

GOVERNMENT OF MADRAS.

PUBLIC DEPARTMENT.

11th November 1881, No. 1506.

Administration Report—Observatory and Meteorology.

Read the following paper :—

From N. R. POGSON, Esq., Government Astronomer, to the Chief Secretary to Government, dated Madras, 26th October 1881 [Current No. 2253].

I have the honor to submit my administration reports for the year 1880 upon the Observatory and the Madras Meteorological Department, and much regret that incessant pressure of work has prevented me from doing so long since.

2. Although no longer in charge of the Meteorological Office, I thought it better to give the few remarks and tables for the year 1880, the last in which it was under my control in my own name, and have done so accordingly.

ENCLOSURE No. 1.

Administration Report upon the Madras Observatory for the Year 1880.

The year under review was one of steady progress at the Observatory, unusually free from interruptions by casual phenomena, and the natural result was a corresponding advance towards completion of the standard works in hand throughout the past twenty years.

2. *The Meridian Circle.*—The star catalogue, commenced in June 1862 with this instrument, being so nearly finished as to leave the assistants without sufficient employment on fine nights, it was decided to extend the number of objects it contained from 4,400 to 5,000, taking in useful southern stars of a smaller class, not previously observed elsewhere, with a view to having all completed before June 1882, when the instrument will have been in use exactly twenty years. The number of meridian circle observations recorded in 1880 was 2,325, the annual average being 2,168, and the total number awaiting publication 41,483. The reduction of the observations is now rarely three months in arrears, and the instrument shows but slight signs of wear or deterioration.

3. *Extra Meridional Pursuits.*—The micrometrical observations of minor planets taken with the large equatoreal in 1880 were—of Sappho, 4 in January; of Hestia, 5 in March and April; of Ariadne, 6 in May; of Nausicaa, 3 in June; of Sylvia, 7 in August and September; of Camilla, 4 in October; and of Isis, 8 in December. A partial eclipse of the moon was observed on December 16th; the double star Alpha Centauri was measured on July 23rd and August 25th; and 47 light comparisons of variable stars were also recorded on fifteen nights during the year.

Approximate positions of 1,738 stars were zoned with the large equatoreal for various purposes, 1,321 of which were for the Variable Star Catalogue and Atlas commenced by the Astronomer at Oxford in 1852, and since carried on successively at the Observatories of Oxford, Hartwell, and Madras whenever more pressing duties permitted. The epoch first selected for the positions of the stars in this undertaking before its extensive nature was realized being 1860, it has now been deemed advisable to render it more serviceable for future years by reducing all the catalogues and maps to the epoch 1900—no trifling additional labor for over fifty thousand objects, but the change is fairly in hand and is well worthy of the additional two or three years' delay of publication occasioned thereby. The maps for this work are now 176 in number, each about four inches square, and of course containing very different numbers of stars according to the stellar density of the region under record. Thus, while some show the configurations of upwards of one thousand stars each, others will be found containing only about one hundred. An average map will show about 300 stars, and there will probably be about 200 maps in all before the complete work is ready for publication.

The eight-inch equatoreal by Messrs. Troughton and Simms, the six-inch ditto by Messrs. Lerebours and Secretans, and seven smaller telescopes, four equatorially mounted, are in good order and available whenever required. The Observatory is also further equipped with two spectrescopes, one electrical motor clock, a sextant, a chronograph, four astronomical clocks, one

watchman's ditto, four marine chronometers, and one pocket ditto all in good order, besides several minor instruments more or less in need of cleaning and repairs.

4. *Telegraph Time Signals.*—The adoption of Madras mean time throughout India has rendered time signals a leading feature in the daily routine of the Observatory. Madras mean time has been transmitted daily at 4 P.M. to every Government Telegraph Office in India since February 1873. More accurate local time signals are afforded to the shipping community in three ways; viz., by gunfire, by semaphore, and by means of a sympathetical electrical clock at the Marine Office. The fort time signal gun has been fired by means of electrical currents from the Observatory twice daily, at noon and 8 P.M. since October 1870, and is usually correct within a small fraction of a second. Occasional failures, due to faulty friction tubes and other causes, are unavoidable, but only twenty occurred during 1880, leaving 712 successful signals, or about 97½ per cent. for the whole year. A semaphore attached to the Marine Office Flagstaff was controlled by the normal mean time clock at the Observatory was always available, though unfortunately in an obscure corner of the Marine Office building, to furnish true time to any one requiring it intermediate between the semaphore or gunfire hours. Two other public electrical clocks, in cast-iron cases, standing about 19 feet from the ground, have been in store awaiting orders for their utilization for eight years past.

