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GREENWICH
PHOTO-HELIOGRAPHIC RESULTS

1938

GREENWICH PHOTOHELIOGRAPHIC RESULTS, 1938

ERRATA

Page		
C 4	Jan. 10 Col. 9, line 7 : *for* 171 *read* 171*c*	
C 103	Line 1 : *for* Group 12903 *read* Group 12902	
C 109	Note to **No. 1257,** Group 13128 : *delete* (*a* of Group 13064)	
C 111	**No. 1259,** Group 13138 Col. 3, line 6 : *for* 631 *read* 422	
	Col. 5, line 6 : *for* 322 *read* 215	
	Col. 5, line 13 : *for* 145 *read* 136	
C 133	Group 12941, spot *a* Col. 6, line 5 :	defective figures should read 91·1
		Col. 6, line 6 : defective figures should read 91·2
	Group 12946	Col. 6, line 7 : defective figures should read 103·9
		Col. 6, line 8 : defective figures should read 102·8
		Col. 6, line 9 : defective figures should read 103·6

ROYAL GREENWICH OBSERVATORY
APRIL 1951

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SUPPLIED FOR THE PUBLIC SERVICE.

RESULTS OF MEASURES MADE AT THE ROYAL OBSERVATORY, GREENWICH, OF

PHOTOGRAPHS OF THE SUN

TAKEN AT GREENWICH, THE CAPE AND KODAIKÂNAL IN THE YEAR

1938

UNDER THE DIRECTION OF

H. SPENCER JONES, Sc.D., F.R.S.

ASTRONOMER ROYAL

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GREENWICH PHOTO-HELIOGRAPHIC RESULTS, 1938.

INTRODUCTION.

§1. *Positions and Areas of Sun Spots and Faculæ for each Day in the Year* 1938.

The photographs from which these measures were made were taken at the Royal Observatories of Greenwich or of the Cape, and at the Kodaikánal Observatory, Southern India.

The photographs of the Sun obtained at Greenwich were taken with the Dallmeyer Photoheliograph of 4 inches aperture (usually stopped down to 2·9 inches). The diameter of the Sun's image at the secondary focus is 7½ inches at the Earth's mean distance.

The photographs from the Cape Observatory were taken under the superintendence of His Majesty's Astronomer at the Cape, Dr. J. Jackson, and those from Kodaikánal under the superintendence of the Director, Dr. A. L. Narayan. At the Cape Observatory the instrument employed was a Dallmeyer photoheliograph giving an image of the Sun about 7½ inches in diameter; at Kodaikánal a Cooke photo-visual object-glass of 6 inches aperture was used, the image of the Sun being on about the same scale.

Photographs of the Sun were available for measurement upon each day in 1938, those finally selected for measurement being supplied by the different observatories as under:

Greenwich	260
Cape	91
Kodaikanal	14
Total	365

The names of the measurers of the photographs for the year 1938 are as follows:

H. W. Newton
H. Barton
P. S. Laurie
J. Wickham

At the principal focus of the photoheliographs, excepting that at Kodaikánal, two spider-lines are fixed by which the zero of position-angles on the photographs can be determined. These lines are inclined at an angle of 45° to the celestial equator in the Greenwich and Cape photoheliographs; in the Kodaikánal instrument there is one wire fixed parallel to the equator.

The zero of position-angles for the photoheliographs has been determined by the measurement of plates which have been exposed twice, with an interval of about 100 seconds between the two exposures, the instrument being firmly clamped. Two images of the Sun, overlapping each other by about a fifth part of the Sun's diameter, were therefore produced upon the plates, and the exposures having been so given that the line joining the cusps passed approximately through the centre of the plates, the inclination of the wires of the photoheliograph to this line was measures with the position-micrometer, and a small correction for the inclination of the Sun's path was then applied. Two zero photographs were usually taken each month at Greenwich and at the Cape.

At Greenwich and the Cape, transits of the Sun were also taken over the two wires; the times of contact of the first and second limbs of the Sun with the two wires being noted. The ratio of the time taken by the Sun to pass over the NE - SW wire to that taken to pass over the SE - NW wire gives the tangent of the angle made by the Sun's path to the latter wire, the wires being assumed to be at right angles to each other. From this angle, when corrected for the Sun's motion in declination, the correction for the zero position of the wires can be inferred. Transits were taken usually on four or more days during each month.

The following table gives the correction for zero of position thus determined by the two independent methods for the 4-inch Greenwich and Cape Photoheliographs.

Determination of Zero of Position-Angles.

Month, 1938.	Greenwich.		Cape.	
	Photographic.	Visual.	Photographic.	Visual.
	° ′	° ′	° ′	° ′
January	+ 1 59	+ 2 11	+ 1 01	+ 1 04
February	+ 2 05	+ 2 05	+ 1 15	+ 1 08
March	+ 2 03	+ 2 07	+ 1 19	+ 1 16
April	+ 2 07	+ 2 03	+ 1 25	+ 1 19
May	+ 2 11	+ . ..	+ 1 22	+ 1 22
	+ 1 47	+ 1 48		
June	+ 1 51	+ 1 46	+ 1 25	+ 1 23
July	+ 1 45	+ 1 51	+ 1 24	+ 1 25
August	+ 1 47	+ 1 48	+ 1 21	+ 1 25
September . ..	+ 1 48	+ 1 50	+ 1 22	+ 1 24
October	+ 1 46	+ 1 49	+ 1 26	+ 1 26
November	+ 1 50	+ 1 47	+ 1 29	+ 1 22
December	+ 1 49	+ 1 55	+ 1 27	+ 1 20

The Zero-corrections used during the year 1938 in the reduction of the photographs taken at Greenwich were as follows:

	°
January 1 to May 10	+ 2·10
May 11 to December 31	+ 1·80

The cross wires were found broken on the morning of May 11 and were replaced a few hours later.

The Zero-corrections used in the reductions of the photographs taken at the Cape Observatory were as follows:-

	°
January and February	+ 1·10
March	+ 1·25
April and May	+ 1·35
June to December	+ 1·40

The Zero-correction adopted for the Kodaikánal photographs was + 0°·2 for Jan., Feb., Oct., Nov. and Dec: and + 0°·3 for April to August.

The measures of the photographs were made with a large position-micrometer constructed by Messrs. Troughton and Simms for the measurement of photographs of the Sun up to 12 inches in diameter. In this micrometer the photograph is held with its film-side uppermost on three pillars fixed on a circular plate, which can be turned through a small angle, about a pivot in its circumference, by means of a screw and antagonistic spring acting at the opposite extremity of the diameter. The pivot of this plate is mounted on the circumference of another circular plate, which can be turned by screw-action about a pivot in its circumference, 90° distant from that of the upper plate, this pivot being mounted on a circular plate with a position-circle which rotates about its centre. By this means small movements in two directions at right angles to each other can be readily given, and the photograph can be accurately centred with respect to the position-circle. When this has been done, a positive eyepiece, having at its focus a glass diaphragm ruled with cross-lines into squares, with sides of one-hundredth of an inch (for measurement of areas), is moved along a slide diametrically across the photograph, the diaphragm being nearly in contact with the photographic film, so that parallax is avoided. The distance of a spot or facula from the centre of the disk is read off by means of a scale and vernier to 1/250th inch (corresponding to 0·001 of the Sun's radius for photographs having a solar diameter of 8 inches). The position-angle is read off on the large position circle which rotates with the photographic plate. The photograph is illuminated by diffused light reflected from white paper placed at an angle of 45° between the photograph and the plate below.

Except in a few cases, all photographs were measured independently by two measurers, and the means taken.

In the case of large or complex groups of spots, the positions of the chief components are measured individually, and also for groups so near the east or west limbs of the Sun that the effects of foreshortening are appreciable. In other cases the position of the centre of a group is estimated in the micrometer. In this respect a difference has been made in the practice during years previous to 1916, where in this section components of groups are given separately and combined into groups in the Ledgers.

When required, corrections are applied to the measured distances and position-angles for differential refraction. The formula is given in the *Introduction* for 1909. It is seldom necessary, however, to apply this correction except to a few photographs taken at Greenwich in mid-winter.

The calculations of heliographic longitude and latitude are made by use of the formulæ given in "Researches on Solar Physics: Heliographical Positions and Areas of Sun Spots observed with the Kew Photoheliograph during the years 1862 and 1863", by W. De La Rue, B. Stewart, and B. Loewy. *Phil. Trans.*, 1869. If r be the measured distance of a spot from the centre of the Sun's apparent disk, **R** the measured radius of the Sun on the photograph, (R) the tabular semi-diameter of the Sun in arc, and ρ, ρ' the angular distances of a spot from the centre of the apparent disk as viewed from the Sun's centre and from the Earth respectively, ρ is obtained from the

equations:

$$\rho' = \frac{r}{R}\,(R): \text{ and } \sin(\rho + \rho') = \frac{r}{R}.$$

If D and ϕ are the heliographic latitudes of the Earth and the spot respectively referred to the Sun's equator, and l the heliographic longitude of the spot from the solar meridian passing through the centre of the disk, longitudes west of the centre being reckoned as positive, and χ the position-angle from the Sun's axis

$$\sin\phi = \cos\rho \sin D + \sin\rho \cos D \cos\chi$$

$$\sin l = -\sin\chi \sin\rho \sec\phi$$

χ is found from the position-angle measured from the north point by subtracting P, the position-angle of the north end of the Sun's axis, measured eastward from the north point of the disk. The heliographic longitude of the spot is l + L, where L is the heliographic longitude of the centre of the disk. The three quantities P, D, and L for the time of the exposure of each photograph are derived from the Ephemeris for Physical Observations of the Sun given on p.574 of the *Nautical Almanac* for 1938.

The inclination of the Sun's axis to the ecliptic is assumed to be 82°45′, the longitude of the ascending node of the Sun's equator on the ecliptic for 1938·0 to be 74°53′7, and the period of the Sun's sidereal rotation to be 25·38 days; the meridian which passed through the ascending node on 1854 January 1, Greenwich Mean Noon, being taken as the zero meridian.

§2. *General Catalogue of Groups of Sun Spots for* 1938.

The Catalogue contains every group of spots which lasted for two or more days, and the group numbers are in continuation of those given in 1937, and previous years. Groups seen only once are given with a distinctive numberation in a table which follows the Catalogue.

A number of "Revival" groups of spots have been tabulated in series in a table following the Catalogue and table of 1-day spots. The respective groups of each series are in the same heliographic position and were usually seen in consecutive rotations but with definite breaks in their history between each rotation. The latter feature excludes them from being classed as "Recurrent" groups; they differ from "Intermittent" groups in their being of long-period intermittency. When a "Recurrent" series forms part of a "Revival" series, a reference is made in the last column of the table. Other groups which are given in detail in Ledger II are also indicated.

§3. *Ledgers of the Areas and Heliographic Positions of Groups of Sun Spots for* 1938.

Ledger I. - Recurrent Groups. - This Ledger supersedes the Catalogue of Recurrent Groups of Sun Spots given in years previous to 1916 of the *Greenwich Photo-Heliographic Results,* and the reference numbers of the series are in continuation of those given therein. The groups forming this Ledger have been abstracted from a general Ledger of all spot groups seen throughout the year and were selected upon the following plan, reference being made to the General Catalogue:- If any spot group when first seen was 60° or more to the east of the Central Meridian, then the Catalogue, and, if necessary, the Daily Results also, were searched some fifteen or sixteen days earlier, to ascertain whether a spot group of similar heliographic longitude and latitude was then near the west limb of the Sun. Similarly, if any spot group when last seen was 60° or more to the west of the Central Meridian, then the Catalogue was searched some fifteen or sixteen days later, to ascertain whether a spot group of similar heliographic longitude and latitude was then near the east limb of the Sun. Both the search forward and the search backward have been made in the case of every spot group that was observed close to either the east or west limbs, in order that no possible case of identity might be overlooked. When there appeared to be a case of probable identity between spot groups observed in two consecutive rotations of the Sun, the character of the second group has been carefully compared with that of the first in each of the three elements - area, longitude, and latitude - before accepting it as a Recurrent Group.

Besides the Ledgers of the groups, there have been printed in a similar manner important components of the principal groups. This has been done in all cases where it appeared probable that an individual component lasted to the second or third rotation after its first appearance.

In deriving the proper motions of spots in longitude in Ledgers I and II, the formula adopted as representing the Sun's daily sidereal motion is

$$\xi = 14^\circ\cdot37 - 2^\circ\cdot60 \sin^2\phi$$

where ϕ is the latitude of the spot. *See Greenwich Photo-Heliographic Results,* 1924, § 5.

Ledger II. - Non-Recurrent Groups. - This ledger contains the most important of those groups which do not last to a second rotation. Individual components are also given after their respective groups, where they are large and distinctive.

§4. *Total Areas of Sun Spots and Faculæ for each day, and Mean Areas and Mean Heliographic Latitude of Sun Spots and Faculæ for each Rotation of the Sun, and for the year 1938.*

Particulars relating to this section are given in the headings on pages C 146 and 150-1.

§5. *Observations of Solar Flocculi made with the Spectrohelioscope in the year 1938.*

This section contains measures of radial velocity of dark hydrogen flocculi seen on the Sun's disk near sunspots. The observations were made at Greenwich with a Spectrohelioscope lent by the Mount Wilson Observatory in the autumn of 1929 and set up in the south attic of the Main Building. The observations were made by Mr. Newton, Mr. Barton and Mr. Laurie.

ROYAL OBSERVATORY, GREENWICH.

Positions and Areas of Sun Spots and Faculæ

For each Day in the Year

1938

POSITIONS AND AREAS OF SUN SPOTS AND FACULÆ FOR EACH DAY IN THE YEAR 1938.

Col. 1. (1) Time when photograph was taken expressed in days and decimals of a day reckoning from midnight at commencement of year. (2) Place of observation - Greenwich (G), Cape of Good Hope (C), Kodaikánal (K). (3) Date of Photograph.

Col. 2. Number of Spot Group in order of appearance and in continuation of the Group-numbers given in previous years. Groups seen on one day only are distinguished by the number of the Rotation during which they were observed and by a letter given in the order of their appearance. When there is no number in the second column it is to be understood that there is a Facula unaccompanied by a Spot.

Col. 3. Distance of Spot Group or Faculæ from Sun's centre in terms of the Sun's radius.

Col. 4. Position Angle of Spot Group or Faculæ measured from the north pole of the Sun's axis in the direction N., E., S., W., N.

Col. 5. Heliographic Longitude of the Spot Group derived from the measures.

Col. 6. Heliographic Latitude of the Spot Group similarly derived.

Col. 7. Area of Umbræ corrected for foreshortening in millionths of the Sun's visible hemisphere.

Col. 8. Area of Whole Spots composing the Group similarly expressed.

Col. 9. Area of each group of Faculæ similarly expressed. The positions of Faculæ relative to the Spots with which they are associated are indicated by the letters *n*, *s*, *p*, *f*, c, denoting respectively, north, south, preceding, following, concentric.

In line with the date of each day is given in brackets for the time of photograph the position angle of the Sun's axis from the north point: the heliographic longitude and latitude of the centre of the disk: the total areas of Spots and Faculæ for the day.

POSITIONS AND AREAS OF SUN SPOTS AND FACULÆ FOR EACH DAY IN THE YEAR.

U.T.	Group No.	Measures: Dist.	Measures: Pos. Angle	Position: Long.	Position: Lat.	Area: Umbræ	Area: Whole Spots	Area: Faculæ
			°	°	°			
1938								
0·372		·964	240·1					261
C		·963	260·9					304
		·933	293·3					214
	12652	·928	282·5	156·6	+10·4	5	16	252 *f*
	12653	·902	250·1	153·4	−19·3	50	225	452 *c*
	12650	·862	259·0	149·0	−11·1	38	204	383 *c*
	12658	·748	252·1	137·0	−15·4	40	150	
	12659	·592	308·0	119·1	+18·6	48	228	
	12655	·390	312·8	106·7	+12·4	18	83	
	12660	·210	187·3	91·3	−15·1	51	228	
	12662	·321	357·4	90·6	+15·5	4	17	
	12661	·911	83·7	24·7	+ 4·4	40	275	478 *f*
		·938	110·3					193
Jan. 1			(+2·1)	(89·7)	(−3·1)	(294)	(1426)	(2537)
1·353		·969	278·0					173
C	12653	·977	251·9	154·7	−18·4	34	200	437 *f*
	12650	·960	259·5	150·6	−11·0	37	224	316 *f*
	12658	·883	254·2	138·4	−15·4	55	397	143 *c*
	12659	·758	298·2	121·4	+18·6	68	370	
	12655	·585	298·0	108·7	+13·2	29	155	
	12660	·333	230·0	92·1	−15·4	26	198	
	12662	·385	324·0	90·4	+15·5	5	31	
	12661	·798	82·0	24·6	+ 4·4	35	208	324 *nf*
	12663	·911	74·6	12·9	+12·6	5	12	178 *f*
		·826	110·1					247
		·952	109·8					195
Jan. 2			(+1·6)	(76·8)	(−3·2)	(294)	(1795)	(2013)
2·292		·990	251·8					357
C		·963	262·3					77
	12658	·964	255·2	139·1	−15·2	54	527	233 *c*
	12659	·859	294·0	120·1	+18·5	73	380	206 *c*
	12655	·751	291·6	110·2	+13·7	12	93	
	12660	·517	247·1	93·7	−14·4	26	100	
	12661	·654	79·0	24·5	+ 4·6	38	178	
	12663	·801	70·0	13·8	+13·8	17	123	210 *c*
		·898	114·4					529
		·924	62·0					166
Jan. 3			(+1·2)	(64·4)	(−3·3)	(220)	(1401)	(1778)
3·321		·984	253·6					227
C		·889	248·9					198
	12659	·949	291·1	119·9	+18·7	77	519	288 *c*
	12655	·895	288·0	112·2	+14·4	2	7	303 *f*
	12660	·709	252·7	95·1	−14·6	38	156	
	12664	·724	330·9	76·6	+36·0	11	54	
	12661	·464	73·3	24·5	+ 4·6	43	203	
	12663	·638	64·3	14·8	+13·2	30	219	

U.T.	Group No.	Measures: Dist.	Measures: Pos. Angle	Position: Long.	Position: Lat.	Area: Umbræ	Area: Whole Spots	Area: Faculæ
			°	°	°			
1938								
		·947	114·5					154
		·949	81·4					342
Jan. 4			(+0·7)	(50·9)	(−3·4)	(201)	(1158)	(1512)
4·305		·957	250·0					338
C		·888	287·6					542
	12659	·968	288·8	111·3	+17·2	17	63	489 *c*
	12660	·861	256·0	96·8	−13·8	19	86	433 *f*
	12664	·792	324·0	73·3	+36·8	7	36	139 *c*
	12661	·266	59·0	24·7	+ 4·3	20	136	
	12663	·475	54·4	14·7	+12·7	47	349	
	1127c	·864	80·2	339·2	+ 6·5	5	19	336 *c*
	12665	·903	79·6	334·5	+ 7·8	5	20	298 *c*
	12666	·982	70·2	320·9	+18·7	10	21	131 *c*
		·899	57·0					233
Jan. 5			(+0·2)	(37·9)	(−3·6)	(130)	(730)	(2939)
5·289		·962	284·1					338
C		·843	285·1					240
	12660	·944	256·4	95·8	−14·1	26	114	514 *c*
	12664	·867	316·6	72·7	+36·5	19	146	193 *c*
	12661	·149	358·9	25·2	+ 4·8	15	70	
	12663	·333	30·5	15·1	+12·9	65	327	
	12667	·884	78·5	324·1	+ 8·3	14	82	443 *f*
	12666	·921	67·3	321·1	+19·2	13	122	250 *c*
	12668	·932	103·8	316·2	−14·2	3	11	322 *c*
		·795	76·4					129
		·964	113·2					252
Jan. 6			(−0·3)	(25·0)	(−3·7)	(155)	(872)	(2681)
6·207		·948	285·9					122
C		·906	256·0					171
	12660	·995	256·6	96·3	−13·7	10	81	362 *sf*
	12664	·932	312·2	73·1	+36·9	75	392	269 *c*
	12661	·269	303·4	24·7	+ 4·8	10	38	
	12663	·295	347·0	15·6	+12·9	81	367	
	12669	·790	61·6	324·4	+19·4	6	56	
	12667	·766	75·8	323·3	+ 8·3	25	111	
	12666	·843	64·0	318·5	+19·4	21	143	136 *c*
	12668	·822	105·0	316·8	−14·5	2	15	175 *f*
	12670	·883	59·9	315·0	+24·2	6	19	85 *c*
		·848	97·0					102
		·860	76·0					294
		·882	122·2					137
		·898	114·6					319
		·954	105·6					239
		·964	96·5					163
Jan. 7			(−0·8)	(11·7)	(−3·8)	(236)	(1222)	(2574)

Group 12662. Jan. 1–2. A pair of small spots.
Group 12663. Jan.2–13. One or two small spots on Jan.2–3, developing (not entirely on normal lines) into a very long stream of medium-sized spots.
Group 12664. Jan. 4–8. A pair of spots becoming prominent on Jan. 7.
Group 12665. Jan. 5–8. A small spot seen only on Jan. 5 and 8.
Group 12666. Jan.5–17. A large group of stream type with comparatively slow rise to maximum development.
Group 12667. Jan.6–15. A pair of spots, with an occasional companion, remaining much the same from day to day.
Group 12668. Jan.6–13. A few small spots individually unstable but continuing to mark a small disturbed area.
Group 12669. Jan.7–12. A small definite spot preceding Group 12666.
Group 12670. Jan.7–11. A small unstable stream *n* Group 12666.

POSITIONS AND AREAS OF SUN SPOTS AND FACULÆ FOR EACH DAY IN THE YEAR.

U.T.	Group No.	Measures: Dist.	Measures: Pos. Angle	Position: Long.	Position: Lat.	Area: Umbræ	Area: Whole Spots	Area: Faculæ
			°	°	°			
1938								
7·433		·931	293·1					131
G		·912	257·5					83
	12664	·982	309·4	69·3	+37·4	55	344	229 c
	1128a	·801	278·6	49·1	+ 4·5	2	11	
	12661	·495	287·7	24·8	+ 5·2	3	18	
	12663	·417	313·4	14·7	+12·9	109	689	
	12665	·433	64·0	333·7	+ 7·4	1	5	
	1128b	·465	124·8	333·0	−18·9	1	3	
	11667	·565	69·2	324·6	+ 8·3	26	80	
	12669	·638	52·5	324·3	+19·5	6	18	
	12668	·642	108·8	317·9	−15·0	3	8	
	12666	·721	56·8	316·8	+20·2	50	217	
	12670	·749	51·8	316·5	+24·6	8	29	
		·782	103·7					90
		·807	117·5					181
		·904	104·9					113
		·935	113·9					145
		·936	99·1					188
Jan. 8			(−1·3)	(356·7)	(−3·9)	(264)	(1422)	(1160)
8·522		·923	275·6					181
G		·891	290·9					259
	12661	·695	281·0	25·4	+ 4·7	3	15	
	12663	·598	297·8	15·1	+12·8	133	758	
	12667	·360	55·0	325·2	+ 8·0	21	64	
	12669	·486	37·0	324·5	+19·0	2	6	
	12668	·436	112·8	318·1	−13·4	2	12	
	12666	·568	45·9	316·8	+19·6	52	282	
	12670	·620	41·8	315·7	+23·8	31	111	
	12671	·772	105·6	292·4	−14·5	13	47	123 c
		·857	99·3					156
Jan. 9			(−1·8)	(342·4)	(−4·0)	(257)	(1295)	(719)
9·404		·959	289·0					188
G		·923	300·3					134
		·919	258·2					82
		·904	246·1					181
		·844	308·7					97
		·788	239·5					193
	12661	·832	278·1	26·3	+ 4·4	5	27	171 c
	12663	·740	291·4	15·6	+12·7	119	609	
	12667	·229	23·3	325·6	+ 8·0	15	37	
	12669	·404	15·9	324·2	+17·7	2	8	
	12666	·463	29·4	316·9	+19·8	58	333	
	12668	·291	124·8	316·6	−13·5	18	70	
	12670	·535	27·7	315·0	+24·3	21	120	
	12671	·629	108·6	292·9	−14·8	8	28	
		·842	74·0					139
		·891	101·1					99
		·952	66·6					341
Jan. 10			(−2·3)	(330·8)	(−4·1)	(246)	(1232)	(1625)

U.T.	Group No.	Measures: Dist.	Measures: Pos. Angle	Position: Long.	Position: Lat.	Area: Umbræ	Area: Whole Spots	Area: Faculæ
			°	°	°			
1938								
10·406		·933	275·9					214
G		·909	247·5					295
	12663	·876	286·6	16·6	+12·3	90	570	570 c
	12669	·410	337·5	327·1	+18·0	3	9	
	12667	·257	325·5	326·0	+ 8·0	18	61	
	12670	·477	1·1	317·0	+24·2	2	9	
	12668	·170	172·7	316·3	−13·8	6	15	
	12666	·409	3·9	315·9	+19·8	104	558	
	12671	·457	115·9	292·6	−14·7	5	15	
	12672	·986	62·6	240·9	+26·0	26	140	
		·916	63·5					458
Jan. 11			(−2·7)	(317·6)	(−4·2)	(254)	(1377)	(1537)
11·360		·969	274·9					159
K		·959	246·9					226
		·846	247·2					130
	12663	·957	283·7	16·6	+11·8	82	453	882 c
	12669	·513	315·5	327·0	+17·4	1	5	
	12667	·424	299·9	326·7	+ 8·2	10	54	
	12668	·260	229·1	316·6	−13·9	10	47	
	12666	·446	337·1	315·6	+19·9	146	947	
	12671	·314	130·8	290·8	−16·0	3	14	
	12672	·948	60·6	238·4	+26·0	47	317	637 f
	12673	·992	73·0	224·1	+16·2	138	1016	414 p
		·840	60·0					460
		·904	112·6					278
Jan. 12			(−3·2)	(305·0)	(−4·3)	(437)	(2853)	(3186)
12·112		·966	284·4					570
K	12663	·965	283·4	8·3	+11·7	11	64	
	12667	·560	291·5	326·7	+ 8·0	12	35	
	12666	·528	321·7	315·4	+20·2	198	1125	
	12668	·370	242·0	314·7	−14·1	6	27	
	12671	·201	167·5	292·5	−15·7	11	60	
	12672	·904	57·6	236·6	+26·7	56	357	600 c
	12673	·957	71·1	224·5	+16·6	340	1744	580 c
		·828	59·0					142
		·840	114·8					138
		·955	112·0					282
		·971	57·1					144
Jan. 13			(−3·6)	(295·1)	(−4·4)	(634)	(3412)	(2456)
13·283		·922	293·5					289
C		·894	305·1					111
		·882	279·5					334
		·828	238·3					121
	1128c	·985	267·6	359·7	− 3·2	6	11	242 p
	12667	·749	286·3	326·2	+ 9·0	25	82	
	12666	·682	305·8	315·6	+19·8	157	1183	

Group 12671. Jan. 9–15. A stream of small unstable spots.
Group 12672. Jan.11–21. Return of Group 12640. A cluster of spots with one surviving member after Jan.18, *np* Group 12673.
Group 12673. Jan.12–24. A great spot containing a series of umbræ. A medium-sized regular spot appears as an off-shoot between Jan.13 and 14. A lane of bright photospheric matter begins to invade the central part of the great spot on January 18 and 19, and is a conspicuous feature along its major axis on January 20–22.

POSITIONS AND AREAS OF SUN SPOTS AND FACULÆ FOR EACH DAY IN THE YEAR.

U.T.	Group No.	Measures Dist.	Measures Pos. Angle	Position Long.	Position Lat.	Area Umbræ	Area Whole Spots	Area Faculæ
			°	°	°			
1938								
	12671	·287	228·5	292·5	−15·3	9	39	
	12672	·779	50·4	237·8	+26·4	33	218	329 c
	12673	·840	66·9	226·2	+16·6	350	2287	439 c
	12674	·951	73·5	210·2	+13·5	34	126	181 c
		·904	50·7					242
		·945	63·9					127
Jan. 14			(−4·1)	(279·7)	(−4·5)	(614)	(3946)	(2415)
14·427 G		·967	280·2					270
		·814	285·7					213
		·809	255·3					285
	12667	·896	281·8	326·8	+ 8·4	15	58	213 c
	12666	·830	297·8	315·7	+19·9	160	1526	598 c
	12671	·490	244·9	292·0	−16·0	2	10	
	12672	·648	38·8	237·8	+26·2	17	93	
	12673	·677	59·0	227·5	+16·7	402	3019	
	12675	·813	60·4	215·7	+20·6	5	19	197 f
	12674	·847	70·7	209·5	+13·6	22	125	345 f
	12676	·938	98·9	194·7	− 9·9	3	13	136 f
		·937	119·7					389
		·965	79·9					293
Jan. 15			(−4·7)	(264·6)	(−4·6)	(626)	(4863)	(2939)
15·376 C		·975	281·7					347
		·912	256·1					324
		·894	281·3					190
		·840	241·5					317
	12666	·928	293·9	316·5	+20·1	191	1485	540 c
	12672	·570	22·7	237·9	+27·1	20	132	
	12673	·558	49·3	225·9	+17·0	524	3116	
	12675	·706	55·0	214·2	+20·1	4	23	
	12674	·716	66·4	209·9	+13·2	23	126	101 c
	12676	·839	98·3	194·9	− 9·5	2	5	186 f
		·808	58·5					109
		·861	79·5					368
		·953	99·5					341
		·955	77·7					305
Jan. 16			(−5·1)	(252·1)	(−4·7)	(764)	(4887)	(3128)
16·442 G		·980	254·8					202
		·971	279·4					187
		·940	244·2					257
		·842	254·0					418
	12666	·989	291·2	316·8	+19·9	259	1564	421 c
	12672	·526	1·7	237·1	+26·8	23	103	
	12673	·422	28·5	226·0	+17·3	655	3179	
	12675	·531	41·4	216·4	+18·9	2	17	
	12674	·542	55·9	210·7	+13·4	13	79	

U.T.	Group No.	Measures Dist.	Measures Pos. Angle	Position Long.	Position Lat.	Area Umbræ	Area Whole Spots	Area Faculæ
			°	°	°			
1938								
	12677	·495	75·4	210·3	+ 2·8	2	16	
	12676	·704	99·9	194·5	−10·4	3	25	
		754	76·2					85
		·833	98·6					146
		·868	75·4					324
		·890	61·6					75
		·942	51·7					143
		·942	123·8					406
		·948	98·6					268
		·953	109·1					134
Jan. 17			(−5·6)	(238·1)	(−4·8)	(957)	(4983)	(3066)
17·282 C		·932	241·5					185
		·897	265·4					122
	1128d	·925	255·2	295·0	−15·5	3	10	371 c
	12672	·545	343·8	236·8	+26·6	13	53	
	12673	·381	4·1	225·5	+17·3	628	3292	
	12675	·423	24·6	216·5	+17·8	6	30	
	12674	·411	41·2	211·0	+13·2	12	53	
	12677	·319	62·6	210·7	+ 3·7	2	13	
	12678	·964	100·9	155·2	−17·7	7	54	515 n
		·836	122·2					228
		·856	98·6					217
		·890	135·5					217
		·921	48·4					138
		·938	74·9					209
		·951	124·2					274
		·954	110·4					548
Jan. 18			(−6·0)	(227·1)	(−4·9)	(671)	(3505)	(3024)
18·453 G		·962	254·5					311
		·917	284·1					148
		·860	296·9					115
		·790	307·1					172
	12672	·641	323·6	236·6	+26·4	8	17	
	12673	·439	329·4	225·1	+17·3	698	3217	
	12675	·393	347·5	216·7	+17·5	4	23	
	12674	·314	1·3	211·2	+13·2	3	12	
	12677	·191	7·3	210·2	+ 5·9	0	5	
	1128e	·398	56·6	192·1	+ 7·9	2	10	
	12679	·516	100·9	180·8	− 9·9	6	37	
	12678	·823	111·1	157·0	−20·1	34	95	410 f
	12680	·864	101·0	151·7	−12·0	4	22	352 c
	12681	·933	103·3	142·3	−14·2	12	66	334 f
		·843	74·5					129
		·874	125·5					319
		·950	73·9					221
Jan. 19			(−6·5)	(211·6)	(−5·0)	(771)	(3504)	(2511)

Group 12674. Jan. 14–19. A diminishing regular spot with a double nucleus.
Group 12675. Jan. 15–20. One or two small unstable spots *f* Group 12673.
Group 12676. Jan. 15–17. A small spot.
Group 12677. Jan. 17–19. One or two small spots.
Group 12678. Jan. 18–28. Return of Group 12653. A short stream in which the leader is the only important component.
Group 12679. Jan. 19–27. A typical stream of normal type; there is less than the normal separation in longitude between the leader and follower spots.
Group 12680. Jan. 19–23. A very small spot not seen on Jan. 22.
Group 12681. Jan. 19–22. Return of Group 12658. A small regular spot disappearing rather suddenly.

POSITIONS AND AREAS OF SUN SPOTS AND FACULÆ FOR EACH DAY IN THE YEAR.

U.T.	Group No.	Measures: Dist.	Measures: Pos. Angle	Position: Long.	Position: Lat.	Area: Umbræ	Area: Whole Spots	Area: Faculæ
			°	°	°			
1938								
19·415		·949	289·9					339
G		·868	302·6					302
	12672	·745	312·9	236·4	+26·4	3	17	
	12673	·562	311·4	225·1	+17·2	560	3379	
	12675	·449	331·7	211·9	+18·2	0	7	
	12679	·297	105·9	182·2	− 9·5	16	75	
	12678	·670	114·2	158·7	−19·8	33	187	193 *f*
	12680	·733	101·3	151·9	−11·8	3	16	133 *f*
	12681	·829	103·3	143·1	−13·8	8	53	212 *f*
	12682	·989	67·7	120·4	+21·1	20	197	
		·869	70·6					156
		·943	111·4					287
Jan. 20			(−7·0)	(199·0)	(−5·1)	(643)	(3931)	(1622)
20·307		·943	298·2					340
C	12672	·839	306·2	236·0	+26·2	4	12	418 *n*
	12673	·682	301·6	224·4	+16·9	605	3627	318 *p*
	12679	·113	134·6	182·5	− 9·7	27	106	
	1128f	·171	141·0	180·9	−12·8	2	8	
	12678	·506	120·2	159·7	−19·3	21	134	
	12680	·586	102·8	151·6	−11·7	1	4	
	12681	·699	104·5	143·2	−13·8	9	18	209 *f*
	12682	·947	65·8	119·8	+20·9	26	183	161 *p*
		·783	66·0					209
		·868	113·6					188
		·922	56·3					113
		·928	96·2					166
		·947	72·8					209
		·951	109·6					328
Jan. 21			(−7·4)	(187·2)	(−5·2)	(695)	(4092)	(2659)
21·391		·978	296·2					193
G		·935	247·5					145
		·930	295·2					190
		·915	307·9					433
		·880	238·9					176
	12673	·824	295·3	224·0	+17·3	517	3196	729 *c*
	12679	·195	245·0	183·2	−10·0	66	269	
	12683	·236	334·1	178·8	+ 6·9	9	24	
	12684	·387	41·9	157·7	+11·6	7	35	
	12678	·323	140·7	157·1	−19·6	25	109	
	1128g	·431	116·8	149·4	−16·0	2	8	
	12681	·509	107·8	143·1	−13·5	5	13	
	12685	·816	95·7	119·9	− 7·8	2	6	166 *c*
	12682	·853	62·0	119·6	+20·4	29	169	220 *c*
	12686	·932	103·1	103·8	−14·1	5	12 }	460 *f*
	12687	·959	95·5	99·1	− 6·8	7	19 }	
1938								
		·855	113·8					229
		·959	70·5					190
Jan. 22			(−7·9)	(172·9)	(−5·3)	(674)	(3860)	(3131)
22·436		·975	304·9					471
G		·957	248·4					221
		·951	240·0					146
		·910	314·6					130
		·853	243·9					120
		·749	294·7					366
	12673	·928	291·1	224·1	+17·3	474	2983	1265 *c*
	12679	·424	258·3	184·0	− 9·8	39	202	
	12683	·422	300·2	180·7	+ 7·2	8	13	
	12684	·308	5·3	157·5	+12·4	22	77	
	12678	·248	188·3	157·0	−19·5	18	93	
	12680	·160	134·2	152·6	−11·8	2	11	
	1128h	·379	125·5	140·4	−17·8	2	19	
	12688	·762	42·7	122·8	+29·7	8	23	
	12685	·631	95·9	120·0	− 7·9	6	22	
	12682	·736	55·5	119·0	+20·5	24	149	
	12687	·863	94·1	99·4	− 6·3	9	13 }	416 *c*
	12686	·876	101·9	97·8	−13·0	4	17 }	
	12689	·979	69·7	83·8	+18·5	15	60	404 *c*
		·863	69·4					171
		·930	108·1					235
		·975	61·5					201
Jan. 23			(−8·3)	(159·2)	(−5·4)	(631)	(3682)	(4146)
23·280		·953	311·3					143
C		·945	245·7					133
		·868	289·3					372
		·854	303·3					222
		·771	241·4					171
		·745	292·5					263
	12673	·977	289·7	223·1	+17·9	480	2423	1046 *c*
	12679	·578	259·7	183·3	−10·4	29	180	
	12683	·593	289·3	182·3	+ 6·8	5	18	
	12678	·344	221·3	162·0	−20·1	17	80	
	12684	·348	333·1	157·4	+12·7	11	46	
	12685	·470	96·3	120·1	− 7·7	6	24	
	12682	·627	47·1	118·9	+20·5	35	177	
	12687	·734	93·3	100·8	− 6·1	3	6 }	362 *c*
	12686	·762	102·9	98·6	−13·3	11	49 }	
	12689	·891	67·5	88·8	+17·2	4	19	347 *f*
		·899	108·5					177
		·926	57·5					170
Jan. 24			(−8·7)	(148·1)	(−5·4)	(601)	(3022)	(3406)

Group 12682. Jan.20–Feb.1. Return of Group 12659. A stable regular spot.
Group 12683. Jan.22–25. A small group of bi-polar type reduced to one component spot by Jan.24.
Group 12684. Jan.22–28. Small ephemeral spots in a stream which lengthens rapidly.
Group 12685. Jan.22–24. A few small faint spots.
Group 12686. Jan.22–26. Return of Group 12660. A pair of spot-centres widely separated in longitude.
Group 12687. Jan.22–24. A single spot.
Group 12688. Jan.23–27. Intermittent. A small cluster on Jan.23 which re-appears on Jan.26–27.
Group 12689. Jan.23–24. A small group in well-defined faculæ.

POSITIONS AND AREAS OF SUN SPOTS AND FACULÆ FOR EACH DAY IN THE YEAR.

U.T.	Group No.	Measures Dist.	Measures Pos. Angle	Position Long.	Position Lat.	Area Umbræ	Area Whole Spots	Area Faculæ
			°	°	°			
1938								
24·283		·952	286·8					497
C		·936	301·5					336
		·870	285·6					348
		·837	238·2					304
	12683	·773	284·0	183·8	+ 7·2	5	13	
	12679	·747	261·0	183·3	−10·4	22	92	
	12678	·503	237·7	161·8	−20·4	10	42	
	12684	·499	305·4	159·3	+11·8	11	66	
	1128i	·302	259·9	152·3	− 8·2	3	15	
	12682	·509	31·8	118·4	+20·2	35	172	
	12686	·611	104·7	97·7	−13·3	10	43	
		·806	64·0					290
		·844	53·2					223
		·969	50·4					229
Jan. 25			(−9·2)	(134·9)	(−5·5)	(96)	(443)	(2227)
25·422		·970	284·0					360
G		·933	240·2					401
		·887	284·7					209
		·789	232·1					194
	12679	·903	260·7	184·8	−10·8	17	90	220 *c*
	12678	·689	246·5	162·0	−20·1	9	30	
	12684	·712	292·4	161·9	+11·5	13	58	
	12688	·588	357·5	121·6	+30·2	6	22	
	12682	·433	4·3	117·9	+19·9	26	166	
	12690	·342	8·9	116·8	+14·1	2	4	
	12686	·379	113·4	99·0	−13·8	4	13	
	1128j	·556	99·0	86·2	− 9·6	5	16	
	12692	·743	45·8	83·5	+26·6	25	91	
	12691	·708	55·6	81·9	+19·1	14	48	
		·850	58·3					122
		·936	111·3					85
		·941	47·3					365
		·965	58·5					171
Jan. 26			(−9·7)	(119·9)	(−5·6)	(121)	(538)	(2127)
26·457		·969	282·1					151
G		·961	243·7					193
		·877	235·1					286
		·849	261·5					143
	12679	·981	259·9	185·7	−11·0	10	28	171 *f*
	12684	·875	286·4	165·0	+11·4	13	58	283 *f*
	12678	·818	249·5	160·7	−19·9	6	15	186 *c*
	12688	·618	335·7	123·1	+28·7	1	4	
	12682	·468	336·3	117·8	+19·7	31	162	
	12690	·388	331·4	117·3	+14·2	1	4	
	12691	·575	43·3	81·7	+19·5	13	29	
	12692	·659	34·9	81·2	+27·5	9	28	
	12693	·985	75·9	28·7	+12·2	25	99	254 *c*
		·858	40·5					274
1938								
		·951	43·9					226
		·968	84·5					94
Jan. 27			(−10·1)	(106·3)	(−5·7)	(109)	(427)	(2261)
27·131		·929	238·4					216
K		·902	262·6					289
		·864	228·3					219
		·856	288·8					212
	12684	·937	284·4	164·9	+11·2	6	23	129 *p*
	12678	·911	249·9	163·3	−20·7	12	48	284 *c*
	12694	·582	300·4	128·2	+12·1	26	77	
	12682	·537	322·2	117·8	+19·6	28	161	
	1128k	·388	21·5	89·0	+15·4	2	9	
	12691	·501	31·0	81·6	+19·8	5	15	
	12693	·957	74·9	26·4	+12·6	81	410	389 *c*
		·834	37·9					235
		·934	83·6					167
		·945	40·3					213
		·964	111·8					92
Jan. 28			(−10·4)	(97·4)	(−5·8)	(160)	(743)	(2445)
28·402		·966	284·5					198
G		·964	251·3					209
		·961	261·7					211
		·936	235·9					267
		·894	290·4					101
		·864	249·7					426
		·857	299·1					150
	12694	·774	291·4	128·0	+12·4	67	280	156 *c*
	12682	·697	306·0	117·2	+19·4	36	149	
	12695	·544	13·0	72·8	+26·0	11	28	
	12693	·849	70·7	25·5	+12·9	121	602	532 *c*
	12696	·935	93·7	11·5	− 5·6	28	108	258 *c*
		·880	113·1					270
Jan. 29			(−10·9)	(80·6)	(−5·9)	(263)	(1167)	(2778)
29·384		·954	243·2					269
C		·952	256·8					365
		·832	243·0					256
		·830	263·1					215
	12694	·898	287·0	129·1	+12·4	47	282	231 *c*
	12682	·824	299·0	117·5	+19·7	18	166	100 *c*
	12695	·531	353·8	71·3	+25·9	6	22	
	12693	·710	64·2	26·8	+13·5	113	590	191 *f*
	12696	·821	92·5	12·4	− 5·5	10	66	250 *c*
		·885	69·5					198
		·974	99·2					343
Jan. 30			(−11·4)	(67·7)	(−5·9)	(194)	(1126)	(2418)

Group 12690. Jan.26–27. A small spot *s* Group 12682.
Group 12691. Jan.26–28. A small ephemeral stream.
Group 12692. Jan.26–27. A small ephemeral stream on the same meridian as Group 12691.
Group 12693. Jan.27–Feb.8. A large stream of normal type.
Group 12694. Jan.28–31. A pair of spots representing the simplest form of a group of stream type.
Group 12695. Jan.29–31. A wide pair of small spots of which one remains on Jan.31.
Group 12696. Jan.29–Feb.7. A small group which has disappeared by Feb.3; a small spot re-appears on Feb. 7.

POSITIONS AND AREAS OF SUN SPOTS AND FACULÆ FOR EACH DAY IN THE YEAR.

