

# Kodaikanal Observatory

Bulletin No. CXLII

## PART I

### SUMMARY OF PROMINENCE OBSERVATIONS FOR THE FIRST HALF OF 1954

The results of observations of prominences made at Kodaikanal Observatory during the first half of 1954 supplemented by data computed from photographs supplied by Mt. Wilson and Meudon Observatories for those days on which Kodaikanal had imperfect or no observations are summarised in this Bulletin.

*Calcium prominences on the limb.*—During the half-year under review photographs of calcium prominences at the limb were obtained at Kodaikanal on 143 days which were counted as 139 1/4 effective days after giving due weightage to the photographs according to their quality. Spectroheliograms for 31 days were obtained from the Mt. Wilson Observatory and for 23 days from the Meudon Observatory. In all, complete observations were available for 174 days and these were counted as 170 1/4 effective days.

The mean daily areas (in sq. minutes of arc) and the mean daily numbers of prominences derived from the above records are given below :—

	Combined data	
	Mean daily areas (sq. minutes)	Mean daily numbers
North . . . . .	0.85	2.80
South . . . . .	0.52	2.31
TOTAL	1.37	4.91

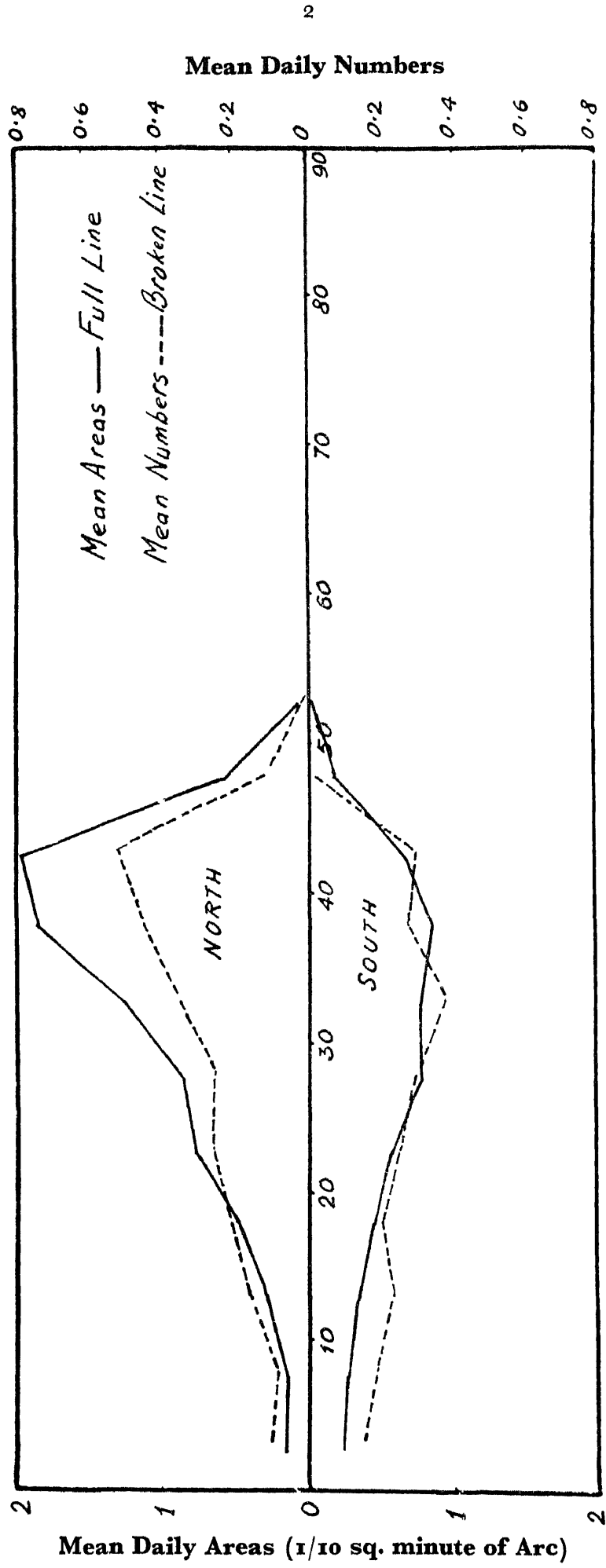
The figures when compared with the corresponding values of the previous half-year show a decrease of activity, the decrease in area being 23.5 per cent and the decrease in number 22.7 per cent.

The values based on Kodaikanal observations alone are given below for comparison with similar data published in Bulletins prior to 1923, *i.e.* before the co-operation of other observatories came into force:

	Kodaikanal data only	
	Mean daily areas (sq. minutes)	Mean daily numbers
North . . . . .	0.80	2.67
South . . . . .	0.47	2.39
TOTAL	1.27	5.06

The distribution of areas and numbers in five-degree ranges of latitude as obtained from the combined data is represented in diagram I.

DIAGRAM I  
 Mean Areas and Numbers  
 of Calcium Prominences.  
 January to June 1954.



Compared with the previous half-year the peak of activity in the northern hemisphere is slightly more pronounced and has advanced by about 5 degrees towards the pole, it is centred in the latitude belt  $40^{\circ}$ - $45^{\circ}$ . In the southern hemisphere, however, the peak of activity in the belt  $35^{\circ}$ - $40^{\circ}$  seen during the previous half-year persists, but is considerably flatter during the present half-year.

The monthly, quarterly and half-yearly areas, numbers, heights and extents of prominences as derived from all available photographs are tabulated below:—

1954 Months	Number of days (effective)	Area (sq minutes)	Numbers	Daily means		Mean height	Mean extent
				Areas (sq. minutes)	Numbers		
1	2	3	4	5	6	7	8
January . . . . .	27	36.55	158	1.35	5.85	41.45	2.00
February . . . . .	26	27.95	116	1.07	4.45	40.21	2.39
March . . . . .	29½	46.05	121	1.55	4.06	40.82	3.91
April . . . . .	27½	33.30	116	1.20	4.18	42.88	2.79
May . . . . .	30½	51.90	181	1.68	5.88	45.37	2.58
June . . . . .	29	37.75	144	1.30	4.99	45.93	2.80
1st quarter . . . . .	82½	110.55	395	1.33	4.77	40.95	2.71
2nd quarter . . . . .	87½	122.95	441	1.40	5.04	44.90	2.71
1st half-year . . . . .	170½	233.50	836	1.37	4.91	43.04	2.71

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

1954 January—June	Percentage East	
	East	West
Total areas (sq. minutes) . . . . .	109.2	124.3
Total numbers . . . . .	374	462

#### Observations with the Prominence Spectroscope

No metallic or eruptive prominence was observed during the half-year. No bright reversals of H-alpha line or dark reversal of  $D_3$  line on the disc near sunspot was observed.

No displacement in prominence was observed with the spectroscope.

The mean heights of 4 prominences in H-alpha,  $D_3$  and H-beta lines observed with the spectroscope and the mean height in K line of the same prominences as measured from calcium spectroheliograms are given below —

K . . . . .	52"
H-alpha . . . . .	50"
$D_3$ . . . . .	43"
H-beta . . . . .	38"

*Observations with the Hale Spectrohelioscope*

Details of Doppler displacements in H-alpha line observed in prominences and dark markings are given below :—

1	North	South	East	West	Total	Displacements		
						To red	To violet	Both ways
	2	3	4	5	6	7	8	9
Displacements in prominences . . .	19	8	8	19	27	..	..	27
Displacements in dark markings . . .	5	2	2	5	7	1		6

*Solar Flares*

Details of solar flares observed during the period are given in the following table :—

Date 1954	Time in I. S. T					Mean latitude	Mean longitude from Central Meridian	Intensity	Maximum width of H-alpha line observed	Remarks
	Beginning		Maximum		End					
	H.	M.	H.	M.	H.					
March, 15 . . . . .	08	28	..		08	32	7°S	30°E	1	...

*Sudden disappearances of prominences and dark markings*

No sudden disappearance of prominences or H-alpha absorption markings was observed during the period.

*Prominences projected on the disc as absorption markings*

During the half-year under review photographs of the sun's disc in H-alpha line were obtained at Kodaikanal on 153 days. H-alpha spectroheliograms were also received for 25 days from Mt. Wilson Observatory and for 15 days from the Meudon Observatory. On the whole records were available for 178 days which were counted as 174 1/4 effective days after weightage according to the quality of the photographs.

The mean daily areas in millionths of the sun's visible hemisphere (uncorrected for foreshortening) and the mean daily numbers of the H-alpha dark markings as derived from the combined photographs are given below:—

	Combined data	
	Mean daily area (Millionths of the sun's visible hemisphere)	Mean daily number of the sun's visible hemisphere
North . . . . .	388.3	4.04
South . . . . .	161.0	1.71
TOTAL	549.3	5.75

On comparing with the previous half-year's values, these figures show a considerable decrease in activity both in areas and numbers. The areas show a decrease of 49·2 per cent and the numbers a decrease of 50·4 per cent.

The figures based solely on Kodaikanal photographs are also given for comparison with similar data.

		Kodaikanal data only	
		Mean daily area (Millionths of the sun's visible hemisphere)	Mean daily number
North	. . . . .	364·1	4 02
South	. . . . .	121·4	1 51
TOTAL		485·5	5 53

The distribution of the areas of the absorption markings in 5 degree ranges of latitude as obtained from the combined data is shown in diagram II.

Just as is the case with the limb prominences, the zones of maximum activity are situated in the latitude belt  $40^{\circ}$ - $45^{\circ}$  in the northern hemisphere and  $35^{\circ}$ - $40^{\circ}$  in the southern hemisphere.

The distribution of total areas and numbers of the dark markings east and west of the sun's axis of rotation is given below :—

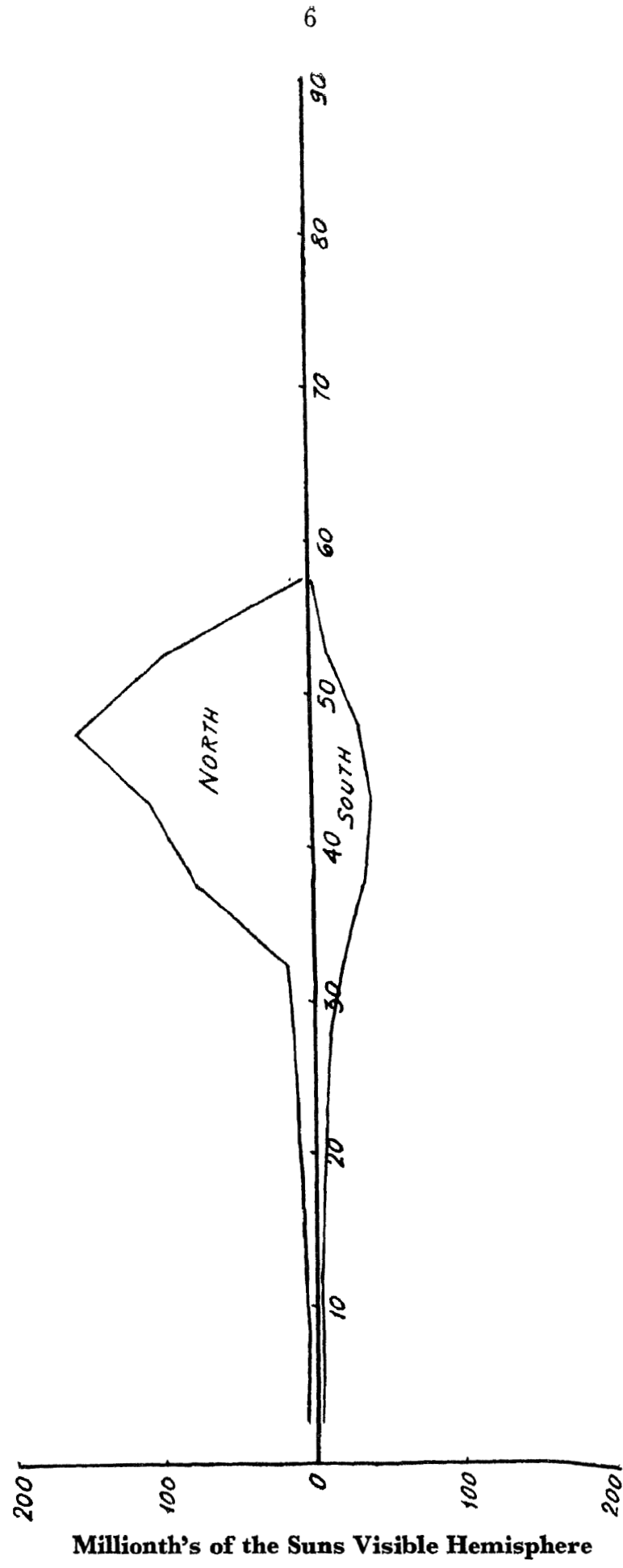
January—June 1954	Combined data		
	East	West	Percentage East
Total area (Millionths of the sun's visible hemisphere)	53,881	41,866	56·2
Total numbers	537	466	53·5

Contrary to the previous half-year, the half-year under review shows an eastern excess both in the areas and in the numbers.

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

DIAGRAM II

Mean Areas of H-alpha  
Absorption Markings.  
January to June 1954.



## PART II

### MAGNETIC OBSERVATIONS FOR THE FIRST HALF OF 1954

Brief descriptions of the absolute instruments, the variometers and the system of observations are available in Bulletins No CXXXII and CXXXVI of this observatory. The data given in this bulletin are derived mainly from the records of the La Cour instruments, but in case of failure of La Cour records the Watson magnetograms have been used.

The adopted values of the scale co-efficients of the horizontal force, vertical force and declination magnetographs for the first half of 1954 are 80.0  $\gamma/cm.$ , 110.0  $\gamma/cm.$  and 16.0' /cm. respectively.

#### *Trends in Magnetic variations.*

The mean value of and the range in horizontal force for the first half of 1954 were 39,475  $\gamma$  and 88  $\gamma$  respectively showing an increase in the mean value and a decrease in the range over the corresponding values viz. 39,461  $\gamma$  and 91  $\gamma$  for the second half of 1953. In the case of the vertical force, the mean value as well as the mean range decreased from the corresponding values for the previous six months, the mean value falling from 2,415  $\gamma$  to 2,401  $\gamma$  and the mean range from 37  $\gamma$  to 34  $\gamma$ . The mean westerly declination increased from 2°34' 6 to 2°35' .1 but the mean range in D fell from 3' .6 to 3' .3.

KODAIKANAL, }  
June, 1956. }

A. K. DAS,  
*Deputy Director-General of Observatories.*

TABLE 1

## Hourly Values of Declination (Westerly), 1954

(Averages for sixty minutes centred at the full hours of Greenwich Mean Time)

January

2° plus tabular quantities

Date	Hours G.M.T														
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1	36 5	36 4	36 7	35 9	35 6	35 9	36 8	36 7	35 9	34 8	34 3	34 4	34 8	34 6	34 6
2**	36 5	37 2	37 6	37 2	36 0	36 5	36 8	35 6	34 8	34 3	33 6	33 6	34 1	34 6	34 8
3	35 1	35 6	36 8	37 3	35 9	35 9	35 9	35 7	35 1	34 1	34 1	32 8	33 6	34 1	34 6
4*	35 4	35 9	36 5	36 8	36 0	35 2	36 2	35 9	34 9	34 1	33 5	33 3	33 8	34 1	34 3
5	35 1	35 2	35 1	35 7	36 4	36 7	36 4	36 5	36 0	34 8	34 3	34 0	34 1	34 1	34 3
6	35 4	35 7	37 0	37 3	36 0	35 4	35 2	35 1	34 8	34 1	33 3	33 0	33 3	33 3	33 5
7	34 8	34 9	35 1	35 6	36 0	35 7	35 1	35 1	34 9	34 9	34 8	34 3	34 8	34 9	34 9
8	35 4	35 6	35 7	34 9	35 7	36 2	36 0	35 6	34 8	34 0	33 3	35 6	35 9	34 6	34 8
9	36 5	36 7	37 2	37 3	36 0	36 7	37 6	37 5	36 0	35 2	34 4	34 1	34 3	34 3	34 3
10*	35 2	35 1	35 6	35 7	35 9	36 4	36 7	36 5	36 0	35 1	34 3	33 6	33 8	34 1	34 6
11	35 4	35 4	35 6	35 6	35 2	35 7	36 7	36 4	36 2	35 6	34 6	34 4	34 3	34 1	34 3
12	35 4	35 7	35 7	36 0	35 7	35 4	37 0	36 2	35 4	34 9	34 0	33 5	34 1	34 8	34 9
13	35 6	35 6	35 2	34 8	35 1	35 7	36 2	36 2	36 2	36 0	35 7	35 2	35 1	34 9	34 8
14	36 0	36 2	36 2	36 0	35 7	35 9	35 6	36 2	35 4	35 1	35 1	34 4	34 4	34 6	34 8
15	36 0	36 0	36 0	35 8	37 1	35 4	35 4	35 5	35 0	35 1	35 4	35 5	35 0	34 9	34 7
16	36 3	36 2	37 0	36 6	36 2	35 0	34 7	35 0	34 7	34 6	34 7	34 2	34 4	34 4	34 6
17	35 5	36 2	36 5	35 7	34 6	35 4	35 5	35 0	34 9	35 4	34 9	34 7	34 7	34 7	34 9
18	35 8	36 2	36 5	36 8	35 7	35 0	34 9	35 2	35 2	34 9	35 0	35 0	34 9	34 7	34 6
19**	35 7	35 7	35 7	35 8	34 9	34 9	35 0	34 9	34 1	33 8	33 4	33 9	34 9	35 0	34 9
20**	34 7	34 9	35 5	36 5	36 5	36 5	36 3	36 0	35 5	34 9	34 2	34 2	34 6	34 7	34 7
21**	35 0	35 4	35 7	36 0	35 0	34 9	35 2	34 7	33 9	33 3	33 3	33 4	33 9	33 8	33 6
22	34 6	34 9	35 2	35 5	36 2	36 0	36 5	35 7	34 9	34 6	34 1	34 2	34 9	34 6	34 2
23**	35 2	35 5	35 5	35 5	35 0	35 2	35 8	35 7	35 2	34 1	34 1	34 6	34 4	35 1	35 2
24	35 4	35 8	36 2	35 9	34 7	35 4	36 0	36 2	36 0	35 4	34 9	34 6	34 7	34 7	34 7
25	35 0	34 9	34 7	34 7	34 4	34 9	36 2	36 3	35 7	35 0	34 2	34 0	34 2	34 2	34 1
26*	34 6	34 9	35 2	35 4	35 5	35 5	35 7	36 6	36 2	35 7	34 9	34 2	34 1	34 4	34 4
27	35 4	35 4	35 0	34 4	34 1	34 7	35 5	36 0	36 3	35 5	35 0	34 1	34 1	34 4	34 1
28*	35 4	35 5	35 7	35 4	35 0	34 9	34 6	35 2	35 4	35 0	34 4	34 4	34 7	34 7	34 6
29*	35 4	35 4	35 4	36 0	35 5	35 5	36 0	36 5	36 2	35 4	35 0	34 9	35 0	35 0	35 0
30	35 7	36 0	36 0	36 0	34 9	35 0	35 2	35 5	35 7	35 0	34 7	34 4	34 4	34 4	34 4
31	35 4	36 0	36 8	36 5	36 3†	36 0	36 3	35 5	35 2	35 0	34 9	34 9	34 9	34 7	34 9
Mean	35 5	35 7	36 0	36 0	35 6	35 6	35 9	35 8	35 4	34 8	34 4	34 2	34 5	34 5	34 5
Mean*	35 2	35 8	35 7	35 9	35 6	35 7	35 8	36 1	35 7	35 1	34 4	34 1	34 3	34 5	34 6
Mean**	35 4	35 7	36 0	36 2	35 5	35 6	35 8	35 4	34 7	34 1	33 7	33 9	34 4	34 6	34 6

\* Five international quiet days

\*\* Five international disturbed days.

† Loss of record, (day omitted for means).