5. *Meteorology.*—The Madras Meteorological Register was continued in the form adopted since the year 1861. The solar heat in vacuo was 142.7° or 7.7° in excess of ordinary years, the rainfall, 61.80 inches, being 12.86 above average, and the number of rainy days 115 or 35 more than usual. The coldest night was January 3rd, when the temperature fell to 59.0°, and the hottest day May 19th, when it reached 108.1°. The north-east monsoon crept in very imperceptibly about the middle of October, and the rain in November was excessive, amounting to 23 inches, though the heaviest day's register was only 5.66 inches on November 28th. No severe storm visited Madras during the year.

Presidency Meteorological Department.

The Madras Meteorological Department comprises twelve stations, viz., Bangalore, Bellary, Cochin, Coimbatore, Madras, Madura, Masulipatam, Negapatam, Salem, Secunderabad, Trichinopoly, and Wellington. A trained assistant is employed at each up-country station to make the necessary records and reductions under the honorary superintendence of the Local Medical Officer, and the reduced results should be communicated to the Meteorological Superintendent at Madras regularly at the close of each month. It was formerly customary for all reductions to be made at the Madras Observatory, the records only being furnished by the Observers, and the change introduced of entrusting them with the calculations also has only been partially successful, the necessarily careful revision of the registers and correction of frequent errors being quite as much trouble as the complete reductions. From Madura, Masulipatam, Secunderabad, and Trichinopoly only copies of the registers were submitted, while from Wellington no records of any kind were obtainable until the appointment of a new assistant in August.

2. A code weather report was telegraphed daily from Madras and some other stations to the Meteorological Reporter to the Government of India, at Simla during the summer season and to Calcutta throughout the year. Similar daily messages were also sent to Bombay, by order, since September 1st. Copies of the registers reduced or revised at Madras should be furnished to the former officer immediately after the close of each month, but these have too often been considerably in arrears and must inevitably remain so while one individual is overburdened with the double duties of Government Astronomer and Meteorological Superintendent.

3. It is to be regretted that, owing to the want of a reserve supply of instruments, several of the registers for 1880 are incomplete, especially in regard to sun thermometers and anemometers. A few of these wants have since been supplied direct from Calcutta. All the barometers, thermometers, and anemometers furnished to the various stations since 1867 have been carefully compared with the Madras Observatory standards before being issued for use.

4. The table of monthly and annual rainfall in the districts of the Madras Presidency in 1880, with annual averages for eleven years (one solar spot period) shows a slight excess throughout the Southern and Eastern Districts and a deficiency on the West Coast and in the Northern Districts. In other words, this amounts to saying that the rain attending the south-west monsoon partially failed, but that a good north-east monsoon was experienced. Several new rain stations have been started during the last two years; but, as the gauges were not previously tested at the Observatory, the registers cannot be accepted as reliable and are therefore excluded. It is a great mistake to increase the number of stations by the distribution of inaccurate gauges when correct ones would cost no more. The mean rainfall for the Presidency found from the eleven meteorological stations (Wellington being unavoidably omitted) is 46.0 inches on 96 days, and this is unquestionably far more reliable than the 45.4 inches on 62 days derived from the 226 stations of the Board of Revenue.

RAINFALL in the Districts of the Madras Presidency in the Year 1880.

