

Public (1897) Department.

ORDINARY PRINTED.

G.O., No. 815-6

DATED 28. 6. 97

INDEXED.

[Despatch Abstract.]

Madras Observatory.

Pending the Administration Report of the
for the year 1896. Copy to the Govt of India.

BACK PAPERS.

G.O.	No.	Department.	Date.	G.O.	No.	Department.	Date.

FURTHER PAPERS.

G.O.	No.	Department.	Date.	G.O.	No.	Department.	Date.

Government {1897} of Madras. PUBLIC.

Recd. } *Enclosures*
Regd. } 1897. *Spare copies*

G.O., &c., Nos. 815, 816, 28th June 1897.

JUNE.

Madras Observatory.

Recording the administration report of the — for the year 1896. Copy to the Government of India.

GOVERNMENT OF MADRAS.

PUBLIC DEPARTMENT.

READ—the following paper :—

From the Government Astronomer, Madras, dated 31st May 1897, No. 111.

ENCLOSURE.

ADMINISTRATION REPORT OF THE MADRAS OBSERVATORY
FOR THE YEAR 1896.

Staff.—There have been a number of changes amongst the members of the staff during the year, of which the most important are the resignation of P. Subbiah Mudaliar, B.A., who had done excellent work as a computer, and the appointment of V. S. Somasundram Pillai, M.A., and S. Sitarama Aiyar, B.A. With the exception of two old members of the staff, all the assistants are now graduates.

2. *Buildings and Instruments.*—In common with most other buildings in Madras both the house and the observatory suffered considerably during the heavy rain of the south-west 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 will be replaced by a new one, on a better plan, before next monsoon. The photoheliograph which had been sent out for use at Kodaikānal was set up in a corrugated-iron hut specially built for it. It has not been brought into regular use, but is available, if required, at any time. 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.

3. *Time service.*—The time service 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 and Sons' shop by an hourly current from the standard mean time clock. The time-gun failed on 11 occasions out of 732, giving a percentage of success of 98.5. 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 in accordance with proposals which have since received the sanction of Government. 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.			
January 10th ..	8 P.M. gun ..	Failed ..	The clock did not act.
May 7th ..	Semaphore ..	Do. ..	Interruption in line.
" 14th ..	Noon gun ..	Do. ..	
" 3rd ..	Do. ..	Do. ..	Tube broke.
" 15th ..	8 P.M. gun ..	Do. ..	The gunner lost his keys.
July 14th ..	Do. ..	Do. ..	Tube broke.
" 18th ..	Noon gun ..	Do. ..	
August 3th ..	Semaphore ..	Failed 1 P.M., dropped 2 P.M. ..	
" 11th ..	Noon gun ..	Failed ..	
" 17th ..	Do. ..	Do. ..	Unknown; probably defect in line.
" 17th ..	8 P.M. gun ..	Fired 2 minutes late ..	
" 18th ..	Noon gun ..	Failed ..	
October 27th ..	Do. ..	Do. ..	Lanyard broke.
November 5th ..	Semaphore ..	Failed 1 P.M., dropped 2 P.M. ..	Unknown.
" 27th ..	Do. ..	Do. ..	Not set on account of cyclone.
December 3rd ..	Do. ..	Failed ..	The Marine Signaller had allowed
" 7th ..	Do. ..	Do. ..	his instrument to get very dirty.
" 8th ..	Do. ..	Failed 1 P.M., dropped 2 P.M. ..	

4. *Observations.*—The observations for the determination of time have been carried on as usual. The readings for determining the graduation errors of the meridian circle were completed and the final values of the errors were obtained for every five degrees. In all 72,192 micrometer readings were employed in this determination. In December Captain Burrard, R.E., of the Great Trigonometrical Survey, visited Madras to make a re-determination of the latitude in co-operation with the Government Astronomer, but the observations were not completed by the end of the year. It may not be out of place to point out that the question of the exact latitude of the Madras Observatory is one of considerable importance as regards the work both of the Great Trigonometrical Survey and of the Observatory. Madras is the only station where the latitude determined by the Survey has been checked by independent observations, and hence any discrepancy between the two different determinations deserves the closest investigation. For the work of the Observatory itself an exact determination of the latitude is of prime importance in view of the publication of the star catalogue. A large number of readings have been taken for the re-determination of the flexure of the transit instrument, but a final value has not yet been worked out. Telegrams were received from Kiel announcing the discovery of several comets. These were all searched for, but none of them were bright enough to be seen in the Madras equatorial.

