KODAIKÁNAL AND MADRAS OBSERVATORIES.

REPORT FOR THE YEAR 1906.

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KODAIKÁNAL AND MADRAS OBSERVATORIES.

I.—REPORT OF THE KODAIKÁNAL OBSERVATORY FOR THE YEAR 1906.

1. **Staff.**—The staff of the Observatory on the 31st December 1906 was as follows:—

Director	C. Michie Smith, B.Sc.
Assistant Director	J. Evershed (*not yet joined*).
First Assistant	K. V. Sivarama Aiyar, M.A.
Second Assistant	S. Sitarama Aiyar, B.A.
Third Assistant	G. Nagaraja Aiyar.
Fourth Assistant	S. Balasundaram Aiyar.
Writer	L. N. Krishnaswamy Aiyar.
Photographic Assistant	R. Krishna Aiyar.

There were no changes in the staff during the year. The Fourth Assistant was absent on privilege leave for three months from January 2. Mr. Evershed is expected to join his appointment in January 1907.*

The subordinate staff of the Observatory consists of a book-binder and book-binder's boy, a mechanic, four peons and a boy peon for the dark room, and two lascars.

2. **Distribution of work.**—The Director takes charge of the spectroheliograph and is helped by the Photographic Assistant. The First, Second, and Third Assistants are also trained to use the instrument if necessary. The First, Second, and Third Assistants are in charge of the work with the Cooke equatorial (spectroscopic), the Lerebour and Secretan equatorial (visual), the photoheliograph, the transit instrument, and the seismometer. They have also to do the astronomical computing and the preparation of the observations for the press. The Fourth Assistant has charge of the clock comparisons and, with the help of the writer, is responsible for the whole of the meteorological work. The writer is responsible for the accounts, correspondence and all office records.

3. **Buildings and grounds**—(*a*) *Spectroheliograph building.*—The new moving roof for covering the siderostat, referred to in last report, is now being erected. The new roof will be much smaller than the old one. It has been constructed at the Public Works Workshops, Madras, and is of an excellent design and thoroughly rigid. The roof of the main building still leaks during heavy rain but not to a serious extent.

(*b*) *Photoheliograph building.*—The new dome for the photoheliograph was received in July 1906, but there has been much delay in its erection, which was not completed by the close of the year.

(*c*) *House for the Assistant Director.*—Work on this was begun in February, but the work has progressed with extraordinary slowness and at the close of the year not more than two-thirds of the masonry was completed.

(*d*) Only a small part of the usual annual repairs had been completed by the close of the calendar year, but it is hoped that they will all be carried out before the close of the official year. They are all small and the buildings as a whole are in good order.

(*e*) *Grounds.*—In the early part of the year the grounds were several times in danger from grass fires, but the fire lines and extensive counterfiring saved them from

* Mr. Evershed reached Kodaikánal on the 21st January 1907.

all harm. As the season was a favourable one for planting a large number of young pines and cedars were planted out and are growing well. The roads and paths were maintained in good order.

(*f*) The well from which the aermotor pumps was dry for only about two months and there was no serious difficulty in obtaining the amount of water required.

4. **Instruments.**—The following are the principal instruments belonging to the Observatory :—

Six-inch Cooke equatorial.
Six-inch Lerebour and Secretan equatorial, remounted by Grubb with a 5-inch Grubb portrait lens of 36 inches focus attached.
Spectrograph—consisting of an 11-inch polar siderostat, 6-inch Grubb lens of 40-feet focus, and a 4-inch concave grating of 10-feet focus, mounted on Rowland's plan. A plane grating with collimator and camera lenses of 8-feet focus can be substituted for the concave grating.
A rhomb with ends cut at 45° mounted on a graduated circle, can be placed in front of the slit so as to enable any part of the limb to be brought on to the slit.
Six-inch transit instrument and barrel chronograph, formerly the property of the Great Trigonometrical Survey of India.
Six-prism table spectroscope—Hilger.
Photoheliograph—Dallmeyer No. 4.
Theodolite, six-inch—Cooke.
Two phototheodolites by Steinheil for cloud photography.
Sextant.
Spectroheliograph with 18-inch siderostat and 12-inch Cooke triple achromatic lens of 20 feet focus, by the Cambridge Scientific Instrument Company, Limited.
Evershed spectroscope with three prisms for prominence and sunspot work, by Hilger.
Mean time clock, Kullberg 6826.
Sidereal clock, Shelton.
Mean time chronometer, Kullberg 6299.
Sidereal chronometer, Kullberg 6134.
Tape chronograph, Fuess.
Micrometer for measuring spectrum photographs, Hilger.
Dividing engine, Cambridge Scientific Instrument Company, Limited.
Two Balfour Stewart actinometers.
Buchanan's solar calorimeter.
Induction coil with necessary adjuncts.
Small polar siderostat.
Universal instrument.
Complete set of meteorological instruments, including Richard barograph and thermograph, and wind-recorders.
A high class screw cutting lathe by Messrs. Cooke & Sons.

The Spectroheliograph.—The spectroheliograph was in constant use throughout the year up to December 17 when the siderostat had to be dismounted to permit of the erection of the new moving roof. This instrument has worked very satisfactorily throughout the year. A new collimating slit and a new setting microscope were ordered in the beginning of the year, but have not yet been received from the makers. To reduce the unsteadiness of the air a tube has now been placed between the lens and the mirror with very satisfactory results. When the new moving roof is erected the siderostat will be brought much closer to the lens, and it is hoped that this will still farther improve matters. The side walls have also been raised to a height of 5 feet so as to protect the mirror, as far as possible, from the strong winds which blow at certain seasons. All mechanical work is executed very slowly here, but it is confidently hoped that the spectroheliograph will be in full working order again before the end of January. All the other instruments were in good working order at the close of the year.

OBSERVATIONS.

(*a*) Solar Physics.

5. The first five months of the year were on the whole favourable for solar observations, but the remainder of the year was decidedly unfavourable. There were 26 days in the year on which no observations were possible. The following table shows for each day the observations that were made :—

Table A.

Solar Observations in 1906.

A = Spots observed. B = Spot spectra. C = Prominences. D = Photoheliograms. E = Spectroheliograms.

Date.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.
1 ..	A B C D E	A B C D E	—	A B C D E	A B *C* D *E*	A B *C* D E	A— D E	A — —	A B C D *E*	A— C D *E*	A— C D *E*	*A* ———
2 ..	A B C D E	A B C D E	A— C D E	A B C D E	A B C D E	A B C D E	A B C D E	A B C D E	A B C D E	A— C D E	A— C D *E*	A B C D *E*
3 ..	A B C D E	A B C D E	A— C D E	A —— D E	A— *C* D—	A— C D E	A B C D E	A—— D E	A B C D E	A— C D E	A ———	A B C D E
4	A B *C* D E	A B C D E	A— C D E	A B C D E	A— C D E	A— *C* D *E*	A B C D E	A— D E	A *B C* D E	A— C D E	A B C D *E*	A B C D E
5 ..	A—— D—	A— C D E	A— C D E	A —— D *E*	A— C D E	A —— D *E*	A— *C* D—	A— *C* D *E*	A —— D—	A— C D E	A— C D E	A— *C* D *E*
6 .	A— C D E	A B C D E	A— C D E	A B C D E	A B C D E	A— C D E	A *B* — D E	A B C D E	A *B C* D E	A— C D E	A— C D *E*	A ———
7 ..	A— *C* D	A B C D E	A B C D E	A B *C* D E	A B C D E	A— C D E	A *B* — D *E*	A— C D *E*	A— C D E	A— C D E	*A* ———	———
8 ..	A— C D E	A B C D E	A B C D E	A *B C* D E	A B C D E	A B C D E	A—— D *E*	A— *C* D *E*	A— C D E	A— C D E	A ———	A ———
9 ..	A B C D E	A B C D E	A B C D E	A B C D E	A B C D E	A —— D—	A— *C* D E	A—— D E	A B C D E	A— C D E	A— *C* D—	———
10 ..	A B C D E	A B C D E	A B C D E	A B C D E	A —— D—	A B C D E	A B C D E	A — *C* D *E*	A B C D E	A— C D E	A B C D—	A— D—
11 ..	A B C D E	A B C D E	A B C D E	A B C D E	A B *C* D E	A B C D E	A B C D E	A — C D *E*	A B C D E	A— C D E	A —— D *E*	A— C D E
12 ..	A B C D E	A B C D E	A B C D E	A B C D E	A B C D E	A —— D—	A B C D *E*	A B C D E	A *B C* D E	A— C D E	A— C D *E*	A— *C* D E
13 ..	A B C D E	A — C D E	A B C D E	A B C D E	A B C D E	———	———	A— *C* D E	A B C D E	A— C D E	*A* ———	A—— D E
14 ..	A— *C* D *E*	A— C D E	A B C D E	A B C D E	A B C D E	A ———	A— *C* D *E*	A —— D E	A B C D E	A— C D E	———	A B C D E
15 ..	A B C D E	A B C D E	A B C D E	A B C D E	A B C D E	A B C D—	A — *C* D—	A — C D E	A B C D E	A— C D E	*A* ———	A B *C* D E
16 ..	———	A B C D E	A B C D E	A B C D E	A B C D E	A —— D—	A —— D *E*	A — C D *E*	A B C D E	A— C D E	A— *C* D *E*	A B C D E
17 ..	A ———	A *B C* D E	A —— D *E*	A B C D E	A B C D E	———	———	A — C D E	A B C D E	A ———	A —— D *E*	A— D—
18 ..	A— D—	A B C D E	A— *C* D *E*	A B C D E	A B C D E	A ———	A— *C* D *E*	A —— D E	A ———	———	A B C D *E*	A B C D—
19 ..	A B C D E	A B C D E	A B C D E	A B C D E	A B C D E	A B C D—	A —— D—	A — C D *E*	A —— D *E*	———	A B C D E	A B C D—
20 ..	A— C D E	A B C D E	A B C D E	A B C D E	A B C D E	A —— D—	A —— D—	A — C D *E*	A ———	A ———	———	A *B C* D—
21 ..	A— C D *E*	A B C D E	A *B C* D E	A B C D E	A B C D E	A— *C* D—	———	A — C D *E*	———	A ———	A— D—	———
22 ..	A— C D E	A B C D E	A B C D E	A *B C* D E	A B C D E	A— C D *E*	A— C D E	A —— D—	A —— D—	A —— D *E*	A— *C* D—	A B C D—
23 ..	A B C D E	A B C D *E*	A B C D E	A B C D E	A B C D E	A —— D *E*	A B C D E	A —— D—	A — *C* D—	A— *C* D E	A B C D E	A B C D—
24 ..	A B C D E	A B C D E	A B C D E	A— C D E	A B C D E	A B C D E	A— C D E	———	———	A— *C* D *E*	———	A B C D—
25 ..	A B C D E	A— *C* D *E*	A B C D E	A— C D E	A B C D E	A ——— D *E*	A *B C* D E	A —— D—	A —— D *E*	———	A ———	———
26 ..	A B C D E	A *B C* D E	A B C D E	A — D—	A B C D E	A B *C* D E	A— C D E	A — — —	A — C D E	———	A B C D E	A ———
27 .	A B C D E	A *B C* D E	A B C D E	A *B* — D E	A B C D E	A— *C* D E	A —— D *E*	A — — —	A — C D E	———	A B C D E	———
28 ..	A B C D *E*	———	A B C D E	A B C D E	A *B C* D E	A —— D E	A B *C* D E	A —— D—	A — C D E	A— C D—	A B C D E	A ———
29 ..	A B C D E		A *B C* D E	A B C D E	A B C D E	A —— D *E*	——— E	A B C D E	A — C D E	A— *C* D E	A— *C* D *E*	A B C D—
30 ..	A B C D E		A B C D *E*	A B C D E	A —— D E	A B C D E	A— *C* D E	A B C D E	A — C D *E*	A— C D E	A B C D E	A B C D—
31 ..	A B C D E		A B C D E		A B *C* D E		A—— D E	A B C D E		A— C D E		A B C D—

