Kodaikanal Observatory.

BULLETIN No. LXXXVIII.

SUMMARY OF PROMINENCE OBSERVATIONS FOR THE SECOND HALF OF THE YEAR 1929.

In pursuance of the programme of work adopted since 1st January 1923 under the auspices of the International Astronomical Union, all observatories taking spectroheliograms of the sun have been asked to co-operate with the Kodaikanal Observatory by supplying copies of their photographs on those days when the Kodaikanal records are imperfect or wanting. In response to our requirements for the second half of the year 1929, the Mount Wilson Observatory supplied prominence plates for 59 days and Hα disc plates for 33 days; Meudon Observatory supplied K_3 disc plates for 3 days and Hα disc plates for 36 days, the Pitch Hill Observatory (Mr. Evershed's) at Ewhurst, Surrey, England, supplied 7 prominence plates and 5 Hα disc plates.

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.

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 183 days for which plates were available being reduced to 165 effective days.

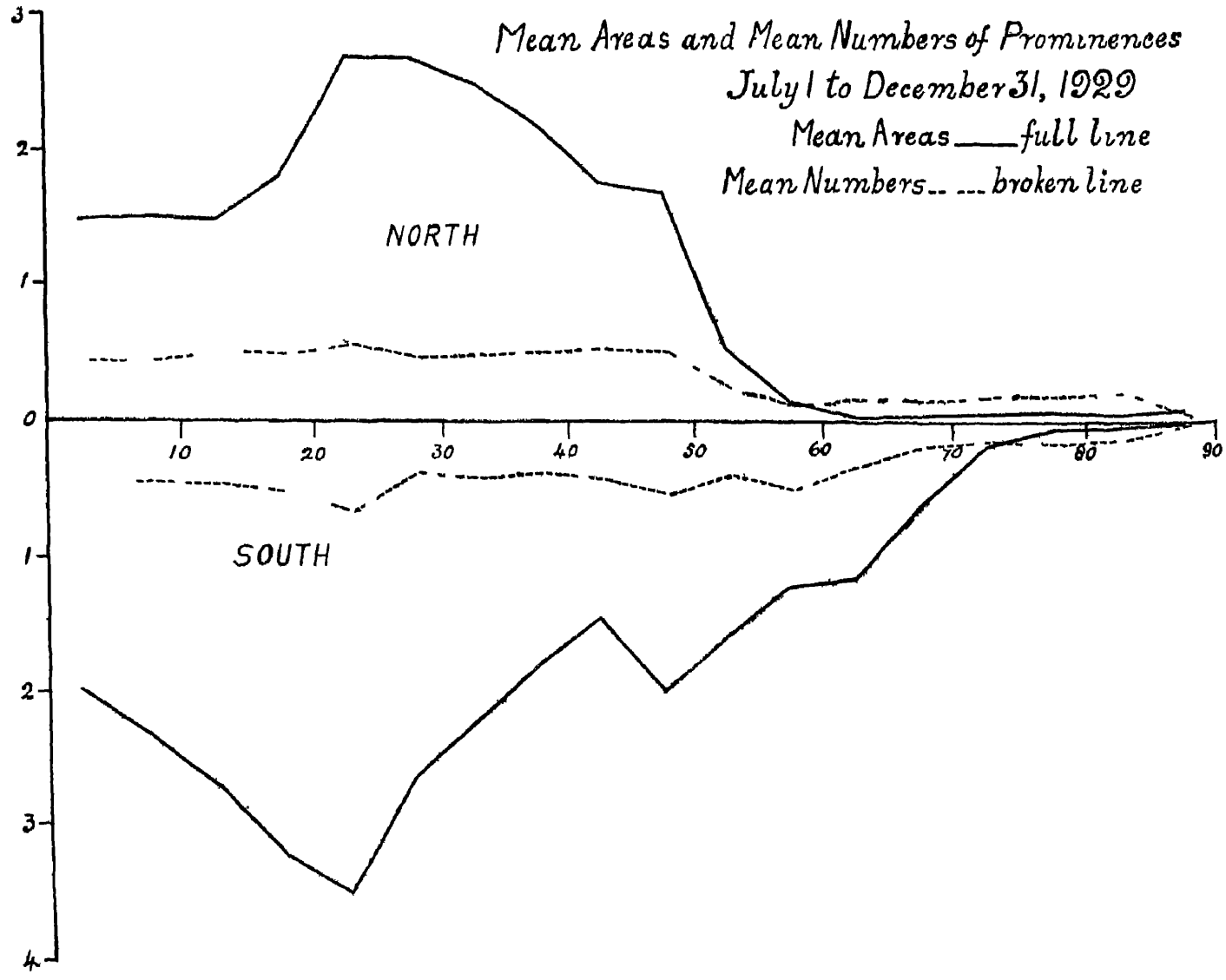
	Mean daily areas (square minutes).	Mean daily numbers.
North	2·09	6 26
South	2 86	6·62
Total .	4 95	12·88

