

Miscellaneous.—About five hundred visitors have signed the visitors' book, and various schools, primary and secondary, have brought classes.

At the request of the brother of the donor, the name of the library has been changed to the "Alexander Turnbull Library," and he has generously presented a bronze name-plate to be affixed to the iron entrance-gate. With a view to the sorting-up and completion of the already considerable section of Pacific Island dialects, correspondence has been entered into with various missionary bodies and private collectors, from whom much assistance is being obtained.

GOVERNMENT ASTRONOMER AND SEISMOLOGIST.

Astronomical Observations.—Observations of meridian transits of stars and the sun have been made for the purpose of controlling the time service. The interval between observations is sometimes unduly long owing to unfavourable weather conditions.

Time-service Equipment.—The astronomical clocks on which the time service depends are not sufficiently accurate for this duty. The need of precision clocks has been recognized by the Government, and specifications have been prepared for the clocks, and it is expected that orders will soon be placed for them.

Time Service.—The following time-signals are sent out from the observatory. Most of the signals are automatically set by the observatory mean-time clock :—

Automatic time-signals :—

- (1.) To the General Post Office, Wellington, by galvanometer, daily, except Sundays and public holidays :
- (2.) To some of the watchmakers in Wellington, by galvanometer, daily, except Sundays and public holidays :
- (3.) To ships and to the general public at Wellington, by electric lights at the Observatory, daily, except Saturdays, Sundays, and holidays :
- (4.) To the Auckland Harbour Board, by electric lights at Auckland, on Tuesdays and Fridays :
- (5.) To the Lyttelton Harbour Board, by dropping the time-ball at Lyttelton, on Tuesdays and Fridays :
- (6.) To the South Island telegraph-offices, by galvanometer, on Tuesdays and Fridays :
- (7.) Wireless time-signals, through the Wellington Radio-station, on Tuesday and Friday evenings :
- (8.) Wireless time signals, through the Wellington Radio-station, every morning, except Sundays and public holidays.

All the automatic time-signals are sent at the exact hour of Greenwich mean time, and are automatically repeated at the first, second, fourth, and fifth minutes. Each signal begins at the 0 second, and lasts approximately one second.

Non-automatic time-signals :—

- (1.) To ships in Wellington, by telephone, on application to the Observatory.
- (2.) The Observatory time-signals sent to the General Post Office are distributed by telegraphic hand-signals to some 2,300 telegraph and telephone offices distributed all over New Zealand, at 9 a.m. daily, except on Sundays and holidays.
- (3.) Similar hand-signals are also sent to all railway telegraph-offices in New Zealand at 9 a.m. daily, except on Sundays and holidays.
- (4.) The Wellington Telephone Exchange distributes time-signals by telephone to exchange subscribers, generally to the nearest minute of time: the clock in the exchange is checked by comparing it with the Observatory automatic time-signal.

The wireless time-signal sent from the Observatory have been received by many ships at considerable distances from New Zealand. The signals are transmitted by the Wellington Radio-station ($41^{\circ} 16'$ south, $174^{\circ} 46'$ east of Greenwich), on a wave-length of 600 metres, and are Telefunken quenched-spark signals. The type of signal sent from the Observatory consists of long dashes of about one second duration, and it is probably due to this long dash that the signal reaches so far. The longest distance reported to the Observatory was 4,320 miles, for the wireless-telegraph time-signal received by the s.s. "Tainui." The s.s. "Waimana" reported the reception of the time signal at a distance of 3,638 miles.

In order to meet the demand made by the officers of ships for daily wireless time signals, arrangements have been made to send out a signal every day, except Sundays and Government holidays, at 11 hours G.M.T. (= 10.30 a.m. N.Z.T.). In addition to these signals, others are sent every Tuesday and Friday evening at 21 hours G.M.T. (= 8.30 p.m. N.Z.T.).

The signals are sent from the Observatory as follows: The operator at the radio-station sends out a warning a few minutes before the hour, and then connects the observatory circuit to the wireless sending-key. The Observatory operator sends a series of signals by hand, beginning at 59 minutes 10 seconds and finishing 10 seconds before the automatic time-signal is sent at the 0 minute of the hour. Similarly, other hand-signals are sent before the automatic signals at the other minutes. In each case the hand signals terminate 10 seconds before the automatic ones, and in this way the navigator receives a useful warning-signal which enables him to get a very precise result. Judging by the numerous reports of the reception of these signals by the navigating officers, the wireless-telegraph time-signals are made increasing use of.

Reception of other Wireless Time-signals at the Observatory.—The Observatory has been equipped with a single-valve wireless receiving-outfit. The aerial consists of two wires, 0.120 in. in diameter, spaced $4\frac{1}{2}$ ft. apart, and each about 190 ft. long, with down-leads at the northern end of about 40 ft. With this outfit the time-signals from Pearl Harbour (NPM), Hawaii, and from Bordeaux (LY),