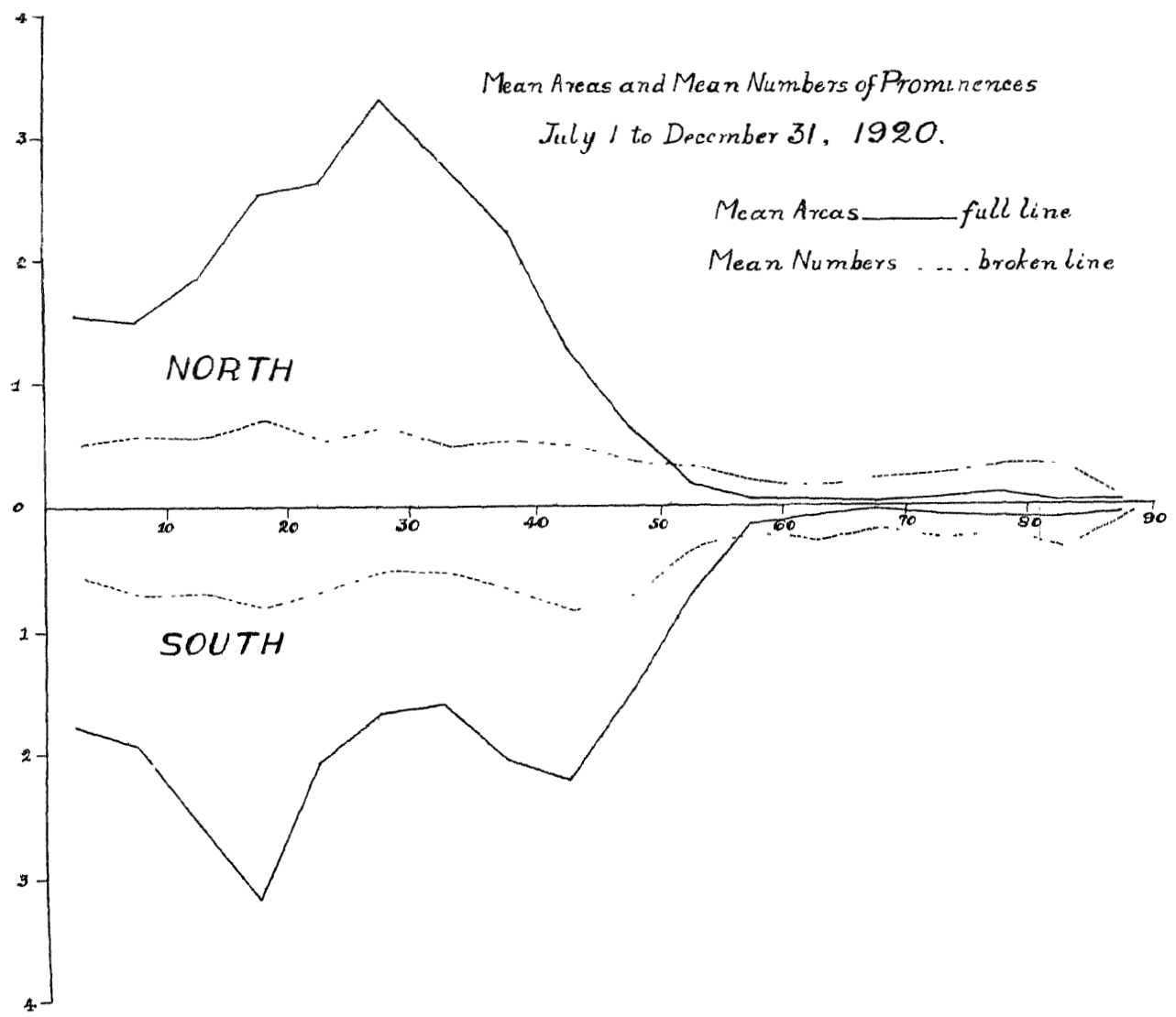
Kodaikanal Observatory.

BULLETIN No. LXVI.

SUMMARY OF PROMINENCE OBSERVATIONS FOR THE SECOND HALF OF THE YEAR 1920.