TABLE I

Hourly Values of Declination (Westerly), 1954

(Averages for sixty minutes centred at the full hours of Greenwich Mean Time)

January

2° plus tabular quantities

Hours G.M.T									Mean	Maximum		Minimum		Range	Date
15	16	17	18	19	20	21	22	23		Time	Mag.	Time	Mag.		
									H M		H M.				
34.6	31.1	34.4	34.4	34.8	34.9	35.1	35.2	35.6	35.3	06 04	37.2	09 54	34.1	3.1	1
34.4	31.4	34.1	33.8	33.5	34.0	34.1	34.3	34.9	35.0	01 30	37.8	11 22	33.2	4.6	2**
34.8	34.8	34.6	34.6	31.8	31.8	31.9	35.1	35.6	35.0	02 26	37.3	10 54	32.5	4.8	3
34.3	34.3	34.1	34.3	34.3	34.6	34.6	31.8	34.9	34.8	02 30	37.3	10 30	33.0	4.3	4*
34.4	34.6	34.4	34.3	31.0	33.6	34.6	34.4	34.9	34.9	05 46	37.0	20 00	33.2	3.8	5
33.6	34.0	34.1	31.3	31.3	34.1	34.3	34.1	34.4	34.6	03 04	37.8	11 54	33.0	4.8	6
34.9	34.8	34.6	31.4	34.6	34.9	31.9	35.1	35.2	35.0	03 16	37.0	11 50	34.1	2.9	7
34.9	34.8	34.9	35.1	35.2	35.4	35.6	35.7	35.9	35.2	06 04	36.4	10 10	33.2	3.2	8
34.4	34.4	34.4	34.6	31.6	34.8	34.9	35.1	35.2	35.4	02 34	37.8	11 14	34.0	3.8	9
34.6	31.8	34.8	34.8	34.8	34.9	35.1	35.2	36.0	35.1	05 42	37.2	11 50	33.3	3.9	10*
34.4	34.6	34.8	34.8	34.8	34.9	35.1	35.2	35.4	35.1	06 04	36.5	13 30	33.6	2.9	11
34.8	34.9	35.1	35.1	34.9	35.1	35.4	35.6	35.7	35.2	06 26	36.8	11 04	33.2	3.6	12
34.8	34.8	34.9	35.1	35.2	35.4	35.4	35.7	35.9	35.4	05 46	36.4	14 54	34.6	1.8	13
34.6	34.8	34.8	31.9	35.1	35.2	35.6	35.6	36.0	35.3	07 00	36.6	11 26	34.3	2.3	14
34.7	34.7	34.9	35.0	35.2	35.4	35.7	35.8	36.2	35.4	00 04	36.2	08 38	34.2	2.0	15
34.4	34.6	34.6	34.4	34.2	34.1	34.4	31.7	35.0	34.9	03 00	37.1	11 10	33.9	3.2	16
34.9	34.9	34.9	35.0	35.2	34.7	35.5	35.7	36.0	35.2	01 54	36.8	09 26	34.4	2.4	17
34.7	34.6	34.6	34.6	34.6	34.6	34.6	34.9	35.7	35.1	03 10	37.4	13 42	34.1	3.3	18
34.6	34.2	34.2	33.9	33.3	33.1	33.9	33.4	33.9	34.5	02 34	36.0	19 42	32.6	3.4	19**
34.7	34.7	34.6	34.9	31.7	31.6	34.6	34.9	34.9	35.1	03 00	37.1	10 50	33.9	3.2	20**
33.6	33.6	33.8	33.8	33.6	33.4	33.6	33.9	34.1	34.2	02 56	36.2	14 30	33.3	2.9	21**
34.4	34.4	34.4	34.6	34.4	34.6	34.6	31.6	34.9	31.5	06 04	36.8	09 50	33.4	3.4	22
35.2	35.1	35.2	35.2	35.2	35.2	35.2	35.2	35.2	35.1	05 50	36.2	08 30	34.0	2.2	23**
34.6	34.6	34.4	34.6	34.6	34.9	35.0	35.2	35.2	35.1	06 54	36.5	11 00	34.1	2.4	24
34.1	34.1	34.1	34.1	31.1	34.1	34.1	34.4	34.6	34.6	06 52	36.6	10 30	33.8	2.8	25
34.4	34.4	34.4	34.2	34.2	34.4	31.6	34.7	36.0	34.9	07 10	36.8	11 50	33.9	2.9	26*
34.1	34.1	31.2	34.2	34.2	34.1	34.7	35.0	35.2	34.7	07 50	36.3	11 30	34.1	2.2	27
34.6	34.6	34.7	34.7	34.9	35.0	35.2	35.4	35.0	35.0	02 00	35.7	10 00	34.4	1.3	28*
35.2	35.2	35.4	35.4	35.4	35.4	35.5	35.7	35.7	35.5	07 20	36.6	10 20	34.9	1.7	29*
34.4	34.7	34.7	31.9	34.9	35.0	35.0	35.2	35.2	35.1	07 25	36.0	11 20	34.4	1.6	30
35.0	35.0	35.0	35.0	35.0	35.7	35.2	35.7	35.7	35.4	02 15	36.8	12 45	34.7	2.1	31
34.5	34.6	34.6	34.6	34.6	34.7	34.9	35.0	35.3	35.0					3.0	Mean
34.6	34.7	34.7	34.7	34.7	34.9	35.0	35.1	35.6							Mean*
34.5	34.4	34.4	34.3	34.1	34.1	34.3	34.3	34.6							Mean**

\* Five international quiet days.

\*\* Five international disturbed days.

† Loss of record; (day omitted for means).

TABLE 2

Hourly Values of Declination (Westerly), 1954  
(Averages for sixty minutes centred at the full hours of Greenwich Mean Time.)

February

2° plus tabular quantities

Date	Hours G.M.T														
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1	35 3	35 2	35 5	36 1	34 8	34 2	33 9	33 7	33 4	33 2	32 6	33 1	33 2	33 4	33 4
2	34 5	34 5	34 7	34 2	34 2	34 5	34 7	35 0	35 0	34 8	34 2	33 6	33 7	33 9	31 2
3	34 7	34 7	34 7	34 7	34 7	35 0	36 1	36 6	36 6	35 8	34 5	31 4	31 2	31 5	31 2
4	35 0	35 2	35 3	34 8	35 0	35 0	34 7	34 2	33 9	33 4	33 1	33 7	31 2	31 5	31 5
5*	35 0	35 0	35 3	35 2	35 8	36 1	36 4	35 8	35 0	31 7	34 2	33 9	33 9	34 0	31 0
6*	35 0	35 2	35 2	34 8	34 7	35 0	35 0	35 3	35 0	34 7	31 2	33 9	34 5	31 7	31 8
7*	35 0	34 8	35 0	35 3	35 5	36 1	36 1	35 8	35 3	35 0	34 7	35 0	35 2	31 8	31 8
8*	35 0	35 2	35 3	35 3	35 2	35 3	35 3	35 8	35 5	35 0	31 7	34 5	31 7	31 7	31 8
9	35 6	35 8	35 8	36 8	37 4	37 2	37 4	37 1	36 9	36 6	36 4	36 1	35 5	35 3	35 2
10	36 3	36 3	36 3	35 8	34 9	34 2	34 8	35 3	36 1	36 6	36 9	36 6	36 1	35 3	36 1
11	35 6	35 6	35 5	35 3	34 7	34 8	35 2	35 3	35 8	35 3	35 3	35 0	31 7	31 5	31 5
12*	34 7	34 7	34 7	34 5	34 2	33 9	34 2	33 7	33 7	33 7	34 0	33 9	31 7	31 2	31 0
13	34 5	34 8	34 8	34 7	35 0	35 2	35 2	35 0	34 8	31 7	31 5	31 5	31 5	31 2	31 2
14	35 0	35 2	35 2	35 2	35 8	36 1	36 1	36 6	36 8	36 8	36 6	35 8	35 0	31 7	31 7
15**	35 0	34 8	34 8	34 5	34 2	34 2	34 5	35 0	35 0	31 7	34 7	34 2	33 1	33 4	33 6
16	34 5	34 2	34 5	35 0	35 2	35 2	35 3	35 3	35 3	31 8	34 5	34 2	33 6	33 9	33 9
17	35 2	35 0	34 7	34 2	33 9	35 0	35 5	35 8	35 8	35 1	31 6	33 7	34 2	31 1	31 1
18	34 7	34 5	34 9	34 2	33 7	34 2	34 7	35 2	34 8	34 5	33 9	33 2	33 1	33 8	33 7
19	34 5	34 9	34 9	34 8	34 8	34 7	34 7	34 2	34 5	34 2	34 5	31 2	31 0	31 2	33 7
20	34 7	34 7	34 8	35 0	35 2	35 8	35 4	36 0	35 4	35 2	31 8	34 8	31 8	31 8	31 7
21	34 5	34 5	34 2	33 9	34 2	34 2	35 0	35 3	35 0	31 5	33 9	34 0	33 9	31 2	31 2
22**	33 9	33 4	34 0	35 2	34 8	34 8	35 0	35 0	35 0	31 8	34 2	33 7	33 6	33 6	33 1
23**	34 5	33 7	33 2	31 8	33 1	33 7	34 8	35 0	35 0	34 7	34 4	33 9	33 4	33 2	32 4
24	34 2	34 2	34 2	34 2	35 2	36 1	37 1	37 7	37 1	35 8	35 5	35 0	31 2	31 2	31 7
25	35 2	35 2	35 0	34 7	34 8	35 3	36 1	36 8	36 6	36 3	35 3	35 0	35 2	35 2	35 0
26**	35 8	36 1	36 1	35 0	35 0	35 3	36 4	36 4	36 3	36 3	35 5	34 2	34 0	31 2	34 2
27**	34 8	35 0	35 0	35 2	35 2	35 8	36 1	36 6	36 6	36 1	35 6	35 5	35 3	35 2	35 2
28	35 0	34 8	35 0	35 3	35 8	35 8	36 0	36 3	36 9	36 1	36 3	36 0	35 6	31 8	31 7
Mean . . .	34 9	34 9	34 9	34 8	34 9	35 1	35 4	35 6	35 6	35 1	34 8	34 5	34 1	31 3	31 3
Mean* . . .	34 9	35 0	35 1	35 0	35 1	35 3	35 4	35 3	34 9	34 6	31 4	31 2	31 6	31 5	31 5
Mean** . . .	34 8	34 6	34 6	34 3	34 5	34 8	35 4	35 6	35 6	35 3	34 9	31 3	33 9	33 9	33 8

\* Five international quiet days

\*\* Five international disturbed days.

† Loss of record, (day omitted for means)

TABLE 2

Hourly Values of Declination (Westerly), 1954

(Averages for sixty minutes centred at the full hours of Greenwich Mean Time)

February

2° plus tabular quantities

Hours G.M.T.									Mean	Maximum		Minimum		Range	Date
15	16	17	18	19	20	21	22	23		Time	Mag	Time	Mag		
										H	M.	H	M		
33.2	33.1	33.1	32.3	33.1	33.4	33.6	33.9	33.9	33.8	02 55	36.1	18 10	32.3	3.8	1
34.2	34.2	34.2	31.2	31.5	34.7	31.8	31.8	31.7	31.4	08 40	35.0	11 30	33.6	1.4	2
34.2	34.5	31.5	31.7	34.7	34.7	31.7	34.7	34.7	34.9	06 55	36.9	13 30	33.9	3.0	3
31.7	34.7	34.7	31.8	31.8	31.8	35.0	35.0	35.0	31.6	02 10	35.3	10 00	35.1	2.2	4
34.2	31.5	31.7	31.7	34.1	31.2	31.5	31.7	34.8	31.7	05 50	36.4	10 30	33.7	2.7	5*
34.7	34.8	35.0	35.0	35.0	35.0	35.0	35.0	35.0	31.9	07 15	35.5	10 40	33.7	1.8	6*
31.8	35.0	35.0	34.7	34.7	31.7	31.8	35.0	35.0	35.1	04 50	36.3	10 00	34.7	1.6	7*
35.2	35.2	35.2	35.2	35.2	35.2	35.2	35.2	35.5	35.1	07 10	36.1	10 50	31.5	1.6	8*
35.3	35.5	35.2	35.2	35.3	35.5	35.5	35.8	36.1	36.0	06 15	37.7	14 50	35.0	2.7	9
36.1	36.1	36.1	36.1	36.3	36.3	36.3	36.3	36.1	36.0	09 50	36.9	04 00	33.9	3.0	10
34.5	34.5	31.5	31.2	31.2	34.2	34.7	31.7	34.7	31.9	08 45	36.1	20 00	34.2	1.9	11
34.0	31.2	31.2	33.9	33.9	34.2	33.9	34.2	34.2	34.1	12 20	34.7	08 20	33.7	1.0	12*
34.2	31.2	31.4	31.5	34.5	31.5	34.7	34.7	34.8	34.7	06 35	35.2	13 10	33.9	1.3	13
34.5	34.2	34.4	34.7	34.7	34.7	34.7	31.7	34.8	35.3	09 10	36.8	15 55	34.2	2.6	14
33.1	33.4	33.7	33.7	33.9	31.2	34.2	31.2	34.5	31.2	08 05	35.2	15 20	32.6	2.6	15**
33.7	33.6	33.7	33.9	33.7	34.5	34.7	34.5	34.2	34.4	07 40	35.3	16 00	33.2	2.1	16
31.0	34.3	31.4	31.5	34.5	31.2	34.2	34.4	34.7	34.6	07 50	35.9	12 42	33.6	2.3	17
33.9	33.8	31.0	33.0	34.2	34.1	34.1	34.4	34.3	34.1	06 50	35.4	11 30	32.6	2.8	18
33.9	31.2	31.5	31.5	34.2	34.2	31.5	31.7	34.7	34.4	05 50	35.0	14 05	33.6	1.4	19
34.7	34.8	31.8	35.0	34.8	34.8	34.8	34.8	34.8	35.0	07 00	36.0	15 00	34.7	1.3	20
34.2	33.6	33.7	33.1	33.6	33.9	33.9	34.5	34.2	31.2	06 10	35.3	18 15	32.6	2.7	21
33.6	33.6	31.2	34.2	34.2	34.7	34.7	31.5	34.2	31.3	08 15	35.2	11 00	33.4	1.8	22†
33.2	33.1	32.9	33.7	33.9	33.9	34.4	34.7	34.7	33.8	06 35	35.2	08 10	31.5	3.7	23**
34.8	35.0	35.3	35.3	35.3	35.2	35.3	35.2	35.2	35.3	07 00	37.7	12 00	31.2	3.5	24
35.0	35.0	35.0	35.0	35.3	35.3	35.3	35.3	35.3	35.3	06 45	36.9	03 00	34.7	2.2	25
34.2	33.9	33.9	33.9	33.9	31.5	31.7	34.7	34.7	35.0	06 20	37.1	11 30	33.7	3.4	26**
35.0	35.0	34.7	35.2	35.0	35.0	35.0	35.0	35.0	35.3	07 10	36.8	16 30	31.7	2.1	27**
31.7	34.7	35.0	35.2	35.3	35.3	35.5	35.6	35.6	35.5	13 06	37.2	18 24	31.4	2.8	28
34.3	34.1	34.5	34.4	31.5	34.6	34.7	31.8	34.8	34.8	.	.	.	.	2.3	Mean
34.6	34.7	31.2	34.7	34.6	34.7	34.7	31.8	34.8	.	.	.	.	.	.	Mean*
33.8	33.8	33.9	34.1	34.2	34.5	34.6	34.6	34.6	.	.	.	.	.	.	Mean**

† Five international quiet days

\*\* Five international disturbed days.

† Loss of record; (day omitted for means).

TABLE 3

## Hourly Values of Declination (Westerly), 1954

(Averages for sixty minutes centred at the full hours of Greenwich Mean Time)

March

2° plus tabular quantities

Date	Hours G.M.T														
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1*	35 6	35 8	35 6	35 0	34 7	34 8	35 2	36 3	36 8	36 6	36 1	35 7	35 3	35 0	35 0
2	35 2	35 5	35 5	35 3	35 0	35 3	35 8	36 3	36 3	36 3	35 6	35 2	31 7	34 7	34 8
3*	36 3	36 3	36 3	36 0	35 8	35 3	36 0	36 6	37 1	36 8	36 3	35 6	31 8	34 8	34 8
4	36 1	36 1	36 1	35 6	35 1	35 1	35 1	35 8	35 9	36 2	36 1	35 1	34 6	34 8	34 8
5	35 9	35 6	35 3	34 5	34 5	34 5	34 0	33 7	34 8	34 6	31 5	34 3	33 7	34 0	34 0
6	34 5	34 6	34 8	34 8	34 6	34 3	31 5	35 0	34 5	34 5	34 5	34 3	34 0	34 5	34 6
7	35 0	35 0	35 3	34 8	34 8	34 8	35 0	35 0	35 6	35 9	35 3	34 8	34 6	34 5	34 5
8	34 8	35 1	35 3	35 3	35 1	35 1	35 3	35 8	35 9	35 9	35 1	34 8	34 8	34 8	31 8
9	34 5	34 8	35 0	35 1	35 3	35 6	35 3	35 4	35 6	34 8	34 2	33 7	34 5	34 5	34 5
10	35 0	35 0	35 6	35 9	35 4	35 6	35 6	35 9	35 8	35 9	35 3	35 0	34 8	34 6	34 6
11	35 0	35 1	35 4	35 3	35 1	35 3	35 9	35 1	35 0	35 1	34 8	34 5	34 5	34 3	34 0
12	35 0	35 3	35 6	35 9	36 1	36 1	36 1	35 1	35 0	34 8	34 6	34 5	34 5	34 5	34 8
13	34 8	34 8	35 0	35 1	35 0	35 6	36 1	36 1	36 1	35 6	31 8	34 5	34 5	34 5	34 6
14**	35 0	35 0	34 8	34 8	35 1	35 4	35 4	34 8	34 3	31 3	33 7	33 4	33 7	34 3	34 6
15**	34 6	35 0	35 0	35 0	35 1	35 8	36 1	36 1	35 0	34 6	33 7	33 4	34 0	34 0	31 6
16	35 3	35 4	35 6	34 8	35 0	35 1	35 1	35 0	34 8	34 2	33 4	33 0	33 5	33 8	34 0
17	35 1	35 0	35 0	35 4	35 6	36 1	36 1	36 1	36 2	35 6	34 5	34 5	31 5	34 6	35 0
18	34 8	34 5	33 7	34 5	35 1	35 6	36 4	36 2	36 1	35 0	34 5	34 5	31 6	31 8	35 0
19	35 0	34 5	34 5	35 0	35 4	36 9	37 8	37 8	37 2	36 2	35 3	35 0	34 8	31 8	34 8
20**	35 1	34 5	33 8	34 5	34 8	35 4	36 6	37 0	37 2	36 2	35 9	35 0	34 6	34 8	35 0
21	35 3	35 0	34 5	34 5	35 9	36 6	37 8	38 0	37 8	37 2	36 2	35 1	35 1	35 1	35 1
22	35 0	34 8	34 8	34 8	35 0	35 9	37 2	36 9	36 6	36 2	35 1	35 0	35 3	35 3	35 1
23**	35 3	35 1	35 1	34 8	34 5	35 6	36 1	35 0	34 6	34 5	34 8	35 0	35 0	35 0	35 0
24**	34 5	34 5	34 6	34 8	35 9	36 6	37 2	36 7	36 1	34 8	34 5	34 6	35 0	35 0	34 8
25	34 5	34 3	34 0	34 8	35 6	36 4	37 0	37 7	37 5	36 6	36 1	35 4	34 8	34 6	34 8
26	35 0	34 8	34 8	34 8	36 2	37 2	38 0	38 2	37 5	36 6	35 1	34 6	34 6	34 8	35 0
27*	34 8	34 6	33 5	34 5	35 6	37 2	38 8	38 5	37 5	36 1	35 3	34 5	34 5	34 6	34 8
28*	35 0	34 6	34 0	34 0	34 6	35 6	36 2	36 7	36 7	36 1	35 6	34 8	34 8	34 8	34 8
29*	35 1	34 8	35 0	35 0	35 0	35 1	35 6	36 1	36 2	36 1	35 4	35 6	35 6	35 3	35 0
30	35 0	35 0	35 0	35 6	36 2	36 6	37 2	37 4	36 6	35 6	35 0	35 3	35 6	35 0	34 5
31	34 8	34 5	34 5	34 8	35 6	36 4	37 2	37 4	36 9	35 8	35 1	34 8	34 5	35 0	35 0
Mean	35 0	35 0	34 9	35 0	35 2	35 7	36 2	36 2	36 1	35 6	35 0	34 7	34 6	34 7	34 7
Mean*	35 4	35 2	34 9	34 9	35 1	35 6	36 4	36 8	36 9	36 3	35 8	35 2	35 0	34 9	34 9
Mean**	34 9	34 8	34 7	34 8	35 1	35 8	36 3	35 9	35 4	34 9	34 5	34 3	34 5	34 6	34 8

\* Five international quiet days.

\*\* Five international disturbed days.

† Loss of record, (day omitted for means).