Compared with the previous half-year, areas have decreased in the northern hemisphere but increased in the southern, giving no appreciable change in the total; numbers continue to decrease, the percentage decrease on the previous half-year being 11·8.

For comparison with bulletins issued prior to the co-operation of other observatories, the means based on Kodaikanal photographs alone are also given, 149 days of observation being counted as 129 effective days.

	Mean daily areas (square minutes)	Mean daily numbers.
North (Kodaikanal photographs only)	2 01	6 84
South (do.) . .	3 02	7 23
Total	5 06	14 07

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 distribution of prominence areas is generally similar to that in the previous half year The activity between 55° N and 90° N has now almost disappeared, whilst in the southern hemisphere there is greater activity from 10° S to 30° S and near 50° S



The monthly, quarterly and half yearly areas and numbers, and the mean height and 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 SECOND HALF OF 1929.

Months.	Number of days (effective).	Areas	Numbers.	Daily means.		Mean height	Mean extent
				Areas	Numbers.		
1929.						"	°
July	24¾	88·9	325	3·6	13·1	39·0	5·5
August	29¼	111·3	312	3·8	11·2	42·0	6·2
September	28¼	172·3	411	6·0	14·3	35·4	7·2
October	27¼	145·5	362	5·3	13·0	29·9	7·0
November	26½	147·1	336	5·6	12·8	38·6	7·0
December	28¼	152·3	350	5·1	12·4	42·5	7·4
Third quarter	82¼	372·5	1,078	4·5	13·0	38·6	6·4
Fourth quarter	82¼	444·9	1,048	5·4	12·7	36·9	7·3
Second half-year	165	817·4	2,126	5·0	12·9	37·8	6·9

Distribution east and west of the Sun's axis.

Unlike the previous half-year, the areas are almost equally divided between the east and west of the sun's axis, whereas the numbers show an excess at the east limb as will be seen from the following table —

1929 July to December.	East.	West.	Percentage East
Total number observed	1,103	1,022	51·9
Total areas in square minutes	408·3	408·2	50·0

Eruptive prominence.

A large eruptive prominence was observed on the 5th September 1929. A prominence extending from latitudes 20° to 45° in the south-west quadrant developed into a large arch, the brightest portion of which could be traced for over 2½ hours, ultimately reaching a height of 13′ above the sun's surface before fading away. At the same time an arched prominence extending from latitudes 55° to 82° in the south-east quadrant remained almost unchanged in appearance.

Metallic prominences.

Twenty-five metallic prominences were observed during the half-year. Their details are given below :—

TABLE II.—LIST OF METALLIC PROMINENCES OBSERVED AT KODAIKANAL, JULY TO DECEMBER 1929.

Date.	Hour I.S.T.	Base.	Latitude.		Limb.	Height.	Lines
			North	South.			
1929.	H. M	°	°	°		"	
July 4	9 23		11		E	15	4924·1, 5016, b_4, b_3, b_2, b_1, 5316·8, 5363·0, D_2, D_1, 6677
17	12 25			6	W	5	4924·1, 5018·6, b_4, b_3, b_2, b_1, 5234·8, 5316·8, 5363·0, D_2, D_1
20	11 21	2	7		E	10	4924·1, 5018·6, b_4, b_3, b_2, b_1, D_2, D_1, 6677