The distribution of prominences observed and photographed during the half year ending 31st December 1920, is represented in the accompanying 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 means are corrected for incomplete or imperfect observations, the total of 143 days being reduced to 129 effective days.



The distribution of areas is markedly different from that in the first half of the year; in the northern hemisphere there is less activity near the equator and in the belt from 40° to 60° but greater activity from 20° to 40°, whilst in the southern there is less activity near the equator and from 20° to 35° but greater activity from 40° to 55°.

The mean daily areas and numbers corrected for imperfect observations are given below :—

	Mean daily areas (square minutes).	Mean daily numbers
North	2·10	7·41
South	2·17	8·47
Total ...	4·27	15·88

Areas show a decrease of only 1 per cent from the first half of the year with nearly equal activity in the two hemispheres, whilst numbers show a total increase of 20 per cent due to a 10 per cent increase in the northern and 31 per cent increase in the southern. The average brightness of a single prominence was practically the same for both northern and southern hemispheres.

The monthly, quarterly and half-yearly areas and numbers together with the mean height and extent of a prominence are given in table I. The unit of area is 1 square minute of arc.

TABLE I.—ABSTRACT FOR THE SECOND HALF OF 1920.

Month.	Number of days (effective)	Areas.	Numbers.	Daily Means.		Mean height	Mean extent
				Areas	Numbers.	"	"
July	18	55·5	246	3·08	13·7	27·8	2·71
August	23	76·1	382	3·31	16·6	27·6	2·36
September	25	104·0	408	4·16	16·3	27·8	3·51
October	21	101·4	368	4·83	17·5	32·1	3·54
November	13	55·9	191	4·30	14·7	31·9	3·95
December	29	157·3	453	5·42	15·6	33·0	3·58
Third quarter	66	235·6	1036	3·56	15·7	27·7	2·98
Fourth quarter	63	314·6	1012	4·99	16·1	32·5	3·64
Second-half-year	129	550·2	2048	4·27	15·9	30·1	3·26

Distribution east and west of the sun's axis.

There is again a western preponderance both of areas and of numbers which in the case of areas is much larger than for the preceding half-year.

1920 July to December	East.	West.	Percentage east.
Total number observed	972	1076	47·46
Total areas in square minutes	240·7	309·5	43·76

The average brightness of eastern prominences was practically the same as that of western prominences.

Metallic Prominences.

Forty-two metallic prominences were observed in the second half of the year, which is only 50 per cent of the number in the first half. Details of these prominences are given in the following table :—

TABLE II.—LIST OF METALLIC PROMINENCES OBSERVED AT KODAIKANAL, JULY TO DECEMBER 1920.

