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Kodaikanal Observatory

BULLETIN No. CXX

SUMMARY OF PROMINENCE OBSERVATIONS FOR THE YEAR 1941

PART I

SUMMARY OF PROMINENCE OBSERVATIONS FOR THE FIRST HALF OF THE YEAR 1941

This summary is based on the data obtained from the photographs taken at this observatory supplemented by those available from the other co-operating observatories at Mount Wilson, Meudon and Ewhurst, for those days on which photographs at Kodaikanal were either lacking or of poor quality. 161 K-Prominence photographs were taken at Kodaikanal and 13 were received from Mount Wilson for the first half of this year On the whole, photographs were available for 170 days which were reckoned at 153½ days after giving weightage to days of incomplete observation.

The Mean daily areas (in square minutes of arc) and numbers of prominences derived from all available data are given below. The means calculated from observations at Kodaikanal only are also given for comparison with bulletins issued prior to 1st January 1923 *i.e.*, before the co-operation of other observatories came into force :—

	Combined data		Kodaikanal data only	
	Mean daily areas	Mean daily numbers	Mean daily areas	Mean daily numbers
North	2·42	7·24	2·49	7·27
South	1·54	5·81	1·58	5·88
Total . .	3·96	13·05	4·07	13·15

Compared with data for the previous half year, the areas show a decrease of about 11 per cent. and the numbers a decrease of 1 per cent.

Distribution of prominences in latitude is shown 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 square minutes of are for the full line and number for the broken line. In the northern hemisphere, the areas show maximum activity in the zone 15° to 35° as compared with two zones of activity at 5° to 15° and 25° to 45° shown in the two half years of 1940. In the southern hemisphere the peak of activity continues to be in the zone 25° to 35° as in the previous half year though less pronounced. The numbers show a fairly uniform distribution over the range 0° to 55° in both the hemispheres.

79 S.P. Obs. K.K.

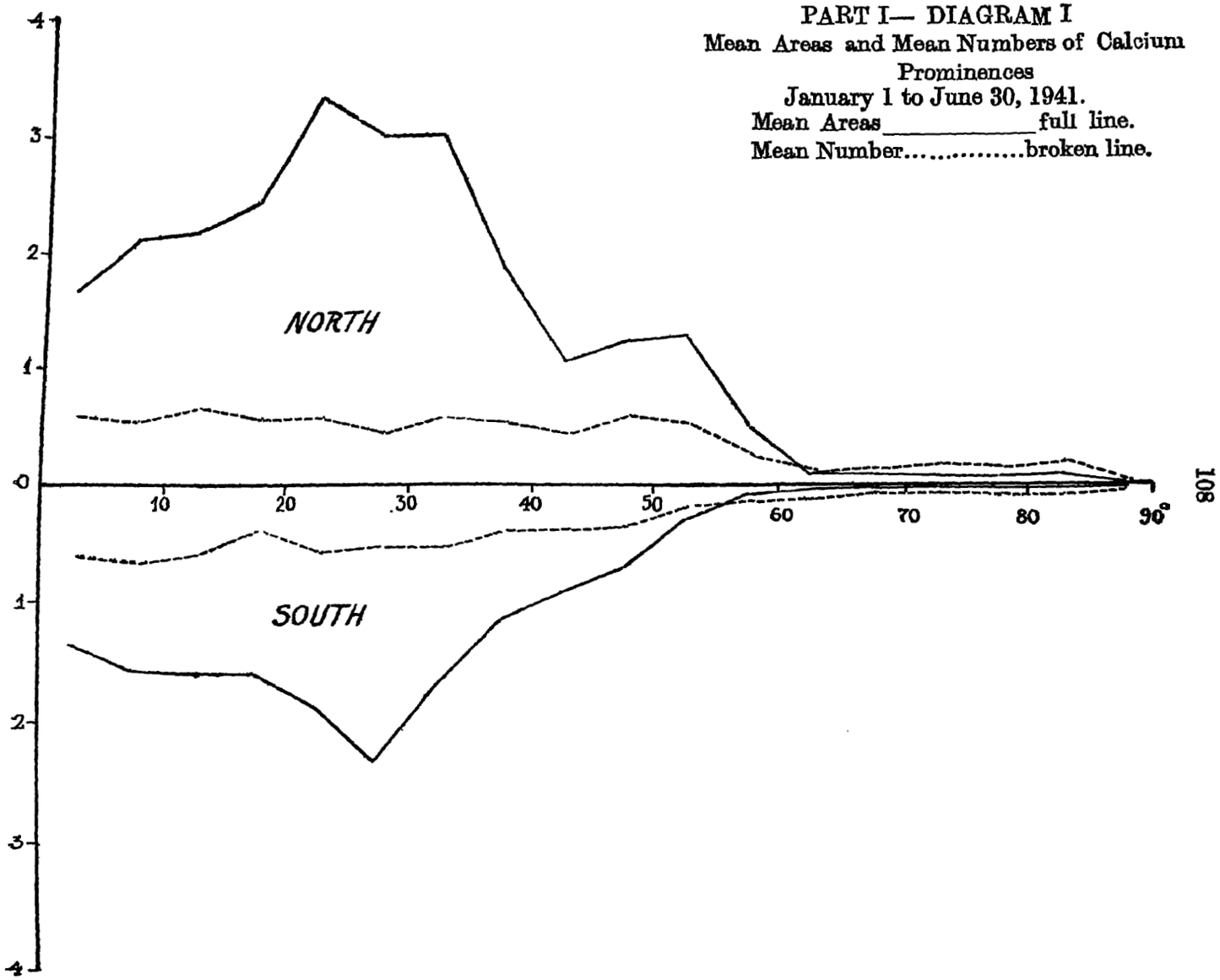
PART I— DIAGRAM I

Mean Areas and Mean Numbers of Calcium Prominences

January 1 to June 30, 1941.