Date.	Hour I S T.	Base.	Latitude.		Limb.	Height.	Lines.
			North.	South.			
1929.	H. M.	°	°	°		"	
August 14	8 50	5		6·5	W	10	4924·1, 5016, 5018·6, b_4, b_3, b_2, b_1, 5234·8, 5276·2, 5316·8, 5363, D_2, D_1, 6677.
27	9 20		9		W	10	Faint b_4, b_3, b_2, b_1, D_2, D_1
September 13	9 16		8		E	10	4924·1, 5018·6, b_4, b_3, b_2, b_1, 5269·8, 5316·8, D_2, D_1, 6677, 7065
17	9 17	2		19	E	10	4924·1, 5018·6, b_4, b_3, b_2, b_1, 5234·8, 5276·2, 5316·8, 5363·0, D_2, D_1.
18	8 39	2		19	E	10	5018·6, b_4, b_3, b_2, b_1, 5234·8, 5276·2, 5316·8, D_2, D_1.
24	8 38	3	1·5		E	20	4924·1, 5016, 5018·6, b_4, b_3, b_2, b_1, 5276·2, 5316·8, 5363·0, D_2, D_1.
October 7	9 15	3		12·5	E	10	4924·1, 5016, 5018·6, b_4, b_3, b_2, b_1, 5234·8, 5270·0, 5276·2, 5316·8, 5363·0, D_2, D_1, 6677, 7065.
11	9 13	2	12		W	10	4924·1, 5016, 5018·6, b_4, b_3, b_2, b_1, 5234·8, 5270·0, 5363·0, D_2, D_1, 6677, 7065.
15	9 24	3		20·5	W	15	4924·1, 5016, 5018·6, b_4, b_3, b_2, b_1, 5234·8, 5276·2, 5316·8, 5363·0, D_2, D_1.
18	9 15	3		21·5	E	5	Faint D_2, D_1.
20	8 41	4		14	W	10	4924·1, 5016, 5018·6, b_4, b_3, b_2, b_1, 5234·8, 5276·2, 5316·8, 5363·0, D_2, D_1.
November 9	9 50	1		1·5	E	10	4924·1, 5016, 5018·6, b_4, b_3, b_2, b_1, 5234·8, 5276·0, 5316·8, 5363·0, D_2, D_1.
16	11 50	2		16	W	10	4924·1, 5016, 5018·6, b_4, b_3, b_2, b_1, 5234·8, 5276·0, 5316·8, 5363·0, D_2, D_1, 6677, 7065.
22	9 5	5	10·5		W	15	4924·1, 5016, 5018·6, b_4, b_3, b_2, b_1, 5270, 5316·8, D_2, D_1, 6677, 7065.
December 5	9 1	2	14		W	10	4924·1, 5016, 5018·6, b_4, b_3, b_2, b_1, 5363·0, D_2, D_1, 6677.
6	9 15	3		3·5	E	15	4924·1, 5016, 5018·6, b_4, b_3, b_2, b_1, 5234·8, 5276·2, 5316·8, 5363·0, D_2, D_1, 6677, 7065.
10	9 4	4	8		E	10	4924·1, 5016, 5018·6, b_4, b_3, b_2, b_1, 5234·8, 5270·2, 5316·8, 5363·0, D_2, D_1, 6677.
11	9 2	3	11·5		W	20	4924·1, 5016, 5018·6, b_4, b_3, b_2, b_1, 5234·8, 5270·2, 5316·8, 5363·0, D_2, D_1.
18	10 26	2	18		W	10	4924·1, 5018·6, b_4, b_3, b_2, b_1, 5234·8, 5276·0, 5316·8, 5363·0, D_2, D_1.
20	10 13	2	12		E	15	4924·1, 5016, 5018·6, b_4, b_3, b_2, b_1, 5234·8, 5276·2, 5316·8, 5363·0, D_2, D_1, 6677, 7065.
21	8 56		20		E	10	4924·1, 5018·6, b_4, b_3, b_2, b_1, 5276·2, 5316·8, D_2, D_1.
21	8 58	4	14		E	15	4924·1, 5016, 5018·6, b_4, b_3, b_2, b_1, 5234·8, 5276·2, 5316·8, 5363·0, D_2, D_1, 6677, 7065.

The distribution of metallic prominences was as follows :—

	1°—10°	11°—20°	21°—30°	31°—40°	Mean latitude.	Extreme latitudes.
North	5	9	...	...	11·2	1°·5 and 20°·0
South	4	5	2	..	12·7	1°·5 and 21°·5

Fourteen were on the east limb and 11 on the west limb.

Displacements of the hydrogen lines.

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

TABLE III.—DISPLACEMENTS OF THE HYDROGEN LINES, JULY TO DECEMBER 1929.