Date		Hour I S T	Base	Latitude		Limb.	Height	Lines
				North.	South.			
1920		H M	°	°	°		"	
July	4	8 26	4	12		W	65	4924·1, b_1, b_2, b_3, b_4, 5316·8, D_1, D_2, 6677, 7065.
	4	8 22	4	23		W	30	b_1, b_2, b_3, b_4, 5316·8, D_1, D_2, 6677.
	17	8 38	9	12·5		E	40	b_1, b_2, b_3, b_4, 5316·8, D_1, D_2.
	21	9 0	2	Equator		E	15	b_1, b_2, b_4, D_1, D_2
	27	9 12	1		13·5	E	60	b_1, b_2, b_3, b_4, D_1, D_2
August	13	8 30	1		17·5	E	15	b_1, b_2, b_3, b_4, 5316·8, D_1 D_2, 6677, 7065.
	30	9 20	18	19		W	85	b_1, b_2, b_3, b_4, D_1 D_2.
	31	8 47	6	27		W	70	4924 1, 5018·6, b_1, b_2, b_3, b_4, 5316·8, D_1, D_2.
September	1	8 37	4	30		W	80	4924 1, 5018 6, b_1, b_2, b_3, b_4, 5316 8, D_1, D_2.
	9	9 36	6		14	W	110	4924 1, 5018·6, b_1, b_2, b_3, b_4, 5316·8, D_1, D_2, 6677, 7065.
	12	9 49	29	19 5		E	80	b_1, b_2, b_3, b_4 D_1, D_2
October	1	8 20	26	3		W	30	4924 1, 5018 6, b_1, b_2, b_3, b_4, 5234·8, 5276·2, 5284·2, 5316 8, 5363·0, 5535·1, D_1, D_2, 6677, 7065
	18	10 10	1	25·5		E	10	4924 1, D_1, D_2.
	19	8 35	3		13	E	10	b_1, b_2, b_3, b_4, 5316·8, D_1, D_2 6677.
	20	8 55	6		17	E	20	b_1, b_2, b_3, b_4, D_1, D_2.
	20	8 41			16·5	W	10	4924·1, 5018·6, b_1, b_2, b_3, b_4, 5234·8, 5276·2, 5316·8, 5363 0, 5535·1, D_1, D_2, 6677.
	23	8 40	4		8	W	60	4924 1, 5016, 5018·6, b_1, b_2, b_3, b_4, 5316 8, D_1, D_2, 6677, 7065
November	2	8 55	3		14 5	E	30	b_1, b_2, b_3, b_4, 5316·8, D_1, D_2
	30	9 24	1		22·5	E	70	b_1, b_2, b_3, b_4, D_1, D_2
	30	10 55	5	42·5		W	70	b_1, b_2, b_3, b_4, D_1, D_2.
December	1	9 15	2		14	E	65	b_1, b_2, b_3, b_4, D_1, D_2.
	1	9 10			28	W	90	4924·1, b_1, b_2, b_3, b_4, 5316·8, D_1, D_2.
	2	7 52	1	17·5		E	40	b_1, b_2, b_3, b_4, D_1, D_2.
	2	9 6			11	E	10	b_1, b_2, b_3, b_4, D_1, D_2.
	2	10 25	7	37·5		W	50	4924·1, 5018·6, b_1, b_2, b_3, b_4, D_1, D_2.
	3	8 34	4	41		W	75	4924 1, 5018·6, b_1, b_2, b_3, b_4, 5234·8, 5276·2, 5281·2, 5316·8, 5363·0, D_1, D_2.
	6	8 54	1		10·5	W	20	4924 1, 5016, b_1, b_2, b_3, b_4, 5316·8, D_1, D_2, 6677, 7065.
	7	8 30		18		W	55	4924·1, 5018·6, b_1, b_2, b_3, b_4, 5316·8, D_1, D_2.
	10	8 16	3		24·5	W	25	4924·1, 5018·6, b_1, b_2, b_3, b_4, 5234·8, 5276·2, 5316·8, 5363·0, 5535·1, D_1, D_2.
	11	10 5		19		W	95	4924·1, 5018·6, b_1, b_2, b_3, b_4, 5316·8, D_1, D_2.
	12	9 50	9	37·5		E	75	D_1, D_2.
	12	9 30		72		W	110	b_1, b_2, b_3, b_4, D_1, D_2.
	13	11 50	2	34		E	90	b_1, b_2, b_3, b_4, 5316 8, D_1, D_2.
	13	11 42	2		11	W	90	b_1, b_2, b_3, b_4, 5316 8, D_1, D_2.
	13	11 34	2	18		W	45	b_1, b_2, b_3, b_4, 5316·8, D_1, D_2
	19	9 12	1		15·5	E	55	b_1, b_2, b_3, b_4, D_1, D_2.
	20	9 0	3	15·5		E	25	4924·1, 5018 6, b_1, b_2, b_3, b_4, 5316 8, D_1, D
	21	9 42	2	19		E	60	b_1, b_2, b_3, b_4, 5316 8, D_1, D_2
	21	9 51			10	E	60	b_1, b_2, b_3, D_1, D_2.
	26	9 20		4		E	10	b_1, b_2, b_3, b_4, 5316·8, D_1, D_2
	26	9 8	4		18	W	30	5018·6, b_1, b_2, b_3, b_4, 5316 8, D_1, D_2
	29	9 45		23		W	25	5018·6, b_1, b_2, b_3, b_4, 5316 8, D_1, D_2.

The metallic prominences recorded were distributed as follows :—

—	...	1° to 30°	31° to 60°	61° to 90°	Mean latitude	Extreme latitudes.
					°	° °
North		17	5	1	24·8	3 and 72
South		18	.	...	15 5	8 and 25
Equator	1	.	..	.		

Twenty were on the eastern limb and 22 on the western.

Displacements of the hydrogen lines.

