

APPENDICES.

APPENDIX No. 1.

REPORT ON THE DIFFERENCE OF LONGITUDE BETWEEN SYDNEY OBSERVATORY, NEW SOUTH WALES, AND SURVEY OBSERVATORY, MOUNT COOK, WELLINGTON, NEW ZEALAND.

Mr. ADAMS to the SURVEYOR-GENERAL.

SIR,—

Wellington, 1st July, 1884.

I have the honour to report as follows on the observations taken in December, 1883, for the determination of the difference of longitude between Sydney and Wellington:—

The successful observation of the last transit of Venus on the 7th December, 1882, by Colonel Tupman, at Burnham, Canterbury, New Zealand, and also by yourself and other observers throughout New Zealand, made it a matter of importance that the longitudes of the various stations of observation should be obtained with the greatest possible accuracy.

The account of the observation of the transit of Venus by the members of the Survey Department is given in the annual report for 1882–83 on the surveys of New Zealand; so I need not refer further to it here.

Before Colonel Tupman left this country he exchanged several sets of time-signals with Sydney, with the object of determining the difference of longitude, but, the weather being unfavourable, the results were not satisfactory, so it was decided that the Survey Department of New Zealand should undertake a fresh set of observations for the purpose. Before these observations were commenced it was necessary that the New Zealand and Sydney observers should meet and take observations to determine their relative personal equation.

With this object I visited the Observatories of Melbourne and Sydney during the months of September and October, 1883, and took observations at both places on several nights.

At Sydney the weather was very cloudy, but good observations were obtained on five nights, when Mr. H. C. Russell, B.A., F.R.A.S., Government Astronomer, Mr. H. A. Lenehan, First Assistant, and myself compared observations.

The determination of the relative personal equation of the above observers in observing transits of stars is given in the following table, where the letters R, L, and A stand for Messrs. Russell, Lenehan, and Adams respectively:—

The equation $A - L = +0.07s$. signifies that A's clock correction – L's clock correction = $+0.07s$; or that A makes the clock $0.07s$. more slow than does L: that is, A observes before L.

A – R.				A – L.			
			s.				s.
1883.	Oct.	2,	–03	1883.	Oct.	2,	00
	"	4,	–02		"	4,	+05
	"	9,	+01		"	11,	+06
	"	12,	–01		"	12,	+08

The adopted personal equations are as follow:—

$$A - R = 0.00s; \quad A - L = +0.07s.$$

Owing to some unavoidable delays, it was not found possible to exchange signals with Sydney till the beginning of December, 1883. But during that month signals were successfully exchanged with Sydney on the nights of December 5, 15, 16, and 18, 1883, good star observations being also obtained on each of these nights.

The star observations at Sydney Observatory were made by Mr. H. A. Lenehan, and the time-signals were sent and received by Mr. H. C. Russell.

All observations at the Survey Observatory, Mount Cook, Wellington, New Zealand, were made by myself, and I also sent and received all time-signals. The period of time over which the star observations at Mount Cook extend is from December 3, 1883, to January 11, 1884.

A full account of the Sydney Observatory, with description of instruments, methods of observation, &c., is given in a publication entitled "Results of Astronomical Observations made at the Sydney Observatory, New South Wales, in the Years 1877–78," and published in Sydney in 1881, which I forward herewith.

The following description relates to the instruments in the Survey Observatory, Mount Cook, Wellington:—

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