Date.		Hour I S.T.	Latitude.		Limb.	Displacement.			Remarks
			North.	South.		Red.	Violet.	Both ways.	
1929.		H. M	°	°		A.	A.	A.	
July	2	9 41		7	W	1 5			At top.
	3	9 14		25	W	Slight			At base of the floating prominence, extends over 4° from 23° to 27°.
	3	9 21		18	W	0·5			At top; extends over 3° from 20° to 23°.
	3	9 23		2·5	W		2		At top.
	3	9 26	17		W	Slight			Do.
	4	9 21	11		E	1	2		At base.
	4	9 7		15·5	W	0 5			At top.
	4	9 0	7·5		W		1		Do., extends over 3° from 6° to 9°.
	4	8 49	32		W	1			At base, extends over 4° from 30° to 34°
	14	10 7		54·5	W		1		At base.
	14	10 5	5		W	0 5			At top.
	15	9 14	7		E	0 5			Do.
	17	12 25		6	W			1	At base.
	18	8 49	16		W		0·5		Do
	20	11 20	7		E			1	
	20	9 23	18		W	0·5			At base
	24	9 46	21		W		1 5		Do
	28	8 15	10		W	1			At top.
	29	12 16		23	W	1			Do
	30	11 24		4	E		1		At base.
	31	8 50		5	E		1		At top.
August	1	8 50		20	W	0 5			Do.
	4	8 50	54·5		E	0·5			At base.
	5	9 38		23	W	1·5	1		To red at top; to violet at base.
	5	9 44		23	E	1 5			At base.
	6	8 31		68·5	W	1·5			At top.
	6	8 25	57·5		W		0·5		In chromosphere.
	8	14 51	0·5		E	1			
	8	15 3		18	W		Slight		At base.
	9	9 37	24		E	0·5			At top.
	9	9 39	7·5		E	1			Do.
	11	8 55	49		W	1			Do.
	11	8 54	54		W		Slight		At base
	12	8 44		12	E	0·5			At top
	12	8 37	3		W		0·5		
	13	9 24	57		E	0·5			At base.
	13	9 28	5		E	1			Do.
	14	8 50		8	W	1	1		To red at top, to violet at base.
	14	8 50		5	W	1 5			At top
	14	8 43	8		W		0 5		At base.
	19	9 59	30		W		Slight		
	22	11 12		22	W	2			At top.
	24	10 10	28		W	1·5			Do.
	25	8 48	72		W	0·5			Do.
	27	9 20	9		W	Slight			Do.
	27	9 2	48		W		1		Do.
	30	9 5		7	W	1·5			Do.
	31	9 25	28		E	1			At top, extends over 4° from 26° to 30°
	31	9 28	1·5		E	2			Extends over 3° from 0° to 3°,
	31	9 7		16	W		0·5		At base.
September	1	9 13	30		E		1		At top.
	1	9 8		16	W	Slight			Do.
	2	8 42		54·5	W		Slight		
	2	8 39	28		W	0 5			At top.
	3	9 0	25		E		0 5		At base
	4	8 43	57 5		E	0·5	1		To red at base; to violet at top.
	5	9 40		7	W	3			At top, extends over 16° from +1° to −15°
	5	9 40		3	W	6			At top (floating prominence).
	6	9 30	23		E		1		
	6	9 6	11		W	1			At top.
	9	8 44	7		E		0·5		Do.
	10	9 8	44		E	Slight			Do.