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

TABLE III.

Date.		Hour I.S.T.	Latitude. North.	Latitude. South	Limb.	Displacements Red.	Displacements Violet	Displacements Both ways.	Remarks
1920.		H. M	°	°		A	A	A	
July	4	8 45	15		E	3			
	4	8 26	15		W	4	2		To red at top, to violet at base
	7	9 38		3·5	E		1 5		
	12	8 46	22·5		E	1			At base.
	12	10 37	14		W		1		
	17	8 38	12 5		E	3	1		To red at top, to violet at base.
	17	8 24		21	W		Slight		
	18	8 46	56 5		E	Slight			
	18	8 30	70 5		W		Slight		At base.
	21	8 52		20	W	Slight			
	21	8 45	70·5		W		Slight		
	21	8 35	83·5		W		0·5		
	22	9 29	8		E	1			
	23	9 25	14		E	Slight			
	27	9 7		72	W		Slight		
	28	8 49		9	E	Slight			
August	6	8 50		4	W	Do.			
	11	8 55		56	W	Do.			
	11	8 48	16		W		Slight		
	12	9 45	24		E	Slight			
	12	9 31		21	E	1·5			
	13	8 38	53		E	Slight			
	13	8 30		17·5	E	1			
	14	11 0		12	E	Slight			
	21	8 27		10	W	Do.			
	26	9 32	70		E		Slight		
	27	8 40		55	W		Do.		
	27	8 40		46 5	W		Do.		
	27	8 25	6		W				
	27	8 24	18		W	Slight			
	28	9 11		9·5	E	1			
	28	9 0		26	E		Slight		
	28	9 0		28	E	Slight			
	29	7 26		59 5	E		Slight		
	29	7 40	23		W			Slight	
	30	10 0		42·5	W		Slight		
	30	9 20	19		W	2			
	30	9 12	49 5		W		Slight		
	31	8 35	61		E	Slight			
	31	8 35		18·5	E	Do			
	31	8 30		43 5	E	1	0·5		To red at base, to violet at top.
	31	8 38		71 5	W		Slight		
	31	8 47	27		W		Do		At base.
September	1	8 44	78		W		Do.		
	2	9 57	27·5		E		2		
	2	9 52	11		E	2			
	2	9 48		15	E	Slight			
	2	9 45		19	E	Do.			
	3	8 39		5 5	W	Do			
	4	10 25		57 5	E		Slight		
	4	10 28		66	E	Slight			
	5	11 13	7 5		E	Do			
	6	9 1		17	W	Do.			
	6	8 50	3		W		Slight		
	7	8 27		63	W	Slight			
	7	8 31		14 5	W	1			
	8	8 59	69		E		Slight		At top.
	8	8 53		14·5	W		2		
	8	9 10		14·5	W		Slight		At top