U.T.	Group No.	Measures: Dist.	Measures: Pos. Angle	Position: Long.	Position: Lat.	Area: Umbræ	Area: Whole Spots	Area: Faculæ
			°	°	°			
1938								
30·278		·943	305·8					155
C		·927	246·9					209
		·905	263·1					248
		·833	245·1					189
		·753	259·3					164
	12694	·966	284·5	128·9	+12·3	38	233	316 *c*
	12682	·908	294·5	116·7	+19·3	30	164	183 *c*
	12695	·558	339·7	68·2	+25·6	2	8	
	12693	·559	56·3	27·5	+12·7	110	690	
	12696	·665	91·3	14·2	- 5·3	9	29	
	12697	·938	99·7	345·7	-11·2	24	172	250 *c*
		·800	62·5					261
		·940	80·4					280
Jan. 31			(-11·7)	(55·9)	(-6·0)	(213)	(1296)	(2255)
31·393		·966	258·0					186
G		·949	247·1					358
		·943	305·3					161
		·901	291·1					260
		·848	260·2					479
		·798	294·4					153
		·787	308·2					302
		·774	246·4					129
	12682	·982	291·4	117·2	+19·6	28	168	278 *s*
	12698	·445	302·8	63·4	+ 8·3	15	52	
	12693	·399	36·6	27·2	+12·7	98	679	
	12696	·479	89·7	12·7	- 5·2	9	57	
	12697	·827	99·7	345·3	-11·4	38	225	236 *c*
		·881	77·0					411
		·969	104·6					295
		·970	69·4					446
		·973	78·0					258
Feb. 1			(-12·2)	(41·3)	(-6·1)	(188)	(1181)	(3947)
32·288		·965	289·5					205
C		·935	260·1					366
		·887	291·4					192
		·874	251·2					354
		·850	302·3					366
		·763	334·5					246
		·748	352·7					236
	12698	·606	292·5	63·8	+ 8·3	21	76	
	12693	·324	5·0	27·8	+12·6	110	656	
	12696	·305	88·3	11·7	- 5·3	11	59	
	12697	·702	99·9	344·8	-11·3	50	245	
	12699	·979	105·9	310·3	-16·7	10	50	224 *f*
		·863	74·5					299
		·903	105·1					158
		·929	63·3					450
		·945	78·2					228
		·948	49·7					169

U.T.	Group No.	Measures: Dist.	Measures: Pos. Angle	Position: Long.	Position: Lat.	Area: Umbræ	Area: Whole Spots	Area: Faculæ
			°	°	°			
1938								
		·983	70·1					269
Feb. 2			(-12·5)	(29·5)	(-6·1)	(202)	(1086)	(3762)
33·468		·950	289·4					234
G		·944	249·4					261
		·920	301·8					278
		·844	323·8					192
		·810	340·2					162
	12698	·796	285·3	64·6	+ 8·2	9	25	149 *c*
	12693	·392	323·8	28·0	+12·4	130	657	
	12697	·477	102·3	345·7	-11·2	76	379	
	12699	·897	105·6	309·7	-16·7	10	44	482 *c*
	12700	·991	110·4	290·0	-21·0	32	188	
		·801	72·2					135
		·843	58·3					463
		·913	43·2					110
		·925	67·4					677
		·936	118·0					146
Feb. 3			(-13·0)	(13·9)	(-6·2)	(257)	(1293)	(3289)
34·479		·966	298·2					215
G		·900	317·8					228
		·864	331·2					182
	12698	·925	281·6	66·6	+ 8·2	5	11	289 *nf*
	12701	·642	237·9	37·3	-25·0	6	20	
	12693	·551	304·6	28·2	+12·6	90	643	
	12697	·263	110·0	346·1	-11·2	59	331	
	12699	·778	107·0	309·7	-17·1	11	41	213 *f*
	12702	·879	110·3	299·0	-20·8	4	9	273 *c*
	12700	·941	110·2	289·7	-21·1	38	130	466 *c*
	12703	·947	113·0	288·6	-23·8	3	6	
		·759	52·1					272
		·830	63·0					506
		·926	58·2					156
Feb. 4			(-13·4)	(0·6)	(-6·3)	(216)	(1191)	(2800)
35·438		·949	313·2					256
G		·898	325·0					241
	12698	·974	280·4	63·4	+ 8·6	4	20	210 *c*
	12701	·790	244·0	39·0	-24·3	3	12	
	12693	·700	296·0	28·1	+13·0	115	661	
	12697	·093	155·4	345·7	-11·1	59	276	
	12699	·632	108·9	309·5	-16·7	14	44	
	12702	·766	111·4	298·7	-20·4	2	7	
	12700	·854	110·6	289·4	-20·8	27	132	360 *c*
	12703	·905	114·6	283·1	-24·9	26	90	
		·751	52·0					68
		·839	100·2					75
		·858	54·6					169
Feb. 5			(-13·8)	(348·0)	(-6·3)	(250)	(1242)	(1379)

Group 12697. Jan.31–Feb.11. A regular spot preceded by small companions increasing to a small stream about Feb.4. The regular spot partly breaks up on Feb.7–8 but continues to the west limb.
Group 12698. Feb. 1– 5. A small short-lived stream.
Group 12699. Feb. 2–12. A small regular spot gradually dying out; there is an occasional small companion.
Group 12700. Feb. 3–12. A regular spot disappearing rather suddenly. Group 12703 develops closely south-following.
Group 12701. Feb. 4– 6. A tiny stream on Feb.4: a single small spot on Feb. 5 and 6.
Group 12702. Feb. 4–11. One or more very small spots in the wake of Group 12699.
Group 12703. Feb. 4–16. A very large stream of spots beginning as a tiny spot on Feb.4. The stream is approximately of normal type, but it becomes somewhat complex after Feb.9. The rear portion is dying out rapidly as the west limb is approached.

POSITIONS AND AREAS OF SUN SPOTS AND FACULÆ FOR EACH DAY IN THE YEAR.

U.T.	Group No.	Measures: Dist.	Measures: Pos. Angle	Position: Long.	Position: Lat.	Area: Umbræ	Area: Whole Spots	Area: Faculæ
			°	°	°			
1938								
36·334		·983	275·6					168
C		·955	251·1					168
		·941	313·4					184
		·916	263·1					176
		·913	324·4					217
		·883	279·6					190
	12701	·894	245·9	39·5	−24·3	2	9	136 c
	12693	·822	290·7	28·1	+12·9	84	555	715 c
	12704	·554	249·0	8·8	−16·8	5	24	
	12697	·184	241·9	345·7	−11·3	66	277	
	12699	·477	114·0	309·2	−16·9	15	53	
	12702	·645	115·2	297·7	−20·9	1	4	
	12700	·739	112·2	289·4	−20·5	24	134 }	299 c
	12703	·812	116·7	284·5	−22·8	30	134 }	
		·900	72·6					292
		·931	111·2					278
Feb. 6			(−14·2)	(336·2)	(−6·4)	(227)	(1190)	(2823)
37·457		·972	245·6					182
G		·968	257·4					149
		·864	247·4					268
		·846	277·4					151
		·796	301·4					228
	12693	·946	286·2	30·0	+13·0	68	477	1025 c
	12696	·754	269·2	10·4	− 4·9	2	5	234 p
	12704	·741	252·6	9·0	−17·2	7	19	
	12697	·418	257·6	345·9	−11·1	79	429	
	1129a	·412	12·8	316·0	+17·2	2	14	
	12705	·497	14·6	313·7	+22·2	4	17	
	12699	·278	131·2	308·8	−16·9	12	47	
	12702	·432	121·6	298·6	−19·0	4	19	
	12700	·563	117·7	289·3	−20·7	29	143	
	12703	·646	121·8	284·2	−25·1	88	526	
	12706	·988	74·0	242·7	+14·6	28	164	
		·956	60·8					328
		·959	48·4					132
Feb. 7			(−14·6)	(321·4)	(−6·5)	(323)	(1860)	(2697)
38·315		·933	248·7					303
C		·867	267·1					319
		·847	252·8					153
	12693	·990	284·1	29·9	+12·9	58	274	728 c
	12697	·587	260·7	346·1	−10·7	80	479	
	12705	·461	1·7	309·3	+20·8	2	7	
	12699	·178	174·7	309·1	−16·6	9	36	
	12702	·288	137·1	298·2	−18·5	2	18	
	12700	·417	126·3	289·2	−20·3	15	125	
	12703	·504	130·5	285·2	−25·0	122	1042	
	12706	·941	71·3	242·9	+15·1	25	147 }	453 c
	12707	·983	74·7	233·0	+13·7	26	122 }	
		·818	113·1					112

U.T.	Group No.	Measures: Dist.	Measures: Pos. Angle	Position: Long.	Position: Lat.	Area: Umbræ	Area: Whole Spots	Area: Faculæ
			°	°	°			
1938								
		·895	55·9					269
Feb. 8			(−14·9)	(310·1)	(−6·5)	(339)	(2250)	(2337)
39·382		·972	284·8					182
G		·963	246·3					199
		·963	264·7					419
		·956	254·3					190
		·790	285·5					203
	12697	·776	262·4	347·3	−10·1	61	314	304 c
	12699	·288	231·0	309·2	−16·5	7	19	
	12702	·231	193·2	299·3	−19·5	2	20	
	12700	·269	155·4	289·3	−20·7	26	128	
	12703	·351	156·2	287·1	−25·2	204	1031	
	12706	·840	67·3	242·9	+15·0	26	136 }	2087 c
	12707	·963	71·5	224·6	+15·8	101	596 }	
	1129b	·916	107·8	229·1	−19·0	5	11	218 f
	12708	·975	94·4	218·7	− 5·7	4	20	417 c
		·801	51·3					199
		·893	96·3					116
		·954	53·5					303
Feb. 9			(−15·3)	(296·1)	(−6·6)	(436)	(2275)	(4837)
40·623		·919	283·5					379
G		·819	292·8					351
		·760	308·7					336
	12697	·931	262·6	348·7	− 9·3	54	278	629 c
	1129c	·688	285·0	321·4	+ 5·3	3	9	
	12709	·598	302·3	310·8	+12·9	1	7	
	12699	·516	248·4	309·6	−16·7	5	15	
	12702	·377	235·1	298·7	−18·7	2	14	
	12700	·292	211·9	289·2	−20·8	14	80	
	12703	·328	198·7	286·3	−24·6	196	1242	
	12706	·677	59·0	242·9	+15·1	18	133	
	12707	·842	66·4	226·6	+15·8	102	485	1392 c
	12708	·832	91·6	223·3	− 5·0	12	85	324 f
	12710	·980	99·9	200·5	−11·0	16	56	367 c
		·823	109·3					273
		·916	49·0					504
Feb. 10			(−15·8)	(279·7)	(−6·6)	(423)	(2404)	(4555)
41·391		·964	279·4					170
G		·901	294·7					211
		·842	282·0					351
		·832	252·9					226
		·806	306·2					546
	12697	·972	261·7	346·6	− 9·6	27	163	488 s
	12709	·757	295·1	314·4	+13·9	2	10	134 c
	12699	·650	252·0	309·6	−16·7	1	15	
	12702	·523	244·3	299·4	−18·9	2	8	
	12700	·404	231·3	289·2	−20·9	13	80	

Group 12704. Feb. 6–7. A tiny ephemeral stream.
Group 12705. Feb. 7–8. Two small spots widely separated in longitude on Feb.7; one spot remains on Feb. 8.
Group 12706. Feb. 7–18. With Group 12707, a return of Group 12673. A stable regular spot.
Group 12707. Feb. 8–20. A stream, apparently in its declining stages, within an extensive area of faculæ. The chief components are at the rear; throughout there are considerable changes.
Group 12708. Feb. 9–19. One or two small spots becoming a small stream from Feb.14–16.
Group 12709. Feb.10–13. A small faint spot.
Group 12710. Feb.10–22. A stream in which both components – leader and follower – are double on Feb.12 and 13.

POSITIONS AND AREAS OF SUN SPOTS AND FACULÆ FOR EACH DAY IN THE YEAR.

U.T.	Group No.	Measures: Dist.	Measures: Pos. Angle	Position: Long.	Position: Lat.	Area: Umbræ	Area: Whole Spots	Area: Faculæ
			°	°	°			
1938								
	12703	·411	216·9	285·4	−25·5	204	1170	
	12706	·567	50·4	242·8	+15·2	23	127	
	12707	·745	61·8	226·8	+15·7	66	439	920 *f*
	12708	·704	90·6	224·8	− 5·2	9	41	142 *f*
	12710	·924	99·0	201·6	−10·8	29	135	508 *c*
	12711	·959	117·7	195·1	−28·4	7	19	493 *f*
	12712	·970	96·9	193·2	− 8·3	34	123	238 *f*
		·861	44·4					438
		·900	108·4					105
		·939	72·7					314
Feb. 11			(−16·0)	(269·6)	(−6·7)	(417)	(2330)	(5284)
42·398 G		·960	291·1					345
		·934	253·8					186
		·928	277·8					305
		·865	302·4					734
		·852	288·4					211
		·773	316·6					196
	12699	·801	254·2	309·7	−16·6	2	7	459 *c*
	12700	·579	242·8	289·7	−20·9	8	36	
	12703	·567	233·8	286·7	−25·3	152	1255	
	1129d	·371	158·8	247·8	−26·7	2	8	
	12706	·434	32·0	242·7	+15·0	19	111	
	12708	·507	90·0	225·9	− 5·8	5	41	
	12707	·616	54·3	225·3	+15·3	67	582 }	
	12710	·806	98·6	202·4	−10·8	40	180 }	155 *c*
	12711	·891	119·4	193·9	−29·1	23	115 }	
	12713	·898	115·0	192·4	−25·3	5	25 }	337 *c*
	12712	·902	95·9	191·6	− 8·2	54	274	
	12714	·933	98·0	187·0	− 9·8	18	114	239 *c*
	12715	·954	77·7	185·7	+ 9·6	15	54	372 *c*
	12716	·967	102·0	180·4	−13·2	8	68	232 *c*
		·787	51·4					203
		·798	37·7					271
		·875	72·6					207
		·884	60·8					351
Feb. 12			(−16·4)	(256·4)	(−6·7)	(418)	(2870)	(4803)
43·435 G		·984	254·6					167
		·951	295·1					925
		·924	249·8					352
		·919	257·5					165
		·899	306·6					276
		·832	249·2					284
	12709	·949	284·8	312·0	+11·7	3	14	223 *c*
	12703	·732	241·2	287·8	−25·5	168	1183	
	12706	·365	359·2	243·0	+14·5	32	130	
	12707	·464	38·4	225·4	+14·7	68	644	
	12708	·301	87·7	225·2	− 5·8	2	14	
	12710	·637	99·1	203·0	−11·0	63	356	
	12713	·771	118·7	196·3	−21·5	2	7 }	318 *c*
	12711	·787	122·5	193·2	−29·5	25	124 }	
1938								
	12717	·772	112·3	192·8	−21·5	5	13	56 *c*
	12712	·779	95·1	191·3	− 8·3	57	362 }	155 *c*
	12714	·818	97·2	187·5	− 9·8	22	152 }	
	12715	·845	74·6	187·3	+ 9·1	4	24	223 *f*
	12716	·878	101·9	180·8	−13·7	62	288	389 *c*
		·934	119·2					497
		·946	72·1					398
		·967	81·7					610
		·984	107·8					238
Feb. 13			(−16·8)	(242·7)	(−6·8)	(513)	(3311)	(5276)
44·445 G		·958	297·3					506
		·944	251·9					615
	12703	·850	244·7	287·2	−25·0	171	1292	392 *c*
	12706	·421	327·2	243·0	+14·1	18	103	
	12707	·362	6·5	227·0	+14·2	81	629	
	1129e	·212	21·4	225·0	+ 4·5	2	5	
	12708	·101	73·2	223·8	− 5·1	7	31	
	12718	·211	89·5	217·2	− 6·5	6	60	
	12710	·422	101·5	204·6	−11·0	66	298	
	12719	·587	55·7	199·6	+13·4	2	8	
	12711	·650	128·9	194·0	−29·6	14	76	
	12717	·606	116·4	192·6	−21·2	22	60	
	12712	·609	94·9	191·7	− 8·3	65	353	
	12714	·662	96·9	187·8	− 9·7	17	129	
	12715	·708	72·1	186·8	+ 7·5	20	59	
	12716	·746	102·2	181·0	−13·6	69	424	161 *c*
	1129f	·871	69·1	172·5	+14·4	2	4	311 *p*
		·835	117·1					298
		·908	78·7					824
		·929	99·1					403
		·941	109·4					439
		·948	125·3					287
Feb. 14			(−17·1)	(229·4)	(−6·8)	(562)	(3531)	(4236)
45·334 C		·896	288·4					200
	12703	·934	245·8	287·5	−25·0	106	1234	701 *c*
	12706	·541	309·6	243·0	+13·9	12	72	
	12707	·402	337·6	226·8	+14·9	59	481	
	12708	·110	287·4	223·7	− 5·0	12	44	
	12718	·075	101·1	213·5	− 7·7	12	46	
	12710	·223	108·8	205·3	−10·8	52	240	
	12719	·443	39·3	201·0	+13·4	2	7	
	12711	·522	139·2	194·7	−29·6	12	63	
	12717	·456	124·2	194·0	−21·1	19	39	
	12712	·432	95·0	192·0	− 8·3	56	320	
	12715	·532	65·8	188·6	+ 6·5	35	159	
	12714	·488	97·0	188·4	− 9·4	15	79	
	12716	·594	103·2	181·4	−13·4	63	327	
		·754	60·7					93
		·772	74·6					246
		·792	100·1					221

Group 12711. Feb.11–19. A wide pair of spots of which the follower is represented by a cluster on Feb.18.
Group 12712. Feb.11–23. A typical example of a bipolar group; the following component has died out by Feb.21.
Group 12713. Feb.12–13. A pair of small spots *n* Group 12711.
Group 12714. Feb.12–22. A spot almost in contact with the following component of Group 12712. This spot becomes temporarily a short stream.
Group 12715. Feb.12–22. A vigorous stream of spots that individually are not distinctive.
Group 12716. Feb.12–23. A bipolar group. While the following member breaks up into a cluster, the leader becomes larger for a few days.
Group 12717. Feb.13–17. A pair of spots separating rapidly in longitude.
Group 12718. Feb.14–19. A disturbed area between Groups 12708 and 12710 marked by one or two small unstable spots.
Group 12719. Feb.14–17. One or two small spots.

POSITIONS AND AREAS OF SUN SPOTS AND FACULÆ FOR EACH DAY IN THE YEAR.

U.T.	Group No.	MEASURES Dist.	MEASURES Pos. Angle	POSITION Long.	POSITION Lat.	AREA Umbræ	AREA Whole Spots	AREA Faculæ
			°	°	°			
1938								
		·846	116·6					108
		·868	106·9					354
		·893	75·5					220
		·900	127·2					241
Feb. 15			(-17·4)	(217·7)	(-6·9)	(455)	(3111)	(2384)
46·373		·841	313·8					224
C	12703	·984	245·9	285·4	-24·8	93	948	1005 *f*
	12706	·694	298·2	242·9	+13·7	10	73	
	12707	·529	313·0	227·5	+14·8	58	559	
	12708	·351	274·8	224·5	- 4·8	20	123	
	12718	·172	268·7	213·9	- 7·0	9	48	
	12710	·064	194·5	204·9	-10·4	42	187	
	12719	·368	15·7	198·1	+13·8	6	33	
	12711	·417	157·8	193·6	-29·4	8	51	
	12712	·198	96·4	192·6	- 8·0	57	303	
	12717	·316	139·8	191·5	-20·7	4	19	
	12714	·259	100·9	189·1	- 9·4	20	86	
	12715	·343	50·0	188·7	+ 6·0	40	306	
	12716	·395	106·3	181·2	-12·7	76	405	
	12720	·882	95·6	141·8	- 8·2	4	36	120 *nf*
		·885	109·5					293
		·901	123·6					260
		·929	65·0					283
		·979	75·7					264
Feb. 16			(-17·8)	(204·0)	(-6·9)	(447)	(3177)	(2449)
47·301		·975	242·9					256
C		·938	300·1					317
	12706	·820	292·3	243·0	+13·7	10	63	114 *f*
	12707	·671	301·3	228·1	+14·8	73	583	
	12708	·576	270·5	227·0	- 5·3	13	62	
	12718	·396	270·5	215·2	- 6·1	2	15	
	12710	·252	254·9	206·1	-10·4	32	203	
	12719	·370	343·3	198·1	+13·8	2	11	
	12711	·391	182·6	193·0	-29·8	7	24	
	12712	·029	218·0	192·8	- 8·2	42	226	
	12717	·239	178·3	191·4	-20·7	1	3	
	12714	·074	137·9	188·9	-10·0	12	78	
	12715	·243	14·9	188·2	+ 6·6	68	327	
	12716	·204	121·3	181·5	-12·9	57	430	
	12720	·738	95·4	144·0	- 8·6	10	38	97 *c*
		·768	49·5					165
		·840	123·5					301
		·858	66·2					303
		·954	75·7					415
Feb. 17			(-18·1)	(191·8)	(-6·9)	(329)	(2063)	(1968)
48·412		·811	328·0					231
G		·795	311·4					420
	12706	·933	287·6	243·2	+13·7	3	12	} 1082 *c*
	12707	·815	293·7	227·5	+14·7	83	518	
1938								
	12708	·778	268·8	228·4	- 5·3	7	28	
	12718	·703	272·0	221·8	- 3·6	3	15	
	12710	·488	261·2	206·4	-10·4	44	216	
	12712	·283	264·8	193·7	- 8·2	39	199	
	12714	·237	252·4	190·4	-10·8	11	58	
	12711	·439	206·6	190·2	-29·9	5	18	
	12715	·307	322·6	188·0	+ 7·2	46	212	
	12716	·130	217·0	181·8	-12·9	56	450	
	12720	·573	95·3	142·1	- 8·7	13	74	
	12721	·960	105·4	102·4	-16·7	35	231	604 *c*
		·816	61·6					127
		·834	72·5					392
		·955	72·7					224
Feb. 18			(-18·4)	(177·2)	(-7·0)	(345)	(2031)	(3080)
49·394		·872	320·9					330
C		·845	305·5					467
	12707	·926	288·7	228·8	+14·4	64	440	1817 *c*
	12708	·900	267·3	228·5	- 5·5	5	13	266 *f*
	1129g	·943	302·1	227·8	+27·1	6	28	243 *f*
	12718	·826	267·7	220·0	- 5·9	2	10	254 *f*
	12710	·677	261·9	207·0	-10·6	31	155	
	12712	·497	265·6	194·1	- 8·3	36	175	
	12714	·443	258·6	190·4	-11·3	10	55	
	12715	·477	299·7	188·8	+ 7·3	28	160	
	12711	·512	218·9	185·9	-29·9	2	10	
	12716	·317	249·7	181·9	-13·0	62	330	
	12720	·395	95·1	140·9	- 8·5	14	52	
	12721	·880	105·1	102·0	-16·6	40	255	1036 *f*
		·800	71·4					298
		·823	56·0					176
		·906	44·7					218
		·931	69·9					262
Feb. 19			(-18·7)	(164·2)	(-7·0)	(300)	(1683)	(5367)
50·438		·955	264·7					616
G		·940	300·9					790
		·937	314·5					261
		·805	290·9					174
	12707	·993	285·2	231·3	+14·1	29	139	993 *nf*
	12710	·807	261·3	204·7	-11·1	36	191	348 *c*
	12712	·696	265·5	194·8	- 8·2	30	175	
	12714	·643	261·0	190·7	-11·2	7	31	
	12715	·671	289·1	190·1	+ 7·2	21	101	
	12716	·527	256·4	182·1	-13·1	44	274	
	12720	·185	103·7	139·6	- 8·2	18	64	
	12721	·753	106·3	101·7	-16·9	36	243	510 *f*
		·837	67·7					248
		·973	60·5					115
		·987	69·5					133
Feb. 20			(-19·1)	(150·5)	(-7·0)	(221)	(1218)	(4188)

Group 12720. Feb.16–23. A small stream.
Group 12721. Feb.18–Mar.2. A regular spot with small companions on Feb.22–24. A sudden decrease in area occurs between Feb.27 and Mar.1.

POSITIONS AND AREAS OF SUN SPOTS AND FACULÆ FOR EACH DAY IN THE YEAR.

U.T.	Group No.	Measures Dist.	Measures Pos. Angle	Position Long.	Position Lat.	Area Umbræ	Area Whole Spots	Area Faculæ
			°	°	°			
1938								
51·402		·968	295·8					331
C		·893	292·4					144
		·862	248·4					114
		·823	237·0					260
	12710	·926	260·8	206·3	−11·2	15	171	424 c
	12712	·844	254·4	195·7	− 8·6	20	143	271 c
	12714	·795	260·8	190·8	−11·6	3	17	
	12715	·856	281·7	195·0	+ 6·2	12	65	246 c
	12716	·701	258·4	182·4	−13·1	15	169	
	12720	·093	264·4	143·1	− 7·6	4	28	
	12721	·605	109·2	101·2	−17·2	50	301	
	12722	·975	82·6	61·8	+ 5·5	13	52	126 s
		·891	59·9					299
		·951	68·4					243
Feb. 21			(−19·4)	(137·8)	(−7·1)	(132)	(946)	(2458)
52·301		·927	248·8					181
C		·896	239·0					336
		·824	293·1					186
	12710	·951	260·8	198·8	−11·0	6	34	445 p
	12715	·945	278·6	195·7	+ 5·7	18	96	671 f
	12712	·932	263·8	195·2	− 8·3	29	160	441 c
	12714	·900	260·4	190·8	−11·7	5	9	
	12716	·825	259·0	182·0	−13·1	20	119	275 c
	12723	·794	241·4	177·2	−26·8	14	51	126 c
	12720	·297	259·3	143·2	− 9·9	2	6	
	12724	·387	210·6	138·6	−26·3	6	29	
	12725	·327	115·2	108·3	−14·8	2	16	
	12721	·446	114·4	101·0	−17·0	52	331	
	12722	·890	80·8	64·4	+ 4·8	23	91	310 c
		·828	53·2					188
		·878	61·8					241
		·886	70·8					221
		·971	103·1					226
		·989	113·0					207
Feb. 22			(−19·6)	(126·0)	(−7·1)	(177)	(942)	(4054)
53·384		·975	241·4					232
G		·972	281·0					403
		·897	233·5					265
	12712	·995	262·6	196·7	− 8·0	43	168	405 f
	12716	·940	259·0	182·5	−12·8	16	64	537 f
	12723	·920	243·4	179·1	−27·2	49	142	203 c
	12726	·837	282·2	166·9	+ 6·1	4	28	332 c
	1129h	·747	253·6	160·0	−16·9	2	5	
	12720	·493	269·6	141·3	− 6·4	2	20	
	1129i	·493	251·2	140·5	−15·4	1	2	
	12724	·551	229·4	139·6	−27·2	4	19	
	12725	·154	152·6	107·5	−14·9	10	40	
	12721	·257	135·2	100·8	−17·4	50	289	
	12722	·747	77·0	65·0	+ 4·8	28	75	

U.T.	Group No.	Measures Dist.	Measures Pos. Angle	Position Long.	Position Lat.	Area Umbræ	Area Whole Spots	Area Faculæ
			°	°	°			
1938								
	12727	·989	76·4	32·3	+12·2	30	144	335 c
		·795	64·2					148
		·855	53·4					189
		·874	73·8					134
		·908	101·5					245
		·953	104·0					393
Feb. 23			(−20·0)	(111·7)	(−7·1)	(239)	(996)	(3821)
54·389		·970	256·7					390
G		·871	290·2					160
		·864	252·6					293
	12723	·981	243·5	179·3	−27·3	39	293	340 c
	12726	·939	279·6	167·0	+ 6·4	53	202	430 c
	12724	·715	240·2	142·0	−26·0	42	162	
	12725	·210	226·4	107·5	−15·3	16	50	
	12721	·187	191·0	100·6	−17·6	47	250	
	12722	·560	70·3	66·7	+ 4·8	16	42	
	12728	·891	115·2	35·3	−25·7	2	4	366 c
	12727	·932	73·8	32·4	+12·3	20	120	585 c
		·895	103·4					92
Feb. 24			(−20·2)	(98·5)	(−7·1)	(235)	(1123)	(2656)
55·465		·969	255·9					197
G		·956	285·9					166
		·951	237·6					210
		·898	229·1					198
		·855	262·1					235
	12726	·988	277·6	164·2	+ 6·3	0	28	300 c
	12724	·849	243·7	141·9	−26·0	57	381	269 c
	12725	·442	250·3	109·7	−15·1	7	17	
	12721	·328	234·5	100·5	−17·8	44	239	
	12729	·567	28·7	67·2	+22·8	24	97	
	12722	·371	56·1	66·4	+ 5·0	14	76	
	12727	·829	70·0	31·7	+12·2	23	98	442 c
		·827	115·9					144
		·875	94·5					117
		·949	67·9					578
Feb. 25			(−20·5)	(84·3)	(−7·2)	(169)	(936)	(2856)
56·426		·950	261·7					224
G		·874	289·6					235
	12724	·930	244·2	140·8	−26·6	83	391	353 c
	12730	·629	267·0	110·7	− 7·5	15	90	
	12725	·627	253·6	110·1	−15·8	3	12	
	12721	·503	246·2	100·4	−18·0	35	208	
	12729	·501	7·9	67·3	+22·4	38	176	
	12727	·700	64·4	31·6	+12·1	13	45	446 f
		·931	65·3					348
		·952	76·6					246
		·956	100·1					433
Feb. 26			(−20·8)	(71·6)	(−7·2)	(187)	(922)	(2285)

Group 12722. Feb.21–Mar.2. A regular spot, with a follower on Feb.21–23, breaking up on Feb.21–23, dying out by Feb. 26. Three days later a few tiny ephemeral spots appear in the same area.
Group 12723. Feb.22–24. A group forming near the west limb.
Group 12724. Feb.22–27. A stream of normal type developing near the west limb.
Group 12725. Feb.22–26. A tiny stream *p* Group 12721.
Group 12726. Feb.23–25. A group developing near the west limb.
Group 12727. Feb.23–Mar.3. Return of Group 12693. A regular spot disappearing rapidly after Feb.27; two or three small companion spots are seen on Feb.28, Mar.1 and 3.
Group 12728. Feb.24–Mar.1. One tiny spot on Feb.24; a pair on Mar.1.
Group 12729. Feb.25–Mar.3. A stream passing rapidly through its phases of development and decay.
Group 12730. Feb.26–Mar.1. Smallish spots in stream formation.

POSITIONS AND AREAS OF SUN SPOTS AND FACULÆ FOR EACH DAY IN THE YEAR.

U.T.	Group No.	Measures Dist.	Measures Pos. Angle	Position Long.	Position Lat.	Area Umbræ	Area Whole Spots	Area Faculæ
			°	°	°			
1938								
57·384		·930	286·7					429
G		·888	299·5					237
		·861	313·3					193
	12724	·984	244·6	140·7	−26·2	28	304	579 *c*
	12730	·772	266·9	109·7	− 6·9	41	147	172 *c*
	12721	·671	251·3	100·7	−17·8	40	200	
	12729	·517	345·5	67·0	+22·8	36	157	
	12731	·167	139·7	52·6	−14·5	14	56	
	12727	·555	54·7	31·5	+12·3	8	30	
		·746	62·7					226
		·844	58·1					167
		·867	71·5					142
		·906	99·9					500
		·911	29·7					40
		·956	77·9					497
Feb. 27			(−21·1)	(59·0)	(−7·2)	(167)	(894)	(3182)
58·401	12730	·899	265·8	109·9	− 6·9	28	182	222 *c*
C	12721	·815	252·9	100·4	−18·1	18	122	400 *p*
	12729	·614	323·3	69·0	+22·8	23	130	
	12731	·182	228·1	53·6	−14·1	54	328	
	12727	·388	31·0	33·8	+12·3	2	15	
		·829	98·9					217
		·851	76·1					181
		·982	108·1					166
Feb. 28			(−21·3)	(45·6)	(−7·2)	(125)	(777)	(1186)
59·378		·934	292·4					378
G	12730	·969	264·8	108·8	− 6·8	26	121	495 *c*
	12721	·922	253·7	100·7	−17·8	12	73	794 *c*
	12729	·738	310·4	70·1	+22·8	26	107	
	12722	·579	291·5	65·4	+ 6·2	4	32	
	12731	·371	250·2	53·7	−13·9	69	438	
	12727	·333	0·0	32·7	+12·2	5	27	
	12728	·304	174·9	31·0	−24·7	2	10	
	12732	·951	107·2	319·6	−18·5	13	29	525 *c*
		·812	62·4					224
		·942	63·8					370
		·967	76·2					305
Mar. 1			(−21·6)	(32·7)	(−7·2)	(157)	(837)	(3091)
60·433	12721	·985	253·1	100·3	−17·8	6	25	505 *c*
G	12729	·846	303·0	69·0	+22·9	17	86	273 *c*
	12722	·737	287·2	63·8	+ 7·5	1	10	214 *p*
	12731	·583	255·4	54·2	−14·3	61	455	
	12732	·847	107·3	320·6	−18·4	8	20	217 *c*
		·870	57·2					444
		·908	71·9					532
		·953	107·9					323
		·971	61·5					361
Mar. 2			(−21·8)	(18·8)	(−7·2)	(93)	(596)	(2869)
1938								
61·378		·980	277·3					172
G		·880	281·5					480
	12729	·911	299·8	65·6	+23·3	5	26	554 *c*
	12731	·739	257·7	54·3	−13·9	75	427	241 *c*
	12727	·569	301·1	36·0	+10·8	2	8	
	12732	·709	108·6	321·6	−18·2	6	34	154 *f*
	12733	·971	114·6	288·5	−25·6	82	361	836 *n*
		·808	52·9					222
		·814	70·1					284
		·869	110·9					150
		·917	59·1					396
		·960	73·4					201
Mar. 3			(−22·1)	(6·4)	(−7·2)	(170)	(856)	(3690)
62·380		·964	296·2					549
G		·956	279·9					450
		·894	286·3					98
		·779	290·0					200
		·765	245·5					110
	12731	·874	257·9	54·7	−14·0	80	485	348 *c*
	12732	·535	112·7	322·1	−18·1	4	24	
	12733	·902	115·0	288·4	−25·6	80	359	1372 *n*
	12734	·983	64·7	278·3	+23·1	69	410	356 *c*
		·752	66·2					100
		·777	112·3					217
		·864	56·4					446
		·868	72·5					209
		·959	83·9					96
Mar. 4			(−22·3)	(353·2)	(−7·2)	(233)	(1278)	(4551)
63·375		·910	316·4					157
G		·838	287·0					521
		·818	243·8					306
		·782	300·6					202
	12731	·961	257·4	55·1	−14·1	94	346	457 *c*
	12732	·377	121·6	320·4	−18·1	7	30	
	1130a	·628	30·0	319·7	+26·1	1	3	
	12733	·799	117·0	288·1	−25·8	64	320	1508 *f*
	12734	·925	61·6	278·3	+22·8	62	463	633 *c*
		·826	51·8					194
		·833	75·0					198
Mar. 5			(−22·6)	(340·1)	(−7·2)	(228)	(1162)	(4176)
64·433		·961	281·0					506
G		·916	245·4					465
		·899	288·5					443
		·876	264·4					125
		·822	299·6					287
	12731	·990	255·3	49·3	−15·5	31	151	212 *c*
	12735	·544	341·2	337·1	+23·8	13	31	
	12732	·205	157·9	321·5	−18·1	5	18	

Group 12731. Feb.27–Mar.6. A stream of normal type.
Group 12732. Mar. 1–12. Two or more small spots not seen on Mar.8 and 9. The group, reviving on Mar.10, contains a larger spot as follower.
Group 12733. Mar. 3–15. Return of Group 12703. A stable regular spot. Group 12742 forms closely *nf* on Mar.10.
Group 12734. Mar. 4–15. A large single spot with marked changes in its umbra. A nebulous cluster of spots closely follows.
Group 12735. Mar. 6–10. A tiny stream on Mar. 6 and 7, the leader alone being left afterwards.

POSITIONS AND AREAS OF SUN SPOTS AND FACULÆ FOR EACH DAY IN THE YEAR.

U.T.	Group No.	Measures Dist.	Measures Pos. Angle	Position Long.	Position Lat.	Area Umbræ	Area Whole Spots	Area Faculæ
1938			°	°	°			
	12733	·657	121·4	287·8	−25·7	61	302	1007 *f*
	12734	·833	56·0	277·7	+23·0	76	491	395 *f*
		·962	58·5					158
		·981	75·2					139
Mar. 6			(−22·8)	(326·1)	(−7·2)	(186)	(993)	(3737)
65·383 G		·982	284·6					370
		·980	245·3					325
		·930	290·6					401
		·873	244·8					168
		·866	302·6					240
		·801	290·4					183
	12735	·631	323·8	337·6	+24·0	17	90	
	12732	·247	224·2	323·9	−17·2	4	21	
	12733	·515	129·8	287·7	−25·7	61	309	316 *f*
	12734	·725	48·8	277·5	+22·6	70	520	180 *f*
	12736	·966	78·5	240·4	+ 9·1	42	255	515 *f*
		·961	68·6					538
		·971	98·3					90
		·977	91·7					152
Mar. 7			(−23·0)	(313·6)	(−7·2)	(194)	(1195)	(3478)
66·388 G		·970	288·0					214
		·852	257·6					184
	12735	·747	311·4	338·1	+23·9	14	33	
	12733	·385	147·3	287·1	−25·9	62	293	
	12734	·609	36·5	277·4	+22·6	98	527	
	12737	·523	135·0	275·7	−28·2	2	12	
	12736	·885	75·6	240·4	+ 9·1	51	238	866 *f*
	12738	·879	96·0	238·5	− 8·7	29	80	140 *c*
		·907	65·0					909
		·950	93·3					376
		·973	59·1					366
Mar. 8			(−23·2)	(300·4)	(−7·2)	(256)	(1183)	(3055)
67·383 G		·934	327·0					197
		·931	252·6					312
		·926	283·0					341
		·908	263·0					446
	12735	·851	304·0	337·6	+23·9	4	12	219 *c*
	12733	·324	178·1	286·6	−26·0	58	281	
	12734	·527	19·0	276·6	+22·6	114	766	
	12737	·468	151·1	272·1	−31·1	0	7	
	12736	·764	71·7	240·2	+ 9·0	41	206	301 *f*
	12738	·732	96·2	240·0	− 9·4	50	199	154 *c*
	12739	·830	65·4	236·0	+15·8	4	10	220 *c*
	12740	·894	56·7	231·7	+25·4	4	10	703 *f*
	12741	·988	64·4	210·7	+23·8	28	82	252 *sf*
		·799	57·3					265
		·865	94·7					244
		·883	77·0					439
		·904	64·2					217

U.T.	Group No.	Measures Dist.	Measures Pos. Angle	Position Long.	Position Lat.	Area Umbræ	Area Whole Spots	Area Faculæ
1938			°	°	°			
		·955	93·4					153
		·955	69·8					103
		·968	103·1					466
		·960	65·0					155
Mar. 9			(−23·4)	(287·3)	(−7·2)	(303)	(1573)	(5187)
68·384 G		·968	260·8					474
		·961	327·2					188
	12735	·934	299·4	337·0	+24·1	3	12	369 *c*
	12732	·762	252·2	323·6	−18·1	2	3	
	12733	·375	210·4	286·2	−25·9	42	277	
	12742	·273	200·0	279·9	−22·0	7	34	
	12734	·501	355·0	276·8	+22·6	110	764	
	12737	·355	186·6	276·7	−27·7	2	8	
	12738	·536	96·1	241·6	− 9·3	44	181	
	12736	·611	65·6	240·0	+ 8·7	42	203	
	12740	·831	50·5	228·3	+26·9	2	4	445 *c*
	12741	·938	61·0	210·4	+24·0	26	66	598 *sf*
		·789	57·4					169
		·877	63·2					299
		·904	100·2					541
		·928	81·4					307
		·930	52·6					609
		·932	73·4					234
		·965	108·6					186
		·987	114·6					388
Mar. 10			(−23·6)	(274·1)	(−7·2)	(280)	(1552)	(4807)
69·380 G		·984	295·1					151
		·923	300·8					553
		·876	286·6					299
		·813	306·6					303
	1130b	·917	255·8	328·3	−15·8	2	5	412 *c*
	12732	·869	252·8	321·8	−18·4	18	62	
	12733	·505	228·4	285·7	−26·0	51	251	
	1130c	·528	318·7	282·2	+16·6	2	11	
	12742	·408	228·7	280·3	−22·4	34	150	
	12734	·552	333·5	276·4	+22·5	103	713	
	12738	·304	98·9	243·4	− 9·5	49	202	
	12736	·442	53·8	240·0	+ 8·3	39	152	
	12739	·555	42·2	238·1	+17·6	3	15	
	12740	·730	42·0	228·0	+26·7	3	9	
	1130d	·774	74·8	210·8	+ 6·9	6	17	205 *c*
	12741	·856	56·0	210·1	+24·1	14	99	381 *sf*
	12743	·919	106·4	193·4	−17·9	16	94	111 *c*
	12744	·952	112·9	187·6	−24·0	14	42	649 *sf*
		·854	46·8					449
		·883	70·2					140
		·887	95·8					400
		·891	81·2					180
		·960	82·9					174
		·979	59·9					307
Mar. 11			(−23·8)	(261·0)	(−7·2)	(354)	(1822)	(4714)

Group 12736. Mar. 7–18. A regular spot of which the northern part breaks away as an entity and separates in latitude.
Group 12737. Mar. 8–10. A tiny spot on each day *f* Group 12733.
Group 12738. Mar. 8–18. A fairly large group of stream type containing spots that individually undergo considerable day-to-day changes. By March 16, the leader has finally stabilized as a regular spot.
Group 12739. Mar. 9–13. A feeble group *n* Group 12736.
Group 12740. Mar. 9–11. A single small spot in extensive faculæ.
Group 12741. Mar. 9–21. A small, stable regular spot. Group 12755 forms *n* its position on Mar. 18.
Group 12742. Mar. 10–15. A short stream appearing *nf* Group 12733; one spot remains on Mar. 12.
Group 12743. Mar. 11–12. A few small spots.
Group 12744. Mar. 11–21. A stream of changing spots.

POSITIONS AND AREAS OF SUN SPOTS AND FACULÆ FOR EACH DAY IN THE YEAR.

U.T.	Group No.	Measures Dist.	Measures Pos. Angle	Position Long.	Position Lat.	Area Umbræ	Area Whole Spots	Area Faculæ
			°	°	°			
1938								
70·529		·976	297·0					246
G		·944	285·8					369
		·913	300·0					306
		·873	244·0					198
		·836	309·9					257
		·832	285·3					139
	12732	·962	252·6	321·2	−18·7	28	119	530 c
	12733	·673	238·4	285·3	−26·2	47	252	
	12742	·590	240·3	279·5	−23·0	32	142	
	12734	·672	315·9	276·1	+22·6	94	699	
	1130e	·144	17·6	243·3	+ 0·7	2	9	
	12738	·062	124·0	242·8	− 9·1	65	323	
	12736	·288	19·8	240·2	+ 8·5	28	101	
	12739	·431	22·2	236·1	+16·3	1	4	
	12741	·732	47·0	210·0	+24·1	18	111	172 c
	12743	·787	107·0	193·8	−17·8	11	37	153 c
	12744	·850	113·8	187·7	−23·9	46	188	306 c
		·787	71·9					178
		·917	106·4					150
		·930	56·1					535
		·933	41·4					296
		·935	77·9					453
		·940	115·6					510
Mar.12			(−24·0)	(245·8)	(−7·2)	(372)	(1985)	(4798)
71·625		·979	296·6					350
C		·928	304·1					142
		·894	251·5					404
		·884	238·5					177
	12745	·920	262·1	298·9	−10·1	11	38	123 c
	1130f	·846	262·4	289·6	−10·3	4	10	80 c
	12733	·812	242·6	284·8	−26·4	51	225 }	279 c
	12742	·742	243·9	278·0	−24·0	22	81 }	
	12734	·794	305·2	275·7	+22·1	80	660	312 c
	12738	·205	258·6	243·1	− 9·4	85	527	
	12736	·300	330·3	240·0	+ 7·9	16	111	
	12739	·419	345·0	237·9	+16·6	2	9	
	12741	·611	33·2	210·0	+24·0	16	78	
	12744	·706	117·4	188·2	−24·2	28	158	90 f
	12746	·766	71·4	184·2	+ 9·3	5	17	167 c
	12747	·915	99·0	165·3	− 9·4	5	11	173 f
		·797	107·5					193
		·849	50·0					443
		·855	119·0					328
		·879	75·2					396
		·952	111·8					138
Mar.13			(−24·2)	(231·4)	(−7·2)	(325)	(1925)	(3795)

U.T.	Group No.	Measures Dist.	Measures Pos. Angle	Position Long.	Position Lat.	Area Umbræ	Area Whole Spots	Area Faculæ
			°	°	°			
1938								
72·381		·942	249·1					447
G		·923	290·4					128
		·783	232·3					208
	12745	·965	260·3	297·0	−11·2	8	17	278 p
	12733	·888	243·9	284·1	−26·4	57	257 }	420 c
	12742	·833	245·3	277·4	−24·5	10	68 }	
	12734	·875	300·1	275·9	+21·9	81	535	462 c
	12738	·393	263·5	244·6	− 9·1	93	582	
	12736	·404	307·9	240·1	+ 7·5	19	95	
	12741	·547	20·8	209·2	+23·6	15	94	
	12744	·594	121·5	187·8	−24·1	35	179	
	12746	·679	67·3	182·1	+ 9·6	1	6	
	12748	·721	122·5	178·0	−28·0	3	9	173 f
		·818	44·7					246
		·851	100·1					268
		·862	111·0					205
		·971	114·9					361
Mar.14			(−24·3)	(221·4)	(−7·2)	(322)	(1842)	(3196)
73·375		·980	286·9					244
G		·871	231·9					248
	1130g	·967	250·3	284·9	−20·8	4	14	196 c
	12733	·960	244·5	283·5	−26·5	46	232 }	765 sf
	12742	·928	246·3	277·2	−24·6	12	29 }	
	12734	·955	295·5	276·1	+21·7	62	482	825 n
	12738	·592	264·9	244·8	− 8·8	146	722	
	12736	·575	294·3	240·1	+ 7·5	13	75	
	12749	·558	305·3	236·0	+12·4	6	21	
	12741	·513	359·2	208·7	+23·5	18	96	
	12744	·442	132·5	187·5	−24·1	33	176	
	12748	·572	125·9	177·5	−25·8	2	5	
	12747	·693	99·3	164·1	−11·7	3	17	
		·798	112·5					149
		·821	125·7					172
		·885	98·3					212
		·922	129·7					136
		·935	116·5					520
		·978	80·3					310
Mar.15			(−24·5)	(208·3)	(−7·2)	(345)	(1869)	(3777)
74·507		·989	293·3					666
G		·966	246·3					652
		·935	236·3					292
		·851	288·5					151
		·823	301·3					253

Group 12745. Mar.13–14. A pair of small spots on Mar.13: a single spot on Mar.14.
Group 12746. Mar.13–14. A pair of spots on Mar.13: a single spot on Mar.14.
Group 12747. Mar.13–16. A single spot on Mar.13: a pair of spots on Mar.15–16.
Group 12748. Mar.14–17. A small spot following Group 12744.
Group 12749. Mar.15–17. A small short-lived group.