TABLE 3

## Hourly Values of Declination (Westerly), 1954

(Averages for sixty minutes centered at the full hours of Greenwich Mean Time)

March

2° plus tabular quantities

Hours G.M.T.									Mean	Maximum		Minimum		Range	Date
15	16	17	18	19	20	21	22	23		Time	Mag.	Time	Mag.		
									H   M		H. M.				
35 0	34 8	34 8	31 8	35 0	35 2	35 0	35 2	35 2	35 1	08 00	36 8	01 00	31 7	2 1	1*
34 7	34 7	34 7	34 7	31 8	35 0	35 0	35 2	35 6	35 2	06 50	36 4	18 00	34 7	1 7	2
34 8	34 7	31 8	35 0	35 0	35 2	35 3	35 6	35 8	35 6	08 10	37 1	12 30	31 7	2 4	3*
35 0	35 0	35 0	35 0	35 0	35 0	35 0	35 0	35 3	35 3	08 10	36 2	12 10	33 7	2 5	4
34 3	34 5	34 5	31 5	31 5	31 5	34 5	31 5	31 5	34 5	00 10	36 1	07 00	33 5	2 6	5
34 8	34 8	31 8	31 6	31 8	31 8	31 8	31 8	34 8	34 6	06 15	35 1	12 00	34 0	1 1	6
34 6	34 8	34 8	35 0	34 8	31 6	35 0	34 8	31 8	35 0	09 00	36 2	14 00	34 0	2 2	7
34 6	34 6	31 5	34 6	34 5	31 5	31 3	34 0	34 7	31 9	08 15	36 1	22 15	33 2	2 9	8
34 5	33 8	31 6	34 6	33 7	31 0	31 6	34 8	31 8	34 7	08 15	36 1	10 30	33 4	2 7	9
31 6	31 6	31 5	34 8	34 6	34 5	34 5	34 8	35 0	35 1	08 45	36 1	01 50	34 3	1 8	10
31 5	31 6	31 8	35 0	35 0	35 0	35 0	35 6	35 1	31 9	05 30	35 9	14 00	33 2	2 7	11
34 8	34 8	34 6	34 6	34 6	31 8	31 6	34 8	31 8	35 0	05 00	36 6	10 05	31 0	2 6	12
34 5	31 5	31 5	34 5	31 6	34 6	31 6	31 8	34 8	34 9	06 30	36 2	12 15	31 0	2 2	13
34 5	33 9	34 0	34 2	34 3	34 8	31 8	31 6	34 8	31 5	01 10	36 2	10 50	33 2	3 0	14**
31 6	34 5	34 5	31 6	31 6	34 8	31 3	34 8	31 7	31 7	06 50	36 6	10 20	33 0	3 6	15**
31 5	31 6	35 1	35 0	35 0	35 1	35 1	35 1	35 1	31 7	06 45	35 1	10 40	32 7	2 4	16
35 0	34 6	34 5	34 6	34 8	35 0	35 0	35 0	31 8	35 1	07 15	36 4	10 15	31 5	1 9	17
35 0	35 0	35 0	31 8	34 8	35 0	35 0	35 0	35 1	35 0	06 00	36 6	09 30	31 0	2 6	18
34 8	34 8	34 6	34 6	34 6	31 8	35 0	35 1	35 3	35 3	06 10	38 0	11 30	34 5	3 5	19
31 8	34 5	34 5	31 5	34 5	31 6	34 8	31 8	35 0	35 1	07 30	37 2	12 00	34 0	3 2	20**
35 0	35 0	31 8	31 8	31 6	31 6	36 4	31 6	31 8	35 5	06 30	38 0	11 00	34 5	3 5	21
35 0	35 0	34 8	34 5	34 5	31 6	31 5	34 5	35 0	35 2	06 15	37 2	21 30	34 0	3 2	22
34 8	34 6	34 6	34 6	34 6	34 3	31 0	31 0	31 0	34 7	06 00	36 2	21 30	33 5	2 7	23**
34 8	34 8	34 6	34 6	34 6	34 6	34 3	31 5	34 5	31 5	06 15	37 5	09 45	33 8	3 7	24**
35 0	35 1	35 1	35 1	35 1	35 0	31 8	35 0	35 0	35 4	07 10	37 7	12 50	34 5	3 2	25
35 0	35 0	35 0	31 8	31 6	34 8	31 8	35 0	31 8	35 4	06 15	38 2	12 00	33 7	4 5	26
35 0	31 8	31 8	31 8	34 8	34 8	31 8	34 8	31 8	35 3	06 00	39 1	02 00	33 4	5 7	27*
35 0	35 0	35 0	35 0	35 1	35 1	35 1	35 1	35 1	35 6	07 50	37 0	02 30	33 8	3 2	28*
35 0	35 0	35 0	35 0	35 0	35 0	34 8	35 0	35 0	35 2	07 20	36 1	16 00	34 8	1 6	29*
34 6	35 0	35 0	31 8	31 8	34 6	34 6	34 6	31 8	35 3	06 30	37 5	11 15	34 5	3 0	30
35 0	35 0	31 8	31 8	34 6	34 6	34 8	31 6	31 6	35 2	06 00	37 7	11 30	31 3	3 4	31
34 8	34 7	34 7	34 7	34 7	34 7	34 7	34 8	34 9	35 1					2 8	Mean
35 0	34 9	34 9	34 9	35 0	35 1	35 0	35 2	35 3	..	..				..	Mean*
34 7	34 5	34 4	34 5	34 5	34 6	34 5	34 5	34 6	.	.	.			.	Mean**

\* Five international quiet days

\*\* Five international disturbed days.

† Loss of record, (day omitted for means).

TABLE 4

## Hourly Values of Declination (Westerly), 1954

(Averages for sixty minutes centred at the full hours of Greenwich Mean Time)

April

2° plus tabular quantities

Date	Hours G.M.T.														
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1*	31.5	31.0	33.7	34.3	36.6	37.8	38.3	38.2	36.9	35.8	35.0	31.8	31.8	35.0	35.0
2	35.4	35.0	34.6	34.6	35.6	36.6	37.2	37.5	36.7	36.2	35.0	31.6	35.1	35.6	35.6
3	34.8	34.5	34.0	31.5	35.6	36.4	37.2	36.9	36.1	31.8	34.6	31.8	35.3	35.6	35.6
4	35.0	34.8	34.6	35.0	36.1	36.7	37.0	37.2	36.6	36.2	35.1	35.0	35.0	35.3	35.6
5	35.0	34.6	34.0	34.5	34.5	35.6	36.7	37.2	37.2	37.0	36.2	36.1	35.6	35.6	35.6
6	34.8	34.8	34.6	34.3	34.5	35.6	35.9	36.9	36.9	36.2	35.8	35.4	35.6	35.3	35.3
7*	35.6	35.1	35.1	35.6	35.6	36.2	37.2	37.5	37.4	36.7	36.2	35.3	35.0	35.0	35.1
8	34.6	34.4	34.1	34.6	35.4	36.2	37.0	36.8	36.4	36.0	35.9	35.4	34.9	34.8	34.8
9	34.8	34.6	33.8	34.3	34.4	34.9	35.7	36.2	36.0	35.2	34.6	34.4	34.3	34.6	34.6
10	34.9	34.8	34.6	34.6	35.7	36.2	36.5	37.3	37.8	37.5	36.5	36.0	36.2	36.2	36.0
11**	31.8	34.3	33.6	33.8	34.6	35.4	36.2	36.5	36.7	36.4	35.9	35.4	35.4	35.7	35.9
12**	35.1	33.8	32.8	32.7	32.2	32.8	34.3	35.2	35.4	35.7	35.4	35.1	34.6	35.4	35.4
13	33.5	33.2	33.2	33.6	34.4	34.8	35.4	35.7	35.4	35.1	35.1	34.9	31.9	34.9	31.9
14	34.8	34.3	33.5	34.3	34.4	34.8	35.9	36.2	36.2	36.0	35.4	35.4	35.7	35.7	35.6
15**	34.8	33.8	33.6	34.3	35.1	35.9	36.4	36.4	36.2	35.4	31.8	31.8	34.8	34.6	31.4
16	34.3	33.5	33.0	33.6	34.6	35.9	36.5	37.3	36.7	36.2	35.9	35.4	35.4	35.4	35.4
17	34.8	34.4	31.0	34.1	31.8	35.9	36.7	37.0	37.0	36.4	34.9	34.6	31.6	31.9	35.4
18	35.2	34.4	34.3	34.6	35.4	36.5	37.6	37.8	37.5	37.0	36.5	36.0	35.9	35.9	35.9
19	35.7	35.1	31.4	34.3	34.3	35.7	36.5	37.0	36.4	35.9	35.7	34.8	35.1	35.4	35.1
20†	34.6	34.6	34.0	33.8	34.3	36.0	37.3	37.3	37.0	35.9	35.7	35.4	35.8	35.7	35.4
21	34.8	34.8	34.3	34.6	35.4	37.0	37.6	38.1	37.8	36.5	35.9	35.7	35.1	35.2	35.9
22	35.4	34.6	34.1	34.3	34.8	35.9	37.0	37.6	37.2	37.0	36.2	35.4	34.6	34.1	31.8
23†*	34.4	33.8	33.3	33.8	34.9	36.2	37.3	38.0	37.0	36.0	35.4	35.1	35.1	35.9	35.9
24	34.8	34.1	33.2	33.6	34.3	35.7	36.5	37.0	36.8	36.2	35.1	34.9	35.1	34.9	35.1
25†	34.8	34.4	34.3	34.8	35.4	36.5	37.0	37.0	36.5	35.9	35.4	34.8	34.8	34.8	34.8
26	34.8	34.6	34.3	34.3	34.8	36.0	37.0	37.3	36.5	35.9	35.4	34.8	34.8	34.9	34.9
27	33.8	32.8	32.2	32.7	33.6	34.6	35.9	36.4	35.9	35.4	34.9	34.3	34.3	31.8	35.1
28†	34.1	33.3	33.2	34.1	35.1	35.9	37.5	37.8	37.2	36.5	35.9	35.4	35.1	35.2	35.1
29†	34.6	31.6	33.3	34.3	34.6	35.2	35.7	36.2	35.9	35.4	34.9	34.4	34.4	34.6	34.9
30	34.4	34.3	31.4	34.9	34.9	35.9	37.0	37.5	37.0	35.7	34.9	34.1	34.8	35.2	35.4
Mean	34.8	34.3	33.9	34.2	34.9	35.8	36.7	37.0	36.7	36.1	35.5	35.1	35.1	35.2	35.3
Mean*	34.7	34.3	33.9	34.6	35.5	36.3	37.1	37.3	36.8	36.1	35.5	34.9	34.9	34.9	35.0
Mean**	34.7	34.1	33.5	33.7	34.2	35.3	36.3	36.7	36.5	35.9	35.4	35.2	35.2	35.5	35.4

\* Five international quiet days

\*\* Five international disturbed days.

† Loss of record, (day omitted for means).

TABLE 4

Hourly Values of Declination (Westerly), 1954

(Averages for sixty minutes centred at the full hours of Greenwich Mean Time)

April

2° plus tabular quantities

Hours G.M.T.									Mean	Maximum		Minimum		Range	Date
15	16	17	18	19	20	21	22	23		Time	Mag.	Time	Mag.		
									H M.		H M.				
34 8	34 8	34 8	34 8	34 6	34 8	34 8	35 1	35 3	35 3	06 45	38 3	02 30	33 7	4 6	1*
35 3	35 3	35 0	35 0	35 0	34 8	34 8	34 6	31 5	35 4	06 30	37 7	10 45	34 5	3 2	2
35 6	35 6	35 3	35 0	35 0	34 6	34 8	34 8	34 8	35 2	05 45	37 4	02 00	34 0	3 4	3
35 6	35 4	35 1	35 0	35 0	31 8	34 8	34 8	34 8	35 1	07 30	37 4	22 15	34 5	2 9	4
35 6	35 6	35 3	35 0	35 0	31 8	31 8	34 8	34 8	35 5	06 40	37 2	01 45	34 0	3 2	5
35 3	35 0	35 0	35 0	34 8	35 0	35 1	35 3	35 3	35 3	07 15	37 2	03 00	34 3	2 9	6
35 0	35 0	31 6	34 6	34 8	34 6	34 8	34 8	34 8	35 5	07 00	37 7	20 10	34 6	3 1	7†
34 9	35 1	35 1	31 9	34 9	35 1	31 8	34 4	34 4	35 2	06 30	37 2	02 10	34 1	3 1	8
34 1	34 1	31 3	34 4	34 6	31 6	34 8	34 6	34 9	34 7	07 30	36 4	01 50	33 8	2 6	9
35 9	35 1	31 9	34 9	34 9	35 1	35 1	34 9	34 8	35 7	08 40	37 8	03 00	34 4	3 4	10
35 9	35 1	35 1	34 6	34 6	34 6	31 3	34 6	34 8	35 2	08 00	37 0	21 30	33 5	3 5	11**
35 4	31 8	31 6	31 3	34 3	34 3	34 1	33 8	34 2	34 4	08 45	36 0	04 20	31 7	4 3	12**
34 8	34 9	31 6	34 6	34 6	34 8	33 8	34 9	34 9	34 6	06 50	36 0	01 15	33 0	3 0	13
35 1	35 4	35 4	35 2	35 2	35 1	35 1	35 4	35 1	35 2	08 00	36 7	02 00	33 3	3 4	14
34 3	34 3	31 3	31 3	33 8	33 5	33 4	34 3	34 3	34 6	06 35	36 7	21 10	33 2	3 5	15**
35 4	35 1	31 9	34 6	34 3	34 3	34 3	34 3	34 3	34 6	06 30	37 5	02 15	33 0	4 5	16
35 1	35 1	35 1	31 6	34 3	31 3	34 6	34 9	34 9	35 1	07 30	37 4	02 00	33 8	3 6	17
35 9	35 9	35 7	35 4	34 9	35 4	34 6	34 9	35 4	35 8	06 30	37 8	02 30	34 1	3 7	18
34 9	34 8	31 3	34 3	34 4	34 4	34 4	31 6	34 8	35 1	06 00	37 2	02 50	34 1	3 1	19
36 2	35 9	35 9	35 4	34 9	34 8	34 8	31 8	34 8	35 4	06 30	37 5	02 10	33 6	3 9	20*†
36 0	36 0	36 2	35 9	35 9	35 9	35 9	35 9	35 7	35 9	07 00	38 1	02 15	34 1	4 0	21
34 9	31 9	34 8	31 8	34 8	34 8	31 8	34 8	34 8	34 8	06 55	37 8	02 15	33 8	4 0	22
35 9	35 7	35 1	31 6	34 6	34 6	34 8	34 8	31 8	35 3	06 50	38 0	02 00	33 3	4 7	23**
35 4	35 1	31 9	34 6	34 6	34 6	31 8	31 6	34 6	35 0	06 45	37 2	02 00	33 0	4 2	24
34 9	34 8	31 8	34 6	34 4	34 4	31 6	31 6	34 6	35 1	06 00	37 2	01 30	33 8	3 4	25*
34 8	34 8	34 8	34 8	34 6	34 6	34 4	31 3	34 3	35 1	07 00	37 5	02 00	34 1	3 4	26
34 6	34 8	34 8	34 8	34 4	34 6	34 1	34 3	31 3	34 5	06 10	36 7	02 30	31 6	5 1	27
35 4	35 4	35 1	35 4	35 4	35 1	31 9	34 8	34 8	35 3	06 50	37 8	01 40	33 2	4 6	28*
34 9	34 9	34 9	34 3	34 3	34 3	31 3	34 6	34 6	34 6	07 00	36 7	02 15	33 3	3 4	29*
35 4	35 4	35 2	35 1	35 1	35 1	35 1	35 1	35 1	35 3	06 45	37 5	11 15	33 8	3 7	30
35 3	35 2	35 0	34 8	34 1	34 7	34 7	34 7	34 2	35 1	..	.	.	.	3 6	Mean
35 0	35 0	34 9	34 7	34 7	34 6	34 7	34 8	34 8	.	.	.	.	.	.	Mean*
35 5	35 2	35 1	34 6	34 4	34 4	34 3	34 5	34 6	.	..	.	..	..	.	Mean**

\* Five international quiet days.

\*\* Five international disturbed days.

† Loss of record, (day omitted for means)

TABLE 5

## Hourly Values of Declination (Westerly), 1954

(Averages for sixty minutes centred at the full hours of Greenwich Mean Time)

May

2° plus tabular quantities

Date	Hours G M T														
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1*	34.8	34.3	34.4	34.9	36.2	37.3	37.5	37.6	37.5	36.7	36.0	35.9	35.4	35.7	35.9
2	34.8	34.3	33.8	33.8	35.1	36.4	37.3	37.3	36.8	36.0	35.1	35.1	35.1	35.2	35.6
3	34.4	33.6	33.3	33.8	35.1	36.4	36.8	37.3	36.7	36.0	35.4	35.2	35.6	35.9	35.9
4**	34.8	34.4	34.3	34.8	35.9	36.4	37.0	37.6	36.8	36.0	34.8	34.8	34.9	35.7	36.0
5	34.6	34.1	34.6	35.1	35.9	37.0	37.6	37.8	37.5	36.5	36.8	36.4	36.9	35.1	35.4
6	34.8	34.4	34.4	34.6	35.1	35.7	36.2	36.7	36.8	36.7	35.7	34.8	34.8	35.4	35.7
7*	34.8	34.6	34.8	35.4	37.0	38.0	38.3	38.0	37.5	38.1	35.4	34.9	35.1	35.4	35.7
8	34.1	33.5	33.5	34.8	35.4	35.9	36.4	36.7	36.7	36.0	35.9	35.4	34.9	35.9	35.9
9**	34.3	33.5	33.2	33.8	35.9	36.8	37.5	37.3	36.8	36.0	35.1	34.8	35.4	35.1	35.4
10	34.8	34.1	33.5	31.0	34.8	36.0	36.7	37.0	36.7	36.2	35.7	35.2	35.1	35.4	35.6
11**	34.3	33.3	32.5	32.7	31.1	35.4	36.6	37.5	37.8	37.5	36.8	36.2	35.1	34.9	35.1
12	34.3	34.3	33.5	33.8	34.9	36.7	38.1	38.4	37.6	37.0	36.2	35.2	35.3	35.1	35.4
13	34.8	34.3	33.8	33.8	34.6	35.4	35.9	35.9	36.0	35.4	34.8	34.3	34.6	35.2	35.4
14	34.3	34.3	33.6	34.4	35.4	34.8	35.9	37.0	36.7	35.9	35.2	34.4	34.3	35.2	35.4
15	34.4	33.5	33.0	33.5	35.1	36.7	37.0	37.2	36.8	35.9	35.1	34.9	34.9	35.1	35.2
16	34.6	34.4	34.4	34.9	36.7	37.8	38.9	38.9	38.3	37.3	34.7	36.0	35.4	35.1	35.9
17*	35.1	34.4	34.0	34.6	36.4	37.2	37.3	37.3	36.8	36.2	35.4	34.9	34.8	34.9	35.1
18**	34.4	34.1	34.0	33.8	34.3	35.7	36.8	37.0	37.3	36.5	35.7	34.8	34.6	34.8	34.9
19	34.8	34.3	31.3	34.6	34.8	36.2	37.0	37.3	37.5	37.0	36.7	36.4	36.0	35.7	35.9
20	34.9	34.8	34.3	34.4	34.6	35.6	36.4	37.0	36.8	36.4	35.7	35.4	35.4	35.1	35.4
21**	34.4	33.8	34.1	34.4	34.8	36.0	37.3	38.3	37.6	37.0	35.6	34.6	34.3	34.8	34.9
22	33.8	33.3	33.0	33.5	34.4	35.7	36.7	37.5	37.3	37.0	36.0	35.1	34.8	34.8	34.9
23	34.1	33.5	33.3	34.1	35.1	36.2	37.5	37.6	37.0	36.4	35.4	34.9	34.3	34.4	34.8
24	34.4	33.3	33.5	33.5	33.5	34.9	36.0	36.8	36.7	36.0	34.8	34.3	33.8	33.6	33.8
25*	33.3	32.8	32.2	32.2	33.5	34.4	37.0	36.0	35.4	34.8	34.3	33.5	33.8	34.3	34.3
26	33.2	32.8	32.2	32.2	33.3	34.3	35.2	36.0	36.2	36.0	35.1	34.9	34.3	34.1	34.1
27	33.5	32.8	32.5	32.7	33.2	34.1	35.6	35.9	36.0	36.0	35.9	35.1	34.8	34.3	34.3
28	33.8	33.5	32.5	32.2	32.5	33.5	34.3	34.4	34.3	34.1	33.5	33.3	33.8	33.8	34.3
29	33.5	32.5	31.9	32.0	33.5	34.8	35.7	36.2	35.7	35.4	35.1	34.9	34.8	34.8	34.6
30*	34.1	33.8	33.5	33.6	33.6	34.6	35.4	36.2	36.2	36.0	35.2	34.4	34.1	34.8	34.8
31	34.3	33.5	33.0	33.3	34.3	35.1	35.9	36.5	36.2	35.4	34.6	34.4	34.6	34.6	34.6
Mean	34.3	33.8	33.5	33.8	34.9	35.8	36.7	37.0	36.8	36.2	35.4	35.0	34.9	35.0	35.2
Mean*	34.4	34.0	33.8	34.1	35.3	36.3	37.1	37.0	36.7	36.4	35.3	34.7	34.7	35.0	35.2
Mean**	34.4	33.8	33.6	33.9	35.0	36.1	37.0	37.5	37.3	36.6	35.6	35.0	34.9	35.1	35.3

\* Five international quiet days.