Note.—Where a letter is in italics it means that on that day observations were not complete.

SOLAR Observations—Abstract.

	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Total.
A	30	27	30	30	31	28	27	29	28	26	27	26	339
B	20	23	23	25	25	9	11	6	14	..	9	16	181
C	27	25	29	27	29	17	19	15	22	22	18	19	269
D	29	27	30	30	31	27	27	24	26	23	21	22	317
E	27	27	30	29	29	19	23	20	24	22	17	10	277

6. **Photographs of the sun** with the Dallmeyer photoheliograph were taken on 317 days against 327 in 1905. During the first five months there were only 4 days on which no photograph could be obtained. During the year it was found possible to send to Greenwich all the solar negatives except one—December 28—required to fill in the gaps in the Greenwich and Dehra Dun set of daily photographs. From the beginning of the year a copy of each sun photograph has been printed in P.O.P. These when bound in volumes will be very useful for reference and will save much handling of the original negatives.

7. **Observations of sunspots.**—The sun is examined for spots and faculæ every morning when the weather permits. The sun's image is projected on an 8-inch disc, and the positions of the spots and faculæ are marked on it. There were 26 days on which no observation of this class could be made.

8. **Sunspot spectra.**—Observations of sunspot spectra were made with the Evershed three-prism spectroscope on 181 days as against 179 days in 1905, but on 14 of these days complete observations were prevented by bad weather. These observations include a record of the most prominent widened lines and a careful examination of the behaviour of the hydrogen and helium lines in the neighbourhood of all spots. These observations are still made in the same way as in previous years, but as soon as the Committee of the International Union for Solar Research issues its final proposals they will be adopted as the guide for future work. It seemed best to make no change in the method of work while the Committee's report was still under consideration.

At the request of the Director of the Solar Physics Observatory, South Kensington, lists are made out of the 12 "most widened lines" between D and F and are forwarded to him.

9. **Prominences.**—Prominences were recorded visually on 269 days against 297 in 1905. On 53 of these days the observations were either not complete or not satisfactory on account of the weather. The record of the prominences is made round the disc on which the spots and faculæ have been projected. This record is compared next day with the photographs taken with the spectroheliograph and all prominences shown in the photograph but not in the drawing are added in blue pencil. Where there is much difference between the photograph and the drawing the differences are noted. In the case of the eruptive prominences the spectra are studied but, owing to lack of time, only the most conspicuous bright lines are recorded. All conspicuous displacements of the C line are also noted and their amounts estimated.

10. **Spectroheliograms.**—Photographs with the spectroheliograph were taken on only 277 days against 317 in 1905. This falling off was due partly to the large number of unfavourable days in the second-half of the year and partly to the fact that work with this instrument was stopped on December 17 when the siderostat had to be dismantled. Up to that date photographs were taken on every day on which it was possible to obtain them. On no less than 52 of these days, however, the results were not satisfactory owing to the state of the weather. Attempts are always made to obtain spectroheliograms even if the conditions seem very unfavourable, and surprisingly good photographs are at times obtained through clouds so thick that the

exposure required is as much as six to eight times as great as with a clear sky. The great difficulty in such cases is to get a good setting, but this difficulty will be removed when the observatory is provided with an electric installation. In all, 1,163 photographs were taken and the average quality of the negatives was distinctly better than in the previous year. On the whole the photographs of prominences seem to be rather better than those of flocculi when the sky is quite clear, but on the other hand good flocculi photographs are often obtained when the glare from thin cirrus clouds is strong enough to seriously interfere with prominence photography. The great difficulty in spectroheliograph work is to get sufficiently steady images of the sun on which to work. So far as this observatory is concerned the time during which photographs of the highest quality can be obtained is confined to a comparatively short time in the morning, and the finer the day the shorter is this time. Something has been done and more can probably still be done to lengthen this favourable period, but from the nature of the case it must always be short. Spectroheliograms taken at other times are good enough for many purposes, but cannot be expected to show the same sharpness of definition. Fortunately it is possible, under favourable conditions, to obtain the necessary photographs in a very short time. On the whole, the results for the year, though by no means perfect, are such as to show that very valuable results can be obtained here on a large number of days even in a year when the weather has been much less favourable than it is on the average.

A slightly enlarged copy of the best flocculi negative for each day is made on bromide paper. This is useful as an index and saves too much handling of the original negative. The Director of the Solar Physics Observatory, South Kensington, having asked for spectroheliograms, flocculi photographs, mostly negatives, for 245 days were sent to him and in exchange 58 positives from his prominence photographs were received.

Summary of Results.

11. **Sunspots.**—The following table shows the monthly number of new groups observed, the mean daily number of spots visible, and the distribution between the northern and southern hemispheres:—

—	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Year.
New groups	22	18	38	30	20	27	25	26	28	19	15	29	297
Daily number	4·3	2·9	6·0	4·8	4·1	4·7	7·2	3·6	4·7	1·8	2·9	5·3	4·4
North	16	12	20	21	15	18	15	15	20	12	9	18	191
South	6	6	18	9	5	9	10	11	8	7	6	11	106

The total number of new groups seen during the year was 297 against 295 last year. There were two days, October 13 and 17, when the visible disc was free from spots. On the latter date the weather was poor and it is possible that a small spot might have been overlooked. There were 25 days on which only one group was visible and 15 of these days were in October and November. There were eleven groups visible on March 27, April 2, and July 11. Ten groups were visible on four other days.

The distribution of the groups between the two hemispheres was again very unequal, for nearly two-thirds of the whole number of new groups appeared in the northern hemisphere. The mean daily number of groups visible varied from 1·8 in October to 7·2 in July and the average for the year was 4·4. The mean latitude of the spots was 12°·2 in the northern hemisphere and 13°·7 in the southern. There were two groups within 1° and five groups within 2° of the equator. There was a great falling-off in spot activity during October and November, but in December there was a marked recrudescence of activity.

The most important groups seen during the year were the following:—

No. 719, 739, 755 This group was first seen coming round the east limb on December 13, 1905. It remained visible during three rotations. During its second round it was considerably changed in form. It was throughout a regular-shaped spot of moderate size.

No. 745, 764 was formed on the visible surface on January 21 as a group of small spots which soon developed into a double spot of considerable size and activity. This was seen during two rotations. During its second round it consisted only of the leader which traversed the disc almost unchanged as a regular-shaped quiet spot.

No. 748, 766 appeared as a small dot on January 22 and soon developed into a moderate-sized spot. This also was seen during two rotations.

No. 750 was an irregular group of large spots that was seen from January 26 to February 7.

No. 786 was first seen on March 16 as a small streak not far distant from the eastern limb. In a few days it had changed into a large spot of regular outline. It was a very active spot.

No. 788, 820 came round the limb on March 18 and 19 as two separate spots and in two days they had coalesced into a single large spot with a double umbra. Thereafter it underwent little change and disappeared round the limb on March 30. It again returned on April 15 as two separate spots, close together, and traversed the disc almost unchanged.

No. 801 was first seen close to the east limb on March 27 as a group of very small spots but soon developed into a conspicuous group of irregular outline with a number of detached umbræ.

No. 806 came round the limb on March 31. This was a large but quiet spot.

No. 813 first appeared on the east limb on April 5. It was a group of moderately large and very active spots.

No. 846 was seen as a single dot not far from the east limb on May 10. By the 15th it had formed into a regular double-spot group with a number of small spots between the main ones. During its development the group was very disturbed.

No. 849 came round the east limb on May 19 as a train of 3 spots, the largest leading. The rear spot which was the smallest broke into small dots on the 24th and the middle one similarly broke up 2 days later. The leader alone completed its course across the disc.

No. 866, 880, 905, 924 was formed on the visible disc as a group of small dots on June 8. On June 28 when it came round again it was one of largest seen during the year. It was a single round spot of regular outline. The spectrum was undisturbed in hydrogen but there were some brilliant calcium eruptions in its neighbourhood during its second rotation. This spot went round four times and lasted for 11 weeks. During the last two rounds it had undergone very little change except a slight diminution in size.