POSITIONS AND AREAS OF SUN SPOTS AND FACULÆ FOR EACH DAY IN THE YEAR.

U.T.	Group No.	Measures: Dist.	Measures: Pos. Angle	Position: Long.	Position: Lat.	Area: Umbræ	Area: Whole Spots	Area: Faculæ
			°	°	°			
1938								
	12738	·788	264·3	245·7	− 8·8	115	635	247 c
	12736	·755	286·5	240·1	+ 7·5	11	52	
	12749	·747	294·7	237·4	+13·1	2	3	
	12741	·561	335·3	208·2	+23·7	16	80	
	12750	·401	302·8	213·1	+ 5·9	29	114	
	12744	·309	159·7	186·7	−23·8	30	178	
	12748	·401	146·1	179·0	−26·2	4	16	
	12747	·478	101·8	165·0	−11·9	7	25	
	12751	·766	98·8	143·1	−11·3	17	48	86 c
	12752	·896	79·6	131·2	+ 6·0	4	15	125 n
	12753	·933	73·3	127·2	+12·8	12	33	281 n
	12754	·975	96·2	115·7	− 7·6	85	456	645 c
		·865	119·2					372
		·962	80·5					259
		·967	107·3					212
Mar. 16			(−24·7)	(193·4)	(−7·1)	(332)	(1655)	(4241)
75·618 G		·966	236·7					357
		·855	307·9					403
	12738	·926	263·9	246·9	− 8·3	99	576	630 c
	12736	·894	282·4	240·2	+ 7·7	10	42	368 n
	12749	·877	289·9	236·6	+13·7	4	45	685 n
	12750	·625	288·5	215·1	+ 5·7	8	40	
	12741	·669	318·3	207·7	+23·7	12	71	
	12744	·307	201·5	185·7	−23·6	25	162	
	12748	·332	182·7	179·7	−26·4	2	10	
	12751	·581	100·1	143·1	−11·7	11	38	
	12752	·754	75·7	131·6	+ 5·9	7	14	130 f
	12753	·810	69·1	128·1	+12·3	11	23	295 f
	12754	·886	95·3	116·0	− 8·0	75	522	761 f
		·823	125·1					238
		·888	107·4					251
		·959	61·9					212
		·974	110·0					239
Mar. 17			(−24·9)	(178·7)	(−7·1)	(264)	(1543)	(4569)
76·425 G		·935	292·6					559
		·929	305·1					379
		·847	302·0					329
	12738	·980	262·3	247·3	− 8·9	90	495	894 c
	12736	·962	280·0	240·7	+ 7·6	7	49	608 n
	12750	·761	283·4	215·9	+ 5·4	9	23	
	12755	·801	311·4	210·2	+26·7	11	37	124 c
	12741	·757	309·8	207·3	+23·5	17	90	
	12744	·405	223·6	185·8	−23·8	30	102	
	12751	·418	103·2	143·6	−11·9	4	17	
	12752	·624	70·8	131·9	+ 6·1	12	14	
	12753	·700	63·4	128·2	+12·8	5	19	
	12754	·787	94·0	116·0	− 7·5	64	443	665 f
		·840	110·8					167
		·939	108·4					376
Mar. 18			(−25·0)	(168·1)	(−7·1)	(249)	(1289)	(4101)
1938 77·375 G		·982	293·9					298
		·980	259·7					369
		·978	282·5					597
		·977	304·2					416
		·930	247·1					173
		·910	294·1					258
		·880	265·9					165
	12750	·894	279·5	217·7	+ 5·2	4	10	246 f
	12755	·887	306·3	209·1	+27·5	32	154	248 c
	12741	·858	303·1	207·1	+23·6	15	103	275 f
	12744	·564	237·7	186·8	−23·6	9	35	
	12752	·458	60·7	132·0	+ 6·4	5	15	
	12754	·644	93·5	115·3	− 7·7	55	386	
		·787	98·9					206
		·858	110·5					283
		·975	83·0					440
Mar. 19			(−25·1)	(155·6)	(−7·1)	(120)	(703)	(3974)
78·366 G		·954	276·8					326
		·928	288·4					270
		·920	258·2					412
		·802	248·2					256
		·792	314·0					253
	12755	·955	301·8	208·5	+27·5	22	146	232 c
	12741	·939	298·6	206·6	+23·8	16	66	221 f
	12744	·722	244·2	187·4	−23·3	6	17	
	12756	·065	341·9	143·7	− 3·5	2	18	
	12753	·383	38·6	128·5	+10·5	2	7	
	12754	·446	93·0	115·9	− 7·6	53	313	
	12757	·972	101·6	65·1	−12·9	115	596	563 c
		·906	80·6					305
		·954	65·4					272
Mar. 20			(−25·2)	(142·5)	(−7·0)	(216)	(1163)	(3110)
79·374 G		·970	284·5					188
		·969	259·6					175
		·926	303·2					122
		·924	252·2					222
		·905	323·4					313
	12755	·990	300·0	205·6	+28·2	24	93	377 c
	12741	·986	295·6	205·2	+23·7	12	79	
	12744	·844	246·9	186·6	−23·2	16	57	437 sf
	12758	·841	309·2	176·3	+27·4	4	10	407 c
	12756	·294	282·1	145·9	− 3·2	5	16	
	12754	·228	93·4	116·0	− 7·6	47	306	
	1130h	·879	60·2	74·1	+22·0	2	4	241 c
	12757	·941	103·6	58·1	−15·1	251	1417	1098 c
		·779	76·5					192
		·888	78·8					210
		·951	62·6					432
Mar. 21			(−25·4)	(129·2)	(−7·0)	(361)	(1982)	(4414)

Group 12750. Mar.16–19. A small but fully-formed stream which suddenly appears and rapidly dies out.
Group 12751. Mar.16–18. A feeble stream of small spots.
Group 12752. Mar.16–19. A small definite spot.
Group 12753. Mar.16–20. A small regular spot disappearing suddenly between Mar.18 and 19. A tiny marking is seen near its place on Mar.20.
Group 12754. Mar.16–27. Return of Group 12730. A compact stream in which the components are almost touching on Mar.16 to 19.
Group 12755. Mar.18–21. A smallish group forming *n* Group 12741.
Group 12756. Mar.20–21. A pair of spots of which one survives on Mar.21.
Group 12757. Mar.20–Apr.2. Return of Group 12731. A pair of very large regular spots widely separated in longitude. On most days, there is an absence of companion spots. A small part of the follower spot tends to break away after Mar.27.
Group 12758. Mar.21–23. One or two small spots.

POSITIONS AND AREAS OF SUN SPOTS AND FACULÆ FOR EACH DAY IN THE YEAR.

U.T.	Group No.	Measures: Dist.	Measures: Pos. Angle	Position: Long.	Position: Lat.	Area: Umbræ	Area: Whole Spots	Area: Faculæ
			°	°	°			
1938								
80·379		·944	313·5					225
G		·924	245·3					820
		·850	285·9					218
	12758	·934	302·9	177·8	+27·3	6	28	333 *p*
	1130i	·797	240·3	167·2	-27·7	2	6	77 *s*
	1130j	·488	238·6	142·4	-20·9	2	5	
	1130k	·151	272·3	124·7	- 6·5	1	4	
	12754	·026	225·8	117·1	- 8·0	32	155	
	11301	·339	169·5	112·1	-26·4	6	32	
	12757	·839	102·8	58·5	-14·5	270	1453	619 *c*
		·883	58·5					445
Mar. 22			(-25·5)	(116·0)	(-7·0)	(319)	(1683)	(2737)
81·454		·961	252·2					352
G		·935	242·4					455
		·926	287·8					342
		·906	260·4					238
		·895	230·6					245
	12758	·994	298·1	180·8	+26·7	18	34	448 *n*
	12754	·274	265·8	117·7	- 7·8	31	154	
	12759	·164	286·2	110·8	- 4·2	2	20	
	12760	·544	88·0	68·9	- 4·7	6	16	
	12757	·703	104·0	57·1	-14·7	284	1512	426 *f*
		·881	79·2					278
		·916	115·0					380
		·945	70·8					374
		·966	103·0					160
Mar. 23			(-25·6)	(101·8)	(-6·9)	(341)	(1736)	(3698)
82·383		·968	242·1					314
G		·968	259·1					210
	1130m	·951	278·6	160·3	+ 5·9	3	6	251 *p*
	12761	·828	222·5	138·4	-42·2	4	16	
	12754	·477	266·8	118·1	- 7·6	20	106	
	1130n	·536	306·6	115·5	+12·4	5	11	
	12759	·384	276·5	111·9	- 3·9	2	5	
	12760	·328	83·9	70·5	- 4·6	2	7	
	12757	·540	106·5	57·3	-14·7	277	1443	
		·831	114·5					312
		·847	67·8					299
		·962	66·5					299
		·962	76·8					180
Mar. 24			(-25·7)	(89·5)	(-6·9)	(313)	(1594)	(1865)
83·329		·940	256·5					342
C		·866	242·8					372
		·844	290·2					440
		·747	291·6					242

U.T.	Group No.	Measures: Dist.	Measures: Pos. Angle	Position: Long.	Position: Lat.	Area: Umbræ	Area: Whole Spots	Area: Faculæ
			°	°	°			
1938								
	12761	·904	226·2	138·5	-42·2	14	69	193 *c*
	12754	·659	266·7	118·5	- 7·3	18	54	
	12760	·182	73·8	67·1	- 3·8	1	3	
	12757	·360	113·5	57·2	-14·7	278	1514	
		·918	62·8					425
		·924	74·0					244
Mar. 25			(-25·8)	(77·1)	(-6·8)	(311)	(1640)	(2258)
84·338		·926	279·3					500
G		·918	245·7					366
		·890	235·4					230
		·880	264·6					434
		·871	292·1					426
	12761	·965	228·3	139·4	-42·0	4	17	323 *sf*
	12754	·816	266·5	118·7	- 6·8	10	75	396 *c*
	1130o	·129	233·7	69·9	-11·1	2	4	
	12757	·184	134·3	56·0	-14·1	261	1390	
		·815	58·5					225
		·862	109·2					228
		·879	47·1					189
		·923	74·5					343
		·924	100·7					281
Mar. 26			(-25·9)	(63·8)	(-6·8)	(277)	(1486)	(3941)
85·360		·972	246·6					215
C		·971	265·3					441
		·953	285·6					378
		·923	235·0					319
		·895	250·8					286
	12754	·930	265·6	119·0	- 6·6	8	35	809 *f*
	1130p	·290	221·7	62·0	-19·1	1	9	
	12757	·170	217·8	56·5	-14·5	246	1354	
	12762	·977	109·4	331·2	-20·4	51	207	256 *c*
		·972	102·0					188
Mar. 27			(-26·0)	(50·3)	(-6·8)	(306)	(1605)	(2892)
86·453		·963	251·4					113
G		·953	263·2					579
		·944	241·0					273
		·838	243·2					202
	12757	·354	245·4	55·3	-14·8	257	1349	
	12762	·897	109·2	331·7	-20·1	53	246	578 *f*
	12763	·926	104·8	327·4	-16·2	5	29	293 *c*
		·839	59·4					273
		·951	66·2					256
		·957	91·0					235
Mar. 28			(-26·0)	(35·9)	(-6·7)	(315)	(1624)	(2802)

Group 12759. Mar.23–24. One or two tiny spots *nf* Group 12754.
Group 12760. Mar.23–25. A tiny group *np* Group 12757.
Group 12761. Mar.24–26. A small group in high southern latitude.
Group 12762. Mar.27–Apr.8. A regular spot near which companions form and disappear between March.30 and April 4–5, leaving the original spot unaltered. On April 6 another formation appears just southwards, and this time, the regular spot is absorbed into the new large spot with its double umbra that results.
Group 12763. Mar.28–Apr.5. A very small group, not seen on April 2 and 3, *n* Group 12762.

POSITIONS AND AREAS OF SUN SPOTS AND FACULÆ FOR EACH DAY IN THE YEAR.

U.T.	Group No.	Measures Dist.	Measures Pos. Angle	Position Long.	Position Lat.	Area Umbræ	Area Whole Spots	Area Faculæ
			°	°	°			
1938								
87·376		·934	251·9					429
G		·845	279·1					206
		·822	304·7					236
	12757	·522	252·3	54·5	−14·9	237	1310	
	12764	·294	153·1	15·5	−21·8	2	8	
	12762	·794	110·3	331·4	−20·1	55	266	239 *f*
	12763	·801	103·8	330·3	−15·0	6	30	387 *f*
	12765	·901	109·8	319·0	−20·7	5	25	298 *f*
		·882	91·1					268
		·918	61·5					339
		·932	73·5					146
		·977	99·1					281
Mar. 29			(−26·1)	(23·7)	(−6·7)	(305)	(1639)	(2829)
88·386		·970	252·3					246
G		·937	276·0					266
		·927	294·8					257
		·892	268·0					74
		·846	304·3					340
	12757	·689	255·6	53·8	−14·7	232	1226	
	12764	·268	211·2	18·8	−19·8	7	39	
	12762	·652	114·3	331·1	−20·7	57	291	
	12763	·680	105·1	327·8	−15·1	9	30	
		·804	114·2					373
		·855	71·6					110
		·857	56·8					294
		·909	99·0					489
		·934	64·4					337
		·967	112·3					278
Mar. 30			(−26·2)	(10·4)	(−6·6)	(305)	(1586)	(3064)
89·381		·943	297·2					528
G	12757	·823	256·8	52·9	−14·6	248	1246	956 *c*
	12764	·418	236·0	18·7	−19·6	12	32	
	12762	·495	121·2	330·4	−20·7	60	357	
	12763	·494	110·0	328·5	−15·5	5	43	
	12766	·974	67·6	284·1	+19·9	4	9	331 *c*
	12767	·980	116·1	277·1	−26·8	32	165	768 *p*
	12768	·988	111·1	274·5	−21·8	35	239	
		·781	95·4					161
		·866	100·8					133
		·880	57·2					399
Mar. 31			(−26·2)	(357·2)	(−6·6)	(396)	(2091)	(3276)
1938								
90·428		·967	296·3					266
G		·840	295·1					267
	12757	·937	257·2	53·7	−14·2	196	1180	971 *c*
	12764	·601	246·7	19·0	−19·0	8	30	
	12762	·319	141·7	331·2	−20·8	75	344	
	12763	·273	121·9	329·6	−14·6	2	11	
	1131a	·615	36·3	320·1	+23·7	1	6	
	12769	·877	68·7	285·8	+15·1	4	13	209 *c*
	12766	·895	64·3	284·8	+19·5	4	20	
	12767	·914	116·7	277·4	−26·9	20	157	337 *f*
	12768	·930	111·7	274·4	−22·5	51	351	420 *c*
		·821	110·0					349
		·837	50·9					325
		·957	63·5					578
Apr. 1			(−26·3)	(343·4)	(−6·5)	(361)	(2112)	(3722)
91·399		·972	277·9					224
G		·940	289·1					363
		·877	242·8					179
	12757	·974	255·1	48·6	−16·0	87	475	688 *c*
	1131b	·388	201·9	339·9	−27·4	2	5	
	12762	·242	182·7	331·3	−20·4	47	247	
	12770	·710	71·7	287·9	+ 8·1	5	16	
	12766	·772	60·7	285·8	+17·6	12	48	207 *c*
	12767	·822	118·7	276·7	−27·1	35	147	462 *f*
	12768	·839	112·7	273·9	−22·5	45	369	324 *c*
	12771	·912	58·5	271·5	+25·2	2	5	786 *f*
	12772	·980	98·1	251·6	− 9·2	54	197	361 *p*
Apr. 2			(−26·3)	(330·6)	(−6·5)	(289)	(1509)	(3594)
92·421		·976	288·9					310
G		·957	244·7					144
		·900	299·7					285
		·883	252·1					236
		·880	288·3					204
	12762	·337	222·9	331·2	−20·4	46	245	
	12770	·526	62·9	289·0	+ 8·2	6	16	
	12766	·631	50·5	286·4	+18·1	7	20	
	12767	·698	123·1	276·1	−27·3	28	128	
	12768	·713	115·7	273·2	−22·6	57	288	
	12771	·817	53·3	271·1	+24·8	2	6	422 *f*
	12772	·907	97·1	251·6	− 9·1	37	192	691 *c*
	12773	·973	76·3	242·5	+11·7	19	38	475 *c*
		·897	124·5					437
		·963	70·4					522
Apr. 3			(−26·3)	(317·1)	(−6·4)	(202)	(933)	(3726)

Group 12764. Mar.29–Apr.1. A small group of feeble activity.
Group 12765. Mar.29–Apr.5. Intermittent. A pair of small spots *f* Group 12762 on Mar.29: a faint marking on Apr.5.
Group 12766. Mar.31–Apr.6. A feeble but persistently disturbed area represented by a few tiny spots on each day.
Group 12767. Mar.31–Apr.13. Return of Group 12733: 3rd. appearance. A stable regular spot with an occasional small companion.
Group 12768. Mar.31–Apr.8. A spot breaking up after Apr.2 into three components that slightly separate in longitude.
Group 12769. Apr. 1 – 5. One or two tiny spots seen only on Apr.1 and 5, near Group 12766.
Group 12770. Apr. 2 – 8. A small spot becoming a diminutive stream on April 4.
Group 12771. Apr. 2 – 3. A tiny spot.
Group 12772. Apr. 2 –14. Return of Group 12738. A stable regular spot.
Group 12773. Apr. 3 – 4. A single spot on Apr. 3: a pair on Apr. 4.

POSITIONS AND AREAS OF SUN SPOTS AND FACULÆ FOR EACH DAY IN THE YEAR.

U.T.	Group No.	Measures Dist.	Measures Pos. Angle	Position Long.	Position Lat.	Area Umbræ	Area Whole Spots	Area Faculæ
			°	°	°			
1938								
93·381		·959	288·4					202
G		·959	250·8					202
		·942	297·8					181
	12762	·494	239·2	331·3	−20·2	33	196	
	12763	·385	240·6	324·9	−16·7	2	7	
	12770	·364	46·8	289·0	+ 8·3	2	15	
	12766	·478	35·4	287·8	+16·9	7	29	
	12767	·565	131·2	276·0	−27·4	31	145	
	12768	·564	122·3	273·5	−22·9	72	329	
	12772	·794	96·9	251·7	− 9·3	39	180	311 *f*
	12773	·917	73·6	240·5	+12·3	14	28	489 *c*
		·837	45·6					152
		·929	64·0					448
		·961	95·0					296
Apr. 4			(−26·4)	(304·5)	(−6·3)	(200)	(929)	(2281)
94·408		·936	286·8					256
G		·873	260·4					273
	12762	·665	246·3	331·2	−20·3	41	218	
	12763	·580	250·1	325·4	−16·6	1	5	
	12765	·511	242·3	319·4	−19·2	2	10	
	12769	·365	4·2	289·3	+15·0	5	17	
	12770	·256	6·3	289·3	+ 8·4	4	13	
	12766	·432	12·2	285·4	+18·6	11	44	
	12767	·435	147·4	275·6	−27·5	17	113	
	12768	·401	135·9	273·7	−23·0	63	250	
	12772	·629	97·4	251·8	− 9·5	31	186	
		·797	61·8					375
		·872	73·0					417
		·873	95·4					368
		·934	60·4					578
Apr. 5			(−26·4)	(290·9)	(−6·3)	(175)	(856)	(2267)
95·381		·968	253·2					184
G		·812	259·2					270
	12762	·808	248·0	331·4	−21·3	88	441	267 *c*
	12766	·449	340·4	287·2	+18·8	2	12	
	12770	·302	329·2	287·1	+ 8·9	8	44	
	12767	·369	173·5	275·4	−27·6	22	106	
	12768	·299	165·0	273·3	−22·9	33	115	
	12772	·448	99·3	251·6	− 9·7	27	166	
	12774	·700	93·0	233·6	− 6·5	14	32	
	12775	·962	94·7	203·7	− 6·2	111	550	587 *c*
		·785	60·6					143
		·907	76·9					211
		·909	53·2					307
		·921	110·5					114
		·922	63·2					321
Apr. 6			(−26·4)	(278·1)	(−6·2)	(305)	(1466)	(2404)

U.T.	Group No.	Measures Dist.	Measures Pos. Angle	Position Long.	Position Lat.	Area Umbræ	Area Whole Spots	Area Faculæ
			°	°	°			
1938								
96·386		·945	278·2					210
G		·915	259·0					400
	12762	·914	249·5	331·2	−21·2	106	667	773 *c*
	12770	·468	302·3	288·3	+ 8·9	10	38	
	12767	·401	202·8	274·9	−27·6	20	98	
	12768	·320	206·5	273·7	−22·6	10	31	
	12772	·237	106·1	251·5	− 9·7	32	158	
	12774	·518	92·8	233·5	− 6·7	26	44	
	12775	·857	93·3	205·7	− 6·0	82	448	629 *c*
		·850	51·0					341
		·851	75·7					357
		·937	108·6					268
		·950	118·0					265
		·952	59·8					649
Apr. 7			(−26·4)	(264·8)	(−6·1)	(286)	(1484)	(3892)
97·388		·953	271·0					147
G		·911	285·4					247
		·881	301·4					353
		·828	259·8					239
	1131c	·983	258·6	331·8	−12·3	11	59	414 *c*
	12762	·979	249·5	331·1	−21·3	129	697	713 *f*
	12770	·631	292·8	287·6	+ 9·1	6	40	
	12767	·509	222·4	274·3	−27·6	16	82	
	12768	·448	229·4	273·1	−22·6	2	7	
	12772	·063	176·6	251·4	− 9·7	39	162	
	12774	·305	93·2	233·8	− 6·8	11	28	
	1131d	·782	54·5	208·2	+22·5	2	3	96 *c*
	12775	·719	92·2	205·6	− 6·0	106	596	202 *f*
	12776	·954	62·1	184·2	+24·3	15	48 }	724 *c*
	12777	·984	61·4	176·5	+26·7	272	1468 }	
		·907	51·5					418
		·925	116·9					742
Apr. 8			(−26·4)	(251·6)	(−6·1)	(609)	(3190)	(4295)
98·334		·978	282·5					244
C		·956	248·6					383
		·952	298·1					559
		·940	261·9					173
		·812	295·4					388
	12767	·633	231·8	273·2	−28·0	23	95	
	12772	·221	251·8	251·3	− 9·8	33	171	
	12774	·085	105·4	234·4	− 7·2	11	44	
	12775	·542	91·7	206·2	− 6·0	77	442	
	12776	·888	57·8	183·3	+25·0	18	108 }	921 *c*
	12777	·936	58·4	176·1	+26·7	246	1470 }	
	12778	·998	113·8	151·2	−24·0	162	699	699 *p*
		·792	112·5					490
		·824	44·2					363

Group 12774. Apr. 6–10. A pair of spots with a companion on Apr. 9; there is only one spot on Apr.10.
Group 12775. Apr. 6–17. A stream led by a regular spot; the train is of diminishing importance and has died out by Apr.16.
Group 12776. Apr. 8–18. A small regular spot in front of Group 12777.
Group 12777. Apr. 8–20. Return of Group 12758. A stream with well-defined leader and follower spots. After Apr.14, the follower shows a pronounced elongation in longitude and is itself drawn out into a short stream of spots which practically touch each other. The axis of the whole group is inclined considerably to the sun's equator.
Group 12778. Apr. 9–22. A large spot nearly regular in structure.

POSITIONS AND AREAS OF SUN SPOTS AND FACULÆ FOR EACH DAY IN THE YEAR.

U.T.	Group No.	Measures Dist.	Measures Pos. Angle	Position Long.	Position Lat.	Area Umbræ	Area Whole Spots	Area Faculæ
			°	°	°			
1938								
		·880	70·2					170
		·907	114·5					722
		·945	76·7					255
Apr. 9			(-26·4)	(239·1)	(-6·0)	(570)	(3029)	(5367)
99·392 G		·968	260·0					212
		·966	303·2					171
		·926	291·2					299
		·920	281·8					226
		·896	246·4					364
		·846	302·0					354
		·785	250·8					286
	12767	·772	238·6	273·0	-27·7	20	87	276 c
	12772	·443	259·5	251·2	- 9·9	30	147	
	1131e	·503	323·4	243·4	+18·1	1	5	
	12774	·134	261·9	232·7	- 6·9	1	2	
	1131f	·358	340·2	232·1	+13·8	4	10	
	12775	·321	90·4	206·4	- 5·7	60	440	
	12776	·781	50·9	183·2	+25·1	18	81 }	877 c
	12777	·847	53·4	175·8	+26·5	222	1472 }	
	1131g	·798	109·8	172·6	-19·3	7	15	135 c
	12778	·960	113·3	150·6	-24·0	109	703	855 c
	12779	·969	101·0	148·8	-12·1	58	406	656 f
		·849	120·0					299
		·874	72·0					324
		·886	36·9					228
Apr. 10			(-26·4)	(225·1)	(-5·9)	(530)	(3368)	(5562)
100·337 G		·974	288·6					219
		·961	246·9					258
		·884	252·1					195
		·876	303·9					288
	1131h	·907	237·9	276·8	-31·5	7	24	183 c
	1131i	·928	295·1	276·4	+20·6	3	9	286 c
	12767	·872	241·1	272·3	-28·0	18	91	287 c
	12772	·624	260·7	251·3	-10·4	29	163	
	12775	·088	80·1	207·7	- 5·0	104	425	
	12776	·676	41·5	183·1	+25·2	18	113	
	12777	·756	45·9	175·3	+27·0	275	1512	
	12778	·893	113·4	149·6	-23·5	146	768	555 c
	12779	·895	100·0	148·8	-11·5	74	373	451 f
Apr. 11			(-26·3)	(212·7)	(-5·9)	(674)	(3478)	(2722)
101·380 G		·969	252·5					187
		·953	297·7					554
		·903	310·1					335
		·779	298·5					788
	12767	·953	242·5	271·7	-27·9	15	80	895 f
1938								
	1131j	·853	265·1	257·6	- 7·2	2	9	256 c
	12772	·791	261·5	251·3	-10·3	25	160	272 c
	12775	·155	270·5	207·8	- 5·7	82	438	
	12780	·235	350·1	201·3	+ 7·5	2	5	
	12776	·565	25·4	183·5	+25·0	17	105	
	12777	·640	33·9	175·4	+26·7	240	1323	
	12778	·778	115·9	149·3	-23·6	108	612	512 f
	12779	·768	100·3	148·6	-11·6	59	365	395 f
		·854	36·7					245
		·907	52·4					232
		·932	73·5					268
		·944	93·9					504
		·947	116·1					500
Apr. 12			(-26·3)	(198·9)	(-5·8)	(550)	(3097)	(5943)
102·340 G		·953	304·9					165
		·856	294·5					924
	12767	·993	242·3	271·2	-28·1	16	53	650 f
	12772	·906	261·6	251·5	-10·0	34	146	547 c
	12775	·387	271·1	208·9	- 4·9	77	364	
	12780	·347	310·5	201·6	+ 7·5	24	90	
	12776	·510	4·0	184·0	+24·7	12	63	
	12777	·565	18·3	174·8	+26·7	225	1373	
	12778	·645	120·7	149·1	-23·7	137	660	
	12779	·611	101·1	148·7	-11·3	62	355	
		·807	96·8					254
		·836	121·7					316
		·841	45·5					206
		·897	67·9					289
		·925	106·6					481
		·930	92·1					439
		·947	122·5					179
Apr. 13			(-26·3)	(186·2)	(-5·7)	(587)	(3104)	(4450)
103·376 G		·926	288·2					878
		·911	302·6					464
		·828	314·4					280
	12772	·981	261·0	251·8	- 9·9	23	154	434 f
	12775	·611	268·2	210·2	- 5·5	67	286	
	12780	·530	294·4	201·5	+ 7·7	21	76	
	12776	·541	339·9	184·3	+25·0	19	61	
	12777	·538	357·8	173·8	+26·8	182	1158	
	12779	·413	104·4	148·6	-11·0	91	397	
	12778	·493	130·4	148·4	-23·7	141	731	
		·835	108·3					267
		·894	94·0					395
		·899	124·4					183
		·947	113·8					191
Apr. 14			(-26·2)	(172·5)	(-5·6)	(544)	(2863)	(3092)

Group 12779. Apr.10–22. A large regular spot breaking on Apr.15 into two parts of unequal size.
Group 12780. Apr.12–16. A small short-lived group.

POSITIONS AND AREAS OF SUN SPOTS AND FACULÆ FOR EACH DAY IN THE YEAR.

U.T.	Group No.	Measures: Dist.	Measures: Pos. Angle	Position: Long.	Position: Lat.	Area: Umbræ	Area: Whole Spots	Area: Faculæ
			°	°	°			
1938								
104·105		·957	285·2					354
K		·951	283·7					166
		·947	296·2					320
		·895	306·7					370
		·861	256·6					102
	12775	·760	269·1	212·3	− 4·4	41	209	
	12780	·663	289·0	202·0	+ 8·1	10	48	
	12776	·609	326·3	184·7	+25·1	13	83	
	12777	·564	342·3	173·9	+26·9	179	1045	
	12779	·261	111·3	148·6	−10·8	62	352	
	12778	·396	143·4	148·0	−23·9	108	756	
	12781	·985	100·3	82·3	−11·1	104	544	332 c
		·902	115·7					239
Apr. 15			(−26·2)	(162·9)	(−5·6)	(517)	(3037)	(1883)
105·379		·961	308·4					379
G		·953	297·2					293
		·858	310·7					273
		·850	296·9					190
	12775	·924	267·7	213·7	− 4·4	41	204	796 f
	1131k	·919	286·5	210·5	+12·8	5	18	158 c
	12780	·833	284·9	200·5	+ 9·2	2	4	302 s
	12776	·751	310·7	184·9	+25·0	15	59	
	1131l	·589	237·0	178·5	−23·3	16	43	
	12777	·662	322·4	172·8	+26·6	155	887	
	12779	·106	196·5	147·9	−11·3	62	342	
	12778	·317	183·3	147·2	−23·9	100	699	
	12782	·925	59·5	84·3	+25·5	9	23	434 c
	12781	·915	99·1	79·6	−10·5	117	877	609 c
	12783	·992	102·3	62·5	−12·9	153	481	381 c
	12784	·993	97·5	62·4	− 8·1	16	57	
		·959	68·5					164
Apr. 16			(−26·1)	(146·1)	(−5·5)	(691)	(3694)	(3979)
106·346		·952	280·2					525
G		·942	293·6					347
		·936	309·2					426
	12775	·988	266·8	214·5	− 4·0	35	205	885 f
	12776	·857	304·0	184·9	+25·3	9	36	186 c
	12777	·770	312·2	172·9	+26·9	103	704	654 c
	12779	·276	250·8	148·6	−10·4	40	264	
	12778	·385	213·9	146·8	−23·8	102	644	
	12782	·851	54·6	82·9	+26·1	2	4	413 c
	12781	·792	99·0	80·8	−10·4	104	851	364 c
	12784	·943	96·4	62·5	− 7·8	13	83	1026 c
	12783	·947	101·8	61·5	−12·9	97	679	
	12785	·991	105·8	50·1	−16·3	32	195	
		·879	73·8					223
		·903	63·9					186
		·961	113·6					319
Apr. 17			(−26·0)	(133·3)	(−5·4)	(537)	(3665)	(5554)
1938								
107·334		·984	259·0					123
G		·939	245·2					389
		·829	248·8					290
		·823	320·6					326
	12776	·937	299·3	184·5	+25·0	13	45	243 c
	12777	·870	304·2	173·4	+26·1	83	456	556 c
	12779	·485	258·0	149·0	−10·4	36	195	
	12778	·521	230·4	146·3	−24·1	104	590	
	12786	·510	113·7	91·3	−16·4	5	16	
	12781	·643	100·5	80·4	−10·8	159	853	
	12784	·838	96·0	63·3	− 7·9	11	55	441 c
	12783	·856	102·4	61·3	−13·4	114	716	
	12785	·944	105·5	49·1	−16·4	27	156	580 c
		·891	114·6					251
		·949	59·4					195
Apr. 18			(−26·0)	(120·3)	(−5·3)	(552)	(3082)	(3394)
108·437		·959	264·1					204
G		·940	247·5					418
		·908	235·3					359
		·888	320·6					352
	12777	·959	299·1	174·3	+26·0	76	313	941 c
	12779	·693	260·3	149·5	−10·5	31	161	
	12778	·684	239·9	145·9	−24·0	92	602	
	1131m	·412	253·3	129·3	−11·5	2	10	
	12786	·309	129·5	91·4	−16·3	10	19	
	12781	·432	104·3	80·6	−10·8	170	876	
	12784	·669	96·7	63·7	− 8·3	15	78	
	12783	·704	103·7	61·2	−13·4	129	690	
	12785	·838	106·3	48·9	−16·5	23	106	560 f
	12787	·962	76·1	33·4	+11·8	16	25	283 c
		·885	55·4					285
		·931	68·1					219
Apr. 19			(−25·9)	(105·7)	(−5·2)	(564)	(2880)	(3621)
109·452		·955	247·2					505
G	12777	·980	302·1	165·5	+30·0	17	79	783 f
	12779	·837	260·9	149·2	−10·4	26	118	308 c
	12778	·815	244·2	145·4	−23·8	89	534	526 c
	1131n	·717	269·1	138·1	− 4·2	5	16	
	12781	·219	116·2	80·8	−10·5	149	850	
	1131o	·374	111·8	71·5	−12·8	5	15	
	12784	·478	97·8	63·8	− 8·2	18	74	
	12783	·522	107·0	61·6	−13·1	122	680	
	12785	·697	108·6	48·9	−16·6	25	115	257 f
	12787	·887	72·6	32·2	+12·9	9	22	188 c
Apr. 20			(−25·8)	(92·3)	(−5·1)	(465)	(2503)	(2567)

Group 12781. Apr.15–27. A large spot with a short train developing as the disk is crossed. The leader alone remains after Apr.25.
Group 12782. Apr.16–17. A small spot.
Group 12783. Apr.16–28. With Group 12785 a return of Group 12757: 3rd appearance. A large spot regular in structure except for a bulge on its eastern side; this breaks away as a separate spot on Apr.20–21. The umbra of the original spot is noticeably well-defined and circular.
Group 12784. Apr.16–23. A small regular spot *np* Group 12783.
Group 12785. Apr.17–29. With Group 12783, a return of Group 12757: 3rd appearance. A small regular spot in the wake of Groups 12781 and 12783. There are companion spots on April 22.
Group 12786. Apr.18–19. A small group *sp* Group 12781.
Group 12787. Apr.19–20. A spot with a small companion on Apr.20.

POSITIONS AND AREAS OF SUN SPOTS AND FACULÆ FOR EACH DAY IN THE YEAR.

U.T.	Group No.	Measures Dist.	Measures Pos. Angle	Position Long.	Position Lat.	Area Umbræ	Area Whole Spots	Area Faculæ
			°	°	°			
1938								
110·360		·906	306·5					126
G		·840	267·9					197
		·758	255·7					231
	12779	·931	260·7	149·2	−10·5	22	78	801 *s*
	12778	·909	245·8	145·3	−24·0	75	445	693 *c*
	12788	·701	302·9	118·5	+18·3	6	19	
	12781	·099	191·2	81·4	−10·6	135	720	
	12784	·285	103·3	64·1	− 8·6	9	58	
	12783	·342	115·4	61·9	−13·2	121	603	
	12785	·547	112·9	48·7	−16·6	24	100	
	1131p	·580	69·7	47·2	+ 7·3	1	2	
		·876	69·5					441
Apr. 21			(−25·7)	(80·3)	(−5·1)	(393)	(2025)	(2489)
111·348		·961	304·2					152
G		·943	288·0					40
		·932	267·6					271
		·889	278·0					256
		·863	260·0					350
		·817	248·3					389
	12779	·989	259·7	149·3	−10·9	16	46	404 *sf*
	12778	·975	246·0	145·3	−24·5	71	376	963 *c*
	1131q	·818	268·4	122·2	− 4·2	4	15	129 *c*
	12788	·832	297·0	118·8	+19·0	8	37	185 *c*
	12781	·268	249·0	82·0	−10·3	118	606	
	12784	·083	144·1	64·4	− 8·9	9	48	
	12783	·168	147·4	62·0	−13·1	88	505	
	12785	·375	121·2	47·9	−15·9	26	91	
		·888	60·4					298
		·917	74·0					365
		·989	75·0					223
Apr. 22			(−25·6)	(67·3)	(−5·0)	(340)	(1724)	(4025)
112·193	12781	·454	257·3	82·7	−10·1	97	506	
K	12784	·167	243·7	64·8	− 9·0	8	22	
	12783	·178	216·0	62·2	−13·1	91	427	
	12785	·240	147·2	48·3	−16·4	17	91	
	12789	·968	80·6	341·8	+ 7·8	29	165	546 *f*
	12790	·969	100·1	340·1	−11·0	30	163	100 *c*
Apr. 23			(−25·5)	(56·1)	(−4·9)	(272)	(1374)	(646)
113·641		·966	249·8					293
G		·945	261·6					485
		·870	243·9					194
	12781	·707	260·9	81·9	− 9·8	108	510	
	12783	·445	249·7	62·3	−13·2	82	408	
	12785	·273	222·6	48·0	−16·3	19	71	
	12791	·800	70·9	346·6	+12·1	41	207	284 *c*
1938								
	12789	·833	77·6	342·1	+ 7·5	32	175	168 *c*
	12790	·836	99·9	340·2	−10·9	58	240	315 *c*
	12792	·901	108·9	332·8	−19·1	21	135	812 *sf*
		·936	33·7					63
		·939	66·5					189
Apr. 24			(−25·3)	(37·0)	(−4·8)	(361)	(1746)	(2803)
114·586		·942	244·0					200
G		·930	253·8					274
		·917	301·9					414
		·826	241·8					159
	12781	·849	261·6	82·7	− 9·6	92	483	458 *c*
	12783	·623	254·5	62·4	−13·2	79	385	
	12785	·432	242·4	47·8	−15·8	10	52	
	12793	·585	34·4	3·3	+24·4	3	11	
	12791	·646	64·9	345·9	+12·1	76	302	
	12789	·696	73·7	342·3	+ 7·8	37	162	
	12790	·685	100·2	341·4	−10·4	29	187	
	12792	·797	110·0	332·5	−18·7	26	141	358 *f*
		·924	117·6					706
Apr. 25			(−25·2)	(24·5)	(−4·7)	(352)	(1723)	(2569)
115·529		·962	300·9					326
G		·897	288·5					227
		·864	299·1					179
	12781	·946	261·7	83·2	− 9·3	82	458	622 *f*
	12783	·772	256·5	62·3	−13·3	74	385	463 *p*
	12785	·600	249·9	47·6	−15·6	9	37	
	12793	·505	19·1	1·6	+23·9	5	13	
	12791	·484	54·3	348·4	+12·1	80	421	
	12789	·531	66·7	342·6	+ 8·1	35	165	
	12790	·500	102·3	342·4	−10·1	39	176	
	12792	·662	113·5	332·3	−18·8	21	105	
	12794	·993	117·6	287·6	−27·9	73	387	335 *c*
		·811	118·7					337
		·864	70·6					250
		·985	74·2					254
Apr. 26			(−25·1)	(12·0)	(−4·6)	(418)	(2147)	(2993)
116·413		·963	286·1					289
G		·912	298·2					369
		·817	241·5					287
	12781	·991	260·9	82·9	− 9·6	72	473	786 *f*
	12783	·885	257·1	62·6	−13·5	77	353	610 *c*
	12785	·742	253·3	47·6	−15·4	10	37	
	12793	·482	357·7	1·5	+24·1	15	64	
	12791	·352	35·6	348·3	+12·2	79	466	
	12790	·312	108·1	342·9	− 9·8	28	125	

Group 12788. Apr.21.22. A tiny stream.
Group 12789. Apr.23–May 4. A stable regular spot with a tiny companion on Apr.27 and 28.
Group 12790. Apr.23–30. A regular spot followed closely by a smaller one.
Group 12791. Apr.24–May 4. A stream of normal type.
Group 12792. Apr.24–May 5. Return of Group 12762. A stable regular spot.
Group 12793. Apr.25–29. Two or three small spots in a stream.
Group 12794. Apr.26–May 9. A spot, with double umbra, which finally separates into two parts on May 6–7.

POSITIONS AND AREAS OF SUN SPOTS AND FACULÆ FOR EACH DAY IN THE YEAR.

U.T.	Group No.	Measures Dist.	Measures Pos. Angle	Position Long.	Position Lat.	Area Umbræ	Area Whole Spots	Area Faculæ
			°	°	°			
1938								
	12789	·372	53·3	342·8	+ 8·5	42	190	
	12792	·516	119·3	332·1	−18·5	21	106	
	12794	·959	117·9	286·8	−28·0	120	583	941 c
	12795	·973	109·1	283·2	−19·6	62	294	
	12796	·981	65·1	284·9	+23·3	35	181	233 c
		·879	52·3					246
		·935	72·2					257
Apr. 27			(−24·9)	(0·3)	(−4·5)	(561)	(2872)	(4018)
117·391 G		·972	264·2					284
		·971	293·1					129
		·804	292·3					256
	12783	·964	257·2	62·4	−13·5	75	367	578 f
	12785	·868	254·8	47·4	−15·3	9	14	515 c
	12793	·532	332·1	3·1	+23·7	22	64	
	12791	·288	0·3	347·3	+12·2	95	456	
	12790	·121	141·8	343·1	− 9·8	16	69	
	12789	·237	19·6	342·8	+ 8·5	37	182	
	12792	·358	134·3	331·8	−18·7	17	90	
	12794	·884	119·8	287·1	−28·2	116	472	
	12795	·903	109·5	283·1	−19·4	52	278	1472 c
	12797	·941	115·6	277·6	−25·5	7	34	
	12798	·964	120·1	273·1	−30·1	28	103	
	12796	·927	62·8	283·9	+23·1	30	199	374 f
	12799	·987	65·0	269·8	+23·8	42	233	239 c
	12800	·981	112·0	268·0	−22·4	35	126	288 f
Apr. 28			(−24·8)	(347·4)	(−4·4)	(581)	(2687)	(4135)
118·376 G		·941	240·8					298
		·900	289·9					518
		·871	251·0					287
	12785	·956	255·4	47·6	−15·2	8	15	679 c
	12793	·669	312·6	6·7	+23·2	6	21	
	1132a	·600	322·7	357·8	+24·5	3	6	
	12791	·360	321·2	347·7	+12·1	82	399	
	12789	·267	325·6	343·1	+ 8·5	38	184	
	12790	·168	234·8	342·4	− 9·8	12	37	
	12792	·253	168·8	331·4	−18·6	19	83	
	1132b	·664	62·3	297·1	+14·5	3	12	
	12794	·778	123·2	287·0	−28·1	82	463	
	12795	·793	111·2	283·0	−19·3	47	264	858 c
	12797	·853	117·3	277·6	−25·3	9	26	
	12796	·834	58·0	284·1	+23·5	44	272	340 f
	12798	·897	121·8	272·7	−30·2	15	97	567 f
	12799	·933	62·6	269·9	+23·6	47	267	648 f
	12800	·922	112·2	267·5	−22·1	39	212	655 c
		·930	93·9					246
		·941	103·2					166
Apr. 29			(−24·6)	(334·4)	(−4·3)	(454)	(2358)	(5262)

U.T.	Group No.	Measures Dist.	Measures Pos. Angle	Position Long.	Position Lat.	Area Umbræ	Area Whole Spots	Area Faculæ
			°	°	°			
1938								
119·337 G		·980	250·3					234
		·961	292·9					402
		·948	282·7					316
		·882	246·1					262
		·865	293·1					243
		·803	304·7					188
	12791	·504	303·7	347·0	+12·4	63	351	
	12789	·425	300·3	343·4	+ 8·5	37	182	
	12790	·376	253·3	343·1	−10·1	3	10	
	12792	·297	211·3	331·1	−18·8	15	79	
	12794	·660	129·5	287·4	−28·2	98	395	
	12796	·721	52·2	283·7	+22·8	59	279	131 c
	12795	·653	115·9	283·2	−19·8	38	178	
	12797	·735	120·9	277·7	−25·1	4	13	
	12798	·802	125·3	272·7	−30·3	13	68	418 f
	12799	·851	58·7	269·3	+23·6	56	274	684 f
	12800	·834	113·9	266·5	−22·1	43	205	669 c
		·761	112·2					114
		·880	100·9					354
		·951	71·9					291
		·962	77·9					81
		·967	96·5					272
		·969	56·2					362
		·974	104·5					187
Apr. 30			(−24·5)	(321·7)	(−4·2)	(429)	(2034)	(5208)
120·400 C		·942	287·7					318
		·861	300·2					388
		·829	286·3					173
	12791	·683	293·1	347·6	+12·4	65	348	
	12789	·616	289·3	343·5	+ 8·4	33	178	
	12792	·454	235·1	330·8	−18·8	16	74	
	12794	·525	141·4	286·0	−28·0	88	388	
	12801	·467	57·5	284·2	+10·7	1	4	
	12796	·587	40·3	283·5	+22·8	60	319	
	12795	·480	126·3	283·5	−20·2	40	163	
	12797	·585	129·0	277·6	−25·3	1	6	
	12798	·672	131·6	271·9	−31·1	13	59	
	12799	·730	51·1	269·2	+24·6	61	276	463 f
	12800	·698	118·7	266·3	−22·6	51	211	321 c
		·803	104·5					259
		·878	71·1					561
		·887	97·1					302
		·950	62·1					313
May 1			(−24·3)	(307·7)	(−4·1)	(429)	(2026)	(3098)
121·397 C		·938	297·3					330
		·938	252·2					214
		·926	283·1					317

Group 12795. Apr.27–May 8. A regular spot on Apr.27, nearly cleft in two on Apr.28 and finally dividing within the next 24 hours. The two parts separate in longitude, the leading part surviving as a small regular spot after May 5.

