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Kodaikanal Observatory

BULLETIN No. CXXV

SUMMARY OF PROMINENCE OBSERVATIONS FOR THE YEAR 1946

PART I

SUMMARY OF PROMINENCE OBSERVATIONS FOR THE FIRST HALF OF THE YEAR 1946

As in the previous bulletins, the summary given in this bulletin is based on the data computed from Kodaikanal observations supplemented by those derived from the photographs obtained from the co-operating observatories of Mount Wilson and Meudon for days on which incomplete or no photographs could be obtained at Kodaikanal.

Calcium Prominences on the limb.—K. Prominence photographs were taken at Kodaikanal on 151 days: Photographs for 26 days were obtained from Mount Wilson and for 18 days from Meudon making the data available for 175 days which were counted as 165½ effective days after giving weightage to the photographs according to their quality. The mean daily areas (in sq. minutes of arc) and mean daily numbers computed from the above photographs are given below :—

	Combined data		Kodaikanal data only*	
	Mean daily areas.	Mean daily numbers.	Mean daily areas.	Mean daily numbers.
North	2·68	5·11	2·64	5·17
South	1·91	4·63	1.94	4·70
Total	4·59	9.74	4·58	9·87

(*For comparison with bulletins before 1923)

The areas show a further increase of 20 per cent while the numbers show a small decrease of 5 per cent over the previous half year indicating a large increase in the number of big prominences.

The distribution in latitude of the areas and numbers is illustrated in the following diagram where the thick line represents the areas and the broken line the numbers. The ordinate represents tenths of square minutes of arc for the full line and numbers for the broken line. In the northern hemisphere, high latitude peaks at 50° to 55° that was prominent in the curve for the last half year has now become less important. The maximum of activity lies in the region 35° to 45° with another region of secondary maximum at 5° to 15°. In the southern hemisphere, the activity is almost uniformly distributed in the region 0° to 60° with a minor peak at 50° to 55°. The numbers show nearly uniform activity throughout the region 0° to 55° in both the hemispheres with a peak at 50° to 55° North as in the last half year.

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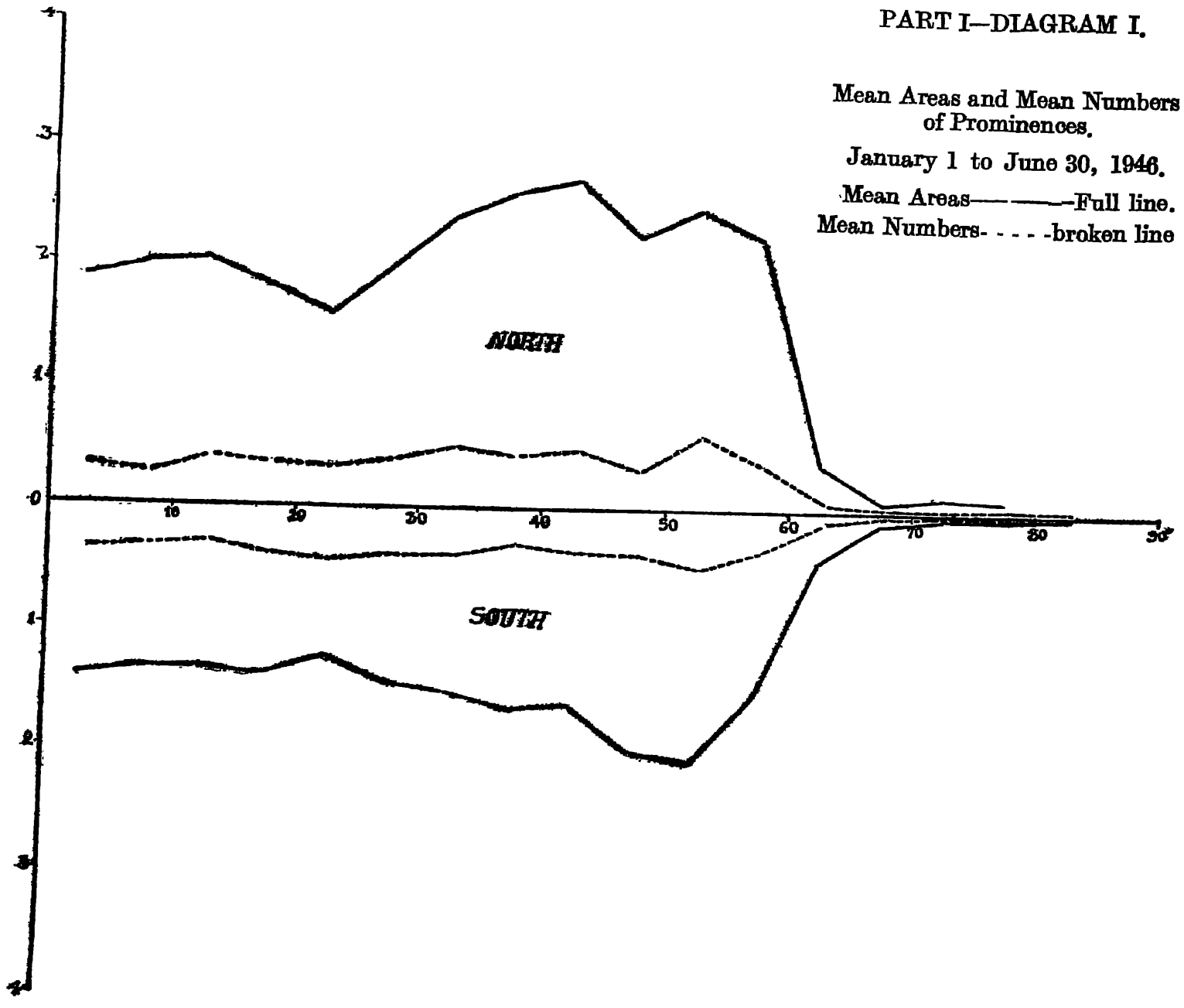
PART I—DIAGRAM I.