Districts.	Stations.	January.		February.		March.		April.		May.		June.		July.	
		INCHES.	DAYS.	INCHES.	DAYS.	INCHES.	DAYS.	INCHES.	DAYS.	INCHES.	DAYS.	INCHES.	DAYS.	INCHES.	DAYS.
Arcoot, North	17	0.23	0.8	0.42	0.6	..	..	1.12	2.4	3.00	7.2	1.39	3.9	2.46	6.4
Arcoot, South	8	0.75	1.5	0.34	0.5	..	..	0.48	1.3	1.49	3.0	0.98	3.4	3.21	6.6
Bellary	15	..	..	..	..	0.27	0.5	0.55	1.7	2.50	4.4	4.07	8.7	1.91	6.1
Canara, South	5	..	..	..	..	0.01	0.2	2.46	4.0	3.21	7.4	35.67	29.6	40.69	30.4
Chingleput	7	1.22	2.4	1.38	0.9	..	0.2	0.23	0.3	0.65	1.0	1.63	4.7	3.84	9.4
Coimbatore	10	0.14	1.0	0.00	0.1	0.08	0.2	3.21	6.4	3.81	9.1	0.98	3.6	0.94	5.5
Cuddapah	11	..	..	..	..	0.03	0.4	0.31	1.5	2.09	4.4	2.64	6.4	1.25	3.6
Ganjam	16	0.09	0.6	0.90	1.3	..	..	1.10	3.3	2.81	6.0	9.23	10.5	10.09	14.8
Godavari	20	0.01	0.1	0.03	0.1	..	..	0.06	0.2	0.28	0.6	2.23	3.7	3.78	5.8
Kistna	11	..	..	0.25	0.5	..	..	0.26	0.7	1.31	3.4	2.96	6.5	1.87	5.8
Kurnool	9	..	..	..	..	..	..	0.35	1.3	1.50	3.3	4.05	8.0	1.53	6.3
Madura	13	0.65	2.1	0.12	0.5	0.50	1.0	1.31	2.3	1.66	4.2	0.61	1.4	0.52	1.9
Malabar	15	0.02	0.1	0.25	0.4	0.36	1.4	5.21	8.1	10.26	10.2	30.19	27.4	25.37	29.2
Mysore (Bangalore)	1	0.67	2.0	..	..	0.41	2.0	2.16	8.0	9.35	20.0	3.89	16.0	6.88	19.0
Nellore	17	0.11	0.5	0.04	0.1	..	..	0.19	0.7	0.73	1.6	1.61	4.8	1.03	3.9
Salem	10	0.37	0.6	0.19	0.6	..	..	1.98	4.2	5.68	8.8	1.07	2.7	1.99	4.9
Tanjore	10	0.72	1.6	0.99	1.6	0.02	0.1	0.74	1.5	0.72	1.7	1.17	2.9	1.29	3.9
Tinnevely	11	0.89	2.1	0.66	1.8	1.06	2.1	2.47	3.8	1.29	3.5	0.27	1.0	0.58	2.0
Trichinopoly	5	0.17	0.6	0.20	0.4	0.05	0.2	1.78	3.8	2.92	5.0	0.68	1.8	0.89	2.4
Vizagapatam	15	0.36	0.4	0.61	1.4	0.02	0.1	1.53	4.3	3.56	6.0	5.81	9.7	9.64	15.4
Presidency Average	226	0.32	0.9	0.32	0.5	0.14	0.4	1.37	3.0	2.94	5.5	5.56	7.8	5.99	9.2

Rainfall in the Districts of the Madras Presidency in the Year 1880—continued.

Districts.	Stations.	August.		September.		October.		November.		December.		ANNUAL RAINFALL.	
		INCHES.	DAYS.	INCHES.	DAYS.	INCHES.	DAYS.	INCHES.	DAYS.	INCHES.	DAYS.	In 1880.	Average of eleven Years.
Arcot, North	17	5.16	6.1	3.85	5.5	7.02	10.1	12.84	14.2	1.98	4.1	39.97	61.3
Arcot, South	8	4.82	8.4	4.65	7.1	8.38	11.8	17.41	16.1	3.77	7.8	46.28	67.5
Bellary ..	15	3.15	6.4	3.63	4.9	8.54	10.6	2.74	5.5	0.12	0.6	27.48	49.4
Canara, South	5	9.94	22.0	8.09	23.2	6.68	10.6	5.10	8.0	1.19	2.2	113.04	137.6
Chingleput	7	3.81	7.9	7.22	7.7	7.18	9.4	17.80	18.9	4.37	6.1	49.33	68.7
Coimbatore	10	3.18	6.5	1.68	4.5	7.33	13.5	10.94	13.9	0.91	3.5	33.20	67.8
Cuddapah	11	3.52	6.3	2.91	5.2	6.16	9.3	8.96	12.1	0.21	0.8	28.05	49.6
Ganjam	16	9.32	12.9	8.75	11.2	10.17	10.4	3.51	5.9	0.06	0.3	56.06	77.6
Godavari	20	1.06	1.8	2.19	2.0	2.80	5.2	6.55	7.3	0.31	0.6	19.30	27.4
Kistna	11	5.01	7.7	4.91	8.1	3.65	6.5	7.47	8.8	0.59	0.6	28.28	48.6
Kurnool	9	5.73	8.1	3.83	7.2	4.63	8.7	2.66	6.8	0.19	0.4	24.47	50.1
Madura	13	2.51	5.2	1.50	3.6	5.74	8.8	14.10	16.2	4.66	5.2	33.88	52.4
Malabar	15	7.61	13.3	5.40	14.1	4.81	11.9	7.89	13.7	0.99	1.9	98.36	131.7
Mysore (Bangalore)	1	11.74	17.0	2.78	9.0	10.95	19.0	2.84	15.0	0.21	3.0	51.88	130.0
Nellore ..	17	3.02	5.7	2.47	5.0	8.94	9.9	24.07	18.4	2.11	2.8	44.32	53.4
Salem ..	10	6.76	7.3	1.75	3.9	9.69	13.2	9.54	13.8	1.02	2.8	40.04	62.8
Tanjore ..	10	6.69	8.7	3.17	6.4	7.34	9.4	25.02	20.2	5.67	7.7	53.54	65.7
Tinnevely	11	1.07	2.5	0.24	1.4	4.23	7.2	14.01	16.5	3.88	4.9	30.65	48.8
Trichinopoly	5	6.52	7.8	2.51	4.8	6.28	10.0	16.56	17.2	3.10	5.2	41.66	59.2
Vizagapatam	15	7.29	13.2	6.29	10.2	8.13	10.8	4.57	7.6	0.31	0.6	48.12	80.7
Presidency Average	226	5.40	8.7	3.89	7.3	6.96	10.3	10.73	12.8	1.78	3.1	45.40	69.5
													44.07
													61.7