Mean Areas_____full line.

Mean Number.....broken line.



The monthly, quarterly and half-yearly areas and numbers and the mean height and extent of the prominences are given in table I.

TABLE I

Months	Number of days (effective)	Areas (sq. mts.)	Numbers	Daily means		Mean height	Mean extent
				Areas	Numbers	"	°
1941							
January	26	89·8	328	3·45	12·62	36·00	5·74
February	25½	98·9	318	3·92	12·59	31·35	4·77
March	27½	118·8	373	4·28	13·44	33·58	4·63
April	27½	112·1	388	4·11	14·24	27·93	3·99
May	24½	107·6	340	4·35	13·74	32·37	4·19
June	22½	82·0	260	3·60	11·43	31·27	4·10
First Qr.	79	307·5	1019	3·89	12·90	34·64	5·05
Second Qr.	74½	301·7	988	4·04	13·22	31·52	4·09
First half year . . .	153½	609·2	2007	3·97	13·04	33·08	4·57

A large eruptive prominence was photographed on the west limb of the sun on February 28th. It reached a height of 10 minutes and occupied 11 square minutes of area.

The distribution of the prominences about the sun's axis is shown below :—

	East	West	Percentage East
Total number observed	994	1013	49·53
Total area (sq. min.) observed	290·8	312·3	48·73

The above table shows a slight eastern defect both in areas and numbers.

Observations with the Prominence Spectroscope.—The details of metallic prominences observed during the half-year are given in table II.

TABLE II

Date	Time I. S. T.*	Base	Latitude		Limb	Height	Lines
			North	South			
	H. M.	°	°	°		″	
January							
24 . .	08 39	6	3		E	20	4 and 10 only.
February							
2 . .	09 07	2	20		E	15	Do.
March							
5 . .	09 01	—	16		W	10	Do.
15 . .	09 05	2		13	E	20	1 to 12.
26 . .	10 20	—	5		W	10	4 and 10 only.
April							
7 . .	08 48	3		0·5	E	15	Do.
7 . .	08 54	1	35·5		W	10	Do.
13 . .	08 35	4	4		W	15	Do.
18 . .	08 24	3		7·5	E	10	Do.
20 . .	10 45	3		10·5	W	40	Do.
20 . .	10 45	4		2	W	15	Do.
May							
1 . .	09 30	4		6	W	10	Do.
6 . .	09 40	2		24	E	10	Do.
9 . .	08 40	8	23		E	20	1 to 12.
30 . .	08 42	2		5	E	10	4 and 10 only.
June							
23 . .	10 10	4		6	E	20	Do.
24 . .	09 30	3		17·5	W	25	Do.

*I. S. T. = G. M. T. + 5h. 30m.

NOTE.—The key to the wave-lengths of the metallic lines is given below:—

No.	λ(A°)	Element	No.	λ(A°)	Element
1	4924·1	Fe^+	7	5276·2	Fe^+
2	5016·0	He	8	5316·8	Fe^+
3	5018·6	Fe	9	5363·0	Fe^+
4	b_4, b_3, b_2, b_1	Mg, Fe^+	10	D_2, D_1	Na
5	5234·8	Fe	11	6677	He
6	5276·0	Cr	12	7065	He

The distribution of metallic prominences was as follows :—

	1°–10°	11°– 20°	21°–30°	31°–40°	Mean Latitude	Extreme Latitude
North	3	2	1	1	15·2°	3 and 35·5°
South	6	3	1	..	9·3°	0·5 and 24°

Particulars of displacements observed in the chromosphere and prominences with the Spectroscope are given in the following table :—

TABLE III

Date 1941	Time I. S. T.	Latitude North °	Latitude South °	Limb	Displacements in A° Red	Violet	Both ways	Remarks
	H. M.							
January								
2 .	09 56		35	E		1		At base ; from 34°–36°.
2 .	09 45		20·5	W	1			At top ; from 19°–22°.
3 .	11 21		8	E		1		At top.
3 .	11 11	28·5		W			1	
12 .	09 37	69·5		E	1			At top.
12 .	09 43	40·5		W	1·5			At top.
15 .	08 59		75·5	E	1			At base.
16 .	08 32		9·5	E		2		At base.
19 .	09 16		4·5	E		0·5		At base.
19 .	09 07	22·5		W	1·5			At top.
21 .	08 55		14	E		1·5		At base ; from 13°–15°.
21 .	08 52		27·5	E		2		Over the whole prominence ; from 26°–29°.
23 .	08 54		6·5	E		0·5		At top ; from 5°–8°.
24 .	08 39	6·5		E		1		From 2°–11°.
29 .	08 30	78		W		0·5		In chromosphere.
February								
2 .	09 07	20		E	1			At top ; from 19°–21°.
5 .	09 24	25·5		W		1		At top.
17 .	08 50	11		W			0·5	At base.
20 .	09 37		32·5	E	1			At base.
24 .	08 48		9·5	W		0·5		At base.
25 .	08 58	8·5		W		1		At top.
27 .	08 42	30·5		W	1			At top.