Mean Areas and Mean Numbers of Prominences.

January 1 to June 30, 1946.

Mean Areas———Full line.

Mean Numbers- - - -broken line



The monthly, quarterly and half-yearly means of areas, numbers, heights and bases are given in table I :—

TABLE I

Months	Number of days (effective)	Areas (sq. mts.)	Numbers	Daily means		Mean height	Mean extent
				Areas (sq. mts.)	Numbers		
1946							°
January . . .	29½	118·75	265	3·39	8·91	53·68	8·03
February . . .	25½	99·0	227	3·84	8·81	48·70	8·45
March	29½	141·55	305	4·80	10·34	54·10	8·06
April	29½	157·1	304	5·37	10·39	57·60	9·19
May	26½	127.3	289	4·85	11·01	50·93	8·04
June	25½	117.1	225	4.64	8·91	47·40	6·55
1st Quarter . . .	85	359·3	797	4·23	9·38	52·42	8·18
2nd Quarter . . .	80½	401·5	818	4·97	10·13	52·44	8·06
1st Half Year. . .	165½	760·8	1615	4·59	9·74	52·43	8·12

Both areas and numbers show eastern defect as is seen from the following figures :—

	East	West	Percentage East
Total areas (sq. minutes)	366·5	394·3	48·17
Total numbers	805	810	49·85

Observations with the Prominence Spectroscope .—Details of metallic prominences observed during this half year are given in table II :—

TABLE II

Date	Time I.S.T. (G.M.T.+ 05 30	Base	Latitude		Limb	Height	Lines
			North	South			
1946	H. M.	°	°	°		′	
January 29	08 32	6	29		E	15	1 to 12 lines.
30	08 45	2	22		E	15	do.
30	08 46	4	32		E	110	do.
30	09 05	2·5		14·5	E	15	do.
31	09 48	1	34·5		E	75	do.
February 2	08 05	2		26	W	35	do.
7	08 50	5		20·5	W	15	4 and 10 only.
10	09 10	1		29·5	W	15	do.
27	08 15	6	31		E	40	1 to 12.
28	09 40	2	15		E	Short	4 and 10 only.
28	09 40	3	31·5		E	Short	1 to 12.

Date	Time I.S.T. (G.M.T. + 05 30)	Base	Latitude North	Latitude South	Limb	Height	Lines
1946							
March 1	H. M. 08 35	6	21		E	40	4 and 10 only.
7	08 45	2		25	E	10	do.
7	08 34	3	23·5		W	10	do.
11	08 48	3	28·5		W	60	1 to 12.
12	09 05	4	24		W	Short	4 and 10 only.
14	08 45	4	16		W	15	10 only.
21	08 18	2	24		E	20	4 and 10 only.
April 16	08 35	4		25	E	15	do.
May 7	08 18	2	27		W	30	do.
11	08 25	5	50·5		W	60	do.
11	08 17	3		8·5	W	40	do.
13	08 35	4	54		W	50	4 and 10 only.
20	08 15	3		52·5	W	30	do.
21	08 05	3	27·5		W	35	do.
21	08 00	1	25·5		W	30	do.
June 4	08 33	2		37	E	15	do.
11	08 09	1	50·5		W	30	do.

Note :—The key to the wave lengths of the metallic lines is given below :—

No.	(A°)	Element	No.	(A°)	Element
1	4924·1	Fe†	7	5276·2	Fe†
2	5016·0	He	8	5316·8	Fe†
3	5018·6	Fe	9	5360·0	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°	41°—50°	Mean latitude	Extreme latitudes
North	1	1	10	4	3	30°	15° and 54°
South	1	1	5	1	1	26°·5	8°·5 and 52°·5

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

TABLE III

Date	Time I. S. T.	Latitude		Limb	Displacements in A°		Remarks
		North	South		Red	Violet	
1946 January	H. M.	°	°				
3	08 45	41		W		Slight	At top.
11	08 20	40·5		E		0·3	At top.
12	09 20		45·5	E	0·5		At top.
14	09 05	52·5		E	0·5	0·5	
16	09 05		42	E	0·6	0·8	At top.
	09 06		47	E	0·6	0·6	At top.
17	09 30		33·5	E	0·8		At base.
	09 32		35·5	E	0·8	0·8	At base.
18	08 29		25	W	0·3		A speck.
	08 28		38·5	W		0·3	At base.
19	00 00		48·5	E	Slight	0·5	At middle and top.
19	09 00		50	E	Slight		At middle and top
22	09 10	22·5		W	1·0		At middle.
23	08 27	13		W	0·3	0·3	At top.
24	08 55	11		W		0·3	At top.
25	10 15	22·5		W			At top.
26	08 44	26·5		W	0·5		At base.
28	08 30	28		E		1	At base and middle.
	08 32	30		E	0·5		At base and middle.
29	09 30	30		W		1·5	do.
	08 32	31		E		2·5	At top.
30	08 32	17		E	2·5		At top.
	08 35	23		E	0.5	0·5	At top.
	08 33	25		E	0·5		At top.
	08 34	28·5		E	0·2	0·2	At top.
	08 36	30		E		0·5	At top and base.
	08 45	33·5		E		2·0	At top and base.
	09 00	22		W	0·5		At top.
31	09 47	30·5		E	2·0	3·5	To R at top and to V at middle.
February 2	07 56	24·5		E	0·5	0·5	At top.
	08 15		24.5	E	0·3	0·5	At top.
	08 05		24	W		1·0	At top.
	08 02	31		W		0·3	At top.