Group 12796. Apr.27–May 9. A regular spot from which a part breaks away on its *f* side and becomes a stream in miniature. The main spot has completely regained its regular outline by May 4.

Group 12797. Apr.28–May 1. A small spot.

Group 12798. Apr.28–May 2. Return of Group 12767: 4th appearance. A small regular spot, with a companion on Apr.29 and May 1, *f* Group 12794.

Group 12799. Apr.28–May 9. A regular spot becoming unstable after Apr.30. The spot is elongated on May 2 and part of it breaks away on the following day.

Group 12800. Apr.28–May 10. A regular spot with a few small followers which are represented by a single spot after May 3.

Group 12801. May 1–2. A small spot on May 1: a pair of larger ones on May 2.

POSITIONS AND AREAS OF SUN SPOTS AND FACULÆ FOR EACH DAY IN THE YEAR.

U.T.	Group No.	Measures: Dist.	Measures: Pos. Angle	Position: Long.	Position: Lat.	Area: Umbræ	Area: Whole Spots	Area: Faculæ
			°	°	°			
1938								
		·768	257·8					300
	12791	·829	287·9	348·2	+12·4	58	301	437 c
	12789	·778	284·1	344·0	+ 8·3	32	171	214 c
	12792	·621	244·3	330·6	-18·8	15	73	
	12794	·431	161·3	285·5	-27·9	69	365	
	12795	·321	149·2	284·5	-19·9	26	108	
	12801	·318	33·6	284·2	+11·4	10	25	
	12796	·485	21·5	283·4	+22·8	40	272	
	12802	·439	136·8	275·6	-22·4	12	78	
	12798	·540	143·0	272·7	-29·1	8	35	
	12799	·611	39·1	269·5	+24·6	51	249	
	12800	·563	126·5	265·2	-23·0	32	185	
	1132c	·829	64·9	242·5	+18·1	4	8	241 c
	1132d	·955	95·1	221·7	- 6·1	3	12	391 sf
	12803	·973	92·9	217·9	- 3·7	50	162	414 c
		·767	96·3					172
		·895	129·9					330
		·938	59·3					582
		·973	110·4					94
May 2			(-24·1)	(294·5)	(-4·0)	(410)	(2044)	(4036)
122·398 C		·856	258·8					321
	12791	·930	284·9	347·8	+12·3	35	342	396 c
	12789	·897	281·5	343·7	+ 8·5	35	148	282 f
	12792	·768	248·8	330·1	-18·7	17	100	214 s
	12795	·276	193·1	285·0	-19·4	20	105	
	12794	·420	187·1	284·6	-28·4	95	437	
	12796	·448	355·9	283·2	+22·5	22	211	
	12802	·324	164·8	276·0	-22·0	60	293	
	12799	·514	21·3	269·4	+24·7	32	232	
	12800	·419	142·4	265·1	-23·1	40	164	
	12803	·888	92·5	218·6	- 4·1	24	76	394 f
		·774	59·9					391
		·883	54·3					284
		·946	148·7					485
May 3			(-23·9)	(281·2)	(-3·9)	(380)	(2108)	(2767)
123·337 G		·936	259·5					333
		·843	237·5					234
	12791	·991	283·1	349·8	+12·4	51	213	396 nf
	12789	·975	279·3	345·0	+ 8·2	24	201	315 f
	12804	·916	293·9	331·7	+20·1	11	66	137 c
	12792	·886	250·8	330·6	-18·7	15	63	355 s
	12795	·378	223·9	284·9	-19·4	18	87	
	12794	·483	208·9	284·1	-28·6	70	383	
	12796	·505	332·7	283·3	+22·9	46	212	
	12802	·336	200·9	276·2	-22·0	82	364	
	12799	·484	357·8	270·0	+25·0	34	186	
	12800	·339	168·1	264·5	-23·1	29	149	
	12805	·684	141·7	237·5	-35·6	12	28	
	12806	·729	140·9	233·5	-37·5	13	47	
	12803	·767	92·2	218·8	- 4·1	25	83	107 c
	12807	·813	97·9	214·5	- 8·6	4	12	327 f
1938								
	12808	·976	97·7	191·2	- 8·3	56	173	388 f
		·852	53·3					377
		·858	79·0					253
		·881	137·8					210
		·907	62·9					160
May 4			(-23·7)	(268·8)	(-3·8)	(490)	(2267)	(3592)
124·338 G		·976	280·5					112
		·912	239·7					480
	12792	·963	251·6	330·1	-18·7	9	26	406 s
	12804	·968	292·7	328·3	+20·9	14	35	281 sp
	12795	·529	237·5	283·8	-19·7	17	98	
	12794	·599	223·6	283·6	-28·9	76	340	
	12796	·615	316·0	283·1	+22·9	34	186	
	12802	·456	225·1	276·1	-23·1	61	308	
	12799	·532	334·1	270·4	+24·9	32	159	
	12800	·358	202·4	264·1	-22·9	22	128	
	12805	·579	155·1	238·3	-35·1	11	33	
	12806	·648	150·9	232·2	-37·7	29	109	
	12803	·595	92·1	219·2	- 4·4	16	43	
	12809	·840	58·9	204·2	+23·4	8	17	78 c
	12808	·904	96·9	190·9	- 7·8	98	474	604 c
	12810	·995	65·9	173·8	+23·5	24	53	184 p
		·771	99·1					239
		·869	49·4					163
		·913	111·9					171
		·954	119·9					187
		·958	55·6					136
		·958	70·2					203
		·982	112·9					88
May 5			(-23·5)	(255·6)	(-3·7)	(451)	(2009)	(3332)
125·453 G		·962	241·1					335
		·917	301·3					268
	12795	·725	246·1	285·4	-19·6	17	71	
	12794	·739	232·8	283·1	-29·1	62	307	
	12796	·756	305·5	282·8	+23·3	31	192	
	12802	·627	238·5	276·0	-22·0	46	226	
	12799	·650	316·1	270·5	+24·7	27	116	
	12800	·478	224·9	262·3	-23·1	20	115	
	12805	·527	172·1	235·9	-34·9	24	108	
	12806	·599	166·7	230·7	-39·0	48	197	
	12811	·338	100·7	221·5	- 6·9	3	7	
	12803	·379	93·1	218·7	- 4·5	10	32	
	12807	·478	99·7	212·6	- 7·8	3	10	
	12808	·786	96·7	189·2	- 7·5	123	705	335 c
	12812	·925	114·5	174·1	-24·0	3	12	199 c
	12810	·950	63·8	172·8	+23·5	28	125	340 nf
		·849	121·9					294
		·948	76·1					211
		·973	54·6					251
		·975	102·7					301
May 6			(-23·3)	(240·9)	(-3·6)	(445)	(2223)	(2534)

Group 12802. May 2–9. A stream of approximately normal type suddenly forming between Groups 12795 and 12800.
Group 12803. May 2–9. Return of Group 12775. A single spot on May 2 breaking up into a pair of components between May 2 and 3.
Group 12804. May 4–5. A group developing near the west limb.
Group 12805. May 4–13. A stream of spots arising with Group 12806.
Group 12806. May 4–10. A composite spot in high latitude, resulting from the fusion of a pair of spots near Group 12805.
Group 12807. May 4–6. A small spot not seen on May 5.
Group 12808. May 4–16. A growing compact stream when first seen. From May 8 to 13, the penumbræ of the components merge to form one very long spot but with two distinct nuclei. [These have opposite magnetic polarites according to the Mount Wilson observations].
Group 12809. May 5–13. A group of slight but persistent activity. Group 12813 comes immediately in front on May 7.
Group 12810. May 5–16. Return of Group 12777. A diminishing regular spot.
Group 12811. May 6–7. A tiny ephemeral group.
Group 12812. May 6–10. A very small spot seen only on May 6 and 10.

POSITIONS AND AREAS OF SUN SPOTS AND FACULÆ FOR EACH DAY IN THE YEAR.

U.T.	Group No.	Measures Dist.	Measures Pos. Angle	Position Long.	Position Lat.	Area Umbræ	Area Whole Spots	Area Faculæ
			°	°	°			
1938								
126·487		·927	288·7					366
G	*1132e*	·956	261·5	300·2	− 9·1	8	30	158 *c*
	12795	·858	249·2	285·3	−19·6	14	55	173 *p*
	12794	·853	237·4	282·5	−29·3	64	309	300 *c*
	12796	·869	299·9	282·3	+23·6	27	182	201 *f*
	12802	·771	244·0	275·4	−22·0	36	203	179 *c*
	12799	·772	305·9	270·4	+24·3	25	113	
	12800	·642	237·4	263·0	−23·0	13	104	
	12805	·534	195·9	237·4	−34·3	55	207	
	12806	·575	183·5	229·8	−38·4	30	184	
	12811	·070	115·1	223·6	− 5·2	2	16	
	12803	·157	99·1	218·3	− 4·9	9	20	
	12813	·512	33·7	209·5	+21·7	1	5	
	12809	·559	37·9	205·4	+22·8	7	19	
	12808	·631	97·3	188·2	− 7·3	160	931	
	12810	·861	60·2	173·0	+23·3	18	112	343 *c*
	12814	·970	63·5	154·6	+24·6	41	160	438 *c*
		·873	73·5					255
		·912	50·5					307
		·926	102·2					333
		·972	109·9					380
May 7			(−23·1)	(227·2)	(−3·5)	(510)	(2650)	(3433)
127·374		·860	229·1					283
G	12795	·940	250·3	285·2	−19·6	10	33	279 *c*
	12794	·932	239·7	282·7	−29·4	78	323	655 *c*
	12796	·943	296·5	282·2	+23·5	27	169	161 *f*
	12802	·888	246·7	277·0	−22·1	16	132	252 *n*
	12799	·872	300·5	270·8	+24·3	16	69	332 *c*
	12800	·769	242·5	263·1	−23·0	18	85	
	12805	·613	211·3	238·2	−34·6	46	220	
	12806	·610	196·1	228·0	−39·0	17	94	
	12803	·053	244·2	218·2	− 4·7	4	12	
	12813	·469	17·1	206·9	+23·2	10	44	
	12809	·493	23·3	203·3	+23·5	8	26	
	12815	·442	110·9	190·6	−12·1	3	4	
	12808	·456	99·9	188·7	− 7·5	170	974	
	12816	·632	57·7	181·7	+16·9	9	26	
	12810	·763	55·1	172·7	+23·3	25	119	312 *nf*
	12814	·911	60·9	154·6	+24·6	56	248	380 *c*
	12817	·976	114·5	138·1	−24·6	52	333	595 *n*
		·848	102·5					290
		·859	43·5					254
		·943	51·8					432
		·946	93·0					190
May 8			(−22·9)	(215·5)	(−3·4)	(565)	(2911)	(4415)
128·509		·950	264·4					202
C		·936	243·6					375
		·927	232·3					450
		·884	303·0					517
		·871	257·4					267
		·839	292·7					150
		·838	282·4					96

U.T.	Group No.	Measures Dist.	Measures Pos. Angle	Position Long.	Position Lat.	Area Umbræ	Area Whole Spots	Area Faculæ
			°	°	°			
1938								
		·825	236·2					165
		·744	297·0					132
	12794	·989	240·7	282·5	−29·5	58	258	410 *c*
	12796	·994	294·2	284·9	+24·4	40	272 }	459 *c*
	12799	·958	296·1	270·4	+23·8	7	31 }	
	12802	·972	247·6	276·7	−22·5	8	42	356 *np*
	12800	·898	245·4	263·1	−23·4	20	75	457 *f*
	12805	·739	224·8	239·3	−34·1	49	244	
	12806	·688	210·0	226·8	−39·3	6	43	
	12803	·333	259·0	219·6	− 6·7	1	2	
	12813	·448	343·2	208·5	+22·1	13	41	
	12809	·451	355·8	202·6	+23·4	10	30	
	12808	·207	111·2	189·3	− 7·4	193	1019	
	12815	·260	117·5	187·0	−10·0	2	8	
	12816	·440	40·7	183·2	+16·4	18	73	
	12810	·617	43·6	172·9	+23·6	25	123	
	12818	·680	105·2	158·4	−12·6	9	25	
	12814	·788	55·0	155·5	+24·5	61	257	330 *c*
	12817	·894	115·8	138·6	−24·4	53	321	774 *c*
	12819	·972	72·5	125·9	+16·1	8	27	268 *f*
	12820	·977	108·6	122·7	−18·8	21	122	349 *c*
		·831	108·4					284
		·881	43·4					289
		·930	102·6					232
May 9			(−22·6)	(200·5)	(− 3·2)	(602)	(3013)	(6562)
129·376		·982	244·1					461
G		·959	298·0					654
		·949	257·0					294
		·940	233·8					397
		·918	307·0					114
		·860	290·8					409
		·847	261·0					187
		·805	304·4					297
	12800	·960	246·8	262·4	−23·1	16	76	572 *f*
	12805	·828	230·1	238·9	−34·1	36	195	407 *f*
	12806	·755	217·0	225·0	−39·6	4	11	81 *c*
	12813	·530	323·2	208·9	+22·0	26	76	
	12809	·490	337·0	201·0	+23·5	5	18	
	12808	·070	171·7	188·4	− 7·2	163	973	
	12816	·359	19·4	181·9	+16·6	30	126	
	12812	·399	148·2	175·9	−22·8	3	5	
	12810	·524	31·0	172·0	+23·5	19	91	
	1132f	·670	29·0	166·4	+32·8	1	3	
	12814	·686	48·8	154·7	+24·1	81	336	
	12818	·582	109·0	154·7	−13·5	3	9	
	12817	·808	117·9	137·7	−24·1	58	295	431 *c*
	12819	·920	70·8	124·4	+16·3	34	110	420 *f*
	12820	·927	109·1	121·5	−18·8	36	96	515 *c*
	12821	·997	101·7	103·1	−11·9	85	250	152 *p*
		·824	40·9					281
		·840	103·2					193
		·941	94·9					234
		·953	42·9					130
		·959	126·0					127
May 10			(−22·4)	(189·0)	(−3·2)	(600)	(2670)	(6356)

Group 12813. May 7–14. A small stream, feebly developed.
Group 12814. May 7–18. A stream in which the following components are more prominent than the leader.
Group 12815. May 8–13. A small variable group *s* Group 12808.
Group 12816. May 8–13. A small stream.
Group 12817. May 8–20. Return of Group 12778. A stable regular spot.
Group 12818. May 9–10. Three tiny spots on May 9: one on May 10.
Group 12819. May 9–21. A regular spot having temporarily a double umbra on May 12–13. There is a small follower on May 10–11, 13 and 14.
Group 12820. May 9–16. A cluster of small spots.
Group 12821. May 10.23. A typical bipolar group, with well defined regular spots as leader and follower respectively. There is an occasional small attendant spot in between.

POSITIONS AND AREAS OF SUN SPOTS AND FACULÆ FOR EACH DAY IN THE YEAR.

U.T.	Group No.	Measures Dist.	Measures Pos. Angle	Position Long.	Position Lat.	Area Umbræ	Area Whole Spots	Area Faculæ
			°	°	°			
1938								
130·601		·968	289·9					276
G		·945	260·6					361
		·941	298·9					549
		·939	240·4					279
		·901	286·9					317
		·852	310·8					325
		·826	297·9					260
	12805	·929	234·3	238·2	−34·1	26	166	640 *f*
	12813	·698	306·0	210·1	+21·7	13	43	
	12809	·593	314·9	199·6	+22·0	9	37	
	12808	·285	255·1	188·8	− 7·1	141	925	
	12815	·304	242·7	188·6	− 9·2	9	21	
	12816	·375	332·9	183·0	+16·0	19	54	
	12810	·449	2·0	171·8	+23·5	9	53	
	12814	·527	30·4	155·9	+24·0	89	506	
	12817	·644	124·8	137·6	−24·0	57	273	
	12819	·768	66·5	126·0	+15·7	20	117	172 *c*
	12820	·796	112·2	121·6	−19·4	19	67	187 *c*
	12821	·954	101·1	100·2	−11·5	106	677 }	499 *c*
	12822	·994	98·4	89·0	− 8·7	31	149 }	
May 11			(−22·1)	(172·8)	(−3·0)	(548)	(3088)	(3865)
131·334		·963	295·7					313
G		·954	286·1					187
		·917	306·9					283
		·872	264·8					414
	12805	·980	235·3	240·7	−34·5	34	162	554 *f*
	12813	·818	300·3	212·8	+22·5	4	9	
	12809	·729	308·0	202·0	+24·3	8	36	
	12815	·471	251·5	190·1	−11·2	10	36	
	12808	·441	260·0	188·9	− 6·9	120	862	
	12816	·471	315·5	183·2	+16·8	10	35	
	12810	·474	343·2	171·7	+24·0	6	35	
	12814	·471	14·3	155·8	+24·1	83	489	
	12817	·539	131·8	137·2	−23·6	48	272	
	12819	·649	61·2	127·0	+15·8	21	117	
	12820	·706	114·6	120·4	−19·2	5	18	
	12821	·883	101·8	101·3	−11·8	120	704	398 *c*
	12822	·971	99·2	86·9	− 9·6	43	252	232 *c*
May 12			(−21·9)	(163·1)	(−2·9)	(512)	(3027)	(2381)
132·348		·969	295·9					273
G		·959	265·7					675
		·940	306·5					225
		·915	283·4					258
		·859	259·1					354
	12805	·997	235·5	235·9	−34·6	43	152	542 *f*
	12813	·892	296·9	208·8	+22·3	25	80	263 *c*
	12809	·829	302·2	199·9	+24·4	2	4	142 *c*
	12815	·689	257·1	192·7	−10·9	6	21	
	12808	·635	262·3	188·9	− 7·1	122	708	
	12816	·603	302·8	181·5	+16·6	6	13	
	12810	·560	324·1	170·7	+24·2	8	35	
	12814	·461	348·7	155·4	+24·0	79	345	
	12817	·412	150·0	136·8	−23·6	48	266	
	1132g	·296	119·7	134·6	−11·1	3	7	
1938								
	12819	·493	49·7	126·8	+15·9	36	163	
	12820	·555	120·7	119·6	−18·8	14	30	
	12821	·757	102·9	101·0	−11·5	112	588	234 *f*
	12822	·888	99·3	87·2	− 9·6	44	229	430 *f*
		·879	111·3					154
		·949	73·7					430
		·972	110·0					286
May 13			(−21·7)	(149·7)	(−2·8)	(548)	(2641)	(4266)
133·341		·952	259·9					404
G	12813	·962	295·6	207·7	+23·7	13	83	262 *c*
	12808	·798	263·0	189·4	− 7·2	74	499	131 *c*
	12810	·679	311·2	170·5	+24·2	7	27	
	12814	·532	329·0	154·1	+25·1	49	233	
	12817	·358	180·2	136·7	−23·6	54	278	
	12819	·353	27·0	127·1	+15·6	26	129	
	12820	·388	137·8	120·6	−19·2	5	15	
	12821	·592	106·2	101·3	−11·7	95	540	
	12822	·762	100·2	87·3	− 9·5	46	261	
	12823	·967	104·0	61·4	−14·2	96	475	509 *c*
		·919	71·2					244
May 14			(−21·4)	(136·6)	(−2·7)	(465)	(2540)	(1550)
134·358		·971	297·1					211
G		·891	291·9					303
		·886	239·7					439
		·794	322·6					140
	12808	·910	263·7	188·5	− 6·8	90	571	646 *c*
	12810	·800	303·5	170·0	+24·4	6	19	155 *c*
	12814	·643	314·7	153·1	+24·5	56	225	
	12817	·416	209·7	136·0	−23·6	55	276	
	12819	·324	347·7	127·2	+15·8	24	126	
	12820	·288	172·9	120·9	−19·1	4	12	
	12821	·404	113·8	101·0	−11·8	93	545	
	12822	·591	102·7	87·5	− 9·6	38	214	
	12823	·880	104·9	62·0	−14·4	81	488	476 *c*
		·930	68·7					246
		·970	99·3					137
		·975	110·5					402
May 15			(−21·1)	(123·1)	(−2·6)	(447)	(2476)	(3115)
135·341		·957	288·3					309
G		·927	239·7					541
		·896	310·6					455
		·870	282·7					277
	12808	·981	263·5	188·9	− 6·9	76	458	599 *c*
	12810	·899	298·9	169·7	+24·5	6	16	198 *c*
	12814	·757	306·8	151·9	+25·0	35	120	449 *c*
	12817	·541	227·6	135·8	−23·6	54	272	
	12819	·421	318·3	127·0	+15·8	20	85	
	12820	·346	215·1	122·2	−18·8	3	7	
	12821	·225	137·5	101·2	−12·0	95	480	
	12822	·408	108·5	87·1	− 9·7	46	247	
	12823	·759	106·6	61·7	−14·2	80	473	

Group 12822. May 11–24. Return of Group 12781. A pair of regular spots, the larger one leading.
Group 12823. May 14–26. Return of Group 12783: 4th appearance. A group of stream type with the largest component (a regular spot) as follower; this alone remains after May 22.

POSITIONS AND AREAS OF SUN SPOTS AND FACULÆ FOR EACH DAY IN THE YEAR.

U.T.	Group No.	Measures: Dist.	Measures: Pos. Angle	Position: Long.	Position: Lat.	Area: Umbræ	Area: Whole Spots	Area: Faculæ
			°	°	°			
1938								
	12824	·774	112·1	61·1	−18·5	18	43	
		·859	63·5					349
		·869	103·5					255
		·904	114·1					423
		·952	73·5					275
		·970	103·1					115
May 16			(−20·9)	(110·1)	(−2·5)	(433)	(2201)	(4245)
136·343 C		·968	298·5					380
		·936	310·8					335
		·900	254·0					516
		·812	318·7					263
	12814	·861	301·2	150·9	+25·1	18	86	888 *c*
	12817	·684	237·2	135·4	−23·6	42	260	
	12819	·572	303·4	126·4	+16·2	24	113	
	12821	·182	204·6	101·1	−11·9	89	487	
	12822	·214	127·0	86·8	− 9·7	42	191	
	12823	·601	111·2	61·5	−14·4	96	444	
	12824	·634	118·6	60·7	−19·5	3	14	
	12825	·857	103·4	38·2	−12·7	27	127	262 *c*
		·845	115·8					391
		·877	71·3					376
May 17			(−20·6)	(96·7)	(−2·4)	(341)	(1722)	(3411)
137·361 G		·972	253·1					405
		·910	310·3					326
		·884	251·3					290
	12814	·942	298·1	150·1	+25·[illegible]	7	13	639 *c*
	12817	·817	242·5	135·4	−23·5	41	317	323 *c*
	12819	·726	294·7	126·5	+15·9	30	110	
	12821	·348	241·1	101·5	−11·8	90	471	
	12822	·144	205·2	87·0	− 9·8	49	207	
	12823	·420	120·3	61·5	−14·3	78	443	
	12825	·724	105·7	37·9	−12·9	41	188	
	12826	·992	105·5	0·6	−15·7	34	210	221 *c*
		·883	63·3					193
		·975	82·3					141
May 18			(−20·3)	(83·4)	(−2·3)	(370)	(1959)	(2538)
138·348 G		·974	296·2					247
		·961	307·4					343
		·960	253·4					401
		·946	262·4					181
	12817	·916	245·0	135·1	−23·6	44	287	444 *c*
	12819	·853	290·2	126·5	+16·0	17	115	
	12821	·531	250·5	100·9	−11·9	62	387	
	1132h	·356	255·4	90·5	− 7·1	1	5	
	12822	·309	243·4	86·5	−10·0	38	213	
	12823	·261	142·4	60·9	−13·9	50	297	
	12825	·557	110·3	38·0	−12·8	81	315	
	12826	·958	106·3	357·3	−16·2	135	705	317 *c*
		·919	81·1				215	
		·949	72·6				358	
		·967	116·0				89	
May 19			(−20·0)	(70·3)	(−2·1)	(428)	(2324)	(2595)
1938								
139·358 G		·872	266·0					254
		·855	300·5					171
	12817	·979	246·1	134·8	−23·8	43	230	684 *f*
	12819	·946	287·7	126·4	+16·0	21	125	443 *f*
	12821	·708	254·9	101·2	−12·1	66	403	
	1132i	·683	249·3	98·3	−15·4	3	12	
	12822	·506	253·8	86·4	− 9·8	31	190	
	12823	·215	195·7	60·4	−13·9	65	295	
	1132j	·480	44·1	36·5	+18·2	3	5	
	12825	·401	120·1	36·2	−13·4	108	455	
	12827	·880	117·9	357·9	−25·3	7	19	141 *c*
	12826	·873	107·3	357·1	−16·0	111	707	718 *c*
		·903	70·1					459
		·931	59·4					240
		·941	80·7					432
		·944	122·3					520
		·959	98·2					270
May 20			(−19·7)	(57·0)	(−2·0)	(458)	(2441)	(4332)
140·343 G		·976	248·2					452
		·952	261·2					213
	12819	·993	286·4	126·0	+16·0	37	122	308 *f*
	12821	·844	257·3	100·9	−11·7	73	373	552 *c*
	12822	·690	258·2	86·9	− 9·5	31	140	
	12823	·342	231·9	59·9	−13·9	45	252	
	12825	·238	148·8	36·6	−13·6	108	447	
	12827	·760	123·0	359·1	−25·7	21	140	118 *c*
	12826	·746	109·8	357·2	−15·9	110	591	265 *f*
	12828	·900	123·0	343·2	−30·3	6	10	288 *c*
		·891	80·2					268
		·948	66·6					177
		·977	112·5					200
May 21			(−19·4)	(43·9)	(−1·0)	(431)	(2075)	(2841)
141·424 G		·809	289·0					282
	12821	·947	258·4	100·6	−11·5	50	345	488 *c*
	12822	·846	259·9	87·0	− 9·5	28	141	322 *c*
	12823	·533	246·2	59·6	−13·9	53	271	
	12825	·238	209·3	36·5	−13·7	96	518	
	12829	·398	63·0	8·7	+ 8·5	4	8	
	12826	·564	116·0	357·9	−15·8	121	610	
	12827	·631	130·2	357·5	−25·5	47	235	
	12830	·695	75·7	346·9	+ 8·5	3	6	
	12828	·804	127·4	342·0	−30·4	6	8	
	12831	·963	83·2	315·8	+ 6·0	12	38	344 *c*
		·835	114·8					182
		·837	62·4					218
		·912	112·8					264
		·959	121·7					247
		·978	98·4					204
May 22			(−19·0)	(29·6)	(−1·8)	(420)	(2180)	(2551)
142·340 G		·940	286·9					215
		·850	290·5					300
	12821	·994	258·7	101·2	−11·4	97	452	473 *c*

Group 12824. May 16–17. One or two very small spots *s* Group 12823.
Group 12825. May 17–27. A stream in rapid change until about May 24.
Group 12826. May 18–30. A stream of variable spots.
Group 12827. May 20–29. A small stream of normal type of which the leader alone remains after May 25.
Group 12828. May 21–23. A small short-lived group, *f* Group 12827.
Group 12829. May 22–30. A large active stream of rapid initial growth.
Group 12830. May 22–23. A very small spot.
Group 12831. May 22–26. A group of small spots.

POSITIONS AND AREAS OF SUN SPOTS AND FACULÆ FOR EACH DAY IN THE YEAR.

U.T.	Group No.	Measures Dist.	Measures Pos. Angle	Position Long.	Position Lat.	Area Umbræ	Area Whole Spots	Area Faculæ
			°	°	°			
1938								
	12822	·940	260·6	87·3	− 9·4	33	136	289 *c*
	12823	·684	251·1	59·2	−14·1	40	223	
	12825	·389	236·4	36·9	−13·9	78	384	
	12832	·222	340·9	21·7	+10·4	3	7	
	12833	·452	187·7	21·4	−28·2	8	15	
	12829	·213	29·5	11·4	+ 9·0	77	235	
	12834	·266	57·7	4·5	+ 6·4	4	12	
	12826	·411	127·1	357·7	−15·9	103	530	
	12827	·517	142·7	357·2	−25·7	42	202	
	12830	·539	70·9	346·6	+ 8·7	0	3	
	12828	·708	133·1	340·9	−30·2	4	10	
	1132k	·639	71·9	339·6	+10·1	1	6	
	12831	·879	82·1	316·6	+ 6·1	9	37	301 *c*
	12835	·989	78·9	296·8	+10·7	31	74	348 *c*
		·824	117·0					260
		·940	122·2					447
		·946	99·6					527
		·985	67·3					180
May 23			(−18·7)	(17·5)	(−1·7)	(530)	(2326)	(3349)
143·335 G		·961	287·0					331
		·850	287·9					219
	12822	·993	260·8	87·3	− 9·3	37	204	308 *f*
	12823	·825	254·0	58·9	−14·1	40	237	469 *p*
	12825	·569	249·0	37·2	−13·1	46	225	
	12832	·367	303·1	22·4	+10·0	19	60	
	12833	·518	210·6	21·6	−27·9	24	78	
	12829	·212	324·6	11·4	+ 8·3	205	1001	
	12834	·106	11·0	3·1	+ 4·4	1	4	
	12826	·283	153·6	356·8	−16·2	98	492	
	12827	·424	163·9	356·8	−25·5	35	180	
	12831	·767	80·2	315·0	+ 6·4	7	28	124 *c*
	11321	·836	101·0	308·1	−10·0	0	8	491 *c*
	12835	·933	77·6	296·4	+11·0	24	75	406 *c*
		·843	128·4					269
		·941	65·7					359
		·957	115·8					291
May 24			(−18·4)	(4·3)	(−1·6)	(536)	(2592)	(3267)
144·341 C		·949	285·9					209
		·772	292·9					260
	12823	·925	255·3	58·0	−14·1	40	228	573 *c*
	1133a	·909	295·0	53·4	+21·9	2	8	253 *c*
	12825	·738	253·3	37·4	−13·2	48	195	175 *c*
	12832	·547	292·5	21·8	+10·8	18	71	
	12833	·637	225·0	21·5	−27·9	15	43	
	12829	·397	294·5	12·3	+ 8·2	252	1191	
	12826	·278	203·0	357·5	−16·1	79	482	
	12827	·419	192·3	356·6	−25·5	27	124	
	12835	·819	76·1	297·3	+10·5	19	43	196 *c*
	12836	·942	71·9	282·2	+16·5	13	56 }	680 *c*
	12837	·949	67·1	281·6	+21·2	3	14 }	
		·765	99·5					171

U.T.	Group No.	Measures Dist.	Measures Pos. Angle	Position Long.	Position Lat.	Area Umbræ	Area Whole Spots	Area Faculæ
			°	°	°			
1938								
		·851	60·2					270
		·922	117·1					640
		·947	78·9					342
		·973	123·4					307
May 25			(−18·1)	(351·0)	(−1·4)	(516)	(2455)	(4076)
145·333 G		·948	247·1					391
		·931	304·4					211
		·893	289·8					492
		·857	244·7					187
	12823	·987	255·7	58·5	−14·4	42	200	426 *f*
	12825	·876	255·3	38·3	−13·5	51	242	774 *c*
	12832	·711	286·9	21·6	+11·0	19	54	
	12833	·734	232·5	18·7	−27·4	18	41	
	12829	·575	284·9	11·8	+ 7·4	281	1324	
	12826	·425	233·7	358·7	−15·7	61	354	
	12827	·499	214·9	356·2	−25·3	16	106	
	12838	·392	15·5	331·5	+20·8	3	12	
	12831	·425	71·7	314·0	+ 6·4	3	8	
	12835	·682	72·3	296·6	+11·0	11	23	
	12836	·851	69·3	281·9	+16·7	9	35 }	1018 *f*
	12837	·870	64·8	280·6	+21·0	23	76 }	
	12839	·910	121·9	275·7	−29·3	6	11	738 *f*
		·825	123·4					172
		·840	79·5					206
		·877	112·5					302
		·966	104·0					217
		·987	62·9					209
May 26			(−17·7)	(337·9)	(−1·3)	(543)	(2486)	(5343)
146·340 G		·960	287·8					262
	12825	·964	256·6	38·8	−13·2	41	275	734 *c*
	12833	·887	237·8	23·3	−28·8	5	19	149 *f*
	12832	·841	284·4	20·6	+11·4	8	23	96 *c*
	12829	·756	281·2	12·8	+ 7·6	275	1392	
	12826	·616	245·8	0·1	−15·6	61	282	
	12827	·620	228·2	355·2	−25·3	17	65	
	12838	·411	342·0	332·4	+21·7	23	62	
	12835	·490	65·6	297·7	+10·5	6	13	
	12837	·716	59·5	283·6	+20·3	11	58	
	12836	·719	65·3	281·8	+16·5	5	17	
	12839	·819	125·7	275·1	−29·3	4	12	344 *f*
		·834	58·2					206
		·934	63·0					411
		·936	115·1					241
May 27			(−17·4)	(324·6)	(−1·2)	(456)	(2218)	(2443)
147·336 C		·937	241·1					519
		·931	257·3					421
	12829	·876	279·3	11·9	+ 7·6	261	1577	602 *c*
	12826	·777	250·6	0·7	−15·6	48	285	198 *c*

Group 12832. May 23–27. A small unstable stream *np* Group 12829.
Group 12833. May 23–27. A small group having its axis highly inclined to the sun's equator.
Group 12834. May 23–24. One or two tiny spots *f* Group 12829.
Group 12835. May 23–28. A pair of spots.
Group 12836. May 25–27. A small regular spot dying out.
Group 12837. May 25–June 5. Return of Group 12796. A regular spot with a distant follower on May 26, 28 and 29; new spots come in on June 2.
Group 12838. May 26–June 1. A stream of rapid rise and decline led by a regular spot.
Group 12839. May 26–27. Return of Group 12794. One or two small spots.

POSITIONS AND AREAS OF SUN SPOTS AND FACULÆ FOR EACH DAY IN THE YEAR.

U.T.	Group No.	Measures Dist.	Measures Pos. Angle	Position Long.	Position Lat.	Area Umbræ	Area Whole Spots	Area Faculæ
			°	°	°			
1938								
	12827	·742	236·1	354·1	−25·1	12	46	226 c
	12838	·522	316·9	333·8	+21·3	64	401	
	12835	·284	46·6	299·4	+10·1	5	19	
	12837	·563	49·7	284·3	+20·3	11	61	
		·790	133·1					376
		·872	117·1					259
		·931	127·7					377
May 28			(−17·1)	(311·4)	(−1·1)	(401)	(2389)	(2978)
148·396 C	12829	·965	278·3	11·6	+ 7·7	286	1996	742 c
	12826	·904	253·1	1·1	−15·7	28	187	517 c
	12827	·860	240·9	353·3	−25·2	4	11	317 c
	12838	·666	303·9	333·5	+20·9	76	396	
	12837	·421	30·3	284·4	+20·2	12	54	
	12840	·424	102·5	272·9	− 6·1	10	49	
	12841	·880	56·9	240·9	+28·1	4	11	196 s
		·841	125·3					489
		·919	96·9					295
		·941	85·7					267
		·949	60·5					308
		·963	127·3					265
May 29			(−16·7)	(297·4)	(−1·0)	(420)	(2704)	(3396)
149·409 G		·950	288·7					261
		·939	244·3					488
		·935	300·5					175
		·935	260·7					128
		·882	233·7					404
		·881	279·8					284
		·840	252·7					201
	12829	·991	279·1	5·9	+ 8·9	108	531	305 f
	12826	·981	254·4	2·4	−15·5	13	179	714 f
	12838	·801	296·7	333·6	+20·5	50	265	
	12842	·517	289·0	313·5	+ 9·0	3	13	
	12837	·356	355·1	285·8	+19·9	7	39	
	12843	·345	166·0	278·9	−20·2	7	69	
	12840	·195	122·0	274·5	− 6·7	33	147	
	12841	·774	51·6	240·8	+28·0	29	94	
		·798	96·3					447
		·850	57·2					177
		·907	128·8					519
		·936	115·9					186
		·945	102·0					501
		·951	63·4					616
		·957	52·9					163
May 30			(−16·3)	(284·0)	(−0·8)	(250)	(1337)	(5569)

U.T.	Group No.	Measures Dist.	Measures Pos. Angle	Position Long.	Position Lat.	Area Umbræ	Area Whole Spots	Area Faculæ
			°	°	°			
1938								
150·105 K		·973	242·9					202
		·972	252·6					245
		·913	234·1					282
	12838	·878	293·6	333·5	+20·2	44	208	251 c
	12842	·665	284·6	315·2	+ 9·1	7	21	
	12837	·402	332·3	286·1	+20·1	7	25	
	12843	·348	195·7	280·4	−20·2	15	74	
	12840	·111	183·1	275·0	− 7·0	44	219	
	12841	·686	45·9	241·0	+27·8	63	259	
	12844	·993	96·1	191·8	− 6·1	53	277	331 p
		·822	105·7					184
		·874	55·7					216
		·915	98·6					287
		·930	65·0					315
May 31			(−16·1)	(274·7)	(−0·7)	(233)	(1083)	(2313)
151·439 G		·949	245·6					317
		·863	278·5					270
	12838	·979	289·8	334·1	+19·2	22	127	444 c
	12837	·580	308·4	286·0	+20·5	4	11	
	12843	·520	230·0	282·1	−20·0	8	50	
	12840	·360	251·4	277·1	− 7·1	31	157	
	12841	·532	26·2	241·8	+27·8	65	325	
	12845	·378	79·0	235·4	+ 3·6	3	6	
	12846	·586	38·0	233·3	+26·9	6	20	
	12847	·433	78·5	232·0	+ 4·4	8	23	
	12844	·912	96·6	191·6	− 6·3	50	277	469 c
		·945	61·6					249
June 1			(−15·6)	(257·1)	(−0·6)	(197)	(996)	(1749)
152·339 C		·968	290·7					184
		·900	233·8					381
		·873	257·4					307
		·828	283·8					218
	1133b	·947	279·3	315·9	+ 8·6	6	31	472 c
	12843	·658	239·1	282·0	−20·1	9	20	
	12837	·652	303·2	280·6	+20·4	14	50	
	12840	·546	257·2	277·5	− 7·3	35	147	
	12841	·477	7·5	241·2	+27·6	65	281	
	12845	·175	65·6	236·1	+ 3·6	2	11	
	12847	·249	70·5	231·7	+ 4·1	13	46	
	12844	·809	97·8	191·6	− 6·6	60	292	407 c
	12848	·984	109·7	166·2	−19·4	32	131	248 c
		·861	60·9					215
June 2			(−15·2)	(245·2)	(−0·5)	(236)	(1009)	(2432)

Group 12840. May 29–June 4. A stream of rapid rise and decline.
Group 12841. May 29–June 7. A long stream in which the follower develops first but is survived by the leader as is usually the case.
Group 12842. May 30–31. A small short-lived group.
Group 12843. May 30–June 3. A short-lived stream on the same meridian as Group 12840.
Group 12844. May 31–June 12. Return of Group 12808. A stable regular spot with occasional tiny companions.
Group 12845. June 1–4. A small spot preceding Group 12847.
Group 12846. June 1–5. A small group *f* Group 12841.
Group 12847. June 1–7 A small stream of unstable spots coming into brief prominence on June 4.
Group 12848. June 2–13. A typical bi-polar group in which the two components are of nearly equal size.

POSITIONS AND AREAS OF SUN SPOTS AND FACULÆ FOR EACH DAY IN THE YEAR.

U.T.	Group No.	Measures: Dist.	Measures: Pos. Angle	Position: Long.	Position: Lat.	Area: Umbræ	Area: Whole Spots	Area: Faculæ
			°	°	°			
1938								
153·333		·979	278·0					110
G		·970	234·1					194
		·963	257·6					146
		·913	282·6					200
	12843	·798	244·5	282·1	−20·3	4	15	
	12837	·776	297·2	279·4	+20·5	19	72	
	12840	·722	260·0	277·7	− 7·5	23	117	
	12841	·496	341·3	242·4	+27·5	65	309	
	12845	·108	307·1	237·0	+ 3·3	2	9	
	12847	·083	350·0	232·9	+ 4·2	15	82	
	12844	·651	99·4	192·0	− 6·4	56	272	
	12848	·922	111·0	166·4	−19·4	24	108	307 *c*
		·916	63·6					140
		·961	70·8					170
		·982	64·0					249
June 3		.	(−14·8)	(232·1)	(−0·4)	(208)	(984)	(1516)
154·349		·960	244·3					400
C		·871	247·6					259
		·869	235·8					384
		·803	225·4					348
	12837	·894	293·8	279·6	+21·0	15	60	915 *c*
	12840	·864	262·0	277·9	− 7·0	16	84	318 *nf*
	12841	·596	322·1	242·9	+27·7	81	338	
	12845	·338	280·0	238·0	+ 3·2	2	5	
	12847	·278	286·6	234·0	+ 4·4	42	170	
	12846	·511	333·0	233·6	+26·8	10	58	
	12849	·162	117·8	210·4	− 4·5	16	53	
	12844	·461	103·6	191·9	− 6·4	63	352	
	12848	·810	114·0	167·2	−19·3	29	128	487 *c*
		·847	58·8					280
		·872	70·4					229
		·934	64·0					486
		·940	98·8					318
		·953	112·6					381
		·959	50·6					271
June 4			(−14·4)	(218·6)	(−0·2)	(274)	(1248)	(5076)
155·351		·956	245·9					450
C		·948	263·3					456
		·914	232·1					593
		·855	220·1					171
	1133c	·974	296·7	280·4	+25·9	4	9	837 *c*
	12837	·960	291·7	277·6	+20·7	7	16	
	12841	·712	311·5	242·3	+28·0	42	244	161 *p*
	12846	·628	313·9	235·3	+25·7	3	6	
	12847	·500	278·5	234·9	+ 4·1	16	74	
	12849	·125	227·3	210·6	− 4·9	11	30	
	12844	·252	115·7	192·2	− 6·4	57	318	

U.T.	Group No.	Measures: Dist.	Measures: Pos. Angle	Position: Long.	Position: Lat.	Area: Umbræ	Area: Whole Spots	Area: Faculæ
			°	°	°			
1938								
	12848	·669	119·3	167·3	−19·1	15	64	
	12850	·901	47·5	148·9	+37·3	5	10	361 *f*
	12851	·993	76·1	122·7	+13·8	118	472	275 *p*
		·851	61·7					350
		·957	60·5					386
		·968	116·1					241
June 5			(−14·1)	(205·3)	(−0·1)	(278)	(1243)	(4281)
156·379		·980	264·3					271
G		·975	293·9					243
		·962	256·0					214
		·955	235·3					380
		·916	244·3					248
		·907	223·9					346
		·893	294·7					227
		·851	235·5					250
	12841	·850	301·7	245·4	+26·5	46	154	536 *c*
	12847	·692	275·9	235·1	+ 4·1	23	108	
	1133d	·664	310·2	225·7	+25·3	0	6	
	12849	·338	255·3	210·8	− 4·9	4	12	
	12844	·111	188·0	192·6	− 6·3	47	282	
	12848	·486	129·9	168·7	−18·1	17	71	
	12850	·822	43·7	147·0	+36·4	26	56	298 *c*
	12852	·879	75·7	131·2	+12·5	2	5	119 *c*
	12851	·940	75·1	122·6	+13·9	106	549	705 *c*
		·875	53·5					311
		·916	114·4					535
		·944	97·8					189
June 6			(−13·7)	(191·7)	(0·0)	(271)	(1243)	(4872)
157·442		·966	243·3					139
G		·953	230·2					440
		·915	288·6					85
		·860	231·9					196
		·836	262·5					163
		·791	220·4					207
	12841	·958	297·2	248·9	+26·0	15	95	731 *f*
	12847	·860	274·5	236·7	+ 3·9	11	31	309 *c*
	12844	·279	247·0	192·6	− 6·1	50	255	
	12853	·421	338·6	187·3	+23·1	1	3	
	12854	·321	8·5	174·8	+18·5	4	12	
	12848	·361	149·4	166·6	−17·9	50	207	
	12855	·412	34·6	163·4	+19·9	2	9	
	12850	·737	35·8	145·3	+36·6	16	47	
	12852	·744	72·6	131·3	+12·9	11	33	
	12851	·838	72·8	122·2	+14·4	102	663	717 *c*
	12856	·835	76·4	122·0	+11·4	13	46	
	12857	·957	100·4	105·1	− 9·9	31	139	639 *f*
June 7			(−13·2)	(177·7)	(+0·1)	(306)	(1540)	(3626)

Group 12849. June 4–6. A small stream.
Group 12850. June 5–11. A group, long-lived for its small size.
Group 12851. June 5–17. A large regular spot behind which a compound train is forming; this decreases for a few days but comes in with renewed activity on June 13. Meanwhile the regular spot has broken into two components by June 12; the leading one, representing the original nucleus, becomes the new leader of the stream and alone survives on June 17.
Group 12852. June 6–16. A small stream in which the leader survives as a regular spot after June 9. A tiny new cluster appears on June 13.
Group 12853. June 7–12. A stream developing towards the west limb.
Group 12854. June 7–8. A tiny ephemeral group.
Group 12855. June 7–9. A small ephemeral group.
Group 12856. June 7–12. A few small spots s Group 12851.
Group 12857. June 7–11. Return of Group 12821. A regular spot disappearing rapidly.