TABLE III—(*contd.*)

Dat 1941	Time I. S. T.	Latitude		Limb	Displacements in A°			Remarks
		North °	South °		Red	Violet	Both ways	
	H. M.							
March								
5 .	09 25	24·5		E		1		At the middle.
6 .	08 38	69		E		1		In chromosphere.
9 .	08 40	7		W	2			At top ; from 6°–8°.
9 .	08 40	10		W		1		At base ; from 9°–11°.
10 .	08 55		43	W	0·5			At top.
15 .	09 05		13	E	1			At top ; from 12°–14°.
24 .	10 29	38·5		W	SL.			At top.
26 .	10 42		65	E	0·5			At base ;from 64°–66°.
April								
4 .	09 30	6		W		1		At base.
6 .	08 40	6·5		W	2			At top ; from 5°–8°.
8 .	09 30		49·5	W	1			At top.
18 .	08 24		7·5	E		1		At base ; from 6°–9°.
20 .	10 45		12	W	0·5	1		To V at base and R at top.
22 .	08 42		49·5	W		1		At top.
May								
9 .	08 40	21		E	2			At top.
9 .	08 40	22		E		1		At base ; from 19°–25°.
9 .	08 45	8		W	1			At top.
June								
12 .	08 42	4		W		1		At base.
23 .	10 10		8	E	2			At top.
23 .	10 18	17·5		W		0·5		At base.

The total number of displacements was 43 as against 40 in the previous half year and their distribution was as follows :—

Latitude	North	South	Total
0°–30°	17	13	30
31°–60°	3	4	7
61°–90°	3	3	6
Total	23	20	43
East limb			20
West limb			23

Of these, 19 were towards red, 22 towards violet and 2 both ways simultaneously.

242 bright reversals of the Hα line and 198 dark reversals of D_3 and 3 displacements of the Hα line were observed on the sun's disc in the neighbourhood of sunspots. Their distribution was as follows :—

	North	South	East	West	Total
Bright reversals of Hα	125	117	129	113	242
Dark reversals of D_3	106	92	104	94	198
Displacements of Hα	1	2	2	1	3

Observations with Spectrohelioscope.—Observations with the Hale Spectrohelioscope in the Hα line were continued as in the previous years for noting the changing phenomena and displacements on the sun's limb and disc. The displacements observed are summarised below :—

	North	South	East	West	Total
Displacements in prominences . . .	20	10	24	6	30
Displacements in dark markings . .	18	12	15	15	30
Displacements in bright flocculi . .	2	1	2	1	3

	Displacements towards			
	Red	Violet	Both ways	Total
Prominences	15	10	5	30
Dark markings	10	13	7	30
Bright flocculi	1	1	1	3

The largest displacement observed during the year was 5·6 A° to red on a dark marking.

A list of chromospheric eruptions observed during this half year is given in table IV.

TABLE IV

Date 1941	Time (I. S. T.) Beginning	Maximum	End	Mean Latitude	Mean Longitude from C.M.	Intensity	Remarks
	H. M.	H. M.	H. M.	°	°		
January							
14		08 44		—10	23W	1	From spectroheliogram.
14		08 44		—3	25E	1	do.
27		13 01		+13	53E	1	do.
29		09 01		+12	29E	1	do.
29		09 01		—2	23E	1	do.
30		12 28		+12	13E	2	do.
31		09 17		—12	50E	1	do.
31		09 17		+12	2W	1	do.
February							
14		08 43		—12	25E	1	do.
14		08 43		+14	45W	2	do.
20		08 26		—12	41W	1	do.
20		08 26		—3	23E	1	do.

TABLE IV—(*contd*)

Date 1941	Time (I. S. T.) Beginning	Maximum	End	Mean latitude	Mean longitude from C.M.	Intensity	Remarks
	H. M.	H. M.	H. M.	°	°		
February							
21 . .		08 31		—10	57W	1	From spectroheliogram.
22 . .		08 05		—12	65W	1	do.
25 . .	08 20	08 30	09 00	+13	28E	1	From spectroheliogram spectrohelioscope.
March							
4 . .		08 37		+12	43E	1	From spectroheliogram
4 . .		08 37		+12	60E	1	do.
8 . .		08 37		+11	21W	1	do.
9 . .		08 31		+12	32W	2	do.
9 . .		08 31		+12	2 W	1	do.
9 . .		08 31		—7	84E	1	do.
10 . .		08 45		—7	65E	1	do.
11 . .		08 29		+14	20E	1	do.
11 . .		08 29		+12	63W	1	do.
12 . .		08 36		+13	7E	1	do.
13 . .		08 31		+14	5W	1	do.
18 . .		08 45		+10	20E	1	do.
22 . .		09 03		—17	57E	1	do.
23. . .		08 12		+10	48W	2	do.
24 . .		08 27		+10	60W	2	do.
25 . .		08 38		+10	72W	1	do.
April							
1 . .		10 63		—3	10W	1	do.
2 . .		08 44		—3	22W	1	do.
7 . .		08 35		—2	60E	1	do.
7 . .		08 35		—8	76E	1	do.
7 . .		08 35		—7	33E	1	do.
9 . .		09 30		—7	7F	1	do.
9 . .		09 30		—10	53E	1	do.
13 . .		10 47		—2	75E	1	do.
14 . .		10 58		—4	35E	1	do.
17 . .		09 21		—10	48W	1	do.
18 . .		08 00		—10	60W	1	do.
19 . .		08 52		—7	80 E	1	do.
19 . .		08 52		—9	72W	1	do.