\*\* Five international disturbed days

† Loss of record, (day omitted for means)



TABLE 5

Hourly Values of Declination (Westerly), 1954

(Averages for sixty minutes centred at the full hours of Greenwich Mean Time)

May

2° plus tabular quantities

Hours G.M.T.									Mean	Maximum		Minimum		Range	Date
15	16	17	18	19	20	21	22	23		Time	Mag.	Time	Mag.		
									H M		H M				
35.7	35.4	35.1	35.1	35.1	34.9	35.1	34.9	34.9	35.7	06 30	37.8	01 00	34.3	3.5	1*
35.4	35.1	35.1	35.1	31.9	34.8	34.8	34.6	31.6	35.3	06 06	37.5	02 20	33.3	4.2	2
35.9	35.7	35.4	35.4	35.2	34.9	35.1	35.1	35.1	35.4	07 02	37.3	01 40	33.3	4.0	3
36.0	36.0	36.0	35.1	31.6	34.8	34.8	34.6	34.6	35.4	07 10	37.6	01 20	34.3	3.3	4**
35.6	35.4	35.4	35.1	35.1	34.9	34.9	34.9	34.8	35.7	06 42	37.8	01 00	34.3	3.5	5
35.7	35.4	35.4	35.4	35.4	35.1	35.1	35.1	34.9	35.4	07 30	37.0	01 20	34.4	2.6	6
35.9	35.1	35.6	35.4	35.2	35.1	35.1	34.9	34.8	35.8	06 10	38.4	01 40	34.6	3.8	7*
35.7	35.2	31.9	34.9	34.9	31.8	34.8	34.6	31.3	35.2	06 50	36.7	01 40	33.5	3.2	8
35.7	35.4	35.4	35.4	35.2	35.1	34.9	35.1	35.1	35.4	06 42	37.6	01 20	33.2	4.4	9**
35.7	35.7	35.7	35.4	35.1	35.1	34.8	31.6	35.1	35.3	07 10	37.2	02 20	33.5	3.7	10
35.4	35.4	35.2	34.9	34.8	34.8	34.8	31.9	35.4	35.2	07 50	37.8	03 00	32.2	5.6	11**
35.6	35.4	35.4	35.2	35.2	35.1	35.4	35.4	35.2	35.6	06 50	38.4	02 20	33.5	4.9	12
35.7	35.7	35.4	35.4	35.1	34.8	34.6	31.6	34.6	35.0	07 30	36.4	02 00	33.5	2.9	13
35.4	35.4	35.2	35.2	35.2	35.2	35.1	35.1	34.9	35.1	07 10	37.3	01 40	33.2	4.1	14
35.1	35.1	34.9	34.8	31.8	34.8	34.8	34.6	31.6	35.1	07 10	37.2	02 00	33.0	4.2	15
35.9	35.9	35.6	35.4	35.4	35.4	35.4	35.4	35.4	36.0	07 10	38.9	01 40	34.3	4.6	16
34.9	34.6	34.6	34.6	31.6	31.6	34.6	34.6	34.8	35.3	07 30	37.5	03 00	33.8	3.7	17*
35.4	35.4	35.1	34.8	31.9	31.9	34.8	31.8	34.6	35.1	08 30	37.3	02 40	33.8	3.5	18**
35.6	35.4	35.4	35.1	34.9	34.8	35.1	34.9	35.1	35.6	08 18	37.5	02 00	33.8	3.7	19
35.4	35.4	35.2	35.2	35.1	34.9	34.8	31.8	31.6	35.3	07 30	37.0	02 36	33.8	3.2	20
35.4	34.4	34.4	31.1	33.8	33.8	34.3	31.3	34.1	35.0	07 18	38.3	01 20	33.3	5.0	21**
34.9	34.6	34.6	34.6	31.4	34.3	34.4	34.3	34.3	34.9	07 30	37.5	02 36	33.0	4.5	22
34.8	34.8	34.8	34.8	31.8	34.6	34.6	34.6	34.6	35.0	07 00	37.6	02 00	33.3	4.3	23
33.8	34.0	33.8	33.8	33.6	33.5	33.5	33.5	33.3	31.2	07 30	36.8	02 40	33.3	3.5	24
34.3	34.3	34.1	33.8	33.5	33.5	33.3	33.3	33.3	34.0	06 50	37.0	02 00	32.2	4.8	25*
34.1	33.8	33.5	33.5	33.5	33.5	33.5	33.8	33.8	31.0	08 02	36.1	03 00	32.2	4.2	26
34.3	34.1	34.0	33.8	33.6	33.8	33.6	33.8	33.8	34.2	09 10	36.4	02 40	32.5	3.9	27
34.3	34.1	34.1	33.8	33.5	33.3	33.3	33.3	33.6	33.6	07 22	34.6	03 00	32.2	2.4	28
34.4	34.3	34.3	33.8	33.8	33.8	33.8	34.3	34.3	34.2	06 50	36.2	02 40	31.9	4.3	29
34.6	34.6	34.6	35.0	34.4	34.3	34.3	34.3	34.3	34.6	08 02	36.7	02 00	33.5	3.2	30*
34.4	34.4	34.6	34.4	34.3	34.4	34.3	34.3	34.3	34.6	07 10	36.7	02 20	32.8	3.9	31
35.2	35.0	34.9	34.8	34.6	34.6	34.6	34.6	34.6	35.0	.	.	.	3.9	Mean	
35.1	34.8	34.8	34.8	34.6	34.5	34.5	34.4	34.4	.	.	.	.	.	Mean*	
35.6	35.3	35.2	34.9	34.7	34.7	34.7	34.8	34.8	.	.	.	.	.	Mean**	

\* Five international quiet days.  
 \*\* Five international disturbed days.  
 † Loss of record; (day omitted for means).

TABLE 6

## Hourly Values of Declination (Westerly), 1954

(Averages for sixty minutes centred at the full hours of Greenwich Mean Time)

June

2° plus tabular quantities

Date	Hours G.M.T														
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1	34 3	34 3	34 0	34 0	34 3	35 2	35 7	37 3	37 0	36 4	35 4	34 6	34 6	34 6	34 9
2	34 1	33 8	33 5	33 5	33 8	35 1	36 4	37 0	37 3	36 5	35 9	34 9	34 6	34 8	35 2
3	34 1	33 3	33 0	33 0	33 0	34 1	34 9	35 7	35 9	34 8	34 1	33 5	33 3	33 8	34 1
4	33 2	32 7	32 7	33 0	33 6	34 3	34 9	35 7	35 6	34 8	34 3	33 8	33 8	34 1	34 4
5*	33 8	33 2	33 0	32 8	34 0	34 9	36 0	36 5	36 7	35 9	35 4	35 4	35 4	35 6	35 6
6	34 8	34 4	33 8	34 3	33 8	34 8	35 9	37 0	37 0	36 7	35 9	35 4	34 9	34 8	34 8
7	34 0	34 0	33 8	33 8	35 1	36 0	37 0	37 6	37 8	37 0	36 1	36 2	36 2	36 2	36 0
8*	34 6	34 4	34 3	34 4	35 1	36 4	37 5	38 0	37 8	37 3	36 5	36 0	36 0	36 0	36 0
9	35 4	34 6	34 3	34 1	34 3	35 2	36 0	36 7	36 8	36 5	36 5	36 5	36 4	36 2	36 4
10**	34 6	33 8	33 8	33 8	35 1	36 0	36 7	37 6	37 8	37 3	36 8	36 2	35 6	35 9	36 0
11*	34 8	34 3	34 3	34 3	33 8	34 9	35 6	36 0	36 4	35 7	35 2	34 8	34 4	34 4	34 6
12**	33 8	33 5	33 2	33 3	36 0	36 7	37 5	38 6	37 8	37 0	36 0	36 2	36 1	36 4	36 4
13**	34 8	34 6	34 6	34 6	35 7	36 7	37 3	38 1	37 8	37 5	36 7	36 4	36 0	36 2	36 2
14**	34 8	34 4	33 6	33 6	33 8	34 9	35 9	36 2	36 0	35 9	35 1	34 6	34 4	34 3	34 9
15	34 3	33 5	33 2	33 2	33 5	34 3	35 2	35 4	35 9	34 8	34 3	34 4	34 6	34 6	34 8
16*	34 4	34 3	34 4	35 4	36 5	37 2	37 8	38 9	38 4	37 2	36 7	36 2	35 9	36 0	36 2
17	34 9	34 4	34 4	35 1	36 0	37 0	37 5	38 6	38 9	38 0	36 7	36 0	36 0	36 0	36 2
18	34 8	34 4	34 6	35 4	36 4	37 3	37 6	37 5	37 3	36 7	36 0	35 1	34 8	35 4	36 0
19	34 2	33 8	33 2	33 8	34 6	36 0	37 0	37 6	36 5	35 7	35 9	36 2	35 6	35 4	36 2
20	34 5	33 7	33 5	33 5	34 8	35 7	36 9	37 7	37 6	37 0	36 2	35 0	35 5	36 3	36 2
21	34 8	34 3	34 1	34 9	36 0	37 2	37 7	37 1	37 2	37 2	36 5	35 6	35 6	35 9	36 0
22	34 3	34 3	34 3	35 4	34 4	34 6	35 4	36 2	36 2	36 2	36 1	36 1	36 2	36 2	36 0
23	34 4	34 0	33 6	33 8	34 6	36 0	37 5	38 0	37 8	37 5	37 0	37 0	37 0	36 8	36 7
24*	35 9	34 8	34 4	34 8	36 0	36 5	37 5	37 8	37 5	37 1	36 8	36 2	36 4	36 4	36 4
25	35 6	34 6	34 3	34 3	35 1	36 7	37 8	38 1	37 8	37 0	36 2	35 9	35 4	35 4	35 6
26	34 6	34 3	33 6	33 3	34 3	34 9	36 0	36 8	37 8	37 5	36 8	36 0	36 0	36 5	36 7
27	34 8	34 4	34 3	34 3	34 8	36 0	36 5	37 5	37 0	36 5	36 0	35 9	35 9	35 9	36 0
28**	35 9	34 9	34 6	34 1	34 6	35 7	36 2	36 5	36 4	36 5	36 2	35 9	35 4	35 4	35 9
29	35 9	34 8	34 6	34 8	35 6	36 4	37 0	37 3	36 8	36 7	36 4	36 0	35 7	35 7	36 0
30	35 4	34 4	34 4	34 6	35 4	36 4	37 3	37 8	37 8	37 6	37 0	36 2	36 0	36 2	36 4
Mean	34 7	34 1	33 9	34 1	34 8	35 8	36 6	37 2	37 1	36 6	36 0	35 6	35 5	35 6	35 8
Mean*	34 7	34 2	34 1	34 1	35 1	36 0	36 9	37 4	37 4	36 7	36 1	35 7	35 6	35 7	35 8
Mean**	34 8	34 2	34 0	33 9	35 0	36 0	36 7	37 3	37 2	36 8	36 2	35 9	35 6	35 6	35 9

\* Five international quiet days

\*\* Five international disturbed days.

† Loss of record, (day omitted for means).

TABLE 6

Hourly Values of Declination (Westerly), 1954

(Averages for sixty minutes centred at the full hours of Greenwich Mean Time.)

June

2° plus tabular quantities

Hours GMT										Mean	Maximum		Minimum		Range	Date
15	16	17	18	19	20	21	22	23			Time	Mag	Time	Mag		
											H	M	H	M		
31.9	34.6	31.4	34.4	31.4	34.3	31.3	31.3	31.3	31.8	07 00	37.3	03 00	33.8	3.5	1	
34.9	31.6	34.4	34.3	34.3	31.2	31.2	31.3	34.3	31.8	07 15	37.6	02 30	33.3	4.3	2	
34.0	33.8	33.8	33.6	33.5	33.5	33.5	33.5	33.5	33.9	07 30	36.2	03 00	32.2	4.0	3	
34.6	34.6	34.6	31.1	31.3	31.3	31.3	34.3	31.3	31.2	07 30	35.9	01 10	32.7	3.2	4	
35.7	35.6	35.2	31.8	31.6	31.1	31.1	31.6	34.8	34.9	07 15	36.8	02 30	32.7	4.1	5*	
34.8	34.6	34.4	34.3	31.1	31.0	33.8	31.0	31.0	34.8	08 00	37.3	02 20	33.5	3.8	6	
36.0	36.0	36.0	35.4	35.1	34.9	31.8	34.6	34.6	35.6	08 00	37.8	02 30	33.7	4.1	7	
36.0	36.0	35.9	35.9	35.7	35.4	35.1	35.4	35.4	35.9	07 50	38.0	02 00	34.1	3.9	8*	
36.2	36.0	36.0	35.7	35.4	35.1	35.1	34.9	34.9	35.6	07 30	37.0	03 00	33.8	3.2	9	
36.0	35.9	35.4	35.4	35.4	35.1	35.1	34.9	34.9	35.6	08 30	37.8	02 00	33.8	1.0	10**	
34.6	34.6	34.4	34.4	34.4	31.3	31.3	31.3	34.1	34.7	07 45	36.7	03 00	33.2	3.5	11*	
36.2	35.9	35.7	35.4	34.9	31.8	34.8	31.8	31.9	35.7	07 00	38.9	02 00	33.0	5.9	12**	
36.4	36.4	35.9	35.7	35.2	31.6	31.6	34.6	34.8	35.9	06 45	38.4	02 00	34.6	3.8	13**	
35.4	35.4	34.9	31.6	34.6	34.6	34.6	34.6	31.1	34.8	07 00	36.2	03 00	33.0	3.2	14**	
34.8	34.8	34.8	34.6	34.6	31.8	31.8	31.8	31.6	31.5	07 30	36.0	03 00	33.0	3.0	15	
36.2	36.2	36.0	36.0	35.9	35.7	35.4	35.2	35.2	36.1	07 00	39.1	01 00	33.5	5.6	16*	
36.2	36.0	36.0	35.9	35.4	35.4	35.2	31.8	31.6	36.0	07 15	39.1	01 15	31.0	5.1	17	
36.0	35.9	35.9	36.0	31.9	31.6	31.7	31.2	34.6	35.7	06 30	37.8	22 30	31.1	3.7	18	
36.2	36.2	35.5	35.6	35.6	35.1	31.8	35.0	31.9	35.1	06 50	37.7	03 12	33.0	4.7	19	
36.4	36.2	36.0	36.0	35.1	34.8	31.9	31.6	35.1	35.5	07 06	38.0	02 00	33.3	4.7	20	
36.0	35.9	35.9	35.4	35.1	34.9	31.6	31.6	31.4	35.7	06 10	37.8	01 40	34.0	3.8	21	
36.0	35.8	35.2	35.2	34.9	31.8	34.9	35.1	34.8	35.4	07 45	36.5	02 30	33.8	2.7	22	
36.5	36.4	36.2	36.0	35.9	35.4	35.2	35.4	35.7	36.0	07 15	38.0	02 30	33.6	4.2	23	
36.4	36.4	36.2	36.0	36.0	35.9	35.9	35.9	35.9	36.2	07 00	38.0	02 00	34.3	3.7	24*	
35.7	35.7	35.7	35.4	35.1	34.9	31.8	31.8	31.8	35.7	07 30	38.1	03 00	34.0	4.0	25	
36.5	36.4	36.2	36.0	35.7	35.1	35.2	35.1	34.9	35.7	08 30	37.8	03 00	33.3	4.5	26	
36.2	36.2	36.0	36.0	35.9	35.9	35.9	35.9	35.9	35.8	07 00	37.5	02 30	34.0	3.5	27	
35.9	35.4	35.6	35.4	35.9	35.9	35.9	35.9	35.9	35.7	08 00	36.7	02 15	34.3	2.4	28**	
36.0	36.0	35.9	35.4	35.4	35.4	35.4	35.4	35.4	35.8	07 15	37.3	01 30	33.8	3.5	29	
36.2	36.2	36.0	35.9	35.7	35.4	35.1	34.8	35.4	36.0	07 15	37.8	02 30	34.3	3.5	30	
35.8	35.6	35.5	35.3	35.1	31.9	34.9	34.8	31.8	35.4					3.9	Mean	
35.8	35.8	35.5	35.1	35.3	35.1	35.1	35.1	35.1							Mean*	
36.0	35.8	35.5	35.3	35.2	35.1	35.0	35.0	35.0							Mean**	

\* Five international quiet days  
 \*\* Five international disturbed days.  
 † Loss of record; (day omitted for means)

TABLE 7

## Hourly Values of Horizontal Force, 1954

(Averages for sixty minutes centred at the full hours of Greenwich Mean Time)

January

39,000  $\gamma$  plus tabular quantities

Date	Hours GMT														
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1	449	454	468	484	504	520	521	516	499	467	441	439	447	456	456
2**	474	476	484	507	512	502	505	498	500	489	468	454	444	449	433
3	440	444	461	478	489	497	503	511	499	477	462	451	449	450	449
4*	440	443	452	469	484	495	495	476	462	453	461	455	460	458	456
5	461	465	470	480	513	529	531	521	505	477	460	456	458	462	462
6	456	456	459	479	504	513	513	498	472	461	444	444	448	417	452
7	450	451	463	486	505	516	524	512	496	479	463	452	454	460	462
8	452	457	465	488	505	524	528	515	485	441	423	432	444	452	456
9	465	467	477	493	512	538	555	539	510	484	456	450	452	450	419
10*	463	460	466	480	493	512	528	530	520	490	468	454	456	466	466
11	458	460	472	486	508	524	524	512	506	478	468	467	466	464	461
12	460	462	468	492	517	534	556	556	538	522	490	476	472	465	460
13	446	446	454	458	474	486	482	476	471	466	463	456	468	466	462
14	470	473	482	488	492	493	500	506	515	501	496	485	480	476	472
15	458	460	463	470	472	473	474	476	480	484	480	473	466	460	460
16	463	464	472	486	500	502	506	500	492	476	471	478	472	460	466
17	464	468	480	494	492	494	490	485	482	480	476	464	458	458	
18	460	462	468	490	496	494	493	484	479	481	484	477	476	464	418
19**	458	456	468	476	480	490	482	484	464	440	434	432	440	416	450
20**	432	432	444	479	489	494	498	484	473	438	431	434	444	444	444
21**	452	442	454	468	486	496	500	498	478	463	454	450	417	441	411
22	455	456	472	496	520	535	536	498	463	429	424	438	455	456	419
23**	458	458	463	470	492	514	532	536	516	494	479	456	450	447	447
24	458	463	470	482	500	510	552	536	512	485	472	463	458	454	456
25	466	466	463	470	484	504	520	521	522	506	492	479	472	469	471
26*	466	462	454	464	480	495	520	552	552	524	492	472	466	461	464
27	463	472	474	472	480	498	511	516	520	504	494	480	469	460	456
28†	464	466	472	492	516	528	540	518	542	520	485	476	474	472	472
29*	471	472	480	496	503	514	517	516	511	496	490	484	480	473	473
30	472	473	480	487	500	519	524	525	518	508	494	479	472	469	468
31	468	470	482	496	504	512	512	503	492	476	466	463	461	463	462
Mean	458	460	468	482	497	509	515	511	499	480	467	461	460	459	458
Mean*	461	461	465	480	495	509	520	524	517	497	480	468	467	467	466
Mean**	455	453	463	480	492	499	503	500	486	465	454	445	445	446	444

\* Five international quiet days

\*\* Five international disturbed days.

† Loss of record, (day omitted for means).