POSITIONS AND AREAS OF SUN SPOTS AND FACULÆ FOR EACH DAY IN THE YEAR.

U.T.	Group No.	Measures Dist.	Measures Pos. Angle	Position Long.	Position Lat.	Area Umbræ	Area Whole Spots	Area Faculæ
			°	°	°			
1938								
158·614		·976	263·6					188
G		·968	234·0					278
		·950	273·9					434
		·947	299·5					582
		·890	229·6					370
		·812	298·4					282
	12858	·939	264·9	231·3	− 4·6	13	43	366 *f*
	12844	·514	256·8	192·3	− 6·5	53	245	
	12853	·532	319·0	184·5	+23·8	14	35	
	12854	·393	331·9	173·5	+20·5	3	10	
	12848	·327	194·2	167·0	−18·1	40	179	
	12855	·333	2·9	161·2	+19·6	5	22	
	12850	·650	23·9	143·1	+36·6	10	46	
	12852	·516	65·4	133·6	+12·6	23	71	
	1133e	·648	50·2	129·1	+24·6	5	14	
	12856	·608	71·8	126·3	+11·1	7	20	
	12851	·666	68·2	122·6	+14·5	134	815	
	12859	·775	61·4	115·0	+22·5	4	18	
	12857	·850	102·4	104·9	−10·3	17	112	258 *f*
		·944	72·2					268
		·949	101·2					424
June 8			(−12·8)	(162·2)	(+0·3)	(328)	(1630)	(3450)
159·340		·977	273·5					264
G		·970	299·7					186
		·891	258·8					396
		·867	300·6					432
	12858	·981	264·5	231·0	− 5·3	27	58	278 *c*
	12844	·652	259·5	192·5	− 6·5	45	255	
	12853	·642	307·7	185·9	+23·3	15	77	
	12848	·406	217·7	167·6	−18·3	36	160	
	12855	·363	337·1	161·1	+19·9	3	12	
	12850	·613	12·5	143·0	+37·0	10	42	
	12852	·344	52·1	136·4	+12·5	22	84	
	12856	·469	65·0	126·9	+11·7	5	13	
	12851	·547	62·3	122·5	+15·0	114	695	
	12859	·677	56·5	115·1	+22·1	3	12	
	12857	·754	103·9	104·7	−10·1	14	119	233 *f*
		·885	70·9					178
		·912	100·7					229
		·973	73·1					196
June 9			(−12·5)	(152·5)	(+0·4)	(294)	(1527)	(2392)
160·340		·953	259·9					355
G		·932	296·9					413
		·927	307·1					189
	12844	·811	261·7	192·9	− 6·4	35	207	285 *sp*
	12853	·765	300·9	184·8	+23·5	35	131	114 *c*
	12848	·558	234·5	167·8	−18·4	24	145	
	12850	·601	355·6	142·6	+37·2	9	18	
	12852	·217	9·3	137·2	+12·8	26	94	
	12860	·268	32·3	130·9	+13·5	5	12	
1938								
	12856	·302	52·1	125·3	+11·1	16	36	
	12851	·369	48·0	122·9	+14·7	95	521	
	12859	·516	44·8	116·3	+21·8	8	35	
	12857	·592	107·4	104·5	− 9·7	14	48	
	12861	·941	72·8	70·1	+16·3	7	13	120 *f*
		·875	73·0					147
		·975	111·2					254
June 10			(−12·1)	(139·3)	(+0·5)	(274)	(1260)	(1877)
161·385		·922	270·9					154
G	12844	·929	263·0	193·3	− 6·3	38	194	583 *s*
	12853	·893	295·8	186·2	+23·1	35	185	254 *c*
	12848	·730	243·4	168·8	−18·6	19	91	
	12850	·650	336·8	144·2	+37·1	1	5	
	12852	·294	316·8	137·4	+12·9	12	64	
	12860	·239	346·0	128·9	+13·9	3	5	
	12856	·183	353·0	126·8	+11·0	9	35	
	12851	·254	11·7	122·5	+15·0	97	586	
	12857	·401	116·6	104·3	− 9·7	3	10	
	12861	·848	70·8	69·1	+16·5	15	41	101 *c*
	12862	·938	106·8	57·0	−15·5	7	10	200 *c*
		·926	113·8					368
		·939	99·2					115
		·958	65·8					237
		·989	105·0					167
June 11			(−11·6)	(125·5)	(+0·6)	(239)	(1226)	(2179)
162·415		·911	320·8					132
G		·826	293·6					319
	12844	·989	263·6	192·9	− 6·2	59	249	490 *c*
	12853	·971	293·4	186·7	+22·8	40	188	669 *c*
	12848	·880	248·4	171·2	−18·5	9	19	543 *f*
	12852	·470	297·8	137·0	+13·2	16	82	
	12863	·504	212·8	129·2	−24·3	25	79	
	12851	·324	320·1	124·2	+15·0	116	473	
	12856	·285	312·4	124·2	+11·7	7	40	
	1133f	·312	355·6	113·2	+18·8	3	16	
	12861	·726	67·0	67·7	+16·9	18	62	
	12862	·837	108·9	56·8	−15·2	5	8	459 *f*
		·935	73·8					632
		·945	107·2					347
		·969	114·5					101
June 12			(−11·2)	(111·8)	(+0·7)	(298)	(1216)	(3692)
163·337		·904	291·2					513
G	12848	·956	250·6	171·0	−18·2	8	15	729 *f*
	1133g	·955	318·0	165·2	+45·6	3	8	138 *c*
	12852	·622	290·2	136·3	+13·1	15	60	
	12863	·626	227·6	129·9	−24·1	8	22	
	12851	·470	303·1	123·6	+15·7	143	664	

Group 12858. June 8–9. A group near the west limb.
Group 12859. June 8–10. Some small spots *nf* Group 12851.
Group 12860. June 10–11. A small spot *p* Group 12851.
Group 12861. June 10–14. A single small spot on June 10 and 14: a pair of spots on June 11–13.
Group 12862. June 11–21. Return of Group 12823: 5th appearance. A small group, long-lived for its size.
Group 12863. June 12–14. A diminutive stream on June 12: one spot survives on June 13 and 14.

POSITIONS AND AREAS OF SUN SPOTS AND FACULÆ FOR EACH DAY IN THE YEAR.

U.T.	Group No.	Measures: Dist.	Measures: Pos. Angle	Position: Long.	Position: Lat.	Area: Umbræ	Area: Whole Spots	Area: Faculæ
			°	°	°			
1938								
	12864	·204	205·6	104·7	− 9·7	3	6	
	12861	·580	61·2	67·6	+16·9	11	34	
	12865	·705	119·0	59·0	−19·3	10	29	
	12862	·712	112·8	56·9	−15·3	6	15	
	12866	·851	72·8	42·5	+15·0	5	17	497 *c*
	12867	·970	83·8	23·8	+ 6·3	75	418	714 *c*
		·874	111·8					511
		·970	103·6					196
June 13			(−10·8)	(99·6)	(+0·9)	(287)	(1288)	(3298)
164·339 G		·984	316·0					159
		·970	248·2					362
		·967	291·2					222
		·962	301·4					207
		·901	258·9					262
		·883	296·6					403
		·866	245·4					240
		·866	311·4					415
	12869	·815	275·2	140·7	+ 4·8	4	15	
	12852	·787	286·2	137·1	+13·3	7	26	
	12863	·755	236·0	129·6	−24·2	0	4	
	12851	·644	293·0	124·2	+15·3	126	592	
	12861	·426	49·2	66·8	+17·0	3	8	
	12865	·549	127·0	59·0	−18·3	5	14	
	12862	·552	119·8	56·8	−15·0	5	13	
	12866	·760	69·4	38·8	+16·1	4	9	70 *c*
	12868	·779	62·4	38·6	+21·8	12	37	100 *c*
	12867	·885	83·8	24·4	+ 5·9	79	399	1135 *f*
	1133h	·984	82·8	7·0	+ 7·2	14	25	
		·899	104·4					260
		·933	120·6					173
June 14			(−10·4)	(86·4)	(+1·0)	(259)	(1142)	(4008)
165·338 G		·977	261·8					159
		·952	253·2					230
		·939	297·0					446
		·933	310·0					245
		·831	239·2					287
	12869	·920	273·4	139·9	+ 3·6	3	9	177 *p*
	12852	·906	284·0	137·5	+13·1	6	16	140 *c*
	12851	·785	288·4	123·5	+15·0	101	530	312 *c*
	12864	·493	239·9	99·1	−13·2	3	9	
	12870	·127	345·4	75·0	+ 8·1	2	9	
	12865	·416	144·2	58·4	−18·6	5	16	
	12862	·405	134·6	55·9	−15·4	7	15	
	12866	·556	67·6	41·5	+13·1	11	21	
	12868	·611	56·7	40·3	+20·4	3	9	
	12867	·757	83·4	24·3	+ 5·7	94	423	620 *f*
		·938	109·6					378
		·938	77·2					592
		·970	88·8					325
June 15			(−10·0)	(73·2)	(+1·1)	(235)	(1057)	(3911)
1938 166·337 G		·983	273·9					122
		·962	306·6					257
		·926	243·2					482
		·901	274·3					144
	12852	·975	283·5	136·7	+13·4	11	31	133 *c*
	12851	·903	285·7	123·7	+14·7	104	459	714 *c*
	12864	·674	247·9	99·7	−13·7	6	14	
	12870	·294	307·5	73·6	+11·4	1	6	
	12865	·333	175·1	58·2	−18·1	3	5	
	12862	·285	167·9	56·4	−14·9	6	18	
	12866	·377	54·1	41·7	+13·8	6	25	
	12868	·470	44·2	39·5	+20·7	5	18	
	12867	·585	81·7	24·5	+ 5·8	73	414	
	1133i	·894	67·7	358·2	+20·4	0	10	154 *f*
	12871	·985	85·2	340·0	+ 4·9	14	25	213 *c*
		·809	78·3					489
		·826	111·2					354
		·908	85·1					407
		·938	107·1					172
		·947	120·1					160
June 16			(− 9·5)	(59·9)	(+1·2)	(229)	(1025)	(3801)
167·418 G		·978	247·1					282
		·959	258·9					151
		·780	289·6					166
	12851	·985	283·9	125·4	+13·9	70	429	1574 *nf*
	12864	·834	254·1	100·6	−12·4	2	4	237 *p*
	12870	·456	294·5	70·6	+12·0	1	5	
	12862	·368	213·8	57·9	−16·4	21	62	
	12866	·236	15·1	42·0	+14·4	12	67	
	12868	·346	15·3	40·0	+20·7	6	13	
	12867	·366	76·7	24·7	+ 6·0	75	404	
	12872	·651	72·5	6·3	+12·2	8	21	
	12871	·909	85·7	340·4	+ 4·5	8	19	431 *c*
	12873	·942	84·5	335·4	+ 5·6	83	323	
		·770	86·9					90
		·849	83·1					151
		·876	120·6					261
		·939	55·9					192
		·945	64·5					190
		·961	73·3					467
June 17			(− 9·1)	(45·6)	(+1·3)	(286)	(1347)	(4192)
168·343 G		·980	285·3					170
		·902	253·7					317
		·901	289·5					152
	12862	·500	232·1	57·6	−16·6	16	55	
	12866	·263	326·7	41·9	+14·1	8	43	
	12867	·171	61·1	24·8	+ 6·1	75	413	
	12872	·499	63·5	6·1	+14·1	3	8	
	12871	·799	85·5	340·6	+ 4·4	4	15	271 *c*
	12873	·845	84·4	336·0	+ 5·5	101	434	

Group 12864. June 13–17. A small spot on June 13 and 17: a pair on June 15 and 16.
Group 12865. June 13–16. A small but definite spot *s* Group 12862.
Group 12866. June 13–22. A small stream not seen on June 19 and 20.
Group 12867. June 13–25. Return of Group 12829. A large stable spot, completely regular in structure.
Group 12868. June 14–23. A small group *n* Group 12866; new spots come in on June 20.
Group 12869. June 14–15. A pair of small spots on June 14; one component is left on June 15.
Group 12870. June 15–17. A tiny spot on each day differing in position.
Group 12871. June 16–18. A small spot *p* Group 12873.
Group 12872. June 17–21. One or two small spots not seen on June 19 and 20.
Group 12873. June 17–28. A large stream of normal type with conspicuous components in the central part about June 21.

POSITIONS AND AREAS OF SUN SPOTS AND FACULÆ FOR EACH DAY IN THE YEAR.

U.T.	Group No.	Measures		Position		Area		
		Dist.	Pos. Angle	Long.	Lat.	Umbræ	Whole Spots	Faculæ
			°	°	°			
1938								
		·902	70·0					450
		·929	115·9					130
June 18			(-8·7)	(33·4)	(+1·4)	(207)	(968)	(1490)
169·387		·946	255·4					324
C		·826	288·2					258
	12862	·684	242·4	58·8	-17·2	10	29	
	12867	·122	313·5	24·7	+ 6·4	78	392	
	12873	·699	83·4	335·5	+ 5·7	152	784	
	12874	·946	81·6	308·7	+ 8·5	6	20	287 *nf*
		·792	68·2					276
		·871	79·5					181
June 19			(-8·2)	(19·6)	(+1·6)	(246)	(1225)	(1326)
170·373		·960	256·9					194
G		·909	284·9					452
		·840	259·2					101
	12862	·819	248·9	59·0	-16·1	8	28	418 *c*
	12868	·628	301·4	41·2	+20·4	9	22	
	12875	·415	286·6	30·1	+ 8·3	3	7	
	12867	·326	284·4	24·9	+ 6·3	73	358	
	12876	·356	115·6	347·7	- 7·2	5	17	
	12873	·508	81·0	336·3	+ 6·0	148	870	
	12874	·840	81·1	309·7	+ 8·4	10	34	198 *c*
		·946	128·4					287
		·972	115·6					182
June 20			(-7·8)	(6·5)	(+1·7)	(256)	(1336)	(1832)
171·336		·963	284·9					178
G	12862	·918	251·6	58·5	-16·0	11	22	487 *c*
	12866	·747	289·2	40·5	+15·4	7	21	214 *c*
	12868	·759	295·7	40·4	+20·4	28	88	102 *c*
	12875	·603	281·1	30·3	+ 8·1	1	3	
	12867	·523	278·7	24·9	+ 6·1	67	345	
	12872	·297	312·5	6·6	+13·3	3	6	
	1134a	·262	303·2	6·5	+10·0	1	3	
	12876	·174	156·1	349·6	- 7·3	3	9	
	12873	·301	74·5	336·8	+ 6·3	169	945	
	12877	·475	40·7	334·2	+22·7	10	33	
	12878	·400	55·7	333·8	+14·4	3	8	
	12874	·681	80·9	311·2	+ 7·5	5	14	
		·861	66·6					311
		·922	97·3					324
		·923	78·7					155
		·946	118·0					287
		·967	67·3					454
June 21			(-7·3)	(353·7)	(+1·8)	(308)	(1497)	(2512)
1938								
172·341		·974	252·8					226
G		·867	248·1					328
	12868	·883	292·3	41·0	+20·5	15	39	309 *c*
	12866	·868	287·4	39·8	+16·0	2	5	318 *p*
	12867	·710	276·9	25·5	+ 6·2	74	393	
	12876	·190	217·1	347·1	- 6·8	1	5	
	12879	·360	184·2	342·1	-19·0	9	20	
	12873	·100	38·9	336·9	+ 6·3	176	855	
	12877	·359	12·4	335·7	+22·3	62	198	
	12878	·225	22·4	335·5	+13·8	6	13	
	1134b	·456	164·3	332·8	-24·1	1	5	
		·861	98·1					261
		·876	121·0					147
		·912	111·9					117
		·921	60·0					367
		·921	69·3					287
		·968	121·7					180
June 22			(-6·9)	(340·5)	(+1·9)	(346)	(1533)	(2540)
173·343		·968	282·8					218
G		·954	250·2					284
		·911	243·0					273
	12868	·956	290·8	39·4	+20·4	8	15	235 *c*
	12867	·855	275·8	25·8	+ 6·0	62	377	315 *c*
	12879	·435	214·3	342·2	-19·1	18	58	
	12873	·207	291·7	338·3	+ 6·3	178	816	
	12878	·280	317·8	338·3	+13·8	3	5	
	12877	·378	337·0	336·4	+22·2	108	405	
	12874	·290	70·4	311·3	+ 7·5	3	9	
		·790	125·2					131
		·825	58·2					396
		·871	120·8					228
		·879	108·8					192
		·952	126·3					279
		·962	82·4					457
June 23			(-6·4)	(327·2)	(+2·0)	(380)	(1685)	(3008)
174·399		·955	249·2					93
C		·801	279·2					437
	12867	·957	275·8	26·2	+ 6·2	68	343	612 *f*
	12879	·576	231·6	341·6	-19·0	21	66	
	12873	·448	280·6	339·4	+ 6·6	138	762	
	12877	·497	314·8	335·5	+22·4	82	501	
		·845	81·9					365
		·946	64·0					392
		·951	83·7					286
		·956	97·2					346
June 24			(-6·0)	(313·2)	(+2·1)	(309)	(1672)	(2531)

Group 12874. June 19–23. One or two small spots.
Group 12875. June 20–21. A small spot preceding Group 12867.
Group 12876. June 20–25. One or two spots until June 22: a pair of small spots on June 25.
Group 12877. June 21–29. A stream of normal type.
Group 12878. June 21–23. A few faint unstable spots.
Group 12879. June 22–25. A pair of short-lived spots.

POSITIONS AND AREAS OF SUN SPOTS AND FACULÆ FOR EACH DAY IN THE YEAR.

U.T.	Group No.	Measures Dist.	Measures Pos. Angle	Position Long.	Position Lat.	Area Umbræ	Area Whole Spots	Area Faculæ
			°	°	°			
1938								
175·374		·940	250·1					207
G		·916	278·1					525
		·900	288·9					311
		·821	136·5					301
	12867	·996	275·7	25·1	+ 5·9	48	293	216 s
	12876	·769	259·9	350·2	− 9·2	4	25	
	12879	·706	238·5	339·9	−19·8	10	48	
	12873	·636	276·7	339·6	+ 6·0	97	589	
	12877	·637	304·1	335·0	+22·8	87	475	
		·858	99·7					280
		·858	122·3					229
		·870	63·6					349
		·882	85·5					328
		·945	130·9					202
		·950	99·8					468
		·967	62·1					232
June 25			(−5·5)	(300·3)	(+2·3)	(246)	(1430)	(3648)
176·398		·968	285·1					220
C		·968	275·0					417
		·906	296·3					152
		·903	276·1					218
		·902	260·7					245
	12873	·792	276·3	340·8	+ 6·5	103	614	349 p
	12877	·783	297·9	335·3	+23·0	74	410	281 c
	12880	·406	42·5	269·9	+19·6	11	32	
	12881	·993	99·9	204·4	− 9·5	28	110	184 f
		·898	101·7					425
		·980	61·6					121
June 26			(−5·1)	(286·8)	(+2·4)	(216)	(1166)	(2612)
177·657		·942	247·7					272
G		·910	285·3					132
	12873	·948	275·9	341·5	+ 6·4	69	368	635 c
	12877	·912	293·9	334·5	+22·7	61	413	452 c
	12882	·215	223·2	278·6	− 6·5	5	16	
	12880	·286	354·9	271·6	+19·0	11	24	
	12883	·452	108·1	244·6	− 5·8	9	31	
	12884	·536	87·1	237·8	+ 3·7	8	22	
	12885	·772	57·3	223·7	+26·3	19	83	173 c
	12886	·852	116·1	215·5	−20·5	5	9	116 f
	12881	·925	102·5	203·6	−10·5	71	505	374 c
	12887	·963	97·3	196·4	− 6·3	26	168	160 c
		·907	60·7					368
		·975	68·0					256
June 27			(−4·5)	(270·1)	(+2·5)	(284)	(1639)	(2938)
1938								
178·407		·983	249·4					245
G		·952	286·0					167
	12873	·987	275·6	340·8	+ 5·9	65	375	658 c
	12877	·969	292·8	335·5	+22·7	81	386	501 c
	12882	·340	245·2	278·2	− 5·7	1	3	
	12880	·340	323·4	272·5	+18·4	9	24	
	12883	·294	120·8	245·6	− 6·1	15	65	
	12885	·674	52·3	223·8	+26·4	25	137	
	12886	·779	119·4	213·9	−20·6	47	151	129 c
	12881	·846	104·0	203·8	−10·4	58	521	322 c
	12887	·906	98·1	196·0	− 6·2	29	165	133 c
		·825	59·7					224
		·921	123·9					161
		·941	54·3					203
		·959	66·2					491
June 28			(−4·2)	(260·2)	(+2·6)	(330)	(1827)	(3234)
179·384		·982	275·7					210
G		·967	245·1					276
	12877	·988	292·3	328·3	+22·4	22	67	405 c
	12888	·875	278·7	308·1	+ 8·9	19	57	243 c
	1134c	·487	278·5	276·1	+ 6·5	3	9	
	12880	·509	299·1	274·7	+16·7	3	10	
	12883	·158	179·9	247·1	− 6·3	14	59	
	12884	·125	79·1	240·2	+ 4·0	9	30	
	12885	·534	40·9	224·4	+26·2	33	138	
	12886	·651	127·3	213·7	−20·9	74	335	
	12881	·696	106·9	204·9	− 9·6	91	395	
	12887	·787	99·9	196·2	− 6·1	30	173	
	12889	·966	114·8	175·0	−23·1	4	10	607 n
		·878	49·1					253
		·906	65·3					757
June 29			(−3·7)	(247·2)	(+2·7)	(302)	(1283)	(2751)
180·366	12888	·963	278·0	308·6	+ 8·5	9	33	371 c
G	*1134d*	·917	261·9	299·9	− 6·3	6	20	139 c
	12883	·278	232·8	247·0	− 6·9	19	73	
	12885	·427	21·4	224·3	+26·0	30	163	
	12886	·530	140·1	212·9	−21·3	100	506	
	12881	·512	114·3	206·1	− 9·7	98	480	
	12887	·629	103·3	196·4	− 6·1	31	168	
		·847	61·6					333
		·925	114·3					601
		·961	65·5					347
June 30			(−3·3)	(234·2)	(+2·8)	(293)	(1443)	(1791)

Group 12880. June 26–29. A pair of small spots diverging widely in longitude.
Group 12881. June 26–July 8. A long stream of unstable components.
Group 12882. June 27–28. One or two tiny spots.
Group 12883. June 27–July 2. A group representing feeble but persistent activity.
Group 12884. June 27–July 1. Intermittent: a few small unstable spots.
Group 12885. June 27–July 7. A stream in which the following part shows fresh activity on July 4–5, while the original leader is decreasing.
Group 12886. June 27–July 8. An active stream of the same general appearance as Group 12881 near which it is situated. After July 4, the leader and follower stand out as regular spots widely separated in longitude.
Group 12887. June 27–July 9. Return of Group 12844: 3rd appearance. A stable reg lar spot.
Group 12888. June 29–30. A group appearing near the west limb; apparently it is short-lived.
Group 12889. June 29–July 2. One or two small unstable spots.

POSITIONS AND AREAS OF SUN SPOTS AND FACULÆ FOR EACH DAY IN THE YEAR.

U.T.	Group No.	Measures Dist.	Measures Pos. Angle	Position Long.	Position Lat.	Area Umbræ	Area Whole Spots	Area Faculæ
			°	°	°			
1938								
181·337		·965	262·6					173
G		·936	240·0					232
		·874	296·8					207
		·843	234·9					224
	12883	·450	249·4	246·4	− 6·4	10	41	
	12884	·340	273·2	241·2	+ 3·8	8	20	
	1134e	·281	216·8	231·2	−10·1	1	3	
	12885	·400	356·2	223·1	+26·3	25	98	
	12890	·204	145·2	214·7	− 6·7	3	9	
	12886	·434	159·0	211·9	−20·9	127	598	
	12881	·344	129·2	205·8	− 9·7	103	426	
	12887	·445	109·6	196·6	− 5·9	31	163	
	12889	·840	119·4	169·2	−22·5	5	13	524 *n*
		·796	59·4					166
		·896	63·2					401
		·932	87·0					189
July 1			(−2·8)	(221·4)	(+2·9)	(313)	(1371)	(2116)
182·364		·939	297·7					259
G		·939	237·1					505
		·905	287·2					295
	12883	·664	258·4	248·4	− 5·3	1	6	
	12885	·464	329·4	223·0	+26·4	18	100	
	12890	·227	223·4	216·8	− 6·4	3	5	
	12886	·414	187·0	210·9	−21·1	132	631	
	12881	·219	175·3	206·8	− 9·4	116	566	
	12887	·248	129·0	196·7	− 5·9	32	173	
	12889	·699	127·6	171·1	−22·6	7	12	
	12891	·946	96·6	137·4	− 5·2	27	120	266 *f*
	12892	·980	77·0	129·2	+13·4	34	103	396 *sp*
July 2			(−2·4)	(207·8)	(+3·1)	(370)	(1716)	(1721)
183·251	12893	·912	258·3	260·6	− 9·3	7	59	305 *c*
K	12885	·543	317·1	220·2	+26·2	31	129	
	12890	·406	248·0	218·1	− 5·9	0	5	
	12886	·478	211·3	211·4	−21·0	82	457	
	12881	·282	210·7	204·4	−10·9	55	339	
	12887	·157	183·7	196·6	− 5·9	25	146	
	12894	·809	74·6	142·6	+14·2	54	168	269 *c*
	12891	·874	98·0	135·8	− 5·5	44	138	414 *c*
	12892	·921	77·0	129·1	+13·2	24	89	559 *f*
July 3			(−2·0)	(196·0)	(+3·1)	(322)	(1530)	(1547)
1938								
184·377		·975	276·2					194
G		·945	228·4					285
		·879	275·1					389
		·848	298·9					234
		·809	261·9					196
	12893	·988	259·6	261·2	− 9·7	28	88	738 *f*
	12885	·676	307·8	217·8	+27·1	46	210	
	12886	·616	229·2	210·9	−20·8	81	422	
	12881	·474	241·3	206·0	−10·1	141	616	
	12887	·306	240·3	196·5	− 5·5	31	178	
	12894	·619	71·2	144·1	+14·1	161	759	
	12891	·718	101·1	136·2	− 5·6	24	139	173 *c*
	12892	·796	75·9	128·9	+13·2	15	65	311 *c*
	12895	·991	103·5	100·0	−12·9	43	152	475 *sp*
	12896	·993	75·4	97·5	+14·9	37	293	136 *p*
		·799	63·6					163
		·890	120·4					315
		·910	67·0					544
July 4			(−1·4)	(181·1)	(+3·3)	(607)	(2922)	(4153)
185·390		·955	274·1					364
G		·952	263·4					409
		·939	294·7					333
		·864	257·9					332
	12885	·800	301·9	217·3	+27·2	98	445	214 *c*
	12886	·750	237·4	210·2	−21·3	64	377	
	12881	·648	249·2	205·6	−10·6	112	584	
	12887	·505	252·9	196·6	− 5·6	32	164	
	12894	·433	64·6	144·1	+13·8	174	899	
	12891	·546	106·6	136·1	− 6·0	30	116	
	12892	·640	73·3	128·8	+13·2	18	72	
	12895	·946	105·1	98·3	−13·1	88	422	816 *c*
	12896	·946	75·6	96·7	+14·7	43	277	740 *f*
		·861	107·6					204
July 5			(−1·0)	(167·7)	(+3·4)	(659)	(3356)	(3412)
186·406		·963	258·8					401
G	12885	·905	298·7	217·4	+27·3	95	596	564 *c*
	12886	·864	242·5	209·5	−21·5	61	348	916 *c*
	12881	·807	253·8	206·2	−10·8	87	403	559 *p*
	12887	·687	258·1	196·6	− 5·6	29	175	
	12897	·288	330·7	162·8	+17·9	12	39	

Group 12890. July 1–3. A small spot preceding Group 12881.
Group 12891. July 2–10. A regular spot followed by a companion which has disappeared by July 6; another tiny spot comes in on July 10..
Group 12892. July 2–12. Return of Group 12851. A small regular spot decreasing to a tiny marking.
Group 12893. July 3–4. A spot near the west limb.
Group 12894. July 3–13. A large typical bi-polar group in which the leader becomes elongated, develops a double umbra and is dividing into two parts when near the west limb.
Group 12895. July 4–17. A large active stream in which the two principal components – leader and follower – are clusters or composite spots. By July 12, the follower has condensed to a large spot with multiple umbræ.
Group 12896. July 4–16. A spot with double umbra diminishing fairly rapidly after July 10. There are occasional small followers and a cluster on July 10-11.
Group 12897. July 6–9. A small short-lived group.

POSITIONS AND AREAS OF SUN SPOTS AND FACULÆ FOR EACH DAY IN THE YEAR.

U.T.	Group No.	Measures: Dist.	Measures: Pos. Angle	Position: Long.	Position: Lat.	Area: Umbræ	Area: Whole Spots	Area: Faculæ
			°	°	°			
1938								
	12894	·253	44·6	143·8	+13·8	179	975	
	12891	·346	118·5	136·6	− 6·1	20	98	
	12892	·456	66·7	128·9	+13·5	9	44	
	1134f	·571	49·6	125·8	+24·7	1	4	
	12898	·686	71·9	112·0	+14·9	25	74	
	12896	·847	74·5	96·7	+15·4	41	243	829 *f*
	12895	·856	107·3	97·6	−12·8	118	694 }	606 *c*
	12899	·929	106·3	87·9	−13·7	19	74 }	
	12900	·995	106·3	71·3	−15·8	57	311	140 *p*
		·977	70·5					223
July 6			(−0·5)	(154·3)	(+3·5)	(753)	(4078)	(4238)
187·333 G		·980	260·9					256
	12885	·962	297·6	215·6	+27·5	68	479	581 *c*
	12886	·934	245·3	207·5	−21·5	52	305	850 *c*
	12881	·899	255·4	204·4	−11·4	44	316	944 *c*
	12887	·825	260·5	196·6	− 5·7	33	155	89 *c*
	12897	·437	305·7	163·8	+18·1	3	10	
	12894	·178	353·7	143·1	+13·8	188	855	
	12891	·198	151·5	136·6	− 6·4	20	104	
	12892	·283	51·9	128·8	+13·5	7	22	
	12898	·513	67·5	112·8	+14·4	20	61	
	12895	·728	111·1	98·1	−12·6	139	831 }	364 *c*
	12899	·839	109·1	87·5	−13·8	15	96 }	
	12896	·721	72·5	96·8	+15·0	39	250	444 *f*
	12901	·914	74·1	76·1	+16·0	9	17	612 *f*
	12900	·960	107·8	70·4	−15·9	101	512	508 *f*
July 7			(−0·1)	(142·0)	(+3·6)	(738)	(4013)	(4648)
188·554 G		·975	299·5					256
		·863	296·3					475
	12881	·984	257·5	204·3	−11·5	31	185	751 *c*
	12886	·983	246·7	202·7	−22·1	37	178	310 *c*
	12887	·949	262·9	196·8	− 5·5	44	166	152 *c*
	12897	·625	295·3	162·3	+18·4	10	29	
	12894	·338	302·1	143·0	+13·8	161	850	
	12891	·253	226·3	136·5	− 6·4	22	79	
	12892	·182	343·5	128·9	+13·7	1	3	
	12898	·300	49·5	112·3	+14·8	43	135	
	12895	·534	121·1	98·1	−12·7	186	1068	
	12896	·510	66·3	97·1	+15·1	39	217	
	12899	·658	116·3	88·6	−13·9	34	93	
	12901	·785	72·3	75·0	+16·1	12	28	425 *c*
	12900	·851	110·9	70·5	−15·5	110	525	768 *f*
	12902	·991	100·3	44·6	− 9·7	101	440	189 *p*
		·964	69·9					470
July 8			(+0·5)	(125·9)	(+3·7)	(831)	(3996)	(3796)

U.T.	Group No.	Measures: Dist.	Measures: Pos. Angle	Position: Long.	Position: Lat.	Area: Umbræ	Area: Whole Spots	Area: Faculæ
			°	°	°			
1938								
189·351 G		·909	292·8					577
		·871	246·4					462
	12887	·991	263·7	197·0	− 5·7	32	152	215 *f*
	12897	·759	291·0	163·4	+18·2	4	11	
	12894	·483	291·8	142·7	+13·7	160	819	
	12891	·402	244·4	136·6	− 6·4	13	56	
	12892	·255	313·1	126·3	+13·7	1	7	
	12898	·199	17·2	111·8	+14·7	44	152	
	12895	·414	134·4	97·7	−13·2	218	1356	
	12896	·360	56·6	97·3	+15·0	33	210	
	12899	·530	123·4	88·3	−13·5	18	70	
	12901	·621	69·6	78·3	+15·5	3	6	
	12900	·753	114·7	70·2	−15·6	102	514	511 *f*
	12902	·973	101·6	39·9	−10·3	193	836	868 *c*
	12903	·991	83·2	33·0	+ 7·2	123	345	910 *c*
		·930	69·0					188
July 9			(+0·8)	(115·3)	(+3·8)	(944)	(4534)	(3731)
190·392 C		·969	292·6					454
		·942	245·8					709
		·878	287·6					338
		·871	299·7					283
	12894	·664	286·2	142·3	+13·6	111	688	
	12891	·591	254·4	136·3	− 5·9	7	29	
	1134g	·543	297·9	131·7	+18·1	2	18	
	12892	·448	295·7	126·1	+14·7	1	5	
	12898	·262	313·5	112·8	+14·2	21	73	
	12895	·293	171·3	98·9	−12·9	272	1415	
	12896	·216	21·7	96·8	+15·4	50	263	
	12899	·380	142·1	87·7	−13·6	9	28	
	12904	·603	142·7	77·8	−25·0	14	40	
	12900	·600	122·9	70·1	−15·6	83	465	
	12902	·893	103·8	39·9	−10·4	198	1352	690 *c*
	12903	·936	84·3	32·1	+ 6·7	97	481	782 *c*
	12905	·972	106·0	26·9	−14·5	8	19	226 *c*
		·835	67·5					218
July 10			(+1·3)	(101·5)	(+3·9)	(873)	(4876)	(3700)
191·584 G		·969	245·9					221
		·967	285·5					276
		·958	297·2					389
	12894	·843	284·2	143·0	+14·1	90	541	416 *c*
	12898	·533	289·1	116·8	+13·4	5	25	
	12906	·263	304·6	98·6	+12·4	7	44	
	12895	·355	214·8	97·7	−12·9	282	1514	
	12896	·279	316·7	97·2	+15·6	61	232	
	12904	·494	167·8	79·2	−24·8	18	63	

Group 12898. July 6–13. A stream of unimportant spots.
Group 12899. July 6–10. A regular spot, with companions after July 7, closely following Group 12895 but quite distinct from it.
Group 12900. July 6–17. Two regular spots slowly diverging; the following one dies out after July 13, while the leader divides into two parts on July 14–15. There are usually tiny companions.
Group 12901. July 7–9. A widely separated pair of small spots, the leader alone being seen on July 9.
Group 12902. July 8–21. A great spot, developing first as a stream when it comes into view round the east limb. In a few days other spots are forming southwards, and these grow and amalgamate with the original spot to form a great composite spot roughly rectangular in shape on July 15 and 16. A few days later, the lower half of this extensive formation is breaking up as the group passes round the west limb. Meanwhile discrete parts of the northern half of the spot become linked up by penumbræ on July 19, thus giving a temporary increase in area.
Group 12903. July 9–21. Return of Group 12867: 3rd appearance. A stable regular spot north preceded by small spots scattered over an extensive area and dying out by July 16.
Group 12904. July 10–14. A pair of spots, the larger one leading and alone remaining after July 12.
Group 12905. July 10–14. A small spot with a definite umbra in the wake of Group 12902.
Group 12906. July 11–14. A small group close to Group 12896.

POSITIONS AND AREAS OF SUN SPOTS AND FACULÆ FOR EACH DAY IN THE YEAR.

U.T.	Group No.	Measures: Dist.	Measures: Pos. Angle	Position: Long.	Position: Lat.	Area: Umbræ	Area: Whole Spots	Area: Faculæ
			°	°	°			
1938								
	12900	·431	141·8	69·8	−15·8	92	462	
	12902	·741	108·6	40·3	−10·8	263	1845	312 *c*
	12903	·803	84·8	32·4	+ 6·5	101	509	442 *f*
	12905	·876	108·8	27·2	−14·3	12	22	142 *f*
		·921	93·6					190
		·951	79·5					683
		·973	106·7					334
July 11			(+1·8)	(85·8)	(+4·0)	(931)	(5257)	(3405)
192·395 C		·870	259·8					622
	12894	·928	283·0	143·2	+13·6	88	420	529 *c*
	12892	·818	284·7	129·5	+14·3	3	9	177 *f*
	12898	·669	287·7	116·1	+14·8	2	11	
	12906	·428	291·6	99·0	+12·8	17	50	
	12896	·418	299·3	97·1	+15·5	32	172	
	12895	·468	231·6	97·0	−13·1	265	1398	
	12904	·492	187·2	78·9	−25·0	15	40	
	12900	·352	165·8	69·9	−15·8	84	401	
	12907	·326	28·6	65·4	+20·6	2	7	
	12908	·484	147·6	59·0	−20·1	5	18	
	12902	·625	113·8	39·5	−11·2	290	1944	
	12903	·686	84·2	31·7	+ 6·9	98	431	
	12905	·778	111·8	27·1	−14·0	10	14	
		·795	71·1					138
		·874	84·0					435
		·910	111·8					368
		·932	73·1					305
		·972	82·4					412
July 12			(+2·2)	(75·0)	(+4·1)	(911)	(4915)	(2986)
193·334 G		·956	296·6					252
		·942	262·0					373
		·901	238·2					426
		·870	284·1					602
	12894	·988	282·8	144·2	+13·3	73	462	651 *c*
	12898	·792	285·5	114·5	+14·8	2	4	
	12906	·605	285·8	99·1	+12·8	11	35	
	12896	·590	290·8	97·4	+15·5	24	113	
	12895	·619	242·9	96·9	−12·8	262	1484	
	12904	·549	209·7	79·9	−24·4	5	14	
	12900	·370	199·9	70·1	−16·1	91	361	
	12909	·233	329·0	69·7	+15·6	7	33	
	12907	·280	349·0	65·8	+20·1	4	20	
	12908	·407	178·2	61·8	−19·7	9	43	
	12910	·447	41·4	43·9	+23·5	5	16	
	12902	·468	125·2	39·7	−11·7	377	2330	

U.T.	Group No.	Measures: Dist.	Measures: Pos. Angle	Position: Long.	Position: Lat.	Area: Umbræ	Area: Whole Spots	Area: Faculæ
			°	°	°			
1938								
	12903	·503	85·0	32·5	+ 6·1	77	388	
	12905	·638	118·2	27·3	−14·1	5	9	
	12911	·977	86·0	344·9	+ 4·8	21	126	675 *np*
		·819	82·0					402
		·849	70·1					278
		·884	101·1					78
		·903	115·2					359
		·982	106·3					150
		·985	68·8					685
July 13			(+2·6)	(62·6)	(+4·2)	(973)	(5438)	(4931)
194·607 G		·946	249·2					316
		·940	285·1					798
		·896	297·2					362
	12906	·799	282·7	98·6	+12·7	4	12 }	145 *c*
	12896	·791	286·2	97·6	+15·4	20	60 }	
	12895	·798	250·6	96·1	−12·7	260	1471	497 *c*
	12912	·681	293·2	87·0	+18·8	3	11	
	12904	·693	226·5	79·3	−24·8	1	5	
	12900	·520	230·0	70·1	−15·5	57	221	
	12909	·445	296·1	70·1	+15·1	1	3	
	12910	·339	356·0	47·3	+24·0	10	23	
	12902	·301	160·6	40·0	−12·1	357	2431	
	12903	·245	86·2	31·7	+ 5·1	58	299	
	12905	·437	135·7	27·5	−14·1	1	5	
	12911	·874	86·6	344·9	+ 5·1	18	130	543 *c*
	12913	·909	110·6	343·4	−16·6	42	105	237 *c*
		·934	67·7					1027
July 14			(+3·2)	(45·8)	(+4·3)	(832)	(4776)	(3925)
195·364 G		·934	295·8					319
	12896	·883	285·1	97·6	+15·4	13	30	279 *c*
	12895	·879	252·1	94·8	−13·4	217	1291	629 *c*
	12912	·786	290·3	86·6	+18·6	19	60	215 *c*
	12914	·698	281·5	79·7	+11·1	13	37	
	12900	·645	240·3	71·0	−15·0	30	86	
	12908	·623	228·7	65·5	−20·4	1	6	
	12910	·391	330·7	47·8	+24·2	3	8	
	12902	·304	193·7	39·9	−12·7	373	2436	
	12903	·055	72·5	32·7	+ 5·3	60	323	
	12915	·701	77·5	351·5	+11·9	4	16	
	12911	·777	86·6	344·7	+ 5·5	29	142	603 *f*
	12913	·833	113·2	342·9	−16·5	38	154	268 *c*
		·893	66·5					1245
		·980	80·9					465
July 15			(+3·5)	(35·7)	(+4·4)	(800)	(4589)	(4023)

Group 12907. July 12–13. A small spot on July 12: three tiny spots on July 13.
Group 12908. July 12–16. One or two small spots not identical with one another but in the same feeble area of disturbance.
Group 12909. July 13–14. One or two tiny spots.
Group 12910. July 13–15. A very small short-lived group.
Group 12911. July 13–25. Return of Group 12873. A stable regular spot. A new spot appears in the faculæ following on July 25.
Group 12912. July 14–17. A small regular spot with companions on July 16 which alone are seen on July 17.
Group 12913. July 14–19. A small group of bi-polar type; the follower has died out by July 18, and there is a new short-lived companion to the leader.
Group 12914. July 15–17. A few small spots, not obviously developing.
Group 12915. July 15–23. A small group *np* Group 12911.

POSITIONS AND AREAS OF SUN SPOTS AND FACULÆ FOR EACH DAY IN THE YEAR.