Date	Time I. S. T.	Latitude		Limb	Displacements in A°		Remarks
		North	South		Red	Violet	
1946	H. M.	°	°				
February							
3	09 55		21·5	E		1	At base.
7	09 00		56·5	E		Slight	At top.
	08 41	50		W	Slight	Slight	At middle.
	08 50		21·5	W	2·5	1·5	Various displacements of an eruptive prominence.
	09 10				3·5	1·0	
	09 17				3·0	0·5	
	09 25				1·5	0·5	
8	09 03		17·5	W	1·0		At op.
	08 06		25	W		0·5	At middle and top.
9	09 46		22·5	W		0·5	In the chromosphere.
	08 02	42		W		0·5	do.
10	09 30	60		E		4	From base to top.
12	09 35	47		W		2	At middle.
13	08 25		21	W	2	2	A small speck away from limb.
16	09 30		29·5	E	0·5	0·8	In the chromosphere.
	09 20	32		W	0·6		do.
17	08 30	27·5		W	1·0		Floating.
18	08 08	55·6		W		0·1	In the chromosphere.
21	08 37	40·5		E		0·5	At top.
22	08 50	19		W	Slight	0·5	At top.
25	09 30	24·5		E	0·5		Entire prominence.
27	08 10	19·5		E	1·5	1·5	At top.
	08 15	24·5		E		2·0	At top.
28	09 40	27·5		E	2·0		At top and middle.
	08 30	20		E		0·5	At top.
March							
1	08 30	23		E	1	1	In the chromosphere.
	09 35	38·5		E	3 ·0	1	At top.
	08 45		17·5	W	1·0		In the chromosphere.
2	10 30	33		E	3·0	0·5	Away from limb.
3	08 40		37	E	0·5	0·5	At middle.
6	08 30		31·5	E	Slight		At top.
7	08 34	23·5		W	0·5		At top.
8	09 40		31	W	Slight	Slight	At top.
12	08 55	45		W		0·5	At top.
	09 00	16		W	6		14 to 22 gradually decreasing from 6 A° to 1 A° at the top.

Date	Time I. S. T.	Latitude		Limb	Displacements in A"		Remarks
		North	South		Red	Violet	
1946	H. M.	°	°				
March							
14	08 31	31·5		E	1	Slight	At top.
	08 33	49		E		Slight	At top.
	08 42	24·5		W	1·0	0·5	At top.
17	10 15		21	W	1·5	1·5	Entire prominence.
	10 21		47	E	1·0		At middle.
23	08 45	37		E	0·5		At base and middle.
25	08 40	18		E	0·5		At top.
	08 45	48·5		W	Slight		At middle.
27	08 40		30	E	2	2	Entire prominence.
29	08 25	29·5		E	Slight	Slight	At base and top.
	08 40	9		E		Slight	At top.
31	08 25	49·5		E	0·5		At top and middle.
	08 26	33·5		E	Slight	0·5	28 to 39 from bottom gradually to the top.
	08 22		19	W	0·5	0·5	Entire prominence.
April							
1	08 15	40		E	Slight	Slight	At top
	08 20.	55		W	1	1	At top.
	08 32	34		W	Slight	Slight	At top.
	08 35		35·5	E	1·5	1·5	At top.
2	08 18	36·5		E	1·5	0·5	At top.
5	08 25	29·0		W		0·5	In the chromosphere.
6	08 40	39		E		0·5	At middle.
	08 45	50		W		0·5	At top.
9	08 40 – 10 30	31		W	1	1	Entire prominence.
	08 45		38·5	E	0·5	1	At top.
11	08 15	16		W		2	At top.
	08 16	31		W	1		At top.
	08 14	49·5		W	1·0	0·5	At top.
12	08 30		19·5	E	0·5		In the chromosphere.
	08 35		37·5	E		Slight	At top.
	08 20	26·5		W	0·5		At top.
	08 22	47·5		W		0·5	At top.
14	08 15		33	E	1		At middle.
	08 05	42		W	Slight		At base.
16	08 30		54	E	0·5		At top.
17	08 30	37·5		E		0·2	In the chromosphere.
18	08 45	29·5		E	1		At base.

