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[Despatch Abstract.]

Madas Observatory.

Forwarding to the Govt of India re-
port on the — for the year ending
31 March 1897.

Government {1897} of Madras.
PUBLIC.

Recd.

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} 1897.

Enclosures

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G.O., &c., Nos. 864, 865, 3rd July 1897.

JULY.

Madras Observatory.

Forwarding to the Government of India report on the — for the year ending 31st March 1897.

GOVERNMENT OF MADRAS.

PUBLIC DEPARTMENT.

READ—the following paper :—

From C. MICHIE-SMITH, Esq., Government Astronomer, Madras, to the Chief Secretary to Government, dated 18th June 1897, No. 122.

I have the honour to forward the report on the Madras Observatory for the year 1st April 1896 to 31st March 1897 for the Indian Observatories' Committee.

ENCLOSURE.

REPORT on the Madras Observatory for the year 1st April 1896 to 31st March 1897 for the Indian Observatories' Committee.

I have the honour to submit the following report on the working of the Madras Observatory from 1st April 1896 to 31st March 1897.

2. *Staff.*—There have, as usual, been several changes in the staff, but, on the whole, they have been towards greater efficiency. The most important change has been the sanction received towards the close of the year for the revival of the appointment of Assistant to the Government Astronomer on a salary of Rs. 150 per month.

3. *Buildings and Instruments.*—In common with most other buildings in Madras both the Astronomer's house and the Observatory suffered considerably during the heavy rain of the North-East monsoon. The transit shutter leaked very badly and it was a difficult matter to protect the transit circle from serious damage. The shutter has now been condemned and replaced by a new one on a better plan which has stood successfully the test of two heavy thunder-showers accompanied by high winds. The photoheliograph, which was sent out for use at Kodaikānal, was set up in the corrugated-iron hut specially built for it. It has not been brought into regular use, but is available, if required, at any time. The mounting of this instrument is unfortunately not suited for so low a latitude as Madras, and at certain periods of the year no photograph could be taken with it when the sun is near the meridian. Several other instruments intended for the Kodaikānal Observatory have been received including a six-prism spectroscope and a micrometer for measuring spectra. The Director of the Great Trigonometrical Survey of India has made over to the Observatory a transit instrument and a chronograph no longer required in the survey work, and has lent for so long as it may be required, the zenith sector No. 2 which has been largely used for latitude determinations. In January the Lerebour and Secretan equatorial was dismantled and forwarded to Sir Howard Grubb to be remounted along with a portrait lens of six inches aperture and thirty inches focal length. The telescope will be supplied with a new driving clock with Russell's control and should form a very useful instrument as both lenses are of excellent quality.

4. *Time service.*—Hitherto the telegraph lines employed for distributing time signals have been under the charge of the Government Astronomer, but Government has at length sanctioned a proposal of the Government Astronomer that the whole of the lines should be handed over to the Telegraph Department, which will in future be responsible for their upkeep. The time service at present consists in the firing of the time-gun at Fort St. George at noon and 8 P.M., the dropping of the semaphore at the Port Office at 1 P.M., the transmission of a time signal over all India and Burma at 4 P.M., the regulation of the electrical clock at the Telegraph Office, and the control of the turret clock at Messrs. P. Orr & Sons' shop by an hourly current from the standard mean time clock. Arrangements have now been made by which the hourly signal will be also supplied to the Central station of the Madras Railway Company and the Egmore station of the South Indian Railway for the regulation of the clocks along these lines. The time-gun failed on 13 occasions out of 730, giving a percentage of success of 98.2. The failures were almost entirely due either to bad friction-tubes, over which the Government Astronomer has no control, or to defects in the line which are less likely to occur after the lines have been handed over to the Telegraph Department. During the prevalence of south winds, complaints are sometimes made that the time-gun

is fired inaccurately. This is due to the fact that at such times the Mount gun, and not the Fort gun, is heard over all the southern part of Madras. This gun is apparently fired quite casually at any time within about five minutes on either side of noon. The semaphore at the Port Office failed to drop on three days, and on three other days it failed at 1 o'clock but dropped correctly at 2 o'clock. On one day it was not set on account of a cyclone. The 4 P.M. time signal was received at the Telegraph Office on every day, but on one occasion the signal was accidentally stopped exactly half a minute too soon. The following table shows all the failures in the time signals and their causes so far as could be ascertained :—