Date		Hour I S T		Latitude North	Latitude South	Limb.	Displacements. Red.	Displacements. Violet.	Displacements. Both ways	Remarks.
1920.		H	M	°	°		A	A	A	
September	9	11	4	19·5		E	Slight			
	9	11	13		37	E		Slight		
	9	9	29		2	W		Do.		
	9	10	36		13	W		2		
	9	9	37		17	W		Slight		
	9	9	17	15		W	1	2		
	9	9	13	21		W		1		
	9	9	6	31		W	1			
	9	8	53	58 5		W	Slight			
	10	8	55		67	E	3			
	10	8	42		18·5	W	0·5			
	10	8	38	75 5		W		Slight		
	10	8	38	81		W		Do.		
	11	10	51	15		E	Slight			
	11	10	54		1 5	E		Slight		
	11	10	58		17	E		1		
	11	11	2		23	E	Slight			
	11	11	3		36·5	E		1		
	11	10	0		34·5	W		2		
	11	9	57		31 5	W		Slight		
	11	9	52		24	W		1		
	11	9	43		16	W	1			
	11	9	37	4 5		W	Slight.			
	11	9	30	19		W		Slight		
	11	9	24	37		W		Do.		
	11	9	16	49·5		W	Slight			
	12	10	0	81 5		E		Slight		
	12	9	27	28		E	1			
	12	9	23		12	E	1			
	12	9	12		24	E		1		
	12	9	9		29	E	1			At top.
	12	9	7		39	E	1			
	12	10	13		77	W		1		
	12	10	16		70	W		Slight		
	12	10	39	11·5		W	Slight			
	12	10	7	65		W		Slight		
	13	9	8	8		W	Slight			
	16	8	44	10		W		Slight		
	20	9	34		11	E	Slight			
	22	8	30		9	E	Do.			
	23	9	10		3	W	Do.			
	23	9	18		5	W	1			
	23	9	0	18		W		1		
	25	8	49		12 5	E		1		
	25	8	47		28	E	Slight			
	25	8	44		36	E	1			
	25	9	36		7	W	Slight			
	25	9	25	67		W		Slight		
	28	8	25	11		E	Slight			
	29	8	25		80	W		Slight		
	29	8	23		52·5	W	Slight			
	29	8	3	24·5		W	Do.			
October	1	8	50	9		E			Slight	
	1	8	40		19	W	Slight			At top.
	2	9	39		17	W	Do.			
	2	9	11	10		W	Do			
	3	9	55		2·5	W		Slight		
	3	9	49	21		W	Slight			
	3	9	50	28		W		Slight		
	4	9	4	20·5		W		Do		
	4	8	58	40		W		Do.		
	8	9	20	42·5		E		1		
	10	9	47	20 5		E	1			
	10	9	46	16		E	Slight			
	10	9	21		18 5	E	1			
	10	9	9		58·5	E	Slight			

Date.	Hour I.S.T	Latitude		Limb	Displacements			Remarks
		North	South		Red.	Violet	Both ways	
1920.	H. M	°	°		A	A	A	
October 10	10 8	1·5		W	Slight			
10	10 18	6		W		1		
10	10 22	20		W	Slight			
11	9 20	82		E		1		
11	8 46	4 5		W	Slight			
12	8 42	80		E	3			At top
12	8 41	63		E	0·5			
12	8 30	21 5		E	Slight			
13	8 38	63 5		E		Slight		
13	8 44	4		E	1			
13	8 32		19	W			Slight	
13	8 31		5	W	Slight			
14	10 4		19	W		Slight		
14	9 36	20		W	Slight			
14	8 42	45·5		W		2		
14	8 37	53 5		W	3			
15	8 44	31 5		E	Slight			
15	8 40		21	E	Do.			
15	8 37		46	E	Do.			
16	10 45		23	E	1	2		
16	10 57		63·5	E	Slight			
16	9 25		5	W	Do			
16	9 1	26		W	1			At top.
16	8 54		35	W	Slight			Do
17	9 49	42		E		1		At base.
17	9 32	17		E		Slight		
17	9 24		7	E		1		
17	9 11		22	E	2			
17	9 8		32	E	Slight			
17	9 1		51·5	E	1			
17	10 9		20	W	1			
17	10 30		11	W	1			
18	9 47	83 5		E		Slight		
18	9 53	39		E	1			
18	9 56	25·5		E	2			
18	10 45		30	E		1		
18	9 40		65·5	E	1			
18	9 37		77·5	W		2		
18	9 29		24	W		1		
18	9 15	1		W	Slight			
18	9 10	8		W	1	Slight		
18	9 7	11		W	3	1		
18	9 4	13		W	1			
18	9 3	17		W	Slight			
18	8 52	42 5		W	2			
18	8 47	40 5		W	1			
18	8 50	46·5		W	1			
18	8 44	56·5		W	1			
18	8 43	57·5		W		1		
19	8 32		19	E	Slight			
19	8 42		82	W		1		
19	8 45		3	W	Slight			
20	8 35	51 5		E		Slight		
20	9 0		86	E		2		
20	8 42		20	W	Slight			
20	8 30	66·5		W		Slight		
20	8 30	71 5		W			Slight	
21	8 58	16		W	1			
21	8 55	18		W	Slight			
21	8 47	35·5		W		1		
21	8 45	41		W		Slight		
22	9 28	38		E	5			Eruptive prominence
23	8 24		28	E	Slight			
23	8 22		39	E	2			
23	8 40		6	W			1	
23	8 50	52 5		W	0·5			
25	9 20	32		W	2	1		
27	9 27		18	W		Slight		