5. *Reductions.*—The preparation of the catalogue was continued as rapidly as possible and at the close of the year the mean places for 1875.0 had been deduced for the first fourteen hours of right ascension. These places are still subject to a few minor corrections, but if no serious interruption occurs the catalogue should be completed before the end of the current year. The harmonic analysis of the 20-year series of hourly barometric readings was taken in hand and nearly completed. The analysis of the wind for a period of ten years having been undertaken by Professor R. Ll. Jones, the necessary means were prepared with the help of two special clerks who were paid by the Meteorological Reporter to the Government of India.

6. *The Library.*—During the year, 221 volumes and pamphlets were presented to the library and a number of books and periodicals were purchased.

7. *Kodaikānal Observatory.*—The final plans and estimates for the observatory were completed and sanctioned and the chief instruments were under construction, but otherwise there is no progress to report.

8. *Meteorological.*—The meteorological registers were maintained as in former years. In addition to the ordinary observations special observations were undertaken of the movement of the upper clouds, in connection with the international cloud observations, and of thunderstorms and lightning. These observations were carefully carried out by Messrs. Sivaramiah and Lakshminarasa Aiyar. The chief features of the year's meteorology are shown in the appended tables and diagram. The year,

as a whole, was a decidedly abnormal one, the principle features being excessive temperature and deficient wind accompanied by deficiency of rainfall in the first seven months and an excess of rain in the last two months of the year.

Barometer.—The mean atmospheric pressure was below normal in March, April, June, July, and November, and above normal during the rest of the year. The excess in October reached the large value of 0.067 inch. The highest barometer was 30.126 inches on December 27 and the lowest 29.471 on June 16.

Temperatures.—The mean temperature was below normal in January and August and above during the whole of the rest of the year, the excess amounting to 2°.4 in May and to 2°.6 in July, which was the hottest July on record. The highest shade temperature recorded was 112°.4 on May 15, and the lowest 61°.7 on January 12. The mean maximum was 101°.6 in May and 99°.9 in June, both of which are well over the average. The highest temperature in the sun (161°.2) was recorded on October 14, and the lowest on the grass (55°.9) on January 12.

Humidity.—The humidity was considerably above the normal in September, November, and December, and was fairly normal during the rest of the year.

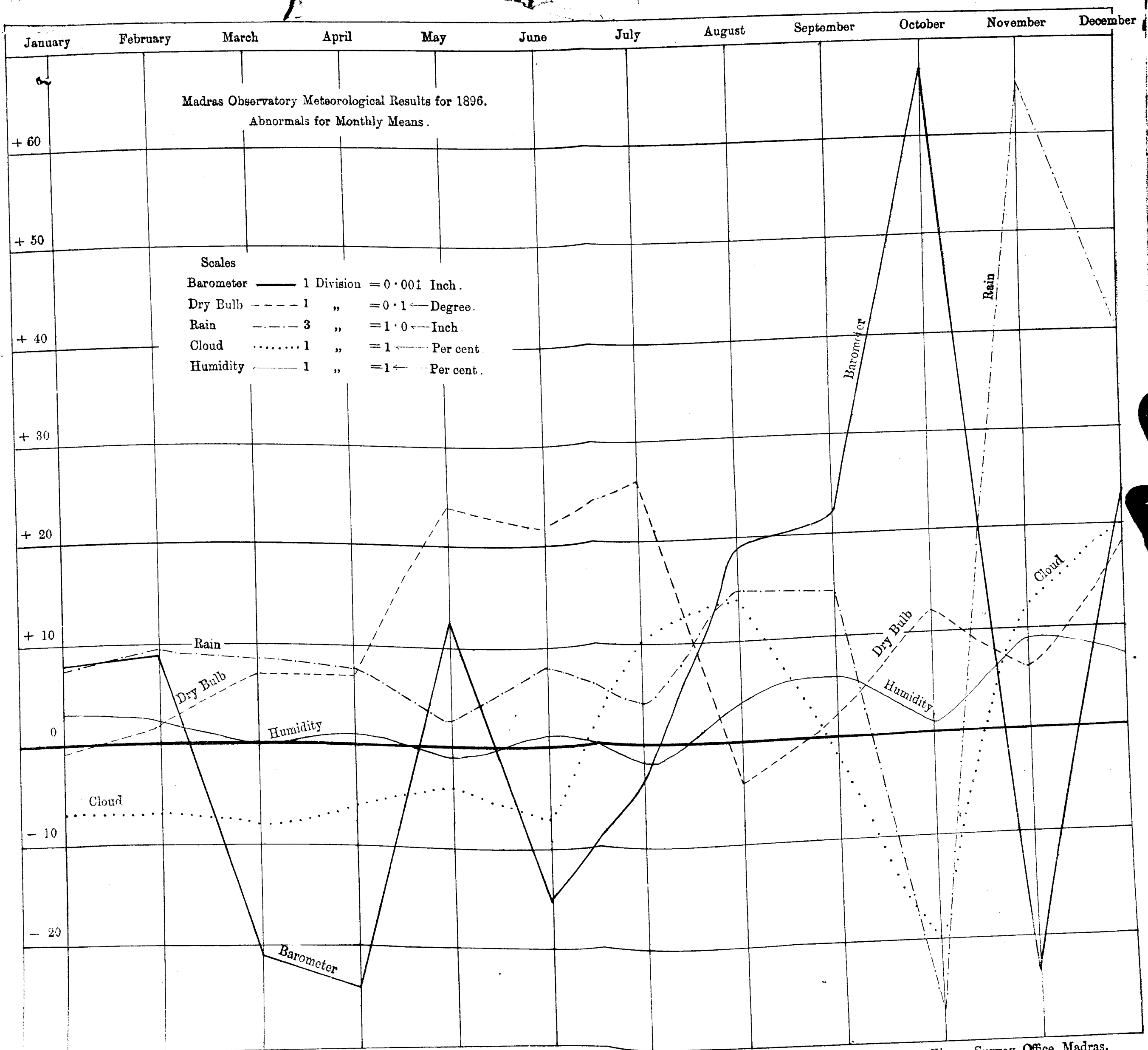
Wind.—The wind direction was normal in April, July, August and November. In June it was two points more southerly and in October two points more northerly than the normal. The wind velocity was defective in all the months except July, when it was in slight excess. The average daily defect amounted to no less than 40 miles in May and November, 44 miles in September, and 43 miles in October.