TABLE IV—(*contd.*)

Date 1941	Time (I. S. T.) Beginning	Maximum	End	Mean latitude	Mean longitude from C.M.	Intensity	Remarks
	H. M.	H. M.	H. M.	°	°		
April							
21 . .		09 59		—8	50E	2	From spectroheliogram.
22 . .		08 01		—8	38E	2	do.
23 . .		08 12		—8	24E	1	do.
24 . .		08 30		—8	12E	1	do.
26 . .		08 32		+2	31W	1	do.
28 . .		09 52		—7	43W	2	do.
28 . .		09 52		+3	59W	1	do.
May							
3 . .		07 44		+16	50E	1	do.
5 . .	08 00	08 10	08 20	+17	24E	2	From spectroheliogram and Spectrohelioscope.
6 . .		08 28		+17	12E	2	From spectroheliogram.
12 . .		10 48		—3	54W	1	do.
12 . .		10 48		+14	1W	1	do.
13 . .		10 36		+26	42E	1	do.
15 . .		11 22		+24	7E	2	do.
20 . .		11 13		—13	39E	1	do.
24 . .		10 31		+0	32E	1	do.
24 . .		10 31		—8	3E	1	do.
30 . .		08 26		—6	47W	1	do.
June							
2 . .		11 25		—15	30E	1	do.
4 . .		08 48		—16	7E	2	do.
4 . .		08 48		—9	15W	1	do.
4 . .		08 48		+14	75E	1	do.
6 . .		08 04		+16	42E	2	do.
6 . .		08 04		—18	17W	1	do.
11 . .		10 12		+14	27W	2	do.
11 . .		10 12		+6	52E	1	do.
12 . .		08 15		—10	5E	2	do.
16 . .		08 31		—9	50W	1	do.
24 . .		09 14		+15	39E	1	do.
24 . .		09 14		+7	53W	1	do
28 . .		14 30		+12	72E	1	do.
28 . .		14 30		—5	40E	2	do.

TABLE IV—(*contd.*)

Date 1941	Time (I. S. T.) Beginning	Maximum	End	Mean latitude	Mean longitude from C.M.	Intensity	Remarks
	H. M.	H. M.	H. M.	°	°		
June 28 . .		14 30		—5	9E	2	From spectroheliogram
28 . .		14 30		+19	24W	1	do.
29 . .		08 08		+7	47W	1	do.
30 . .		10 48		+15	50E	1	do.
30 . .		10 48		+15	49W	1	do.

Prominences projected on the disc as dark markings.—Hα flocculus photographs were taken on 150 days at this observatory and 24 photographs from Mount Wilson, 16 from Meudon and 2 from Ewhurst were obtained. On the whole, data were available for 174 days which were counted as 155½ effective days. The mean daily areas (uncorrected for foreshortening) in millionths of the sun's visible hemisphere and mean daily numbers are given below:—

	Combined data		Kodaikanal data only	
	Areas	Numbers	Areas	Numbers
North	1567	14·54	1586	14·24
South	1354	12·64	1384	12·78
Total	2921	27·18	2970	27·02