Date		Hour I S T	Latitude North.	Latitude South.	Limb	Displacements. Red	Violet.	Both ways	Remarks
1920.		H M	°	°		A	A	A	
November	2	9 2		83	E		Slight		
	2	9 4		41	W		Do		
	6	9 45		9	E		Do.		At top.
	6	9 20		32 5	W		Do		
	6	8 56		21	W	Slight			
	6	8 54		17	W	Do.			
	6	8 40	39		W	1	1		To red at top , to violet at base
	6	8 12	41		W		1		
	6	8 10	52		W	1			
	6	9 30	68·5		W		Slight		
	7	9 19	48·5		E	1			
	7	9 16	35 5		E		Slight		
	7	9 35		29	W	Slight			
	7	10 11	35		W		1		At base.
	7	10 8	38		W		3		At top
	8	9 41	26		E	1			At base.
	8	9 40	33		E		2		
	8	9 50		36	E		1		
	8	9 0	6		W		1		
	8	8 56	17		W	Slight			At base.
	8	8 52	26		W	Do			
	8	9 30	74 5		W	1			
	9	8 25		16	W		Slight		
	10	8 35		45	W		Do		
	10	8 32		28	W		Do		
	12	8 53	20		E	0·5			
	30	10 15	0·5		E		3		At top
	30	9 11		27	E	2			
	30	10 39		40	W		1		
	30	10 55	11		W		1		At top.
	30	11 8	62		W	Slight			
December	1	9 18		33	E	Do			
	1	9 5	12		W		Slight		
	2	9 30	51		E			Slight	
	2	9 32	24		E	2	3		
	2	8 59		11	E	1			At base
	2	8 51		22	E	Slight			At top.
	2	8 15		50	E		Slight		
	2	9 18		36	W		1		
	2	10 1		7	W	Slight			
	2	10 6	10		W	2			
	2	10 12	45		W		1		
	4	9 11	41		E		1		
	4	9 11	26		E	1			At base.
	4	9 5	7		E	1			
	4	8 50		29	E			Slight	At base.
	4	8 47		37	E	Slight			Do.
	4	9 23		51	W	Do			Do
	4	9 21		39	W	2			
	4	9 56	46·5		W	Slight			
	5	8 52	50		W	1			At top.
	5	8 45	67		W	1			
	6	8 36	67		E		1		At base.
	6	8 40	81		W		Slight		
	7	8 3		22	W		Do.		
	7	8 3		18·5	W		Do.		
	8	8 53		9	E		1		At top.
	8	8 13		22	E		Slight		Do
	8	8 38		39	E		1		
	8	9 23	6		W		1		
	8	9 27	13		W	3			At top
	8	9 44	18		W		2		
	9	8 46	89		E		Slight		
	9	9 10		22	E	3			At base.
	10	8 20		52	W		Slight		Do.
	10	8 6	85		W		Do		

Date	Hour I.S.T.	Latitude North	Latitude South	Limb	Displacements. Red.	Displacements. Violet.	Displacements. Both ways.	Remarks
1920.	H. M	°	°		A	A	A	
December 11	9 7	49		E		2		
11	9 12	36 5		E		2		At base
11	9 4	27		E		1		
11	9 8	28		E		3		
11	8 53	29		E	3			
11	9 29		32	W	1			
11	10 30	75		W		1		
12	9 42		12	W	2			At base.
12	9 44		15	W	1			At top
12	9 25	22		W		Slight		
14	9 39	29		E		Do		
19	9 41	11		E		1		
19	9 40	7		E		2		
20	8 45	85		W		Slight		
21	9 42	11		E	1·5			At base
21	9 36		16·5	W	1			
21	9 34		7	W		1 5		At base
21	9 32	32		W	1			
22	9 37	34		E		1		
22	9 46	5 5		E	1			At base
22	9 20		37·5	W	1			
22	9 15		21	W		Slight		
22	9 0	13		W		Do		At base.
23	8 54		19	W		Do		
24	9 4	8		W		2		At base
25	9 1	13		W	2			At top.
26	9 4	20		W	2			Do
27	8 26		18	W		1		Do.
28	9 35	55		E		1		
28	9 27	25		E	1			At base
28	9 7		13	E		Slight		
28	9 51		29	W		1		
28	9 53		20	W		2 5		
28	10 10	33		W	1			
28	10 10	36		W		1		At base.
28	10 10	31		W	Slight			Do.
28	10 13	71		W		Slight		
29	10 10	23		E		2		
29	10 15		12	E	1			
29	10 29		46	E	2			
29	10 31		47	E		1		
29	9 31	32		W	1			
30	9 24	22		E		Slight		
30	9 20	2		E		1		
30	8 59		45	E	Slight			
30	9 50		37	W		2		
31	9 8	76·5		E		1		
31	9 42	8·5		E	1			
31	9 16		39 5	W	1 5			At top.
31	9 32	4		W		3		
31	9 10	85		W		0 5		

