

DOMINION OBSERVATORY.

Acting-Director: R. C. HAYES.

REPORT FOR THE YEAR ENDING 31st DECEMBER, 1939.

BUILDINGS AND GROUNDS.

The Observatory buildings have been kept in good order. The grounds have been attended to periodically by the Wellington City Council.

TIME SERVICE.

Control of Standard Clock. During 1939 a total of 461 short-wave radio time signals was received from abroad, for checking the standard mean time clock. Conditions permitted of more regular daily checking than in the previous year, and this resulted in an improvement in the accuracy of outgoing time signals.

Following the outbreak of war it was considered advisable to revive the practice of taking local transit observations at intervals. This is an emergency measure in order to be prepared for possible interruptions in the overseas radio time signals.

Time Signals sent out. Time signals have been sent out as previously, the following service being provided:

- (1) Time signals by radio (sent automatically by the Observatory signal clock):

- (a) Through Wellington Radio Station ZLW, daily at 10 h. 30 m., a.m., N.Z.M.T. (i.e. 23 h. G.M.T.). In transmitting these time signals the Observatory's call sign (ZMO) is used.

The following table shows the order of accuracy of the ZLW signals during the year 1939:—

Number of times error did not exceed 0.25 sec.	..	..	348
Number of times error between 0.25 and 0.50 sec.	..	..	16
Number of times error between 0.50 and 1.00 sec.	..	..	1
Number of times error greater than 1.00 sec.	..	..	0
Total number of signals sent out			.. .. . 365

Corrections to individual signals can be obtained on application to the Observatory.

There were partial failures of the ZLW signals on 3rd May, 4th May, and 9th October, resulting from trouble at the radio station; and on 28th December, due to a fault in the line from the Observatory to the radio station.

- (b) Through the National Broadcasting Service Station 2YA daily at 10 h. 28 m., a.m.; 3 h. 28 m., p.m.; and (except Sundays) 7 h. 28 m., p.m., and 10 h. 28 m., p.m., N.Z. Civil Time. Station 2YA is responsible for the actual broadcasting of these signals.

- (2) Time signals by telegraph (automatic)—

To the General Post Office and Railways Department, at 9 h. daily (except Sundays).

- (3) Time signals by telephone (non-automatic)—

Time was given frequently in response to telephone calls. Towards the close of 1939 there was a marked increase in the number of calls, due mainly to more frequent calls from the Army Department. The stopping of electric clocks due to power trouble is generally followed by numerous calls for correct time. This was the case particularly in January, when severe westerly gales caused frequent power failures.

Public Clocks:—

The Government Buildings and General Post Office clocks have been checked daily at 9 h., a.m.

The maximum errors of the Government Buildings clock observed during 1939 were 30 seconds fast and 69 seconds slow, the latter due, apparently, to an error in setting the clock to summer-time on 25th September; and of the General Post Office clock, 8 seconds fast and 4 seconds slow.

The synchronous electric clock was checked daily at 9 h., a.m. and 4 h., p.m. The maximum variation observed during the year 1939 was 27 seconds, which occurred during a period of 38 days. The longest uninterrupted run of the clock was 41 days, and during this period the maximum variation observed was 25 seconds.

Clocks and Chronometers.—During the year No. 2 Sidereal clock, No. 3 Mean Time master clock, and No. 5 signal clock were overhauled by the Post and Telegraph Department. No. 5 signal clock was also fitted with a six-dot contact wheel in the workshop of the Department of Scientific and Industrial Research. A second-hand ship's chronometer was purchased for use in time keeping at seismograph stations.

Electric Circuits.—During the latter part of the year considerable progress was made with the overhauling of the electric circuits, particularly those connected with the time service.