Date	Time I. S. T.	Latitude		Limb	Displacements in A°		Remarks
		North	South		Red	Violet	
1946	H. M.	°	°				
April 22	08 20	28		E		0·5	At top.
	08 22	17		E	1		At middle.
25	10 00	7		W	Slight		At middle.
29	08 35		24·5	W	Slight		At base.
	08 36		50·5	E	1·5	1·5	At middle.
	08 30	49·5		W	0·5		At middle.
May 3	08 52	38		W	0·5		
	08 55	26		W	1	1	Entire prominence.
6	09 25	22		W	0·5		At top.
7	08 30		9·5	E	Slight	Slight	Close to limb.
	08 15	50		W		0·5	At top.
	08 18	23·5		W	1		At middle.
	08 24		22·5	W	0·5		At middle.
9	10 20	35·5		W	0·5		At middle.
11	08 24		32	E	0·5		At top.
	08 20	18		W	0·5		At top.
	08 19		9·5	W	1		At top and middle.
13	08 35	29·5		W	1·0	0·5	At top.
15	08 35	54·5		W		0·5	At middle and top.
	08 31	23·5		E		Slight	At top.
16	08 28	52·5		W		0·5	At top.
	08 35		50	E	0·5		At top and base.
17	08 40	55·5		W		0·2	At top.
18	08 20		2·5	W	0·5		At top.
20	08 49		54·5	W		0·5	At base.
27	07 46	27·5		W	0·5		At top.
	07 41	56		E	Slight	Slight	At top.
28	09 10	53·5		E		0·5	In the chromosphere.
31	09 02	57		E		0·3	At middle.
	09 00	26		E		Slight	At middle.
June 2	08 20	8·5		W	1·0		At top.
	08 25		36·5	E	0·5		
4	08 35		24·5	E	Slight	0·5	At top.
	08 32		54·5	E	1·0		At middle.
10	08 39	58		E	0·5		At top.
21	08 45	46·5		E		0·3	At middle.

The number of displacements observed was 137 as against 58 during the previous half year. The distribution in latitude of these displacements was as follows :—

Latitude	North	South	Total
0°—30°	45	21	66
31°—60°	47	24	71
East limb	73		
West limb	64		

Of these 50 were towards red, 44 towards violet and 43 both ways simultaneously.

Bright reversals of the Hα line and dark reversals of D_3 were observed on 59 and 23 occasions respectively in the neighbourhood of active sunspot groups. Displacements of the Hα line on the disc were observed on 36 occasions. Their distribution was as follows :—

	North	South	East	West	Total
Bright reversal of Hαc	41	18	30	29	59
Dark reversal of D_3	22	1	11	12	23
Displacement of Hαc	34	12	24	32	46

Of the displacements 20 were towards the red, 11 towards the violet and 15 both ways simultaneously.

Observations with the Spectrohelioscope .—Observations of prominences, dark markings and bright flocculi were made with the Hale Spectrohelioscope as in previous years. The displacements observed with this instrument in prominences and in Hα dark and bright markings are summarised below :—

	North	South	East	West
Prominences	30	25	29	35
Dark markings	43	19	36	26
Bright flocculi	38	9	22	25

	Towards			
	Red	Violet	Bothways	Total
Prominences	18	8	38	64
Dark markings	15	9	38	62
Bright flocculi	7	4	36	47

Details of chromospheric eruptions observed are given in table IV :—

TABLE IV

Date	Time (I. S. T.) Beginning	Maximum	End	Mean latitude	Mean longitude from C.M.	Intensity	Remarks
1946	H. M.	H. M.	H. M.	°	°		
January 17	10 00	10 05	10 55	+27·5	41W	1	From spectroheliograms and spectrohelioscope.
30	09 30	09 48	09 55	+26	81E	1	From spectrohelioscope.
February 2	10 15	10 30	10 50	+28	47·5E	2	From spectroheliograms and spectrohelioscope.
3	09 00	09 30	11 00	+31·5	36E	2	do.

Date	Time (I. S. T.) Beginning	Maximum	End	Mean latitude	Mean longitude from C.M.	Intensity	Remarks
1946	H. M.	H. M.	H M	°	°		
February 4	11 27	11 34	11 52	+29	30E	1	From spectrohelioscope.
5	09 10	10 07	10 45	+31·5	18E	2	From spectroheliograms and spectrohelioscope.
7	11 15	11 35	11 45	+24·5	14·5W	2	do.
8	11 20	11 24	12 10	+24	33W	2	do.
11		08 25		+22·5	67·5W	1	do.
28		11 01	11 40	+26	82E	2	From spectrohelioscope.
March 1		08 58		+25	60E	1	From spectroheliogram and spectrohelioscope.
7		11 04	11 20	+28	20W	1	do.
8	09 35	09 45	10 08	+25	25W	1	do.
27	09 40	09 48	10 15	+20	5E	3	do.
April 4		09 55		—30	57E	1	From spectrohelioscope
		08 07		—30	35E	1	do.
6		08 11		+25	26W	1	From spectroheliogram.
8		10 00		—32	85E	2	From spectrohelioscope and spectroheliogram.
8		08 14		—36	27E	1	From spectroheliogram.
18	09 30	09 39	10 00	—20	55E	2	From spectrohelioscope and spectroheliogram
18		10 03		—35	45W	1	do.
24		09 07		+34	47E	1	do.
May 2		07 55		+25	67W	1	do.
8		09 46		—25	45W	1	do.
11		11 20		—14	44E	2	do.
29		08 16		—20	77W	1	do.
June 22		08 15		South	East	1	From spectrohelioscope.