The total number of displacements observed was 310, which were distributed as follows :—

Latitude	North	South.
1°—30°	88	87
31°—60°	48	40
61°—90°	32	15
Total ...	168	142
East limb ...	. .	133
West limb ...	.. ..	177
	Total ..	310

One hundred and sixty-two were towards the red, 150 towards the violet ; these include 10 occasions when the displacements were seen to the red and to the violet in different parts of the same prominence. Eight displacements were both ways simultaneously.

Reversals and displacements on the disc.

One hundred and thirty-four bright reversals of the Hα line, 73 dark reversals of the D_3 line and 59 displacements of the Hα line were recorded during the half-year. Their distribution is shown below :—

	North.	South	East.	West
Bright reversals of Hα	58	76	58	76
Dark reversals of D_3	34	39	34	39
Displacements of Hα	28	31	32	27

Forty-five of the displacements were towards the red, 13 towards the violet and 1 both ways simultaneously.

Large Eruptive Prominence of 31st December 1920.

On 31st December 1920 a series of 14 photographs in K light of a large eruptive prominence was obtained by Mr. S. S. Ramaswami Ayyangar. This prominence extended in latitude from + 5°W to − 40°W. Its ascent was probably already in progress when the first photograph was taken at $8^h\ 4^m$. It appeared then in the form of a large arch, the maximum and minimum heights in the middle of the arch being already 290,000 km and 126,000 km, respectively, above the chromosphere. The progress of the prominence consisted, generally speaking, in the ascent of the centre of the arch until at $10^h\ 15^m$ the maximum height was 701,000 km. The northernmost branch of the arch remained visible and in contact with the chromosphere throughout whilst the southernmost which was faint at the commencement disappeared after $8^h\ 52^m$. The brightness of the prominence did not suffer much diminution until after $9^h\ 47^m$ and although the maximum height was reached at $10^h\ 15^m$, only a faint trace of the lower portions remained in the next photograph at $10^h\ 37^m$. Whilst these changes were in progress, a small prominence between − 37°W and − 41°W, about 17,000 km high, remained visible practically without change, and between − 3°W and − 8°W were low changing prominences probably connected with spot group No. 3651 (latitude − 8°) which passed the western limb on December 30th.

Measures have been made of the motion of this eruptive prominence. In determining the times, allowance has been made for the fact that the different parts of the prominence on the same photograph are not photographed simultaneously.

In the northern branch of the arch the changes in the form were so rapid that identical parts of the prominence could not be recognized in successive photographs. In the more southerly parts, however, recognition of identical parts was possible and measures of the motion of several points have been made. The average velocity varied from 38 km/sec to 77 km/sec for different points and the largest velocity observed in any part was 115 km/sec, whilst there is evidence of only slight acceleration the largest being only 7·4 km/sec/sec. These are very much smaller than the velocities and accelerations in the prominence of 26th May 1916 described in Kodaikanal Observatory Bulletin No. LV. The directions in which the different points of the prominence are moving radiate from a point in the chromosphere near − 40°W, indicating a region near this point as the origin of the propelling force.

Measures were also made of the motion radial to the sun of the mean height of the prominence at different latitudes. The rates of ascent were found to be 21 km/sec at 0°W, 40 km/sec at − 10°W, 60 km/sec at − 20°W, 38 km/sec at − 30°W and 35 km/sec at − 40°W, measures in the two last latitudes being possible only in the first three photographs.

