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[Despatch Abstract.]

Address Observatory
Recording the re-
port on the work
ing of the
for 1902

Govt. of {1893} Madras.
PUBLIC.

Issued

Recd.

Encl.

G.O., &c., 15th June 1893,
Nos. 460, 461.

JUNE.

Madras Observatory.

Recording the report on the working of the —
for 1892.

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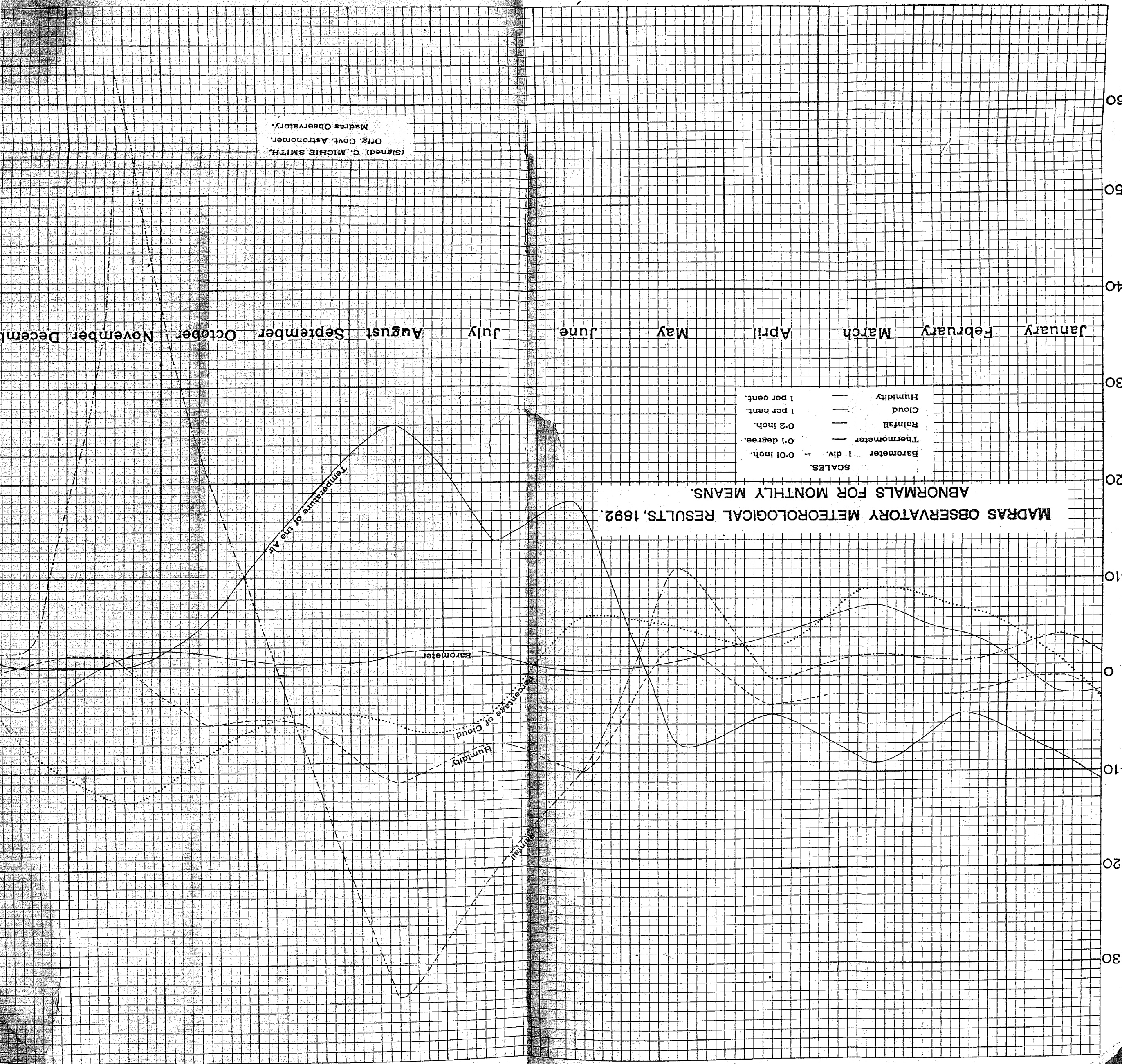
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Madras



APPENDIX I.
MEAN monthly and annual Meteorological Results at the Madras Observatory in 1892.

	Barometer.		Dry Bulb Thermometer.				Wet Bulb.		Sun. Max. in Vac.		Wind.	Rain.		Clear Sky.			
	Reduced to 32°.	Daily Range.	Mean.	Max.	Min.	Range.	Mean.	Min.	°	°	Points.	Miles.	Daily Velocity.		Mean Direction.	Amount.	Days.
Inches.	Inches.	°	°	°	°	°	°	°	°	°	Points.	°	°	Points.	Inches.	No.	Cents.
January	30-012	0-107	75-6	84-9	67-8	17-1	70-0	140-3	65-1	165	3	N. E. by N.	0-13	2	0-13	2	66
February	29-918	0-101	77-2	87-7	68-4	19-3	72-0	142-0	65-7	138	11	E. East.	..	..	..	..	81
March	29-831	0-115	80-8	91-7	72-4	19-3	75-3	144-4	70-0	162	11	S. E. by E.	..	..	..	..	85
April	29-780	0-120	84-7	93-9	78-5	15-4	79-1	144-3	76-8	188	13	S. E. by S.	0-69	1	0-69	1	74
May	29-716	0-121	87-9	100-7	82-5	18-2	78-3	145-9	81-5	227	15	S. by E.	..	..	..	..	65
June	29-696	0-110	85-2	95-3	79-3	17-0	78-1	141-0	78-0	178	17	S. by W.	4-02	12	4-02	12	41
July	29-695	0-102	83-6	93-4	78-0	15-4	76-9	138-1	75-9	155	19	S. W. by S.	7-82	22	7-82	22	22
August	29-728	0-102	81-0	90-5	76-1	14-4	76-8	136-9	74-2	111	18	S. S. W.	10-79	22	10-79	22	26
September	29-763	0-117	81-3	90-9	75-7	15-2	76-1	140-3	74-0	117	19	S. W. by S.	6-29	12	6-29	12	32
October	29-819	0-114	80-2	88-9	74-2	14-7	76-4	143-4	72-3	116	7	E. by N.	6-44	12	6-44	12	51
November	29-918	0-101	77-4	86-4	70-6	15-8	72-3	143-1	68-1	165	1	N. by E.	1-12	3	1-12	3	56
December	30-013	0-109	75-2	84-5	68-4	16-1	70-8	140-3	65-7	159	1	N. by E.	4-74	5	4-74	5	56
Annual ..	29-824	0-110	80-8	90-8	74-3	16-5	75-2	141-7	72-3	157	11	S. E. by E.	42-04	91	42-04	91	55

EXTREME monthly Meteorological Records at the Madras Observatory in 1892.

	Barometer.			Dry Bulb Thermometer.			Wet Bulb.		Humidity.		Sun. Th. in Vacuo.		Grass Therm.		Wind.		Rain.			
	Inches.	Day.	Inches.	Range.	Highest	Lowest.	Day.	°	Day.	Cents.	Day.	°	Day.	°	Miles.	Day.	Miles.	Day.	Inches.	Day.
January	30-119	29-888	10	5-231	86-7	64-3	13	...	...	47	26	143-9	27	60-0	305	17	115	23	0-12	Day.
February	30-078	29-788	23	0-299	92-3	62-6	22	...	...	41	4	146-7	23	59-6	294	30	80	21	...	...
March	29-938	29-673	29	0-265	102-0	66-5	9	...	...	37	13	152-7	29	62-9	284	30	81	13	...	...
April	29-834	29-651	23	0-283	104-2	74-2	13	...	...	52	29	149-4	27	71-9	309	29	108	24	0-69	...
May	29-860	29-586	21	0-274	108-4	79-1	4	...	...	25	28	151-5	23	77-5	306	7	170	25	...	...
June	29-814	29-560	7	0-254	103-9	72-7	22	...	...	32	12	152-5	17	71-2	241	11	116	29	1-60	...
July	29-848	29-568	4 & 5	0-260	98-8	71-0	23	...	...	42	19 & 22	149-5	22	70-5	235	12	93	4	2-35	...
August	29-848	29-597	23	0-251	97-2	73-5	9	...	...	42	13	150-6	13	68-7	235	12	52	4	2-36	...
September	29-892	29-646	10	0-246	95-9	72-5	29	...	...	44	13	153-7	29	71-7	166	20	56	23	2-25	...
October	29-977	29-687	21	0-290	93-2	70-6	9	...	...	39	9	152-9	11	64-1	220	17	60	19	2-30	...
November	29-998	29-719	1	0-279	91-2	68-0	30	...	...	51	12	150-5	24	61-0	252	15	62	3	0-67	...
December	30-110	29-912	2	0-198	86-9	65-1	1	...	...	50	10	150-7	24	61-3	234	1	104	27	3-11	...