Clouds.—The percentage of clouds was in excess in July, August, November and December, and in defect during the rest of the year, the defect in October being 20 %.

Sunshine.—There were 2,422 hours of bright sunshine during the year.

Rain.—The rainfall was in defect during the first seven months of the year and in October, and was in excess in the other four months. The excess was 19.54 inches in November and 11.93 in December. The north-easterly winds of the retreating south-west monsoon began to blow on September 25, and rain from the same quarter began on September 26. This early setting of the monsoon was followed by a long break, and up to November 11 only 18.96 inches of rain has fallen since the beginning of the year. Very heavy rain then set in, and in the following six weeks nearly 50 inches of rain fell. The fall from October 15 to the end of the year was 52.9 inches against an average fall of 27.6 inches.

(Signed) C. MICHIE-SMITH,
Government Astronomer.



APPENDIX I.
MEAN Monthly and Annual Meteorological Results at the Madras Observatory in 1896.

Month.	Barometer.		Dry Bulb Thermometer.				Wet Bulb.	Tension of Vapour.	Relative Humidity.		Sun Max. in Vac.	Min. on Grass.	Wind.		Rain.		Clear Sky.	Bright Sunshine.	
	Reduced to 32°.	Daily Range.	Mean.	Max.	Min.	Range.			Mean.	By Blanford's Tables.			CENTS.	INCHES.	°	°			MILES.
..	30-008	0-116	75-0	84-2	66-6	17-6	59-6	0-654	76	140-9	62-1	128	4	N.E.	0-13	2	70	8-5	
January ..	29-976	0-124	76-9	87-7	68-8	20-9	71-4	697	75	144-2	62-0	88	9	E. by S.	..	..	83	9-9	
February ..	29-887	0-130	80-7	90-6	71-4	19-1	74-5	778	74	147-4	68-0	126	11	S.E. by E.	..	..	84	8-9	
March ..	29-805	0-128	84-7	94-2	74-4	16-8	78-5	894	75	148-5	75-1	168	13	S.E. by E.	..	..	78	9-6	
April ..	29-750	0-114	89-1	101-6	82-3	18-0	79-9	898	66	150-4	80-8	187	16	South.	..	..	66	8-0	
May ..	29-691	0-126	88-6	99-9	81-9	18-0	79-8	867	63	147-9	80-7	191	17	S. by W.	1-49	6	43	6-4	
June ..	29-721	0-130	87-1	97-6	76-6	16-4	77-3	812	63	145-6	79-9	204	20	S.W.	2-12	8	19	3-1	
July ..	29-802	0-126	83-2	93-5	76-6	16-9	78-6	832	74	140-4	74-4	147	19	S.W. by S.	6-04	20	29	4-8	
August ..	29-911	0-119	81-8	90-7	77-3	15-7	77-7	875	78	144-7	75-7	112	17	S. by W.	6-00	15	40	5-4	
September ..	29-904	0-111	78-1	84-2	73-3	10-9	76-4	867	79	138-8	72-5	80	5	N.E. by E.	2-94	9	61	7-2	
October ..	30-004	0-108	77-3	83-5	72-7	10-8	73-6	782	84	134-5	70-4	156	3	N.E. by N.	32-76	19	29	3-6	
November ..	29-853	0-121	82-1	91-7	75-1	16-6	75-8	0-815	75	143-8	72-6	144	11	S.E. by E.	17-21	12	37	5-1	
December ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Annual ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..