No. 907 first appeared on July 27 as three small faint dots not far from the east limb and on the next day it was reduced to a single small dot. By the 30th it had developed into a large group. On that day the spectrum showed great disturbance. This was also one of the great spots of the year.

No. 926 was first seen on August 26 near the central meridian. It might have been formed on the 25th, which was overcast. When first seen it was already a large scattered group extending over 20° of longitude.

No. 944 came round the east limb on September 11 as a single spot of regular outline. A few days later, when near the central meridian, the group consisted of 3 moderate-sized spots with a number of small spots between them, forming a train which extended over 14° of longitude.

No. 981 was a spot of moderate size that came round the limb on November 8. It was a round and regular spot with one small companion in front and several in the rear. On the 10th the spectrum indicated considerable disturbance, in the region occupied by the group.

Nos. 987, 989, 990 were also moderate-sized spots that appeared in November.

No. 1010 was a large regular spot with a divided umbra and a few small companions which came round the limb on December 12. The spectrum showed considerable disturbance, especially on December 15.

No. 1014 was seen first on December 19 as two small dots near the central meridian. It developed very rapidly into a large group.

12. **Prominences.**—As a full list of the prominences observed is being published in the *Bulletins* of the observatory it is only necessary to give here a few notes on the more important prominences of the year.

January.—Prominences of 100″ and upwards were seen on 8 days. One prominence on the 8th covered 25° of the south-west limb and culminated in a peak 2 minutes high. A very striking prominence was seen on the 20th at the east limb. As observed in C light at $9^h\ 15^m$ it was 120″ high and showed motion in the line of sight. It was photographed in H light at $8^h\ 45^m$ and was then 150″ high and totally different in shape from the form sketched half an hour later. The most striking feature of this month's observations was the enormous area round the spot group 750 which seemed to be sending out prominences. There were prominences seen in this region from the 25th to the 31st. On the 30th one of them appeared in this region as a great cloud floating at a height of 70″ above the chromosphere, but the photograph showed that it was connected by thin filaments with a large prominence nearly 20° nearer the equator. Metallic prominences were observed on the 6th, 8th, and 11th.

February.—Large prominences appeared on the west limb at the same latitude from the 9th to the 15th. On the 10th a series of prominences, more or less connected with each other by streamers, covered nearly 45° of the west limb. On the 14th a prominence reaching to a height of at least 6 minutes (the limit of the photograph) was photographed in calcium light. Only three eruptive prominences, showing displacement of the lines in the spectrum, were observed.

March.—This month there were only 4 prominences that could be called "very large". The largest was photographed on the 21st. It was $3\frac{1}{2}$ minutes high and covered 25° of the sun's limb. There were seven eruptive prominences recorded and all were associated with spots.

April.—There were 11 prominences of 100″ and upwards but the tallest was only 150″ high. Between the 11th and 23rd a number of prominences were seen near the west end of the equator indicative of a long active region near the equator.

May.—This month there were 44 prominences of upwards of 1 minute in height. The tallest of the month was one photographed on the 19th in calcium light. It was 108,000 miles high and was a narrow straight jet showing fine details in its structure. Only a trace of the base was seen in Hydrogen light. It was within 10° of the sun's north pole. Four metallic prominences and 6 other prominences in which C was displaced were observed.

June.—The unfavourable weather rendered the prominence record very incomplete but 26 prominences were recorded of upwards of 1 minute in height of which two were $2\frac{1}{2}$ minutes high.

July.—This month also the poor weather that prevailed rendered prominence observations very imperfect. Nineteen large prominences were recorded but the tallest was only 90″. On the 12th two prominences showing displacement of the C line were observed. One of these, at position angle 113° was metallic and had Na and Mg lines reversed. It was close to a brilliant facular region. The other was near a spot which was just disappearing round the west limb.

August.—On the 15 days on which observations were possible 24 prominences of 1 minute and upwards were observed. The tallest was a tree-like prominence 2 minutes high, seen on the 12th at position angle 65°.

September.—Thirty-three prominences of one minute and upwards were recorded on the 22 days on which observations were possible. The tallest of these was two minutes high. It was photographed on the 6th at position angle 155°.

October.—Prominences were fairly abundant during the month and 27 were recorded having a height of one minute and upwards. The tallest of these was seen on the 4th at position angle 158°. It was 140″ high and was quite detached from the limb.

November.—Owing to unfavourable weather prominence observations were very incomplete. Fourteen prominences of or over one minute in height were observed. The tallest of these was 80″ high and was seen on the 1st at position angle 349°.

December.—Thirty-one large prominences, one minute and upwards in height, were recorded, and six of these were two minutes in height. The two tallest were about 150″ high. One of these was seen on the 5th at position angle 132°; the other was photographed on the 13th at position angle 186°.

(*b*) Other Observations.

13. **Time.**—Time is determined with the transit instrument when necessary. The standard clock and chronometers of the observatory are compared and rated daily. The standard clock is also compared daily with the Madras standard clock by means of the signal sent at 4 P.M. over all telegraphic lines in India. A time signal is given daily from this observatory by means of a flag at 10 A.M.

14. **Meteorology.**—Meteorological observations have been carried on exactly as in former years. The instruments are read at 8^h, 10^h and 16^h, local mean time. Temperature and pressure are recorded by a Richard thermograph and barograph and the mean daily temperature and pressures are obtained from the traces, corrected by reference to the eye observations. The wind direction and velocity are got from a Beckley anemograph placed on a tower some little distance from the observatory. The cups and wind vane are at a higher level than the tops of the domes.

Temperature.—The mean temperature of the year was slightly above normal. With the exception of March, which was normal, the monthly mean was in excess for the first seven months. The excess amounted to 2° 3 in February, 2°·7 in April and 2°·0 in May, which are large amounts for this station. For the last five months the mean temperature was below average, but the largest amount was 0°·6, in September. The highest shade maximum recorded was 77°·3 on April 17, and the lowest shade minimum was 41°·9 on January 13. The highest temperature in the sun was 145°·6 on June 12 and the lowest grass minimum 22° 6 on January 3.

Humidity.—The relative humidity was largely below normal in April and May and moderately below in June and September. It was above normal during the rest of the year.

Wind.—The daily wind velocity was very largely below normal in July and considerably below in January, February, and March. It was largely above normal in May and considerably above in September and November. The highest daily records were 732 miles on June 16 and 735 miles on July 20.

Rain.—The rainfall for the year was considerably above the average, the chief excess being in August. There were 119 days on which one-tenth of an inch and upwards fell. There was no day on which as much as 3 inches fell.

Cloud and sunshine.—The year was decidedly more cloudy than usual and the amount of bright sunshine registered was 100 hours below the average and 219 hours below that for 1905. The only months in which the sunshine was above average were April, May, and September : in all the other months it was below.

The transparency of the lower atmosphere, as shown by the visibility of the Nilgiris, was considerably above the average. This is probably to be accounted for by the larger rainfall.

15. **Seismology.**—The Milne horizontal pendulum was in use throughout the year and the results are given in Appendix I. The year has been remarkable for the very large number of great earthquakes which have occurred. Most of these, including those of Colombia, San Francisco, and Valparaiso, were well recorded here. Copies of the chief seismograms have been supplied as usual to the British Association Committee and all applications for copies of individual records by persons interested have at once been complied with.

16. **Library.**—The contributions to the library during the year included 204 sheets of the Greenwich Astrographic chart. One hundred and forty-three volumes were bound during the year.

17. **Publications.**—Bulletins Nos. IV to VII were published during the year and No. VIII was in type at the close of the year.

Bulletins Nos. IV and VI give the observations of sunspot spectra made between March 1904 and December 1905. No. VIII will bring the record up to the end of June 1906. Nos. V and VII contain list of prominences observed from January to December 1905.

18. **General.**—The Director-General of Observatories visited Madras and Kodaikánal in January. The Director inspected the Madras Observatory in November.

The whole of the staff of the Observatory worked well during the year ; those who were responsible for the solar observations are to be congratulated on securing results on a large number of days on which the conditions were very unfavourable.

KODAIKÁNAL,
1*st February* 1907.

C. MICHIE SMITH,
Director, Kodaikánal and Madras Observatories.

II.—REPORT OF THE MADRAS OBSERVATORY FOR THE YEAR 1906.

Staff.—Mr. M. G. Subrahmanyam, the First Assistant, who was on duty at Kodaikánal, returned on the 25th January 1906 and Mr. C. Chengalvaraya Mudaliar reverted to the Meteorological office.

Mr. S. Solomon Pillai took privilege leave for one month from 13th March 1906 and Mr. M. G. Subrahmanyam for three months from the 20th April, Mr. C. Chengalvaraya Mudaliar again acting as First Assistant on both the occasions.

2. **Time service.**—The astronomical observations made during the year were solely directed to time determinations. Transits of the sun were taken occasionally in order to check the rate of the clock when unfavourable weather prevented the regular star observations from being made.

The time gun at the Fort was fired correctly at noon and at 8 P.M. on 708 occasions out of 730, giving a percentage of success of 97·0.

The time ball at the Port office was dropped correctly on all occasions but 3 when it failed at 1 P.M., but was dropped at 2 P.M.

3. **Meteorological observations.**—Meteorological observations were made as usual at 8, 10, 16 and 20 hours, local time. The observations of 10 and 16 hours were reduced and sent to the India Meteorological office, Alipore, on Form F. The record of movements of the clouds observed by means of the nephoscope were also sent to that office every month. Besides the ordinary daily weather messages, special storm observations were called for and supplied to (1) Simla on 3 occasions and (2) Calcutta on 128 occasions.

The tabulation of the traces of the Barograph, Thermograph, and Anemograph at Madras and of the Anemograph at Dodabetta are up to date.