APPENDIX II.

MADRAS Observatory Meteorological Observations—Abnormals for monthly Means.

1892.	January.	February.	March.	April.	May.	June.	July.
1	2	3	4	5	6	7	8
Reduced atmospheric pressure	+ 0-017	- 0-044	- 0-073	- 0-044	- 0-014	- 0-002	- 0-021
Temperature of air	+ 0-8	+ 0-4	+ 0-9	+ 0-4	+ 0-7	- 1-8	- 1-4
Do. of evaporation	+ 1-1	+ 1-2	+ 1-8	+ 1-7	+ 0-1	+ 1-7	+ 1-2
Percentage of humidity	+ 0-0	+ 2	+ 2	+ 3	+ 3	+ 10	+ 7
Greatest solar heat in <i>vacuo</i>	+ 1-8	+ 2-8	+ 0-1	+ 2-8	+ 4-0	+ 2-2	+ 1-4
Maximum in shade	+ 2-1	+ 2-3	+ 3-3	+ 1-2	+ 3-1	+ 1-9	+ 2-2
Minimum in shade	+ 0-1	+ 0-7	+ 0-4	+ 1-1	+ 1-5	+ 1-6	+ 1-0
Do. on grass	+ 2-0	+ 1-9	+ 1-6	+ 2-3	+ 2-8	+ 0-6	+ 0-8
Rainfall in inches	- 0-81	- 0-28	- 0-41	+ 0-06	- 2-21	+ 1-95	+ 4-04
Do. since January 1st	..	- 1-09	- 1-50	- 1-44	- 3-65	- 1-70	- 2-34
General direction of wind	2-N	..	1-E	..	..	2-S	1-S
Daily velocity in miles	+ 16	+ 12	+ 11	+ 1	+ 2	- 36	- 46
Percentage of clear sky	+ 2	+ 7	+ 9	+ 3	+ 5	+ 6	- 4

1892.	August.	September.	October.	November.	December.	Year.
9	10	11	12	13	14	
Reduced atmospheric pressure	- 0-021	- 0-011	- 0-022	- 0-015	+ 0-034	- 0-018
Temperature of air	- 2-6	+ 1-8	+ 0-6	+ 0-1	- 0-1	- 0-5
Do. of evaporation	+ 0-8	+ 0-1	+ 0-9	- 0-3	- 0-6	+ 0-9
Percentage of humidity	+ 11	+ 5	+ 5	+ 2	+ 1	+ 3
Greatest solar heat in <i>vacuo</i>	+ 2-3	+ 0-2	+ 7-2	+ 10-1	+ 6-5	+ 3-3
Maximum in shade	+ 2-7	+ 1-2	+ 0-6	+ 2-4	+ 2-4	+ 0-8
Minimum in shade	+ 1-5	+ 1-6	+ 1-4	+ 1-9	+ 1-8	+ 0-7
Do. on grass	+ 1-1	+ 0-9	+ 0-5	+ 1-3	+ 0-7	+ 0-4
Rainfall in inches	+ 6-31	+ 1-54	+ 4-55	+ 12-63	+ 0-50	..
Do. since January 1st	+ 8-65	+ 10-19	+ 5-64	+ 6-99	+ 7-49	- 7-49
General direction of wind	1-S	..	1-N	1-N	1-N	2-E
Daily velocity in miles	+ 67	+ 43	+ 7	+ 3	+ 25	+ 15
Percentage of clear sky	- 5	- 4	+ 8	+ 13	+ 7	+ 4

+ means above and - below the average.

ORDER—dated 15th June 1893, No. 460, Public.

Recorded.

(True Extract.)

Chief Secretary.

To the Government Astronomer.
Editors' Table.

ENDORSEMENT—dated 15th June 1893, No. 461, Public.

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

J. F. PRICE,
Chief Secretary.

Exd. S. J. Periera.

Date.	Signal.	Fault.	Cause.
Jan. 2nd ..	Gun ..	Fired 4 seconds too soon at noon ..	Clock.
" 7th ..	Semaphore ..	Failed 8 A.M. ..	* Bad friction tube.
Feb. 15th ..	Gun ..	Do. at 8 P.M. ..	Do.
" 16th ..	Do. ..	Do. at noon ..	Do.
" 17th ..	Do. ..	Do. at 8 P.M. ..	Do.
" 24th ..	Do. ..	Do. at noon ..	Do.
March 13th ..	Semaphore ..	Do. 8 A.M. and 2 P.M. ..	* Bad friction tube.
April 6th ..	Gun ..	Do. at noon ..	Do.
" 21st ..	Semaphore ..	Do. at 2 P.M. ..	* Doubtful.
" 25th ..	Do. ..	Do. 8 A.M. and 2 P.M. ..	Do.
" ..	Gun ..	Do. 8 P.M. ..	Do.
" 29th ..	Semaphore ..	Do. 8 A.M. and 2 P.M. ..	Do.
May 23rd ..	Gun ..	Fired nearly 1 second late at 8 P.M. ..	Gun hung fire.
June 5th ..	Semaphore ..	Failed 8 A.M. and 2 P.M. ..	* Bad friction tube.
" 10th ..	Gun ..	Do. at noon ..	Do.
" 27th ..	Semaphore ..	Do. 8 A.M. ..	Do.
July 19th ..	Do. ..	Do. A.M. and 2 P.M. ..	Do.
Aug. 14th ..	Do. ..	Dropped at 6 seconds past 8 ..	Clock.
Sept. 5th ..	Gun ..	Failed at 8 P.M. ..	Friction tube broke.
" 21st ..	Semaphore ..	Do. at 8 A.M. ..	Telegraph office.
Oct. 15th ..	Do. ..	Do. do. ..	Do.
Nov. 2nd ..	Do. ..	Dropped 3 seconds too soon at 8 A.M. ..	Clock.
" 5th ..	Gun ..	Fired nearly 1 second late at noon ..	Unknown.

N.B.—In the cases marked * the failure was almost certainly due to a bad connection at the Telegraph office.

The performance of the time gun was the best on record (98.8 per cent. of success) and reflects great credit on Gunner Watmore who is in charge of it.

5. *Reductions and Publications.*—As mentioned in last report two volumes—Volume IV. of the Meridian Circle Observations and the volume of Meteorological results for 1861–90—were nearly completed at the beginning of the year. These were completed and distributed in January and February. Volume V. (1874–5–6) of the meridian circle observations is a comparatively small one and it was completed early in July and distributed soon after. Volume VI. (1877–8–9) was then taken in hand and was well advanced by the close of the year. It is a particularly heavy one as it deals with 9,637 observations, many of them of stars which were observed in one of these years for the first time. At the same time the printing of the hourly meteorological observations for the period January 1856 to February 1861 was carried on, and about three-quarters of the volume was in type at the close of the year. The completion of this volume will make it possible to discuss the meteorology of Madras for the last 80 years in a systematic manner, and the time of the assistants when not required for other work has been utilized in the preliminary work required for this discussion. As a beginning 5-day means for the whole period of 80 years are being tabulated for the rainfall and barometric pressure. The present position of the Observatory arrears then is that in meteorology the publication of observations is practically up to date and that it is now possible to utilize the long series for practical purposes. In astronomy much remain still in hand. Of the meridian circle observations two more volumes and the final catalogue have to be brought out before it is possible to touch any of the other work, and it is still uncertain how much of this other work may be considered worth publishing. Much of it is certainly valuable, but some has probably been so completely superseded by more recent work with more powerful instruments that it would no longer repay the cost and labour of publication.