TABLE 7

## Hourly Values of Horizontal Force, 1954

(Averages for sixty minutes centred at the full hours of Greenwich Mean Time)

January

39,000  $\gamma$  plus tabular quantities

Hours G.M T									Mean	Maximum		Minimum		Range	Date
15	16	17	18	19	20	21	22	23		Time	Mag	Time	Mag		
$\gamma$	$\gamma$	$\gamma$	$\gamma$	$\gamma$	$\gamma$	$\gamma$	$\gamma$	$\gamma$	$\gamma$	H M	$\gamma$	H. M	$\gamma$	$\gamma$	
456	459	456	459	463	464	467	468	464	470	05 14	524	10 26	434	90	1
418	428	433	423	425	431	433	436	433	461	06 10	516	14 34	414	102	2**
448	445	447	447	446	447	448	446	440	461	07 14	513	22 50	438	75	3
459	459	457	464	460	461	461	460	460	463	05 40	500	00 22	439	61	4*
458	460	459	456	447	442	466	478	455	474	05 52	532	20 10	437	95	5
449	456	450	449	419	450	453	451	453	463	04 40	519	10 32	440	79	6
452	436	436	432	437	451	454	451	451	466	05 31	531	17 52	428	103	7
456	456	454	453	458	459	456	457	456	465	06 02	533	10 08	420	113	8
448	451	454	456	456	461	461	463	464	476	05 56	557	14 52	444	113	9
462	458	456	460	459	468	472	468	462	476	06 26	534	12 10	452	82	10†
463	458	458	460	462	456	456	468	461	475	05 46	538	21 02	450	88	11
445	440	438	434	431	429	440	448	452	476	06 26	565	19 40	426	139	12
456	454	456	458	462	463	460	468	469	463	05 26	496	00 27	444	52	13
468	470	470	473	474	469	467	464	460	481	07 50	522	23 20	453	69	14
458	456	456	454	456	452	456	454	452	464	07 40	490	23 02	446	44	15
466	469	464	464	463	455	456	456	460	473	06 06	509	20 20	452	57	16
458	468	460	463	452	454	462	460	462	471	05 30	498	18 50	448	50	17
453	454	464	471	472	473	461	458	469	472	05 26	504	13 50	442	62	18
448	442	426	424	424	428	429	432	424	419	05 10	498	21 58	418	80	19**
436	438	431	440	456	451	450	448	448	453	05 26	506	17 22	426	80	20**
448	451	452	462	456	452	450	450	450	460	05 58	508	12 52	439	69	21**
448	448	456	454	452	463	456	455	454	465	05 56	548	09 30	416	132	22
446	448	448	450	451	453	457	457	456	470	06 30	538	15 03	440	98	23**
458	454	456	458	462	464	462	463	464	477	05 40	554	13 46	448	106	24
466	460	466	463	460	463	463	462	466	478	06 30	530	16 30	450	80	25
462	462	460	454	454	454	456	461	463	477	07 26	558	18 26	450	108	26*
453	444	446	452	460	464	466	461	464	474	07 38	524	16 20	438	86	27
468	472	476	476	471	474	470	470	474	488	06 46	550	00 10	462	88	28*
472	470	474	468	470	470	468	476	476	484	06 40	520	18 10	463	57	29*
468	481	476	472	466	466	465	468	470	484	06 58	528	20 46	458	70	30
464	470	460	460	458	460	457	468	470	475	06 02	516	20 50	453	63	31
455	455	455	455	455	456	458	459	458	470					84	Mean
465	464	465	464	463	465	465	467	467							Mean*
439	442	438	440	442	444	444	445	442							Mean**

\* Five international quiet days

\*\* Five international disturbed days

† Loss of record, (day omitted for means)

TABLE 8

## Hourly Values of Horizontal Force, 1954

(Averages for sixty minutes centred at the full hours of Greenwich Mean Time)

February

39,000  $\gamma$  plus tabular quantities

Date	Hours G.M.T														
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14
	$\gamma$	$\gamma$	$\gamma$	$\gamma$	$\gamma$	$\gamma$	$\gamma$	$\gamma$	$\gamma$	$\gamma$	$\gamma$	$\gamma$	$\gamma$	$\gamma$	$\gamma$
1	465	464	461	472	485	501	500	491	161	413	435	440	448	440	422
2	455	457	456	457	469	488	498	495	484	163	452	448	455	456	442
3	463	456	450	455	474	498	515	532	506	164	445	418	441	442	460
4	462	460	467	470	496	521	518	502	477	462	461	467	463	457	454
5*	452	455	462	477	504	520	527	510	494	468	456	456	463	463	455
6*	460	460	470	486	504	526	529	516	495	478	471	470	470	472	473
7*	468	469	471	494	512	532	560	541	529	518	503	496	491	488	488
8*	468	468	468	476	498	534	556	556	539	516	495	480	473	463	464
9	473	474	476	490	510	526	535	531	528	517	511	503	488	477	467
10	468	464	464	462	468	488	492	492	500	500	496	487	468	456	467
11	467	460	465	468	487	485	496	503	508	503	496	495	492	489	488
12*	467	468	476	485	504	505	501	484	468	459	457	463	473	472	470
13	476	476	485	495	510	520	521	516	512	500	492	488	479	476	474
14	481	485	497	505	512	521	521	514	505	496	489	480	481	473	463
15**	467	468	477	494	512	514	504	497	492	482	489	468	416	443	438
16	448	455	459	465	469	477	489	489	481	478	476	475	471	463	456
17	477	472	466	465	477	484	499	498	489	170	467	463	460	458	456
18	458	467	479	492	506	525	517	505	489	464	458	148	453	456	458
19	493	497	502	509	523	530	524	493	476	468	462	462	465	449	450
20	471	471	480	491	506	523	518	509	491	476	472	180	481	482	476
21	470	470	472	487	515	536	545	535	521	501	481	482	490	488	487
22**	438	440	441	461	509	509	505	494	483	469	453	442	437	429	441
23**	463	461	457	462	497	497	509	503	495	477	482	468	462	456	449
24	463	461	464	473	492	513	524	517	491	477	472	454	441	432	416
25	468	463	469	478	502	510	521	522	508	486	469	460	461	461	455
26**	459	461	465	469	482	501	517	501	499	491	465	397	411	437	445
27**	450	448	445	448	481	498	507	499	497	170	452	445	437	436	413
28	455	448	449	459	487	510	528	533	521	500	481	469	464	461	449
Mean	464	464	468	477	496	511	517	510	498	482	473	465	462	460	458
Mean*	463	464	469	484	504	523	535	521	505	488	476	473	474	472	470
Mean**	455	456	457	467	496	504	508	499	493	478	468	444	433	440	443

\* Five international quiet days

\*\* Five international disturbed days

† Loss of record; (day omitted for means).

TABLE 8

## Hourly Values of Horizontal Force, 1954

(Averages for sixty minutes centred at the full hours of Greenwich Mean Time)

February

39,000  $\gamma$  plus tabular quantities

Hours G.M.T.									Mean	Maximum		Minimum		Range	Date
15	16	17	18	19	20	21	22	23		Time	Mag	Time	Mag		
$\gamma$	$\gamma$	$\gamma$	$\gamma$	$\gamma$	$\gamma$	$\gamma$	$\gamma$	$\gamma$	$\gamma$	H M	$\gamma$	H M	$\gamma$	$\gamma$	
416	415	413	409	421	436	460	454	454	451	05 30	515	17 31	404	111	1
449	441	445	449	455	456	453	455	459	460	05 42	500	14 10	435	65	2
433	440	444	449	418	451	455	452	460	462	06 50	547	15 16	426	121	3
455	455	457	456	455	453	451	452	452	468	05 46	524	16 10	450	74	4
457	464	461	465	458	452	454	463	462	471	05 32	530	19 42	450	80	5*
470	468	468	469	468	469	469	471	470	479	05 31	531	00 18	457	74	6*
487	484	483	473	467	468	476	476	472	494	06 52	568	18 40	460	108	7*
465	466	468	465	460	471	473	461	472	486	06 31	560	13 14	457	103	8*
462	461	456	449	457	460	460	461	468	485	06 02	542	17 42	446	96	9
461	456	452	447	452	461	462	461	461	470	08 22	503	17 58	444	59	10
487	484	481	460	452	451	472	480	462	480	07 50	510	19 54	444	66	11
472	474	478	479	479	478	479	478	477	477	05 42	511	09 50	453	58	12*
475	474	476	477	475	476	480	480	480	488	06 10	521	14 09	469	55	13
449	434	444	461	457	456	460	457	457	479	05 02	522	16 26	430	92	14
427	429	430	413	436	416	439	415	417	463	01 38	532	12 02	402	130	15**
453	432	431	434	446	461	456	456	457	462	05 58	499	15 42	421	78	16
452	440	436	435	437	442	446	450	453	462	05 52	501	17 40	432	72	17
461	466	474	478	483	481	480	484	488	478	04 50	528	11 08	444	84	18
454	465	462	465	469	474	477	472	471	480	05 18	537	12 27	442	95	19
472	471	472	470	469	472	474	473	472	482	05 09	528	19 08	464	64	20
456	424	415	410	429	425	423	430	433	472	06 18	517	18 14	401	146	21
439	445	448	453	451	468	465	456	461	460	05 18	519	12 58	422	97	22**
441	442	440	438	442	442	452	461	468	465	06 38	513	15 50	429	84	23**
445	445	451	461	458	453	461	462	466	468	06 22	529	13 26	427	102	24
461	451	445	440	454	451	450	453	455	471	06 34	528	17 42	435	93	25
438	421	413	433	445	465	455	443	451	457	06 26	526	11 26	381	145	26**
441	457	438	410	435	441	448	419	417	456	05 46	509	14 58	429	80	27*†
448	453	457	451	456	460	465	463	466	472	06 42	540	14 38	442	98	28
455	452	451	452	454	458	461	461	462	471	.	.	.	.	90	Mean
470	471	472	470	466	468	470	470	470	.	.	.	.	.	.	Mean*
437	439	434	441	442	452	452	451	455	.	.	.	.	.	.	Mean**

\* Five international quiet days.

\*\* Five international disturbed days.

† Loss of record; (day omitted for means).

TABLE 9

## Hourly Values of Horizontal Force, 1954

(Averages for sixty minutes centred at the full hours of Greenwich Mean Time)

March

39,000  $\gamma$  plus tabular quantities

Date	Hours G.M.T.														
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14
	$\gamma$	$\gamma$	$\gamma$	$\gamma$	$\gamma$	$\gamma$	$\gamma$	$\gamma$	$\gamma$	$\gamma$	$\gamma$	$\gamma$	$\gamma$	$\gamma$	$\gamma$
1*	465	465	468	473	490	507	518	521	519	503	485	477	475	474	471
2	469	470	484	505	520	536	544	533	521	500	482	468	466	464	465
3*	478	474	478	485	497	504	505	508	506	508	501	492	477	475	469
4	477	478	485	495	514	525	526	522	509	484	468	456	445	455	458
5	465	457	465	481	501	524	525	519	516	509	494	480	467	454	452
6	467	465	475	483	505	529	533	531	517	504	490	481	479	475	472
7	471	473	481	485	509	513	509	502	506	503	482	470	464	449	443
8	464	463	470	486	504	517	523	511	497	486	477	473	477	477	479
9	475	475	484	501	523	539	536	523	511	489	471	463	466	466	463
10	464	467	475	497	509	521	525	523	509	498	489	481	473	463	457
11	473	477	485	496	501	502	509	498	483	481	483	473	459	447	439
12	473	475	476	495	511	519	511	497	481	476	478	486	481	460	466
13	465	466	472	487	499	506	506	494	479	497	503	501	489	473	464
14**	476	470	477	485	503	511	519	475	437	439	439	415	455	455	463
15**	451	457	479	498	517	537	547	515	483	473	457	459	457	451	455
16	476	480	484	495	521	515	515	509	477	455	443	455	459	451	449
17	457	457	477	501	519	521	507	487	461	457	463	477	479	471	471
18	455	457	461	481	501	495	491	470	447	427	425	443	457	457	456
19	455	461	481	507	535	563	565	525	487	161	455	463	479	473	457
20**	463	457	467	497	519	543	540	531	511	471	457	450	461	475	475
21	467	465	463	479	511	539	559	559	527	491	457	454	469	475	470
22	462	461	477	503	539	555	555	542	517	485	465	461	455	473	471
23**	451	455	479	507	523	541	527	479	447	421	435	435	425	429	449
24**	474	473	471	488	511	531	533	495	457	427	415	439	453	459	457
25	459	453	463	481	503	521	523	525	501	477	463	461	463	459	455
26	465	469	477	497	539	571	573	563	527	487	449	443	445	467	467
27*	463	461	469	499	541	561	571	549	515	479	451	445	455	465	465
28*	467	463	479	499	537	553	552	529	513	495	485	471	467	469	469
29*	475	481	491	501	517	523	513	501	481	477	481	485	486	477	469
30	475	471	487	521	547	551	535	517	497	483	479	487	485	459	425
31	467	461	479	511	537	545	527	487	453	447	453	469	469	469	465
Mean	467	466	476	494	516	530	530	515	493	477	467	466	466	463	461
Mean*	470	469	477	491	516	530	532	522	507	492	481	474	472	472	469
Mean**	463	462	475	495	515	533	533	499	467	446	441	446	450	454	460

\* Five international quiet days

\*\* Five international disturbed days

† Loss of record, (day omitted for means).



TABLE 9

## Hourly Values of Horizontal Force, 1954

(Averages for sixty minutes centred at the full hours of Greenwich Mean Time)

March

39,000  $\gamma$  plus tabular quantities

Hours G M T									Mean	Maximum		Minimum		Range	Date
15	16	17	18	19	20	21	22	23		Time	Mag	Time	Mag		
$\gamma$	$\gamma$	$\gamma$	$\gamma$	$\gamma$	$\gamma$	$\gamma$	$\gamma$	$\gamma$	$\gamma$	H. M	$\gamma$	H M	$\gamma$	$\gamma$	
468	467	464	465	468	474	468	475	475	481	06 54	525	16 58	461	64	1 <sup>†</sup>
464	463	463	467	477	474	471	471	477	486	06 14	547	16 15	461	86	2
466	461	461	460	462	461	466	475	475	481	08 54	509	16 56	456	53	3*
463	464	465	468	473	476	474	470	469	480	05 54	529	12 10	444	85	4
448	449	460	464	463	461	462	461	468	477	05 42	530	15 18	445	85	5
473	475	466	467	468	469	472	471	468	485	06 20	539	20 38	464	75	6
453	458	454	464	461	465	473	468	464	476	05 10	523	14 22	440	83	7
477	478	478	479	471	471	465	460	469	481	05 46	527	22 10	457	70	8
465	469	462	480	461	456	459	460	463	482	05 22	517	20 16	454	93	9
468	467	464	468	469	471	467	471	474	482	05 22	529	14 24	455	74	10
443	445	453	457	469	465	467	485	180	474	05 46	515	13 50	435	80	11
468	464	460	461	461	461	469	467	469	478	05 02	521	13 10	456	65	12
445	443	451	451	472	477	464	461	462	476	05 58	507	16 02	429	78	13
457	433	423	437	447	456	455	455	453	461	05 46	531	17 10	419	112	14**
445	451	451	455	463	471	473	475	475	475	05 54	555	15 12	442	113	15**
453	453	459	455	455	471	457	455	455	471	04 14	523	10 22	441	82	16
465	453	433	443	451	469	467	463	458	471	04 26	531	17 14	429	102	17
449	446	453	447	459	471	457	459	459	459	04 14	505	09 15	420	85	18
458	445	441	445	445	453	453	459	465	477	05 40	571	17 10	438	133	19
469	465	475	471	479	471	463	461	459	480	05 26	553	11 06	447	106	20**
473	471	471	475	467	479	475	465	465	484	06 34	567	10 58	452	115	21
467	469	469	465	463	489	489	453	451	485	06 22	557	22 10	447	110	22
431	411	451	459	451	495	465	457	462	463	05 10	515	09 02	413	192	23**
457	455	453	479	473	457	459	463	465	469	06 22	543	09 52	407	136	24**
451	458	458	457	463	479	465	463	465	474	06 34	535	15 18	449	86	25
463	467	471	461	461	473	475	469	467	485	05 31	591	11 42	437	154	26
465	465	463	465	469	473	470	469	467	483	06 10	577	10 50	439	138	27*
469	469	471	471	475	479	483	485	483	483	05 20	559	01 10	461	98	28*
465	461	463	465	471	471	469	471	471	482	05 22	529	16 20	459	70	29*
431	451	459	459	457	449	445	443	469	478	04 36	555	14 02	423	132	30
459	457	459	461	459	459	479	475	471	476	05 10	547	08 34	443	104	31
459	458	459	462	464	470	467	466	467	477	..	.	.	.	97	Mean
467	465	464	465	469	472	471	475	474	.	.	.	.	.	.	Mean*
452	449	451	460	463	470	463	462	463	.	.	.	.	.	..	Mean**

\* Five international quiet days.

\*\* Five international disturbed days

† Loss of record, (day omitted for means).

TABLE 10

## Hourly Values of Horizontal Force, 1954

(Averages for sixty minutes centred at the full hours of Greenwich Mean Time)

April

39,000  $\gamma$  plus tabular quantities

Date	Hours G.M.T.														
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14
	$\gamma$	$\gamma$	$\gamma$	$\gamma$	$\gamma$	$\gamma$	$\gamma$	$\gamma$	$\gamma$	$\gamma$	$\gamma$	$\gamma$	$\gamma$	$\gamma$	$\gamma$
1*	466	476	494	526	552	560	540	510	464	442	442	460	478	482	476
2	466	468	488	526	560	574	570	544	506	478	458	458	470	460	478
3	454	450	468	506	540	560	514	508	470	430	426	428	452	454	454
4	466	464	486	510	540	552	544	518	492	474	460	458	464	466	464
5	470	470	478	510	534	552	541	524	484	460	450	444	460	461	462
6	474	478	490	510	534	550	546	536	516	504	486	480	478	476	474
7*	471	476	490	511	544	566	576	562	540	512	496	484	476	474	474
8	476	477	490	514	534	546	537	518	494	488	484	482	476	468	470
9	464	458	466	490	510	538	536	518	494	466	460	469	480	480	460
10	468	468	474	484	506	530	538	538	530	512	498	482	468	469	482
11**	465	468	483	509	533	547	553	535	517	497	485	481	481	477	475
12**	460	431	391	377	401	425	461	463	457	457	433	409	379	398	413
13	432	428	430	446	466	484	494	492	478	462	452	448	448	444	446
14	446	448	464	488	496	492	490	482	476	466	466	462	452	450	456
15**	451	451	465	487	503	515	505	491	471	463	457	461	455	449	443
16	453	451	465	491	519	529	527	513	487	469	459	463	469	467	463
17	454	452	458	486	514	530	530	520	502	482	464	460	462	462	462
18	460	456	464	488	504	538	536	530	510	486	472	453	458	462	458
19	458	457	465	489	517	543	541	535	513	489	475	466	469	469	461
20**	461	471	483	489	505	526	543	535	493	459	444	445	453	453	449
21	444	450	460	484	505	522	518	512	486	466	460	460	442	438	444
22	454	454	454	476	506	520	527	534	522	506	484	462	454	460	468
23**	461	462	474	505	540	562	564	548	500	466	455	450	446	454	450
24	452	454	466	484	505	518	516	508	500	478	450	452	452	452	456
25*	462	458	462	489	508	522	516	505	490	474	460	462	464	460	466
26	470	465	466	481	502	508	508	510	494	484	473	466	460	458	456
27	444	440	436	444	482	488	500	488	466	446	434	430	434	433	436
28*	452	452	470	496	522	534	540	520	500	476	460	452	450	454	456
29*	466	470	482	490	514	520	530	530	510	500	484	472	468	465	464
30	468	470	484	505	522	518	516	502	478	472	462	442	436	443	440
Mean	460	459	468	490	514	529	530	518	495	475	463	458	458	458	458
Mean*	463	466	482	502	528	540	540	525	501	481	468	466	467	467	467
Mean**	460	457	459	473	496	515	525	514	488	468	455	449	443	446	446

\* Five international quiet days.

\*\* Five international disturbed days.

† Loss of record, (day omitted for means).

TABLE 10

## Hourly Values of Horizontal Force, 1954

(Averages for sixty minutes centered at the full hours of Greenwich Mean Time)

April

39,000  $\gamma$  plus tabular quantities

Hours G M T.									Mean	Maximum		Minimum		Range	Date			
15	16	17	18	19	20	21	22	23		Time	Mag	Time	Mag					
$\gamma$	$\gamma$	$\gamma$	$\gamma$	$\gamma$	$\gamma$	$\gamma$	$\gamma$	$\gamma$	$\gamma$	H	M	$\gamma$	H	M	$\gamma$			
472	464	468	472	172	170	464	176	471	483	01	16	570	09	34	438	132	1*	
437	450	462	466	466	462	462	458	452	483	05	46	578	14	38	430	148	2	
452	456	458	460	452	448	444	440	436	483	09	10	561	10	22	420	144	3	
464	461	468	466	468	468	469	471	473	482	05	26	551	10	11	451	100	4	
464	466	468	470	470	470	472	471	474	481	05	18	558	10	54	412	116	5	
476	476	472	471	471	471	478	476	472	492	01	38	551	23	22	470	84	6	
470	466	462	460	468	469	471	471	471	491	05	50	582	17	58	454	128	7*	
472	478	478	478	468	481	471	466	458	488	05	01	548	23	11	455	93	8	
444	442	448	468	466	461	466	466	469	476	05	38	542	15	12	439	103	9	
480	478	464	451	460	462	461	461	465	485	01	42	544	16	50	450	91	10	
473	462	465	455	449	447	439	447	437	483	04	50	561	23	02	433	128	11**	
427	428	429	427	430	433	441	441	440	427	06	06	473	12	22	373	100	12**	
448	442	432	429	438	441	444	456	448	451	06	16	501	01	22	424	80	13	
456	448	450	452	456	460	460	461	460	464	01	26	504	16	31	444	60	14	
439	437	417	419	413	442	451	455	455	462	05	22	531	13	31	435	96	15**	
459	455	455	457	449	461	457	455	455	472	05	50	543	19	10	444	99	16	
456	458	460	460	452	452	459	460	456	473	05	21	538	19	26	446	92	17	
454	454	467	464	456	468	461	464	458	476	04	54	516	19	14	450	96	18	
458	449	443	445	463	461	461	467	465	477	04	56	557	17	11	437	120	19	
456	455	453	465	457	445	445	449	451	470	06	50	549	20	20	437	112	20**	
419	448	458	460	456	456	456	456	451	466	05	10	528	12	10	432	96	21	
468	468	464	464	461	466	468	466	468	478	07	02	538	12	26	450	88	22	
450	450	450	440	438	440	466	460	451	474	05	58	576	18	10	434	142	23**	
460	454	450	451	464	466	457	456	458	469	05	10	536	10	26	448	88	24	
464	460	460	460	458	462	462	464	468	473	05	10	527	19	30	454	73	25*	
456	448	454	458	459	465	458	456	452	471	06	56	514	15	46	441	70	26	
442	449	450	447	448	460	456	452	448	452	05	50	508	10	30	425	83	27	
460	460	460	466	471	476	476	471	468	477	05	56	548	11	34	448	100	28*	
466	468	467	468	466	462	470	472	470	472	18 <sup>†</sup>	06	34	536	20	20	460	76	29*
446	448	448	452	456	458	460	457	454	468	01	50	528	11	31	432	96	30	
457	456	457	458	458	460	461	462	460	473						101	Mean		
466	464	463	465	468	468	469	471	471							..	Mean*		
449	446	449	447	443	441	448	450	447								Mean**		

\* Five international quiet days

\*\* Five international disturbed days.