4. **Buildings.**—No repairs to the buildings have been made during the year. The dome of the 8-inch equatorial leaks badly. A new dome is required to replace it, and plans and estimates for this have been submitted to the local Government in the Public Works Department for sanction.

5. **Instruments.**—A new sidereal clock by S. Riefler, Munich, was erected on the north side of the transit instrument and has been used for the transit observations from the 24th July. It has been working very satisfactorily, the rate being very constant. On one occasion, the 29th October, there was a sudden and large disturbance in the rate the cause of which has not yet been found out. Since the recovery from this its rate has been very satisfactory. The tape chronograph received during the previous year has not been brought into use as a relay, which has been ordered, is required in the clock circuit. The following is the list of instruments at the Madras Observatory on the 31st December 1906 :—

(a) Astronomical.

Eight-inch Equatorial Telescope—Troughton & Simms.
Sidereal Clock—Haswall.
" Dent No. 1408.
" S. Riefler No. 61.
Mean Time Clock with galvanometer—Shepherd & Sons.
Meridian Circle—Troughton & Simms.
Mean Time Clock—J. Monk.
Mean Time Chronometer—V. Kullberg 5394.
" " 6544.
" Parkinson & Frodsham 2352.
Portable Transit Instrument—Dolland.
Portable Telescope with stand.
Tape Chronograph—R. Feuss.

(b) Meteorological.

Richard's Barograph—No. 10 L. Casella.
Richard's Thermograph—No. 3618 L. Casella.
Beckley's Anemograph—Adie.

Sunshine Recorder—No. 149 L. Casella.
Anemoscope—P. Orr & Sons.
Nephoscope—Mons. Jules Daboscq & Ph. Pellin.
Barometer, Fortins—1771 L. Casella.
Barometer, Fortins—725 L. Casella (spare).
Barometer, Fortins—1420 L. Casella (spare).
Dry bulb thermometer—No. 94221 L. Casella.
Dry bulb thermometer—No. 38037 Negretti & Zambra (spare).
Wet bulb thermometer—No. 94219 L. Casella.
Wet bulb thermometer—No. 38037 Negretti & Zambra (spare).
Dry maximum thermometer—No. 8581 Negretti & Zambra.
Dry minimum thermometer—No. 69047 L. Casella.
Wet minimum thermometer—No. 91753 Negretti & Zambra.
Sun maximum thermometer—No. 10479 Negretti & Zambra.
Grass minimum thermometer—No. 3377 Negretti & Zambra.
Raingauge (8″ diameter)—No. 1042 Negretti & Zambra.
Measure glass for above.
Raingauge (5″ diameter).
Measure glass for above.

6. **Weather summary.**—The following is a summary of the meteorological conditions at Madras during the year 1906:—

Pressure.—The mean atmospheric pressure was normal in June and August, above normal in March, October, and November and below normal during the other months. The excess in March reached the value of 0·037 inch. The highest pressure recorded was 30·116 inches on January 4 and the lowest 29·477 inches on July 19.

Temperature.—The mean temperature of the air was above normal throughout the year, the excess amounting to 3°·0 in February. The highest shade temperature recorded was 111°·5 on May 27 and the lowest 63°·4 on December 3. The mean maximum in May was 100°·8 which was 3°·0 above the average. The highest temperature in the sun (149°·6) was recorded on May 18 and the lowest on grass was 58°·2 on December 2.

Humidity.—The humidity was above normal throughout the year, the lowest percentage being 33 on October 30.

Wind.—The wind direction was normal in July and August. It was more easterly in January, March, November and December, more westerly in September and more southerly during the other months. The wind velocity was below normal in all other months except February, April and December. The highest wind velocity on any day was 398 miles on December 26 and the lowest 56 on August 21 and September 19. The average daily defect was 40 miles in August.

Cloud.—The percentage of cloud was normal in June and November, above normal in January, February and December and below normal in all the other months.

Sunshine.—The percentage of bright sunshine was normal in July and August, and much below the average during the remaining months. There were 2,080·3 hours of bright sunshine during the year.

Rainfall.—The rainfall was in excess in January, February, June, July, September, and December, and in defect in the other six months, the greatest defects being 6·85 inches and 6·74 inches in October and November respectively. The greatest excess was 11·15 inches in December, when 16·43 inches were received. The north-east monsoon rainfall from October 15 to the end of the year was 27·05 inches which is very near the average (27·6 inches). The total fall for the year was 49·61 inches.

Storm.—A storm of moderate severity passed inland in a north-westerly direction a little to the south of Madras on the morning of December 27. This storm determined heavy rain over the north of the Presidency and the Deccan during the remaining days of the month.

MADRAS,
28*th January* 1907.

R. LL. JONES,
Deputy Director.

Appendix I.

KODAIKÁNAL Observatory Seismological Records in 1906.

No.	Date.	P.T. Commence G.M.T.	L.W. Commence G.M.T.	Maxima G.M.T.	End	Max. Amp.	Duration.	Remarks.
	1906.	H. M.	H. M.	H. M.	H. M.	MM. "	H. M.	
1	Jan. 6 ..	22 15·8	..	..	22 36	..	0 20	Widening of line.
2	15 ..	19 32·0	19 41·2	19 42·4	19 54	0·8 0·4	0 22	
3	21 ..	13 58·7	14 06·9	14 08·0	15 09	2·0 1·1	1 10	
4	27 ..	10 05·0	10 25·6	10 28·7	11 18	1·1 0·5	1 13	
5	31 ..	15 56·7	16 57·7	17 11·0	..	> 22 > 10	..	Colombia E.Q. Boom went beyond scale.
				20·7	..	17 8·2	..	
				25 4	19 20	15 7·2	3 23	
6	Feb. 1 ..	2 48·3	2 48·3	2 48·3	3 54	0·6 0·3	1 06	
7	10 ..	9 13·3	..	..	9 28	..	0 15	Widening of line.
8	18 ..	2 25·6	..	..	2 30	..	0 04	Do.
9	19 ..	2 22·9	3 01·5	3 02·5	..	1·0 0·5	..	
				19·8	5 20	1·3 0·7	2 57	
10	27 ..	19 50·1	19 52·6	19 52·6	..	3·8 1 6	..	
				54·6	20 47	3·6 1·5	0 57	Bashahr E.Q.
11	Mar. 2 ..	6 28·0	6 35·3	6 37·2	7 08	1·4 0·8	0 40	
12	3 ..	9 21·3	..	..	10 25	..	1 04	Widening of line.
13	10 ..	6 59·7	..	..	7 40	..	0 40	Do.
14	10 ..	16 39·2	..	..	17 44	..	1 05	Do.
15	13 ..	14 02·0	14 06·2	14 07·0	14 21	0·4 0·2	0 19	
16	16 ..	22 56·7	23 10·0	23 12·1	23 38	1·5 0·8	0 41	Formosa E.Q.
17	19 ..	8 16·0	..	..	9 01	..	0 45	Widening of line.
18	20 ..	3 53·6?	4 06·0	4 06·8	4 21	0·5 0·3	0 27	
19	21–22.	23 57·7	..	..	0 13	..	0 15	Widening of line.
21	28 ..	18 50·6	18 54·7	18 59·9	..	0·4 0·2	..	
				19 11·2	19 41	0·4 0·2	0 50	
22	Apr. 5 ..	22 38·2	22 48·5	22 49·3	23 03	0·4 0·2	0 25	
23	3 ..	18 15·8	..	..	18 39	..	0 23	Widening of line.
24	13 ..	19 34·9	19 38·2	19 40·3	..	0·5 0·2	..	
				42·3	20 13	0·5 0·2	0 38	Formosa.
25	14 ..	0 09·4	0 19·7	0 24·3	0 48	0·6 0·3	0 39	
26	14 ..	..	4 21 5	4 23·0	4 33	0·5 0·2	?	
27	18 ..	13 31·6	14 24·6	14 28·8	..	2·2 1·2	..	
				33·1	16 02	2·5 1·4	2 30	San Francisco.
28	19 ..	7 17·4	..	..	7 26	..	0 09	Widening of line.
29	25 ..	?	1 50·7	1 50·9	2 10	0·4 0·3	?	
30	29 ..	*16 44·0	16 49·5	16 50·3	17 46	1·9 1·0	1 02	* Possibly 2nd phase.
31	May 2 ..	1 44·6	..	..	1 48	..	0 03	Widening of line.
32	3 ..	8 31·5	8 32·1	8 34·1	8 42	0·5 0·2	0 10	
33	12 ..	5 53·4	6 02·5	6 02·5	6 24	0·8 0·4	0 31	Time slightly uncertain.