6. *The Library.*—The number of publications presented to the library during the year in exchange for the publications of the Observatory was nearly 200. In addition to these valuable positives on glass of two of the fine lunar photographs taken at the Lick Observatory were presented by Professor Holden and it is to be hoped that these may form the nucleus of a collection of astronomical photographs. During the year the work of cataloguing and binding the library books has been carried on steadily. The names of the whole of the bound volumes have been entered on slips and rough lists have been made of the unbound volumes and pamphlets. The cataloguing of the manuscripts records is now in hand. Three hundred and nine volumes had been bound at the Government Press up to the close of the year, and a number of other volumes were ready for binding.

7. *Meteorological.*—The meteorological registers were continued as in the former year except as regards the 2 P.M. observations which had been rendered unnecessary by the re-introduction of the 10 A.M. and 4 P.M. observations. The chief features of the meteorology of the year are shown in the tables and diagram which form an appendix to this report. The mean barometer was below the average in all months except January and December, the deficiency amounting to 0.073 inch in March and the excess amounting to 0.034 inch in December. The mean temperature in the shade was above the average from January to May and below it for the rest of the year. The highest shade temperature recorded was 108.5 on May 22nd, and the lowest 62.5 on February 22nd. The highest temperature recorded by the solar radiation thermometer in vacuo was 157.1 on May 26th. The rainfall was below the average from January to May, above from June to September, and below for the rest of the year. By the end of September the rainfall exceeded the average by 10.19 inches, but by the close of the year the deficiency amounted to 7.49 inches. The rainfall from October 15th to December 31st was only 9.83 inches, against an average due of 27.6 inches. The rainfall for the whole year was 42.04 inches which is 6.98 inches below the average of the last 80 years. The wind direction during the year was nearly normal, but the daily amount varied considerably from the normal. In January, February, March, and May the daily velocity was above the average and in all the other months it was below, the deficiency amounting to no less than 67 miles a day in August. Except in July, August, and September the amount of clear sky exceeded the normal. There were 2,722 hours of bright sunshine during the year against 2,894 in 1891. The accompanying curves show the mean monthly abnormals, i.e., the difference between the monthly means for 1892 and the average monthly means—for the barometer, dry bulb thermometer, humidity, cloud, and rainfall. One feature brought out by last year's meteorological observations is the influence of rainfall on the air temperature, especially in the hot months, excessive rainfall causing deficient temperature. This is, of course, a familiar experience on a smaller scale and it is mentioned now chiefly to call attention to the clearness with which the connection can be shown by curves of abnormals.

8. *Service Books.*—These are maintained in order.

GOVERNMENT OF MADRAS.

PUBLIC DEPARTMENT.

READ—the following paper :—

From C. MICHIE SMITH, Esq., Officiating Government Astronomer, to the Chief Secretary to Government, dated Madras, 5th June 1893, No. 123.

I have the honour to submit herewith my report on the working of the Observatory for 1892.

ENCLOSURE.

ADMINISTRATION REPORT ON THE MADRAS OBSERVATORY FOR THE YEAR 1892.

1. *Staff*.—The Second Assistant L. Moghansing, who had been on the staff since April 1872, died in July 1892. His place was filled by K. V. Sivaramiah, a Master of Arts in Physical Science of the Madras University, who was holding the temporary appointment of computer. His place was taken by P. Soobiah, B.A. There were no other changes in the staff.

2. *Instruments and Buildings*.—These have been in good order throughout the year.

3. *Observations*.—As for several years past, most of the time of the staff has been given to publication work, but the proposals regarding the future of the Observatory made it necessary to devote some time in the early part of the year to observations for comparing the relative merits of Kodaikanal, Kotagiri and Madras as stations for an observatory. Accordingly, the Government Astronomer spent 15 days at Kodaikanal and 16 days at Kotagiri, making an, as nearly as possible, identical series of observations at the two places. These were compared with each other and with a similar series made at Madras and the results were embodied in a special report. The Government Astronomer also undertook the tabulation and discussion of the sunshine observations made at the three stations. A little work was also done in searching for suitable absorption media for observing solar prominences without the use of a spectroscope and a partial success was obtained. A few observations were made on the zodiacal light, which was a very conspicuous object towards the end of December.

4. *Time Service*.—The time service was maintained as in former years except in one respect. From December 1st the semaphore at the Port office was dropped only once a day, at 1 P.M., instead of twice as in former years. The chief reason for the change was that as the motor clock, which drops the semaphore, cannot conveniently be adjusted to correct time before about 11 A.M., the error of the clock at 8 A.M., when the semaphore was first dropped, was the accumulated error of the clock for 21 hours, and this, in extreme cases, might amount to fully 1 second. If, for any cause, the semaphore fails to drop at 1 P.M., an attempt is made to drop it at 2 P.M. The time gun failed on only eight occasions throughout the year and was 4 seconds too soon on one, and 1 second late on two other occasions. The semaphore failed or was more than 1 second wrong on 17 occasions out of a total of 701. Of these failures, two were due to faults at the Observatory and the rest were apparently due to the commutator at the Central Telegraph office. The failures (only $2\frac{1}{2}$ per cent.) are far fewer than in any previous year. The following table shows the failures in the time signals for the year :—

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G.O., &c., 15th June 1893,
Nos. 460, 461.

JUNE.

Madras Observatory.

Recording the report on the working of the —
for 1892.

Henry C. C. K.

APPENDIX I.

MEAN monthly and annual Meteorological results at the Madras Observatory in 1892.

	Barometer.		Dry Bulb Thermometer.			Wet Bulb.		Tension of vapour.	Relative humidity.	Sun. in vac.	Mix. on grass.	Wind.		Rain.		Clear sky.	General weather.
	Reduced to 32°.	Daily range.	Mean.	Max.	Min.	Mean.	Min.					(Daily velocity.)	Mean direction.	Amount.	Days.		
January	30.012	Inches.	75.6	84.9	67.8	70.0	70.0	Inches.	75	140.3	65.1	Points.	Points.	Inches.	No.	Cenla.	
February	29.918	0.101	77.2	87.7	68.4	72.0	72.0	721	77	142.0	65.7	3	N. E. by N.	0.13	2	66	
March	29.831	0.115	80.8	91.7	72.4	75.3	75.3	808	76	144.4	70.0	8	S. E. by E.	..	81	81	
April	29.780	0.120	84.7	93.9	78.5	79.1	79.1	821	77	144.3	76.8	11	S. E. by S.	..	85	85	
May	29.716	0.121	87.9	100.7	82.5	82.3	82.3	841	64	145.9	81.5	13	S. by E.	0.69	74	74	
June	29.696	0.110	85.2	96.3	79.3	78.1	78.1	868	73	141.0	78.0	17	S. by W.	..	65	65	
July	29.685	0.102	83.6	93.4	78.0	76.9	76.9	838	72	138.1	75.9	19	S. W. by S.	4.02	41	41	
August	29.728	0.102	81.0	90.5	76.1	75.8	75.8	822	82	136.9	74.2	11	S. S. W.	7.82	22	22	
September	29.763	0.117	81.3	90.9	75.7	75.2	75.2	832	78	140.3	74.0	18	S. S. W.	10.79	22	22	
October	29.819	0.114	80.2	88.9	74.2	73.3	73.3	860	84	143.4	72.3	19	S. W. by S.	6.39	12	32	
November	29.918	0.101	77.4	86.4	70.6	72.3	72.3	731	77	143.1	68.1	7	E. by N.	6.44	12	51	
December	30.013	0.109	75.2	84.5	68.4	70.8	70.8	696	79	140.3	65.7	1	N. by E.	1.12	3	56	
Annual	29.824	0.110	80.8	90.8	74.3	75.2	75.2	804	76	141.7	72.3	11	S. E. by E.	42.04	91	55	

EXTREME monthly Meteorological records at the Madras Observatory in 1892.