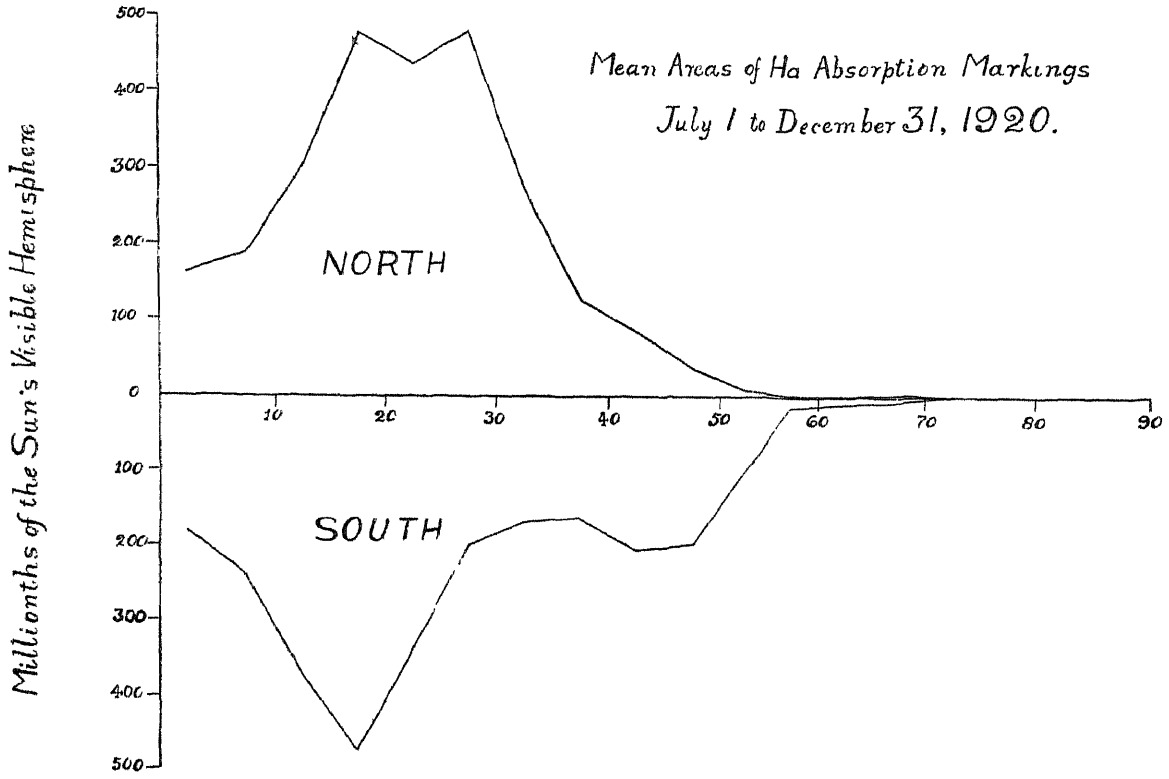
Prominences projected on the disc as absorption markings.

Photographs of the sun's disc in Hα light were obtained on 129 days, counted as 107 effective days. The mean daily areas in millionths of the sun's visible hemisphere corrected for foreshortening, and the mean daily numbers are given below.

								Areas.	Numbers.
North	...	..		...	...	.	.	2597	154
South	...	...	...		.		..	2661	156
						Total	...	5258	310

These figures represent an increase on the first half of the year of 20 per cent for areas and 21 per cent for numbers; the increase is larger for the northern hemisphere.

The distribution of the mean daily areas in latitude is represented in the accompanying diagram



The distribution is generally similar to that of prominence areas. Compared with the previous half-year there is less activity near the equator in both hemispheres; in the northern hemisphere there is an increase in a belt from 10° to 40°, and in the southern a decrease from 20° to 40° and an increase from 40° to 50°. These changes from the first half of the year are similar to the changes in prominence areas.

There is again a preponderance of markings at the western side of the central meridian, the percentage east being 46·74 for areas and 49·21 for numbers.

KODAIKANAL OBSERVATORY,
7th February 1921.

T. ROYDS,
Assistant Director.

MADRAS PRINTED BY THE SUPERINTENDENT, GOVERNMENT PRESS—1921.

PRICE, 8 *annas*.