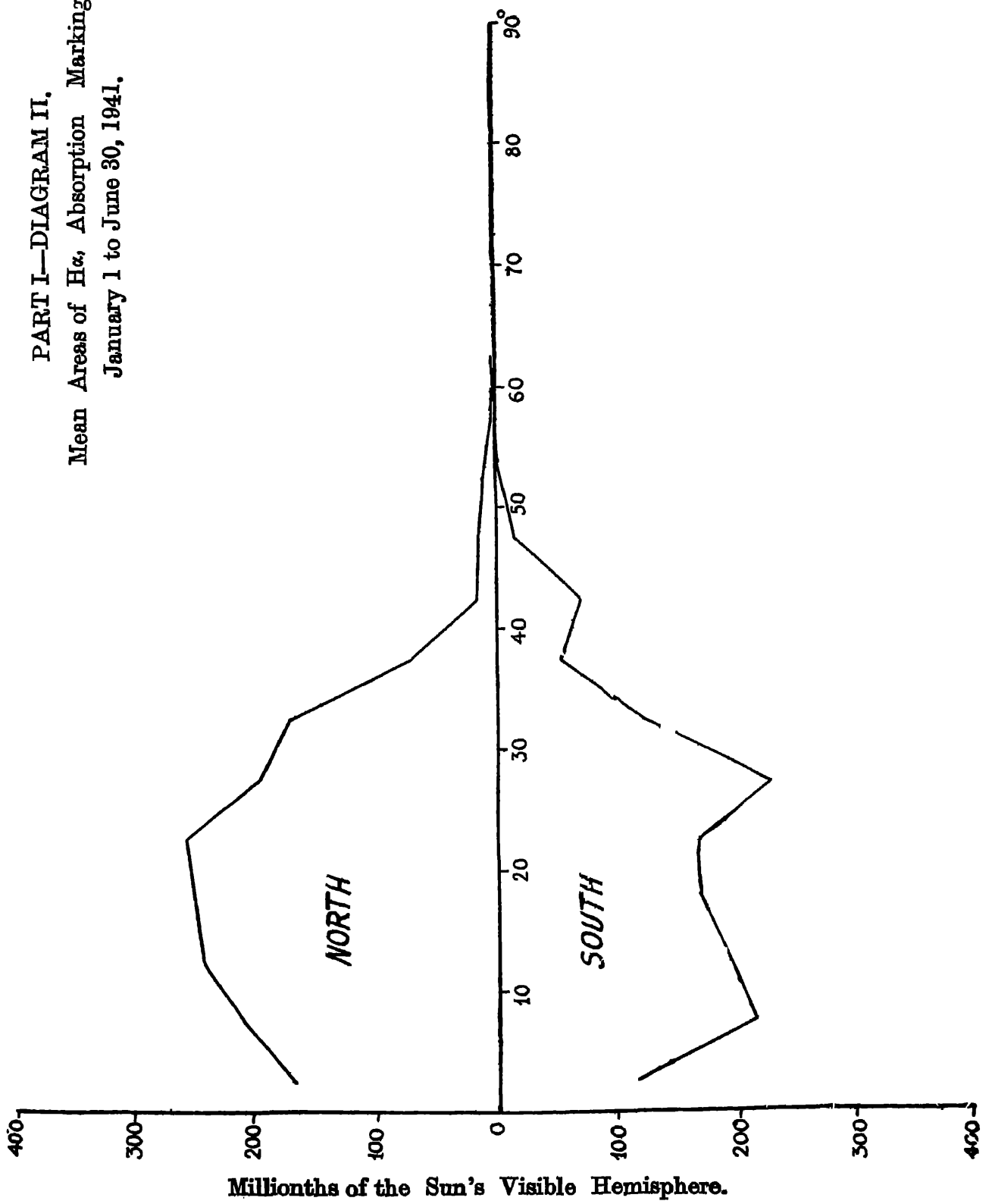
Areas and numbers show decrease of 28 per cent and 34 per cent respectively over the previous half year indicating a decreasing trend of activity.

The latitudinal distribution of areas is shown in the following diagram. The well pronounced peaks of activity shown in the previous half year at 10° to 25° N and 10° to 35°S have disappeared; the maximum activity is now spread over the zone 5° to 35° in the north and there are two peaks of moderate activity at 5° to 10°S and 25° to 30°S.

The areas show a slight preponderance on the east and the numbers a very slight eastern defect, the percentage east being 50·83 and 49·36 for areas and numbers respectively.

PART I—DIAGRAM II.

Mean Areas of Hα, Absorption Markings.
January 1 to June 30, 1941.



Millionths of the Sun's Visible Hemisphere.

PART II

Summary of observations for the second half of the year 1941

Calcium Prominences at the limb.—Photographs of calcium prominences were obtained at Kodaikanal on 128 days during this half year and 58 photographs were received from Mount Wilson, making the data available for 173 days which were reckoned as 152 effective days after giving weightage to imperfect photographs. The mean daily areas and mean daily numbers derived from these are given below, together with the corresponding figures obtained from the Kodaikanal photographs only, for comparison.

	Combined data		Kodaikanal data only	
	Mean daily areas	Mean daily numbers	Mean daily areas	Mean daily numbers
North	1·99	6·88	1·94	6·96
South	1·65	5·35	1·59	5·39
Total	3·64	12·23	3·53	12·35

In conformity with decreasing trend of activity, the areas show a decrease of about 8 per cent and number 6 per cent over the figures for the previous half year.

The distribution in latitude of areas and numbers is shown in the following diagram :—