D t		Hour I.S.T	Latitud		Limb	Displ m nt			R marks
			North.	S uth		Red	Vi l t	Both w y	
1929		H. M				A	A	A	
Sept mbe	10	9 18	10		W	1	1 5		T d t t p to v ol t t base
	11	8 41		9	W		1		At bas
	11	8 39	5		W	0 5			At t p
	12	9 5	65		E	2			D
	12	9 6	38 5		E		Sl ght		At bas
	12	9 13	22 5		E	3	2 5		T d t t p; to l t at base
	12	8 56		43	W	0 5			At t p
	1	8 46	12		W	1			At t p xt nds o er 4 fr m 10 to 14
	13	9 14		8	E			2	At b
	13	8 49	7		W			Slight	
	13	8 40	68		W	2			At b se
	16	9 12	32 5		E	0 5			D
	16	9 6		10	E	1	1 5		T d at base to vi l t at top
	17	9 0		24	E	1			At bas
	18	8 32	41 5		W	Slight			At top
	19	9 13		26	W	1 5			At base
	19	8 52	60		W	0 5			Do
	20	14 58	3		E			Slight	
	20	15 17		33 5	W	0 5	1 5		T d t bas to vi let at top
	21	9 26		22 5	E	1 5			At top xtends o 3 fr m 21° to 24
	21	9 1		53 5	W		1		At t p
	21	9 0		50 5	W	2 5	1		T d t bas to vi let t top
	21	8 46	58		W		1		Ext ds 3° fr m 57° to 60°
	22	8 42	42 5		W	1			At t p
	24	8 26	15		E	0 5			At b
	24	8 38	2		E	0 5			Do
	27	9 2		17 5	W	0 5			At t p
	28	11 20	13		E		1		
O tobe	1	8 49	34 5		E	1			At bas
	1	8 45	32		W	Slight			At top
	5	9 9	47		E	0 5			At top; xtends o 1 3 from 46 to 49
	5	8 58		1	W			1	
	5	8 50	11 5		W	0 5			At top xtends e 5 f m 9 to 14
	5	8 43	52 5		W	1 5			At t p
	6	8 51	3		E	0 5			At bas
	6	8 45	20		W	1 5			At t p
	7	9 17		3	E	2			At bas
	7	9 15		12	E	0·5			D
	7	8 53	17		W	1 5			At top
	11	9 50	52 5		E	0 5			At b
	11	9 55		15 5	E			0 5	
	11	9 16	2		W	1			At t p xtends o er 4 from 0 to 4
	11	9 16	7		W	2			At top
	11	9 16	9		W		0 5		D
	11	9 14	12		W	1			Do
	14	8 39	5		E	0 5			At bas
	14	8 43		57 5	E	2			D
	15	9 15		8	W	0 5			D
	16	9 58		18	W		0 5		At t p
	16	10 12	81		W		1		D
	17	10 32		23	W		2		At bas
	17	10 3		20	W	1 5			D
	17	10 30		18	W	1 5			At top
	17	10 30		16 5	W		2		Do
	18	9 7	69 5		E	1 5			Do
	18	9 13	13		E	2			At b se
	18	9 14		8	E		2·5		At top; extends o e 4° from 6 to 10°
	18	9 15		21	E	3 5			At top
	18	8 55		26 5	W	0·5			Do
	18	8 53		46 5	W	1 5			At t p xtends over 3° from 15 to 18
	18	8 46	8		W		1		
	19	8 45	23		E	1 5			At top
	19	8 40		3	W	0·5			At b se
	20	8 30	16		E	Slight			At top
	20	8 41		18	W	2	3		T el at top to vi let at b se
	20	8 41		13	W	1	1 5		Do

