

Kodaikanal Observatory.

BULLETIN No. CVIII.

SUMMARY OF PROMINENCE OBSERVATIONS FOR THE FIRST HALF OF THE YEAR 1935.

In pursuance of the programme of work adopted since 1st January 1923 under the auspices of the International Astronomical Union, all observatories taking spectrohelograms of the sun have been asked to co-operate with the Kodaikanal Observatory by supplying copies of their photographs for those days when the Kodaikanal records are imperfect or wanting. In response to our requirements for the first-half of the year 1935, the Mount Wilson Observatory supplied calcium (K_{232}) prominence plates for 19 days and H_{α} disc plates for 15 days and the Meudon Observatory supplied calcium (K_3) disc plate for 1 day and H_{α} disc plates for 10 days.

When only incomplete or imperfect photographs for any day are available from more than one observatory the best photograph is chosen as representing the solar activity of that day, after weighting it according to its quality, and the remaining photographs are ignored.

Calcium Prominences at the Lamb —The mean daily areas and numbers of prominences photographed during the half-year by means of the K line of calcium are given below. The means are corrected for incomplete or imperfect observations, the total of 177 days for which plates were available being reduced to 163 effective days.

	Mean daily areas (square minutes)	Mean daily numbers
North	1.99	6.81
South	2.49	6.77
	—	—
Total	4.48	13.58
	—	—

Compared with the previous half-year, areas and numbers show an increase of 14 per cent and 2 per cent. respectively.

For comparison with bulletins issued prior to the co-operation of other observatories the means based on Kodaikanal photographs alone are also given, 167 days of observation being counted as $155\frac{1}{2}$ effective days.

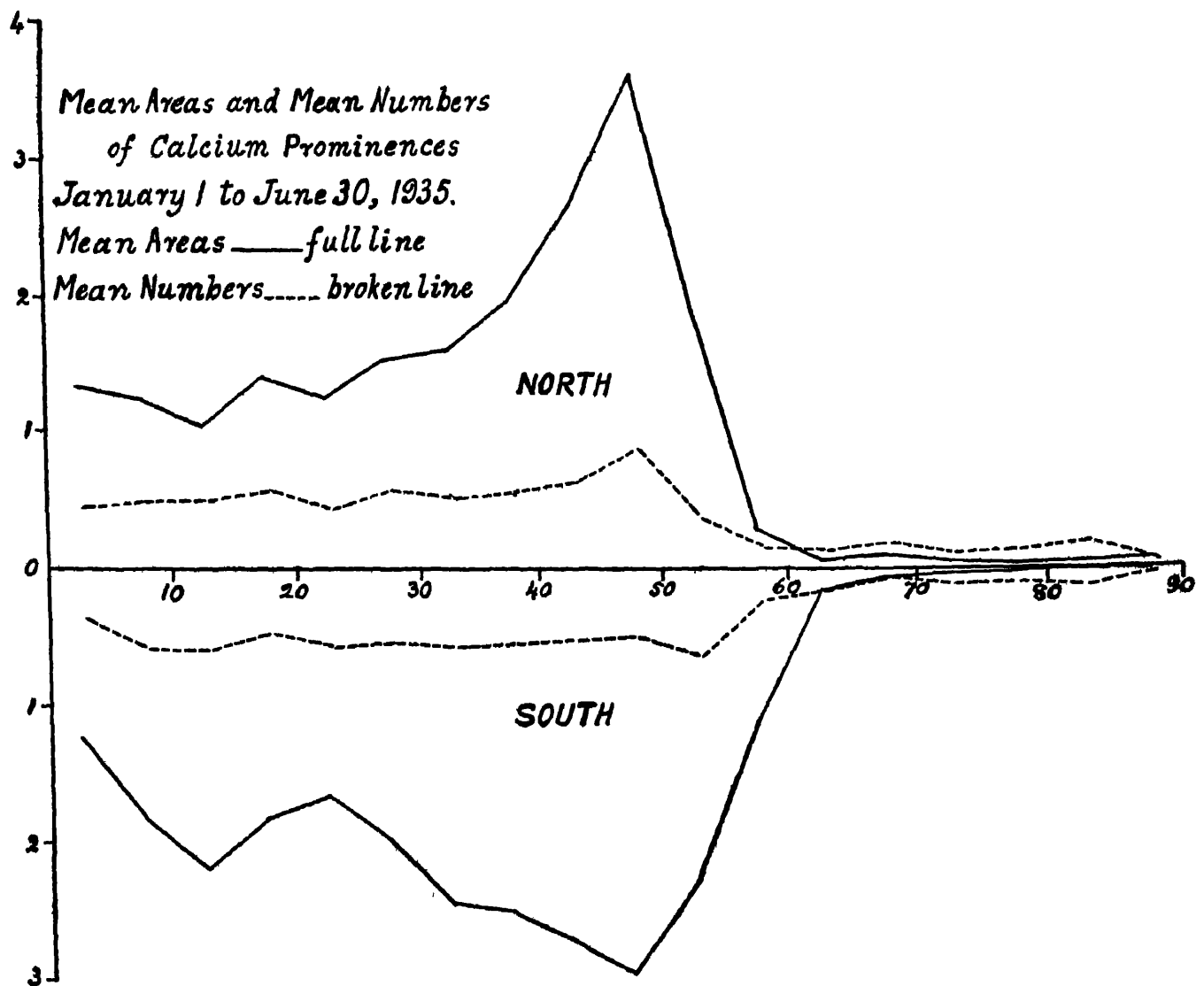
	Mean daily areas (square minutes)	Mean daily numbers.
North (Kodaikanal photographs only)	2.01	6.80
South (do)	2.50	6.86
	—	—
Total	4.51	13.66
	—	—