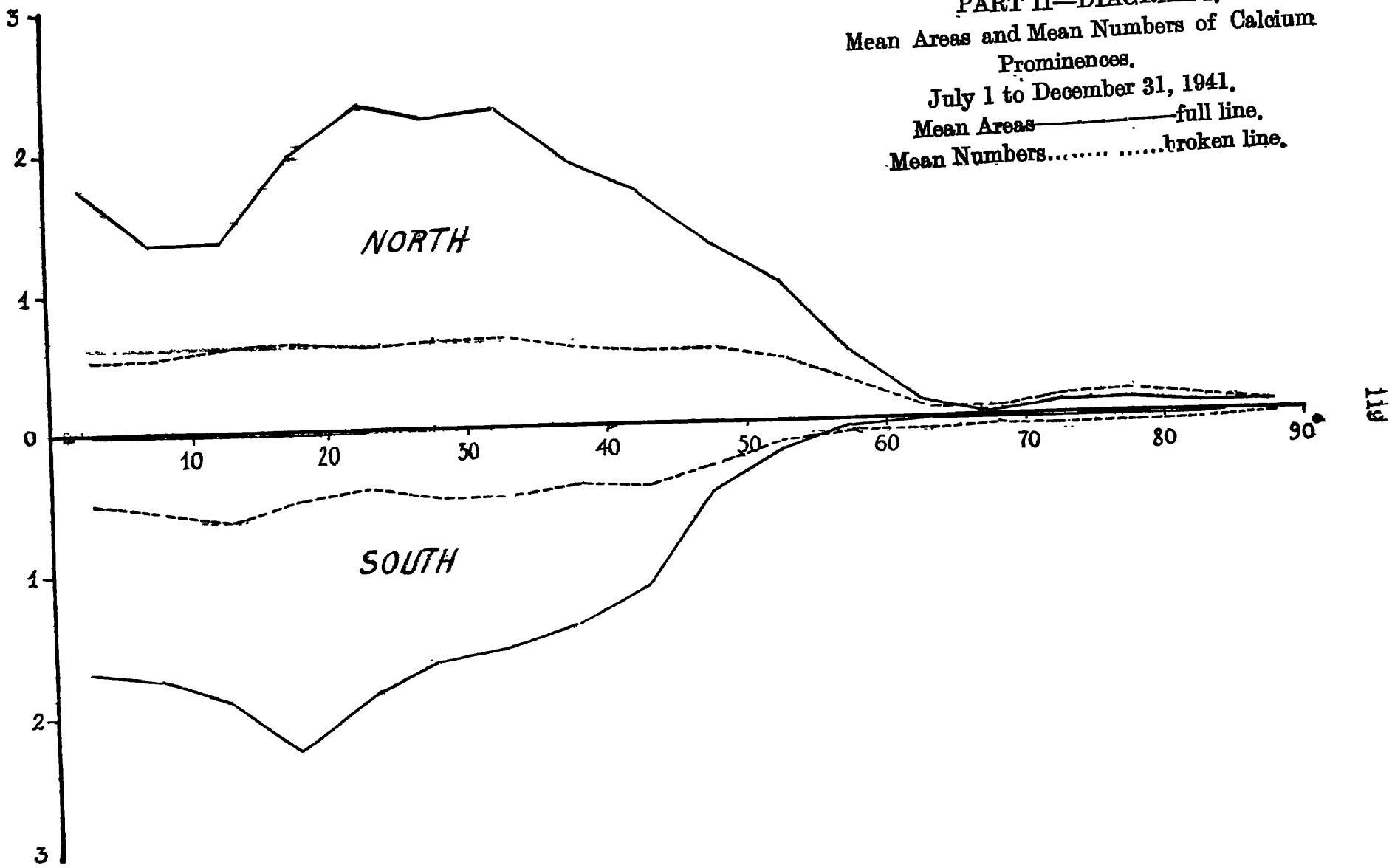
PART II—DIAGRAM I.

Mean Areas and Mean Numbers of Calcium Prominences.

July 1 to December 31, 1941.

Mean Areas————full line.

Mean Numbers..... .....broken line.



The areas do not show any major peak of activity in the northern hemisphere but the main activity is spread over the zone 15° to 45°. In the southern hemisphere the peak of activity has shifted by 10° towards the equator, when compared with the previous half year, and now lies in the zone 15° to 20°.

The table shows a slight eastern defect for both areas and numbers.

The monthly, quarterly and half yearly means of areas, numbers, heights and extents of prominences are given in table I.

TABLE I

Months	Number of days (effective)	Areas (sq. mts.)	Numbers	Daily means		Mean height	Mean extent
				Areas	Numbers	"	°
1941							
July	28½	68·9	308	2·44	10·90	30·32	3·92
August	26½	99·2	361	3·71	13·50	34·52	4·16
September	26½	91·5	352	3·42	13·16	35·18	4·37
October	23½	82·1	294	3·49	12·51	31·44	4·54
November	20½	97·9	240	4·78	11·71	39·42	6·91
December	26½	113·8	304	4·34	11·58	35·63	5·19
3rd Quarter	81½	259·6	1021	3·18	12·48	33·34	4·15
4th Quarter	70½	293·8	838	4·18	11·93	35·50	5·55
II half-year	152	553·4	1859	3·64	12·23	34·42	4·85

The distribution of areas and numbers east and west of sun's axis was as follows :—

	East	West	Percentage
Total area (sq. minutes)	273·9	279·7	49·48
Total number	899	960	48·36

Observations with the prominence Spectroscope.—The details of metallic prominences observed during this half year are given in table II.

TABLE II

Date	Time I. S. T.	Base	Latitude		Limb	Height	Lines
			North	South			
1941	H. M.	²	°	°		"	
July 22	09 45	2	...	16	W	10	4 and 10 only.
Aug. 5	09 01	4	...	14	E	10	do.
Sep. 23	08 43	5	10·5	...	W	25	1 to 12.
Oct. 12	09 40	5	...	12·5	E	10	4 and 10 only.
Dec. 1	08 55	...	23	...	E	10	do.
4	09 05	2	7	...	E	10	do.
5	08 45	4	...	21	W	20	do.
24	08 55	1	...	4·5	E	10	do.
27	09 53	4	14	...	E	15	do.

NOTE.—For key to the wave-lengths refer to Table II, Part I.