	Barometer.		Dry Bulb Thermometer.			Wet Bulb.		Humidity.		Sun. Th. in vacuo.		Grass therm.		Wind.		Rain.	
	Highest.	Lowest.	Range.	Highest.	Lowest.	Highest.	Lowest.	Highest.	Lowest.	Highest.	Lowest.	Highest.	Lowest.	Highest.	Lowest.	Greatest fall.	
January	Inches. 30.119	Inches. 29.888	Inches. 0.231	Day. 10	Day. 25	Day. 13	Day. 26	° 64.3	° 59.6	° 143.9	° 127	° 60.0	° 69.6	Day. 4	Miles. 115	Inches. 0.12	Day. 23
February	30.078	29.788	0.290	23	29	22	24	62.6	59.6	146.7	23	59.6	69.6	17	80	..	21
March	29.934	29.673	0.261	22	29	13	24	66.5	59.6	146.7	23	59.6	69.6	20	81	..	13
April	29.860	29.586	0.274	21	22	4	29	74.2	59.6	149.4	27	71.9	71.9	29	108	0.69	24
May	29.814	29.560	0.254	7	12	72.7	22	79.1	59.6	151.5	23	71.5	71.5	3	170	..	25
June	29.843	29.588	0.255	23	23	23	19 & 22	82	59.6	152.5	22	70.5	70.5	11	116	1.60	29
July	29.843	29.597	0.246	23	23	9	19 & 22	82	59.6	152.5	22	70.5	70.5	12	92	2.36	4
August	29.843	29.597	0.246	23	23	9	19 & 22	82	59.6	152.5	22	70.5	70.5	14	53	2.36	25
September	29.892	29.646	0.246	21	23	9	19 & 22	82	59.6	152.5	22	70.5	70.5	20	56	2.36	23
October	29.977	29.687	0.290	21	23	9	19 & 22	82	59.6	152.5	22	70.5	70.5	17	60	2.36	19
November	29.998	29.719	0.279	21	23	9	19 & 22	82	59.6	152.5	22	70.5	70.5	15	62	0.67	13
December	30.110	29.912	0.198	2	3	1	10	65.1	50	150.7	24	61.3	61.3	1	104	8.11	15

APPENDIX II.

MADRAS Observatory Meteorological Observations—Abnormals for monthly means.

1892.	January.	February.	March.	April.	May.	June.	July.
1	2	3	4	5	6	7	8
Reduced atmospheric pressure	+ 0.017	- 0.044	- 0.073	- 0.044	- 0.014	+ 0.002	- 0.021
Temperature of air	+ 0.8	+ 0.4	+ 0.9	+ 0.4	+ 0.7	+ 1.8	+ 1.4
Do. of evaporation	+ 1.1	+ 1.2	+ 1.8	+ 1.7	+ 0.1	+ 1.7	+ 1.2
Percentage of humidity	+ 0.0	+ 2	+ 2	+ 3	+ 3	+ 10	+ 7
Greatest solar heat in <i>vacuo</i>	+ 1.8	+ 2.8	+ 0.1	+ 2.8	+ 4.0	+ 2.2	+ 1.4
Maximum in shade	+ 2.1	+ 2.3	+ 3.3	+ 1.2	+ 3.1	+ 1.9	+ 2.2
Minimum in shade	+ 0.1	+ 0.7	+ 0.4	+ 1.1	+ 1.5	+ 1.6	+ 1.0
Do. on grass	+ 2.0	+ 1.9	+ 1.6	+ 2.3	+ 2.8	+ 0.6	+ 0.8
Rainfall in inches ~~on days~~	+ 0.81	+ 0.28	+ 0.41	+ 0.06	+ 2.21	+ 1.95	+ 4.04
Do. since January 1st ~~on days~~	+ 1.09	+ 1.50	+ 1.44	+ 3.65	+ 2.21	+ 1.70	+ 2.34
General direction of wind	N	N	N	N	N	N	N
Daily velocity in miles	+ 16	+ 12	+ 11	+ 1	+ 2	+ 2.6	+ 1.8
Percentage of clear sky	+ 2	+ 7	+ 9	+ 3	+ 5	+ 6	+ 4

1892.	August.	September.	October.	November.	December.	
9	10	11	12	13	14	
Reduced atmospheric pressure	- 0.021	- 0.011	- 0.022	- 0.015	+ 0.034	- 0.018
Temperature of air	- 2.6	- 1.8	- 0.6	- 0.1	- 0.1	- 0.5
Do. of evaporation	+ 0.8	+ 0.1	+ 0.9	+ 0.3	+ 0.6	+ 0.9
Percentage of humidity	+ 11	+ 5	+ 5	+ 2	+ 1	+ 3
Greatest solar heat in <i>vacuo</i>	+ 2.7	+ 0.2	+ 7.2	+ 10.1	+ 6.5	+ 3.3
Maximum in shade	+ 2.7	+ 1.2	+ 0.6	+ 2.4	+ 2.4	+ 0.8
Minimum in shade	+ 1.5	+ 1.6	+ 1.4	+ 1.9	+ 1.8	+ 0.7
Do. on grass	+ 1.1	+ 0.0	+ 0.5	+ 1.4	+ 0.7	+ 0.4
Rainfall in inches ~~on days~~	+ 6.31	+ 1.54	+ 4.65	+ 12.63	+ 0.60	+ 7.49
Do. since January 1st ~~on days~~	+ 8.65	+ 10.19	+ 5.64	+ 6.99	+ 7.49	+ 7.49
General direction of wind	N	N	N	N	N	N
Daily velocity in miles	+ 67	+ 43	+ 7	+ 3	+ 25	+ 15
Percentage of clear sky	- 6	- 4	+ 8	+ 13	+ 7	+ 4

+ Means above and - below the average.

ORDER—dated 15th June 1893, No. 460, Public.

Recorded.

(True Extract.)

J. F. PRICE,
Chief Secretary.To the Government Astronomer.
Editors' Table.

ENDORSEMENT—dated 15th June 1893, No. 461, Public.

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

Chief Secretary.

Exd. S. J. Periera.

Date.	Signal.	Fault.	Cause.
Jan. 2nd ..	Gun ..	Fired 4 seconds too soon at noon ..	Clock.
" 7th ..	Semaphore ..	Failed 8 A.M. ..	*
Feb. 15th ..	Gun ..	Do. at 8 P.M. ..	Bad friction tube.
" 16th ..	Do. ..	Do. at noon ..	Do.
" 17th ..	Do. ..	Do. at 8 P.M. ..	Do.
" 24th ..	Do. ..	Do. at noon ..	Do.
March 13th ..	Semaphore ..	Do. 8 A.M. and 2 P.M. ..	*
April 6th ..	Gun ..	Do. at noon ..	Bad friction tube.
" 21st ..	Semaphore ..	Do. at 2 P.M. ..	*
" 25th ..	Do. ..	Do. 8 A.M. and 2 P.M. ..	*
" ..	Gun ..	Do. 8 P.M. ..	Doubtful.
" 29th ..	Semaphore ..	Do. 8 A.M. and 2 P.M. ..	*
May 23rd ..	Gun ..	Fired nearly 1 second late at 8 P.M. ..	Gun hung fire.
June 6th ..	Semaphore ..	Failed 8 A.M. and 2 P.M. ..	*
" 10th ..	Gun ..	Do. at noon ..	Bad friction tube.
" 27th ..	Semaphore ..	Do. 8 A.M. ..	*
July 19th ..	Do. ..	Do. A.M. and 2 P.M. ..	*
Aug. 14th ..	Do. ..	Dropped at 6 seconds past 8 ..	Clock.
Sept. 5th ..	Gun ..	Failed at 8 P.M. ..	Friction tube broke.
" 21st ..	Semaphore ..	Do. at 8 A.M. ..	Telegraph office.
Oct. 15th ..	Do. ..	Do. do. ..	Do.
Nov. 2nd ..	Do. ..	Dropped 3 seconds too soon at 8 A.M. ..	Clock.
" 5th ..	Gun ..	Fired nearly 1 second late at noon ..	Unknown.

N.B.—In the cases marked * the failure was almost certainly due to a bad connection at the Telegraph office.

The performance of the time gun was the best on record (98·8 per cent. of success) and reflects great credit on Gunner Watmore who is in charge of it.