Date		Hour I S T.		Latitude.		Limb.	Displacement			Remarks.
				North	South.		Red.	Violet.	Both ways	
1929.		H	M.	°	°		A.	A.	A.	
October	22	9	14		27	W	2	1		To red at top, to violet at base
	22	9	10	57 5		W	1			At top
	23	10	6		27	W		Slight		Middle of prominence.
	23	10	14	25		W	1			At top
	24	9	37	78		E	1 5			At base.
	24	9	45	13		E	0·5			At top; extends over 4° from 11° to 15°.
	24	9	26		15 5	W	1 5			At top, extends over 3° from 14° to 17°
	24	9	25		11 5	W	2			At base
	27	11	54		19	E	0·5			Do
	28	9	0		34	W		Slight		Do.
	28	9	4		20	W	1			At top
November	3	8	50	2		E	0 5			At base
	8	11	52	12		E	0 5			At top
	8	11	17		8	E	1			Do.
	9	9	57	11		E	1			Do
	9	9	33		1	E	1			Do.
	9	10	12	5		W			2	
	9	10	12	8		W	3			At top
	10	8	50	12		W	1·5	1		To red at top, to violet at base
	10	8	50	15		W		0 5		At base
	16	11	50		19	W			2	
	18	8	44	17		W		0·5		At base
	19	8	55	17		E		Slight		Do.
	20	9	30	14		E		Do.		At top
	22	9	40	26		E	0 5			Do
	22	9	40		17	E		1		At base
	22	9	40		22·5	E	1·5			At top.
	22	9	10		15·5	W	1·5			Do.
	22	9	9	3·5		W	1			Do.
	22	9	8	8		W			1	
	22	9	5	13		W		3		
	22	9	0	26		W	1·5	1		To red at base; to violet at top
	25	9	0	20		E		1·5		At top
	25	9	0	14·5		E	1·5			Over middle of prominence, extends over 5° from 12° to 17°.
	25	9	0	10		E	1			At top, extends over 6° from 7° to 13°.
	25	9	2	5		E	2·5			No prominence.
	26	9	10	22		E		1		At top
	26	9	7	20		E	1			Do
	26	9	8	15·5		E		1·5		Floating cloud, displacement extends over 3° from 14° to 17°.
	26	8	56		10	E		1		At top, extends over 4° from 8° to 12°
	26	9	13		18	E		0·5		At top.
	27	11	56	16		E		Slight		Do
	27	12	30	72		W	Slight			In chromosphere.
	28	9	26	13·5		E	1			At top.
	28	9	7	42·5		W	0 5			At base.
	29	10	10		13	E	1·5			
	29	10	11		30	E	1			At base.
	29	9	41	4·5		W	4	3		To red at top; to violet at base
	29	9	18	4 5		W	1			At top.
	29	9	2	64		W	1			Do
	30	10	23		1	E		1		Do.
	30	10	22		9	E	2			Do.
	30	9	40		14	E		2		Throughout the tall filamental prominence
	30	10	7		36·5	W		2		At base.
	30	10	12		3	W		1		In chromosphere.
December	5	9	33	0·5		E		1		At top.
	5	9	34		3·5	E			1·5	
	5	9	35		16·5	E		1		At top.
	5	9	15		50	W	0·5	1		To red at base; to violet at top
	5	9	9		25	W	2			At top
	5	9	0	12		W			1	
	5	9	40	37 5		W	0·5			At top

Date	Hour IST	Latitude North	Latitude South	Limb	Displacement Red	Displacement Violet	Displacement Both ways	Remarks
1929	H M	°	°		A	A	A	
December 5	9 15		3	E	2	4		To violet at top ; to red at base
6	9 6		21	W		2·5		At base
6	9 4	15		W	2	1·5		To red at top , to violet at base
7	9 50		3	E	1			At base.
7	9 51		20	W	1·5			At top.
7	9 44	7		W	4			Do
7	9 44	14		W	1			Do
10	9 4	10		E	2·5			At base
10	9 10		2	E	1·5	0·5		To red at base , to violet at top
10	8 55	12		W	0·5			At top
11	9 2	12		W		2·5		Do
12	9 13	6		W	1·5			Do
13	8 58	15		E	0·5			At base
13	8 54		23	W	1			At top
14	9 17	3		E	5			At base
14	9 13		26	W	1			At top
16	9 0		15	E		1		Do
16	8 50	20		W		Slight		At base
17	9 9	10		E	Slight			Do
18	9 27	33		E	2			Do
18	9 21	18		E	1			
19	9 4		1	W		1		At base
19	8 56	69		E		Slight		Do
20	10 11	21		E	1			Do
20	10 13	12		E	1·5	2		To red at base ; to violet at top
20	10 3		11	W	1	1·5		Do do.
20	9 53		4	W		1		At base
21	8 58		15	E	3·5	2		To red at base , to violet at top
21	8 50		60	W	0·5			At base
23	9 10		12	W	0·5			Do
23	9 2		12	W	1·5			At top.
23	9 4		2	W	1·5	0·5		To red at top , to violet at base
23	9 0	22		W	1			At top.
26	8 53	18		W	0·5			Do
28	8 42	18		W	1			Do
31	9 16	29		E	Slight			Do.
31	9 20	9		E		2		Do

The total number of displacements was 250 as against 348 in the previous half-year and their distribution was as follows :—

Latitude	North	South.
1°—30°	106	96
31°—60°	25	13
61°—90°	9	1
Total	140	110
East limb	...	104
West limb	...	146
Total	...	250

Reversals and displacements on the Sun's disc.

Three hundred and sixty-five bright reversals of the Hα line, 354 dark reversals of D_3 line and 74 displacements of the Hα line were observed during the half-year. Their distribution is given below :—

	North	South.	East.	West.
Bright reversals of Hα	174	191	182	183
Dark reversals of D_3 ...	167	187	177	177
Displacements of Hα	38	36	33	41

Fifty-two displacements were towards the red, 19 towards the violet and 3 both ways simultaneously.