† Loss of record, (day omitted for means).

TABLE II

## Hourly Values of Horizontal Force, 1954

(Averages for sixty minutes centred at the full hours of Greenwich Mean Time)

May

39,000  $\gamma$  plus tabular quantities

Date	Hours G.M.T														
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14
	$\gamma$	$\gamma$	$\gamma$	$\gamma$	$\gamma$	$\gamma$	$\gamma$	$\gamma$	$\gamma$	$\gamma$	$\gamma$	$\gamma$	$\gamma$	$\gamma$	$\gamma$
1*	456	462	480	500	514	509	498	486	470	452	452	462	472	470	468
2	464	474	492	520	542	540	531	514	494	475	454	454	462	468	468
3	462	462	476	497	510	526	526	516	499	494	460	466	475	474	474
4**	478	484	498	524	538	550	548	541	529	505	482	462	462	466	468
5	456	458	466	484	498	510	526	516	514	488	470	457	450	457	460
6	464	464	478	496	504	520	526	530	524	498	470	457	460	466	465
7*	474	470	486	506	534	518	548	542	529	508	486	470	472	478	476
8	474	474	482	497	502	508	518	510	496	486	482	481	478	476	471
9**	454	450	456	480	505	498	502	473	456	448	438	438	418	450	450
10	452	460	472	490	500	504	495	481	482	473	170	468	466	460	464
11**	460	458	460	480	492	506	505	512	520	514	500	476	452	438	442
12	456	454	454	480	506	536	548	540	520	496	466	454	452	452	462
13	462	468	476	486	504	510	508	505	492	468	456	458	460	456	452
14	461	470	482	498	508	514	506	484	470	456	442	444	454	460	457
15	466	474	492	514	534	534	526	508	498	483	470	478	483	478	478
16	456	462	470	486	503	514	516	510	494	474	458	457	462	466	466
17*	478	480	489	506	532	550	549	542	528	512	494	481	478	472	472
18**	490	498	506	500	510	512	510	510	510	498	482	452	438	438	444
19	462	457	462	468	482	488	492	486	482	472	474	476	473	466	466
20	478	482	480	488	502	516	512	506	488	476	466	466	466	462	463
21**	456	458	471	482	498	514	518	518	506	486	458	442	446	454	452
22	454	457	462	473	485	498	506	503	498	486	470	457	456	458	454
23	466	460	472	488	519	560	562	534	504	464	440	436	446	452	452
24	466	467	467	488	512	542	550	548	530	500	474	460	452	458	461
25*	468	476	480	497	512	521	528	524	510	500	483	478	476	476	470
26	470	470	475	488	504	522	542	541	540	522	500	488	477	473	468
27	462	463	467	484	500	510	522	530	516	502	484	462	460	462	466
28	467	467	469	489	501	512	516	506	492	479	470	473	475	472	462
29	476	473	474	480	488	498	502	500	484	490	490	484	470	464	460
30*	468	468	470	480	486	492	487	490	489	484	472	482	464	465	464
31	470	474	478	490	505	521	534	538	524	504	494	487	479	470	470
Mean	465	468	476	492	507	519	521	515	503	487	471	465	463	463	463
Mean*	469	471	481	498	516	524	522	517	505	491	477	475	472	472	470
Mean**	468	470	478	493	509	516	517	511	504	490	472	454	449	449	451

\* Five international quiet days.

\*\* Five international disturbed days

† Loss of record, (day omitted for means)

TABLE 11

## Hourly Values of Horizontal Force, 1954

(Averages for sixty minutes centred at the full hours of Greenwich Mean Time)

May

39,000  $\gamma$  plus tabular quantities

Hours G.M.T									Mean	Maximum		Minimum		Range	Date		
15	16	17	18	19	20	21	22	23		Time	Mag	Time	Mag				
$\gamma$	$\gamma$	$\gamma$	$\gamma$	$\gamma$	$\gamma$	$\gamma$	$\gamma$	$\gamma$	$\gamma$	H	M	$\gamma$	H	M	$\gamma$	$\gamma$	
468	468	468	468	468	468	468	468	466	473	04	58	516	09	40	448	68	1*
468	468	468	468	470	470	470	470	466	482	01	10	550	10	26	448	102	2
470	468	465	470	466	468	470	478	180	481	05	31	530	10	26	458	72	3
468	462	463	450	452	451	454	462	462	486	01	58	560	18	02	447	113	4**
458	460	456	460	460	462	464	464	466	473	06	02	536	11	38	441	92	5
466	467	466	468	470	471	471	470	471	481	06	50	536	11	10	454	82	6
480	480	482	486	484	480	478	478	476	494	05	46	551	11	18	465	89	7*
465	454	452	466	462	463	476	456	454	479	06	22	524	22	22	444	80	8
452	450	454	458	455	454	458	459	458	460	01	18	520	10	10	432	88	9**
468	462	466	472	470	466	461	458	457	472	05	20	508	00	26	450	58	10
448	450	452	452	462	464	461	462	458	472	07	50	532	13	06	430	102	11**
458	460	460	470	465	466	468	472	466	478	06	10	550	13	08	446	104	12
457	458	462	462	458	451	452	458	460	470	05	02	516	20	54	448	68	13
457	454	456	458	460	462	468	466	466	469	01	40	521	10	10	436	88	14
462	454	456	460	462	466	466	462	458	482	05	10	540	16	26	448	92	15
466	464	463	466	478	478	478	479	478	477	05	24	522	10	46	452	70	16
473	474	470	472	474	476	478	484	492	494	05	26	556	17	26	464	92	17*
452	452	455	454	460	463	464	466	466	476	07	30	516	13	10	432	81	18**
464	462	460	462	460	462	476	476	482	471	05	50	496	01	05	452	44	19
462	461	466	467	468	465	468	470	462	477	05	14	528	20	34	458	70	20
448	450	452	450	457	451	454	454	455	468	07	02	528	11	14	432	96	21**
455	458	462	464	462	462	466	467	467	470	06	10	512	15	02	452	60	22
456	460	460	460	462	464	466	464	466	476	05	26	572	10	50	433	139	23
462	461	465	462	465	460	460	463	463	481	06	10	552	12	10	448	104	24
472	474	476	472	471	478	470	470	476	486	06	20	532	00	20	464	68	25*
462	466	461	460	465	466	471	470	468	486	06	10	514	18	05	458	86	26
468	466	468	467	468	466	466	466	466	479	06	51	532	11	50	458	74	27
462	462	464	464	464	464	468	473	471	477	05	40	520	18	50	460	60	28
456	456	462	461	458	454	458	462	466	474	06	10	516	15	02	418	68	29
466	466	466	468	467	464	468	470	470	471	05	10	496	11	10	460	36	30*
464	462	467	470	473	474	468	468	468	485	06	50	541	16	10	460	84	31
462	462	463	464	465	465	467	467	467	477						82	Mean	
472	472	472	473	473	473	472	474	476								Mean*	
454	453	455	453	457	458	458	461	460								Mean**	

\* Five international quiet days.

\*\* Five international disturbed days.

† Loss of record; (day omitted for means).

TABLE 12

## Hourly Values of Horizontal Force, 1954

(Averages for sixty minutes centred at the full hours of Greenwich Mean Time)

June

39,000  $\gamma$  plus tabular quantities

Date	Hours G M T														
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14
	$\gamma$	$\gamma$	$\gamma$	$\gamma$	$\gamma$	$\gamma$	$\gamma$	$\gamma$	$\gamma$	$\gamma$	$\gamma$	$\gamma$	$\gamma$	$\gamma$	$\gamma$
1	468	470	474	488	506	524	540	542	530	510	482	463	460	462	464
2	476	477	486	496	502	504	514	524	526	512	490	474	476	470	466
3	466	467	470	482	500	520	528	524	520	500	484	470	472	476	478
4	472	472	474	490	497	522	534	529	512	481	458	436	434	416	451
5*	455	459	466	476	485	497	505	510	508	498	482	464	460	466	467
6	462	460	459	476	493	524	550	560	554	538	506	478	462	462	468
7	468	460	454	448	466	486	504	513	508	494	478	470	470	474	463
8*	468	468	473	486	492	500	500	498	494	486	472	470	474	471	491
9	468	466	464	466	481	500	508	512	510	502	482	472	470	470	468
10**	470	468	466	472	494	514	510	484	484	478	460	442	440	444	
11*	442	442	442	452	464	488	508	516	516	506	481	454	414	446	448
12**	462	463	464	468	482	500	508	508	506	490	471	470	473	474	472
13**	454	458	466	471	491	497	505	510	503	482	462	456	457	464	462
14**	465	466	462	462	484	505	512	506	502	489	470	456	438	450	457
15	468	474	484	494	500	506	504	490	478	467	447	444	454	460	460
16*	456	466	481	488	492	492	489	490	485	474	462	458	458	456	457
17	460	466	482	494	510	522	534	537	527	498	470	456	458	463	466
18	478	484	497	508	521	522	510	486	470	454	438	438	448	456	458
19	480	482	503	512	520	526	506	490	476	450	442	437	439	443	450
20	472	476	484	490	503	516	518	510	502	491	483	472	466	460	462
21	484	488	492	496	502	512	514	510	504	493	482	476	463	462	461
22	476	480	482	483	486	491	496	498	490	482	472	470	476	471	478
23	480	478	472	490	512	529	532	514	498	472	476	484	480	476	480
24*	482	494	502	504	520	511	516	512	500	488	482	482	486	481	481
25	484	490	494	514	537	550	558	544	519	494	488	484	478	470	470
26	484	486	487	488	500	519	528	528	522	498	478	474	488	500	500
27	492	498	498	501	515	520	521	519	513	502	494	484	478	484	490
28**	490	481	474	462	482	500	502	488	484	470	459	458	462	470	468
29	475	478	482	488	495	508	508	490	480	474	472	476	474	476	476
30	484	488	494	501	514	522	530	526	514	491	480	470	471	481	478
Mean	471	473	478	485	498	511	517	512	505	489	473	465	463	466	468
Mean*	461	466	473	481	491	498	504	503	501	490	476	466	464	465	470
Mean**	468	467	466	468	487	503	507	499	496	482	464	456	452	460	461

\* Five international quiet days.

\*\* Five international disturbed days

† Loss of record, (day omitted for means)

TABLE 12

Hourly Values of Horizontal Force, 1954

(Averages for sixty minutes centred at the full hours of Greenwich Mean Time)

June

39,000  $\gamma$  plus tabular quantities

Hours G M T.									Mean	Maximum		Minimum		Range	Date
15	16	17	18	19	20	21	22	23		Time	Mag	Time	Mag		
$\gamma$	$\gamma$	$\gamma$	$\gamma$	$\gamma$	$\gamma$	$\gamma$	$\gamma$	$\gamma$	$\gamma$	H M	$\gamma$	H M	$\gamma$	$\gamma$	
462	466	468	170	470	470	469	470	471	483	07 10	518	12 02	456	92	1
462	461	460	160	460	460	461	466	470	181	07 26	532	19 02	456	76	2
476	474	472	474	478	476	476	482	479	185	05 50	532	00 21	462	70	3
458	456	454	456	451	463	160	458	460	172	06 02	510	11 26	428	112	4
467	467	468	460	460	456	460	460	460	173	07 32	516	00 20	452	64	5*
468	468	470	174	470	471	473	478	475	487	07 10	564	02 22	458	106	6
462	461	466	166	164	462	160	462	161	472	07 11	516	03 51	445	71	7
466	468	468	466	470	470	470	471	468	478	06 10	508	15 10	461	44	8 <sup>†</sup>
466	468	472	470	471	472	470	470	472	478	07 18	516	02 10	457	59	9
441	442	442	450	451	419	116	114	412	461	05 22	532	12 02	424	108	10**
452	452	452	454	455	460	460	460	460	461	08 02	518	01 05	438	80	11*
470	466	462	454	446	457	454	454	451	472	07 10	519	19 02	442	70	12**
470	470	462	463	458	452	458	463	462	471	07 12	514	20 01	448	66	13**
460	462	458	460	456	456	458	462	463	469	07 30	521	12 30	428	93	14**
462	462	466	467	467	465	463	464	461	471	05 26	512	10 38	440	72	15
457	457	458	460	462	460	458	458	458	468	01 02	500	10 50	452	48	16*
468	468	468	470	470	470	470	468	470	482	07 02	538	11 10	452	86	17
458	460	462	478	470	462	470	473	476	474	01 34	528	10 30	436	92	18
453	458	460	469	470	468	468	470	471	473	05 02	530	11 11	432	98	19
463	466	470	472	473	474	478	480	482	482	05 54	523	13 50	456	67	20
464	462	460	462	469	473	474	474	475	481	06 31	519	17 06	457	62	21
476	476	470	474	478	478	480	482	483	481	06 50	504	10 42	468	36	22
482	484	488	490	482	479	478	480	484	488	06 02	536	09 26	468	68	23
484	486	484	484	484	483	485	488	491	492	03 50	524	10 50	478	46	24*
472	476	478	478	482	482	478	481	483	495	05 51	560	13 56	466	94	25
49 <sup>†</sup>	498	492	492	488	492	498	494	492	497	06 58	534	10 34	470	61	26
490	484	481	480	478	484	490	494	492	495	06 02	527	18 32	476	51	27
468	464	466	467	471	470	474	474	474	474	05 26	513	10 40	452	61	28* <sup>†</sup>
474	474	470	472	474	476	482	484	482	481	05 26	520	18 10	468	52	29
476	474	475	476	482	482	478	482	488	490	06 22	534	11 18	466	68	30
467	468	467	469	469	469	470	472	472	479					73	Mean
465	466	466	465	466	466	467	467	467							Mean*
462	461	458	459	456	457	458	459	459							Mean**

\* Five international quiet days.  
 \*\* Five international disturbed days.  
 † Loss of record; (day omitted for means).

TABLE 13

## Hourly Values of Vertical Force, 1954

(Averages for sixty minutes centred at the full hours of Greenwich Mean Time)

January

2,000  $\gamma$  plus tabular quantities

Date	Hours G M T.														
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14
	$\gamma$	$\gamma$	$\gamma$	$\gamma$	$\gamma$	$\gamma$	$\gamma$	$\gamma$	$\gamma$	$\gamma$	$\gamma$	$\gamma$	$\gamma$	$\gamma$	$\gamma$
1	403	402	403	400	397	393	380	382	388	393	404	408	407	406	406
2**	404	402	402	406	409	413	405	404	405	402	406	405	400	406	399
3*	408	407	406	407	406	406	405	397	393	397	405	405	397	397	400
4*	405	404	399	402	408	404	400	402	408	413	416	415	410	408	407
5	408	407	406	406	400	394	391	385	387	396	404	409	410	407	406
6	402	403	400	400	402	397	393	383	387	397	408	413	412	409	409
7	406	407	405	400	396	397	391	380	378	385	393	403	405	407	406
8	406	409	409	406	404	400	395	390	388	398	414	415	412	409	407
9	407	406	405	400	399	390	383	383	388	394	403	405	403	402	404
10*	405	406	406	402	399	391	387	387	387	391	402	414	412	406	405
11	406	406	408	406	398	380	377	381	383	385	393	403	404	402	402
12	403	404	405	406	409	410	406	399	402	410	409	412	406	402	399
13*	403	402	405	402	396	387	381	387	393	398	399	402	405	404	402
14	400	399	399	398	404	406	406	408	408	403	405	406	406	405	405
15	396	398	400	406	407	407	406	405	399	393	392	391	395	396	399
16	400	396	394	397	410	416	415	409	408	409	408	407	405	404	406
17	407	406	407	409	405	397	395	395	396	397	395	394	396	400	404
18	402	400	396	393	407	410	406	402	403	403	398	398	404	398	400
19**	398	397	398	393	391	390	391	392	385	380	383	386	393	398	402
20**	397	394	394	391	391	390	393	394	398	402	405	405	399	398	399
21**	400	397	395	391	393	387	387	392	388	390	392	394	395	402	405
22	405	403	402	399	395	385	384	387	393	405	414	413	406	403	403
23**	404	404	403	394	404	397	394	392	390	390	390	391	†	†	†
24	†	†	†	400	394	381	370	360	361	371	381	388	390	391	393
25	395	397	396	394	398	393	388	383	382	387	391	393	396	397	398
26*	402	400	400	403	397	393	387	383	381	373	385	396	400	397	398
27	397	398	395	393	388	385	383	383	377	378	386	391	393	392	391
28*	399	399	399	402	406	405	399	392	386	391	399	405	406	104	403
29*	400	397	396	394	390	387	386	386	387	386	387	388	390	393	394
30	391	391	391	387	400	392	391	387	382	385	391	396	397	397	400
31	394	393	394	396	400	400	397	396	398	398	397	394	395	397	397
Mean	402	401	401	400	400	397	393	393	388	394	399	402	402	402	402
Mean*	402	401	400	401	400	396	392	390	390	391	398	404	404	402	401
Mean**	400	397	397	395	396	395	394	395	394	393	397	397	397	401	401

\* Five international quiet days.

\*\* Five international disturbed days.

† Loss of record, (day omitted for means)



TABLE 13

Hourly Values of Vertical Force, 1954

(Averages for sixty minutes centred at the full hours of Greenwich Mean Time)

January

2,000  $\gamma$  plus tabular quantities

Hours G.M.T.									Mean	Maximum		Minimum		Range	Date
15	16	17	18	19	20	21	22	23		Time	Mag	Time	Mag.		
$\gamma$	$\gamma$	$\gamma$	$\gamma$	$\gamma$	$\gamma$	$\gamma$	$\gamma$	$\gamma$	$\gamma$	H. M	$\gamma$	H M	$\gamma$	$\gamma$	
406	406	406	407	406	405	405	405	404	401	10 55	410	05 35	372	38	1
398	407	413	407	409	409	409	410	407	406	05 08	417	14 30	385	32	2**
404	403	405	405	405	405	405	404	404	403	03 45	410	08 17	387	23	3
408	407	408	410	410	410	409	408	407	407	10 05	419	05 53	391	28	4*
406	406	406	405	401	402	414	413	400	403	21 35	425	07 04	380	45	5
406	408	405	407	408	408	407	407	407	403	11 15	416	07 15	373	43	6
403	398	402	403	406	413	409	406	406	400	20 18	416	07 17	372	44	7
406	405	405	405	407	406	404	405	404	405	10 20	417	07 30	378	39	8
405	405	406	407	407	407	406	405	405	401	03 30	409	06 35	373	36	9
403	402	403	404	406	407	407	405	405	402	11 15	417	07 37	383	36	10*
400	400	399	400	399	399	400	401	405	397	03 00	412	05 52	366	46	11
397	398	400	399	399	400	404	405	402	404	04 40	414	16 10	390	24	12
400	400	402	402	400	400	398	400	399	399	03 02	409	06 05	380	29	13
405	405	405	404	402	400	400	400	398	403	07 45	412	20 32	394	18	14
398	399	402	400	402	400	399	399	398	399	04 30	409	11 05	385	24	15
408	408	407	407	408	406	406	406	407	406	05 00	419	12 30	393	26	16
405	405	405	404	402	402	405	404	404	402	03 20	413	10 50	386	27	17
403	405	408	407	408	406	400	406	402	403	04 55	414	13 38	390	24	18
403	398	394	396	398	400	398	397	395	394	18 25	406	09 02	372	34	19**
395	397	395	399	402	403	400	398	399	397	19 00	408	04 35	381	27	20**
406	407	406	409	408	406	405	407	406	399	18 15	413	05 50	378	35	21**
402	403	405	405	406	407	403	402	404	401	10 15	416	06 05	375	41	22
†	†	†	†	†	†	†	†	†	†	†	†	†	†	†	23**
392	393	395	398	398	397	396	396	396	395	17 05	410	08 25	377	33	24
397	395	402	397	398	399	400	400	400	395	17 05	410	08 25	377	33	25
398	397	396	396	397	397	396	395	398	394	03 07	406	08 10	364	42	26*
394	394	398	402	404	403	405	403	399	393	19 35	408	08 45	368	40	27
402	405	401	404	404	404	403	403	404	401	03 35	410	08 15	377	33	28*
394	393	394	394	395	394	394	394	395	392	17 05	404	08 53	378	26	29*
403	405	403	399	398	397	397	396	394	395	03 30	409	07 35	374	35	30
399	402	394	397	396	396	393	394	393	396	16 10	406	17 08	385	21	31
402	402	403	403	403	403	403	403	402	400	.	.	..	..	33	Mean
401	401	401	402	402	403	402	401	402	.	.	.	..	..	.	Mean*
401	402	402	403	404	405	403	403	402	.	.	.	.	.	..	Mean**

\* Five international quiet days.  
 \*\* Five international disturbed days  
 † Loss of record; (day omitted for means).