5. *Reductions and Publications.*—As mentioned in last report two volumes—Volume IV_A of the Meridian Circle Observations and the volume of Meteorological results for 1861–90—were nearly completed at the beginning of the year. These were completed and distributed in January and February. Volume V_A (1874–5–6) of the meridian circle observations is a comparatively small one and it was completed early in July and distributed soon after. Volume VI_A (1877–8–9) was then taken in hand and was well advanced by the close of the year. It is a particularly heavy one as it deals with 9,637 observations, many of them of stars which were observed in one of these years for the first time. At the same time the printing of the hourly meteorological observations for the period January 1856 to February 1861 was carried on, and about three-quarters of the volume was in type at the close of the year. The completion of this volume will make it possible to discuss the meteorology of Madras for the last 80 years in a systematic manner, and the time of the assistants when not required for other work has been utilized in the preliminary work required for this discussion. As a beginning 5-day means for the whole period of 80 years are being tabulated for the rainfall and barometric pressure. The present position of the Observatory arrears then is that in meteorology the publication of observations is practically up to date and that it is now possible to utilize the long series for practical purposes. In astronomy much remain still in hand. Of the meridian circle observations two more volumes and the final catalogue have to be brought out before it is possible to touch any of the other work, and it is still uncertain how much of this other work may be considered worth publishing. Much of it is certainly valuable, but some has probably been so completely superseded by more recent work with more powerful instruments that it would no longer repay the cost and labour of publication.

6. *The Library.*—The number of publications presented to the library during the year in exchange for the publications of the Observatory was nearly 200. In addition to these valuable positives on glass of two of the five lunar photographs taken at the Lick Observatory were presented by Professor Holden and it is to be hoped that these may form the nucleus of a collection of astronomical photographs. During the year the work of cataloguing and binding the library books has been carried on steadily. The names of the whole of the bound volumes have been entered on slips and rough lists have been made of the unbound volumes and pamphlets. The cataloguing of the manuscripts records is now in hand. Three hundred and nine volumes had been bound at the Government Press up to the close of the year, and a number of other volumes were ready for binding.

7. *Meteorological.*—The meteorological registers were continued as in the former year except as regards the 2 P.M. observations which had been rendered unnecessary by the re-introduction of the 10 A.M. and 4 P.M. observations. The chief features of the meteorology of the year are shown in the tables and diagram which form an appendix to this report. The mean barometer was below the average in all months except January and December, the deficiency amounting to 0·073 inch in March and the excess amounting to 0·034 inch in December. The mean temperature in the shade was above the average from January to May and below it for the rest of the year. The highest shade temperature recorded was 108·5 on May 22nd, and the lowest 62·5 on February 22nd. The highest temperature recorded by the solar radiation thermometer in vacuo was 157·1 on May 26th. The rainfall was below the average from January to May, above from June to September, and below for the rest of the year. By the end of September the rainfall exceeded the average by 10·19 inches, but by the close of the year the deficiency amounted to 7·49 inches. The rainfall from October 15th to December 31st was only 9·83 inches, against an average due of 27·6 inches. The rainfall for the whole year was 42·04 inches which is 6·98 inches below the average of the last 80 years. The wind direction during the year was nearly normal, but the daily amount varied considerably from the normal. In January, February, March and May the daily velocity was above the average and in all the other months it was below, the deficiency amounting to no less than 67 miles a day in August. Except in July, August and September the amount of clear sky exceeded the normal. There were 2,722 hours of bright sunshine during the year against 2,894 in 1891. The accompanying curves show the mean monthly abnormalities, i.e., the difference between the monthly means for 1892 and the average monthly means—for the barometer, dry bulb thermometer, humidity, cloud and rainfall. One feature brought out by last year's meteorological observations is the influence of rainfall on the air temperature, especially in the hot months, excessive rainfall causing deficient temperature. This is, of course, a familiar experience on a smaller scale and it is mentioned now chiefly to call attention to the clearness with which the connection can be shown by curves of abnormalities.

8. *Service Books.*—These are maintained in order.

Public (1893) Dept.

To
The Government Astronomer

5th June 1903

Recd 7. VI. 93

CHIEF SECRETARY
GOVERNMENT OF MADRAS
26 JUN 93

Enclosures: 3 and
another sent separately

Submitting report on
the Observatory for 1892.

A
8/6

Under the
ad. no. 111 to
C. S. 111
[with enclosure]

c 13/6
R 15/6

15th June 1893, No. 460.
order! 14 June
Recorded.
13/6/93

To
The Govt. Astronomer & Deputy
Editorial Table. 28/7/93
No 461.
Copy to the Govt. of India Rev. and
Agricultural Department. 28/7/93
500 copies
28/7

For C. A.
This paper is in the C. T. list.
May it be selected? Last
year it was.

349
15/6

Proof - Plan sent to be lithographed
23/6

15TH JUNE 1893, Nos. 460, 461, PUBLIC.

GOVERNMENT OF MADRAS.
PUBLIC DEPARTMENT.

READ—the following paper:—

From C. MICHIE SMITH, Esq., Officiating Government Astronomer, to the
Chief Secretary to Government, dated Madras, 5th June 1893, No. 123.

I have the honour to submit herewith my report on the working of the Obser-
vatory for 1892.

ENCLOSURE.

ADMINISTRATION REPORT ON THE MADRAS OBSERVATORY FOR THE YEAR 1892.

1. *Staff*.—The Second Assistant L. Moghansing, who had been on the staff since
April 1872, died in July 1892. His place was filled by K. V. Sivaramiah, a Master
of Arts in Physical Science of the Madras University, who was holding the temporary
appointment of computer. His place was taken by P. Soobiah, B.A. There were no
other changes in the staff.

2. *Instruments and Buildings*.—These have been in good order throughout the
year.

3. *Observations*.—As for several years past, most of the time of the staff has been
given to publication work, but the proposals regarding the future of the Observatory
made it necessary to devote some time in the early part of the year to observations
for comparing the relative merits of Kodaikanal, Kotagiri and Madras as stations for
an observatory. Accordingly, the Government Astronomer spent 15 days at Kodaikanal
and 16 days at Kotagiri, making an, as nearly as possible, identical series of
observations at the two places. These were compared with each other and with a
similar series made at Madras and the results were embodied in a special report.
The Government Astronomer also undertook the tabulation and discussion of the
sunshine observations made at the three stations. A little work was also done in
searching for suitable absorption media for observing solar prominences without the
use of a spectroscope and a partial success was obtained. A few observations were
made on the zodiacal light, which was a very conspicuous object towards the end of
December.

4. *Time Service*.—The time service was maintained as in former years except in
one respect. From December 1st the semaphore at the Port office was dropped only
once a day, at 1 P.M., instead of twice as in former years. The chief reason for the change
was that as the Motor clock, which drops the semaphore, cannot conveniently be
adjusted to correct time before about 11 A.M., the error of the clock at 8 A.M., when the
semaphore was first dropped, was the accumulated error of the clock for 21 hours, and
this, in extreme cases, might amount to fully 1 second. If, for any cause, the
semaphore fails to drop at 1 P.M., an attempt is made to drop it at 2 P.M. The time
gun failed on only eight occasions throughout the year and was 4 seconds too soon on
one, and 1 second late on two other occasions. The semaphore failed or was more than
1 second wrong on 17 occasions out of a total of 701. Of these failures, two were due
to faults at the Observatory and the rest were apparently due to the commutator at the
Central Telegraph office. The failures (only 2½ per cent.) are far fewer than in any
previous year. The following table shows the failures in the time signals for the
year:—

8

Enclosure no. III to Letter
from the Government Astronomers
dated 5th June 1903 No. $\frac{123}{93}$

referred to
the

referred to

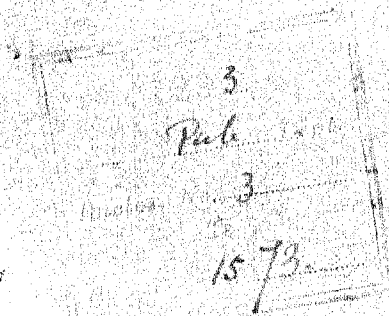
referred to

Appendix I.

1893
Re 6
1573.

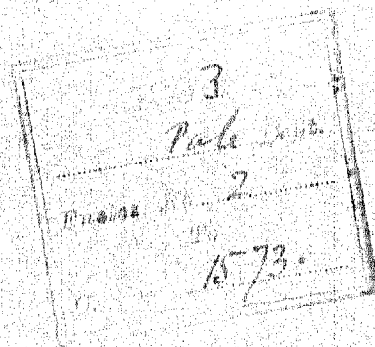
Enclosure I to letter
from the Government Astronomer
of 5th June 93 No. $\frac{123}{93}$.