Kodaikánal Observatory Seismological Records in 1906—*cont.*

Number.	Date.	P.T. Commence G.M.T.	L.W. Commence G.M.T.	Maxima G.M.T.	End G.M.T.	Max. Amp.	Duration.	Remarks.
	1906.	H. M.	H. M.	H. M.	H. M.	MM. "	H. M.	
34	May 19 ..	23 20·9	..	..	23 38	..	0 17	Widening of line.
35	27 ..	6 11·0	..	..	6 28	..	0 17	Do.
36	June 1 ..	5 21·3	Lost.	Lost.	7 35	1·4 0·7	2 14	Sheet marked at 6 hours 17 minutes.
37	10 ..	20 51·5	20 59·0	21 00·8	..	1·1 0·5	..	
				02·6	21 37	1·2 0·6	0 45	
39	19 ..	11 31·5	11 56·7	11 57·7	12 52	0·6 0·3	1 20	
40	24 ..	11 22·3	11 30·0	11 32·0	..	3·0 1·6	..	
				42·8	12 52	2·0 1·1	1 30	
41	July 10 ..	20 00·8	..	..	20 14	..	0 18	Widening of line.
42	14 ..	0 45·2	0 52·6	0 53·7	..	0·5 0·2	..	
				57·8	1 12	0·6 0·3	0 27	
43	Aug. 10 ..	4 07·6	4 10·1	4 10·8	4 14	0·5 0·2	0 6	
44	15 ..	22 26·5	..	..	22 33	..	0 6	Widening of line.
45	17 ..	0 25·6 *	0 59·9	1 03·0	..	12·0 5·1	..	* No first P.Ts.
				08·1	..	11·0 4·7	..	
				13·3	..	9·0 3·8	..	Valparaiso E.Q.
				2 02·4	..	21·0 8·9	..	
				07·9	..	8·0 3·4	..	
				10·2	4 46	7·0 3·0	4 20	
46	17 ..	7 14·8	..	..	7 30	..	0 15	Widening of line.
47	17 ..	10 19·8	..	..	10 36	..	0 16	Do.
48	17 ..	14 04·6	..	..	14 23	..	0 18	Do.
49	18 ..	7 15·4	7 53·4	8 01·5	8 24	0·6 0·2	1 9	
50	19 ..	10 18·3	10 48·3	10 58·2	11 27	0·6 0·2	1 9	Beginning and end faint and doubtful.
50a	25 ..	12 08·1	..	..	12 46	..	0 38	Widening of line.
51	25 ..	14 01·5	14 08·6	14 10·7	..	2·4 1·1	..	
				12·7	..	1·5 0·7	..	
				14·2	..	1·5 0·7	..	
				17·8	15 50	1·1 0·5	1 48	
52	26 ..	6 09 0	..	..	7 43	..	1 34	Widening of line.
53	30 ..	2 57·6	4 03·7	4 09·3	4 54	0·5 0·2	1 56	Tacna and Arica.
54	31 ..	15 02·8	15 06·9	15 06·9	15 37	0·6 0·3	0 34	
55	Sept. 6 ..	19 27·5	..	..	..	..	0 2	Widening of line.
56	7 ..	19 01·1	19 33·0	19 35·1	..	0·6 0·3	..	
				40·4	..	0·5 0·2	..	
				42·3	..	0·7 0·3	..	
				46·3	20 43	0·5 0·2	1 42	
57	14 ..	16 16·6	16 25·9	16 44·5	..	1·5 0·7	..	
				57·4	..	1·6 0·8	..	
				17 02·6	18 57	1·5 0·7	2 40	

Kodaikánal Observatory Seismological Records in 1906—*cont.*

No.	Date.	P.T. Commence G.M.T.	L.W. Commence G.M.T.	Maxima G.M.T.	End G.M.T.	Max. Amp.	Duration.	Remarks.
	1906.	H. M.	H. M.	H. M.	H. M.	MM. "	H. M.	
58	Sept. 17 ..	8 59·9	..	..	9 54	..	0 54	Widening of line. Transcaucasia.
59	28 ..	15 55·4	16 07·6	16 08·7	16 25	0·4 0·2	0 30	
60	Oct. 2 ..	2 05·0	2 41·8	3 11·2	4 59	2·3 1·1	2 54	
61	2 ..	14 53·4	15 23·3	15 34·1	16 25	0·4 0·2	1 32	
62	6 ..	12 49·0	12 51·5	12 52·6	13 29	0·6 0·3	0 40	
63	10 ..	1 47·6	1 51·7	1 52·6	2 03	0·5 0·3	0 15	
64	10 ..	13 04·1	13 23·8	13 25·3	..	0·6 0·4	..	
				28·9	14 04	0·5 0·3	1 00	
65	10, 11.	23 27·7	23 38·2	23 41·0	..	0·6 0·4	..	
				46·5	0 13	0·5 0·3	0 45	
66	17 ..	9 56·8	?	10 30·5	10 48	0·6 0·4	0 51	
67	24 ..	14 53·1	14 57·4	15 01·6	16 05	21 10·1	1 12	
68	Nov. 12 ..	17 45·6	..	..	17 59	..	0 13	Widening of line.
69	19 ..	7 25·4	7 32·6	7 44·0	9 33	4·2 2·6	2 08	
70	Dec. 19 ..	1 40·2	..	1 44·3	..	0 5 0·3	..	
				2 23·1	2 46	0·6 0·3	1 06	Kopal E.Q.
71	22 ..	18 27·0	18 37·1	18 42·2	20 15	5·0 2·7	1 48	
72	23 ..	17 45·2	18 19·8	18 24·4	18 48	1·4 0·8	1 03	
73	26 ..	6 12·7	..	..	6 58	..	0 45	Widening of line.

Appendix II.

Latitude 10° 13′ 50″ N.
Longitude 5h 09m 52s E.

Height of barometer cistern above mean sea level 7688 feet.

MEAN monthly and annual Meteorological Results at the Kodaikánal Observatory in 1906.

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.	Min.	By Blanford's tables.				Daily velocity.	Mean direction.		Amount.	Days.		
	INCHES.	INCHES.	°	°	°	°	°	°	INCHES.	CENTS.	°	°	MILES.	POINTS.	POINTS.	INCHES.	NO.	CENTS.	HOURS.
January ..	22·852	0·069	54·4	64·8	48·1	16·7	48·9	41·9	0·296	70	120·3	39·6	291	7	E. by N.	4·10	4	66	217·2
February ..	·850	·070	57·2	67·3	50·7	16·6	51·2	44·0	·321	68	127·2	38·6	222	22	W. S. W.	3·37	4	60	202·5
March ..	·878	·071	57·9	69·0	50·7	18·3	50·2	43·0	·289	60	130 9	40·7	286	7	E. by N.	2·79	4	67	242·9
April ..	·854	·065	62·1	73·8	54·8	19·0	52·6	45·8	·306	55	136·2	42·8	292	10	E. S. E.	2·73	5	66	233·2
May ..	·821	·071	62·1	71·1	56·4	14·7	55·5	50·1	376	67	138·0	49·3	286	4	N. E.	4·10	9	56	238·1
June ..	·768	·057	58·4	65·6	53·8	11·8	54·0	49·8	·375	77	125·3	48·5	357	26	W. N. W.	2·06	10	22	90·5
July ..	·739	·056	56·9	63·6	53·3	10·3	53·8	50·1	·386	83	121·2	50·0	407	29	N. W.by N.	6·89	13	23	94·5
August ..	·761	·069	56·3	62·5	52·5	10·0	54·4	50·8	·406	89	118·5	49·2	331	31	N. by W.	12·44	19	21	90·1
September ..	·781	·069	55·9	62·8	51·4	11·4	52·5	48·0	·363	81	124·2	46 5	342	30	N. N. W.	4·93	8	37	134·4
October ..	·813	·078	55·5	62·6	51·6	11·0	53·6	49·8	·398	89	115·1	46·9	268	7	E. by N.	7·00	17	29	111·7
November ..	·845	·073	53·8	60·8	49·5	11·3	51·8	47·1	·372	88	115·5	45·1	311	4	N.E.	10·93	15	26	110·3
December ..	·822	·071	53·3	60·4	48·3	12·1	49·9	44·4	·330	81	107·9	42·7	293	4	N.E.	6·19	11	34	129·3
Annual ..	22·815	0·068	57·0	65·4	51·8	13·6	52·4	47·1	0·352	76	122·9	45·0	307	2	N.N.E.	67·53	119	42	1894·7

EXTREME monthly Meteorological Records at the Kodaikánal Observatory in 1906.

Month.	Barometer.					Dry bulb thermometer.				Wet bulb.		Humidity.		Sun Th. *in vacuo.*		Grass therm.		Wind.				Rain.	
	Highest.		Lowest.		Range.	Highest.		Lowest.		Lowest.		Lowest.		Highest.		Lowest.		Highest.		Lowest.		Greatest Fall.	
	INCHES.	DAY.	INCHES.	DAY.	INCHES.	°	DAY.	°	DAY.	°	DAY.	CENTS.	DAY.	°	DAY.	°	DAY.	MILES.	DAY.	MILES.	DAY.	INCHES.	DAY.
January ..	22·949	20	22·774	16	0·175	73·3	1	41·9	13	33·9	2, 4	2	4	137·3	29	22 6	3	686	18	161	2	2·53	18
February ..	·960	4	·761	15	·199	73·1	23	47·2	3	35·6	8	25	11	141·8	13	29·7	7	357	1	118	13	2·46	28
March ..	·982	10	·792	19	·190	74·2	26	46·9	3	33·3	3	14	3	141·7	14	34·4	11	543	6	172	20	0·99	21
April	·942	11	·786	29	·156	77·3	17	50·8	1	41·4	12	20	16, 25	145 0	2	30·9	6	480	25	194	4	1·82	28
May	·907	13	·753	31	·154	76·1	25	52·7	21	42·9	31	31	7, 26	142·2	13	39·3	6	440	9	129	28	1·25	1
June	·865	10	·662	17	·203	74·6	1	50·7	16	44·7	1	36	1	145·6	12	39·2	1	732	16	126	9	0·44	18
July	·852	31	·617	19	·235	69·2	4	50·6	21	44·1	2	50	2	143·6	4	44·3	27	735	20	179	9	1·26	11
August ..	·883	5	·661	22	·222	67·1	16	50·3	14	42·5	13	70	13	140·4	11	42·5	13	701	23	145	13	1·27	18
September ..	·874	15	·703	5	·171	67·1	30	47·6	29	41·5	27	32	27	141·2	30	37·2	7	646	25	85	7	0·98	15
October ..	·910	12	·690	27	·220	67·2	10	47·1	31	38·9	31	52	30	144·0	10	38·3	31	679	28	136	11	1·25	24
November ..	·918	5,27	·788	19	·130	65·5	17	45·8	22	38·4	19	39	18	126·8	19	37·2	26	609	23	142	15	2·91	15
December ..	·901	10	·789	20	·162	67·8	4	43·6	12	34·2	3	12	14	135·2	16	30·6	4	548	26	93	30	1·25	7

Appendix III.

KODAIKÁNAL mean hourly Wind Velocity for the year 1906.