EXTREME Monthly Meteorological Records at the Madras Observatory in 1896.

Month.	Barometer.			Dry Bulb Thermometer.			Humidity.		Sun Th. in Vacuo.		Grass Therm.		Wind.		Rain.	
	INCHES.	DAY.	INCHES.	DAY.	INCHES.	DAY.	CENTS.	DAY.	°	°	°	°	MILES.	DAY.	INCHES.	DAY.
January ..	30-118	24	29-875	30	0-243	87-6	12	61-7	12	145-4	55-9	12	191	24	19	8
February ..	30-125	25	29-889	19	276	91-7	23	63-1	29	149-7	58-2	29	185	22	39	4
March ..	30-009	26	29-739	20	276	85-3	39	63-8	29	151-2	60-3	1	185	15	56	..
April ..	29-932	24	29-644	15	288	85-3	46	73-5	9	151-0	70-2	6	236	17	24	..
May ..	29-880	5	29-617	15	288	85-3	27	76-8	14	159-8	75-1	6	236	10	21	..
June ..	29-826	2	29-477	16	365	103-3	35	74-8	21	167-4	74-0	16	320	20	104	1-16
July ..	29-935	20	29-627	28	408	105-5	40	74-4	4	155-9	73-7	20	342	28	101	0-93
August ..	29-865	21	29-627	2	238	98-2	49	73-5	31	153-8	72-4	21	200	7	11	1-04
September ..	29-978	29	29-671	1	307	99-6	36	72-7	16	155-8	72-6	22	203	18	29	1-18
October ..	30-042	28	29-728	6	314	96-8	46	68-6	23	155-6	66-3	23	142	15	30	25
November ..	30-072	30	29-751	22	321	90-3	58	68-6	11	147-6	67-0	9	340	27	20	21
December ..	30-126	27	29-833	17	293	86-7	53	68-3	12	147-6	64-8	12	252	16	77	5-13

APPENDIX II.

MADRAS Observatory Meteorological observations—Abnormals for monthly means.

Months.	Barometer.	Dry bulb.	Wet bulb.	Humidity.	Sun in vacuo.	Dry Maxi- mum.
1	2	3	4	5	6	7
1896.	INCH.	°	°	PER CENT.	°	°
January	+ 0.008	- 0.1	+ 0.4	+ 3	+ 2.5	- 0.4
February	+ 0.009	+ 0.2	+ 0.6	+ 2	+ 4.5	+ 1.1
March	- 0.021	+ 0.7	+ 0.6	Same as	+ 6.9	+ 1.3
April	- 0.024	+ 0.7	+ 0.9	+ 1	+ 6.8	+ 1.8
May	+ 0.018	+ 2.4	+ 1.6	+ 1	+ 7.4	+ 3.8
June	- 0.015	+ 2.2	+ 2.2	+ 2	+ 6.9	+ 1.6
July	- 0.003	+ 2.6	+ 1.4	+ 4	+ 0.4	+ 0.2
August	+ 0.021	+ 0.4	+ 0.6	+ 6	+ 3.4	+ 0.2
September	+ 0.022	+ 0.2	+ 1.4	+ 1	+ 9.7	+ 1.7
October	+ 0.067	+ 1.2	+ 1.1	+ 9	+ 5.3	+ 0.8
November	+ 0.023	+ 0.6	+ 2.5	+ 7	+ 1.3	- 0.1
December	+ 0.023	+ 1.8	+ 3.0	+ 7	-	-