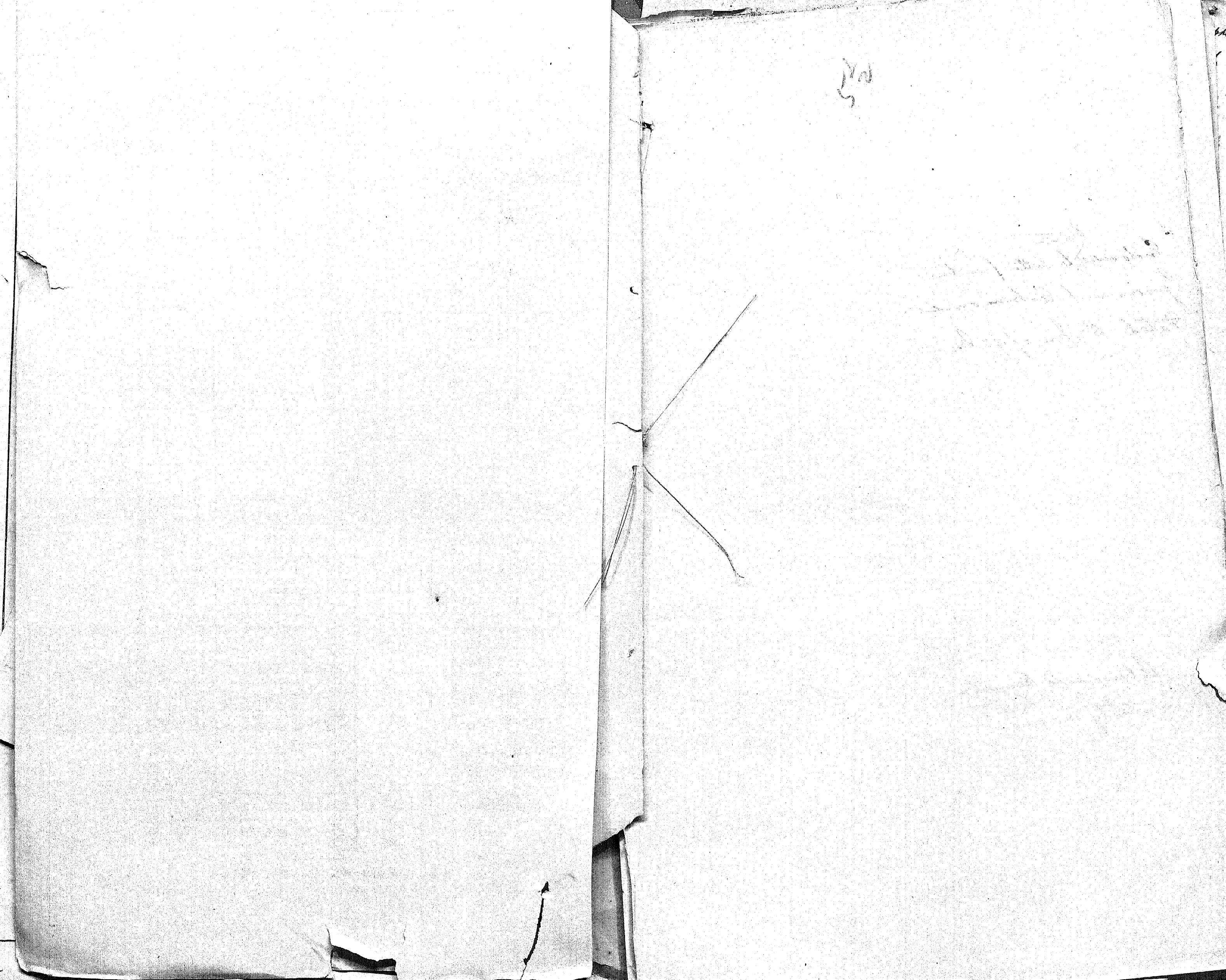
Report for 1892.



Enclosure to letter from the
Government Astronomer
dated 5th June/93 No. $\frac{123}{93}$

Abnormal Results
for monthly means.





Mean Monthly and Annual Meteorological Results at the Madras Observatory in 18

	Barometer.		Dry Bulb Thermometer.			Wet Bulb.		Tension of Vapour.		Relative Humidity.		Sun Max. in Vac.		Min on Grass.		Wind.		Rain.		Clear Sky.		General Weather.
	Reduced to 32°.	Inches.	Mean.	Max.	Min.	Range.	Mean.	Min.	By Blanford's Tables.	Inches.	Cents.	°	°	°	°	Daily Velocity.	Mean Direction.	Amount.	Days.	Cents.	No.	
January																						
February																						
March																						
April																						
May																						
June																						
July																						
August																						

Extreme Monthly Meteorology

as Observatory in 18

	Barometer.		Dry Bulb Thermometer.		Wet Bulb.		Humidity.		Sun Th. in Vacuo.		Grass Therm.		Wind.		Rain.	
	Highest.	Lowest.	Highest.	Lowest.	Lowest.	Day.	Lowest.	Day.	Highest.	Day.	Lowest.	Day.	Highest.	Lowest.	Greatest Fall.	Day.
January																
February																
March																
April																
May																
June																
July																
August																
September																
October																
November																
December																

Appendix II.

Madras Observatory Meteorological Observations
Observations for monthly means

	January	February	March	April	May	June	July	August	September	October	November	December
Reduced atmospheric pressure ...	+0.017	-0.044	-0.078	-0.044	-0.014	-0.002	-0.021	-0.021	-0.011	-0.022	-0.018	-0.018
Temperature of air ...	+0.8	+0.4	+0.9	+0.4	+0.7	-1.8	-1.4	-2.6	-1.8	-0.6	-0.1	-0.5
Do. of evaporation ...	+1.1	+1.2	+1.8	+1.7	+0.1	+1.7	+1.2	+0.8	+0.1	+0.9	-0.6	+0.9
Percentage of humidity ...	0.0	+2	+2	+3	-3	+10	+7	+11	+5	+5	-2	+3
Greatest solar heat in vacuo ...	+1.8	+2.8	-0.1	+2.8	+4.0	+2.2	+1.4	-2.3	-0.2	+7.2	+10.1	+3.3
Maximum in shade ...	+2.1	+2.3	+3.3	+1.2	+3.1	-1.9	-2.2	-2.7	-1.2	+0.6	+2.4	+0.8
Minimum in shade ...	-0.1	-0.7	+0.4	+1.1	+1.5	-1.6	-1.0	-1.5	-1.6	-1.4	-1.8	-0.7
Do. on grass ...	+2.0	+1.9	+1.6	+2.3	+2.8	-0.6	-0.8	-1.1	-0.9	-0.5	-1.4	+0.4
Rainfall in inches on days...	-0.81	-0.28	+0.41	+0.06	-2.21	+1.95	+4.04	+6.31	+1.54	-4.55	-12.68	-7.49
Do. since January 1st on days	2.2	-1.09	-1.50	-1.44	-3.65	-1.70	+2.34	+8.65	+10.19	+5.64	-6.99	2.25
General direction of wind ...	...	...	...	...	...	2.8	1.5	1.8	...	1.2	1.2	1.2
Daily velocity in miles ...	+16.	+12	+11	-1	+2	-36	-1.6	-67	-4.3	-7	-3	-15
Percentage of clear sky ...	+2	+7	+9	+3	+5	+6	-4	-5	-4	+8	+13	+4
Percentage of bright sunshine ...	...	...	...	...	...	below the	average.	...	...	...	...	...

was below, the deficiency amounting to no less than 67 miles a day in August. Except in July, August, and September the amount of clear sky exceeded the normal. There were 2722 hours of bright sunshine during the year against 2894 in 1891. The accompanying curves show the mean monthly abnormal, i.e. the difference between the monthly means for 1892 and the average monthly means - for the barometer, dry bulb thermometer, humidity, cloud, and rainfall. One feature brought out by last year's meteorological observations is the influence of rainfall on the air temperature, especially in the hot months - excessive rainfall causing deficient temperature. This is, of course, a familiar experience on a smaller scale and it is mentioned now chiefly to call attention to the clearness with which the connection can be shown by curves of abnormalities.

6. Service Books. These are maintained in order.

C. Nicolson Smith.

Offg. Asst. Astronomer

Appendix I.

Mean Monthly and Annual Meteorological Results at the Madras Observatory in 1892.