Month.	Hours.																							
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
January	14	15	15	14	15	14	14	13	13	14	16	14	12	12	11	10	9	8	9	11	12	12	13	14
February	10	9	8	8	8	9	9	8	8	9	10	10	11	10	10	9	8	8	8	10	11	10	10	10
March	11	12	11	12	13	14	14	14	15	14	16	15	13	12	12	11	10	8	9	9	9	10	10	11
April	11	11	11	11	12	13	13	14	15	15	16	15	13	11	12	11	10	10	11	13	12	11	11	12
May	12	11	12	12	12	12	12	12	13	12	13	13	13	13	13	12	12	11	10	10	11	11	12	12
June	16	16	16	16	15	15	16	15	14	14	15	14	13	13	14	15	13	14	14	16	16	16	15	16
July	20	19	19	19	20	19	19	17	17	15	15	14	14	13	14	14	14	16	16	17	17	18	19	20
August	13	13	14	14	13	12	12	12	13	13	11	12	12	12	12	12	11	12	12	13	14	15	16	16
September	16	17	17	17	16	16	16	16	16	16	14	13	14	12	12	12	10	11	11	12	13	14	15	15
October	11	11	11	11	12	12	12	12	14	13	13	13	12	11	11	10	10	9	10	10	10	10	10	11
November	13	13	13	12	13	13	13	13	13	13	12	11	12	11	11	11	10	10	11	13	13	13	14	15
December	13	13	13	13	13	13	13	13	12	12	13	12	11	11	10	9	9	10	11	13	13	14	14	14
Mean ..	13	13	13	13	14	14	14	13	14	13	14	13	12	12	12	11	10	11	11	12	13	13	13	14

Appendix IV.

KODAIKÁNAL Mean Hourly Bright Sunshine for the year 1906.

Month.	Hours.												Remarks.
	6-7	7-8	8-9	9-10	10-11	11-12	12-13	13-14	14-15	15-16	16-17	17-18	18-19	
January ..	0·12	0·67	0·81	0·85	0·86	0·81	0·75	0·76	0·64	0·45	0·27	0·02	..	The total number of hours of bright sunshine was 1,894·7 which is 43·3 per cent. of the possible amount.
February ..	·16	·80	·90	·89	·89	·84	·75	·68	·52	·46	·30	·04	..	
March ..	·11	·73	·89	·94	·92	·88	·85	·70	·63	·53	·50	·15	..	
April	·02	·68	·91	·94	·95	·94	·78	·67	59	·50	·35	·11	..	
May	·19	·65	·81	·86	·87	·87	·85	·76	·64	·54	·50	·13	..	
June	·07	·28	·37	·45	·49	·50	·36	·20	·14	·08	·06	·03	..	
July	·08	·33	·44	·48	·40	·37	·28	·20	·21	·12	·08	·05	0·01	
August ..	·08	·36	·44	·40	·37	·31	·26	·21	·17	·17	·11	·04	..	
September ..	·06	·60	·67	·67	·63	·53	·43	·34	·23	·15	·12	·04	..	
October ..	·03	·42	·54	·55	·53	·39	·36	·26	·17	·18	·13	·03	..	
November ..	·01	·30	·42	·47	·43	·39	·43	·45	·34	·23	·20	·01	..	
December ..	·00	·30	·49	·54	·52	·44	·44	·42	·44	·34	·22	·03	..	
Mean ..	0·08	0·51	0·64	0·67	0·66	0·61	0·54	0·47	0·39	0·31	0·24	0·06	0·00	

Appendix V.

NUMBER of days in each month on which the Nilgiris were visible in 1906.

Month.	Very clear.	Visible.	Just visible.	Tops only visible.	Total.
January	2	9	10	..	21
February	..	5	14	..	19
March	3	5	6	3	17
April	..	1	4	..	5
May	4	6	4	..	14
June	9	3	3	..	15
July	7	3	3	1	14
August	8	7	3	..	18
September	6	9	5	..	20
October	6	6	4	..	16
November	2	4	2	2	10
December	8	5	..	1	14
Total ..	55	63	58	7	183

Latitude—10° 9′ N.

Longitude—5*h*. 10*m*. 10*s*. E.

Appendix VI.

Height of Barometer cistern above sea level 944 ft.

MEAN monthly and annual Meteorological Results at the Periyakulam Observatory in 1906.

Month.	Barometer.		Dry bulb thermometer.				Wet bulb.		Tension of vapour.	Relative humidity.	Sun Max. *in vac*	Min. on grass.	Wind.			Rain.		Clear sky.
	Reduced to 32°.	Daily range.	Mean.	Max.	Min.	Range.	Mean.	Min.	By Blanford's tables.				Daily velocity.	Mean direction.		Amount.	Days.	
	INCHES.	INCHES.	°	°	°	°	°	°	INCHES.	CENTS.	°	°	MILES.	POINTS.	POINTS.	INCHES.	NO.	CENTS.
January	29·007	0·146	77·4	89·2	66 9	22·3	68·8	64·6	0 590	62	141·3	61·0	44·4	13	S.E. by S	1·95	1	64
February	28·958	·160	81·2	93·7	70·1	23·6	70·4	66·9	·601	56	147·8	64·1	50·9	13	S.E. by S.	1·55	1	72
March	29·077	·158	81·3	94·1	69·4	24·7	70·3	66·0	·596	56	148 3	63·2	50·1	11	S.E. by E.	4·15	6	76
April	28·891	·148	86·4	101·4	73·3	28·1	72·3	68·3	·608	49	157 0	66·8	56·9	11	S.E. by E.	0·18	1	74
May	·846	·134	83·9	97·1	73·5	23·6	74·7	70·9	·737	63	154·1	69·7	73 3	16	S.	8·21	11	61
June	·822	·111	82·9	95·0	73·7	21·3	72·0	68·9	·640	57	154·2	69·2	102·6	16	S	0·10	..	36
July	·803	·104	81·4	91 0	72·6	21·4	71·4	68·5	·634	59	154·7	68·8	89·5	18	S.S.W.	0·81	3	39
August	·845	·121	79·6	90·8	71·9	18·9	72·5	69·8	·705	70	148·3	68·7	54·8	13	S.E. by S.	10 82	10	39
September	·869	·133	80·1	92·0	70·7	21·3	71·0	68·0	·639	62	150 0	66·1	67·8	16	S.	1·11	3	45
October	·916	·131	78·3	88·6	71·3	17·2	72·5	69·5	·726	75	136·6	67·5	37·7	15	S. by E.	5·16	11	37
November	·989	123	76·2	85·5	69·9	15·6	71·2	68·0	·698	77	137·3	66·1	41·1	16	S.	6·50	12	37
December	·970	·121	75·1	85·0	67·8	17·2	69·5	66·0	·648	74	131·4	63·5	32·3	10	E.S.E.	2 76	5	39
Annual ..	28·916	0·132	80·3	92·2	70·9	21·3	71·4	68·0	0·652	63	146·8	66·2	58·4	14	S.S.E.	43·30	64	52

EXTREME monthly Meteorological Records at the Periyakulam Observatory in 1906.

Month.	Barometer.					Dry bulb thermometer.				Wet bulb.		Humidity.		Sun. Th. *in vacuo*.		Grass therm.		Wind.				Rain.	
	Highest.		Lowest.		Range.	Highest.		Lowest.		Lowest.		Lowest.		Highest.		Lowest.		Highest.		Lowest.		Greatest fall.	
	INCHES.	DAY.	INCHES.	DAY.	INCHES.	°	DAY.	°	DAY.	°	DAY.	CENTS.	DAY.	°	DAY.	°	DAY.	MILES.	DAY.	MILES.	DAY.	INCHES.	DAY.
January	29·146	20	28·827	16	0·319	92·7	16	59·3	1	57·4	1	24	31	153·4	15	50·8	1	82 4	14	27·1	3	1·95	18
February	·159	4	·763	24	·396	100·2	24	60·9	1	58·7	1	25	24	156·8	15	52·4	1	114 0	25	27·7	19	0·85	28
March	·168	10	·808	19	·360	98·3	31	61·4	10	56·3	10	16	8	157·1	17	51 3	10	82·6	17	38·1	7	2·29	18
April	·018	11	·760	7	·258	104·2	19	67·0	13	60·4	13	16	13	162·7	21	57·6	13	80·3	30	40·8	27	0·11	27
May	28·987	11	·699	7	·288	103·3	7	66·1	20	65·8	20	2ɒ	7	162·1	3	64 8	31	111·7	27	27 1	3	2·80	7
June	·939	10	·702	7	·237	100·2	10	69·5	1	64·4	1	34	30, 1	166·0	12	61·9	1	188·4	7	36·4	18	0 05	14
July	·965	31	·621	19	·344	99·4	24	67·6	2	64·0	2	25	24	167·2	8	60·9	2	176·2	11	43·8	14	0·28	20
August	·991	5	·726	22	·265	96·3	6	68·1	31	65·3	30	39	30, 31	162·8	3	62·2	31	96·7	4	20 9	24	5·70	11
September	·998	30	·739	3	·259	96·3	11	64·9	27	62·0	27	34	30	160·3	8	58·2	27	104·8	27	26·1	21	0·72	17
October	29·038	8	·758	28, 29	·280	96·1	2	66·2	31	63·8	31	40	1	158·9	3	60·0	31	69·2	16	4·9	26	1·13	9
November	·101	27	·876	10	·225	91·9	4	64·6	26	63·2	19, 26	42	2	147·1	3, 9	59·9	26	71·2	24	11.7	2	2·03	8
December	·087	10	·836	20	·251	89·7	19	59·8	13	58·4	13	37	24	144·4	20	53·2	13	65·7	24	2·6	27	1·05	29

Appendix VII.

MADRAS OBSERVATORY.—Abnormals from monthly means for the year 1906.