(366)

Price annas 5 or 6d.

The distribution of prominences in latitude is represented in the following diagram, in which the full line gives the mean daily areas and the broken line the mean daily numbers for each zone of 5° of latitude. The ordinates represent tenths of a square minute of arc for the full line and numbers for the broken line.

The general increase in prominence activity observed in the previous half-year is maintained. Compared with the second-half of 1934, there has been increased activity in the belts 10° to 15° and 30° to 40° in the southern hemisphere. The maximum of activity as seen in areas remains stationary in the belt 45° to 50° in both the hemispheres, while the maximum in numbers has advanced 5° towards the poles in the southern hemisphere.



The monthly, quarterly and half yearly areas and numbers and the mean height and the mean extent of the prominences on photographs from all co-operating observatories are given in Table I. The unit of area is 1 square minute of arc. The mean height is derived by adding together the greatest heights reached by

individual prominences and dividing by the total number of prominences observed, the mean extent is derived by adding together the lengths of the base on the chromosphere of individual prominences and dividing by the total number of prominences.

TABLE I. — ABSTRACT FOR THE FIRST HALF OF 1935.

Months	Number of days (effective)	Areas.	Numbers.	Daily means		Mean height.	Mean extent.
				Areas	Numbers		
1935							°
January	25½	112 5	339	4 4	13 3	37·0	4 96
February	27½	121 2	409	4 5	15 0	33·5	4 60
March	28½	128·2	396	4 5	13 8	33 8	5·26
April	26½	122 4	369	4 7	14 1	32·2	5·20
May	28½	134 8	348	4 7	12 1	36·9	6·35
June	26½	112 9	352	4 3	13·3	35·7	5·38
First quarter	81½	361 9	1,144	4 4	14 0	34·6	4 95
Second quarter	81½	370 1	1,069	4 5	13 1	34 9	5 67
First half	163	732·0	2,213	4·5	13·6	34 8	5·29

Distribution East and West of the Sun's Axis.