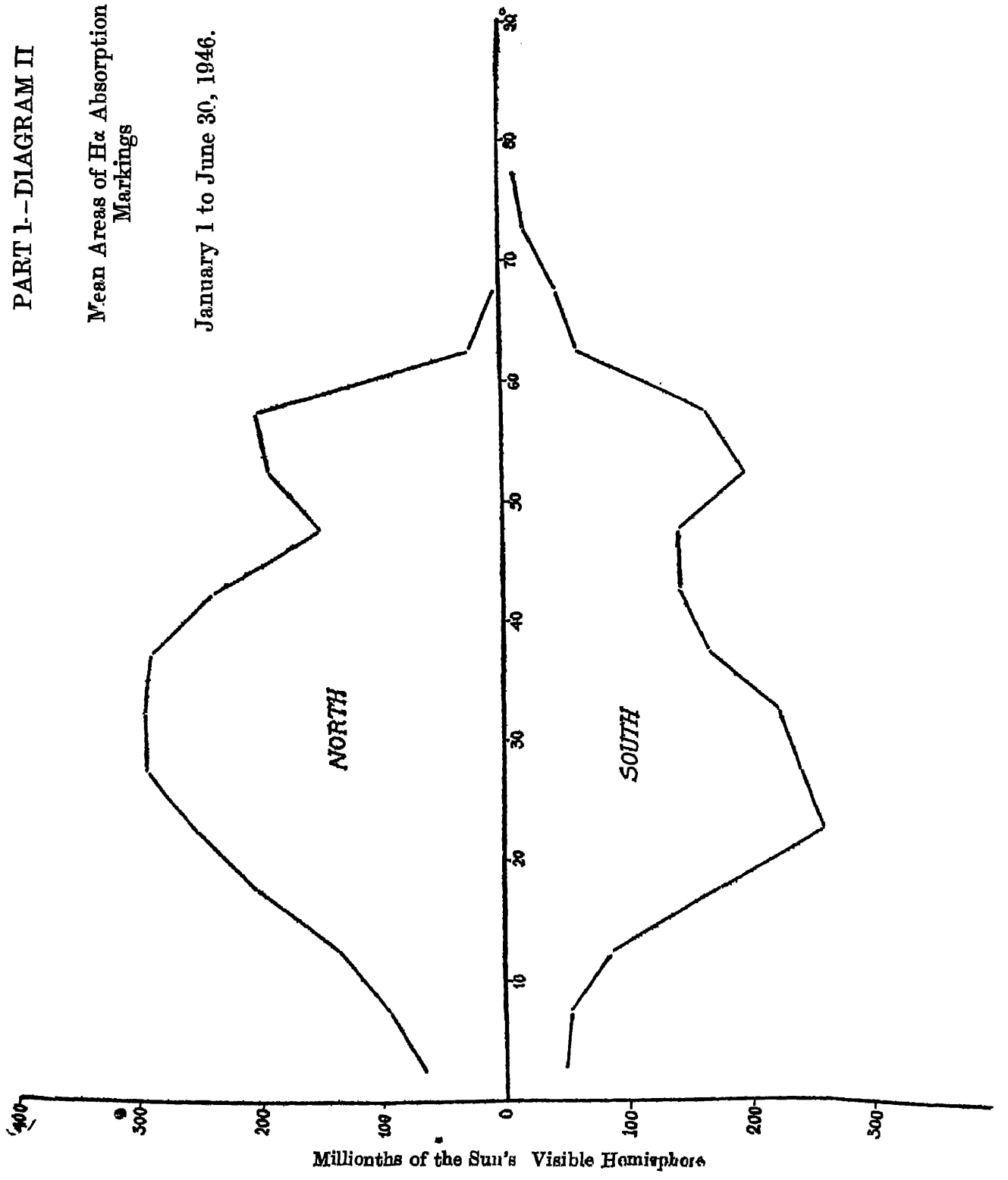
Prominences projected on the disc as Hα dark markings.—Hα flocculus plates were taken at Kodaikanal on 148 days; 33 photographs were obtained from Mount Wilson and 24 from Meudon Observatories making the data available for 180 days which were counted as 165 effective days. The mean daily areas in millionths of the sun's visible hemisphere (without applying foreshortening correction) and the mean daily numbers derived from the above photographs are given below :—

	Combined data		Kodaikanal data only	
	Mean daily areas	Mean daily numbers	Mean daily areas	Mean daily numbers
North	2456	16·33	2402	16·20
South	2054	15·68	2102	15·94
Total	4510	32·01	4504	32·14

PART 1.–DIAGRAM II

Mean Areas of Hα Absorption Markings

January 1 to June 30, 1946.



Millionths of the Sun's Visible Hemisphere

Compared with the figures for the previous half year, the areas and numbers indicate a steep rise of 59 per cent and 39 per cent respectively.

Part I, Diagram II illustrates the distribution in latitude of the areas of the markings. In the northern hemisphere, the steep peak at 50° to 55° observed in last half-year's curve is replaced by a comparatively minor one at 55° to 60° the main activity being now confined to the region 25° to 40°. In the southern hemisphere, the maximum of activity is seen at 20° to 25° with a secondary maximum at 50° to 55°.

As in the case of prominences, the markings also show an eastern defect, the percentage east being 48·81 and 49·83 for areas and numbers.

PART II

Summary of Prominence Observations for the Second Half Year of 1946

Calcium prominences at the limb.—During the second half of this year, K—Prominence plates were taken at Kodaikanal on 102 days and Mount Wilson Observatory supplied 72 photographs making the data available for 159 days which were counted as 139¾ effective days. The mean daily areas and mean daily numbers computed as usual are given below :—

	Combined data		Kodaikanal data only	
	Mean daily areas	Mean daily numbers	Mean daily areas	Mean daily numbers
North	2·01	5·82	1·99	5·91
South	1·92	5·92	1·90	5·81
Total	3·93	11·74	3·89	11·72

Compared with the figures for the previous half year, the areas show a decrease of 14 per cent and the numbers an increase of 20 per cent.

The distribution in latitude of the areas and numbers is shown in the following diagram. The curves show prominent peaks of activity at 55° to 60° North and 50° to 55° South.