Abnormals of	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Annual.
Reduced atmospheric pressure	— 0·018	— 0·049	+ 0·037	— 0·009	— 0·013	Same as	— 0·036	Same as	— 0·013	+ 0·007	+ 0·031	— 0·016	— 0·009
Temperature of air	+ 1·4	+ 3·0	+ 0·2	+ 1·2	+ 2·7	+ 0·5	+ 1·3	+ 0·2	+ 0·6	+ 1·2	+ 0·8	+ 0·5	+ 1·1
Do. of evaporation	+ 2·9	+ 3·7	+ 0·9	+ 2·3	+ 3·2	+ 2·4	+ 2·8	+ 2·5	+ 1·9	+ 1·1	+ 1·6	+ 2·2	+ 2·3
Percentage of humidity	+ 7	+ 4	+ 3	+ 4	+ 4	+ 7	+ 7	+ 10	+ 6	+ 1	+ 4	+ 8	+ 5
Greatest solar heat *in vacuo*	— 8·2	— 3·5	— 4·8	— 1·0	— 1·0	— 6·2	— 4·9	— 5·8	— 8·4	— 3·6	— 4·6	— 13·5	— 5·5
Maximum in shade	— 0·7	+ 1·3	— 0·7	+ 1·9	+ 3·0	— 1·0	+ 1·5	— 1·7	— 0·3	+ 0·7	+ 0·7	— 2·0	+ 0·2
Minimum in shade	+ 2·0	+ 4·6	— 0·5	+ 0·9	+ 2·2	+ 0·5	+ 0·6	Same as	+ 0·4	+ 0·6	+ 0·2	+ 1·6	+ 1·1
Do. on grass	+ 2·9	+ 5·8	— 0·3	+ 1·3	+ 2·6	+ 0·7	+ 1·5	+ 0·4	+ 0·8	+ 0·4	+ 1·0	+ 2·8	+ 1·8
Rainfall in inches	+ 3·16	+ 0·66	— 0·39	— 0·62	— 2·12	+ 0·29	+ 0·58	— 0·11	— 1·58	— 6·85	— 6·74	+ 11·15	....
Do. since January	..	+ 3·82	+ 3·43	+ 2·81	+ 0·69	+ 0·98	+ 1·56	+ 1·45	+ 3·03	— 3·82	— 10·56	+ 0·59	+ 0·59
General direction of wind	3 points E.	4 points S	1 point E.	1 point S.	1 point S.	1 point S.	Same as	Same as	2 points W.	3 points S.	2 points E.	2 points E.	1 point S.
Daily velocity in miles	— 17	+ 14	— 19	+ 19	— 3	— 24	— 5	— 40	— 26	— 13	— 22	+ 8	— 10
Percentage of cloudy sky	+ 11	+ 8	— 1	— 9	— 9	Same as	— 9	— 15	— 3	— 12	Same as	+ 11	— 3
Do. of bright sunshine	— 22·4	— 13·1	— 12·1	— 11·6	— 12·9	— 19·1	+ 0·8	+ 0·6	— 8·6	— 1·0	— 13·9	— 21·7	— 11·2

+ means *above* normal, — *below*.

Appendix VIII.

ABSTRACT of the mean meteorological condition of Madras in the year 1906 compared with the average of past years.

Mean values of	1906.	Difference from	Average.
Reduced atmospheric pressure	29·855	0·009 below.	29·864
Temperature of air	82·2	1·1 above.	81·1
Do. of evaporation	76·8	2 3 ,,	74·5
Percentage of humidity	77	5 ,,	72
Greatest solar heat *in vacuo*	134·2	5·5 below.	139·7
Maximum in shade	91·0	0·2 above.	90·8
Minimum in shade	75·8	1·1 ,,	74 7
Do. on grass	73·7	1·8 ,,	71 9
Rainfall since January 1st on 92 days	49·61	0 59 ,,	49·02
General direction of wind	S.E. by S.	1 point S.	S.E.
Daily velocity in miles	161	10 below.	171
Percentage of cloudy sky	46	3 ,,	49
Do. of bright sunshine	47·2	11·2 ,,	58·4

DURATION and quantity of the wind from different points.

From	Hours.	Miles.	From	Hours.	Miles.	From	Hours.	Miles.	From	Hours.	Miles.
North ..	170	1,285	East ..	174	810	South ..	168	1,194	West ..	199	1,615
N. by E. ..	269	1,945	E. by S. ..	315	1,640	S. by W. ..	311	2,091	W. by N. ..	250	1,849
N.N.E. ..	214	1,349	E.S.E. ..	338	1,617	S.S.W. ..	228	1,620	W.N.W. ..	157	1,203
N.E. by N...	230	1,632	S.E. by E.	712	3,929	S.W. by S.	244	1,559	N.W. by W.	158	1,100
N.E. ..	153	1,345	S.E. ..	504	3,023	S.W. ..	137	845	N.W. ..	58	418
N E. by E.	219	1,717	S.E. by S.	1,140	9,466	S.W. by W.	266	1,751	N.W. by N.	83	493
E.N.E. ..	155	836	S S.E. ..	398	2,963	W.S.W. ..	212	1,533	N.N.W. ..	81	493
E. by N. ..	184	990	S. by E. ..	334	2,431	W. by S. ..	336	2,376	N. by W...	231	1,490

There were 132 calm hours during the year. The resultant corresponding to the above numbers is represented by a S.E. by S. wind, blowing with a uniform daily velocity of 48 miles.

Appendix IX.

MADRAS OBSERVATORY.—Number of hours of wind from each point in the year 1906.

Month.	N.	1	2	3	4	5	6	7	E.	9	10	11	12	13	14	15	S.	17	18	19	20	21	22	23	W.	25	26	27	28	29	30	31	Calm.
January	10	23	33	49	38	50	60	36	74	121	80	57	33	12	1	..	2	2	3	2	4	3	..	1	.	..	..	..	..	..	4	21	25
February	1	..	..	5	3	4	7	13	30	60	76	148	68	151	21	23	5	12	15	11	5	7	6	2	..	..	1	..	1	.	..	..	7
March	3	2	4	2	4	17	27	27	24	55	50	152	129	123	41	10	12	12	14	5	1	4	1	..	1	.	..	..	..	1	.	3	20
April	..	..	..	.	..	..	..	..	..	..	..	..	33	341	128	52	29	55	43	25	8	1	.	.	..	..	.	..	..	..	..	..	5
May	..	2	1	..	..	1	..	1	2	3	11	15	42	190	90	96	42	70	49	30	4	10	11	16	14	15	10	8	6	1	1	..	3
June	1	..	1	..	2	..	1	3	3	5	8	38	32	86	39	60	17	37	18	32	23	49	41	77	36	34	35	22	5	7	4	..	4
July	..	3	1	..	1	..	1	2	3	5	5	20	14	52	23	37	16	35	17	36	33	85	68	103	56	68	13	26	6	7	4	3	1
August	3	10	5	2	2	1	3	12	7	23	30	49	33	48	16	20	5	37	24	49	38	60	41	50	30	44	26	33	7	17	5	1	13
September	..	1	..	1	1	1	3	1	2	8	20	41	40	34	24	7	14	22	34	25	17	25	38	70	55	72	65	54	12	7	1	3	22
October	30	48	14	22	11	17	13	38	8	10	33	121	49	54	10	15	3	20	8	22	3	21	6	15	6	17	6	14	21	16	16	37	20
November	32	86	71	75	62	86	27	18	14	8	3	20	17	23	4	2	17	6	3	5	1	1	..	2	1	.	1	1	..	15	30	83	6
December	90	94	84	74	29	42	13	33	7	17	22	51	24	26	1	12	6	3	..	2	..	..	..	..	..	..	..	..	..	12	16	80	6
Annual ..	170	269	214	230	153	219	155	184	174	315	338	712	504	1,140	398	334	168	311	228	244	137	266	212	336	199	250	157	158	58	83	81	231	132

Appendix X.

MADRAS OBSERVATORY.—Number of miles of wind from each point in the year 1906.

Month.	N.	1	2	3	4	5	6	7	E.	9	10	11	12	13	14	15	S.	17	18	19	20	21	22	23	W.	25	26	27	28	29	30	31	Total.
January	77	191	228	325	372	370	268	222	230	578	343	311	95	79	2	..	12	5	10	9	12	9	..	3	..	..	..	..	..	.	27	160	3938
February	8	..	..	54	31	36	47	92	124	261	265	728	404	1076	150	87	26	89	99	79	35	50	32	10	..	..	7	..	5	..	..	..	3795
March	12	5	7	3	22	100	116	111	131	290	246	917	675	911	184	78	82	81	98	24	2	16	2	..	2	..	..	..	..	5	..	11	4131
April	..	.		..		.	.	..	..	..	..	..	296	2957	1140	447	274	539	378	199	44	14	..	..	..	..	..	.		.	..	..	6288
May	..	17	10	..	..	8	..	11	16	32	110	145	405	2096	763	865	349	545	433	235	26	77	88	141	128	182	115	76	53	7	1	..	6934
June	10	..	7	..	18	..	10	31	23	31	58	312	270	877	304	379	127	198	113	212	153	359	360	681	362	312	336	230	34	38	29	..	5874
July	..	23	9	..	12	..	9	18	30	42	53	179	124	458	161	292	123	211	115	244	229	648	615	848	507	564	130	207	39	37	31	20	5978
August	21	23	24	15	15	7	19	66	41	162	186	276	170	237	82	102	35	161	157	308	257	367	219	276	224	282	120	178	41	61	13	6	4151
September	..	7	..	5	7	7	20	6	14	60	115	234	192	198	98	59	67	104	151	128	63	111	193	334	356	441	454	325	109	26	4	21	3889
October	184	242	38	96	71	104	76	146	46	41	118	487	201	307	43	60	16	103	51	79	17	96	24	77	33	68	39	79	137	99	78	160	3416
November	198	471	379	514	512	766	155	102	86	53	13	82	57	87	29	8	47	19	15	26	7	4	..	6	3	..	2	5	..	81	147	427	4301
December	775	966	647	620	285	319	116	185	69	90	110	258	134	183	7	74	36	36	..	16	..	.	..	..	..	..	..	..	..	139	163	685	5913
Annual ..	1285	1945	1349	1632	1345	1717	836	990	810	1640	1617	3929	3023	9466	2963	2431	1194	2091	1620	1559	845	1751	1533	2376	1615	1849	1203	1100	418	493	493	1490	58608

Appendix XI.

