

Astronomical Observatory,  
Williamstown, 4th January, 1858.

Subsequent to my report for the half-year ending 30th June, 1857, a great improvement has been made in the establishment by the erection of a commodious and substantial meridian room, in place of the temporary tent hitherto used for the purpose.

The building is of wood, erected on a foundation of stone. It comprises a meridian room 13 x 16, and a computing room 9 x 13. The foundations for the instruments have been all rebuilt in a most substantial manner, and the result of these improvements is highly satisfactory. Observations can be obtained on every clear night, whereas before a breeze of wind had the effect of entirely putting a stop to work. From the improvement in the foundation of the instruments, greater precision with a diminution of labor is obtainable.

The erection of this building has had the effect of giving too much shelter to that part of the enclosed ground used for meteorological purposes, and it would be highly desirable that the enclosure (already too small for the proper seclusion of the observatory) should be extended so as to afford an exposed space for the meteorological instruments. I have forwarded a requisition for the necessary extension of fencing, and trust that this will shortly be effected.

A better position of the altazimuth instrument is much needed, as it has now become unserviceable except for the southern heavens; for the temporary room used for it has, by the erection of the larger building for the meridian instrument, been shut out from sweeping over the greater portion of the northern skies, and in order to afford a sufficient range for the instrument it will be necessary to erect a more substantial room connected with the meridian room, the cost of which would be about £150. The room would then be fit for the reception of an equatorial of five or six feet focus, which I hope will one day replace the small instrument now used.

The instruments continue to perform satisfactorily, and their powers of work are much improved by the new foundations; nevertheless their capacities are too limited for the demands of the observatory, and I much regret that instruments of a proper class, and such as have been for several consecutive years estimated for, do not appear provided for on the Estimates of 1858. I, however, still hope the Government will see the necessity of equipping the observatory on which so much depends, especially as regards maritime affairs, with good and sufficient instruments.

The greater part of the labor of the observatory has been devoted to the transit observations, as being the most important. The question of the longitude of Gellibrand's Point has also had much attention, and the observations and calculations pertaining to this have absorbed a considerable portion of time. The results of these observations tend to support the correctness of my assumption of longitude; and as I have, besides calculating every observation for this purpose myself by two different formulæ, forwarded the results to the Astronomical Society, in order to obtain to each observation the correction of the "moon's place" as deduced from observations at Greenwich on the same dates, I trust to be able shortly to forward a full statement of my observations for longitude with every correction applied.

Nine hundred and twenty (920) complete observations in R. A. have been made during the year 1857. Twenty-three (23) of which were of the moon. The labor of reducing these observations is so great, that I am unable to complete them in time to accompany this report, but expect to do so before the end of March.

The general utility of this establishment is, I am happy to report, more felt every year. The proximity of the observatory to the shipping renders it available to every master for information or assistance; and numerous applications are constantly made, more especially with reference to chronometers. A recognized source of the required information is, I believe, acknowledged as a great convenience to masters of vessels.

The careful testing of the performance of chronometers before and after long voyages has become a matter of very great importance, and every means are being adopted by the English Government to enable masters and owners of vessels to have their chronometers (upon the performance of which life and property so often depend) thoroughly and strictly tested under all ordinary temperatures; and a means of doing this at the observatory would result in much good, as every chronometer thus tested would, from tables formed from its performances under different temperatures, be a much more perfect and reliable instrument in the hands of the navigator. Such a system persevered in at this port, as it is in Liverpool, would do much to eliminate the causes of the serious changes in the rates of chronometers which so often take place in long voyages, to the imminent danger of the vessel to which they are intended to be a security. A small room for this purpose connected with the observatory could be readily constructed at a small outlay; the chief point to be sought being to obtain an artificial high temperature at will.

TIME BALLS.—The new time ball and apparatus about being erected here is almost completed, and will most probably be ready for working in about a week. The removal

of the old time ball to Queenscliff will be conducive of much convenience to masters of vessels leaving, as they will be by its means enabled to obtain *accurate errors* of their chronometers up to the very last moment of leaving port, and the signal being given from the observatory at the same instant of Greenwich time as is used at Williamstown and Melbourne, they are thus able to test *the rates* as obtained during their stay in port also.

In my report for the half-year ending June, 1857, I suggested the adoption of the *electric clock signal* mode of maintaining uniformity of time at all the public offices and in places where public clocks are used. By the method adopted in the Greenwich Observatory this plan could be readily and inexpensively applied pretty generally, and without any interference to the business of the telegraphic lines, the use of which would be required *for one minute once or twice a day only*. As I shall shortly be in possession of every particular regarding this plan of timekeeping so successfully and beneficially used in England, I hope to be able to furnish the Government with a statement of the cost of adopting it. As a means of maintaining uniform time throughout the telegraphic offices, I believe it will be less expensive than ordinary clocks; for public clocks like that at the Post Office, the plan would be invaluable, and its adoption at the different railway stations would result in much convenience to the public.

Meteorological Observations are made and recorded as heretofore, but I have to report that damage or breakage has occurred to several of the instruments, and that it is a matter of difficulty to replace them in the colony. Some unavoidable gaps are thus made in the otherwise regular records of the state of the atmosphere. Instruments to supply their place were estimated for, but I believe no provision appears on the estimate for obtaining them. The "Ostler's" self-registering anemometer and pluviometer is out of use; its position on the tower of the Electric Telegraph Station being required for the time ball, it was dismantled, and there is no fitting place for its re-erection.

TIDE GAUGE.—The self-registering tide gauge in my charge continues to work satisfactorily, and a sufficient number of observations have been made up to the end of 1857 from which to calculate the zero of tide. The result of past observations I hope to have ready so as to forward them along with the Astronomical Observations for 1857 by March next.

I have the honor to be,  
Sir,  
Your most obedient Servant,

ROBT. L. J. ELLERY,  
Superintendent of the Astronomical Observatory.

To the  
General Superintendent of Electric Telegraphs.