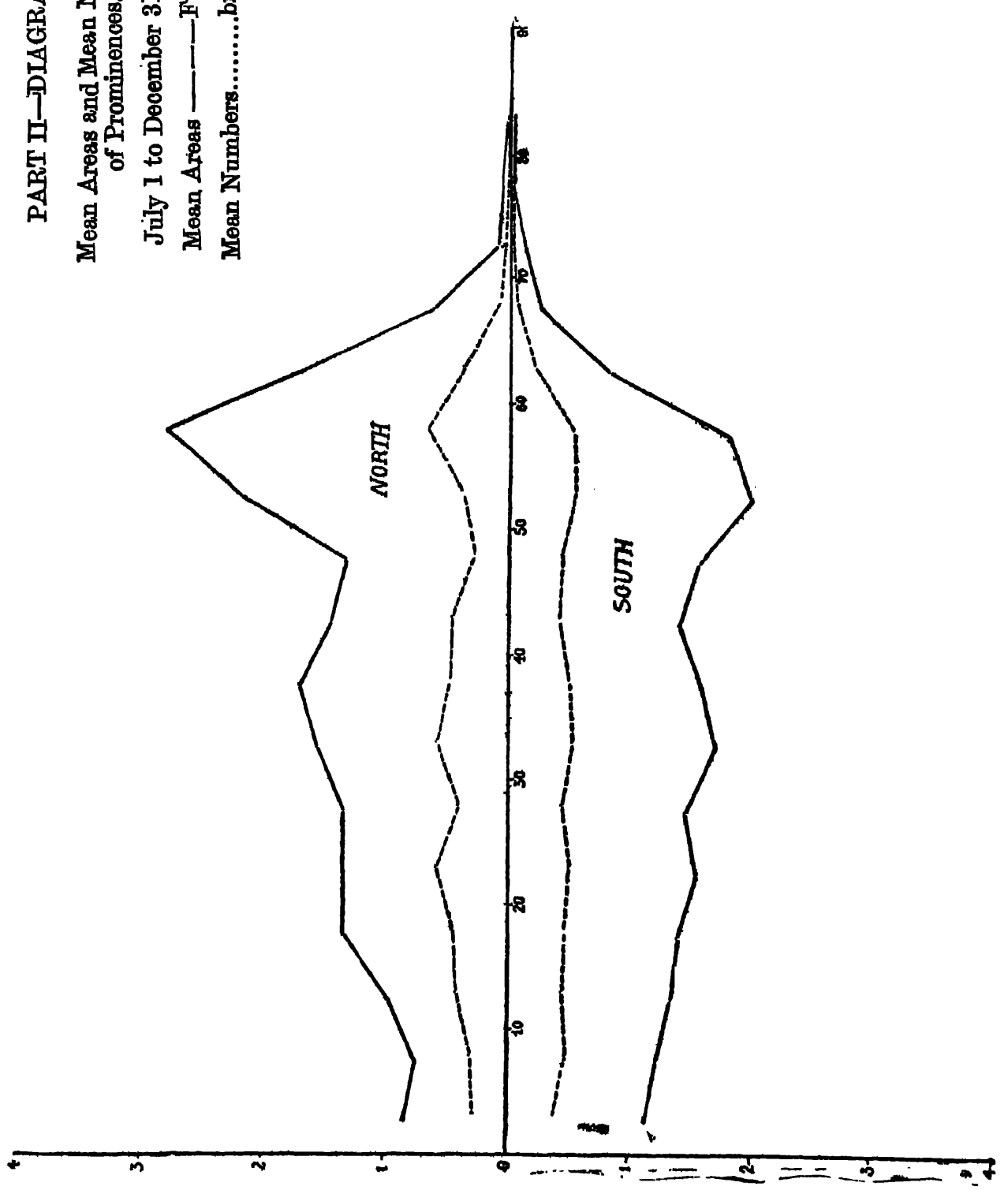
PART II—DIAGRAM I

Mean Areas and Mean Numbers of Prominences.

July 1 to December 31, 1946.

Mean Areas ——.——Full line.

Mean Numbers.....broken line.



The monthly, quarterly and half-yearly means of areas, numbers, heights and bases of prominences are given in the following table :—

TABLE I

Months	Number of days (effective)	Areas	Numbers	Daily means		Mean height	Mean extent
				Areas	Numbers		
1946							
July	24½	103·75	266	4·19	10·75	58·20	5·61
August	27½	104·3	326	3·79	11·85	45·51	4·28
September	24½	101·5	243	4·10	9·82	56·05	7·83
October	24	77·60	283	3·23	11·79	44·86	4·76
November	18½	70·65	231	3·82	12·49	48·39	4·58
December	20½	92·25	292	4·56	14·42	52·06	5·86
3rd Quarter	77	309·55	835	4·02	10·84	52·49	5·74
4th Quarter	62½	240·50	806	3·87	12·84	49·35	5·12
Second half year	139½	550·05	1641	3·94	11·74	50·95	5·43

The prominences show an eastern defect as is seen from the following table:—

	East	West	Percentage East
Total areas (in sq. minutes)	254·5	295·5	46·27
Total numbers observed	820	821	49·97

An eruptive arch-type prominence of height 6′ was photographed on the Northwest limb of the sun at latitude 42° on 1946 December 20.