MADRAS OBSERVATORY.—Number of inches of rain from each point in the year 1906.

Month.	N.	1	2	3	4	5	6	7	E.	9	10	11	12	13	14	15	S.	17	18	19	20	21	22	23	W.	25	26	27	28	29	30	31	Calm.
January	..	0·45	0·79	0·75	0·35	0·92	0·08	0·16	0·12	0·12	0·10	0·09	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	0·12	..
February	..	..	..	..	..	..	..	..	0·56	0·32	..	0·01	..	0·05	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
March	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
April	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
May	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
June	..	..	..	..	..	..	..	..	..	..	..	..	0·08	0·01	..	0·01	..	0·01	..	0·85	0·02	0·50	0·05	0 02	0 17	0·03	0·27	..	..	0·31	0 07	..	..
July	..	..	..	..	..	..	..	0·03	..	..	..	0 03	0·24	0·02	..	0·11	..	0 32	..	0·42	..	0·60	0·99	0·29	..	0·45	0·02	0·06	..	..	0·04	0·83	..
August	..	..	..	..	..	..	..	0·01	0·05	0 04	0 04	..	..	0·07	..	0 05	0·01	0·03	0·98	0·58	0·37	0·19	0·05	0·04	1·65	0·11	..	0·11	..	0·07	..	..	..
September	..	..	..	..	..	..	..	..	..	..	0·01	1·43	..	0·25	..	0·01	..	..	0·18	0·03	0·17	0·20	1·55	0·32	0·16	0·42	0·82	0·24	..	0·40	..	0 06	0 02
October	0·67	0·69	0·66	0·08	0·02	0·34	..	0·34	0·01	0·33	0·37	..	0·37	..	..	..	..	..	..	..	..	..	..	..	..	0·08	..	..	0·13	..	..	0·06	..
November	0·03	0·46	0·78	0·17	0·43	0·26	0 59	0·07	0·11	0·63	0·11	0·43	..	..	..	..	..	..	..	0·19	..	..	..	0·82	..	..	..	..	..	0·27	0·83	0·29	..
December	2 96	2·43	0·33	1·76	0·64	1·27	0 16	1·47	0·29	..	0·57	0·13	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	0·56	0·58	3·28	..
Annual ..	3·66	4·03	2·56	2·76	1·44	2·79	0 ·83	2·08	1·14	1·44	1·20	2·12	0·69	0·40	..	0·18	0·01	0·36	1·16	2·07	0·56	1·49	2·64	1·49	1·98	1·09	1·11	0·41	0·13	1·61	1·52	4·64	0·02

Appendix XII.

MADRAS OBSERVATORY.—Wind, cloud and bright sunshine, 1906.

Month.	Wind resultant.		Clouds (0—10).					Bright sunshine.	
	Velocity.	Direction.	8 H.	10 H.	16 H.	20 H.	Mean.	Average per day.	Greatest number of hours in a day.
	MILES.							HOURS.	
January	94	E.N.E.	4·6	5·5	5·1	3·6	4·8	5·9	8·9
February	110	S.E.	3·6	4·4	3·0	1·6	3·2	8·1	10·0
March	113	S.E.	2·2	3·3	2·1	1·5	2·3	8·0	10·3
April	195	S.S.E.	3·4	2·1	1·4	0·7	1·9	8·0	9·4
May	165	S. by E.	3·5	3·2	2·7	2·0	2·9	6·9	9·2
June	98	S.W. by S.	6·1	6·3	7·4	6·0	6·4	3·5	7·3
July	118	S.W. by W.	6·5	5·8	6·6	6·0	6·2	4·2	7·6
August	58	S.W. by S.	5·1	5·3	6·4	4·1	5·2	5·2	9·6
September	60	W.S.W.	6·5	5·8	6·1	4·9	5·9	8·6	9·7
October	23	E.	4·7	5·3	4·8	3·8	4·7	6·0	10·3
November	107	N.E. by N.	5·5	7·0	6·5	4·6	5·9	4·4	9·3
December	129	N.N.E.	6·2	6·6	7·2	5·2	6·3	4·0	8·3
Annual ..	48	S.E. by S.	4·8	5·1	4·9	3·7	4·6	6·1	9·2

Appendix XIII.

MEAN monthly and annual Meteorological results at the Madras Observatory in 1906.

	Barometer.		Dry bulb thermometer.				Wet bulb.		Tension of vapour.	Relative humidity.	Sun Max. *in vac.*	Min. on grass.	Wind.			Rain.		Cloudy sky.	Bright sunshine.	Dew point.
	Reduced to 32°.	Daily range.	Mean.	Max.	Min.	Range.	Mean.	Min.	By Blanford's tables.				Daily velocity.	Mean direction.		Amount	Days.			
	INCHES.	INCHES.	°	°	°	°	°	°	INCHES.	CENTS.	°	°	MILES.	PTS.	POINTS.	INCHES.	NO.	CENTS.	HOURS.	°
January	29·979	0·103	76·5	83·9	69·5	14·4	72·1	68·6	0·733	80	130·2	66·6	127	8	E.	4·05	5	48	182·3	69·0
February	·916	·130	79·7	87·9	72·6	15·3	74·5	71·6	·789	77	136·2	69·6	136	12	S. E.	0·94	3	32	226·0	71·0
March	·942	·122	80·2	88·5	71·6	16·9	74·8	70·7	·792	77	135 7	68·3	133	11	S. E. by E.	..	..	23	248·4	70·9
April	·817	·132	85·2	94·8	78 1	16·7	79·9	76·8	·951	78	140·7	76·0	210	14	S. S. E.	..	..	19	239·7	76·4
May	·722	·124	89·4	100·8	83 0	17·8	81·5	77·8	·971	71	142·0	81·5	224	16	S.	..	..	29	214·1	76·5
June	·703	·121	86·9	97·3	80·8	16·5	79·0	75·8	·886	69	134·3	79·3	196	18	S. S. W.	2 40	6	64	105·7	73·9
July	·685	·113	85·8	97·1	79·1	18 0	78·7	74·9	·887	72	133 8	78·1	193	20	S. W.	4 45	15	62	131·5	74·1
August	·749	·128	83·5	92·0	77·3	14·7	78·5	75·2	·911	80	134·2	75·8	134	19	S. W. by S.	4·45	12	52	161·0	75·2
September	·764	·122	83·6	92·9	77 5	15 4	78·2	74 9	·892	78	132·9	75·8	130	20	S. W.	6·27	14	59	129·7	74·6
October	·848	·129	81·8	89·7	75 8	13·9	76·7	74·1	·857	79	135·5	73 2	110	10	E. S. E.	4 15	9	47	186·5	73·3
November	·954	·107	78·3	85·7	72·5	13·2	74·5	71·5	·803	83	132·8	70·5	143	4	N. E.	6·47	15	59	131·1	71·9
December	·933	·108	76·0	81·6	71·4	10·2	72·8	70·2	·768	85	122·3	69·2	191	4	N. E.	16·43	13	63	124·3	70·5
Annual ..	29·834	0·120	82·2	91·0	75·8	15·2	76·8	73·5	0·853	77	134·2	73·7	161	13	S. E. by S.	49·61	92	46	2,080·3	73·1

EXTREME monthly Meteorological records at the Madras Observatory in 1906.

	Barometer.					Dry bulb thermometer.				Wet bulb.		Humidity.		Sun Th. *in vacuo.*		Grass therm.		Wind.				Rain.	
	Highest.		Lowest.		Range.	Highest.		Lowest.		Lowest.		Lowest.		Highest.		Lowest.		Highest.		Lowest.		Greatest fall.	
	INCHES.	DAY.	INCHES.	DAY.	INCHES.	°	DAY.	°	DAY.	°	DAY.	CENTS.	DAY.	°	DAY.	°	DAY.	MILES.	DAY.	MILES.	DAY.	INCHES.	DAY.
January	30·095	20	29·850	16	0·245	86·8	10	65·1	1	65·0	9	54	9	138·2	12	60·9	1	284	16	59	2	2·38	16
February	**·116**	**4**	·736	24	·380	94·8	19, 23	64·4	3	63·6	3	50	5	146·3	18	60·3	3	204	12	83	3	0·77	28
March	·110	5	·770	19	·340	92·4	19	67·7	3	66·7	3	56	22	145·1	19	64·1	12	201	19	86	5	..	..
April	29·939	11	·674	19	·265	101·5	20	71·8	12	70·4	12	43	12	144·5	9	67·5	12	328	18	153	1	..	..
May	·905	11	·547	25	·358	**111·5**	**27**	77·2	6	74·8	18, 19, 21	38	24	**149·6**	**18**	74·6	6	272	29	170	18	..	..
June	·866	10	·544	20	·322	106·1	2	75·8	14	72·4	15	41	20	149·5	3	74·5	14	259	7	95	10	1·43	11
July	·897	31	**·477**	**19**	·420	103·2	2	73·0	28	73·0	28	45	6	143 7	24	72·7	17	295	23	126	16	1·25	28
August	·890	5	·577	24	·313	97·9	30, 31	73·5	20	73·0	20	43	28	144·3	18	72 7	20	204	28	**56**	**21**	1·58	1
September	·921	15	·613	5	·308	99·4	13	72·3	20	72·0	28	45	6	147·9	5	72·3	20	188	12	**56**	**19**	**3·98**	**20**
October	·977	12	·611	28	·366	94·6	12	69·2	28	65·6	28	**33**	**30**	148·6	10	67·7	28	172	25	83	10	1·84	18
November	30·070	27	·833	1	·237	90·9	6	68·7	27	67·6	27	53	7	143·5	9	65·6	27	215	24	76	29	1·66	23
December	·073	10	·772	14	·301	84·9	23	**63·4**	**3**	**63·3**	**3**	58	11	135·4	16	**58·0**	**2**	**398**	**26**	95	29	3·59	13