The distribution of metallic prominences was as follows :—

	1°–10°	11°–20°	21°–30°	31°–40°	Mean latitude	Extreme latitudes
North	1	2	1	..	13°.6	7° & 23°
South	1	3	1	..	13°.6	4°.5 & 21°

Particulars of displacements observed in the chromosphere and prominences are given in the following table :—

TABLE III

Date 1941	Time I. S. T.	Latitude North	Latitude South	Limb	Displacements in A° Red	Displacements in A° Violet	Displacements in A° Both ways	Remarks
July	H. M.	°	°					
5 . .	08 56	...	10·5	E	0·5	...		At base.
13 . .	08 40	...	16·5	W	1	...		At top ; from 15°–18°.
30 . .	08 40	12	...	E	...	2		At top.
October								
11 . .	09 38	..	9	E	1	...		At top.
11 . .	09 35	...	76	W	...	0·5		In chromosphere.
December								
3 . .	08 55	23	...	E	...	1		at top.
4 . .	09 05	7	..	E	...	1		at top.
5 . .	08 45	..	20	W	1	...		at base.
5 . .	08 45	..	22	W	0·5	...		At top.
23 . .	08 36	85·5	...	W	0·5	...		At top.
27 . .	09 53	13·5	...	E	1·0	...		At top ; from 12° to 15°.

The total number of displacements was 11 as against 43 in the previous half year. Of these, 7 were towards red and 4 towards violet. Their distribution was as follows :—

Latitude	North	South
0°–30°	4	5
31°–60°	..	..
61°–90°	1	1
Total	5	6

Bright reversal of the Hα line and dark reversal of D_3 were observed over active spot groups on 122 and 78 occasions respectively. Displacement of the Hα line on the sun's disc was seen on 4 occasions. Their distribution was as follows :—

	North	South	East	West	Total
Bright reversal of Hα	75	47	62	60	122
Dark reversal of D_3	50	28	41	37	78
Displacement of Hα	3	1	2	2	4

Observations with spectroheliscope.—The observations made during the second half of the year are summarised below :—

	North	South	East	West	Total
Displacements in Prominences	12	23	18	17	35
Displacements in dark markings	36	16	24	28	52
Displacements in bright flocculi	1	..	..	1	1

	Displacements towards			
	Red	Violet	Both ways	Total
Prominences	15	10	10	35
Dark markings	32	11	9	52
Bright flocculi	1	..	..	1

The chromospheric eruptions observed are given in table IV below :—

TABLE IV

Date	Time (I. S. T.) Beginning	Maximum	End	Mean latitude	Mean longitude from C.M.	Intensity	Remarks
July	H. M.	H. M.	H. M.	°	°		
1		09 23		+17	60W	2	From spectroheliogram.
12		15 30		—15	42E	1	do.
17		08 39		—14	17W	1	do.
18		08 42		—14	32W	1	do.
18		08 42		+15	37W	1	do.
30		09 34		—4	42W	2	do.
August							
2		08 10		+13	35W	1	do.
23		09 06		+12	50E	2	do.
23		09 06		+12	36W	1	do.
September 13		08 59		+19	48E	2	do.
16		08 35		+10	8E	2	do.
16		08 35		+12	23E	1	do.
16		08 35		—9	13W	1	do.