Compared with the previous half-year, both areas and numbers show a very slight defect in the east limb as will be seen from the following table :—

1935, January to June.	East.	West	Percentage East.
Total number observed	1,094	1,119	49 44
Total areas in square minutes	365·0	366 0	49 93

Date	Hour I S T		Latitude		Lamb	Displacement			Remarks	
			North	South		Red	Violet	Both ways		
	H	M	°	°		A	A	A		
April	1	8	50	68	E		Slight		In chromosphere	
	4	9	32	13 5	E	Slight			Do	
	5	9	28	47 5	W			Slight		
	10	10	22	24	E	2			At base	
		10	22	27	E	1			Do	
		10	22	29	E		1		At top	
		11	17	43	E	1			Throughout the height extending over 3°	
		11	40	60	E	1			Throughout the height extending over 11°	
	15	11	14		58 5	W	0 5			At base
		11	10		18 5	W	1			At top extends over 3° from -17° to -20°
23	8	46	62 5	W			Slight			
28	9	16		34 5	W	2 5	Slight		At top	
29	9	57	46	W					In chromosphere	
30	8	55	44	E	Slight				At top	
May	2	9	37	48	E	1 5			At top extends over 2° from +47° to +48°	
	3	9	19		30	E	Slight		Extends over 2° from -20° to -31°	
	4	9	19		32 5	E		Slight		At top
		9	37		24	E		1		Do
		9	37		28	E		Slight		In chromosphere
		9	24		29	E	Slight			At base
	7	9	32		15 5	E	0 5			At top
	8	9	27		50	E		Slight		
	10	9	10	31		E			2	
		9	01		6 5	W	Slight			At top
	11	10	00		29	W			3	In chromosphere
		10	00		25	W			2	At base
		10	00		17 5	W			2	At top extends over 5° from -15° to -20°
	12	8	58		37	W			1	At top, extends over 4° from -35° to -39°
		8	58		33	W	1			At base extends over 2° from -32° to -34°
13	9	42		38	W	3			At base	
	9	42		32 5	W	2 5	1 5		To red at base and to violet at top	
14	10	15		4 5	E	Slight			At top	
18	10	8		30	W			Slight	At base	
22	9	35		55	E	Slight			In chromosphere	
29	9	29	25		E	Slight			At base	
30	9	04	84		E	Slight			At top	
June	1	10	46		71	W	2		At top	
	4	9	15		45	E	Slight			At top extends over 2° from -44° to -46°
		9	00	7		W	Slight			At top
	7	9	07		20	E			Slight	At top extends over 2° from -19° to -21
		9	09		25	E	Slight			At base
	8	9	10		31 5	E				Extends over 2°
10		05		23 5	W	1			At top	

The total number of displacements was 91 as against 45 in the previous half-year, and their distribution was as follows :—

	North	South.
1° to 30°	8	34
31° to 60°	10	28
61° to 90°	7	4
	—	—
Total	25	66
	—	—
East limb	41
West limb	50
	—	—
Total	91	—

Of these displacements, 56 were towards the red, 29 towards the violet and 6 both ways simultaneously

Reversals and displacements on the Sun's disc.

One hundred and seventy-three bright reversals of the H_{α} line, 139 dark reversals of the D_2 line and 14 displacements of the H_{α} line were observed during the half-year. Their distribution is given below —

	North	South	East.	West
Bright reversals of H_{α}	70	103	99	74
Dark reversals of D_2	56	83	78	61
Displacements of H_{α}	7	7	7	7

Five displacements were towards the red, five towards the violet and four both ways simultaneously.