Observations with the Prominence Spectroscope :—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			
1946							
July	H. M.		°	°			
12	08 32	5	35·5		E	25	b_1, b_2, b_3, b_4 and D 1 D_2.
28	09 10	3		29·5	E	10	do.
29	09 15	4	34		W	10	do.
November							
23	08 48	2	37		W	60	do.
23	08 52	2		10	W	15	do.
December							
11	08 55	3	15·5		E	15	do.

The distribution of metallic prominences was as follows :—

	1°—10°	11°—20°	21°—30°	31°—40°	Mean latitude	Extreme Latitudes
North	..	1	..	3	30°·5	15°·5 & 37°
South	1	..	1	..	19°·7	10° & 29°·5

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

TABLE III

Date	Time I. S. T.	Latitude		Limb	Displacements in A°		Remarks
		North	South		Red	Violet	
1946	H. M.	°	°				
July 8	09 00	26		W	0·5		At top.
9	00 05	40		E		4	At top & middle.
11	08 30		20	E	3·5	1·0	At middle.
12	08 32	32		E	0·1	0·5	At middle.
13	08 35	13		W	Slight	Slight	At top.
13	08 34	27·5		W	0·3		At top.
14	08 35	25		W	0·5	0·5	At middle.
	08 38		22	W	0·5		At middle.
15	08 10	61·5		W	0·5		At top.
18	09 26	24		E	0·3		At middle.
	09 25	21·5		E		1	At top.
21	09 20		6·5	W	2·0	2·0	At top.
	09 25		60·5	W		1·5	At top.
	09 05	28·5		E		0·5	At top.
26	08 50	20·5		W	Slight	0·5	At top.
28	09 10		29·1	E	1	Slight	At top.
29	09 15	34		W	1	Slight	At top.
August 6	09 49	26·5		W		0·5	At middle.
10	10 02	26·5		E	1·5		At top.
30	08 30	21		E		1	At top.
September 9	08 30		52·5	W		0·5	At top.
10	09 15	43·5		W	0·5		At top.
15	08 15	35		E		1	At top.
	08 25		33·5	E	0·5		At top.
16	08 10	64		W		4	At middle and top.
	08 35		46	E	0·25		At middle.

TABLE III—*contd.*

Date	Time I. S. T.	Latitude		Limb	Displacements in A°		Remarks
		North	South		Red	Violet	
1946	H. M.	°	°				
September 19	08 50	[illegible]	38	E		4	Eruptive prominence.
28	08 12	60 [illegible]		E	0·5		At top.
	08 01	23·5		W	0·5	1	At top.
	08 00	51·5		W	0·5		At top.
October 5	08 15	0	0	W	Slight	Slight	
21	08 40	31·5		W	0·5		
November 20	08 05	45		E		0·5	
23	08 48	34		W	0·5	1	Middle to Red.
	09 05		14·5	E		0·5	Faint.
December 11	09 39	17		W	0·5		
	08 42		18·5	W		Slight	
12	09 30	33·5		W	3	3	Changing.
13	09 30	34·5		W	1		
14	09 45	32·5		E	0·5		At top.
20	09 50		3	W	1		
	09 43		19·5	E	2		
28	09 30	7		W	1·5	0·5	At top.

The distribution in latitude of these displacements was as follows :—

Latitude	North	South
0°—30°	16	8
31°—60°	11	6
61°—90°	2	..
East limb		18
West limb		25

Of these 17 were towards red, 14 towards violet and 12 both ways simultaneously.

Bright reversals of the Hα line and dark reversals of D_3 were observed in the neighbourhood of active spot groups on 38 and 22 occasions respectively. The Hα line was seen displaced over the disc on 5 occasions. The distribution of these was as follows :—

	North	South	East	West	Total
Bright reversal of Hcc	29	9	20	18	38
Dark reversal of D_3	17	5	11	11	22
Displacement of Hcc	4	1	5	..	5

Of the displacements 3 were towards the violet and 2 both ways simultaneously.

Observations with Spectrohelioscope.—Doppler displacements observed with the Hale spectrohelioscope during the second half of 1946 are summarised below :—

	North	South	East	West
Displacements in prominences	9	7	10	6
Displacements in dark markings	8	5	10	3
Displacements in bright flocculi	7	6	8	5

	Towards			
	Red	Violet	Bothways	Tot
Displacements in prominences	8	6	2	16
Displacements in dark markings	5	3	5	13
Displacements in bright flocculi	5	3	5	13