TABLE 14

## Hourly Values of Vertical Force, 1954

(Averages for sixty minutes centred at the full hours of Greenwich Mean Time)

February

2,000  $\gamma$  plus tabular quantities

Date	Hours G.M.T.														
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14
	$\gamma$	$\gamma$	$\gamma$	$\gamma$	$\gamma$	$\gamma$	$\gamma$	$\gamma$	$\gamma$	$\gamma$	$\gamma$	$\gamma$	$\gamma$	$\gamma$	$\gamma$
1	392	391	391	388	395	393	386	380	381	394	406	405	406	393	390
2	400	399	395	395	402	397	390	382	378	384	393	394	398	400	395
3	404	400	399	393	391	384	381	385	380	380	387	394	390	395	395
4	399	397	396	393	391	391	384	383	387	390	387	380	382	384	386
5*	393	392	387	383	394	394	392	390	393	395	396	396	397	396	394
6	395	395	393	390	384	381	381	380	383	392	400	400	395	393	394
7*	393	395	394	392	391	387	386	386	381	378	380	380	385	390	391
8*	388	390	391	392	398	392	383	373	374	378	382	387	392	392	393
9	395	397	398	397	392	391	390	387	385	383	384	387	387	387	386
10	386	388	392	392	394	391	390	381	380	372	376	382	385	388	391
11	393	388	393	388	391	391	394	391	387	384	388	394	397	398	399
12*	393	394	392	388	392	391	392	393	394	395	395	395	397	399	402
13	395	394	395	398	394	391	387	390	388	386	388	391	391	395	396
14	394	393	392	388	382	378	378	381	383	383	383	386	393	392	391
15**	391	392	390	392	405	402	405	407	403	398	393	385	371	396	397
16	398	399	399	204	393	388	388	390	391	390	392	395	396	394	393
17	403	394	391	386	385	386	391	391	390	390	†	†	†	†	†
18	†	†	†	399	396	388	384	392	397	402	406	402	403	†	†
19	†	†	†	†	394	388	383	380	387	394	397	395	394	387	386
20	395	395	396	393	384	380	†	†	†	381	385	386	386	387	385
21	387	386	387	386	393	398	391	392	392	391	393	100	404	396	397
22**	400	397	395	396	402	401	395	393	393	394	393	396	394	391	398
23**	397	398	393	390	388	391	370	373	375	380	384	385	391	394	393
24	400	399	400	397	396	392	335	386	387	393	392	386	384	386	397
25	392	392	394	395	391	383	378	380	377	376	378	384	387	392	391
26**	395	393	393	398	402	402	393	385	383	380	375	357	385	400	396
27**	394	394	392	394	387	385	377	381	382	371	372	376	386	392	393
28	394	392	386	386	385	381	375	371	371	370	370	377	387	392	388
Mean .	395	394	393	392	393	390	386	385	385	385	387	388	391	393	394
Mean*	392	393	391	389	392	389	387	384	385	388	391	391	393	394	395
Mean**	391	395	393	394	397	395	388	388	387	385	383	380	385	395	395

\* Five international quiet days

\*\* Five international disturbed days.

† Loss of record, (day omitted for means)

TABLE 14

Hourly Values of Vertical Force, 1954

(Averages for sixty minutes centred at the full hours of Greenwich Mean Time)

February

2,000  $\gamma$  plus tabular quantities

Hours G M T.									Mean	Maximum		Minimum		Range	Date
15	16	17	18	19	20	21	22	23		Time	Mag	Time	Mag		
$\gamma$	$\gamma$	$\gamma$	$\gamma$	$\gamma$	$\gamma$	$\gamma$	$\gamma$	$\gamma$	$\gamma$	H M	$\gamma$	H M	$\gamma$	$\gamma$	
390	391	392	393	402	403	402	406	403	391	10 40	415	07 05	376	39	1
402	398	400	402	404	403	400	402	404	397	01 05	407	08 28	374	33	2
393	398	400	402	399	400	400	398	400	394	17 17	406	08 35	372	34	3
386	386	387	390	391	390	388	392	392	389	19 15	402	11 00	373	29	4
398	398	399	399	395	393	394	398	397	394	21 52	402	06 55	380	22	5*
393	393	394	396	397	397	395	394	393	392	10 25	406	06 35	373	33	6*
391	392	393	391	392	393	394	392	391	389	21 00	397	09 50	376	21	7†
394	395	396	397	396	402	397	394	395	390	03 22	403	07 06	368	35	8*
386	388	380	382	386	388	387	387	387	388	03 05	399	17 25	374	25	9
388	387	381	383	388	393	391	391	393	387	03 52	396	09 17	365	31	10
400	399	397	390	391	392	399	398	391	393	21 38	406	08 28	377	29	11
402	400	402	400	399	398	398	398	398	396	17 12	403	05 32	383	20	12*
400	398	400	400	398	397	398	396	395	394	03 00	403	09 20	381	22	13
388	387	393	396	395	395	393	392	391	389	18 48	402	09 40	375	27	14
393	395	399	402	399	403	397	402	398	396	06 55	409	12 00	364	45	15**
392	391	393	398	403	407	398	397	398	395	19 58	408	15 40	375	33	16
†	†	†	†	†	†	†	†	†	†						17
†	†	†	†	†	†	†	†	†	†						18
390	394	399	397	398	399	400	400	396	†						19
385	386	387	387	388	390	391	391	388	†						20
386	380	387	390	399	393	394	395	398	392	18 45	406	15 52	368	38	21
394	398	399	399	398	404	397	394	399	397	20 20	407	12 55	382	25	22**
393	395	391	396	396	397	402	401	403	390	22 20	407	06 05	362	45	23**
394	394	397	399	394	392	395	392	394	393	03 40	404	11 47	377	27	24
394	391	390	392	398	395	393	394	395	389	03 02	399	08 20	366	33	25
393	386	388	397	400	405	394	391	397	391	19 55	414	11 05	354	60	26**
400	393	387	392	391	391	392	393	392	388	15 35	407	09 40	362	45	27**
393	395	394	394	394	396	397	393	393	386	16 15	404	09 35	362	42	28
393	393	393	395	396	397	396	396	396	392				..	33	Mean
396	396	397	397	396	397	396	395	395	..				..	..	Mean*
399	393	393	395	397	400	396	397	398	..	..			..	..	Mean**

\* Five international quiet days.  
 \*\* Five international disturbed days.  
 † Loss of record; (day omitted for means).

TABLE 15

## Hourly Values of Vertical Force, 1954

(Averages for sixty minutes centred at the full hours of Greenwich Mean Time)

March

2,000  $\gamma$  plus tabular quantities

Date	Hours G M T.														
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1*	396	396	398	400	394	392	384	374	368	367	374	383	389	392	392
2	390	392	395	399	388	384	378	379	380	375	378	384	392	393	393
3*	393	390	390	395	396	396	395	394	389	380	378	383	387	390	388
4	395	394	394	395	396	392	390	386	378	375	374	378	382	388	389
5	388	387	389	393	395	392	387	387	385	382	379	379	384	380	385
6	393	392	393	394	395	394	388	387	386	383	385	387	389	392	392
7	389	390	392	389	396	390	386	384	379	375	371	378	383	383	382
8	393	393	390	389	380	378	375	382	380	379	383	384	387	389	390
9	392	389	388	390	388	384	380	378	375	370	373	378	386	386	386
10	395	395	395	397	397	392	387	385	380	379	384	388	388	386	387
11	392	393	396	397	388	386	386	392	398	399	397	389	386	385	388
12	390	388	389	394	392	387	386	393	402	406	404	398	390	386	394
13	395	394	392	389	388	387	390	393	398	406	400	397	396	393	393
14**	399	397	395	390	394	396	393	387	398	401	405	402	396	393	396
15**	395	396	402	400	392	393	388	380	389	398	395	394	392	394	393
16	†	†	†	401	398	392	399	399	395	397	404	407	397	393	394
17	396	395	394	390	382	382	388	392	398	400	402	399	398	396	396
18	395	398	400	402	392	383	381	390	405	408	408	406	398	396	397
19	396	398	394	388	388	384	379	380	389	402	408	408	404	394	390
20**	400	398	394	393	392	384	378	378	374	375	393	397	399	398	397
21	399	397	395	393	392	383	368	363	357	367	382	393	396	395	395
22	393	394	390	384	379	371	368	374	375	375	383	387	392	392	393
23**	390	395	393	388	382	374	368	368	383	392	397	389	382	390	397
24**	398	394	392	393	395	388	389	395	407	411	407	407	400	397	397
25	400	396	396	394	394	393	388	385	379	380	392	399	401	397	395
26	393	396	388	380	384	371	361	357	365	375	388	404	402	399	396
27*	399	400	396	393	376	362	353	359	367	379	394	402	395	392	390
28*	396	396	396	390	386	374	364	365	368	378	384	389	393	394	394
29*	394	395	393	392	390	387	389	394	401	402	398	393	396	396	395
30	404	402	406	402	398	393	395	400	411	416	411	399	389	384	380
31	401	400	399	396	393	384	379	384	406	418	415	408	399	397	397
Mean	395	395	394	393	390	385	381	382	386	388	391	393	392	391	392
Mean*	396	395	395	394	388	382	377	377	379	381	386	390	392	393	392
Mean**	397	396	393	391	391	385	382	382	391	395	401	399	394	395	397

\* Five international quiet days

\*\* Five international disturbed days.

† Loss of records; (day omitted for means).

TABLE 15

Hourly Values of Vertical Force, 1954

(Averages for sixty minutes centred at the full hours of Greenwich Mean Time)

March

2,000  $\gamma$  plus tabular quantities

Hours G.M.T.									Mean	Maximum		Minimum		Range	Date
15	16	17	18	19	20	21	22	23		Time	Mag.	Time	Mag.		
$\gamma$	$\gamma$	$\gamma$	$\gamma$	$\gamma$	$\gamma$	$\gamma$	$\gamma$	$\gamma$	$\gamma$	H M	$\gamma$	H M	$\gamma$	$\gamma$	
392	394	393	393	394	391	392	395	393	389	02 58	401	08 52	362	39	1*
393	394	396	397	399	394	393	392	393	390	03 00	400	09 25	370	30	2
389	390	392	392	393	393	391	394	392	391	03 26	398	10 07	375	23	3*
392	393	393	395	396	395	393	389	390	389	03 30	397	10 01	371	26	4
386	389	395	394	391	393	393	393	395	389	03 20	397	11 25	375	22	5
393	395	393	391	396	395	395	389	388	391	01 35	399	09 23	376	23	6
392	390	390	395	394	392	395	392	392	387	03 40	400	10 07	367	33	7
390	392	390	393	392	393	388	387	394	387	19 52	398	05 55	370	28	8
389	392	390	397	388	389	392	392	393	386	17 39	408	09 20	365	43	9
391	392	390	395	395	395	392	393	393	391	03 10	404	08 53	375	29	10
390	393	396	396	400	395	396	401	394	393	08 58	405	12 42	383	22	11
395	395	394	396	396	401	396	396	391	394	09 10	408	13 05	377	31	12
389	391	398	399	406	404	394	393	396	395	19 08	411	15 55	380	31	13
392	383	386	393	397	399	396	395	393	395	09 55	410	16 00	379	31	14**
392	395	395	396	397	397	†	†	†	†	†	†	†	†	†	15**
397	396	398	397	398	405	394	395	394	†	†	†	†	†	†	16
393	393	389	397	399	405	398	396	395	395	20 08	414	04 53	373	41	17
392	395	399	396	401	404	391	395	395	397	08 45	411	05 25	375	36	18
392	392	394	399	399	400	396	398	400	395	10 05	410	06 12	373	37	19
397	391	402	399	401	395	393	395	394	393	17 00	406	08 30	365	41	20**
396	397	398	400	398	404	395	392	393	389	20 03	405	07 56	354	51	21
393	395	397	395	398	410	400	386	388	388	20 15	420	05 55	362	58	22
390	397	400	402	397	415	392	392	397	390	19 45	431	06 40	359	72	23**
397	397	397	408	404	391	397	398	399	398	08 36	412	05 40	379	33	24**
394	396	395	395	397	401	392	392	393	393	20 00	410	08 25	373	37	25
397	399	400	396	399	404	402	398	398	390	11 11	412	06 40	353	59	26
393	393	394	395	396	397	395	395	396	388	11 08	408	06 25	348	60	27*
394	394	395	396	398	397	398	398	396	389	21 30	404	06 52	356	48	28*
395	396	399	400	402	399	398	401	402	396	08 20	409	11 22	386	23	29*
390	401	404	402	399	397	396	396	406	399	08 43	418	13 40	370	48	30
397	398	400	404	401	401	407	406	402	400	08 50	419	05 55	371	48	31
393	394	395	397	398	398	395	391	395	392	.	.	.	.	38	Mean
393	393	395	395	397	396	395	397	396	.	..	.	.	.	.	Mean*
394	393	396	401	400	401	395	395	396	.	.	.	.	.	.	Mean**

\* Five international quiet days.

\*\* Five international disturbed days.

† Loss of record, (day omitted for means).

TABLE 16

## Hourly Values of Vertical Force, 1954

(Averages for sixty minutes centred at the full hours of Greenwich Mean Time)

April

2,000  $\gamma$  plus tabular quantities

Date	Hours G M T														
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14
	$\gamma$	$\gamma$	$\gamma$	$\gamma$	$\gamma$	$\gamma$	$\gamma$	$\gamma$	$\gamma$	$\gamma$	$\gamma$	$\gamma$	$\gamma$	$\gamma$	$\gamma$
1*	408	410	401	400	385	381	380	388	403	415	420	414	402	400	399
2	402	401	399	393	378	368	361	366	377	385	389	393	393	390	391
3	400	404	408	407	391	383	379	381	390	395	406	410	406	401	400
4	404	403	406	401	395	385	376	383	396	399	401	403	403	402	402
5	404	411	407	401	382	371	370	374	377	389	399	401	399	400	399
6	403	406	405	403	393	391	388	390	390	393	392	392	393	395	396
7*	405	407	405	403	391	382	377	372	374	382	390	392	394	398	399
8	406	410	413	404	402	399	398	398	400	404	403	401	396	396	400
9	402	404	407	410	403	399	394	391	391	399	408	407	405	402	399
10	405	411	407	400	396	392	391	391	386	390	395	398	399	402	403
11**	404	410	405	399	388	384	388	386	390	398	399	400	401	399	399
12**	417	403	390	386	389	391	388	384	391	393	388	385	382	399	404
13	402	403	405	403	408	406	404	404	407	406	405	404	403	402	403
14	405	411	406	401	384	388	391	395	399	396	398	398	396	402	403
15**	405	410	408	403	401	400	389	386	394	401	402	399	393	399	401
16	408	410	407	403	401	394	389	381	383	396	404	408	406	403	402
17	404	410	413	413	411	401	392	385	386	394	401	403	403	404	404
18	410	411	412	411	404	399	386	388	392	395	402	401	404	405	405
19	405	413	414	414	410	399	389	388	391	394	401	405	407	406	405
20**	410	417	417	411	405	395	389	385	391	399	410	411	407	401	401
21	408	415	417	416	410	406	400	391	396	406	417	416	401	400	403
22	412	415	417	417	410	399	392	392	391	391	399	408	411	412	412
23**	411	414	415	413	413	412	404	396	394	402	410	410	403	401	404
24	410	414	413	406	401	391	384	384	388	391	399	405	406	405	407
25*	415	416	418	414	410	407	403	399	399	400	405	413	408	407	407
26	412	413	413	408	413	410	408	403	402	404	410	410	408	408	408
27	411	413	411	406	408	402	394	389	396	404	412	413	414	413	413
28*	414	414	412	401	388	379	373	377	383	388	394	401	405	404	405
29*	412	414	412	408	403	401	399	396	396	399	406	411	410	405	406
30	412	413	411	411	403	393	389	384	388	399	398	391	391	398	399
Mean	408	410	409	405	399	394	389	388	391	397	402	404	402	402	403
Mean*	411	412	410	405	396	390	386	386	391	397	403	406	404	403	403
Mean**	409	411	407	402	399	397	392	387	392	399	402	401	397	400	402

\* Five international quiet days.

\*\* Five international disturbed days.

† Loss of record, (day omitted for means).

TABLE 16

Hourly Values of Vertical Force, 1954

(Averages for sixty minutes centred at the full hours of Greenwich Mean Time)

April

2,000  $\gamma$  plus tabular quantities

Hours G.M.T.									Mean	Maximum		Minimum		Range	Date
15	16	17	18	19	20	21	22	23		Time	Mag.	Time	Mag.		
$\gamma$	$\gamma$	$\gamma$	$\gamma$	$\gamma$	$\gamma$	$\gamma$	$\gamma$	$\gamma$	$\gamma$	H M.	$\gamma$	H M.	$\gamma$	$\gamma$	
401	401	404	403	403	402	100	406	404	401	09 53	424	06 14	371	53	1*
395	402	405	406	401	403	405	103	101	392	21 00	411	06 15	359	52	2
401	404	105	405	402	403	406	402	410	400	11 00	414	06 05	370	44	3
403	404	406	407	407	406	410	401	402	400	21 13	414	05 51	369	45	4
401	402	403	404	403	403	403	402	401	396	17 47	412	05 37	366	46	5
399	400	400	403	402	403	403	402	403	398	03 05	407	08 34	384	23	6
399	399	399	400	410	404	403	403	404	396	18 55	414	06 55	365	49	7*
403	403	403	403	403	403	402	100	398	102	19 55	410	12 32	390	20	8
395	398	401	411	406	406	406	407	106	403	17 45	415	07 00	381	34	9
402	400	400	404	405	405	403	404	405	400	20 00	411	07 56	382	29	10
401	400	404	102	401	403	401	106	402	399	23 55	424	05 05	379	45	11**
408	408	410	408	407	105	410	406	403	398	21 20	420	12 10	380	40	12**
401	403	403	404	411	412	411	412	405	105	21 20	414	13 43	392	22	13
404	403	401	407	407	408	406	405	105	401	01 20	413	04 36	374	39	14
400	403	408	407	406	406	411	407	406	402	17 30	413	07 00	380	33	15**
403	403	404	406	403	404	403	403	403	401	19 55	413	07 46	373	40	16
406	408	412	411	408	407	111	411	405	401	03 00	416	07 36	378	38	17
406	410	414	411	410	116	412	407	404	405	19 45	415	06 20	379	36	18
406	405	405	411	414	412	412	411	111	405	03 05	416	07 25	380	36	19
405	406	406	413	406	403	405	408	107	105	18 00	423	06 47	377	46	20**
407	406	412	408	407	406	405	404	405	407	10 25	418	07 13	383	35	21
411	411	410	410	110	108	408	408	107	407	03 13	420	08 45	389	31	22
406	407	408	404	407	408	417	408	407	407	20 47	423	07 45	386	37	23**
410	407	408	413	416	114	410	408	413	404	19 35	416	06 35	379	37	24
408	407	410	412	413	413	413	413	413	409	02 30	420	07 20	391	29	25*
410	408	411	412	414	416	412	410	412	410	19 54	421	07 35	395	26	26
414	415	417	414	416	416	412	413	414	410	19 21	421	06 55	381	40	27
406	406	410	411	412	411	410	408	408	401	19 22	416	06 30	363	53	28*
408	410	411	412	412	411	410	411	412	407	01 15	416	06 21	392	24	29*
404	404	406	405	406	406	405	405	406	401	00 48	414	07 00	381	33	30
404	405	403	408	408	407	407	407	406	402		..			37	Mean
404	405	407	408	410	408	407	408	408	.	.	.	.	..	..	Mean*
404	405	407	407	405	405	409	407	405	.	..	.	.	..		Mean**

\* Five international quiet days.  
 \*\* Five international disturbed days.  
 † Loss of record, (day omitted for means).