Date.	Signal.	Fault.	Cause.
1897.			
May 7th	Semaphore	Failed	Interruption in line.
" 14th	Noon gun	Do.	Tube broke.
June 3rd	Do.	Do.	
" 16th	8 P.M. gun	Do.	The gunner lost his keys.
July 14th	Do.	Do.	Tube broke.
" 18th	Noon gun	Do.	
August 9th	Semaphore	Failed 1 P.M., dropped 2 P.M.	
" 11th	Noon gun	Failed	Unknown; probably defect in line.
" 17th	Do.	Do.	
" 17th	8 P.M. gun	Fired 2 minutes late	
" 18th	Noon gun	Failed	Lanyard broke.
October 27th	Do.	Failed 1 P.M., dropped 2 P.M.	Unknown.
Nov. 5th	Semaphore	Do.	Not set on account of cyclone.
" 27th	Do.	Do.	
Dec. 3rd	Do.	Failed	The Marine Signaller had allowed his instrument to get very dirty.
" 7th	Do.	Do.	
" 8th	Do.	Failed 1 P.M., dropped 2 P.M.	
1898.			
Feb. 17th	Noon gun	Failed	Instrument out of adjustment.
March 22nd	8 P.M. gun	Do.	Tube broke.
" 23rd	Do.	Do.	Do.

5. *Observations.*—The observations for determining the time were carried on as usual.

The readings for determining the division errors of the meridian circle were completed and the values of the errors for each space of five degrees determined. In all 72,192 micrometer readings were employed, and the final results are the means for three different observers. In December Captain Burrard, R.E., of the Great Trigonometrical Survey, came to Madras to re-determine the latitude. He brought with him the zenith telescope, used on the former occasion, and zenith sector No. 2, and determinations were made with both instruments by Captain Burrard and with the zenith sector, used as a zenith telescope (Lalout's method), by the Government Astronomer. The results of the observations had not been fully worked out by the close of the year. On March 16th, the Government Astronomer began a series of observations of the star's declination with the zenith sector, and though these were not completed within the period to which this report refers, it may be stated that 58 observations gave as the value of the latitude $13^{\circ} 4' 8''.01 + 0''.08$, which agrees closely with the accepted value and with Mr. Downing's recent re-determination from Taylor's mural circle observations.

From a number of determinations of the flexure correction of the meridian circle, which have recently been made, it is almost certain that the value hitherto adopted is too small. The observations are, however, not yet completed, but it may be noted that an increase in the correction for flexure would bring the value of the latitude determined from observations of circumpolar stars into better agreement with the values otherwise obtained.

Telegrams reporting the discoveries of several comets were received from Kiel. All of these were looked for, but none of them were found to be within the grasp of the Madras equatorial.

6. *Reductions.*—The preparation of the catalogue has been continued whenever other work would permit, and at the close of the year the mean places for 1875.0 had been deduced for the first sixteen hours. This part of the work should be completed by the end of July, and the catalogue should be ready for the press before the end of the year, if no serious delay is caused by other work.

7. *The Kodaikānal Observatory.*—There is little to report in this connection. The plans and estimates for the Astronomer's house have not yet been finally sanctioned. Those for the observatory and for the Assistant's houses have been sanctioned and forwarded to the Superintending Engineer for execution, and ample funds have been provided for the work during the current year. No actual work had been done by the end of March, but there is some slight reason to hope that a beginning will be made before very long. Such a forecast must, however, be taken, like that for the monsoon, with "due caution."

8. *The Eclipse of 1898, January 21-22.*—Proposals have been laid before Government, and sanctioned, for observing the total eclipse of the sun next January. After correspondence with Colonel Gore, R.E., Karad has been fixed upon as the most suitable station.

9. *Meteorological*.—The meteorological records have been maintained in the usual form and all reductions have been kept up to date. The hourly barometer readings for twenty years have been taken in hand and the harmonic analysis has been completed. Professor R. L. Jones has undertaken the analysis of the hourly wind records for eleven years and the work is nearing completion. The Beckley anemograph, which has been in constant use since 1864, was taken down in February and thoroughly repaired. During the time when it was out of use, the record was continued with a small anemograph lent by the Harbour Engineer.

ORDER—No. 864, Public, dated 3rd July 1897.

The report will be forwarded to the Government of India.

(True Extract.)

J. F. PRICE,
Chief Secretary.

To the Government Astronomer.

ENDORSEMENT—No. 865, Public, dated 3rd July 1897.

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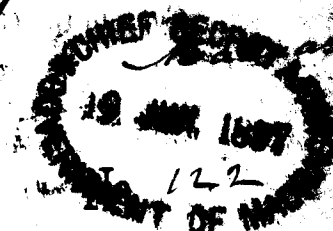
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