	Barometer.		Dry Bulb Thermometer.				Wet Bulb.		Tension of Vapour.	Relative Humidity.	Sun Max. in Vac.	Min on Grass.	Wind.		Rain.		Clear Sky.	General Weather.	
	Reduced to 32°.	Daily Range.	Mean.	Max.	Min.	Range.	Mean.	Min.	By Blanford's Tables.	Cents.	°	°	Daily Velocity.	Mean Direction.		Amount.			Days.
														Inches.	°				
~~January~~	Inches.	Inches.	°	°	°	°	°	°	Inches.	Cents.	°	°	Miles.	Points.	Points.	Inches.	No.	Cents.	
January	30.012	0.107	75.6	84.9	67.8	17.1	70.0	—	.662	75	140.3	65.1	165	8	N E by N	0.13	2	66	
February	29.918	0.101	74.2	84.7	68.4	19.3	72.0	—	.721	77	142.6	65.7	138	8	E S E	—	—	81	
March	29.831	0.115	80.8	91.7	72.4	19.3	75.3	—	.808	76	144.4	70.0	162	11	S E by E	—	—	85	
April	29.780	0.120	84.7	93.9	78.5	15.4	79.1	—	.921	77	144.3	76.8	188	13	S E by S	0.69	1	74	
May	29.716	0.121	87.9	100.7	82.5	18.2	78.3	—	.811	64	145.9	81.5	227	15	S E by E	—	—	65	
June	29.696	0.110	85.2	96.3	79.3	17.0	78.1	—	.818	72	141.0	78.0	178	17	S E by W	4.02	12	41	
July	29.695	0.102	83.6	98.4	78.0	15.4	76.9	—	.888	73	138.1	75.9	165	19	S W by S	7.82	22	22	
August	29.728	0.102	81.0	90.5	76.1	14.4	76.8	—	.870	82	136.9	74.2	111	18	S S W	10.79	22	26	
September	29.763	0.117	81.3	90.9	75.7	15.2	76.1	—	.832	78	140.3	74.0	117	19	S W by S	6.29	12	32	
October	29.819	0.114	80.2	88.9	74.2	14.7	76.4	—	.810	84	143.4	72.3	116	7	N E by N	6.44	12	51	
November	29.918	0.101	77.4	86.4	70.6	15.8	72.3	—	.731	77	143.1	68.1	165	1	N E by E	1.12	3	56	
December	30.013	0.109	75.2	84.5	68.4	16.1	70.8	—	.696	79	140.3	65.7	139	1	N E by E	4.74	5	56	
Annual	29.824	0.110	80.8	90.8	74.3	16.5	75.2	—	.804	76	141.7	72.3	157	11	S E by E	42.04	91	55	

Extreme Monthly Meteorological Records at the Madras Observatory in 1892.

	Barometer.			Dry Bulb Thermometer.		Wet Bulb.		Humidity.		Sun Th. in Vacuo.		Grass Therm.		Wind.		Rain.	
	Highest.	Inches.	Day.	Lowest.	Inches.	Range.	Day.	Lowest.	Cents.	Day.	Lowest.	Day.	Lowest.	Highest.	Miles.	Day.	Greatest Fall.
January	30.119	29.888	10	0.231	86.7	26	13	0.643	47	143.9	27	13	60.0	30.5	30.5	4	0.12
February	30.073	29.788	23	0.290	92.3	29	22	62.6	41	146.7	23	22	59.6	25.4	25.4	17	—
March	29.938	29.673	29	0.265	102.0	24	9	66.5	37	152.7	29	9	62.9	28.4	28.4	30	—
April	29.934	29.651	22	0.283	104.2	29	13	74.2	52	149.4	27	13	71.9	27.7	27.7	29	0.69
May	29.846	29.586	21	0.274	108.4	22	4	79.1	25	151.5	23	3	77.5	30.6	30.6	7	—
June	29.814	29.560	7	0.254	103.9	12	22	72.7	32	152.5	17	22	71.2	24.1	24.1	11	1.60
July	29.818	29.538	4	0.260	98.8	19	23	71.0	42	149.5	22	23	70.5	25.9	25.9	12	2.36
August	29.818	29.597	23	0.251	97.2	3	9	72.1	42	150.6	13	10	68.7	17.2	17.2	3	2.25
September	29.892	29.646	10	0.226	95.9	15	29	72.5	44	153.7	29	29	71.7	16.6	16.6	20	2.25
October	29.977	29.687	21	0.290	99.2	9	9	66.6	39	152.9	11	9	64.1	22.0	22.0	17	2.30
November	29.998	29.719	1	0.277	97.2	3	30	66.0	51	150.5	1	30	61.0	25.2	25.2	15	0.64
December	30.110	29.912	2	0.198	86.9	3	1	65.1	50	150.7	24	1	61.5	23.4	23.4	1	3.11

Lick Observatory were presented by Professor Holden and it is to be hoped that these may form the nucleus of a collection of astronomical photographs. During the year the work of cataloguing and binding the library books has been carried on steadily. The names of the whole of the bound volumes have been entered on slips and rough lists have been made of the unbound volumes and pamphlets. The cataloguing of the M.S. records is now in hand. 309 volumes had been bound at the Government Press up to the close of the year and a number of other volumes were ready for binding.

7. Meteorological. The meteorological registers were continued as in the former year except as regards the 2 P.M. observations which had been rendered unnecessary by the re-introduction of the 10 A.M. and 4 P.M. observations. The chief features of the meteorology of the year are shown in the tables and diagrams which form an Appendix to this report. The mean barometer was below the average in all months except January and December, the deficiency amounting to

to 0.073 inch in March and the excess amounting to 0.034 inch in December. The mean temperature in the shade was above the average from January to May and below it for the rest of the year. The highest shade temperature recorded was 108.5 on May 22nd and the lowest 62.5 on February 22nd. The highest temperature recorded by the solar radiation thermometer in vacuo was 157.1, on May 26th. The rainfall was below the average from January to May, above from June to September, and below for the rest of the year. By the end of September the rainfall exceeded the average by 10.19 inches, but by the close of the year the deficiency amounted to 4.49 inches. The rainfall from October 15th to December 31st was only 9.83 inches against an average due of 24.6 inches. The rainfall for the whole year was 42.04 inches which is 6.98 inches below the average of the last ⁸⁰ years. The wind direction during the year was nearly normal, but the daily amount varied considerably from the normal. In January, February, March, and May the daily velocity was above the average and in all the other months it was

The performance of the time gun was the best on record (98.8 per cent of success) and reflects great credit on Gunner Watmore who is in charge of it.

5. Reductions and Publications: As mentioned in last report two volumes - Vol. IV of the Meridian Circle observations and the volume of meteorological Results 1861-90 were nearly completed at the beginning of the year. These were completed and distributed in January and February. Vol. V (1874-5-6) of the Meridian Circle observations is a comparatively small one and it was completed early in July and distributed soon after. Vol. VI (1877-8-9) was then taken in hand and was well advanced by the close of the year. It is a particularly heavy one as it deals with 9,637 observations - many of them of stars which were observed in one of these years for the first time. At the same time the printing of the Hourly Meteorological observations for the period January 1856 to February 1861 was well on, and about three quarters of the volume was in type at the close of the year. The completion of this volume will make it possible to discuss the meteorology of Madras for the last 80 years in a systematic manner, and the time of the Assistants when not required for other work has been utilized in the preliminary work required for this

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this discussion. As a beginning 5-day means for the whole period of 80 years are being tabulated for the rainfall and barometric pressure. The present position of the Observatory appears then is that in meteorology the publication of observations is practically up to date and that it is now possible to utilize the long series for practical purposes. In Astronomy much remains still in hand. Of the Meridian Circle observations two more volumes and the final Catalogue have to be brought out before it is possible to touch any of the other work, and it is still uncertain how much of this other work may be considered worth publishing. Much of it is certainly valuable, but some has probably been so completely superseded by more recent work with more powerful instruments that it would no longer repay the cost and labours of publication.

6. The Library. The number of publications presented to the library during the year in exchange for the publications of the Observatory was nearly 200. In addition to these valuable positives on glass of two of the fine lunar photographs taken at the

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with each other and with a similar series made at Albadras and the results were embodied in a special report. The Government astronomer also undertook the tabulation and discussion of the sunshine observations made at the three stations. A little work was also done in searching for suitable absorption media for observing solar prominences without the use of a spectroscope and a partial success was obtained. A few observations were made on the zodiacal light, which was a very conspicuous object towards the end of December.