U.T.	Group No.	Measures Dist.	Measures Pos. Angle	Position Long.	Position Lat.	Area Umbræ	Area Whole Spots	Area Faculæ
			°	°	°			
1938								
196·361		·876	237·4					178
G	12896	·962	284·6	97·0	+15·2	9	25	602 c
	12895	·964	255·4	95·3	−12·8	212	1016	913 c
	12912	·899	288·0	86·3	+18·1	20	120	432 c
	12914	·866	280·0	82·6	+10·9	9	21	144 c
	12900	·785	247·0	70·7	−14·8	14	66	454 c
	12908	·693	235·3	59·6	−19·6	1	6	
	12916	·427	307·7	43·4	+19·3	13	36	
	12902	·418	224·6	39·9	−12·9	355	2168	
	12903	·131	269·8	30·0	+ 4·5	45	264	
	12917	·617	143·6	358·7	−25·5	10	29	
	1134h	·502	104·2	353·5	− 3·1	3	4	
	12915	·530	74·8	351·1	+11·8	5	14	
	12911	·613	86·4	344·8	+ 5·7	23	118	
	12913	·703	118·6	342·7	−16·1	26	104	
	12918	·907	85·0	317·3	+ 6·4	0	2	488 n
		·818	64·8					467
July 16			(+ 4·0)	(22·5)	(+ 4·5)	(745)	(3993)	(3678)
197·481		·858	289·7					504
G		·839	240·7					483
	12895	·995	255·0	90·3	−14·4	77	398	
	12912	·966	288·5	83·1	+19·0	4	17	503 p
	12914	·959	280·1	81·5	+11·0	9	31	354 c
	12900	·904	249·5	69·4	−16·3	8	37	531 c
	12916	·617	294·0	43·9	+18·2	6	25	
	1134i	·603	300·7	41·5	+21·7	9	29	
	12902	·591	241·4	39·7	−12·5	272	1954	
	1134j	·500	284·2	37·2	+11·1	3	5	
	12903	·382	270·3	30·1	+ 4·4	43	254	
	12917	·525	159·7	356·2	−24·9	8	15	
	12915	·300	62·1	352·0	+12·5	1	5	
	12911	·388	86·0	344·9	+ 5·8	23	115	
	12913	·524	131·5	343·7	−16·1	10	41	
	12918	·787	84·3	315·8	+ 7·4	11	37	133 c
		·947	82·1					505
July 17			(+ 4·5)	(7·7)	(+ 4·6)	(484)	(2963)	(3013)
198·393		·956	283·2					331
C		·945	247·7					947
		·897	293·0					314
	1135a	·983	260·8	74·1	− 8·1	11	29	209 p
	12916	·752	291·7	43·3	+19·3	37	235	239 c
	12902	·737	246·9	39·7	−13·4	288	2322	410 c

U.T.	Group No.	Measures Dist.	Measures Pos. Angle	Position Long.	Position Lat.	Area Umbræ	Area Whole Spots	Area Faculæ
			°	°	°			
1938								
	12903	·567	271·1	30·2	+ 4·5	56	251	
	12917	·502	181·5	356·5	−25·3	4	10	
	12915	·137	30·9	351·6	+11·4	1	4	
	12913	·362	156·1	347·0	−14·6	7	22	
	12911	·185	83·9	345·1	+ 5·8	24	130	
	1135b	·758	131·2	316·4	−26·2	2	7	
	12918	·650	85·0	315·2	+ 6·8	9	26	
	12919	·874	81·5	294·7	+ 9·7	4	13	372 c
	12920	·975	74·1	277·9	+16·6	49	287	440 f
		·857	67·6					161
		·919	127·9					146
		·922	99·1					372
		·959	63·1					214
July 18			(+ 4·9)	(355·7)	(+ 4·7)	(492)	(3336)	(4155)
199·332		·980	249·5					465
G		·971	293·5					152
	12916	·874	289·5	43·8	+19·3	40	122	370 c
	12902	·856	251·2	39·4	−13·3	401	2473	1042 c
	12903	·736	272·0	30·6	+ 4·8	56	270	334 p
	1135c	·412	293·0	6·1	+13·7	1	4	
	12921	·274	280·9	358·9	+ 7·5	4	6	
	12917	·543	202·5	356·4	−25·3	1	3	
	12915	·233	307·0	354·1	+12·7	8	21	
	12913	·349	193·5	348·0	−15·0	3	6	
	12911	·043	297·5	345·4	+ 6·0	26	130	
	1135d	·282	11·0	339·9	+20·8	0	12	
	12918	·456	83·3	316·3	+ 4·6	5	8	
	12919	·774	83·7	292·4	+ 7·9	2	4	
	12922	·856	102·1	285·8	− 7·7	2	5	98 f
	12920	·907	74·0	278·0	+16·6	44	289	520 f
	12923	·938	84·9	273·4	+ 6·4	7	13	295 f
	12924	·971	69·8	266·5	+20·7	0	14	258 f
	12925	·991	100·5	262·0	− 9·7	18	83	176 c
July 19			(+ 5·3)	(343·2)	(+ 4·8)	(618)	(3463)	(3710)
200·478	12916	·978	289·7	46·7	+20·2	5	21	720 f
G	12902	·960	254·0	39·7	−13·8	377	3379	1507 c
	12903	·887	272·6	30·6	+ 4·6	55	294	996 np
	12921	·520	273·4	359·4	+ 6·0	4	19	
	12915	·450	288·0	354·0	+12·4	5	31	
	1135e	·457	309·3	350·3	+21·3	1	5	
	12911	·300	274·1	345·5	+ 5·9	25	115	
	12926	·221	292·8	340·0	+ 9·7	9	44	

Group 12916. July 16–20. A group of small but active spots.
Group 12917. July 16–19. A small feeble stream, one spot being left on July 18–19.
Group 12918. July 16–20. Two or three small spots not identical from day to day.
Group 12919. July 18–19. A small spot.
Group 12920. July 18–29. A large regular spot showing signs of breaking up about July 22. Three days later, division into two parts has actually taken place and complete extinction soon follows.
Group 12921. July 19–20. A single spot on July 19: a pair on July 20.
Group 12922. July 19–29. A small changing group showing renewed activity on July 27.
Group 12923. July 19–26. A small persistent group.
Group 12924. July 19–30. A small stream lengthened on July 24–25 by the addition of new spots that might possibly represent a separate group.
Group 12925. July 19–30. Return of Group 12893. A small regular spot dying slowly out; there are two small followers on July 27.
Group 12926. July 20–24. A small bipolar group of rapid rise and decay.

POSITIONS AND AREAS OF SUN SPOTS AND FACULÆ FOR EACH DAY IN THE YEAR.

U.T.	Group No.	Measures Dist.	Measures Pos. Angle	Position Long.	Position Lat.	Area Umbræ	Area Whole Spots	Area Faculæ
			°	°	°			
1938								
	12918	·183	70·2	318·1	+ 8·3	5	13	
	12922	·712	103·6	284·2	− 6·1	23	75	
	12920	·778	72·8	277·5	+16·4	55	284	467 *f*
	12923	·814	85·4	273·6	+ 6·6	4	12	284 *f*
	12924	·883	69·0	266·5	+20·8	2	5	459 *f*
	12925	·926	102·6	261·9	− 9·7	24	97	348 *nf*
	12927	·984	88·3	248·5	+ 2·6	0	5	115 *f*
July 20			(+ 5·8)	(328·1)	(+ 4·9)	(594)	(4399)	(4896)
201·437 G		·991	294·2					249
		·857	277·6					366
	12902	·994	256·8	37·6	−12·5	224	1876	978 *c*
	12903	·966	273·4	30·4	+ 4·5	53	255	612 *np*
	1135f	·944	293·4	26·3	+23·7	3	8	128 *p*
	12915	·616	283·7	353·0	+12·2	6	23	
	12911	·506	273·4	345·8	+ 6·0	26	134	
	12926	·447	280·0	341·7	+ 8·8	38	175	
	12922	·537	110·0	285·0	− 6·3	22	68	
	12920	·631	69·8	277·4	+16·4	51	275	
	12923	·670	85·6	273·3	+ 6·6	6	21	
	12924	·795	66·6	264·0	+21·5	15	45	364 *f*
	12925	·827	105·0	261·5	− 9·5	16	93	166 *c*
	12927	·926	88·6	247·6	+ 3·2	7	30	402 *f*
		·933	97·1					247
		·954	109·8					1269
		·967	86·9					392
July 21			(+ 6·2)	(315·4)	(+ 4·9)	(467)	(3003)	(5173)
202·398 C		·992	294·4					84
		·950	279·4					352
	12911	·683	273·3	345·8	+ 5·9	20	123	
	12926	·630	277·9	341·7	+ 8·9	40	133	
	12922	·378	118·5	283·3	− 5·6	9	30	
	12920	·464	63·6	277·1	+16·4	43	256	
	12923	·485	85·6	273·7	+ 6·5	6	17	
	12928	·593	66·4	268·0	+17·8	4	11	
	12924	·657	62·5	264·1	+21·5	18	62	
	12925	·693	109·2	261·3	− 9·4	15	95	
	12927	·837	89·3	245·9	+ 3·3	4	15	205 *c*
	12929	·887	111·3	243·5	−16·2	2	21	674 *c*
	12930	·981	98·5	224·9	− 7·3	63	129	228 *f*
		·907	65·2					210
		·983	65·2					266
July 22			(+ 6·6)	(302·7)	(+ 5·0)	(224)	(892)	(2019)

U.T.	Group No.	Measures Dist.	Measures Pos. Angle	Position Long.	Position Lat.	Area Umbræ	Area Whole Spots	Area Faculæ
			°	°	°			
1938								
203·366 G		·968	286·8					272
		·957	242·8					294
		·939	276·2					249
		·849	247·0					380
	12915	·904	282·0	354·8	+13·0	6	16	264 *c*
	1135g	·864	293·9	348·9	+23·1	2	7	196 *sp*
	12911	·829	273·8	345·9	+ 6·0	16	99	226 *c*
	12926	·793	277·5	342·4	+ 9·0	20	66	123 *c*
	12931	·037	305·5	291·6	+ 6·3	30	103	
	12922	·201	161·1	286·2	− 5·9	19	68	
	12932	·367	11·8	285·1	+26·0	1	3	
	12920	·295	47·9	276·8	+16·3	49	279	
	12923	·283	84·8	273·5	+ 6·3	9	31	
	12928	·424	57·4	268·0	+17·9	7	28	
	12924	·499	55·2	264·0	+21·0	40	137	
	12925	·534	116·3	261·0	− 9·2	19	84	
	12927	·690	90·2	246·3	+ 3·6	16	84	
	12929	·760	118·8	245·7	−17·8	5	18	326 *c*
	12930	·918	100·8	224·6	− 7·8	44	220	625 *f*
	12933	·983	112·4	213·5	−20·9	61	516	717 *c*
		·826	61·5					146
		·902	133·6					213
		·925	65·8					436
		·981	61·4					292
July 23			(+ 7·0)	(289·9)	(+ 5·1)	(344)	(1759)	(4759)
204·371 G		·956	291·7					240
		·954	282·7					235
		·937	250·0					350
		·829	293·3					532
	12911	·935	274·4	346·0	+ 6·0	19	86	328 *c*
	12926	·884	276·1	339·0	+ 8·1	15	43	337 *f*
	12931	·253	276·0	291·2	+ 6·5	65	332	
	12922	·256	224·2	286·9	− 5·4	15	64	
	12932	·373	339·1	285·0	+25·4	4	16	
	12920	·195	0·5	276·5	+16·4	33	226	
	12923	·074	68·8	272·4	+ 6·7	4	23	
	12928	·258	33·2	268·1	+17·6	8	33	
	12924	·325	32·8	265·8	+20·9	45	200	
	12925	·365	132·3	260·8	− 9·2	12	79	
	12927	·492	91·7	247·2	+ 3·7	21	128	
	12929	·646	126·0	243·4	−17·9	3	12	
	12930	·795	103·5	225·6	− 7·4	41	190	388 *f*
	12933	·945	115·1	209·8	−21·7	110	696	1011 *c*
	12934	·976	98·1	200·2	− 6·7	59	516	505 *c*
		·852	62·4					415

Group 12927. July 20–Aug.1. A stream led by a small regular spot.
Group 12928. July 22–24. A few small spots merging into Group 12924 on July 25.
Group 12929. July 22–25. A small spot with companions on July 23.
Group 12930. July 22–Aug.2. A regular spot with a pair of small followers on July 23 to 25.
Group 12931. July 23–29. A large stream of normal type developing rapidly.
Group 12932. July 23–27. A small group.
Group 12933. July 23–Aug.4. Return of Group 12886. A large spot with multiple umbræ followed by small scattered spots. A part of the spot breaks away on July 29 from its following side.
Group 12934. July 24–Aug.5. Return of Group 12887: 4th appearance. An active bi-polar group in which the following component is much the larger. A cluster of spots appears after July 27 near the follower, which itself is breaking up into several components. The complete continuity with Group 12887 is doubtful. In any case, the present group has obviously developed anew.

POSITIONS AND AREAS OF SUN SPOTS AND FACULÆ FOR EACH DAY IN THE YEAR.

U.T.	Group No.	Measures Dist.	Measures Pos. Angle	Position Long.	Position Lat.	Area Umbræ	Area Whole Spots	Area Faculæ
			°	°	°			
1938								
		·854	118·9					114
		·950	57·6					356
		·953	104·7					319
July 24			(+ 7·5)	(276·6)	(+ 5·2)	(454)	(2644)	(5130)
205·340 G		·968	248·7					157
		·936	291·2					587
		·837	278·1					247
	12911	·980	275·6	342·4	+ 6·5	25	148	396 c
	1135h	·868	292·2	323·4	+21·8	5	18	233 n
	12931	·477	274·5	292·2	+ 6·8	83	437	
	12922	·442	244·1	287·2	− 6·2	12	62	
	12932	·480	315·9	285·2	+25·0	8	27	
	12920	·291	314·1	276·3	+16·8	24	154	
	12923	·185	278·2	274·3	+ 6·7	3	12	
	12924	·270	343·0	268·5	+20·2	45	225	
	12925	·253	168·3	260·7	− 9·0	15	55	
	12927	·256	93·4	248·9	+ 4·2	23	141	
	12929	·495	138·1	243·6	−16·6	3	8	
	12930	·646	107·7	225·5	− 7·1	34	168	
	12933	·856	118·9	210·4	−21·3	108	888	1127 c
	12934	·901	99·7	200·6	− 6·4	53	431	453 c
		·853	57·8					289
		·888	109·0					303
		·940	73·1					183
July 25			(+ 7·9)	(263·7)	(+ 5·3)	(441)	(2774)	(3975)
206·438 G		·956	291·5					618
		·945	277·5					417
	12931	·681	274·7	292·2	+ 7·1	107	549	
	12922	·667	252·1	288·9	− 7·7	27	157	
	12932	·627	305·1	283·7	+25·5	6	15	
	12920	·485	295·5	276·3	+16·8	27	119	
	12923	·408	274·7	273·3	+ 6·8	4	18	
	1135i	·510	224·4	270·9	−16·3	3	13	
	12924	·427	305·9	270·6	+19·4	17	62	
	12925	·320	218·7	260·8	− 9·1	10	64	
	12927	·026	225·9	250·3	+ 4·4	26	136	
	12930	·444	116·9	225·8	− 6·6	29	148	
	1135j	·600	135·9	222·8	−20·6	3	9	
	12933	·736	126·1	209·6	−21·5	88	693	373 f
	12934	·773	103·3	200·2	− 6·7	69	388	205 f
		·910	133·6					280
		·959	111·3					209
		·978	80·2					162
July 26			(+ 8·3)	(249·2)	(+ 5·4)	(416)	(2371)	(2264)
207·364 C		·961	283·3					198
		·857	284·9					332
	12931	·823	274·7	292·5	+ 6·9	100	624	451 c
	12922	·796	256·5	288·1	− 7·3	80	451	370 c
	12932	·756	299·1	283·8	+25·3	3	14	75 p
	12920	·650	289·9	276·6	+17·0	9	34	
	12924	·569	297·5	269·3	+19·8	20	69	
1938			°	°	°			
	12925	·465	237·5	260·0	− 9·5	9	36	
	12927	·274	266·7	252·8	+ 4·3	18	89	
	12930	·283	136·3	225·7	− 6·5	23	130	
	12933	·605	136·5	210·6	−21·1	110	711	
	12934	·618	107·7	200·8	− 6·4	79	412	
		·873	126·9					223
		·912	114·7					399
		·915	141·2					219
		·931	80·5					346
July 27			(+ 8·7)	(237·0)	(+ 5·4)	(451)	(2570)	(2613)
208·439 C		·954	285·3					164
		·882	295·1					118
	12931	·947	275·4	294·3	+ 6·9	88	460	781 c
	12922	·925	259·1	289·1	− 7·9	55	333	497 c
	12920	·813	286·8	277·0	+16·8	3	23	103 p
	12924	·700	294·2	265·7	+20·7	30	121	
	12925	·658	249·2	261·2	− 9·2	9	43	
	12927	·500	268·3	252·7	+ 3·9	25	82	
	12930	·212	192·6	225·5	− 6·4	24	131	
	1135k	·550	175·2	219·8	−27·6	1	11	
	12933	·496	155·4	210·0	−21·3	110	534	
	12934	·425	117·6	200·6	− 6·2	67	373	
	12935	·571	93·3	188·2	+ 2·6	2	8	
		·807	60·5					187
		·927	64·0					206
		·957	79·2					474
July 28			(+ 9·2)	(222·8)	(+ 5·5)	(414)	(2119)	(2530)
209·368 C		·941	294·6					326
	12922	·985	260·5	289·3	− 8·3	40	163	1202 c
	12931	·977	277·1	288·6	+ 8·1	46	200	622 p
	12920	·915	285·7	277·1	+16·6	2	5	362 c
	12924	·811	292·0	263·9	+21·0	14	56	480 c
	12925	·794	254·0	260·9	− 9·0	7	22	
	12927	·669	270·2	252·5	+ 4·3	28	111	
	12930	·329	230·9	225·3	− 6·5	16	93	
	1135l	·362	336·6	219·6	+24·8	1	36	
	1135m	·437	2·4	209·3	+31·4	2	18	
	12933	·456	176·4	208·7	−21·3	108	664	
	12934	·274	137·4	199·8	− 6·1	89	433	
	12935	·358	95·8	189·7	+ 2·6	2	17	
	12936	·948	71·6	138·5	+19·1	6	14	563 c
		·876	79·6					464
July 29			(+ 9·6)	(210·5)	(+ 5·6)	(361)	(1832)	(4019)
210·340 C		·983	288·3					428
		·970	277·3					271
		·839	242·6					329
	12924	·913	290·1	263·8	+20·7	7	19	859 c
	12925	·910	257·3	261·4	− 9·0	5	19	213 f
	12927	·826	270·7	253·3	+ 3·8	63	306	324 c
	12930	·506	246·9	225·4	− 6·4	16	86	
	12933	·488	202·3	209·0	−21·1	94	552	

Group 12935. July 28–30. One or more tiny spots.

Group 12936. July 29–Aug.4. One or two very small intermittent spots.

POSITIONS AND AREAS OF SUN SPOTS AND FACULÆ FOR EACH DAY IN THE YEAR.

U.T.	Group No.	Measures Dist.	Measures Pos. Angle	Position Long.	Position Lat.	Area Umbræ	Area Whole Spots	Area Faculæ
			°	°	°			
1938								
	12934	·205	194·7	200·6	− 5·7	64	354	
	12935	·110	107·1	191·6	+ 3·8	2	4	
	12936	·865	71·3	137·8	+19·0	4	9	518 *f*
		·912	101·0					324
		·964	70·0					598
July 30			(+ 9·9)	(197·6)	(+ 5·7)	(255)	(1349)	(3864)
211·397 G		·969	291·8					513
		·898	246·7					603
	12927	·937	271·5	253·1	+ 3·4	73	411	451 *c*
	12930	·690	253·7	225·3	− 6·8	19	87	
	12933	·609	224·2	210·5	−20·7	61	373	
	12934	·337	235·4	199·7	− 5·5	51	273	
	12937	·982	101·8	106·1	−10·4	18	83	896 *c*
		·886	71·0					775
		·926	109·1					157
		·949	122·7					116
		·974	75·0					289
July 31			(+ 10·4)	(183·6)	(+ 5·8)	(222)	(1227)	(3800)
212·328 G		·959	280·2					89
		·954	249·6					746
		·901	295·6					210
		·787	296·0					279
	12927	·992	272·4	254·0	+ 3·1	52	301	559 *c*
	12930	·823	257·2	225·1	− 7·1	14	79	198 *f*
	12938	·683	273·4	214·4	+ 6·5	3	11	
	12933	·717	231·6	208·4	−21·8	67	395	
	12934	·506	249·5	199·6	− 5·1	62	411	
	12939	·577	205·5	187·2	−25·7	5	17	
	1135n	·396	69·9	148·9	+13·2	1	4	
	12936	·583	64·6	137·5	+19·3	3	5	
	12937	·924	103·8	105·7	−10·4	18	83	603 *s*
	12940	·946	93·4	100·7	− 1·3	24	49	314 *c*
	12942	·992	109·3	91·1	−18·2	94	366	696 *c*
	12941	·984	77·8	90·8	+13·0	49	208	778 *n*
	12943	·995	97·2	88·0	− 6·5	43	263	
		·860	71·6					535
		·929	113·6					216
Aug. 1			(+ 10·8)	(171·3)	(+ 5·8)	(435)	(2192)	(5223)
213·464 G		·965	296·0					312
		·886	296·4					369
		·801	304·1					295
1938								
	12930	·942	260·4	225·4	− 6·9	18	68	379 *f*
	12938	·879	274·4	218·0	+ 6·7	2	9	109 *f*
	12944	·875	248·4	213·8	−15·7	5	19	300 *c*
	12933	·867	241·6	210·8	−20·9	57	311	900 *c*
	12934	·718	256·6	200·7	− 5·3	73	420	217 *s*
	12939	·707	225·8	190·1	−24·6	1	5	
	1135o	·342	274·8	176·3	+ 6·9	3	4	
	1135p	·574	58·1	124·6	+22·6	3	7	
	12937	·797	108·4	106·1	−10·8	19	83	360 *sf*
	1135q	·811	73·4	102·2	+16·9	2	4	216 *c*
	12940	·824	95·7	101·4	− 1·3	8	55	289 *f*
	12945	·875	74·2	95·1	+16·6	2	5	341 *f*
	12942	·937	109·2	89·8	−15·7	54	253	540 *f*
	12941	·915	78·8	89·7	+12·6	81	366	718 *c*
	12943	·938	99·2	87·8	− 6·5	53	289	466 *f*
		·815	133·4					108
Aug. 2			(+ 11·2)	(156·3)	(+ 5·9)	(381)	(1898)	(5919)
214·344 G		·960	294·4					290
		·876	302·8					373
		·837	313·6					198
	12944	·950	251·7	213·7	−15·2	8	22	442 *f*
	12933	·940	245·0	210·3	−21·0	39	265	1529 *sf*
	12934	·845	259·2	201·0	− 5·8	66	413	401 *c*
	1135r	·390	68·6	122·9	+13·7	1	3	
	12937	·666	113·5	106·4	−10·7	15	83	
	12946	·712	118·9	104·6	−15·5	10	26	
	12940	·687	98·5	102·1	− 1·4	10	57	
	12941	·820	78·6	89·4	+12·8	83	390	451 *c*
	12945	·827	72·0	89·0	+18·2	14	40	257 *c*
	12942	·861	111·4	88·8	−15·0	51	267	302 *c*
	12943	·852	101·4	87·7	− 6·4	57	290	522 *f*
		·868	120·5					309
		·970	112·8					323
Aug. 3			(+ 11·6)	(144·7)	(+ 6·0)	(354)	(1856)	(5397)
215·342 G		·937	301·9					420
	12933	·990	247·4	210·1	−21·3	24	220	1416 *sf*
	12934	·951	261·6	202·4	− 6·0	34	165	1016 *c*
	12947	·843	274·4	189·1	+ 6·9	42	179	196 *c*
	1135s	·566	281·9	165·7	+11·7	3	5	
	12936	·254	331·3	138·9	+18·8	3	19	
	1135t	·440	3·1	129·9	+31·9	3	23	
	12937	·499	123·9	106·7	−10·7	17	79	
	12946	·582	128·7	103·4	−16·0	11	52	
	12940	·496	104·5	102·9	− 1·8	10	42	

Group 12937. July 31–Aug. 11. Return of Group 12895. A stable regular spot.
Group 12938. Aug. 1 – 2. A pair of small spots on Aug. 1: a single spot on Aug. 2.
Group 12939. Aug. 1 – 2. A pair of small spots on Aug. 1: a single spot on Aug. 2.
Group 12940. Aug. 1 –10. A small regular spot decreasing; a small spot follows on Aug. 7.
Group 12941. Aug. 1 –13. A stable regular spot with a small train of companions.
Group 12942. Aug. 1 –13. With Group 12937 a return of Group 12895. A stable regular spot with a cluster *sp* until Aug. 9.
Group 12943. Aug. 1 –13. A stable regular spot.
Group 12944. Aug. 2 – 3. A pair of small spots of which one is left on Aug. 3.
Group 12945. Aug. 2 – 4. Two or three small scattered spots *n* Group 12941.
Group 12946. Aug. 3 –11. A small variable group *s* Group 12937.
Group 12947. Aug. 4 – 6. A group developing rapidly near the west limb; subsequent development is lost to view.

POSITIONS AND AREAS OF SUN SPOTS AND FACULÆ FOR EACH DAY IN THE YEAR.

U.T.	Group No.	Measures Dist.	Measures Pos. Angle	Position Long.	Position Lat.	Area Umbræ	Area Whole Spots	Area Faculæ
			°	°	°			
1938								
	12941	·671	77·7	89·5	+12·7	61	362	213 *f*
	12942	·740	115·8	88·7	−14·4	43	208	
	12945	·703	70·5	87·5	+17·9	4	10	
	12943	·717	104·9	87·5	− 6·3	49	286	228 *f*
	12948	·987	116·5	54·8	−24·9	27	209	441 *c*
		·894	115·5					386
		·979	103·5					396
Aug. 4			(+ 11·9)	(131·5)	(+ 6·0)	(331)	(1859)	(4712)
216·342 G		·982	300·9					130
		·974	239·5					536
	12934	·992	263·5	200·1	− 5·6	19	34	388 *c*
	12947	·949	276·9	190·2	+ 8·5	83	587	389 *c*
	1135u	·879	278·4	180·0	+10·3	2	5	107 *c*
	12949	·243	25·1	112·0	+18·7	5	20	
	12937	·349	146·1	106·8	−10·8	14	78	
	12940	·282	117·7	103·8	− 1·6	7	30	
	12946	·456	145·5	102·7	−16·1	13	50	
	12941	·475	74·4	90·4	+12·7	53	299	
	12942	·592	124·5	88·1	−14·2	36	194	
	12943	·551	111·5	87·3	− 6·4	46	283	
	12948	·953	119·8	51·6	−25·9	75	493	465 *c*
	12950	·973	107·2	44·1	−15·1	185	1090	1297 *c*
	12951	·983	67·9	37·5	+22·8	24	117	539 *p*
	12952	·997	87·1	32·6	+ 3·4	30	140	
		·807	119·1					158
		·949	84·2					449
Aug. 5			(+ 12·3)	(118·2)	(+ 6·1)	(592)	(3420)	(4458)
217·365 C		·934	243·3					446
		·890	278·3					320
	12947	·993	277·6	188·4	+ 8·2	74	613	348 *c*
	12949	·251	333·0	111·6	+19·0	8	41	
	12937	·292	187·7	107·0	−10·5	9	87	
	12940	·138	181·3	104·9	− 1·7	9	14	
	12946	·367	177·7	103·8	−15·2	7	15	
	12941	·259	63·8	91·0	+12·5	41	236	
	12942	·437	141·9	88·6	−14·1	38	210	
	12943	·367	125·3	87·2	− 6·3	38	272	
	12948	·875	124·1	51·4	−25·7	74	437	410 *c*
	12950	·891	110·9	45·2	−15·4	165	1143	1911 *c*
	12951	·924	67·9	36·8	+22·8	23	133	445 *c*
	12952	·950	88·3	32·9	+ 3·6	32	177	310 *c*
		·861	88·3					354
Aug. 6			(+ 12·7)	(104·7)	(+ 6·2)	(518)	(3378)	(4544)

U.T.	Group No.	Measures Dist.	Measures Pos. Angle	Position Long.	Position Lat.	Area Umbræ	Area Whole Spots	Area Faculæ
			°	°	°			
1938								
218·320 C		·961	280·9					150
		·960	259·9					157
		·854	280·0					424
	12949	·373	306·9	110·4	+18·8	2	9	
	12937	·385	221·3	107·0	−10·7	17	71	
	12946	·424	209·3	104·5	−15·5	12	62	
	12940	·231	232·7	102·6	− 1·9	7	17	
	12941	·114	7·3	91·3	+12·7	37	198	
	12942	·356	171·1	88·9	−14·3	37	244	
	12943	·232	158·7	87·3	− 6·3	44	263	
	12948	·786	130·5	50·6	−26·0	65	422	378 *f*
	12950	·788	114·9	44·5	−15·2	147	1051	921 *f*
	12951	·832	66·3	36·4	+23·1	16	108	612 *c*
	12952	·860	89·5	32·8	+ 3·6	21	147	298 *c*
		·937	124·5					434
		·945	112·7					230
		·954	78·1					431
Aug. 7			(+ 13·1)	(92·1)	(+ 6·2)	(405)	(2592)	(4035)
219·459 G		·954	279·6					394
		·864	284·1					367
	12937	·563	240·1	106·7	−10·8	15	68	
	12940	·504	254·9	106·0	− 2·0	5	8	
	12946	·561	229·5	103·2	−15·7	26	80	
	12953	·306	300·1	92·8	+14·9	3	7	
	12941	·252	297·6	90·2	+12·8	50	216	
	12942	·395	210·9	89·0	−13·5	39	200	
	12943	·277	219·1	87·1	− 6·2	48	272	
	12948	·660	141·9	50·3	−25·5	67	366	
	12950	·620	124·1	45·0	−15·0	163	920	
	12951	·680	62·4	36·2	+23·1	18	78	
	12952	·700	91·3	32·6	+ 3·6	31	173	
	12954	·989	115·5	359·6	−24·0	107	953	458 *c*
		·805	129·4					337
		·874	120·5					163
		·888	80·7					334
		·971	82·9					211
		·979	67·3					120
Aug. 8			(+ 13·5)	(77·0)	(+ 6·3)	(572)	(3341)	(2384)
220·387 G		·969	284·9					318
		·951	276·3					154
		·947	264·7					229
		·851	293·9					174
	12937	·713	248·0	106·8	−10·8	13	81	

Group 12948. Aug. 4–15. A bi-polar group consisting of two regular spots the following one surviving the leader by a few days.
Group 12949. Aug. 5– 7. A small ephemeral group.
Group 12950. Aug. 5–17. Return of Group 12902. A group consisting of a regular spot as leader, another spot (less perfectly formed) as the follower, and a few small companions. The axis of the group is considerably inclined to the sun's equator, the leader spot, contrary to the normal position, being in the higher latitude.
Group 12951. Aug. 5–15. A regular spot slowly diminishing; a pair of ephemeral companions appear on Aug.15.
Group 12952. Aug. 5–17. Return of Group 12903: 4th appearance. A stable regular spot.
Group 12953. Aug. 8–12. A pair of spots close to Group 12941.
Group 12954. Aug. 8–19. A pair of spots; the follower, at first a regular spot, becomes elongated and partly breaks up on Aug.15.

POSITIONS AND AREAS OF SUN-SPOTS AND FACULÆ FOR EACH DAY IN THE YEAR.

U.T.	Group No.	Measures: Dist.	Measures: Pos. Angle	Position: Long.	Position: Lat.	Area: Umbræ	Area: Whole Spots	Area: Faculæ
			°	°	°			
1938								
	12940	·659	258·7	104·8	− 2·6	6	18	
	12946	·705	240·0	103·9	−15·7	16	55	
	12953	·484	290·2	92·6	+15·1	10	39	
	12941	·423	286·1	89·2	+12·5	50	272	
	12942	·512	230·1	88·4	−13·4	37	184	
	12943	·433	241·5	87·1	− 6·1	36	257	
	12955	·199	329·1	70·8	+16·1	4	12	
	12948	·573	156·5	50·1	−25·5	61	336	
	12950	·487	137·2	44·8	−15·0	150	835	
	12951	·540	55·7	35·8	+23·2	14	76	
	12952	·535	92·9	32·5	+ 3·8	20	140	
	12954	·945	117·9	359·0	−23·8	117	955	719 c
		·937	84·7					516
		·945	67·3					166
Aug. 9			(+ 13·9)	(64·7)	(+ 6·3)	(534)	(3260)	(2276)
221·099 K		·918	292·1					586
	12937	·816	251·5	107·2	−11·1	15	60	84 c
	12940	·780	261·2	105·6	− 2·8	3	10	
	12946	·787	245·0	102·8	−15·1	5	28	221 c
	12953	·616	286·5	92·9	+15·1	36	176	
	12941	·559	282·8	89·1	+12·5	64	290	
	12942	·626	238·6	88·5	−13·7	45	199	
	12943	·564	249·4	87·2	− 6·0	50	249	
	12955	·377	296·1	75·8	+15·5	1	5	
	12948	·543	170·5	49·6	−25·9	52	254	
	12950	·405	154·0	44·8	−15·0	143	842	
	12951	·428	47·0	35·5	+23·0	14	48	
	12952	·388	95·1	32·6	+ 4·0	33	151	
	12954	·888	120·9	359·2	−23·6	122	918	
	12956	·926	84·6	347·2	+ 7·4	8	22	148 f
		·872	68·8					247
		·894	121·2					591
		·953	78·8					173
		·967	69·7					205
Aug. 10			(+ 14·1)	(55·3)	(+ 6·4)	(591)	(3252)	(2255)
222·344 G		·977	292·8					262
		·941	235·0					435
		·922	287·1					279
		·922	262·8					316
		·899	275·4					150
		·834	235·2					248
	12937	·944	255·9	107·5	−11·0	14	69	209 f
	12946	·925	251·6	103·6	−14·3	6	9	593 s
	12953	·812	283·9	93·4	+15·0	39	152 }	262 p
	12941	·769	280·8	89·4	+12·5	60	215 }	
	12942	·803	247·6	88·5	−13·6	34	178	312 c
	12943	·765	257·0	87·2	− 5·6	42	220	
	12948	·561	194·1	47·6	−26·4	31	170	
	12957	·297	341·2	44·8	+22·7	1	5	

U.T.	Group No.	Measures: Dist.	Measures: Pos. Angle	Position: Long.	Position: Lat.	Area: Umbræ	Area: Whole Spots	Area: Faculæ
			°	°	°			
1938								
	12950	·373	194·5	44·4	−14·6	153	839	
	12958	·074	263·0	43·1	+ 6·0	2	8	
	12959	·470	178·4	38·1	−21·4	4	18	
	1135v	·265	168·6	35·9	− 8·5	3	4	
	12951	·290	12·9	34·9	+22·8	7	23	
	12952	·112	112·3	33·0	+ 4·1	20	128	
	12954	·767	129·0	358·4	−23·9	122	776	
	12956	·783	85·3	347·1	+ 7·8	4	7	181 c
	12960	·958	114·4	329·9	−21·1	31	213	470 f
		·862	65·6					337
		·908	80·8					379
		·916	53·4					169
		·946	72·0					181
		·977	78·1					200
		·979	64·8					137
Aug. 11			(+ 14·6)	(38·9)	(+ 6·5)	(573)	(3034)	(5120)
223·339 G		·982	254·0					464
		·962	266·1					214
		·951	290·6					139
		·944	240·6					327
	12953	·936	282·9	95·9	+14·3	20	72	266 c
	12941	·899	280·5	90·3	+12·2	42	183	352 f
	12942	·911	251·9	88·6	−13·5	32	187	446 c
	12943	·891	260·4	87·6	− 5·5	37	167	142 f
	12948	·634	210·8	47·0	−26·8	30	112	
	12957	·415	314·9	44·4	+23·1	3	25	
	12950	·472	220·1	44·1	−14·9	144	804	
	12958	·314	271·6	44·1	+ 6·7	7	22	
	12959	·488	204·5	38·2	−19·9	3	17	
	12951	·307	335·2	33·8	+22·6	5	23	
	12952	·134	251·1	33·1	+ 4·0	31	119	
	12954	·664	139·1	357·4	−24·3	117	651	
	12956	·620	85·7	347·4	+ 7·8	3	6	
	12960	·884	118·0	329·3	−21·0	39	214	466 f
	1135w	·969	95·1	310·8	− 3·3	0	4	155 f
		·854	70·8					163
		·864	49·3					125
		·917	79·1					278
		·945	62·8					270
Aug. 12			(+ 14·9)	(25·8)	(+ 6·5)	(513)	(2606)	(3807)
224·497 G		·970	242·8					208
	12941	·984	281·3	91·0	+12·2	38	164	1007 f
	12942	·986	255·2	88·5	−13·3	41	146	343 sf
	12943	·978	263·1	87·4	− 5·3	26	172	385 sf
	1135x	·894	282·7	72·0	+ 8·2	6	20	114 f
	1135y	·905	242·7	69·9	−21·3	2	10	410 sf
	12948	·747	223·7	45·8	−27·3	7	31	
	12950	·641	237·3	44·2	−14·8	127	774	
	12959	·615	227·5	38·9	−18·7	3	11	

Group 12955. Aug. 9–10. A tiny short-lived group.
Group 12956. Aug.10–13. Return of Group 12911: 3rd appearance. A small faint spot.
Group 12957. Aug.11–12. A small spot.
Group 12958. Aug.11–12. A very small ephemeral group.
Group 12959. Aug.11–13. Two small faint spots.
Group 12960. Aug.11–22. A stable regular spot.

POSITIONS AND AREAS OF SUN SPOTS AND FACULÆ FOR EACH DAY IN THE YEAR.

U.T.	Group No.	Measures Dist.	Measures Pos. Angle	Position Long.	Position Lat.	Area Umbræ	Area Whole Spots	Area Faculæ
			°	°	°			
1938								
	1135z	·627	217·0	34·7	−24·0	3	9	
	12951	·468	308·1	33·8	+22·8	3	10	
	12952	·390	264·9	33·2	+ 4·1	25	114	
	12961	·491	165·5	2·8	−21·7	3	6	
	12954	·560	156·5	356·3	−24·4	92	658	
	12956	·393	84·5	347·2	+ 8·2	3	5	
	12962	·651	125·3	336·9	−16·6	9	27	
	12960	·762	124·8	328·5	−20·9	35	219	302 *f*
		·835	61·1					222
		·870	96·5					134
		·948	83·8					781
		·953	98·9					373
Aug. 13			(+ 15·3)	(10·4)	(+ 6·6)	(423)	(2376)	(4279)
225·373 C		·993	282·2					562
		·959	283·4					155
		·941	242·8					584
		·896	292·6					253
		·862	253·2					496
	12948	·836	230·8	45·5	−27·5	8	16	320 *p*
	12950	·761	244·6	43·8	−14·4	104	769	400 *c*
	12951	·619	299·8	34·4	+23·3	4	15	
	12952	·570	267·5	33·5	+ 4·0	13	104	
	12961	·478	185·8	1·8	−21·7	7	30	
	12954	·527	174·4	355·6	−24·9	93	582	
	12962	·549	136·0	335·4	−17·2	1	5	
	12960	·651	133·2	328·4	−20·7	35	217	
	12963	·768	82·4	308·4	+10·1	3	12	
		·859	72·9					237
		·865	102·8					369
		·888	87·2					748
		·928	111·8					206
		·953	101·0					297
		·958	72·5					363
Aug. 14			(+ 15·6)	(358·8)	(+ 6·6)	(268)	(1750)	(4990)
226·367 G		·941	253·2					819
		·924	291·8					266
		·878	277·4					381
		·834	293·2					329
		·830	261·3					159
		·818	234·0					542
	12948	·920	236·0	45·0	−27·6	6	18	461 *p*
	12950	·883	249·4	44·2	−14·7	108	608	759 *c*
	12951	·762	292·9	34·6	+21·7	4	7	
	12952	·742	269·4	33·6	+ 4·1	18	92	
	12961	·531	205·0	359·7	−22·1	4	22	
	12954	·550	195·4	355·0	−25·3	91	563	
	12960	·533	147·8	328·1	−20·3	38	241	
	12963	·603	83·4	308·5	+ 9·3	3	9	
	12964	·954	80·2	272·5	+11·3	39	149	452 *c*

U.T.	Group No.	Measures Dist.	Measures Pos. Angle	Position Long.	Position Lat.	Area Umbræ	Area Whole Spots	Area Faculæ
			°	°	°			
1938								
	12965	·983	108·0	269·1	−16·2	13	24	192 *c*
	12966	·993	88·0	262·5	+ 2·8	28	159	
		·808	82·0					221
		·843	102·8					232
		·942	67·2					363
Aug. 15			(+ 16·0)	(345·7)	(+ 6·7)	(352)	(1892)	(5176)
227·568 G		·976	281·2					412
		·958	262·8					256
		·940	240·2					571
		·911	293·7					536
	12950	·976	253·1	44·7	−14·7	105	544	1382 *c*
	12952	·896	271·2	33·5	+ 4·1	20	69	158 *c*
	12954	·655	215·2	354·6	−26·2	65	410	
	12960	·462	176·4	328·0	−20·6	28	186	
	12967	·518	67·4	299·9	+17·3	20	74	
	12968	·835	74·4	272·9	+16·7	4	16 }	305 *c*
	12964	·836	81·0	272·7	+11·2	25	171 }	
	12965	·930	112·0	265·2	−17·6	14	52	274 *c*
	12966	·930	90·2	261·5	+ 2·3	24	142	311 *nj*
		·818	65·2					134
		·916	70·6					90
		·971	66·5					244
		·987	110·2					221
Aug. 16			(+ 16·4)	(329·8)	(+ 6·7)	(305)	(1664)	(4894)
228·348 G		·968	244·3					367
		·954	293·9					561
	12950	·995	256·3	41·7	−12·8	43	283	333 *f*
	12952	·962	272·2	33·7	+ 4·0	25	70	312 *f*
	12954	·732	224·1	353·9	−26·0	69	373	
	12960	·476	196·2	327·6	−20·4	26	187	
	12967	·370	57·9	300·4	+17·7	19	105	
	1136a	·381	84·6	297·1	+ 8·3	4	22	
	12964	·715	80·7	273·7	+11·4	34	185	
	12968	·727	74·5	273·0	+15·9	13	40	
	12965	·838	115·2	267·3	−16·7	17	34	
	12966	·844	91·1	262·1	+ 2·8	21	123	395 *f*
		·847	115·0					207
		·902	64·1					340
		·953	111·1					305
Aug. 17			(+ 16·7)	(319·5)	(+ 6·8)	(271)	(1422)	(2820)
229·459 G		·947	283·0					239
		·892	243·4					382
	12954	·847	233·4	353·7	−25·9	47	214	386 *c*
	12960	·575	218·6	327·2	−20·3	36	192	
	12963	·085	316·8	308·2	+10·3	15	64	
	12967	·235	33·0	297·1	+18·1	12	39	

Group 12961. Aug.13–15. A tiny short-lived group *p* Group 12954.
Group 12962. Aug.13–14. A small stream *np* Group 12960.
Group 12963. Aug.14–20. One or two small spots on Aug.14 and 15: a small stream on Aug.18–20.
Group 12964. Aug.15–26. A variable stream.
Group 12965. Aug.15–18. One or two small spots spread over an area of weak disturbance.
Group 12966. Aug.15–26. Return of Group 12927. A regular spot dying out as it approaches the west limb.
Group 12967. Aug.16–25. A small unstable stream re-forming on Aug.19–20.
Group 12968. Aug.16–20. A small group *n* Group 12964.

POSITIONS AND AREAS OF SUN SPOTS AND FACULÆ FOR EACH DAY IN THE YEAR.

U.T.	Group No.	Measures		Position		Area		
		Dist.	Pos. Angle	Long.	Lat.	Umbræ	Whole Spots	Faculæ
			°	°	°			
1938								
	12968	·517	70·0	274·6	+16·0	11	29	
	12964	·512	79·6	274·1	+11·1	37	140	
	12966	·682	93·3	262·0	+ 2·8	18	109	
	12965	·760	120·8	261·6	−17·9	4	16	
		·811	62·2					174
		·916	112·8					491
		·941	62·6					239
		·972	81·8					286
Aug. 18			(+ 17·0)	(304·8)	(+ 6·8)	(180)	(803)	(2197)
230·622 G		·958	246·0					392
		·954	275·5					225
		·855	278·2					224
	12954	·941	238·2	352·9	−26·7	24	87	422 c
	1136b	·686	299·8	330·5	+25·1	6	17	
	12960	·718	232·5	326·8	−20·4	33	158	
	12963	·335	284·2	308·7	+11·2	12	42	
	12967	·259	322·2	299·1	+18·5	3	5	
	1136c	·284	187·0	291·5	− 9·4	3	7	
	12970	·211	22·2	283·7	+18·1	3	11	
	12968	·301	57·3	274·3	+16·0	17	57	
	12964	·280	73·0	273·7	+11·3	20	111	
	12966	·462	97·1	262·3	+ 2·9	20	106	
	12969	·773	130·2	249·1	−24·6	7	25	
		·902	83·4					406
		·929	66·0					351
		·961	108·4					565
		·973	99·0					219
Aug. 19			(+ 17·4)	(289·5)	(+ 6·9)	(148)	(626)	(2804)
231·362 C		·973	241·9					588
		·950	279·0					280
		·866	283·0					306
	12960	·807	238·1	326·6	−20·5	46	212	413 c
	12963	·512	279·3	310·5	+10·7	7	21	
	12967	·310	309·2	294·3	+17·9	20	58	
	12968	·170	13·8	277·3	+16·3	11	29	
	12964	·096	39·8	276·1	+11·1	9	46	
	12966	·304	102·0	262·5	+ 3·0	21	105	
	12971	·973	114·0	207·3	−21·3	9	28	308 n
		·785	60·8					177
		·815	81·7					304
		·886	63·6					260
		·906	111·7					258
		·929	99·0					445
		·978	77·3					219
Aug. 20			(+ 17·6)	(279·7)	(+ 6·9)	(123)	(499)	(3558)
1938								
232·369 C		·930	282·2					215
		·905	293·0					261
	12960	·908	243·0	326·2	−20·9	32	162	339 c
	12967	·499	294·6	294·8	+18·0	17	42	
	12970	·365	306·0	284·5	+18·9	5	24	
	12964	·182	294·4	276·1	+11·1	11	68	
	12966	·097	136·2	262·6	+ 2·9	18	112	
	1136d	·686	57·0	226·2	+27·3	5	15	
	12971	·910	117·8	206·6	−21·7	5	21	1002 c
	12972	·927	83·0	197·9	+ 9·1	5	17	488 sf
		·794	63·1					217
		·800	104·0					193
		·817	117·6					323
		·883	99·3					387
		·924	77·7					328
		·944	57·0					338
Aug. 21			(+ 18·0)	(266·4)	(+ 6·9)	(98)	(461)	(4091)
233·395 C		·964	295·0					142
		·951	279·1					184
		·878	287·3					188
		·845	277·9					180
	12960	·977	246·3	326·2	−21·2	30	159	291 c
	12967	·682	289·5	295·2	+18·3	15	42	
	12970	·535	294·3	283·6	+18·7	5	16	
	12964	·415	281·1	277·2	+11·0	16	63	
	12966	·185	246·7	262·6	+ 2·8	19	104	
	12972	·817	83·4	197·7	+ 9·4	3	17	372 f
	1136e	·914	124·3	194·7	−27·4	5	11	819 c
	12973	·963	84·7	178·0	+ 6·9	7	16	301 f
Aug. 22			(+ 18·3)	(252·8)	(+ 7·0)	(100)	(428)	(2477)
234·342 G		·942	290·8					268
		·927	280·3					271
		·878	254·8					142
		·851	273·8					286
	1136f	·923	259·8	306·2	− 6·6	6	14	141 c
	12967	·816	287·3	295·1	+18·1	9	23	239 c
	12964	·592	277·7	276·7	+10·1	29	102	
	12966	·386	259·3	262·5	+ 2·4	19	116	
	12974	·350	325·6	252·7	+23·5	1	3	
	12969	·536	193·7	248·3	−24·3	14	57	
	12975	·416	168·8	235·5	−17·0	43	123	
	1136g	·489	137·6	220·5	−14·5	3	10	
	12971	·688	129·2	205·9	−19·9	3	10	
	12972	·675	83·6	197·6	+ 9·4	6	12	
	12973	·881	85·8	178·3	+ 7·0	7	19	490 nf

Group 12969. Aug.19–27. A wide pair of small spots on Aug.19: a small stream on Aug.23: one or two spots afterwards.
Group 12970. Aug.19–22. A few small ephemeral spots.
Group 12971. Aug.20–27. Return of Group 12933: 3rd appearance. One or two spots, small but distinctive on Aug.25–27.
Group 12972. Aug.21–27. Return of Group 12947. A small spot, replaced on Aug.26 by another following the original position.
Group 12973. Aug.22–26. A small distinct spot.
Group 12974. Aug.23–26. A small spot seen only on Aug.23 and 26.
Group 12975. Aug.23–29. A stream of sudden growth. The follower is the first important component to form; the leader, represented by a cluster, develops a few days later.

