

- (1) பக்கங்காரின் எண்ணிக்கை 18
(2) புதுக்கித் திருப்பிய நாள் Aug. 1970
(3) ஆதாரங்குறிப்பவர் சுருக்கொப்பம் 62

தமிழ்நாடு ஆவணக் காப்பகம்.

தமிழ்நாடு அரசு

Public துறை

அரசாணை எண். மு. கோப்புத் தாள் எண்.	1461-62	அச்சகம் பலவகை
நாள் :	2. 11. 1877	198

மடிக்கவோ கண்டபடி கையாளவோ கூடாது

62

1461-62
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GOVERNMENT OF MADRAS.

PUBLIC DEPARTMENT.

2nd November 1877, Nos. 1461-62.

Meteorological Observations.

Read the following paper :—

No. 10. *From N. R. POGGSON, Esq., F.R.A.S., Government Astronomer, to the Chief Secretary to Government, dated Madras Observatory, 24th October 1877.*

I have the honor to report for the information of Government the recent accomplishment of a very important and laborious series of observations upon the planet Mars in opposition, for the determination of the constant of Solar Parallax, or in other words of the true mean distance of the Sun from the Earth. As it may appear somewhat strange to the uninitiated that this fundamental measure, which all have been taught from childhood to accept as nearly ninety-five million miles, should still be an object of research, a few brief words of explanation upon the subject may not be out of place before proceeding to further detail.

The most elaborate drawings of any building unless accompanied by a scale shewing how many feet go to the inch, or the most perfect map of a country without a scale of miles, would alike fail to realize to the mind the size of the former or the extent of the latter, although the relative proportions and distances would in either case be accurately known from such drawings or maps. Celestial distances are so vast that our puny efforts under ordinary circumstances would be utterly powerless, even to compare them with each other, with the most refined appliances at our command. Fortunately however, theoretical astronomy steps in to the rescue, and a well-known law of nature, discovered by the immortal Kepler, furnishes us with the relative distances of every member of the solar system if the periods of revolution around the sun are correctly known. Practical astronomy enables us to determine the periods of revolution with marvellous accuracy, and we are thus furnished with a map or plan of our planetary system, relatively almost perfect, but without a scale by which to appreciate its actual dimensions in familiar miles. If we can by any means ascertain the precise distance in miles between any two members of the system at a definite time, we have at once the scale by which to measure all. But we are limited to our own world, which though nearly eight thousand miles thick is a mere insignificant point in the huge scaleless map before us. The distances are usually far too great for us to appreciate, but occasionally our nearest neighbours, Venus, Mars and some of the Minor Planets approach us so nearly as to afford the desired opportunity. Venus, when passing between the earth and the sun, comes nearest of all to us, and this recurs at intervals of only nineteen months apart. But unfortunately she is then, as viewed from the earth, necessarily nearly in the direction of the sun; generally a little above or below, and therefore lost in his overpowering brilliancy except when seen passing across his disc as a black round spot. Transits of Venus are however so rare that only two can happen in a century and sometimes only one. The extensive and costly preparations made by all the civilized nations of the world in December 1874, will be fresh in the recollection of all, and will no doubt be repeated at the next transit in 1882. The various expeditions from Europe alone cost upwards of two hundred thousand pounds, and owing to certain yet insurmountable difficulties the results will probably prove far from conclusive.

2. The planet Mars offers a far better opportunity when the earth comes between him and the Sun at successive intervals of about twenty-five and a half months. He is then seen rising at sunset and setting at sunrise, is visible throughout the night,

and conspicuously brilliant. At such times he is said to be in opposition and is by no means at an unmeasurable distance. If observations are taken from opposite sides of the earth he will be found considerably displaced by our nearly eight thousand mile base line, and his distance may be determined. To measure this displacement with the utmost attainable accuracy requires however a long succession of observations extending over several weeks, and can be done in two ways; either by different observers, one as far north and the other as far south as possible; or by one observer near the equator, for it is manifest that if the position of Mars is accurately determined near the time of his rising and again about the time of his setting, diurnal rotation will meanwhile have carried the observer to the opposite side of the earth's centre and have given the widest base line to measure from that the world can afford. This then is the method your astronomer has pursued, night and morning, from August 7th to October 9th, upon every possible opportunity; with what result the future must unfold, but there is every reason to hope with success. Alas that the appliances available in the Madras Observatory are of so inferior an order for the solution of so grand a problem. An expedition for the same purpose was also fitted out by the Royal Astronomical Society under Mr. D. Gill to the island of Ascension. An excellent heliometer, kindly lent by Lord Lindsay for Mr. Gill's use, and his more favorable southern latitude, will probably have secured that astronomer better results than my utmost endeavours here could obtain, but I have done my best with such means as I had, and have little doubt but that either Mr. Gill's observations, costing only a comparative trifle for his voyage to Ascension and back, or my own at Madras, costing not a single rupee extra, will furnish more reliable determinations of the solar parallax than all the prodigious outlay lavished over the popular Transit of Venus in 1874. So long since as April 1857 the Astronomer Royal when advocating the Mars plan in a lecture at the Royal Astronomical Society expressed his opinion "that this method is the best of all." After my appointment to my present post, before I left England in January 1861, and repeatedly since, Sir George Airy has urged my most earnest attention to these observations and his wishes have ever been most respectfully considered and acted upon in this as in all other matters as far as possible.

