist in succession to the late Mr. Hogben as from 1st June, 1920.

* G. Hogben, *Journal of Science and Technology*, 1920, Vol. 3, p. 110.