POSITIONS AND AREAS OF SUN SPOTS AND FACULÆ FOR EACH DAY IN THE YEAR.

U.T.	Group No.	Measures Dist.	Measures Pos. Angle	Position Long.	Position Lat.	Area Umbræ	Area Whole Spots	Area Faculæ
			°	°	°			
1938								
		·877	128·6					394
Aug. 23			(+ 18·6)	(240·3)	(+ 7·0)	(140)	(489)	(2231)
235·342		·987	262·8					173
G		·978	286·6					214
		·932	277·1					511
		·915	257·0					337
	12967	·942	286·5	298·4	+17·8	3	7	288 *f*
	12964	·776	276·5	278·3	+ 9·4	18	97	140 *p*
	12966	·585	264·1	262·6	+ 2·3	20	91	
	12969	·593	211·5	247·8	−23·7	3	13	
	12975	·432	198·1	235·1	−17·2	51	273	
	12971	·569	142·5	205·6	−19·6	3	9	
	12972	·490	82·5	197·7	+ 9·7	5	9	
	12973	·728	87·1	180·2	+ 6·9	5	13	
		·944	69·8					326
		·961	83·0					283
Aug. 24			(+ 18·9)	(227·1)	(+ 7·0)	(108)	(512)	(2272)
236·340		·976	280·9					164
G		·972	259·1					249
		·908	290·3					409
		·850	243·8					296
	12967	·983	287·0	294·7	+17·9	32	98	287 *c*
	12964	·905	277·6	279·3	+ 9·9	16	72	462 *f*
	12966	·752	267·0	262·4	+ 2·5	14	66	
	12969	·708	226·4	247·7	−23·3	4	8	
	12975	·536	222·0	235·8	−16·8	77	307	
	12971	·481	166·0	206·8	−20·7	9	28	
	12972	·282	79·0	197·7	+ 9·9	5	7	
	12976	·323	59·2	197·2	+16·3	3	5	
	12973	·564	87·9	179·5	+ 7·0	3	8	
	12977	·728	79·4	167·0	+12·5	15	44	
	12978	·963	63·3	138·1	+27·6	19	42	194 *c*
		·846	73·6					217
		·888	84·4					275
		·941	73·8					200
		·961	103·1					343
Aug. 25			(+ 19·2)	(213·9)	(+ 7·1)	(197)	(685)	(3096)
237·457		·962	285·5					266
G		·936	248·7					319
		·925	294·3					311
		·878	239·3					356
	12964	·983	278·4	279·2	+ 9·5	13	24	430 *f*
	12966	·894	269·2	262·3	+ 2·5	8	20	275 *c*
	12974	·796	296·3	250·9	+25·1	2	4	
	12975	·694	236·7	236·2	−16·7	71	305	
	1136h	·452	311·7	220·7	+24·0	3	5	
1938								
	12971	·483	197·6	208·0	−20·3	6	18	
	12976	·182	12·1	196·8	+17·3	3	5	
	12972	·138	89·7	191·1	+ 7·1	3	6	
	12973	·327	88·1	179·9	+ 7·4	3	7	
	1136i	·418	77·9	174·6	+11·5	3	8	
	12977	·544	77·7	165·7	+12·7	38	118	
	1136j	·866	107·2	141·9	−11·1	5	7 }	356 *c*
	12979	·915	110·1	136·4	−15·1	24	63 }	
	12978	·899	62·7	135·0	+27·6	32	86	242 *c*
		·971	110·4					234
		·973	68·3					155
		·978	117·4					96
Aug. 26			(+ 19·5)	(199·1)	(+ 7·1)	(214)	(676)	(3040)
238·482		·981	250·6					126
G		·942	259·0					275
		·934	286·1					157
		·915	271·8					533
		·898	295·2					263
	12969	·940	240·6	249·5	−24·5	3	7	452 *n*
	12975	·845	244·0	238·2	−17·5	49	303	369 *c*
	1136k	·651	229·4	217·0	−19·0	3	7	
	12971	·578	218·4	208·0	−20·3	5	10	
	12972	·213	284·4	197·6	+10·0	1	5	
	12977	·335	73·0	166·5	+12·4	25	87	
	12979	·802	114·9	136·9	−15·1	7	27	275 *c*
	12978	·799	60·7	134·0	+27·5	24	96	131 *c*
	12980	·994	77·4	100·6	+13·2	65	239	497 *c*
		·906	65·1					315
		·927	120·9					157
		·944	95·3					308
		·958	108·4					803
Aug. 27			(+ 19·8)	(185·6)	(+ 7·1)	(182)	(781)	(4661)
239·381	12975	·938	248·5	239·6	−17·3	27	249	278 *c*
C	12971	·691	230·1	208·0	−20·4	5	12	
	11361	·398	188·2	177·1	−16·0	2	8	
	12977	·151	49·5	167·0	+12·7	19	93	
	1136m	·518	88·5	142·4	+ 6·8	4	13	
	12978	·691	56·7	133·1	+27·7	18	120	
	12980	·962	77·4	98·6	+14·0	73	376	471 *c*
		·864	61·1					132
		·936	111·5					465
Aug. 28			(+ 20·0)	(173·7)	(+ 7·1)	(148)	(871)	(1346)
240·105	12975	·978	250·5	239·0	−17·3	52	223	333 *c*
K	12977	·106	335·7	166·8	+12·6	20	83	
	12978	·580	51·3	133·7	+27·3	24	117	
	12981	·700	118·8	125·1	−14·2	9	34	

Group 12976. Aug.25–26. A very small spot.
Group 12977. Aug.25–30. A small stream.
Group 12978. Aug.25–31. A small stream of which the following part is the last to die out.
Group 12979. Aug.26–Sept.4. A pair of spots on Aug.26–27: a small single spot on Sept. 2 and 4.
Group 12980. Aug.27–Sept.7. A long irregular stream; the largest and most persistent individual spot follows.
Group 12981. Aug.29–Sept.6. A small variable stream.

POSITIONS AND AREAS OF SUN SPOTS AND FACULÆ FOR EACH DAY IN THE YEAR.

U.T.	Group No.	Measures Dist.	Measures Pos. Angle	Position Long.	Position Lat.	Area Umbræ	Area Whole Spots	Area Faculæ
			°	°	°			
1938								
	12980	·911	78·3	97·8	+13·5	135	618	665 *c*
	12982	·971	97·1	89·1	− 5·1	8	27	212 *p*
	12983	·979	105·7	88·4	−13·7	65	206	200 *c*
	12984	·984	73·8	83·0	+17·2	5	27	559 *c*
		·836	104·1					382
		·941	116·9					705
Aug. 29			(+ 20·2)	(164·2)	(+ 7·1)	(318)	(1335)	(3056)
241·341 G		·960	249·2					461
		·959	294·4					207
		·954	276·6					179
		·899	260·2					356
		·899	242·3					227
		·817	227·7					392
	1136n	·898	291·2	212·3	+22·2	2	6	163 *c*
	12977	·336	287·4	166·9	+12·5	8	39	
	1136o	·237	303·6	159·5	+14·6	3	8	
	12978	·444	34·6	131·2	+28·2	18	69	
	12981	·506	134·6	126·1	−14·1	9	14	
	12985	·742	125·9	108·1	−20·2	10	41	
	12980	·783	78·5	95·9	+13·4	117	544	322 *f*
	12982	·865	100·2	89·3	− 5·1	7	14	126 *f*
	12983	·886	109·6	88·8	−13·6	44	215	310 *c*
	12984	·909	74·0	81·7	+17·5	11	38	654 *s*
	12986	·989	78·6	65·3	+12·3	7	16	151 *c*
		·837	122·8					467
		·941	123·8					466
Aug. 30			(+ 20·6)	(147·8)	(+ 7·2)	(236)	(1004)	(4481)
242·415 C		·958	294·3					258
		·955	260·1					299
		·951	247·0					334
		·899	233·7					716
		·876	284·5					374
		·836	274·1					340
	12978	·362	7·3	130·6	+28·2	12	40	
	12981	·399	157·3	124·5	−14·4	10	36	
	1136p	·663	127·7	100·3	−17·9	5	38	
	12980	·597	77·3	97·0	+13·4	93	514	
	12983	·752	116·0	89·6	−14·1	75	344	
	12982	·718	104·3	89·5	− 5·0	5	13	
	12984	·787	73·1	81·6	+17·7	3	15	428 *s*
	12986	·932	79·7	64·1	+12·2	15	69	377 *c*
		·829	127·3					323
		·041	118·2					347
		·961	102·5					343
		·971	109·7					217
Aug. 31			(+ 20·9)	(133·6)	(+ 7·2)	(218)	(1069)	(4356)

U.T.	Group No.	Measures Dist.	Measures Pos. Angle	Position Long.	Position Lat.	Area Umbræ	Area Whole Spots	Area Faculæ
			°	°	°			
1938								
243·388 G		·964	285·7					261
		·962	238·7					706
		·939	275·9					377
		·927	298·5					165
	12987	·398	338·1	130·5	+28·7	8	15	
	12981	·396	193·7	126·4	−15·4	5	15	
	12985	·496	157·9	109·4	−20·2	5	20	
	12988	·300	57·3	105·6	+16·3	1	4	
	12980	·419	73·4	96·5	+13·4	81	359	
	12983	·610	124·2	89·6	−13·8	57	325	
	12982	·555	110·6	89·5	− 5·1	3	11	
	12984	·622	69·7	83·1	+18·1	1	3	
	12986	·818	80·3	65·5	+12·0	72	297	225 *f*
	12989	·980	110·5	45·8	−18·3	34	192	419 *c*
	12990	·978	104·5	45·2	−12·5	12	63	417 *p*
		·903	110·6					162
		·949	73·4					294
		·955	94·9					227
		·963	117·9					134
Sept. 1			(+ 21·1)	(120·8)	(+ 7·2)	(279)	(1304)	(3387)
244·344 G		·980	238·1					180
		·978	267·9					106
		·970	277·0					299
		·966	299·0					180
		·894	278·1					297
		·815	280·9					224
	12979	·593	235·1	138·1	−13·5	1	3	
	12987	·499	318·5	130·2	+28·6	3	10	
	12981	·458	219·8	125·7	−13·7	12	45	
	12985	·452	179·4	107·9	−19·6	8	30	
	12988	·160	14·7	105·8	+16·1	3	5	
	12980	·233	63·7	95·9	+12·9	92	460	
	12983	·467	138·7	89·8	−13·7	62	281	
	12984	·455	64·5	82·8	+17·8	3	18	
	12986	·688	80·5	64·5	+11·7	135	704	
	12991	·849	75·5	49·6	+16·1	2	5	250 *c*
	12989	·919	113·5	45·8	−18·2	43	200	623 *sf*
	12990	·910	107·5	45·6	−12·7	11	30	625 *f*
	12992	·994	79·7	23·6	+11·0	22	180	345 *c*
		·788	115·9					258
		·853	108·9					409
		·893	95·9					244
		·919	123·9					300
		·928	62·3					242
		·950	88·8					223
		·972	68·7					437
Sept. 2			(+ 21·3)	(108·2)	(+ 7·2)	(397)	(1971)	(5242)

Group 12982. Aug.29–Sept. 1. Return of Group 12943. A small regular spot dying out.
Group 12983. Aug.29–Sept. 9. Return of Group 12942: 3rd appearance. A stable regular spot; a companion also of regular structure, suddenly appears in front between Aug.30 and 31.
Group 12984. Aug.29–Sept. 4. A few small spots in the wake of Group 12980.
Group 12985. Aug.30–Sept. 3. A very small group not seen on Aug.31.
Group 12986.. Aug.30–Sept.11. A large stream of normal type seen from its initial development near the east limb.
Group 12987. Sept.1–2. A small short-lived spot.
Group 12988. Sept.1–2. A tiny outlying spot to Group 12980.
Group 12989. Sept.1–13. With Group 12990 a return of Group 12950: 3rd appearance. A stable regular spot with one or two small companions on Sept.4–7 and on Sept.10.
Group 12990. Sept.1–3. A small spot.
Group 12991. Sept.2–3. One or two small spots *nf* Group 12986.
Group 12992. Sept.2–13. A regular spot disappearing rather quickly as it approaches the west limb.

POSITIONS AND AREAS OF SUN SPOTS AND FACULÆ FOR EACH DAY IN THE YEAR.

U.T.	Group No.	Measures Dist.	Measures Pos. Angle	Position Long.	Position Lat.	Area Umbræ	Area Whole Spots	Area Faculæ
			°	°	°			
1938								
245·340		·963	242·6					209
G		·955	279·4					445
		·860	281·2					341
	12981	·599	238·8	126·4	-11·9	6	22	
	12993	·259	289·1	109·4	+11·8	3	7	
	1136q	·403	212·5	107·8	-12·8	3	9	
	12985	·502	203·6	107·3	-20·2	3	13	
	12980	·113	355·1	95·6	+13·7	64	299	
	12983	·368	165·2	89·5	-13·6	53	260	
	12986	·498	78·9	65·2	+11·8	157	812	
	12991	·708	75·8	49·9	+15·1	6	19	
	12990	·799	112·6	45·9	-13·2	7	17	274 *f*
	12989	·821	118·4	45·7	-18·3	39	182	976 *sf*
	12992	·939	80·8	24·4	+11·1	29	157	567 *f*
		·834	62·4					103
		·857	91·4					305
		·901	68·6					479
		·952	112·0					219
Sept. 3			(+ 21·6)	(95·0)	(+ 7·2)	(370)	(1797)	(3918)
246·399		·930	281·5					490
G		·839	291·3					465
	12979	·861	246·5	136·0	-16·0	5	18	275 *c*
	12981	·755	245·7	125·7	-12·9	52	147	
	12993	·474	280·9	109·2	+11·5	9	35	
	12994	·560	207·1	97·0	-22·9	3	7	
	12980	·287	292·7	96·7	+13·2	33	225	
	12983	·380	201·3	89·1	-13·5	54	297	
	12984	·225	346·7	84·1	+19·8	3	5	
	12986	·284	72·7	65·0	+11·7	124	844	
	12989	·715	126·9	43·8	-19·7	46	251	620 *f*
	12992	·828	81·9	24·7	+10·7	30	137	590 *f*
		·814	65·1					211
		·886	114·5					425
		·902	58·1					131
		·914	70·2					152
		·990	71·9					93
Sept. 4			(+ 21·9)	(81·0)	(+ 7·2)	(359)	(1966)	(3452)
247·402		·960	253·0					312
G		·958	283·9					234
		·938	294·2					325
		·902	241·7					204
		·880	300·4					160
	12981	·882	251·2	126·5	-12·8	52	231	378 *c*
	12993	·671	278·7	110·1	+11·1	15	64	
	1136r	·590	291·3	103·0	+18·2	3	6	
	12994	·663	221·7	96·4	-23·3	1	3	
	12980	·478	284·9	96·0	+13·4	34	158	
	12983	·498	225·9	89·3	-13·5	58	279	
	1136s	·594	214·5	89·1	-22·5	1	4	
	12986	·082	21·1	66·1	+11·6	186	937	
	1136t	·482	183·9	65·8	-21·4	1	3	
	1136u	·449	165·3	60·9	-18·5	1	3	

U.T.	Group No.	Measures Dist.	Measures Pos. Angle	Position Long.	Position Lat.	Area Umbræ	Area Whole Spots	Area Faculæ
			°	°	°			
1938								
	12989	·570	139·5	44·9	-19·0	56	219	
	12992	·677	81·9	25·0	+10·8	31	136	
	12995	·943	73·0	356·2	+18·4	7	13	164 *c*
		·781	130·1					290
		·853	69·3					112
		·884	130·7					260
		·947	115·9					350
Sept. 5			(+ 22·1)	(67·8)	(+ 7·2)	(446)	(2056)	(2789)
248·453		·967	299·5					361
C		·895	262·5					346
		·886	247·1					1000
		·860	232·4					608
	12981	·977	252·9	128·9	-15·0	21	161	818 *np*
	12993	·833	279·1	110·8	+11·5	12	50	303 *c*
	12980	·715	280·6	99·8	+12·6	24	123	
	12983	·664	239·5	89·9	-13·8	61	296	
	12986	·232	289·1	66·8	+11·4	218	1342	
	12989	·467	161·5	44·9	-19·1	49	214	
	12992	·489	81·1	24·6	+10·6	30	144	
	12995	·854	72·0	354·9	+19·1	4	9	250 *f*
		·826	136·8					242
		·850	122·2					424
		·965	121·3					530
Sept. 6			(+ 22·3)	(53·9)	(+ 7·2)	(419)	(2339)	(4882)
249·433		·965	295·8					149
G		·958	250·7					605
		·953	261·7					204
		·939	242·7					360
		·899	299·5					257
		·882	275·4					167
		·858	236·5					364
	12993	·933	279·6	110·6	+11·5	7	19 }	303 *c*
	12980	·896	280·4	105·2	+12·5	16	92 }	
	12983	·788	246·5	88·8	-13·5	50	292	
	12986	·422	280·9	65·9	+11·1	188	1167	
	12989	·439	188·3	44·8	-18·4	36	186	
	12992	·277	76·7	25·2	+10·5	26	139	
		·898	125·5					321
		·904	75·9					311
		·929	65·1					177
Sept. 7			(+ 22·5)	(41·0)	(+ 7·2)	(323)	(1895)	(3218)
250·360		·965	249·7					455
C		·960	281·8					1000
		·929	237·2					536
		·867	262·2					198
		·859	281·2					559
	12983	·892	250·8	88·5	-13·5	46	240	483 *c*
	12986	·611	278·6	66·5	+10·9	189	1319	
	12989	·499	211·2	44·4	-18·2	38	176	

Group 12993. Sept. 3- 7. A small group preceding Group 12980.
Group 12994. Sept. 4- 5. A small short-lived spot.
Group 12995. Sept. 5-10. A small spot on Sept.5 and 6; a cluster on Sept.10.

POSITIONS AND AREAS OF SUN SPOTS AND FACULÆ FOR EACH DAY IN THE YEAR.

U.T.	Group No.	Measures Dist.	Measures Pos. Angle	Position Long.	Position Lat.	Area Umbræ	Area Whole Spots	Area Faculæ
			°	°	°			
1938								
	12992	·085	45·4	25·2	+10·6	18	128	
	12996	·954	80·4	315·4	+11·3	26	87	409 c
		·924	113·6					279
		·955	71·8					505
		·963	96·2					315
Sept. 8			(+ 22·8)	(28·7)	(+ 7·2)	(317)	(1950)	(4739)
251·339 G		·958	237·4					175
		·950	276·4					258
		·935	261·7					236
		·916	288·6					642
		·860	236·4					282
	12983	·964	253·7	87·7	−13·5	50	198	639 sf
	12986	·779	278·0	67·3	+10·7	182	1014	344 p
	12989	·617	227·5	44·3	−18·2	42	200	
	12992	·173	292·0	25·2	+10·8	23	128	
	12996	·870	81·4	314·8	+11·0	24	129	378 c
		·875	119·6					117
		·886	72·8					554
		·931	101·5					423
		·961	85·6					202
		·973	72·0					315
Sept. 9			(+ 23·0)	(15·8)	(+ 7·2)	(321)	(1669)	(4565)
252·345 G		·973	289·6					520
		·944	237·5					332
		·932	256·3					215
		·825	249·6					458
	12986	·906	278·2	68·0	+10·5	134	848	883 c
	12989	·740	237·0	43·2	−18·3	57	250	
	12992	·386	280·2	25·1	+10·5	24	107	
	12995	·229	11·2	359·8	+20·1	4	21	
	12996	·736	81·7	314·8	+11·0	19	79	162 c
	12997	·741	72·8	314·8	+17·5	6	24	311 f
	12998	·993	80·0	278·4	+10·7	20	37	391 p
		·803	105·2					266
		·892	82·6					204
		·915	98·0					347
		·937	69·8					605
Sept. 10			(+ 23·2)	(2·5)	(+ 7·2)	(264)	(1366)	(4694)
253·487 G		·943	250·4					435
		·889	259·1					298
		·872	288·2					148
	12986	·971	278·4	64·2	+ 9·9	43	270	847 c
	12989	·876	244·6	43·5	−18·1	46	191	712 c
	12992	·612	277·6	25·3	+10·3	20	97	
	12997	·530	68·6	316·4	+17·3	4	6	
	12996	·567	80·4	312·8	+11·3	18	76	
1938								
	12998	·930	81·6	278·4	+10·5	19	73	517 c
	12999	·949	84·2	275·3	+ 7·8	8	28	
		·862	80·0					355
		·943	68·0					369
Sept.11			(+ 23·4)	(347·4)	(+ 7·2)	(158)	(741)	(3681)
254·412 G		·989	277·6					223
		·958	285·2					397
		·949	260·6					597
		·882	271·8					332
		·812	292·6					326
	12989	·951	247·9	43·2	−18·4	26	173	1067 c
	12992	·761	277·4	25·1	+10·3	18	62	
	12997	·357	59·4	316·5	+17·3	3	5	
	12996	·376	78·2	313·3	+11·1	22	67	
	12998	·832	82·0	278·4	+10·7	14	61	571 c
	12999	·841	85·5	277·7	+ 7·7	10	50	
		·866	70·4					358
		·929	111·8					188
		·932	62·8					154
		·969	81·2					143
Sept.12			(+ 23·6)	(335·2)	(+ 7·2)	(93)	(418)	(4356)
255·361 G		·959	272·2					315
		·934	227·7					297
		·917	239·2					443
		·876	292·8					454
	12989	·994	250·5	43·4	−18·4	40	316	1021 f
	12992	·883	277·8	25·2	+10·3	10	43	336 c
	12996	·172	68·0	313·4	+10·8	14	106	
	12998	·692	82·4	278·7	+10·4	11	56	168 c
	12999	·701	86·8	278·0	+ 7·4	20	92	
		·833	59·8					179
		·903	82·9					455
		·903	104·0					291
		·938	61·4					285
		·986	110·2					251
Sept.13			(+ 23·8)	(322·7)	(+ 7·2)	(95)	(613)	(4495)
256·355 G		·966	247·3					194
		·943	295·1					462
		·928	280·1					601
	12996	·093	317·7	313·2	+11·1	12	66	
	12998	·506	81·9	279·1	+10·3	12	50	
	12999	·532	86·7	277·3	+ 7·8	30	144	
		·945	111·7					563
		·963	98·3					132
Sept.14			(+ 23·9)	(309·6)	(+ 7·2)	(54)	(260)	(1952)

Group 12996. Sept.8–17. A small stream.
Group 12997. Sept.10–12. One or two small spots.
Group 12998. Sept.10–18. Return of Group 12964. A small regular spot preserving its identity with respect to a new group, Group 12999, which develops first southwards. Complete continuity with Group 12964 in the previous rotation is somewhat doubtful.
Group 12999. Sept.11–22. A bi-polar group in which the leader shows a sudden increase on Sept.14 to 15 in taking its final form as a regular spot.

POSITIONS AND AREAS OF SUN SPOTS AND FACULÆ FOR EACH DAY IN THE YEAR.

U.T.	Group No.	Measures Dist.	Measures Pos. Angle	Position Long.	Position Lat.	Area Umbræ	Area Whole Spots	Area Faculæ
			°	°	°			
1938								
257·338		·920	239·7					319
G	12996	·278	289·7	312·1	+12·3	18	92	
	12998	·305	79·5	279·0	+10·0	7	55	
	12999	·310	87·5	278·5	+ 7·6	51	260	
	13000	·983	69·0	215·4	+21·9	56	370	443 *n*
		·877	117·5					610
		·950	105·9					518
Sept.15			(+ 24·1)	(296·6)	(+ 7·2)	(132)	(777)	(1890)
258·340		·975	274·0					139
G		·974	241·4					441
		·888	236·4					288
	13001	·769	286·7	333·6	+17·4	20	55	119 *c*
	12996	·479	282·9	311·7	+12·5	6	34	
	12998	·091	56·6	278·9	+10·0	8	35	
	12999	·085	86·7	278·4	+ 7·5	63	368	
	1137a	·466	40·9	263·3	+27·3	1	3	
	1137b	·526	68·5	252·6	+17·3	1	3	
	13000	·921	69·1	215·5	+22·0	76	413	749 *c*
		·822	104·3					271
		·846	123·7					399
		·897	63·5					177
		·912	114·1					424
		·937	100·6					351
		·985	73·5					203
Sept.16			(+ 24·3)	(283·3)	(+ 7·2)	(175)	(911)	(3561)
259·376		·971	284·5					148
G	13001	·893	286·1	333·6	+17·6	9	37	277 *c*
	12996	·657	283·8	310·8	+14·5	3	6	
	12998	·174	286·7	279·4	+ 9·9	7	35	
	12999	·166	271·1	279·3	+ 6·9	56	331	
	13002	·285	126·3	256·5	− 2·7	4	8	
	13003	·743	65·8	222·6	+22·6	3	13	
	13000	·799	68·1	216·9	+21·8	72	296	430 *nf*
		·814	121·3					271
		·841	107·1					245
		·925	73·7					205
		·964	117·1					200
		·965	81·4					263
Sept.17			(+ 24·5)	(269·7)	(+ 7·2)	(154)	(726)	(2039)
260·404		·970	285·8					255
C		·924	298·1					276
		·853	249·7					497
		·826	288·5					326
		·826	276·4					480
	13004	·741	282·7	304·1	+14·1	3	29	
1938								
	12999	·412	271·3	280·5	+ 7·0	59	347	
	12998	·392	278·3	279·2	+ 9·8	5	19	
	1137c	·234	78·1	242·7	+ 9·7	1	4	
	13003	·581	59·7	223·2	+23·0	2	12	
	13000	·642	65·2	217·6	+21·2	48	289	
		·901	81·5					535
		·926	119·6					571
Sept.18			(+ 24·6)	(256·1)	(+ 7·1)	(118)	(700)	(2940)
261·369		·947	256·8					271
G		·935	288·2					110
		·857	287·9					199
	1137d	·931	280·2	312·7	+12·1	11	31	542 *c*
	12999	·608	272·2	281·0	+ 6·9	65	322	
	13002	·287	231·4	256·3	− 3·4	2	5	
	13000	·480	57·8	217·7	+21·2	59	255	
	1137e	·921	66·8	175·6	+24·1	5	18	83 *c*
	13005	·973	116·6	171·7	−23·8	4	9	94 *c*
	13006	·993	100·8	161·8	− 9·8	90	513	466 *sp*
		·889	127·1					287
		·933	120·0					262
Sept.19			(+ 24·8)	(243·4)	(+ 7·1)	(236)	(1153)	(2314)
262·538		·990	280·9					216
G		·945	257·7					231
		·863	282·5					225
	13004	·955	283·5	301·6	+15·0	15	60	319 *nf*
	12999	·804	273·0	281·6	+ 6·7	56	287	144 *nf*
	1137f	·737	291·5	274·8	+20·5	1	3	
	13000	·297	32·3	218·1	+21·5	35	177	
	13005	·890	121·9	172·2	−24·1	2	8	177 *nf*
	13006	·933	103·5	161·1	− 9·8	108	710	914 *c*
		·812	129·5					306
		·946	75·1					109
Sept.20			(+ 24·9)	(227·9)	(+ 7·1)	(217)	(1245)	(2641)
263·364		·878	290·1					272
C	13004	·991	284·0	300·7	+14·8	32	126	158 *f*
	12999	·900	274·2	281·4	+ 6·8	50	299	557 *f*
	13000	·261	354·2	218·6	+22·1	34	158	
	1137g	·309	58·4	201·2	+16·1	2	14	
	13006	·848	106·3	161·5	− 9·8	99	748	694 *f*
	13007	·971	103·2	142·9	−11·0	53	277	590 *f*
		·830	126·2					233
		·836	73·2					222
		·965	68·6					348
Sept.21			(+ 25·0)	(217·0)	(+ 7·1)	(270)	(1622)	(3074)

Group 13000. Sept.15–27. A large regular spot with a pair of followers that have disappeared by Sept.19. Between Sept. 17 and 18, the regular spot divides into two parts which separate in longitude; the new leader alone remains on Sept.26.
Group 13001. Sept.16–17. A pair of spots.
Group 13002. Sept.17–19. A very small spot not seen on Sept.18.
Group 13003. Sept.17–18. A pair of small spots rather widely separated in latitude, preceding Group 13000.
Group 13004. Sept.18–21. A small spot.
Group 13005. Sept.19–20. A small spot.
Group 13006. Sept.19–Oct.1. A large spot with a piece detached on its following side and showing little or no tendency to drift away from the parent spot.
Group 13007. Sept.21–Oct.3. A large stable regular spot.

POSITIONS AND AREAS OF SUN SPOTS AND FACULÆ FOR EACH DAY IN THE YEAR.

U.T.	Group No.	Measures: Dist.	Measures: Pos. Angle	Position: Long.	Position: Lat.	Area: Umbræ	Area: Whole Spots	Area: Faculæ
			°	°	°			
1938								
264·344		·955	289·2					284
G		·865	270·4					139
	12999	·974	275·2	281·5	+ 6·7	43	254	749 *nf*
	1137h	·554	218·0	225·2	−19·3	2	8	
	13000	·364	316·5	219·7	+22·0	21	108	
	13008	·608	114·8	170·3	− 8·9	1	3	
	13006	·712	111·0	161·9	− 9·6	97	723	
	13007	·898	105·6	142·7	−10·7	51	321	276 *c*
	13009	·973	104·2	129·7	−12·0	176	1297	796 *c*
		·872	110·2					160
		·883	70·8					286
		·944	60·6					354
		·964	70·8					117
Sept. 22			(+ 25·2)	(204·1)	(+ 7·0)	(391)	(2714)	(3161)
265·334		·981	278·6					340
G		·968	293·7					286
		·921	263·1					271
		·905	275·5					313
		·884	307·7					202
		·853	238·7					503
	13000	·523	302·2	219·5	+22·3	18	86	
	13008	·452	130·1	170·5	−10·3	2	8	
	13006	·556	119·5	161·7	− 9·8	101	618	
	13007	·790	109·7	142·0	−10·9	58	411	230 *c*
	13009	·898	107·1	129·9	−12·0	223	1432	737 *c*
	13010	·936	60·6	121·1	+29·9	9	18	158 *c*
		·845	60·7					188
		·956	97·9					151
		·968	78·1					419
		·969	117·5					215
		·980	107·9					541
Sept. 23			(+ 25·3)	(191·0)	(+ 7·0)	(411)	(2573)	(4554)
266·357		·962	273·7					162
G		·961	285·3					198
		·918	243·8					388
	13000	·691	295·4	219·8	+22·4	16	82	
	13006	·383	135·9	161·9	− 9·1	96	685	
	13007	·640	116·4	141·9	−10·8	94	386	
	13009	·781	111·2	129·6	−11·8	176	1129	328 *c*
	13011	·962	79·8	102·5	+11·7	32	137 }	636 *c*
	13012	·968	77·4	101·1	+13·9	8	18 }	
		·882	77·8					420
		·929	113·2					574
		·963	88·2					124
Sept. 24			(+ 25·4)	(177·5)	(+ 7·0)	(422)	(2437)	(2830)
1938								
267·173	13000	·799	292·5	219·3	+22·1	12	95	
K	13006	·296	165·5	162·4	− 9·6	62	546	
	13007	·514	125·6	141·6	−11·0	93	416	
	13009	·656	116·5	130·1	−11·4	128	1046	
	13010	·740	55·3	122·3	+30·0	17	67	
	13011	·898	80·3	102·2	+11·8	19	113 }	134 *c*
	13012	·901	78·0	101·8	+13·8	5	11 }	
		·964	68·6					78
Sept. 25			(+ 25·5)	(166·7)	(+ 7·0)	(336)	(2294)	(212)
268·485		·968	250·8					316
G		·941	263·3					261
	13000	·930	291·0	218·6	+22·0	18	78	340 *f*
	13006	·361	219·0	162·7	− 9·5	85	460	
	13013	·242	296·0	162·2	+12·8	23	147	
	13007	·341	155·0	141·0	−11·1	87	380	
	13014	·247	43·6	139·2	+17·0	60	248	
	13009	·447	134·3	130·4	−11·6	188	846	
	13010	·555	43·6	123·3	+29·8	11	27	
	13011	·726	80·6	102·6	+11·5	21	103	
	13012	·753	76·7	100·4	+14·5	10	46	
	13015	·903	107·0	87·6	−12·1	10	31	393 *sf*
	1137i	·909	79·3	83·4	+12·6	5	15	625 *c*
	13016	·982	78·0	69·4	+13·0	0	23	591 *c*
		·854	76·8					127
		·942	121·2					369
Sept. 26			(+ 25·6)	(149·4)	(+ 6·9)	(518)	(2404)	(3022)
269·346		·902	298·7					218
G	13000	·980	291·1	218·1	+22·0	22	76	483 *f*
	13006	·494	236·1	162·6	− 9·6	71	457	
	13013	·419	286·1	162·4	+12·9	20	91	
	13007	·311	189·1	141·0	−10·9	78	377	
	13014	·177	353·9	139·2	+17·0	68	301	
	13009	·344	158·1	130·6	−11·7	133	747	
	13010	·452	29·7	123·2	+29·7	6	27	
	13011	·574	79·5	103·1	+11·7	19	87	
	13012	·615	74·7	100·4	+14·8	19	77	
	1137j	·783	53·5	90·1	+32·4	3	14	
	13015	·806	110·5	87·8	−12·0	8	38	322 *f*
	13016	·923	79·3	70·1	+12·5	5	10	1006 *c*
	13017	·967	99·5	64·3	− 7·3	17	77	398 *f*
		·850	78·8					506
		·878	125·9					314
		·920	65·9					282
		·957	106·9					153
		·968	114·9					241
Sept. 27			(+ 25·7)	(138·1)	(+ 6·9)	(469)	(2379)	(3923)

Group 13008. Sept.22–23. A small spot in front of Group 13006.
Group 13009. Sept.22–Oct.3. Return of Group 12981. A compact stream that diminishes rather rapidly, leaving the leader (a regular spot) on Oct. 2 and 3.
Group 13010. Sept.23–28. A small unstable group, not seen on Sept.24.
Group 13011. Sept.24–Oct.1. A diminishing regular spot. Group 13012 forms closely north of it.
Group 13012. Sept.24–Oct.4. A small stream long-lived for its size.
Group 13013. Sept.26–30. A small composite spot dividing into two and rapidly dying out.
Group 13014. Sept.26–Oct.3. A stream led by a regular spot.
Group 13015. Sept.26–Oct.1. Return of Group 12983: 4th appearance. A small regular spot.
Group 13016. Sept.26–Oct.7. Return of Group 12986. A small spot that disappears after the second day: a small stream of variable spots then appears on Sept.30.
Group 13017. Sept.27–Oct.2. A diminishing regular spot with occasional companions.

POSITIONS AND AREAS OF SUN SPOTS AND FACULÆ FOR EACH DAY IN THE YEAR.

U.T.	Group No.	Measures: Dist.	Measures: Pos. Angle	Position: Long.	Position: Lat.	Area: Umbræ	Area: Whole Spots	Area: Faculæ
			°	°	°			
1938								
270·350		·971	289·8					299
G		·912	236·0					590
		·872	222·8					222
	13006	·659	247·0	162·6	− 9·6	82	577	
	13013	·614	282·6	162·6	+13·1	8	25	
	13007	·402	221·0	140·3	−11·0	79	384	
	13014	·295	308·1	138·8	+17·0	85	379	
	13009	·338	197·4	130·7	−11·9	91	521	
	13010	·402	9·6	120·4	+30·1	5	21	
	13012	·376	68·2	103·8	+14·4	18	60	
	13011	·376	76·0	103·0	+11·5	15	55	
	13015	·674	116·8	86·9	−12·3	9	17	
	13017	·874	102·5	65·7	− 7·4	11	59	484 *f*
		·865	79·0					742
		·896	110·5					338
Sept. 28			(+ 25·8)	(124·8)	(+ 6·8)	(403)	(2098)	(2675)
271·397		·951	241·5					502
G	13013	·842	283·5	168·7	+15·0	8	18	135 *c*
	13006	·813	253·2	164·1	− 9·4	78	502	591 *c*
	13007	·566	238·7	140·4	−11·1	87	448	
	13014	·488	293·6	138·8	+17·3	52	306	
	13009	·469	228·1	131·8	−11·8	58	340	
	1137k	·422	163·7	103·9	−17·0	1	4	
	13011	·161	54·6	103·3	+12·1	5	20	
	13012	·184	46·8	103·1	+13·9	16	74	
	11371	·532	137·0	88·8	−16·6	2	5	
	13015	·506	128·9	87·3	−12·2	6	17	
	13017	·735	106·9	66·0	− 7·5	9	53	
	13018	·934	71·1	41·1	+20·1	6	25	245 *f*
	13019	·964	108·7	39·6	−15·9	24	111	274 *c*
		·859	113·1					207
		·874	100·7					339
		·922	85·7					387
		·951	117·6					251
Sept. 29			(+ 25·9)	(111·0)	(+ 6·8)	(352)	(1923)	(2931)
272·340	13013	·934	283·5	168·4	+15·0	15	38	286 *f*
G	13006	·924	256·6	164·1	− 9·6	86	543	945 *c*
	13007	·713	246·9	140·4	−11·2	60	413	
	13014	·665	288·7	139·7	+17·3	43	232	
	13009	·635	241·7	133·3	−12·0	47	204	
	13012	·160	330·5	103·2	+14·7	22	136	
	13011	·128	324·0	103·0	+12·6	2	6	
	13015	·379	148·4	86·9	−12·2	4	7	
	13020	·326	68·2	80·6	+13·3	2	10	
	13016	·434	73·4	73·4	+13·2	10	27	
	13017	·587	113·9	65·9	− 8·0	7	33	
	13018	·843	70·2	41·1	+20·2	16	75	245 *f*
	13019	·891	111·8	39·4	−16·0	20	78	355 *f*
		·925	122·2					355
		·962	77·6					234
		·966	68·6					205
Sept. 30			(+ 26·0)	(98·6)	(+ 6·7)	(334)	(1802)	(2625)
1938								
273·417		·957	282·0					427
G	13006	·986	258·8	163·1	− 9·8	04	438	802 *f*
	13014	·844	285·9	142·3	+17·0	25	146	339 *c*
	13007	·855	252·4	140·4	−11·2	78	374	438 *p*
	13009	·801	248·9	134·2	−12·5	31	148	
	13012	·339	294·3	102·9	+14·4	26	114	
	13011	·314	283·4	102·4	+10·5	2	21	
	13015	·330	188·3	87·2	−12·3	4	10	
	13020	·141	28·5	80·4	+13·8	2	16	
	13016	·208	55·3	74·3	+13·4	16	46	
	13017	·380	128·6	67·1	− 7·2	5	10	
	13018	·699	67·6	41·0	+20·4	46	177	
	13019	·771	117·3	39·1	−16·0	17	98	150 *f*
	1137m	·886	77·7	21·5	+14·0	4	10	226 *p*
		·819	128·2					234
		·942	121·1					428
		·945	64·9					220
		·969	79·4					366
Oct. 1			(+ 26·1)	(84·4)	(+ 6·7)	(320)	(1608)	(3630)
274·455		·917	294·9					193
C		·819	303·2					184
		·800	239·9					457
	13014	·950	285·3	143·3	+16·6	28	127	465 *f*
	13007	·952	256·1	140·8	−11·0	77	411	1155 *c*
	13009	·938	253·9	137·9	−12·6	31	152	
	13012	·543	285·9	103·1	+14·1	17	77	
	13016	·142	329·2	75·0	+13·6	8	49	
	13017	·252	166·3	67·3	− 7·5	9	34	
	13018	·541	62·5	40·1	+20·1	49	217	
	13019	·630	126·1	38·8	−16·1	11	54	
		·918	83·5					724
		·923	114·7					245
		·952	72·7					348
Oct. 2			(+ 26·1)	(70·7)	(+ 6·6)	(230)	(1121)	(3771)
275·377		·927	300·0					330
G		·860	240·6					753
		·837	283·6					284
	13014	·994	286·0	143·6	+16·6	31	158	450 *f*
	13007	·993	258·0	140·0	−11·0	53	326	972 *f*
	13009	·988	255·8	137·5	−12·9	28	126	
	13012	·737	282·8	106·1	+13·9	8	36	
	1137n	·719	285·2	104·4	+15·5	4	19	
	13016	·322	293·6	76·1	+13·7	11	66	
	1137o	·311	176·8	57·5	−11·4	2	7	
	13018	·389	52·2	39·5	+20·0	41	214	
	13019	·503	139·4	38·7	−16·1	13	75	
		·878	84·8					343
		·884	73·4					260
		·934	118·6					293
Oct. 3			(+ 26·2)	(58·5)	(+ 6·6)	(191)	(1027)	(3685)

Group 13018. Sept. 29–Oct. 10. A typical bi-polar group, the leader out-living the follower as is usual.
Group 13019. Sept. 29–Oct. 8. Return of Groups 12989 and 90: 4th appearance. A slowly diminishing regular spot.
Group 13020. Sept. 30–Oct. 1. One or two small spots in front of Group 13016.

POSITIONS AND AREAS OF SUN SPOTS AND FACULÆ FOR EACH DAY IN THE YEAR.

