REPORT

OF THE

KODAIKANAL OBSERVATORY

FOR THE YEAR

1926

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This report is concerned with the astronomical and seismological work of the Kodaikanal Observatory. The meteorological data will be published in the "India Weather Review" and administrative details will be incorporated in the annual report of the India Meteorological Department.

2. *Preliminary.*—The full effect of the abolition of the Assistant Director's post is now being felt in the amount of research which can be accomplished. A fifty per cent reduction in the staff qualified for experimental research has resulted in a relatively much greater reduction in the amount of research which can be undertaken, for a considerable portion of the Director's time is occupied in maintaining the efficiency of the ordinary routine work.

The collection of spectroheliograms from other observatories for those days on which records could not be obtained at Kodaikanal was continued as part of the programme of the International Astronomical Union. The data of solar activity given in this report are, however, based on Kodaikanal photographs only, as photographs from other observatories will not be available until a considerable time after the end of the year.

The Observatory continued to participate in Lord Rayleigh's scheme of observations for determining the luminosity of the night sky. These observations were made on all days when sky conditions permitted and results were communicated periodically to Lord Rayleigh. They have, however, been discontinued from 23rd January, 1927, at the request of Lord Rayleigh.

3. *Weather conditions.*—As a result of the failure of the north-east monsoon the weather has been more than usually favourable for solar observations. The mean definition in the north dome was 2·9 on a scale in which 1 is the worst and 5 the best, whilst the number of days on which the definition was estimated as 4 or above was 45.

4. *Photoheliograph.*—Photographs on a scale of 8 inches to the sun's diameter were taken on 345 days using a 6-inch achromatic object glass and green colour screen.

5. *Spectroheliographs.*—Monochromatic images of the sun's disc in K light were obtained on 344 days, prominence plates on 311 days and H*a* disc plates on 328 days. During the year a total of 2805 spectroheliograms were obtained.

6. *Six-inch Cooke Equatorial and Spectroscope.*—Work with this instrument has been continued on the same lines as formerly for visual observations of solar phenomena which cannot be readily photographed.

7. Plans have been completed for certain improvements in the H*a* spectroheliograph. At present two mirrors are used to deflect the sun's image into this spectroheliograph and it is now proposed to do away with these mirrors. The new parts which are necessary for

the requisite modification of the spectroheliograph are now being manufactured in England. When the alteration has been carried out, the H*a* spectroheliograph will be reconstructed to secure greater stability, designs for which are now ready.

8. Considerable time has been devoted to the collection of material for a review of prominence activity which it is hoped to publish in a Memoir. This work is, however, not yet complete.

9. The year 1926 has seen a large increase in solar activity in consequence of the advance of the sunspot cycle. Three remarkable features observed during the year are noted here :—

(1) An unusually bright filament on the sun on the 22nd February 1926. The whole development of a bright filament is exhibited in the series of spectroheliograms obtained at Kodaikanal on this day. In point of brilliance, extent and completeness of the observations this example exceeds any other in the Kodaikanal record and is believed to be the finest ever photographed.

(2) A dark marking which was first seen on the 18th December, 1925, and disappeared on the 16th April, 1926, attained on the 21st February, 1926, an area which exceeded in size any previously recorded at Kodaikanal.

(3) An eruptive prominence on the 10th December, 1926, was observed to ascend rapidly to a height of over 14', or 400,000 miles.

Summary of sunspot and prominence observations.

10. *Sunspots.*—The following table gives the monthly numbers of new groups observed at Kodaikanal and their distribution between the northern and southern hemispheres. The mean daily numbers of spots visible are also given:—

—	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Year.
New groups ...	14	16	22	24	28	18	20	17	24	18	21	25	247
North	5	12	9	14	18	11	9	7	11	10	9	10	125
South	9	4	13	10	10	7	11	10	13	8	12	15	122
Mean daily numbers.	4·5	4·9	4·3	3·4	4·5	4·8	3·4	4·1	3·8	5·0	4·5	6·2	4·5

The above figures indicate a large increase of activity compared with the previous year, the increase being greater in the southern hemisphere.

The approximate mean latitude of the spots was 18°5 in the northern hemisphere and 17°2 in the southern.

With the advance of the new spot cycle there was an increase in the number of active and disturbed spots.

During the year, bright reversals of the H$^{\alpha}$ line in the neighbourhood of sunspots numbered 705, nearly twice as many as in 1925, while the number of H$^{\alpha}$ displacements on the disc was 217, twice as many

as in 1925. Of these displacements, 159 were towards the red, 50 towards the violet and 8 both ways simultaneously. D_3 was observed as a dark line on 456 occasions, or nearly three times as often as in 1925.

11. *Prominences.*—The mean daily areas in square minutes of arc derived from the Kodaikanal photographic records are shown below :—

——	North.	South.	Total.
1926—January to June	4·66	3·52	8·18
July to December	4·40	3·26	7·66

The mean daily numbers were 18·2 and 18·3 respectively, in the two half-years.

Compared with the year 1925, these figures indicate an increase of 31 per cent in areas and 6 per cent in numbers.

The maximum of prominence activity in high latitudes has advanced about 10° towards the poles compared with the year 1925. The eastern hemisphere showed an excess over the western in prominence numbers, but a defect in prominence areas.

Prominences showing metallic lines were observed on 152 occasions. Of these, 99 were in the northern hemisphere.

Six hundred and fifty displacements of the hydrogen lines were observed in the chromosphere and prominences as against 546 during 1925. Three hundred and seventy-four were towards the red, 257 towards the violet and 19 both ways simultaneously.

The mean daily area of prominences projected on the disc as absorption markings was nearly double that of the previous year. On the whole there was an excess in the western hemisphere in both areas and numbers.

12. *Time.*—The error of the standard clock is usually determined by reference to the 16-hour signal from the Madras Observatory. This is rendered possible by the courtesy of the Telegraphic Department which permits the Madras wire to be joined through to this Observatory. The signal is received with accuracy on most days and all failures are at once reported to the Postmaster-General, Madras.

13. *Seismology.*—The Milne horizontal pendulum recorded 87 earthquakes during the year. For details of the records, reference may be made to the " India Weather Review."

14. *Library.*—One hundred volumes were bound during the year.

15. *Publications.*—The annual report for 1925, and Kodaikanal Observatory Bulletins Nos. 78 and 79 dealing with the prominence observations of 1925 were published and distributed during the year.

A paper on " Unusual bright filaments on the sun on the 22nd February, 1926 " was communicated to the Royal Astronomical Society (see Monthly Notices 86, 380, 1926).

KODAIKANAL,
23*rd February* 1927.

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