MEAN Annual Meteorological Results for 1880.

Stations.	Barometrie Pressure.	Solar Heat in Vacuo.	Temperature in Shade.	Daily Range.	Relative Humidity.	Daily Velocity of Wind.	Rainfall.
Bangalore	INCHES. 26.925	° 146.9	° 72.4	° 18.3	CENTS. 68	MILES. 81	INCHES. 51.88
Bellary ..	28.389	142.8	80.0	22.5	56	..	22.04
Cochin ..	29.888	..	79.5	13.1	79	..	104.93
Coimbatore	28.517	..	77.6	21.0	69	112	28.95
Madras	29.839	142.7	81.1	16.0	69	157	61.80
Madura	29.402	138.0	82.3	22.8	62	114	34.62
Masulipatam	29.830	146.5	82.6	..	70	..	35.84
Nagapatam	29.843	147.9	81.5	15.1	75	151	55.90
Salem ..	28.947	..	80.0	21.6	68	119	51.16
Secunderabad	28.065	149.7	77.6	23.9	59	..	26.74
Trichinopoly	29.614	151.0	82.0	21.3	66	63	32.26
Wellington	..	..	..	..	..	..	..

No returns furnished until August, when a new Assistant took charge of the station.

EXTREME Meteorological Records in 1880.

Stations.	Highest Reading of Sun Maximum.	Highest Reading of Shade Maximum.	Lowest Reading of Shade Minimum.	Greatest Velocity of Wind.	Heaviest Fall of Rain.
Bangalore	° 161.2	° 98.1	° 53.5	MILES. 304	INCHES. 5.40
Bellary ..	ON May	ON May	ON December	ON July	ON August
Cochin ..	21.	10.	1.	..	August
Coimbatore	..	February	15.	19.	July
Madras ..	22.	26.	31.	14.	October
Madura ..	5.	19.	3.	7.	November
Masulipatam	6.	9.	16.	1.	October
Nagapatam	5.	..	..	5.	November
Salem ..	30.	7.	11.	15.	November
Secunderabad	18.	4.	3.	25.	November
Trichinopoly	..	30.	27.	21.	June
Wellington	..	5.	14.	..	November

PUBLIC DEPARTMENT, 11TH NOVEMBER 1881, No. 1506.

ORDER THEREON, 11th November 1881, No. 1506.

Recorded.

(True Extract.)

Chief Secretary.

To the Government Astronomer.

Exd. A. F. Goodall.

Govt. of (1881) Madras.
PUBLIC.

To
THE GOVERNMENT ASTRONOMER.

Dated November, 11th.

Issued

Recd.

Encl.

G.O., 11th November 1881, No. 1506.

See para 4

NOVEMBER.

In attention that some
of the position of public
works

Administration Reports.—Letter from the Gov-
ernment Astronomer submitting Administration
Reports upon the Madras Observatory and Presi-
dency Meteorological Department for the year
1880, recorded.

Council Not
21/

P. M. G. No 7186

File of original
papers.

Recd. 7 Dec 81.

No 1950

Public G.O 1506
of 1881, with the file
of papers, including
original G.Os and
Members' notes, is
transferred to D.P.W.,
as requested.