Months.	Dry mini- mum.	Grass minimum.	Direction of wind.	Velocity.	Clouds.	Bright sunshine.	Rain.
	8	9	10	11	12	13	14
1896.					PER CENT.	HOURS.	INCHES.
January	- 0.9	- 1.0	1 Point North ..	- 16	- 7	- 0.1	- 0.76
February	- 1.2	- 1.8	1 Point South ..	- 34	- 7	- 0.0	- 0.28
March	- 0.7	- 0.6	1 Point East ..	- 26	- 8	- 0.8	- 0.39
April	+ 0.2	+ 0.4	Same as ..	- 8	- 6	+ 0.1	- 0.62
May	+ 1.5	+ 1.9	1 Point South ..	- 40	- 4	- 0.7	- 2.12
June	+ 1.6	+ 2.1	2 Points South ..	- 29	- 7	- 1.3	- 0.62
July	+ 2.7	+ 3.3	Same as ..	+ 6	+ 10	- 1.0	- 1.75
August	- 0.7	- 1.0	Same as ..	- 27	+ 4	- 0.4	+ 1.48
September	+ 0.2	+ 0.7	1 Point South ..	- 44	- 2	- 0.0	+ 1.31
October	+ 1.1	- 0.7	2 Points North ..	- 43	- 20	+ 0.7	- 8.06
November	+ 1.0	+ 3.0	Same as ..	- 40	+ 12	- 2.7	+ 19.54
December	+ 2.9	+ 4.0	1 Point East ..	- 27	+ 11	- 2.1	+ 11.93

+ means above and - below the average.

ORDER—No. 815, Public, dated 28th June 1897.

Recorded.

(True Extract.)

Chief Secretary.

To the Government Astronomer.

" Public Works Department (with reference to paragraph 7 of the report).
Editors' Table.

ENDORSEMENT—No. 816, Public, dated 28th June 1897.

Copy to the Government of India, Revenue and Agricultural Department.

J. F. PRICE,
Chief Secretary.

Ed. C. M. Thumbuswamy.

Public (1897) Department.

CURRENT No.

C.No. 2052 (q)
Print enclosures.

C.S.

From

The Govt: Astronomer, Madras.

Order W.P. 815 of 28th June 97

Recorded.

No. 111

Dated 31st May 1897.

Received
Registered } 2nd June 1897.Enclosures 1 & 2 diagrams
Spare copies recd: 13-6-97

SUBJECT.

Govt: Astronomer
Editor's Table.
P.W. Dept. (with ref: to para 7 of the report)Copy to the Govt: of India, Rev.
Agri: Dept.Forwarding the administrative
report of the Madras Observatory for
the year 1896.Adverting to para 8 of the report
submitted with his letter No. 111 of the
31st May last, the attention of the Govt:
Astronomer is drawn to G.O. No. 912, Public,
dated 13th November 1896.

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G.O.	No.	Department.	Date.
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R.	809	"	24-7-96
	393-94	"	20-5-95 ^{re.}
(3) G.O.	623-24	"	22-5-97 ^{mis}
Memo	753		24-3-97
(4) G.O.	186	Pub.	26-2-97 ^{Publ.}

-- 366 -- 2-4-97^{mis}

FURTHER PAPERS

(5)		256	--	10-3-97
	G.O.	No.	Department.	Date.
		82-83	"	27-1-97 mis
	R.	1152	"	2-11-96
(6)	G.O.	1074-5		28-9-96
(10)		608-9	"	11-6-96 Publ.
(12)		457-58	--	8-6-95 re.
		912	"	13-11-89

No. 1111

THE OBSERVATORY,

NUNGUMBAKUM.

Madras, 31st May 1897.

FROM

THE GOVERNMENT ASTRONOMER,

Madras.

To

The Hon'ble Mr. T. F. Prier,

Chief Secretary to Government.

SIR,

I have the honor to forward herewith
a copy of the administrative report of the
Madras Observatory for the year 1896.
2. The diagram has not yet been received
from the Press.

I have the honor to be,

Sir,

Your most obedient Servant,

Chichester Smith
Govt. Astronomer

11 June 1897

No. 1429

From M.

THE SUPERINTENDENT, MADRAS SURVEY,

To

The Superintendent,
Government Press
Madras.

REFERENCE—Your letter No. 2464 dated 5 June 97,

forwarding corrected proofs of the following:—

Register No.	Particulars of Map or Diagram.	No. OF COPIES.			
		Total required.	Now sent.	Total sent up to date.	Balance to be sent.
3758	Madras Observatory Meteorological Results for 1896.	40	40	All	Nil
				original returned.	

Please reply on the back of this letter.

Sd/- Superintendent, Madras Survey.

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To

The Superintendent, Madras Survey.

Verified and returned.

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Signature

Date

Office

11/11/97

[G]
[69-A.]
500-3-12-96.

(Order complete.)

Public DEPARTMENT.



C2052

Memorandum No. 1243 of 12-6-97

Read the following paper:—

C2052

10/11/97

Recd 13-6-97

The foot Astronomer
is requested to be so
good as to expedite
the submission of the
diagram referred
to in para 2 of his
letter of the 3/5/ultimo

CW
10/10/97

11/11/97

Foot astronomer (memo only)
2-11/96

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