Prominences projected on the disc as absorption markings.

Photographs of the sun's disc in Hα light were available from Kodaikanal and the co-operating observatories for a total of 183 days, which were counted as 178 effective days The mean daily areas of Hα absorption markings (corrected for foreshortening) in millionths of the sun's visible hemisphere and their mean daily numbers are given below :—

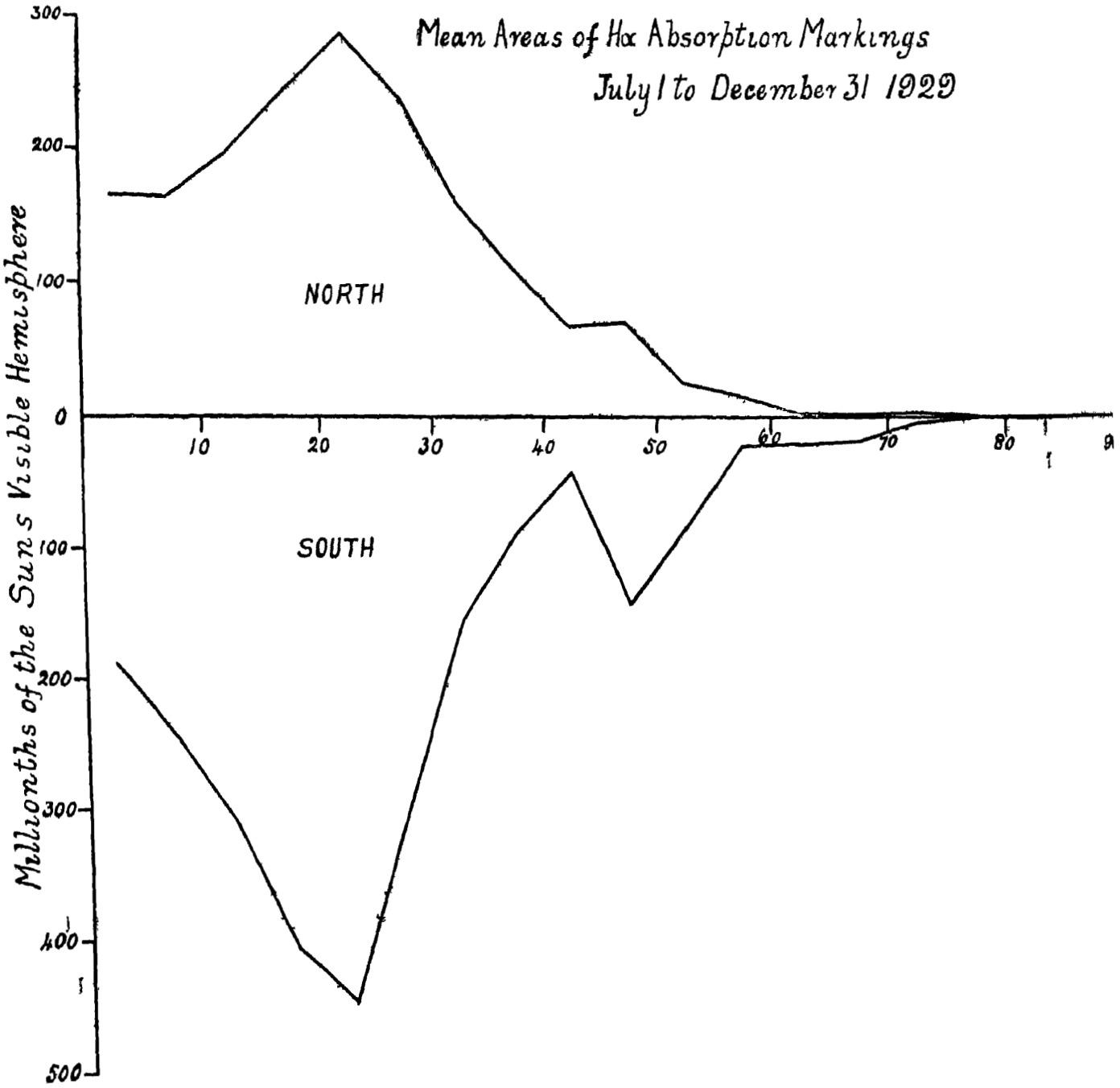
	Mean daily areas.	Mean daily numbers.
North	1,743	11·66
South	2,460	13·84
Total ...	4,203	25 50

The above show a decrease of about 5·1 per cent in areas and an increase of about 0 8 per cent in numbers compared with the previous half-year. The preponderance of activity has now shifted again to the southern hemisphere.