TABLE IV—*contd.*

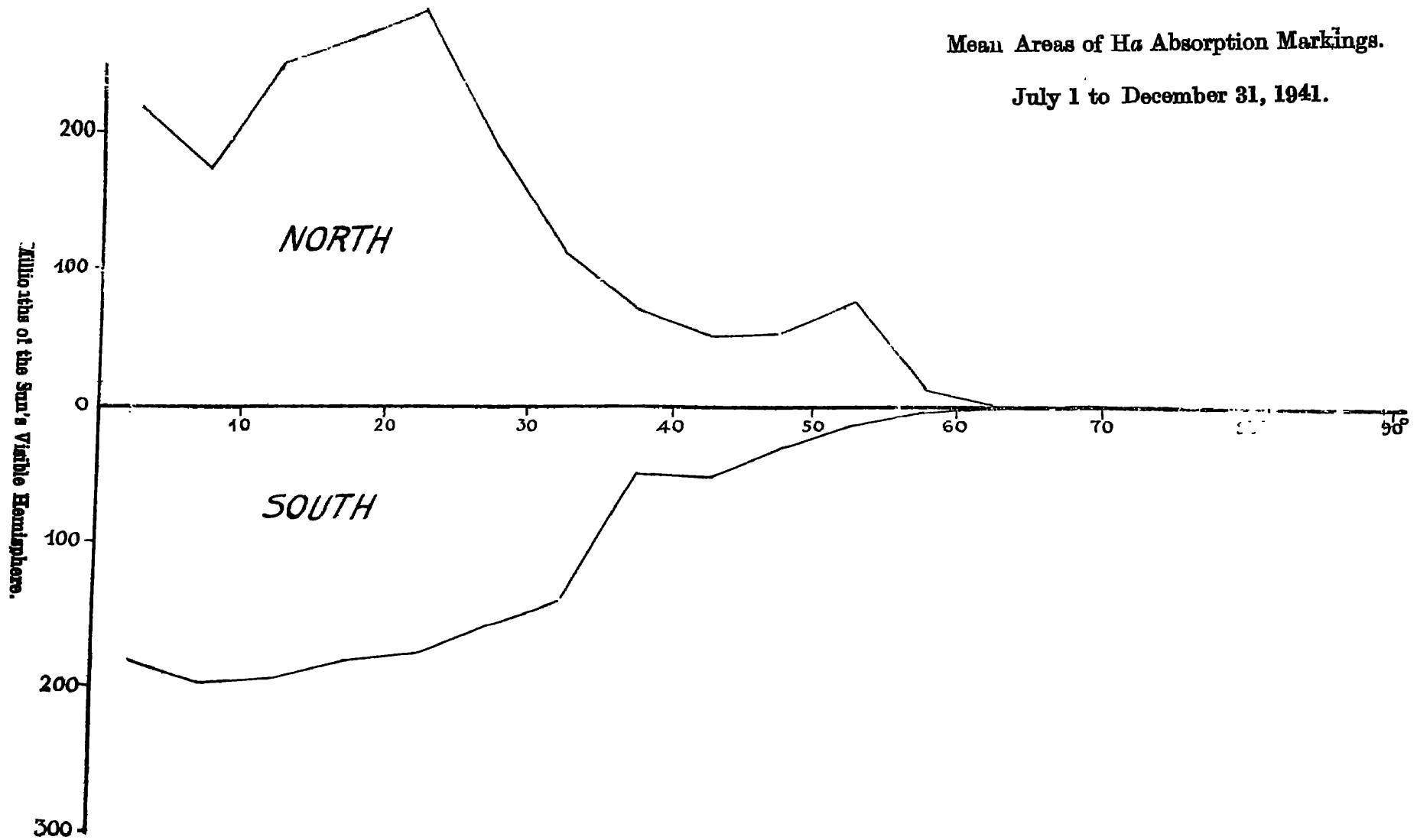
Date	Time (I. S. T.) Beginning	Maximum	End	Mean	Mean longitude from C.M.	Intensity	Remarks
September	H. M.	H. M.	H. M.	°	°		
17 . .		08 36		+10	4W	3	From spectroehliogram.
17 . .		08 36		+12	9E	1	do.
17 . .		08 36		—8	20W	1	do.
18 . .		08 10		+11	5W	1	From spectroheliogram and spectrohelioscope.
18 . .		08 10		+8	20W	1	do.
18 . .		08 10		—7	43W	1½	do.
19 . .		38 31		+12	30W	2	From spectroheliogram.
23 . .		08 51		+12	35W	1	do.
October							
8 . .		15 31		+15	57E	1	do.
15 . .		09 31		+13	24W	2	do.
15 .		09 31		—14	52W	1	do.
17 . .		10 19		—1	14E	1	do.
17 . .		10 19		+20	60E	1	do.
17 . .		10 19		+15	33W	1	do.
18 . .		09 4		—12	10E	1	do.
28 . .		08 10		+13	97E	2	do.
November							
26 . .		15 34		—20	25E	2	do.
25 . .		15 34		+7	39E	1	do.
19 . .		13 09		+9	15E	1	do
30 . .		13 09		—20	13W	2	do
50 . .		09 31		—19	23W	1	do.
December							
9 . .		08 33		—8	40 W	1	do
9 . .		08 10		—9	52W	1	do.
9 . .		14 29		—6	65E	1	do.
12 . .		14 02		—7	23E	1	do.
13 . .		08 07		—7	13E	1	From spectroheliogram and spectrohelioscope.
13 .	08 18	98 26	08 32	—7	13E		do.
16 . .		08 43		—9	28W	2	From spectroheliogram.
18 . .		09 25		+17	17W	1	do.

Prominences projected on the disc as dark markings.—Hα flocculus photographs were taken at this observatory on 110 days during this half year. Mount Wilson kindly supplied photographs for 74 days, Meudon for 45 days and Ewhurst for 11 days making up the data for 175 days which were counted as 151½ effective

PART II—DIAGRAM II.

Mean Areas of Hα Absorption Markings.

July 1 to December 31, 1941.



-days. The mean daily areas in millionths of the sun's visible hemisphere (uncorrected for foreshortening) and the mean daily numbers are given below :—

	Combined data		Kodaikanal data only	
	Mean daily areas	Mean daily Numbers	Mean daily areas	Mean daily numbers
North	1770	16·71	8191	16·16
South	1357	12·65	1430	11·76
Total . . .	3127	29·36	3321	27·92

The areas and numbers show an increase of 7 per cent and 8 per cent respectively over those of the previous half year.

In the northern hemisphere (*vide* Part II—Diagram II) the areas show maximum activity in the zone 15° to 25° and a minor peak of activity at 50° to 55°. In the southern hemisphere instead of the two peaks of activity shown at 4° to 10° and 25° to 30° in the previous half year, we notice a gradual decrease of activity from 5° of latitude to 55° beyond which there is practically no activity.

Both the areas and numbers show a slight eastern defect, the percentage east being 49·33 and 48·55 for areas and numbers respectively.

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

A. K. DAS,

Director, Kodaikanal Observatory.

KODAIKANAL OBSERVATORY,
August 1949.

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