3. The orbit of Mars being very eccentric, it follows that at some oppositions the earth will approach him much closer than at others. These most favorable oppositions recur at intervals of about seventeen years, and the one just past was the best of all for the object in view. I nevertheless believe that even the least favorable oppositions of Mars are better than the Transits of Venus, and under that impression have secured similar observations in the years 1862, 1864, 1869, 1871, 1873 and 1875 besides those of the present year. The distressingly overtaxed life I have led here since meteorological and other comparatively insignificant duties have been allowed to interrupt and upset all my higher and more legitimate astronomical pursuits, has however hitherto prevented me from deducing any results from the six previously observed oppositions of Mars.

4. With these important Parallax researches awaiting investigation; numerous observations of planets, comets and variable stars lying by unproduced; a rich and now nearly completed catalogue of above three thousand stars observed with the Meridian Circle since 1862; an Atlas of Variable Stars comprising about one hundred and thirty maps and probably about forty thousand star positions, besides numerous other unpub-lished works:—with my service already nearly two years in excess of its full term, and after seventeen years unbroken by a single day's leave, it is but natural that I should most earnestly desire and implore of Government such reasonable relief as may enable me to complete the purely scientific pursuits which I ever grieve so deeply to see thrown aside and delayed, to the imminent risk of their total loss and in some cases their lamentable deterioration in value for want of prompt publication.

5. I should gladly seek change and rest if my works in hand were but published, but of that there is no chance or prospect under present conditions. I am continually called upon for replies to long unanswered official letters; am ever unavoidably behind-hand with Reports, and have to turn a deaf ear to repeated requests from distinguished European Astronomers for casual observations of interesting southern objects I should

so delight to comply with; and yet, with longer hours and less rest than perhaps any one else in India, am quite unable to get through my current daily routine, or to prevent the further accumulation of arrears of work.

No. 11. ORDER THEREON, 2nd November 1877, No. 1461.

Ordered that copies of this letter be forwarded to the Secretary of State, and to the Government of India, for information.

2. Mr. Pogson will be requested to state the extent and nature of relief he will require for bringing up the large arrears of work he has on hand.

(Signed) C. G. MASTER,
Secretary to Government.

No. 12. To the Secretary to the Government of India, Department of Revenue, Agriculture, and Commerce, dated Fort St. George, 2nd November 1877, No. 1462.

I am directed to forward, for the information of the Government of India, copy of a report from the Government Astronomer, Madras, on his recent accomplishment of a very important and laborious series of observations upon the planet Mars in opposition, for the determination of the true mean distance of the Sun from the Earth.

(Signed) C. G. MASTER,
Secretary to Government.

No. 13. To the Most Honorable the Secretary of State for India, dated Fort St. George, 2nd November 1877, No. 42

We have the honor to forward, for your Lordship's information, copy of a report from the Government Astronomer, Madras, on his recent accomplishment of a very important and laborious series of observations upon the Planet Mars in opposition, for the determination of the true mean distance of the sun from the earth.

Exd. J. Wright.

661. of 1877 **POURAS.**

PUBLIC.

To
THE GOVERNMENT ASTRONOMER.

Date November, 2nd.

Insert

Recd.

E. J.

G. O. 2nd November 1877, Nos. 1461-72.

NOVEMBER.
Nos. 10-13.

Met. and Astr. Observations.—Copy of letter from
the Government Astronomer, Madras, respecting
the establishment of a series of observations
upon the planet Mars, forwarded to Secretary of
State, and to the Government of India.

3 10

Madras Observatory October 28th 1877

1461-62
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Whom

The Government Astronomer

To

The Chief Secretary to Government
Port St. George. -

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I have the honor to be

Sir,

Your most obedient, Servant

M R Payson

Government Astronomer.

Dr. H. A. Smith, Esq., D.D.
New York, N.Y.

Prof. Geo. (1877) D.D.
Dr. H. A. Smith, Esq., D.D.
The Government of the United States

The Chief Secretary of the Government
Dr. H. A. Smith, Esq., D.D.

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Dr. H. A. Smith, Esq., D.D.
New York, N.Y.

1877

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series of observations upon the plant the
for the determination of the constant of
the function. Quality is shown in
results of these and numerous other
experiments, which will be published in
the last important series, as to give them
the time and attention they demand.

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Public DEPARTMENT.

No. 1462

To

The Secretary to the Government
of India,

DEPARTMENT of Revenue
Agriculture & Commerce.

Sir,

I am directed to forward
for the information of the
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a report from the Government
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the same from the earth.

Fortland George
2nd October 1877

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No.

To
The Secretary to the
Government of
Department.

Dated

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Public Ad. to Eng. 22
Nov 1792 12.

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Oct. of 1877

Justice

Fr. No 2189 377

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Dated
Recd.

Nov 1877, No. 17

Nos. 10-13

Manuscript Minutes

Copy letter from the
President, Madison, Va.,
relating to the
man of a law of
secession upon the
State, Nov 16 1877