For comparison with bulletins issued prior to the co-operation of other observatories, the means based on Kodaikanal photographs alone are also given, 140 days of observation being reckoned as 131 effective days.

	Mean daily areas.	Mean daily numbers.
North (Kodaikanal photographs only) ...	1,651	11·69
South (do.)	2,365	13·59
Total ...	4,016	25·28

The distribution of the mean daily areas in latitude is shown in the following diagram. The principal features of the latitude distribution are the maxima in the zones 20°—25° and secondary maxima at 45°—50°. Compared with the previous half-year there is a large decline from 35°—50° in the northern hemisphere, and near 40° in the southern hemisphere.



There is a slight excess of activity in the eastern hemisphere as regards areas and a slight defect as regards numbers the percentage east being 50 2° for areas and 49 26 for numbers

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

Hydrogen prominences

In 1928 a batch of panchromatic plates was received whose speed was considerably greater than that of previous supplies With this new batch it was found that exposures in the Kodaikanal H*α* spectroheliograph for the disc of the sun were only slightly longer than corresponding photographs in the calcium spectroheliograph using the K line and ordinary plates It was clear therefore that it would be practicable to obtain photographs of the solar prominences in hydrogen light with the H*α* spectroheliograph which up to that time could only be used for disc photographs After making sure that the increased speed was not due to change but was maintained in subsequent supplies of fresh batches of panchromatic plates, it was decided to make

daily photographs of hydrogen prominences part of the regular programme commencing from January 1, 1929. The data for hydrogen prominences for the first and second halves of the year 1929 are given below in the present bulletin and will hereafter be included in the regular half-yearly bulletins.

The Hα prominence plates have proved especially valuable on those days when the sky is very hazy on account of the presence of cloud, for it is then found that the Hα spectroheliograph will show prominences which are completely obscured in the K spectroheliograph. This effect is largely to be attributed to the instrumental differences in the two spectroheliographs, for in the K instrument there is a considerable amount of scattered light which helps the obliteration of prominences when observing conditions are not good.

The mean daily areas of Hα prominences for each half of the year 1929 are given below together with the corresponding areas for calcium prominences collected here for convenience of reference

	Mean daily areas (square minutes)	
	Hα prominences.	K prominences
First half of 1929.		
North	1 31	2 46
South	1 43	2 52
Total ..	2 74	4 98
Second half of 1929.		
North	0 88	2 09
South	1·68	2 86
Total ..	2·56	4 95

The distribution of Hα prominences in latitude is very similar to that of K prominences as might have been expected. It will, however, be noticed that the mean daily areas of Hα prominences are considerably less than those of K prominences. In the first half the Hα prominence areas are only 55 per cent of the K areas and in the second half 52 per cent. This is not necessarily to be interpreted as evidence that the hydrogen prominences are less extensive or less high than calcium prominences. There are innumerable examples where individual prominences are identical in shape, height and area in the Hα and the K photographs There is, however, considerable evidence that in the fainter and more scattered parts of K prominences the Hα counterpart is relatively much fainter when compared with the brighter parts of the prominence. This is not merely a photographic effect caused by the underexposure of the Hα plate, for whilst the main part of a prominence may be stronger in the Hα photograph than in the calcium, the reverse is often true in the fainter parts of the same prominence. The exact relations between the relative intensities in different parts of Hα and K prominences appear worthy of detailed study.

There are also instrumental reasons why the total Hα areas must be slightly smaller than the K areas. In the Hα spectroheliograph, the field of view outside the sun's limb is not so large as in the K spectroheliograph ; the upper parts of some high prominences are therefore missing in the Hα plates. The effect of such instrumental differences over a half-year is believed to be small.

It is noteworthy that the southern preponderance in the second half of 1929 is more marked in Hα prominences than in K prominences, the ratio of northern prominences to southern being 0 52 in Hα and 0 73 in K. It remains to be seen whether a similar difference is maintained in subsequent years.

THE OBSERVATORY, KODAIKANAL,
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