The chromospheric eruptions observed during this half-year are detailed below:—

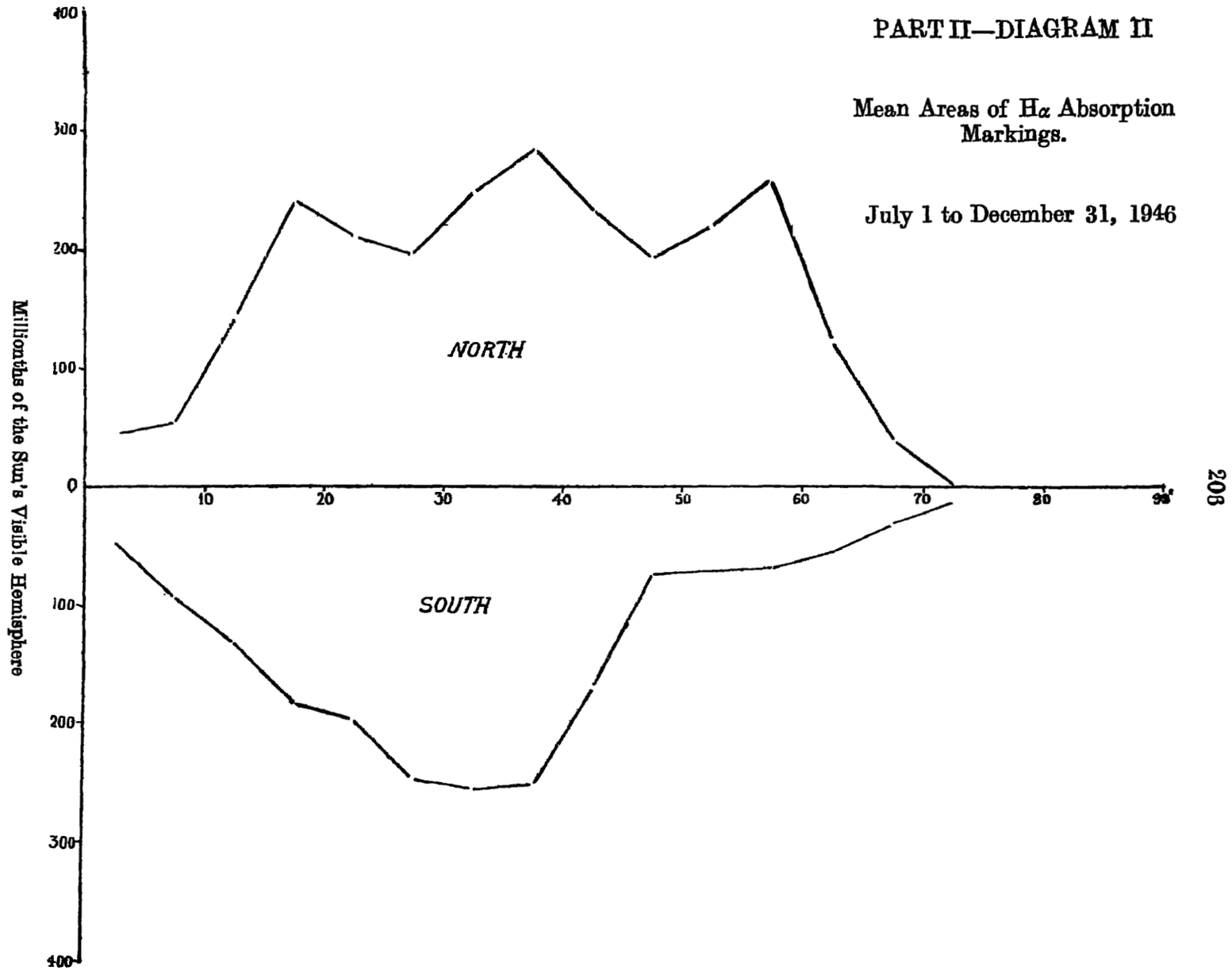
TABLE IV

Date	Time (I. S. T.) Beginning	Maximum	End	Mean latitude	Mean longitude from C.M.	Intensity	Remarks
1946	H. M.	H. M.	H. M.	°	°		
July 2		07 54		+20	65E	1	From both spectrohelioscope and spectroheliogram.
2	08 00	08 05	08 16	+20	65 E	2	do.
2		08 12		—24	64 E	1	do.
2	10 40	10 45	11 17	—24	64 E	3	do.
10		08 02		+38	80 E	1	From spectrohelioscope.
11		08 00		—24	47·5W	1	do.
29		09 45		—27	57 E	1	From both spectroheliogram and spectrohelioscope.
30		09 08		+17	50 E	1	do.
September 16	08 15	08 30	08 35	+21	45 E	3	From both spectroheliogram and spectrohelioscope.
17		08 15		+22	34 E	1	do.
18		08 30		+21	20 E	1	do.
18		08 35		+13	30 W	1	do.
19	08 45	08 50	09 35	+21	85 E	3	do.
October 1		08 08		+25	61 W	1	From spectrohelioscope.
18		09 32		+14	45 W	1	do.
November 20		08 00	08 15	—9	8 E	1	From spectrohelioscope and spectroheliogram.
21		11 30		—9	5 W	1	do.
22		08 13		+13	35 E	1	do.
22	09 10	09 18	09 55	—10	20 W	2	do.
December 13		08 12		+39	33 W	2	do.

PART II—DIAGRAM II

Mean Areas of Hα Absorption Markings.

July 1 to December 31, 1946



Prominences projected on the disc as Hα dark markings.—During this half year, Hα flocculus photographs were taken at Kodaikanal on 124 days. 57 photographs were supplied by Mount Wilson and 9 by Meudon Observatory, making the data available for 175 days which were counted as 155½ effective days. The mean daily areas and numbers computed form them are given below :—

	Combined data		Kodaikanal data only	
	Mean daily areas	Mean daily numbers	Mean daily areas	Mean daily numbers
North	2515	19·20	2667	19·26
South	1690	15·42	1562	14·28
Total . . .	4205	34·62	4239	33·54

Compared with the figures for the previous half year, the areas show a decrease of 7 per cent and numbers an increase of 8 per cent.

The distribution in latitude of the Hα markings is illustrated in the Diagram II, Part II. In the northern hemisphere there are three peaks of activity at 15° to 20°, 35° to 40°, and 55° to 60°. In the southern hemisphere activity is mainly confined to the region 15° to 40°.

The markings show a slight eastern defect for the areas and eastern preponderance for numbers, the percentage east being 49·44 and 50·14 for areas and numbers respectively.

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

A. K. DAS,

KODAIKANAL OBSERVATORY,
August 1949.

Director, Kodaikanal Observatory,.

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