4. Time Service. The time service was maintained as in former years except in one respect. From December 1st, the semaphore at the Port Office was dropped only once a day - at 1 P.M. - instead of twice as in former years. The chief reason for the change was that as the motor clock, which drops the semaphore, cannot conveniently be adjusted to correct time before about 11 A.M. the error of the clock at 8 A.M., when the semaphore was first dropped, was the accumulated error of the clock for 24 hours, and this, in extreme cases, might amount to fully one second. If for any cause the semaphore fails

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16.9.92

Date	Signal	Fault	Cause
January 2 nd	Gun	Fired 4 ⁵ too soon at noon	Clock
" 7	Semaphore	Failed 8 A.M.	*
February 15	Gun	Failed at 8 P.M.	Bad friction tube
" 16	"	" at noon	"
" 17	"	" at 8 P.M.	"
" 24	"	" at noon	"
March 13	Semaphore	Failed 8 A.M. & 2 P.M.	*
April 6	Gun	Failed at noon	Bad friction tube
" 21	Semaphore	" at 2 P.M.	*
" 25	"	" 8 A.M. & 2 P.M.	*
" "	Gun	" 8 P.M.	Doubtful
" 29	Semaphore	" 8 A.M. & 2 P.M.	*
May 23	Gun	Fired nearly 1 ⁵ late at 8 P.M.	Gun hung fire
June 5	Semaphore	Failed 8 A.M. & 2 P.M.	*
" 10	Gun	Failed at noon	Bad friction tube
" 24	Semaphore	" 8 A.M.	*
July 19	"	" 8 A.M. & 2 P.M.	*
August 14	"	Dropped at 6 ⁵ past 8.	Clock
September 5	Gun	Failed at 8 P.M.	Friction tube broke
" 24	Semaphore	" 8 A.M.	Telegraph office
October 15	"	"	"
November 2	"	Dropped 3 ⁵ too soon at 8 A.M.	Clock
" 5	Gun	Fired nearly 1 ⁵ late at noon	Unknown

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In the cases marked * the failure was almost certainly due to a bad connection at the Telegraph office.

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Administration Report on the Madras
Observatory for the year 1892.

1. Staff. The second Assistant L. Moghan-
sing who had been on the staff since April 1872 died
in July 1892. His place was filled by H. V. Swara-
miah, a Master of Arts in Physical Science of the
Madras University who was holding the temporary
appointment of Computer. His place was taken by
P. Loochiai, B. A. There were no other changes in
the staff.

2. Instruments and Buildings. These have been
in good order throughout the year.

3. Observations. As for several years past, most
of the time of the staff has been given to publica-
tion work but the proposals regarding the future
of the Observatory made it necessary to devote
some time in the early part of the year to obser-
vations for comparing the relative merits of Kodaik-
kanal, Kotagiri and Madras as stations for an
Observatory. Accordingly the Government
Astronomer spent 15 days at Kodaikanal
and 16 days at Kotagiri making an, as near-
ly as possible, identical series of observations
at the two places. These were compared

with

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18 THE OBSERVATORY,
Madras, 5th June 1893.
1873

FROM

THE GOVERNMENT ASTRONOMER,

Madras.

TO

The Chief Secretary to Government,
Public Department.

SIR,

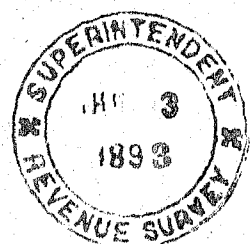
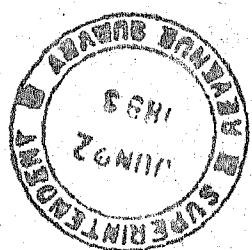
I have the honor to submit herewith
my report on the working of the Observatory
for 1892.

I have the honor to be,

Sir,
Your most obedt. Servant,

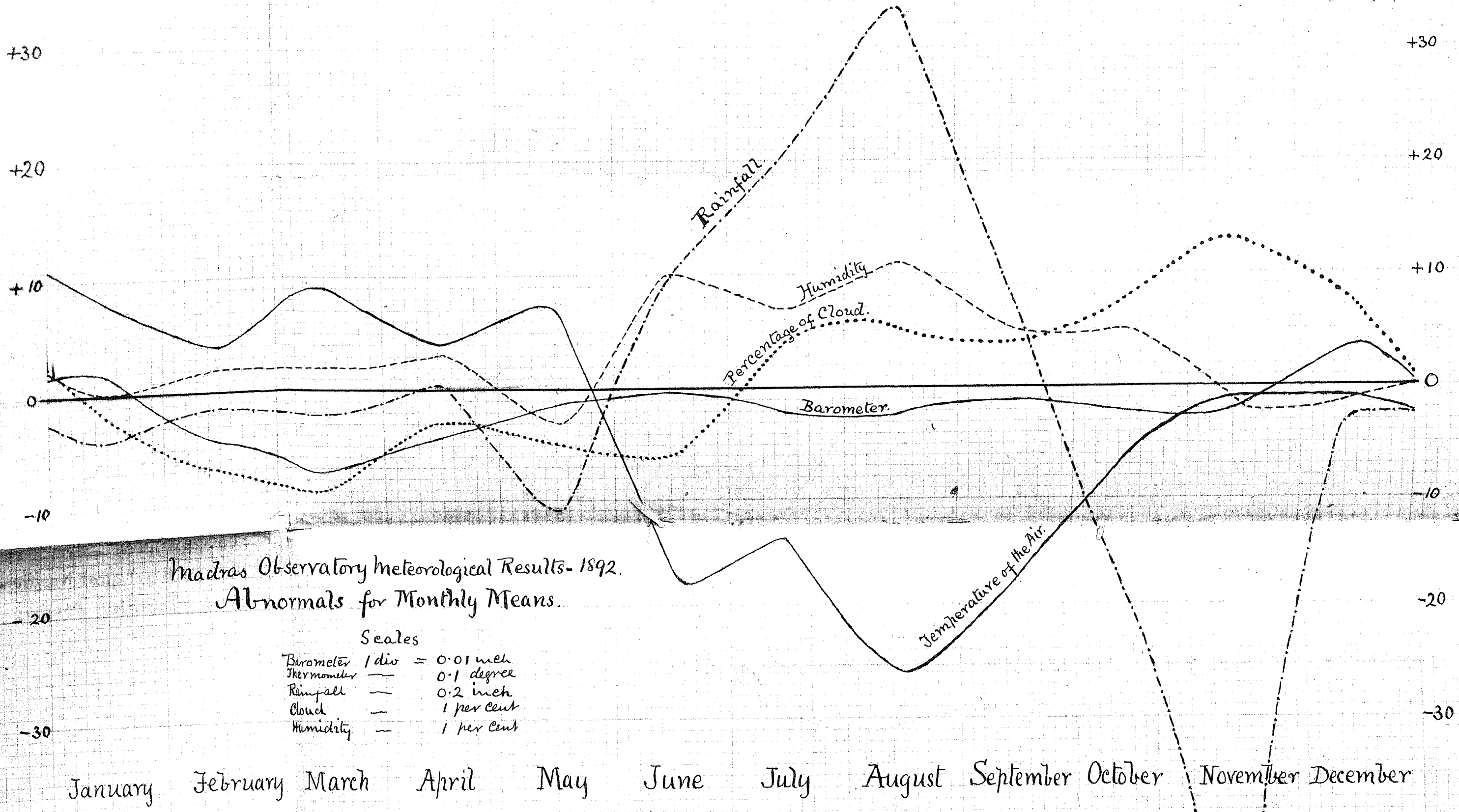
C. Mictue Smith, to de

Offg Govt Astronomer to ob
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MADRAS OBSERVATORY METEOROLOGICAL RESULTS, 1892. ABNORMALS FOR MONTHLY MEANS.

SCALES.
Barometer 1 div. = 0.01 inch.
Thermometer — 0.1 degree.
Rainfall — 0.2 inch.
Cloud — 1 per cent.
Humidity — 1 per cent.

January February March April May June July August September October November December

(Signed) C. MICHELS SMITH,
Offg. Govt. Astronomer,
Madras Observatory.