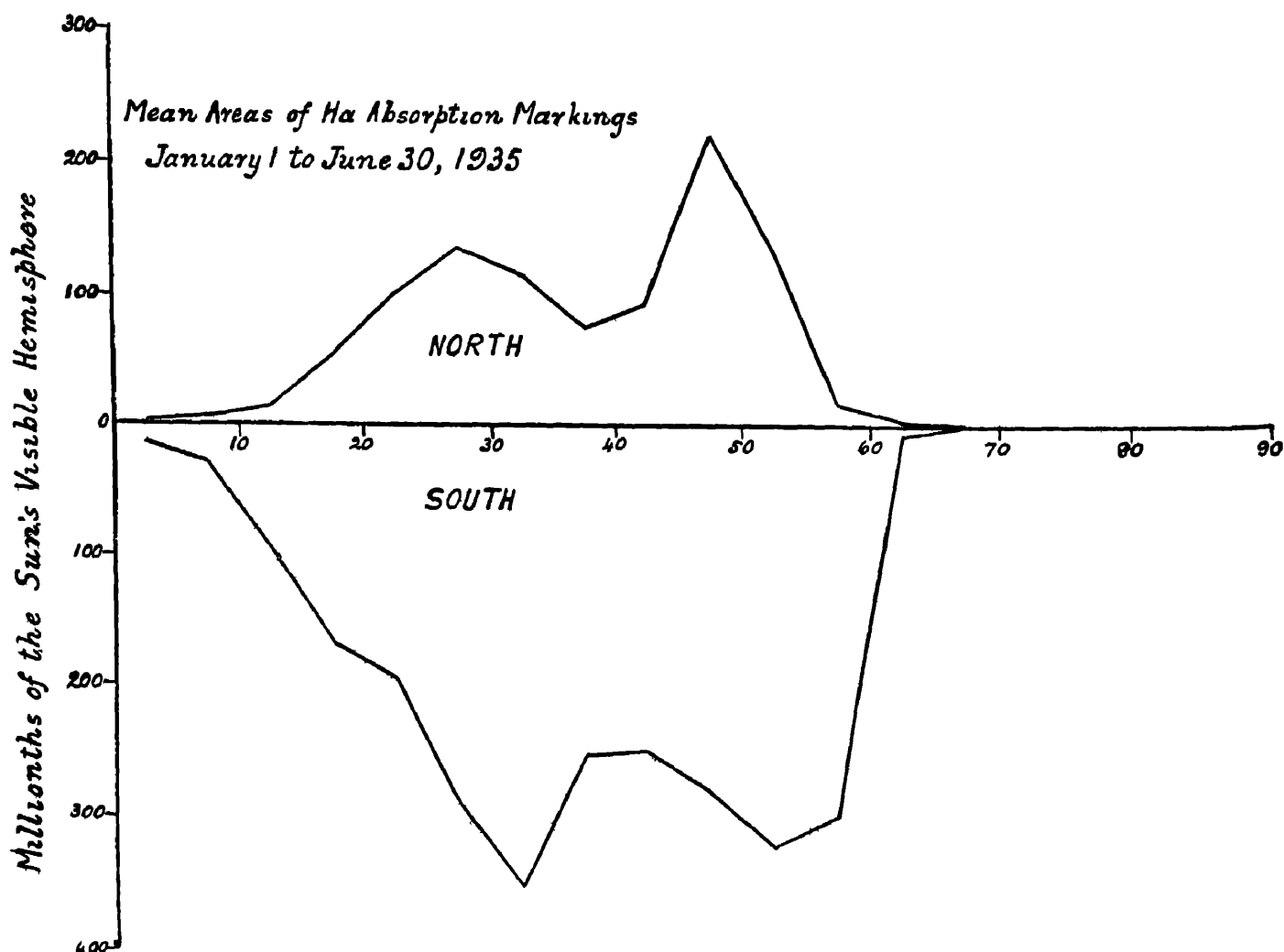
Prominences projected on the Disc as Absorption Markings.

Photographs of the sun's disc in H_{α} light were available from Kodiakanal and the co-operating observatories for a total of 178 days which were counted as 168 effective days. The mean daily areas of H_{α} absorption markings (corrected for foreshortening) in millionths of the sun's visible hemisphere and their mean daily numbers are given below :—

	Mean daily areas	Mean daily numbers
North	959	6.22
South	2,521	13.11
	—	—
Total	3,480	19.33

The distribution of mean daily areas in latitude is shown in the following diagram. Compared with the previous half-year, there has been great increase in activity in the southern hemisphere, the activity in the northern hemisphere remaining almost the same as in the previous half-year. The maximum of activity in the

zone 45° to 50° noted in the two previous half years remains in the same zone in the northern hemisphere and has advanced 5° towards the pole in the southern hemisphere, where a second maximum has also appeared in the belt 30° to 35°



Compared with the previous half year both areas and numbers show a slight eastern defect, the percentage in areas being 48.6 and in numbers 49.0

The mean daily of H α areas absorption markings uncorrected for foreshortening are given below —

	Mean daily areas
North	511
South	1 354

Total	1,865

The uncorrected areas amount to 54 per cent of the corrected ones

The curve of distribution in latitude is similar to that for the corrected areas as usual

Thanks are due to the co operating observatories for the photographs supplied by them

KODAIKANAL,

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