TABLE 16

## Hourly Values of Vertical Force, 1954

(Averages for sixty minutes centred at the full hours of Greenwich Mean Time)

April

2,000  $\gamma$  plus tabular quantities

Date	Hours G.M.T.														
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14
	$\gamma$	$\gamma$	$\gamma$	$\gamma$	$\gamma$	$\gamma$	$\gamma$	$\gamma$	$\gamma$	$\gamma$	$\gamma$	$\gamma$	$\gamma$	$\gamma$	$\gamma$
1*	408	410	401	400	385	381	380	388	403	415	420	414	402	400	399
2	402	404	399	393	378	368	361	366	377	385	389	393	393	390	391
3	400	404	408	407	391	383	379	381	390	395	406	410	406	401	400
4	404	403	406	401	395	385	376	383	396	399	401	403	403	402	402
5	404	411	407	401	382	371	370	374	377	389	399	401	399	400	399
6	403	406	405	403	393	391	388	390	390	393	392	392	393	395	398
7*	405	407	405	403	394	382	377	372	374	382	390	392	394	398	399
8	406	410	413	404	402	399	398	398	400	404	403	401	396	396	400
9	402	404	407	410	403	399	394	391	391	399	408	407	405	402	399
10	405	411	407	400	396	392	391	391	386	390	395	398	399	402	403
11**	404	410	405	399	388	384	388	386	390	398	399	400	401	399	399
12**	417	403	390	386	389	394	388	384	391	393	388	385	382	399	404
13	402	403	405	403	408	406	404	404	407	406	405	404	403	402	403
14	405	411	406	401	384	388	391	395	399	396	398	398	396	402	403
15**	405	410	408	403	401	400	389	386	394	401	402	399	393	399	401
16	408	410	407	403	401	394	389	384	383	396	404	408	406	403	402
17	404	410	413	413	411	401	392	385	386	394	401	403	403	404	404
18	410	411	412	411	401	399	386	388	392	395	402	401	404	405	405
19	405	413	414	414	410	399	389	388	391	394	401	405	407	406	405
20**	410	417	417	411	405	395	389	385	391	399	410	411	407	401	401
21	408	415	417	416	410	406	400	391	396	406	417	416	401	400	403
22	412	415	417	417	410	399	392	392	391	391	399	408	411	412	412
23**	411	414	415	413	413	412	404	396	394	402	410	410	403	401	404
24	410	414	413	406	401	391	384	384	388	391	399	405	406	405	407
25*	415	416	418	414	410	407	403	399	399	400	405	413	408	407	407
26	412	413	413	408	413	410	408	403	402	404	410	410	408	408	408
27	411	413	411	406	408	402	394	389	396	404	412	413	414	413	413
28*	414	414	412	401	388	379	373	377	383	388	394	401	405	404	405
29*	412	414	412	408	403	401	399	396	396	399	406	411	410	405	406
30	412	413	411	411	403	393	389	384	388	399	398	394	391	398	399
Mean	408	410	409	405	399	394	389	388	391	397	402	404	402	402	403
Mean*	411	412	410	405	396	390	386	386	391	397	403	406	404	403	403
Mean**	409	411	407	402	399	397	392	387	392	399	402	401	397	400	402

\* Five international quiet days.

\*\* Five international disturbed days.

† Loss of record, (day omitted for means).



TABLE 16

Hourly Values of Vertical Force, 1954

(Averages for sixty minutes centred at the full hours of Greenwich Mean Time)

April

2,000 γ plus tabular quantities

Hours G.M.T.									Mean	Maximum		Minimum		Range	Date		
15	16	17	18	19	20	21	22	23		Time	Mag.	Time	Mag.				
γ	γ	γ	γ	γ	γ	γ	γ	γ	γ	H	M.	γ	H	M	γ	γ	
401	401	404	403	403	402	400	406	401	401	09	53	424	06	14	371	53	1*
395	402	405	406	401	403	405	403	401	392	21	00	411	06	15	359	52	2
401	404	405	405	402	405	406	402	410	400	11	00	414	06	05	370	44	3
403	404	406	407	407	406	110	401	402	100	21	13	414	05	51	369	45	4
401	402	403	404	403	403	403	402	401	396	17	47	412	05	37	366	46	5
399	400	400	403	402	403	403	402	403	398	03	05	407	08	34	384	23	6
399	399	399	400	410	404	403	403	401	396	18	55	414	06	55	365	49	7*
403	403	403	403	403	403	402	100	398	102	19	55	410	12	32	390	20	8
395	398	401	411	406	406	406	407	106	403	17	45	415	07	00	381	34	9
402	400	400	404	405	405	403	404	405	400	20	00	411	07	56	382	29	10
401	400	404	402	401	403	401	406	402	399	23	55	424	05	05	379	45	11**
408	408	410	408	407	405	410	406	403	398	21	20	420	12	10	380	40	12**
401	403	403	404	411	412	411	412	405	405	21	20	414	13	43	392	22	13
404	403	404	407	407	408	406	405	405	401	01	20	413	04	36	374	39	14
400	403	408	407	406	406	411	407	406	402	17	30	413	07	00	380	33	15*†
403	403	404	406	403	404	403	403	403	401	19	55	413	07	46	373	40	16
406	408	412	411	408	407	411	411	405	401	03	00	416	07	36	378	38	17
406	410	414	411	410	116	412	407	404	405	19	45	415	06	20	379	36	18
406	405	405	411	414	412	412	411	411	405	03	05	416	07	25	380	36	19
405	406	406	413	406	403	405	403	407	405	18	00	423	06	47	377	46	20*†
407	406	412	408	407	406	405	404	405	407	10	25	418	07	13	383	35	21
411	411	410	410	410	408	408	408	407	407	03	13	420	08	45	389	31	22
406	407	408	404	407	408	417	408	407	407	20	47	423	07	45	386	37	23*†
410	407	408	413	416	414	410	408	413	404	19	35	416	06	35	379	37	24
408	407	410	412	413	413	413	413	413	409	02	30	420	07	20	391	29	25*
410	408	411	412	414	416	412	410	412	410	19	54	421	07	35	395	26	26
414	415	417	414	416	416	412	413	414	410	19	21	421	06	55	381	40	27
406	406	410	411	412	411	410	408	408	401	19	22	416	06	30	363	53	28*
408	410	411	412	412	411	410	411	412	407	01	15	416	06	21	392	24	29*
404	404	406	405	406	406	405	405	406	401	00	48	414	07	00	381	33	30
404	405	403	408	408	407	407	407	406	402	.	.	.	.	.	.	37	Mean
404	405	407	408	410	408	407	408	408	.	.	.	..	..	.	.	.	Mean*
404	405	407	407	405	405	409	407	105	.	.	.	.	..	.	.	.	Mean**

\* Five international quiet days.  
 \*\* Five international disturbed days  
 † Loss of record; (day omitted for means).

TABLE 17

## Hourly Values of Vertical Force, 1954

(Averages for sixty minutes centred at the full hours of Greenwich Mean Time)

May

2,000  $\gamma$  plus tabular quantities

Date	Hours G M T.														
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14
	$\gamma$	$\gamma$	$\gamma$	$\gamma$	$\gamma$	$\gamma$	$\gamma$	$\gamma$	$\gamma$	$\gamma$	$\gamma$	$\gamma$	$\gamma$	$\gamma$	$\gamma$
1*	410	413	412	405	398	393	392	397	403	415	420	419	413	405	405
2	414	416	413	403	390	372	379	380	387	396	402	408	407	403	404
3	409	416	414	410	402	396	391	387	391	396	407	410	407	405	406
4**	414	415	413	405	397	390	382	380	386	391	398	397	397	400	398
5	407	410	410	403	401	398	394	388	392	401	407	413	412	410	408
6	413	415	416	414	405	400	394	388	393	396	403	413	413	408	406
7*	413	414	415	415	410	410	405	398	395	401	407	414	413	406	405
8	415	417	419	416	415	410	410	409	410	413	416	416	413	406	407
9**	414	414	412	405	402	401	403	405	415	418	416	413	409	410	410
10	415	416	410	403	398	401	402	407	410	410	408	407	408	408	410
11**	414	417	416	407	394	381	371	375	378	378	385	393	397	401	404
12	413	415	419	414	408	401	396	401	401	402	407	410	410	412	413
13	416	420	415	408	400	397	401	406	413	419	422	424	417	408	410
14	417	416	412	407	404	405	407	413	418	422	427	427	424	415	415
15	422	424	424	420	404	400	404	403	409	416	415	418	415	408	413
16	422	423	419	416	402	392	392	393	393	398	405	410	410	409	409
17*	418	422	422	420	407	394	393	393	397	403	405	415	416	414	414
18**	423	426	419	412	413	413	410	409	412	413	415	410	409	407	412
19	418	416	415	415	413	406	406	405	408	406	405	410	415	414	413
20	423	428	430	425	422	417	410	407	410	410	415	417	415	416	416
21**	418	423	424	422	418	415	410	410	413	413	418	422	424	422	418
22	422	423	423	416	413	412	406	398	397	402	407	414	416	417	416
23	424	426	431	427	425	419	405	396	401	407	420	423	423	418	415
24	424	429	431	430	428	416	403	398	398	401	413	424	428	430	428
25*	431	434	434	428	416	413	408	402	404	408	413	416	417	418	418
26	425	429	436	430	430	422	408	402	402	403	408	414	417	418	419
27	425	426	423	419	416	407	404	402	400	397	403	415	426	428	428
28	425	428	432	430	425	418	416	417	423	426	430	426	422	420	422
29	427	427	430	427	419	416	414	418	423	418	415	414	419	423	422
30*	430	432	435	432	430	427	426	426	423	425	426	426	427	425	425
31	424	426	429	430	422	412	402	400	401	405	412	415	413	414	418
Mean	419	421	421	417	411	405	401	400	403	407	411	415	415	413	413
Mean*	420	423	424	420	412	407	405	403	404	410	414	418	417	414	413
Mean**	417	419	417	410	405	400	395	396	401	403	406	407	407	408	406

\* Five international quiet days

\*\* Five international disturbed days

† Loss of record, (day omitted for means).

TABLE 17

## Hourly Values of Vertical Force, 1954

(Averages for sixty minutes centred at the full hours of Greenwich Mean Time)

May

2,000  $\gamma$  plus tabular quantities

Hours G M T									Mean	Maximum		Minimum		Range	Date		
15	16	17	18	19	20	21	22	23		Time	Mag	Time	Mag				
$\gamma$	$\gamma$	$\gamma$	$\gamma$	$\gamma$	$\gamma$	$\gamma$	$\gamma$	$\gamma$	$\gamma$	H	M	$\gamma$	H	M	$\gamma$	$\gamma$	
407	408	409	409	410	409	410	410	412	408	10	15	428	05	40	391	37	1*
405	406	407	408	408	408	408	408	407	402	11	16	418	05	00	371	47	2
406	406	405	410	408	410	410	413	415	405	23	15	418	07	03	385	33	3
401	401	404	402	403	405	407	412	409	400	22	13	420	07	30	378	42	4**
407	409	408	410	412	412	410	412	412	406	10	51	417	07	16	386	31	5
406	407	407	408	409	409	408	408	410	406	02	55	418	07	10	387	31	6
408	410	412	413	410	410	410	412	413	409	03	00	418	08	30	393	25	7*
404	404	408	414	409	413	414	406	413	412	03	01	422	16	20	401	21	8
410	410	412	413	410	410	412	412	413	410	08	32	419	13	45	400	19	9**
412	412	413	415	414	412	410	409	410	409	18	22	418	03	37	394	24	10
408	410	410	410	414	413	409	410	409	400	02	44	419	06	23	369	50	11**
412	412	414	415	415	416	415	417	416	411	03	08	422	08	40	394	28	12
414	415	416	416	414	415	415	416	416	413	10	20	426	05	19	393	33	13
416	416	416	417	417	417	418	418	417	416	09	46	429	06	27	401	28	14
410	414	417	420	422	422	419	418	420	415	01	07	427	05	05	393	34	15
409	410	410	413	415	414	415	416	416	409	00	25	425	07	47	391	34	16
415	415	415	416	416	417	418	420	422	412	22	18	425	07	08	386	39	17*
415	415	416	415	417	416	416	416	416	414	01	10	427	07	05	401	26	18**
410	413	414	415	416	417	423	420	424	413	20	48	427	09	35	404	23	19
415	419	419	420	422	417	423	419	417	418	02	05	432	08	42	405	27	20
419	423	423	422	424	422	420	420	422	419	03	15	426	07	30	403	23	21**
417	419	419	419	418	420	423	422	424	415	20	52	425	08	04	395	30	22
417	417	416	416	418	419	418	420	422	418	02	12	434	07	10	388	46	23
426	423	424	428	430	430	429	427	429	422	03	13	436	08	10	390	46	24
423	421	425	424	425	426	424	423	423	420	01	50	437	07	15	397	40	25*
418	424	423	423	424	423	424	423	422	419	03	00	438	07	52	395	43	26
427	428	429	428	427	427	425	425	425	419	17	03	431	08	57	390	41	27
423	424	425	426	426	425	426	425	426	424	03	15	434	12	53	414	20	28
423	425	429	427	428	427	428	429	430	423	22	00	432	11	25	407	25	29
425	426	426	425	425	424	424	422	423	426	03	05	436	08	14	416	20	30*
419	422	429	429	432	429	425	424	425	419	19	00	432	06	33	393	39	31
414	415	416	417	417	417	417	417	418	413	.	.	.	.	.	.	32	Mean
416	417	417	417	417	417	417	417	419	.	.	.	.	.	.	.	.	Mean*
411	412	413	412	414	413	413	414	414	..	.	.	.	.	.	..	..	Mean**

\* Five international quiet days.

\*\* Five international disturbed days.

† Loss of record; (day omitted for means).

TABLE 18

## Hourly Values of Vertical Force, 1954

(Averages for sixty minutes centred at the full hours of Greenwich Mean Time)

June

2,000  $\gamma$  plus tabular quantities

Date	Hours G M T.														
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14
	$\gamma$	$\gamma$	$\gamma$	$\gamma$	$\gamma$	$\gamma$	$\gamma$	$\gamma$	$\gamma$	$\gamma$	$\gamma$	$\gamma$	$\gamma$	$\gamma$	$\gamma$
1	419	419	421	419	414	405	397	393	395	396	405	411	415	414	414
2	418	418	419	420	419	414	416	415	418	417	416	418	418	411	413
3	421	426	431	433	436	429	421	417	416	421	422	423	423	421	419
4	417	417	423	429	422	416	399	389	383	389	400	414	419	418	419
5*	422	425	423	422	415	410	407	404	396	396	400	405	407	410	413
6	414	416	417	413	417	408	405	398	396	404	405	406	410	416	416
7	416	419	423	427	442	435	425	417	413	415	421	419	414	408	410
8*	418	419	416	413	405	401	395	393	400	404	405	406	405	406	409
9	414	414	413	410	416	415	414	408	408	406	403	406	414	411	410
10**	414	413	415	417	414	407	394	389	396	395	398	401	403	406	406
11*	414	418	422	421	427	421	417	403	398	401	399	407	414	415	415
12**	418	418	421	422	421	415	406	401	403	405	409	414	409	407	408
13**	414	416	417	415	410	404	395	393	392	392	397	406	409	407	407
14**	419	421	423	423	423	416	410	408	406	403	404	407	407	414	419
15	421	423	425	423	418	419	417	409	410	416	421	423	421	417	418
16*	418	421	420	417	407	405	404	404	401	399	399	406	407	408	408
17	415	417	416	411	408	398	394	383	387	393	403	409	414	409	408
18	418	417	415	413	407	404	403	411	414	416	420	426	425	416	413
19	†	†	†	†	405	396	387	393	406	406	408	†	†	†	†
20	†	†	†	†	†	†	†	†	†	†	†	†	†	†	†
21	†	†	†	†	†	†	†	†	†	†	†	†	†	421	415
22	413	416	414	410	416	416	417	415	413	413	413	413	413	411	408
23	411	415	417	415	400	395	396	397	402	405	409	408	406	402	401
24*	402	405	403	398	393	391	390	389	394	398	406	403	400	397	397
25	405	407	412	409	401	397	401	405	407	405	407	406	403	396	396
26	403	406	409	416	419	416	411	397	393	394	398	407	407	403	401
27	403	403	402	401	396	393	393	398	397	395	397	398	397	397	402
28**	405	403	400	394	396	399	397	391	393	395	400	403	405	402	401
29	405	406	403	402	396	399	396	400	402	403	405	406	402	399	399
30	406	407	403	398	396	391	390	394	397	403	409	409	405	402	396
Mean	413	415	416	415	413	408	404	400	401	402	406	409	409	408	408
Mean *	415	418	417	414	409	406	403	399	398	400	402	405	407	407	408
Mean **	414	416	415	414	413	408	400	396	398	398	402	406	407	407	408

\* Five international quiet days.

\*\* Five international disturbed days.

† Loss of record; (day omitted for means).

TABLE 18

Hourly Values of Vertical Force, 1954

(Averages for sixty minutes centred at the full hours of Greenwich Mean Time)

June

2,000  $\gamma$  plus tabular quantities

Hours G.M.T.									Mean	Maximum		Minimum			Range	Date
15	16	17	18	19	20	21	22	23		Time	Mag.	Time	Mag.	Mag.		
$\gamma$	$\gamma$	$\gamma$	$\gamma$	$\gamma$	$\gamma$	$\gamma$	$\gamma$	$\gamma$	$\gamma$	H. M	$\gamma$	H M	$\gamma$	$\gamma$		
415	415	418	418	418	417	416	416	417	412	02 38	423	06 38	383	40	1	
411	414	414	416	416	416	416	418	419	416	03 07	421	13 08	407	14	2	
418	419	420	420	421	419	420	419	417	422	03 20	438	08 17	410	28	3	
418	420	421	420	421	425	419	418	420	411	03 15	427	07 58	378	49	4	
413	413	413	413	413	413	414	411	413	411	01 47	427	08 52	388	39	5*	
417	416	418	418	418	414	415	417	416	412	03 25	421	07 24	387	34	6	
414	414	414	414	413	414	414	415	416	418	03 35	444	14 08	400	44	7	
413	414	414	414	414	415	413	411	411	409	01 48	422	07 04	386	36	8*	
413	414	415	416	416	416	415	414	414	412	04 02	418	09 55	394	24	9	
409	411	413	415	414	413	413	414	411	408	03 32	418	06 25	382	36	10**	
416	417	416	416	417	417	416	416	416	414	03 12	429	09 52	392	37	11*	
409	410	409	409	409	414	410	410	413	411	02 00	427	07 15	393	34	12**	
409	409	411	414	410	410	416	416	415	408	01 13	420	06 30	385	35	13**	
420	419	417	417	417	416	417	418	418	415	03 00	425	09 15	394	31	14**	
419	419	420	420	419	417	417	418	416	419	02 20	427	07 30	396	31	15	
408	408	410	411	411	411	410	411	414	409	01 06	423	09 35	397	26	16*	
410	413	413	413	413	413	411	413	413	407	00 50	419	07 10	375	44	17	
414	415	416	421	418	415	†	†	†	†	†	†	†	†	†	18	
†	†	†	†	†	†	†	†	†	†	†	†	†	†	†	19	
†	†	†	†	†	†	†	†	†	†	†	†	†	†	†	20	
411	413	411	411	411	413	413	411	408	†	†	†	†	†	†	21	
411	413	413	414	416	415	416	414	413	413	04 45	425	13 15	403	22	22	
401	400	402	403	403	402	402	401	402	404	02 08	421	05 50	391	30	23	
399	400	401	402	403	402	403	405	403	399	10 20	410	13 02	387	23	24*	
399	401	401	403	405	403	403	403	403	403	03 15	415	13 20	394	21	25	
399	402	402	402	403	405	403	402	402	404	03 43	422	08 01	387	35	26	
403	402	401	403	402	403	403	405	403	400	21 52	409	12 45	391	18	27	
401	401	402	401	402	401	402	402	403	400	11 17	407	07 11	387	20	28**	
398	401	401	402	402	403	403	405	405	402	11 30	409	04 20	386	23	29	
400	401	402	402	402	402	400	400	402	401	10 25	411	05 49	383	28	30	
409	410	411	411	411	411	411	411	411	409	.	.	.	.	31	Mean	
410	410	411	411	412	412	411	411	409	.	.	.	..	.	.	Mean*	
410	410	410	411	410	411	412	412	412	.	..	.	.	.	.	Mean**	

\* Five international quiet days.  
 \*\* Five international disturbed days  
 † Loss of record; (day omitted for means)

TABLE 19

## PRINCIPAL MAGNETIC STORMS

January—June, 1954

Greenwich date 1954	Storm time		Sudden commencement			Degree of activity (4)	Maximal activity Greenwich day	Ranges					
	G M T of beginning		Type (2)	Amplitude (3)				D	H	Z			
	G M T of ending (1)			D	H						Z		
	H	M	D	H									
February, 14 .	16	30	17	19					m	15	4	133	50
February, 26 .	04	30	27	16					m	26	3	150	54
March, 14	16	00	15	19					m	15	3	135	33
April, 11 .	16	14	12	22					m	12	4	142	43

The following symbols and conventions have been used according to recognised practice —

1. Approximate time of ending of storm construed as the time of cessation of reasonably marked disturbance movements in the traces
2. s c = Sudden commencement, ( ) = Gradual commencement
3. Signs of amplitudes of 'D' and 'Z' taken algebraically, (D—reckoned negative being westerly).  
(Z—reckoned positive being vertically downwards).
4. Storm described by three degrees of activity. (m) for moderate (when range is less than 250  $\gamma$ );  
(ms) for moderately severe (when range is between 251  $\gamma$  and 400  $\gamma$ );  
(s) for severe (when range is above 400  $\gamma$ ).