A. Dawson
Chief Secretary.

Madras ... }

3rd December 1881

No 2952 of 7-12-81.

Memorandum

In forwarding the accompanying
file of papers (to be returned)
the Consulting Architect to Govt.
the Chief Engineer desires that
Mr. Chisholm will be so good as
to inspect one of the 32 inch
diameter clocks referred to the
- in, and submit a general sketch
with approximate estimate for
the tower which he would pro-
- pose for it at the site already
suggested in the neighbourhood of
Messrs. P. Orr & Son's premises, Mount
Road.

Sd/- R. W. Sankey. C.E.
Chief Eng^r P.W.D.

To
The Cons^g: Architect to Govt.
with enclos. to be returned.
Recd 7-12-81

(Sd/- R.P.)

ROADS AND BUILDINGS.

No. 752

CONSULTING ARCHITECT'S OFFICE,
Chepauk, 22 Dec^r 1871

From

THE CONSULTING ARCHITECT TO GOVERNMENT,

To

THE CHIEF ENGINEER, PUBLIC WORKS DEPARTMENT,
BUILDINGS AND ROADS BRANCH.

Sir,

I have the honor to return
the papers forwarded to me with
your Memo No 2952 dated the
7th December 1881.

The 2 blocks referred to have
complete iron turrets as in Sketch
No 1 unfortunately ironworkers
Gothic but I think by placing
the turret on a heavy stone base
filling in between the columns
with brick and substituting
a carved wood and tiled roof
the iron turrets might be
utilized and a structure
as in Sketch 2 put up for 3
or 4 hundred rupees.

The height of the centre
of the block in Sketch No 1
would be 11' " 8" in Sketch

Enclosures.



CC No 2952 of 7-12-81.

no. 619 a/25-2-80.
no. 100 a/13-1-80
no. 2053 W a/5-8-79
no. 1088 W a/7-4-79
no. 980 W a/31-3-79
no. 616 W a/28-2-79
no. 609 W a/12-3-80

209/12

2 about 16 feet.

I have the honor to be

sir

Your most obedt servt.

Wm. L. W. L.

Comdg Asst. to Governmt.

P. W. C. St. 2091

ROADS AND BUILDINGS.

Mis. G.O. by of 7-12-75.
442 W of 14-2-79
513 W of 19-2-79
G.O. 616 W of 28-2-79
Mis. G.O. 980 W of 31-3-79
G.O. 1088 W of 7-4-79
Mis. 2053 W of 5-8-79
Memo: 100 of 13-1-80
619 of 25-2-80
Mis. 609 W of 12-3-80
Memo: 2952 of 7-12-81.

From

The Consulting Architect
to Government,

To

The Chief Engineer, P. W. Department,
Buildings and Roads Branch.

No. 752

Dated 22nd December 1881

Received 22nd —

No. of ENCLOSURES. *1/6*

Electric Clocks for Madras.

Cir 23/12/81

P. W. DEPARTMENT.

Read the following:—

Letter from the Consulting Architect to Govt No 752 of
22nd December 1881.

FOR ORDERS.

It seems clearly
necessary to hide in some
such manner as that
proposed by Mr. Chisholm
the bad style of ornament
forming the head of the clocks
as they now stand.

2. The cost of the work
as now designed by Mr.
Chisholm will be about Rupees
400 or 500.

W. Lambey Colonel R.E.
Secretary to Govt. M. Dept.

22nd December 1881.

See - of - account
take care!
R.A.

FOR ORDERS.

The Hon D F Carmichael
The Hon W. Anderson

No 38 W

PUBLIC WORKS DEPARTMENT.

PROCEEDINGS OF THE MADRAS GOVERNMENT.

Under date the 7th January 1882.
Read the following:—

Memo. from the Chief Secy: } (G.O. No. 1950 of 3rd Decr/81)
to Govt.

Letter from the Cong. Architect } (" " 452 of 22nd " "
to Govt.

The Consulting
architect to Govt.
will carry out the
work on ^{the} design pro-
- posed by him, and
represented as sketch
No 2 - Submitting
meanwhile a formal
estimate for sanction
and allotment of
funds.

Cong. Architect to Govt. ^{with sketch} R.S.
Exec. P. & A. Accounts ✓
Public Department ✓

26.12.81

Decr/81 9-1-82-

Decr/81 13/12/81

B. No 38 Waf 7th January 1882.

Leaf 11

Subd. in Mississippi River.