U.T.	Group No.	Measures: Dist.	Measures: Pos. Angle	Position: Long.	Position: Lat.	Area: Umbræ	Area: Whole Spots	Area: Faculæ
			°	°	°			
1938								
276·378		·987	256·0					373
G		·956	291·2					158
		·948	301·2					339
		·932	245·3					1016
	1137p	·955	279·7	118·5	+11·0	7	22	389 *f*
	13012	·870	281·8	106·1	+13·4	7	27	671 *c*
	13016	·522	281·9	76·6	+11·8	16	59	
	13021	·521	231·2	69·8	−13·1	8	21	
	13018	·248	22·6	39·5	+19·6	28	165	
	13019	·401	163·4	38·5	−16·0	15	57	
	13022	·280	71·0	29·7	+11·5	17	56	
	13023	·904	86·6	340·5	+ 5·8	2	5	204 *c*
Oct. 4			(+ 26·2)	(45·3)	(+ 6·5)	(100)	(412)	(3150)
277·509		·952	281·5					1148
C		·849	242·7					504
		·844	281·4					663
	1137q	·930	242·6	93·5	−22·5	5	23	414 *p*
	13016	·715	279·3	76·2	+11·1	38	184	
	13021	·705	242·4	70·5	−15·0	3	10	
	13018	·282	327·3	39·7	+20·1	40	171	
	13019	·406	198·6	38·1	−16·1	9	57	
	13022	·091	7·5	29·7	+11·7	87	402	
	13023	·749	88·7	341·8	+ 5·3	7	26	
	13024	·989	74·7	307·8	+16·0	141	1784	344 *c*
		·920	82·1					354
Oct. 5			(+ 26·3)	(30·4)	(+ 6·5)	(330)	(2657)	(3427)
278·380		·967	284·3					602
G		·950	247·1					547
		·876	293·6					241
	13016	·832	279·9	75·5	+11·8	26	142	671 *c*
	13018	·414	306·3	39·6	+20·2	32	128	
	13019	·493	219·5	37·8	−15·7	10	46	
	13022	·205	297·5	29·6	+11·7	82	458	
	13023	·594	90·3	342·5	+ 5·0	2	12	
	13024	·946	74·5	307·0	+16·7	251	2441	1054 *c*
Oct. 6			(+ 26·3)	(18·9)	(+ 6·4)	(403)	(3227)	(3115)
279·122	13016	·919	279·8	76·4	+11·5	11	61	675 *c*
K	13018	·544	297·5	39·9	+20·1	22	118	
	13019	·583	229·5	36·5	−16·5	9	45	
	13022	·363	285·8	29·9	+11·7	117	491	
	13025	·214	81·7	356·8	+ 8·0	2	7	
	13024	·892	74·7	305·6	+16·5	451	2980	680 *c*
Oct. 7			(+ 26·4)	(9·1)	(+ 6·4)	(612)	(3702)	(1355)
1938								
280·400		·962	259·5					490
G		·958	248·6					337
		·943	283·4					628
	1138a	·892	248·2	51·6	−16·2	12	32	448 *c*
	13018	·752	291·2	40·3	+20·0	17	113	
	13026	·716	283·8	37·9	+14·2	16	59	
	13019	·767	242·2	37·0	−16·4	7	21	
	13022	·610	281·0	29·7	+11·7	34	281	
	13025	·085	290·6	356·8	+ 8·0	24	76	
	13024	·721	72·6	306·4	+16·9	371	2952	594 *f*
		·921	87·2					382
		·955	79·1					325
Oct. 8			(+ 26·4)	(352·2)	(+ 6·3)	(481)	(3534)	(3204)
281·399		·964	251·8					470
C		·863	249·4					270
		·855	234·8					495
	13018	·875	289·4	40·1	+19·9	13	75	261 *c*
	13026	·862	282·6	38·9	+14·0	43	180	125 *c*
	13022	·781	279·3	30·6	+11·1	35	173	180 *c*
	13025	·304	274·8	356·7	+ 7·4	29	94	
	13027	·171	52·5	331·1	+12·1	7	15	
	13024	·573	69·0	305·1	+17·0	320	2952	
	13028	·972	98·7	263·8	− 6·9	66	273	361 *c*
		·882	77·5					447
		·904	64·1					349
Oct. 9			(+ 26·4)	(339·0)	(+ 6·2)	(513)	(3762)	(2958)
282·470		·946	251·8					271
G		·945	236·4					519
	13026	·975	283·0	42·9	+14·0	24	97	214 *f*
	13018	·962	288·5	40·1	+19·4	4	16	172 *n*
	13022	·919	279·0	32·1	+10·7	28	135	298 *nf*
	13029	·891	297·2	27·4	+26·9	8	24	101 *c*
	13025	·540	274·4	357·7	+ 7·6	9	50	
	13027	·176	307·2	333·1	+12·2	8	29	
	1138b	·402	44·8	307·1	+22·4	5	15	
	13024	·375	59·0	305·4	+16·9	378	2881	
	13028	·886	101·0	264·0	− 6·8	50	274	220 *c*
		·901	87·8					172
Oct. 10			(+ 26·4)	(324·9)	(+ 6·2)	(514)	(3521)	(1967)
283·378		·966	239·2					515
G	13026	·992	281·3	36·5	+11·9	15	27	679 *nf*
	13022	·980	279·5	32·1	+10·5	22	175	
	13029	·948	297·0	24·8	+27·5	11	34	318 *c*

Group 13021. Oct. 4– 5. Some rather small spots; one alone remains on Oct.5.
Group 13022. Oct. 4–11. A stream of normal type with rapid rise and decline.
Group 13023. Oct. 4– 6. A small spot.
Group 13024. Oct. 5–18. Return of Group 13004. A giant group. Near the east limb it appears as a single composite spot, but on fuller presentation it is seen to be composed of two separate complex spots almost touching one another. The following spot breaks up into a cluster when the group nears the west limb.
Group 13025. Oct. 7–12. A small stream of a few spots.
Group 13026. Oct. 8–11. A group originating near the west limb.
Group 13027. Oct. 9–14. A small stream.
Group 13028. Oct. 9–17. A typical bi-polar group; the follower dies out after Oct.12.
Group 13029. Oct.10–11. A group developing near the west limb.

POSITIONS AND AREAS OF SUN SPOTS AND FACULÆ FOR EACH DAY IN THE YEAR.

U.T.	Group No.	Measures: Dist.	Measures: Pos. Angle	Position: Long.	Position: Lat.	Area: Umbræ	Area: Whole Spots	Area: Faculæ
			°	°	°			
1938								
	13030	·878	240·8	8·4	−22·0	4	17	144 *f*
	13025	·733	274·8	0·2	+ 7·7	12	26	
	13027	·385	287·8	334·8	+12·4	10	24	
	13024	·219	33·0	305·8	+16·6	430	2768	
	13031	·298	65·8	296·8	+12·8	4	16	
	13028	·766	104·0	264·7	− 6·6	44	184	355 *c*
		·945	107·5					462
Oct. 11			(+ 26·4)	(312·9)	(+ 6·1)	(552)	(3271)	(2473)
284·378 G		·983	296·2					117
		·920	283·2					218
	13030	·955	245·0	8·2	−21·7	12	40	150 *f*
	13025	·880	275·9	1·6	+ 8·0	9	30	221 *f*
	13027	·566	283·2	333·9	+12·4	35	164	
	13024	·209	335·8	304·8	+16·9	342	3003	
	13031	·128	18·3	297·3	+12·9	18	66	
	13028	·598	109·0	265·2	− 6·3	30	161	
	13032	·758	109·4	253·3	−10·5	10	27	
	13033	·983	65·6	218·6	+25·1	11	24	283 *n*
		·931	117·8					234
		·958	108·3					237
Oct. 12			(+ 26·4)	(299·7)	(+ 6·0)	(467)	(3515)	(1460)
285·411 C		·932	277·1					672
	13027	·764	281·6	336·0	+12·7	23	85	286 *c*
	13024	·386	299·2	306·6	+16·5	368	2555	
	13031	·226	303·6	297·2	+13·1	16	80	
	13028	·401	120·2	265·8	− 6·0	26	107	
	13032	·567	119·4	256·0	−11·0	2	5	
	13034	·840	101·6	230·4	− 6·4	12	40	198 *c*
	13033	·913	65·8	220·2	+24·5	11	41	480 *f*
		·915	112·1					542
Oct. 13			(+ 26·4)	(286·1)	(+ 6·0)	(458)	(2913)	(2178)
286·378 G		·975	275·7					236
	13027	·891	281·3	336·8	+12·7	15	34	330 *c*
	13024	·550	293·1	305·3	+17·5	365	2724	
	13031	·394	290·9	295·5	+13·5	9	28	
	1138c	·111	342·8	275·3	+11·9	2	12	
	13028	·238	147·4	266·0	− 5·6	12	73	
	13034	·694	105·5	231·3	− 6·3	6	25	
	13033	·798	63·3	221·9	+24·7	11	27	376 *f*
		·951	67·6					445
Oct. 14			(+ 26·3)	(273·4)	(+ 5·9)	(420)	(2923)	(1387)
287·376 G		·960	281·3					352
		·866	279·4					440
	13024	·721	287·1	305·9	+16·3	363	2458	427 *p*
1938								
	13031	·572	286·5	294·5	+14·1	2	19	
	13028	·224	207·9	266·2	− 5·6	12	61	
	13034	·505	113·2	232·5	− 6·3	8	21	
	13033	·659	58·0	222·3	+25·0	6	26	
	13035	·977	63·8	181·3	+26·8	9	21	354 *f*
		·908	59·7					230
Oct. 15			(+ 26·3)	(260·2)	(+ 5·8)	(400)	(2606)	(1803)
288·377 C		·957	256·9					146
		·942	277·3					315
	13024	·854	287·3	305·6	+17·7	312	2220	757 *c*
	13028	·383	241·3	266·6	− 5·2	11	44	
	13034	·337	125·9	231·9	− 5·9	2	6	
	13033	·513	48·3	222·1	+25·0	3	17	
	13035	·906	63·5	182·5	+26·3	8	38	418 *sf*
		·945	101·3					544
Oct. 16			(+ 26·3)	(247·0)	(+ 5·7)	(336)	(2325)	(2180)
289·372 G		·809	273·4					235
	13024	·941	287·4	304·7	+18·3	273	1916	1771 *c*
	13028	·576	252·1	267·2	− 5·4	5	16	
	13036	·482	234·2	257·3	−11·1	13	50	
	13035	·808	61·9	181·7	+25·9	6	20	380 *f*
		·841	105·0					519
		·907	123·8					470
		·929	98·0					260
		·959	105·7					261
Oct. 17			(+ 26·2)	(233·9)	(+ 5·7)	(297)	(2002)	(3896)
290·423 G		·919	272·8					320
	13024	·980	287·0	299·4	+17·8	55	394	965 *c*
	13036	·687	248·2	260·3	−10·5	6	25	
	13035	·696	58·8	179·0	+25·3	0	3	
	13037	·986	101·5	141·2	−10·3	26	143	226 *f*
		·860	101·4					375
		·866	70·6					241
		·965	111·5					175
		·966	68·6					218
Oct. 18			(+ 26·2)	(220·0)	(+ 5·6)	(87)	(565)	(2520)
291·430 G		·960	274·7					174
		·946	283·3					219
		·869	258·7					232
	13036	·814	252·7	258·8	−10·6	23	114	186 *c*
	13037	·928	103·7	140·4	−10·5	39	165	451 *nf*
		·898	70·8					437
		·924	112·5					365
Oct. 19			(+ 26·1)	(206·7)	(+ 5·5)	(62)	(279)	(2064)

Group 13030. Oct.11–12. A small spot.
Group 13031. Oct.11–15. A small out-lying stream to Group 13024.
Group 13032. Oct.12–13. A small spot following Group 13028.
Group 13033. Oct.12–16. Return of Group 13000. A small definite spot.
Group 13034. Oct.13–16. Two or three small spots.
Group 13035. Oct.15–22. A small spot which has died out by Oct.19; another small spot appears on Oct.21–22.
Group 13036. Oct.17–21. A developing stream whose later history is lost to view around the west limb.
Group 13037. Oct.18–29. Return of Group 13007. A stable regular spot; there are small companions on Oct.25.

POSITIONS AND AREAS OF SUN SPOTS AND FACULÆ FOR EACH DAY IN THE YEAR.

U.T.	Group No.	Measures Dist.	Measures Pos. Angle	Position Long.	Position Lat.	Area Umbræ	Area Whole Spots	Area Faculæ
			°	°	°			
1938								
292·455		·935	294·6					292
G	13036	·926	256·2	259·2	−10·6	35	345	511 *c*
	1138d	·279	145·2	184·0	− 7·9	0	2	
	13037	·823	107·1	140·2	−10·7	31	156	277 *nf*
	1138e	·855	114·7	138·7	−17·8	0	2	277 *c*
	13038	·936	66·3	123·6	+24·1	18	71	184 *c*
	13039	·954	77·3	120·2	+13·7	36	269	546 *f*
		·835	64·4					179
		·979	112·0					276
Oct. 20			(+ 26·0)	(193·2)	(+ 5·4)	(120)	(845)	(2542)
293·374		·975	295·6					88
G		·969	275·5					141
		·900	291·0					189
		·786	241·2					215
	13036	·981	257·8	258·4	−10·8	52	203	436 *c*
	1138f	·707	301·4	222·9	+25·6	6	9	
	13035	·308	6·8	178·8	+23·0	0	2	
	13037	·690	111·5	140·5	−10·6	28	148	
	13038	·850	64·4	124·0	+24·5	83	370	258 c
	13039	·872	77·1	120·3	+13·8	49	259	551 *f*
		·912	53·0					267
		·922	87·7					141
		·938	113·0					410
		·946	119·1					208
		·964	76·8					376
		·966	104·6					177
Oct. 21			(+ 26·0)	(181·1)	(+ 5·3)	(218)	(991)	(3457)
294·380		·979	290·9					65
G		·960	254·7					234
		·899	242·3					437
		·828	297·5					285
	13035	·425	329·1	181·9	+26·5	1	2	
	13040	·120	345·9	169·5	+11·9	2	6	
	13037	·528	119·7	140·1	−10·4	26	144	
	13038	·722	60·5	124·2	+24·6	72	365	
	13039	·747	76·3	119·6	+13·8	46	245	367 *f*
	1138g	·823	87·9	112·4	+ 4·8	0	2	114 *c*
		·859	121·3					407
		·895	75·4					290
		·911	112·5					305
		·977	71·4					177
		·978	78·9					270
Oct. 22			(+ 25·9)	(167·8)	(+ 5·3)	(147)	(764)	(2951)
1938								
295·416		·955	248·4					337
G		·918	260·0					110
		·909	294·2					421
		·791	296·8					152
	13040	·302	294·6	170·4	+12·2	11	38	
	13037	·362	139·0	140·3	−10·7	19	129	
	13038	·567	51·6	124·9	+25·1	59	350	
	13039	·582	73·4	119·3	+13·8	32	182	
	13041	·808	111·8	103·7	−14·1	3	9	221 *sp*
	13042	·962	106·2	82·2	−14·0	4	7	233 *f*
		·784	73·4					194
		·818	123·2					181
		·932	77·1					758
		·949	117·0					424
		·954	64·1					218
Oct. 23			(+ 25·8)	(154·2)	(+ 5·2)	(128)	(715)	(3249)
296·434		·951	294·7					248
G		·909	305·6					184
		·842	297·5					132
	1138h	·581	275·6	176·2	+ 7·4	2	5	
	13040	·509	285·3	170·7	+12·1	5	23	
	13037	·278	177·8	140·1	−11·0	28	125	
	13038	·423	34·7	125·3	+25·2	52	297	
	13039	·383	64·7	119·9	+14·1	38	201	
	13043	·528	103·9	110·0	− 2·8	5	8	
	13041	·633	121·5	106·9	−15·0	10	24	
		·813	77·4					479
		·863	117·9					260
		·870	107·9					168
		·915	62·7					141
		·918	129·7					180
		·933	98·9					158
		·935	78·1					721
		·964	119·8					409
		·964	107·7					226
Oct. 24			(+ 25·7)	(140·7)	(+ 5·1)	(140)	(683)	(3306)
297·447		·946	294·0					240
G		·885	254·6					208
		·832	236·6					135
		·799	298·6					155
		·778	250·2					400
	13040	·701	282·4	171·7	+12·2	3	9	
	13037	·339	217·0	139·3	−10·7	32	130	

Group 13038. Oct.20–31. A spot not always of regular structure followed by a companion which expands into a cluster for a few days.
Group 13039. Oct.20–28. A regular spot with double umbra. New spots appear closely *np* on Oct.24, but the whole group dwindles rapidly.
Group 13040. Oct.22–27. A miniature stream fully formed on one day only (Oct.23); only one spot remains after Oct.24.
Group 13041. Oct.23–Nov.1. A vigorous stream with a rapid development between Oct.25 and 26. The head of the stream alone survives as the west limb is approached.
Group 13042. Oct.23–29. One or two small intermittent spots.
Group 13043. Oct.24–30. A pair of tiny spots on Oct.24. Nothing is then seen of this group until it revives on Oct.29–30 as a small cluster.

POSITIONS AND AREAS OF SUN SPOTS AND FACULÆ FOR EACH DAY IN THE YEAR.

U.T.	Group No.	Measures: Dist.	Measures: Pos. Angle	Position: Long.	Position: Lat.	Area: Umbræ	Area: Whole Spots	Area: Faculæ
			°	°	°			
1938								
	13038	·348	6·0	125·1	+25·1	53	270	
	13039	·207	37·0	120·0	+14·4	36	154	
	1138i	·188	65·9	117·4	+ 9·3	1	5	
	13044	·449	152·9	114·0	−18·5	4	10	
	13041	·486	133·0	105·9	−14·7	34	89	
	13045	·603	142·2	103·7	−23·7	3	7	
	13042	·791	113·4	78·9	−15·0	2	3	190 *c*
	13046	·991	76·1	44·4	+14·4	32	159	193 *n*
		·764	124·2					736
		·770	77·8					386
		·823	102·6					174
		·859	133·6					117
		·881	73·6					550
		·898	124·6					360
		·921	111·9					377
		·932	99·6					234
		·937	58·8					149
Oct. 25			(+ 25·6)	(127·4)	(+ 5·0)	(200)	(836)	(4004)
298·437 G		·936	257·3					344
		·934	242·7					197
		·885	296·2					341
		·824	237·7					158
		·812	255·4					296
	13040	·847	281·4	172·2	+12·2	4	8	116 *f*
	13037	·501	237·5	139·7	−11·1	23	113	
	13038	·381	336·0	124·1	+25·1	45	279	
	13039	·179	330·4	119·5	+13·8	18	65	
	13044	·406	182·3	115·3	−18·9	4	14	
	13041	·345	156·7	106·3	−13·5	126	494	
	13045	·514	158·9	102·7	−23·8	10	36	
	13046	·938	76·4	44·3	+14·4	26	132	673 *c*
	13047	·982	64·1	34·3	+26·4	47	223	305 *c*
		·794	72·6					361
		·822	132·3					364
		·837	102·9					210
		·855	117·5					253
Oct. 26			(+ 25·5)	(114·3)	(+ 4·9)	(303)	(1364)	(3618)
299·413 G		·944	297·3					159
		·925	263·4					281
		·923	245·6					312
		·878	289·2					50
	13040	·943	281·2	172·2	+12·1	6	13	127 *f*
	13037	·660	247·0	139·5	−11·1	16	79	
	13038	·494	316·6	123·4	+25·4	50	281	
	13039	·336	296·1	119·4	+13·1	13	56	
	13041	·327	196·2	106·8	−13·5	130	682	
	1138j	·406	191·2	106·2	−18·5	12	38	
	13045	·485	182·2	102·6	−24·1	15	46	
1938								
	13048	·666	152·2	80·1	−31·5	6	15	
	13046	·841	75·7	44·3	+14·6	24	118	596 *c*
	13049	·929	77·4	32·8	+13·5	3	5	
	13047	·927	63·6	33·9	+26·2	53	191	469 *f*
	13050	·966	81·2	26·0	+ 9·7	4	17	115 *f*
		·954	119·4					151
		·974	73·9					263
Oct. 27			(+ 25·4)	(101·4)	(+ 4·8)	(332)	(1541)	(2523)
300·446 G		·976	263·5					108
		·939	253·3					184
		·911	289·8					238
		·841	242·2					199
	13037	·807	252·3	139·2	−11·2	13	40	165 *f*
	13038	·643	305·2	123·3	+25·5	44	220	
	13039	·531	287·0	119·1	+12·9	2	14	
	13044	·618	229·8	117·7	−19·3	1	4	
	13041	·460	227·3	108·1	−13·7	147	616	
	13045	·527	209·5	104·1	−22·6	26	97	
	13051	·199	20·8	83·6	+15·4	2	6	
	13052	·128	55·8	81·7	+ 8·7	4	18	
	13048	·603	168·9	80·0	−31·5	8	23	
	1138k	·204	42·4	79·7	+13·2	1	4	
	13042	·341	154·3	79·1	−13·2	8	28	
	11381	·528	128·2	62·5	−14·7	5	18	
	13046	·695	73·8	44·4	+14·6	29	119	296 *c*
	13049	·815	77·0	33·3	+13·3	2	3	
	13047	·823	61·2	34·5	+26·2	55	251	629 *f*
	13050	·892	81·6	24·6	+ 9·6	14	46	386 *nf*
	13053	·983	73·0	7·8	+17·5	19	69	292 *f*
		·917	125·8					368
Oct. 28			(+ 25·2)	(87·8)	(+ 4·7)	(380)	(1576)	(2865)
301·435 G		·920	288·5					171
		·915	246·0					352
		·879	297·9					126
	13037	·913	255·3	138·8	−11·4	5	27	347 *f*
	13038	·777	300·1	123·0	+26·0	24	181	214 *c*
	13043	·605	258·7	111·1	− 3·1	3	16	
	13041	·630	242·2	109·6	−13·3	104	524	
	13045	·640	224·8	104·0	−22·9	49	233	
	13052	·143	302·1	81·8	+ 8·9	13	34	
	13051	·198	332·7	80·2	+14·7	27	73	
	13042	·321	195·3	79·8	−13·4	1	6	
	13048	·596	186·3	79·2	−31·5	11	23	
	13046	·525	69·7	44·4	+14·4	24	119	
	13047	·699	56·4	34·5	+26·2	52	213	
	13050	·761	81·0	25·3	+ 9·8	7	27	299 *c*
	13053	·918	73·1	7·8	+17·7	16	50	450 *f*
	13054	·979	99·1	357·6	− 7·9	52	238	269 *f*

Group 13044. Oct.25–28. A small variable group *p* Group 13041.
Group 13045. Oct.25–Nov.1. A small variable stream *s* Group 13041.
Group 13046. Oct.25–Nov.6. Return of Group 13026. A stable regular spot.
Group 13047. Oct.26–Nov.6. Return of Group 13029. A close pair of spots becoming a cluster which slowly dies out.
Group 13048. Oct.27–30. A pair of small spots increasing their separation.
Group 13049. Oct.27–28. Return of Group 13022. A tiny spot, *f* Group 13046, probably the return of Group 13022.
Group 13050. Oct.27–30. A group of two or three small spots.
Group 13051. Oct.28–Nov.3. A pair of spots.
Group 13052. Oct.28–30. A small, short-lived group.
Group 13053. Oct.28–Nov.5. A small regular spot with a companion that has died out by Nov.2. A cluster of new tiny companions comes on Nov.5.
Group 13054. Oct.29–Nov.10. A regular spot slowly diminishing with small companions on Nov.1–2, 5 and 8.

POSITIONS AND AREAS OF SUN SPOTS AND FACULÆ FOR EACH DAY IN THE YEAR.

U.T.	Group No.	MEASURES Dist.	MEASURES Pos. Angle	POSITION Long.	POSITION Lat.	AREA Umbræ	AREA Whole Spots	AREA Faculæ
			°	°	°			
1938								
	13055	·986	78·4	354·0	+12·2	38	140	202 *sp*
		·844	59·3					426
		·863	73·7					323
		·882	130·3					365
		·950	114·3					76
Oct. 29			(+ 25·1)	(74·8)	(+ 4·6)	(426)	(1904)	(3620)
302·389 C		·953	257·0					271
		·823	282·0					319
	13038	·884	297·6	122·9	+26·4	36	149	285 *c*
	13043	·773	262·9	112·2	− 2·6	9	28	85 *c*
	13041	·785	249·3	110·9	−13·1	101	518	311 *c*
	13045	·744	232·8	102·2	−23·2	38	200	
	13052	·352	283·7	82·4	+ 9·0	5	16	
	13051	·360	299·7	81·0	+14·5	17	73	
	13048	·621	203·2	78·6	−30·3	8	20	
	13046	·343	60·1	44·4	+14·1	25	105	
	13047	·562	50·3	33·8	+25·0	36	205	
	13050	·632	79·2	23·2	+10·3	3	6	
	13053	·826	72·0	7·0	+17·3	21	61	282 *f*
	13054	·913	100·5	357·5	− 7·7	36	232	450 *f*
	13055	·933	79·0	353·1	+11·9	21	122	291 *f*
		·884	81·5					136
Oct. 30			(+ 24·9)	(62·2)	(+ 4·5)	(356)	(1735)	(2430)
303·337 C		·942	246·5					257
		·937	234·1					135
		·920	282·2					537
		·881	264·9					123
	13038	·959	296·7	123·1	+26·8	30	118	402 *c*
	13041	·903	252·9	112·0	−13·4	69	361	360 *c*
	13045	·847	239·0	101·7	−23·1	34	182	380 *c*
	13051	·548	290·1	81·7	+14·5	12	48	
	13046	·191	28·2	44·4	+14·0	22	119	
	13047	·434	36·1	33·4	+24·6	33	257	
	13056	·385	65·1	28·8	+13·4	2	5	
	13053	·690	69·8	7·3	+17·0	22	76	
	13054	·805	102·8	357·5	− 7·5	32	185	360 *f*
	13055	·832	78·4	353·5	+12·1	27	161	388 *f*
		·946	94·7					188
		·961	73·2					331
Oct. 31			(+ 24·8)	(49·7)	(+ 4·4)	(283)	(1512)	(3461)
304·471 G	13041	·983	255·2	112·4	−13·6	50	293	591 *f*
	13045	·946	244·1	101·8	−22·7	25	143	449 *c*
	13057	·752	300·4	80·4	+25·3	3	17	
	13046	·241	316·0	44·6	+14·2	25	132	
1938								
	13047	·353	2·5	33·7	+24·8	35	258	
	13058	·372	142·6	21·4	−12·9	11	45	
	13053	·491	63·6	7·5	+16·4	15	60	
	13054	·624	107·8	358·0	− 7·5	43	195	
	13055	·698	77·8	350·7	+11·6	60	204	
	13059	·987	74·2	313·4	+16·3	12	67	528 *p*
		·860	67·5					299
		·892	78·7					242
Nov. 1			(+ 24·6)	(34·7)	(+ 4·3)	(279)	(1414)	(2109)
305·424 G		·987	245·1					300
		·981	255·3					212
		·971	284·1					189
		·875	257·5					163
		·861	244·7					198
		·856	231·7					165
	13051	·864	283·7	81·8	+13·9	20	74	385 *c*
	13057	·871	296·3	81·3	+24·8	9	18	87 *c*
	13046	·412	295·5	44·6	+14·1	17	104	
	1138m	·365	199·3	29·4	−15·9	1	5	
	13047	·393	334·5	33·0	+25·7	22	166	
	13058	·293	178·7	21·8	−12·8	7	33	
	13060	·225	71·9	9·8	+ 8·0	23	62	
	13053	·315	48·9	8·0	+16·0	14	48	
	13054	·436	116·3	359·1	− 7·2	28	155	
	13055	·532	75·1	350·7	+11·4	42	167	
	13061	·669	100·3	341·1	− 3·7	8	27	
	1138n	·835	128·2	334·2	−28·2	2	6	
	13062	·941	124·0	318·2	−29·9	6	19	82 *c*
	13059	·933	74·5	313·2	+16·0	18	63	1396 *c*
Nov. 2			(+ 24·5)	(22·2)	(+ 4·2)	(217)	(947)	(3177)
306·344 C		·955	241·3					204
		·943	254·8					226
		·940	296·0					170
		·851	284·5					246
	13051	·953	283·8	82·6	+14·4	7	68	642 *c*
	13046	·581	288·8	44·4	+14·1	21	105	
	13047	·503	316·3	32·4	+25·0	31	146	
	13056	·376	295·8	30·3	+13·2	2	11	
	13060	·075	358·1	10·2	+ 8·3	48	218	
	13053	·203	9·9	7·9	+15·6	8	17	
	13054	·263	136·5	359·5	− 6·9	28	144	
	13055	·366	67·9	349·8	+11·8	26	126	
	13061	·523	103·2	339·5	− 3·3	4	10	
	13059	·840	73·5	313·3	+16·0	14	54	477
		·946	65·7					521
		·953	77·6					277
Nov. 3			(+ 24·3)	(10·0)	(+ 4·1)	(189)	(899)	(2763)

Group 13055. Oct.29–Nov.8. A regular spot without companions at first. On Nov.1, new spots (perhaps a separate group) appear, but these are out-lived by the original spot.
Group 13056. Oct.31–Nov.4. A small intermittent spot.
Group 13057. Nov. 1– 2. One or two small spots.
Group 13058. Nov. 1– 8. A small group on Nov.1–2: one or two small spots on Nov.4–5: a pair of definite spots on Nov.7 of which one remains on the next day.
Group 13059. Nov.1–11. Return of Group 13024: 3rd appearance. A small diminishing regular spot with an occasional companion. There is an extensive area of faculæ associated with the group.
Group 13060. Nov.2–9. A group of bi-polar type in which the following component has gone by Nov.5. The leader develops a double nucleus but does not divide into two parts until Nov.8, when the northern part continues as a regular spot and the southern rapidly disappears.
Group 13061. Nov.2–3. A wide pair on Nov.2, the following spot remaining on Nov.3.
Group 13062. Nov.2–7. One or two small intermittent spots.

POSITIONS AND AREAS OF SUN SPOTS AND FACULÆ FOR EACH DAY IN THE YEAR.

U.T.	Group No.	Measures: Dist.	Measures: Pos. Angle	Position: Long.	Position: Lat.	Area: Umbræ	Area: Whole Spots	Area: Faculæ
			°	°	°			
1938								
307·524		·957	283·8					280
G		·953	250·5					209
		·891	292·1					140
	13046	·768	284·7	44·2	+13·8	17	96	
	13056	·621	286·7	32·0	+13·4	3	8	
	13047	·662	303·6	31·7	+24·6	9	29	
	13058	·541	234·4	21·5	−14·8	8	15	
	13060	·284	285·3	10·5	+ 8·1	43	304	
	13053	·304	310·6	8·3	+15·2	9	18	
	13054	·212	206·9	0·0	− 6·9	19	123	
	13055	·165	33·3	349·2	+11·9	31	116	
	13062	·745	137·7	319·2	−30·1	3	7	
	13059	·684	70·8	312·5	+16·0	14	84	
	1139a	·872	75·3	294·1	+14·7	2	9	413 *p*
	13063	·932	79·3	285·6	+11·4	3	10	270 *f*
	13064	·991	99·6	273·2	− 8·9	206	1018	493 *c*
		·854	63·3					397
		·943	70·1					169
Nov. 4			(+ 24·1)	(354·5)	(+ 4·0)	(367)	(1837)	(2371)
308·439		·971	288·9					187
G		·966	245·3					125
		·943	276·4					147
		·926	254·3					172
		·877	292·3					203
	13046	·883	283·4	44·3	+13·7	16	78	239 *c*
	13047	·793	298·2	32·4	+24·5	7	27	310 *p*
	13058	·671	243·5	20·5	−14·3	3	6	
	13060	·482	279·9	10·9	+ 8·2	46	292	
	13053	·470	299·5	7·6	+16·9	7	24	
	13054	·351	237·2	359·6	− 7·2	21	128	
	13055	·208	315·4	351·0	+12·4	11	45	
	13059	·525	65·0	312·8	+16·1	15	70	
	13065	·547	77·4	309·7	+10·1	4	13	
	13063	·838	78·5	285·6	+11·7	6	13	184 *f*
	13064	·953	100·1	271·2	− 8·3	279	2148	1037 *c*
		·837	66·9					279
		·909	49·0					230
		·920	110·1					193
		·947	67·8					219
		·950	80·3					96
Nov. 5			(+ 23·9)	(342·4)	(+ 3·9)	(415)	(2844)	(3621)
309·381		·875	248·7					284
C		·869	232·5					307
		·765	304·9					179
	13046	·959	283·0	43·7	+13·5	26	136	283 *f*
	13047	·901	294·2	33·4	+23·4	2	13	326 *c*
	13060	·654	278·5	10·7	+ 8·4	36	294	
	13054	·530	250·4	0·1	− 6·9	15	112	
	13055	·366	294·5	349·8	+12·3	8	56	

U.T.	Group No.	Measures: Dist.	Measures: Pos. Angle	Position: Long.	Position: Lat.	Area: Umbræ	Area: Whole Spots	Area: Faculæ
			°	°	°			
1938								
	13066	·208	351·3	331·9	+15·6	6	27	
	13067	·240	62·7	317·6	+10·0	2	13	
	13062	·607	159·1	315·5	−30·7	5	21	
	13059	·363	51·5	312·8	+16·6	11	38	
	13065	·366	71·9	309·4	+10·1	4	14	
	13064	·867	101·9	271·2	− 8·3	315	2037	950 *c*
	13068	·971	108·5	256·0	−16·9	57	192	323
		·775	77·5					142
		·909	80·7					171
Nov. 6			(+ 23·7)	(330·0)	(+ 3·8)	(487)	(2953)	(2965)
310·457		·971	296·1					381
G		·939	278·1					132
		·925	232·7					251
		·911	285·9					157
		·878	300·6					364
	1139b	·975	250·9	30·8	−17·6	15	49	198 *p*
	13058	·927	252·7	21·7	−14·5	24	61	201 *c*
	13060	·821	277·6	10·9	+ 8·3	46	237	266 *f*
	13054	·717	256·7	0·3	− 6·8	13	65	
	1139c	·641	243·7	351·9	−13·4	3	5	
	13055	·565	286·1	349·3	+11·7	6	20	
	13066	·348	305·3	332·8	+15·1	55	211	
	13062	·563	175·5	318·7	−30·3	1	3	
	13067	·099	351·1	316·7	+ 9·3	16	52	
	13059	·231	15·4	312·1	+16·5	8	18	
	13069	·370	41·5	300·8	+19·6	2	13	
	1139d	·445	33·1	300·3	+25·3	2	5	
	13064	·724	105·1	271·0	− 8·2	381	2119	470 *f*
	13068	·882	110·7	256·8	−16·2	37	197	} 398 *c*
	13070	·927	112·6	251·0	−19·3	12	41	
	13071	·980	108·1	239·2	−16·9	82	653	462 *c*
Nov. 7			(+ 23·5)	(315·8)	(+ 3·7)	(703)	(3749)	(3280)
311·332		·958	285·2					182
C		·941	301·1					216
		·940	294·0					86
		·884	286·0					123
		·820	293·3					147
	13058	·984	254·5	22·5	−14·5	0	93	164 *c*
	13060	·919	277·7	11·1	+ 8·5	29	190	336 *c*
	13054	·841	260·1	0·5	− 6·3	16	82	200 *c*
	13055	·770	284·7	354·1	+13·5	3	9	
	13066	·513	293·0	338·4	+14·7	35	256	
	13067	·225	296·5	316·0	+ 9·3	7	19	
	13059	·253	332·8	311·2	+16·6	9	29	
	13064	·565	110·2	272·0	− 8·2	365	2175	
	13068	·784	114·0	256·3	−16·1	43	213	} 219 *c*
	13070	·832	116·7	252·3	−19·7	10	34	
	13071	·921	110·1	239·9	−16·9	89	626	385 *c*
Nov. 8			(+ 23·3)	(304·3)	(+ 3·6)	(606)	(3726)	(2058)

Group 13063. Nov. 4– 5. A small spot.
Group 13064. Nov. 4–17. A great composite spot. When fully presented on the disk, it can be considered as one main spot with a compact train and other companions. The nucleus of this chief spot is crossed by a well-defined "bridge" which is eventually broken by Nov.14. Starting as a subsidiary nucleus, a part of the northern boundary of the spot separates as a partially-formed regular spot and drifts forward in longitude.
Group 13065. Nov. 5– 6. A small single spot on Nov.5: a pair on Nov.6.
Group 13066. Nov. 6–12. A typical bi-polar group.
Group 13067. Nov. 6–10. A small stream.
Group 13068. Nov. 6–17. A stable regular spot; there is a small follower on Nov.9.
Group 13069. Nov. 7–12. A very small spot seen only on Nov. 7, 10 and 12.
Group 13070. Nov. 7– 9. A small group *sf* Group 13068.
Group 13071. Nov. 7–18. A compact stream in rapid change.

POSITIONS AND AREAS OF SUN SPOTS AND FACULÆ FOR EACH DAY IN THE YEAR.

U.T.	Group No.	Measures Dist.	Measures Pos. Angle	Position Long.	Position Lat.	Area Umbræ	Area Whole Spots	Area Faculæ
			°	°	°			
1938								
312·107		·952	288·8					425
K		·923	260·6					315
		·882	296·8					234
		·824	283·8					500
	13060	·972	278·3	10·7	+ 8·9	38	165	357 c
	13054	·925	261·5	0·9	− 6·5	16	61	
	13066	·655	289·0	333·8	+15·0	58	343	
	13067	·388	287·9	316·0	+10·0	12	40	
	13059	·393	308·8	312·7	+17·5	16	43	
	13064	·427	117·1	271·6	− 7·9	409	2133	
	13068	·673	119·4	256·5	−16·5	60	201	
	13070	·751	120·3	250·7	−19·7	4	18	
	13071	·844	112·8	239·8	−17·0	111	578	283 c
		·952	109·0					441
Nov. 9			(+ 23·1)	(294·1)	(+ 3·5)	(724)	(3582)	(2555)
313·395		·985	290·6					110
G		·953	281·8					421
		·894	261·2					158
	13054	·998	262·8	2·9	− 6·9	0	96	362 s
	13066	·832	285·4	332·9	+14·7	47	313	179 c
	13067	·652	281·2	317·4	+ 9·8	6	17	
	13059	·606	293·7	312·4	+16·8	6	14	
	13069	·472	312·3	299·1	+21·6	5	20	
	13064	·217	157·4	272·3	− 8·1	405	2120	
	13068	·475	134·4	256·5	−16·1	40	172	
	13071	·668	119·8	240·0	−16·6	88	438	
		·866	113·0					199
		·887	62·8					183
		·951	107·8					106
		·984	98·3					132
Nov. 10			(+ 22·8)	(277·1)	(+ 3·4)	(597)	(3190)	(1850)
314·400	13066	·933	284·7	332·6	+14·8	49	279	343 c
G	13059	·766	289·2	312·6	+16·7	2	10	444 sp
	13064	·250	214·8	272·1	− 8·6	349	2245	
	13068	·358	159·7	256·4	−16·4	33	207	
	13071	·516	131·8	240·2	−17·1	53	348	
	13072	·853	111·6	208·2	−16·5	0	12	136 c
	13073	·927	99·1	196·7	− 7·2	3	17	162 c
Nov. 11			(+ 22·6)	(263·8)	(+ 3·2)	(489)	(3118)	(1085)
315·471		·948	250·7					279
G		·941	235·1					166
		·894	285·1					997
	13066	·985	285·1	330·0	+15·4	20	118	421 c
	13069	·779	298·3	298·0	+23·7	2	6	308 c
	13064	·428	241·7	272·0	− 8·8	357	2149	
	13068	·349	198·3	256·2	−16·1	32	193	
1938								
	13071	·373	155·1	240·3	−16·6	47	277	
	13072	·743	118·2	206·3	−18·2	26	93	
	13074	·801	78·6	196·8	+11·0	3	22	81 c
	13073	·820	101·3	195·7	− 7·4	3	8	106 c
	13075	·984	99·2	170·8	− 8·5	55	323	166 c
Nov. 12			(+ 22·3)	(249·7)	(+ 3·1)	(545)	(3189)	(2524)
316·370		·960	278·7					231
C		·958	289·3					418
		·849	293·1					307
	13064	·590	251·3	272·1	− 8·4	375	1939	
	13068	·445	222·3	256·0	−16·3	40	185	
	13071	·343	187·7	240·6	−16·8	47	217	
	13076	·156	154·3	234·0	− 5·0	4	17	
	13072	·599	126·3	207·5	−18·1	25	169	
	13074	·666	77·2	196·7	+10·7	28	68	
	13075	·929	100·8	170·7	− 8·9	65	328	274 f
	13077	·963	70·0	163·7	+20·1	37	173	396 f
		·912	108·3					122
		·937	93·0					104
Nov. 13			(+ 22·1)	(237·9)	(+ 3·0)	(621)	(3096)	(1852)
317·414		·961	278·9					156
G		·944	289·8					591
		·917	299·9					272
	13064	·766	255·8	272·6	− 8·9	340	1790	364 p
	13068	·604	236·9	255·9	−16·7	43	193	
	13071	·436	218·6	240·6	−17·0	25	135	
	13076	·238	231·6	234·9	− 5·6	9	30	
	13072	·458	141·8	206·8	−18·2	32	126	
	13074	·477	71·6	196·7	+11·2	41	137	
	13078	·536	57·7	195·6	+19·1	5	21	
	1139e	·802	68·4	172·3	+18·9	2	7	
	13075	·813	102·8	171·0	− 8·6	67	337	649 f
	13077	·889	68·6	162·4	+20·2	51	265	349 c
		·813	58·3					108
		·895	78·4					175
Nov. 14			(+ 21·8)	(224·1)	(+ 2·9)	(615)	(3041)	(2664)
318·237		·946	294·8					176
C		·927	281·4					189
		·861	258·4					1086
	13064	·874	258·0	272·9	− 9·0	307	1643	
	13068	·727	243·4	255·8	−16·9	34	166	
	13071	·547	232·6	240·0	−16·4	23	98	
	13076	·420	248·6	236·3	− 6·2	48	200	
	13072	·373	162·8	206·6	−18·0	36	194	
	13078	·377	44·5	197·1	+18·2	12	44	
	13074	·317	63·6	196·5	+10·7	20	107	

Group 13072. Nov.11–21. A large group of unusual development. The early growth is that of an ordinary bi-polar group but in a few days it is of irregular type lacking distinctive components. A rapid growth then ensues between Nov. 18 and 19, when the component parts, embracing a number of nuclei, are crowded together.

Group 13073. Nov.11–12. A small spot.

Group 13074. Nov.12–21. A small stream with the larger component – a regular spot – surviving after Nov.15. The axis of this group is inclined to the sun's equator in the opposite direction to the normal, i.e. the follower and not the leader spot is nearer the equator.

Group 13075. Nov.12–24. A stable regular spot with a small companion on Nov. 13 and 17.

Group 13076. Nov.13–19. A large stream developing from a pair of tiny spots on Nov.13.

Group 13077. Nov.13–24. A stream in which the leader, a regular spot, predominates. Between Nov.21 and 22, this spot splits into two parts which repel one another.

Group 13078. Nov.14–19. A small stream of unimportant spots.

POSITIONS AND AREAS OF SUN SPOTS AND FACULÆ FOR EACH DAY IN THE YEAR.

U.T.	Group No.	Measures Dist.	Measures Pos. Angle	Position Long.	Position Lat.	Area Umbræ	Area Whole Spots	Area Faculæ
			°	°	°			
1938								
	13075	·695	105·8	170·8	− 8·8	68	320	375 *f*
	13077	·781	66·4	163·8	+20·0	39	226	227 *c*
		·919	107·4					234
Nov. 15			(+ 21·6)	(213·2)	(+ 2·8)	(587)	(2998)	(2287)
319·239 C		·965	283·9					167
		·920	294·7					208
	13064	·962	259·1	273·2	− 9·7	275	1377	2248 *c*
	13068	·852	247·9	255·5	−17·1	32	180	423 *f*
	13071	·695	241·1	239·5	−17·5	13	59	
	13076	·618	256·0	237·0	− 6·4	112	666	
	13072	·378	199·7	207·7	−18·1	62	349	
	1139 f	·186	6·5	198·8	+13·3	2	15	
	13078	·271	5·1	198·6	+18·2	12	45	
	13074	·149	30·2	195·7	+10·1	21	99	
	13075	·525	112·0	170·6	− 9·0	60	293	
	13077	·622	60·7	164·9	+19·9	37	203	
	13079	·951	75·0	128·2	+15·1	13	43	325 *c*
		·908	115·6					179
Nov. 16			(+ 21·3)	(200·0)	(+ 2·7)	(639)	(3329)	(3550)
320·409 G		·939	299·4					101
	13064	·985	262·0	264·0	− 7·4	6	25	522 *sf*
	13068	·957	251·0	255·8	−17·3	29	156	302 *sf*
	13071	·838	247·3	238·5	−17·3	15	59	414 *c*
	13076	·805	260·1	237·3	− 6·4	159	994	402 *c*
	13072	·494	225·4	206·2	−17·9	99	481	
	13078	·359	318·8	198·9	+18·1	7	12	
	13074	·235	304·3	195·9	+10·0	16	71	
	13075	·314	129·0	170·4	− 9·0	74	287	
	13077	·435	46·8	165·0	+19·6	39	164	
	13080	·415	79·5	160·5	+ 6·6	12	36	
	13079	·856	73·0	126·5	+15·8	12	64	390 *c*
		·877	84·8					152
		·929	61·2					277
		·943	109·7					807
		·976	74·8					122
Nov. 17			(+ 21·0)	(184·6)	(+ 2·5)	(468)	(2349)	(3489)
321·462 G		·850	246·3					154
	13071	·939	249·5	238·3	−18·2	6	13	651 *c*
	13076	·920	262·0	236·9	− 6·4	143	917	563 *c*
	13072	·660	238·9	207·0	−17·9	82	557	
	13078	·534	300·3	199·5	+17·6	6	21	
	13074	·445	289·1	195·9	+10·5	7	27	
	13075	·199	179·1	170·5	− 9·0	57	319	
	13077	·308	17·9	165·0	+19·4	28	149	
	13080	·179	65·3	161·3	+ 6·6	11	49	
	13079	·717	70·1	126·4	+15·8	8	44	199 *c*
		·849	71·7					318

U.T.	Group No.	Measures Dist.	Measures Pos. Angle	Position Long.	Position Lat.	Area Umbræ	Area Whole Spots	Area Faculæ
			°	°	°			
1938								
		·860	116·5					455
		·943	97·5					129
		·951	114·5					774
		·976	78·0					304
Nov. 18			(+ 20·7)	(170·7)	(+ 2·4)	(348)	(2096)	(3547)
322·453 G		·983	252·8					319
		·952	244·8					274
		·898	295·4					167
	13076	·985	263·2	237·1	− 6·3	105	629	552 *c*
	13072	·795	245·1	206·8	−18·0	166	1265	275 *c*
	13078	·720	292·3	201·8	+17·5	3	6	
	13074	·637	284·0	196·5	+10·6	6	13	
	13075	·295	228·3	170·5	− 9·0	61	300	
	13077	·321	338·3	164·9	+19·6	28	141	
	13080	·110	313·4	162·3	+ 6·6	25	116	
	13081	·556	143·4	136·5	−24·3	2	4	
	13079	·551	63·6	126·9	+16·1	2	8	
		·837	119·0					500
		·917	76·7					582
		·931	108·2					235
		·934	118·6					156
Nov. 19			(+ 20·4)	(157·7)	(+ 2·3)	(398)	(2482)	(3060)
323·111 K		·933	292·5					166
	13072	·869	247·3	207·0	−18·4	296	1754	492 *c*
	13074	·745	282·2	197·2	+10·5	3	14	
	13075	·415	241·7	171·2	− 9·3	74	329	
	13082	·494	323·3	168·8	+25·3	3	11	
	13077	·395	318·8	165·5	+19·3	28	144	
	13080	·221	288·4	161·7	+ 6·1	47	213	
		·929	75·2					431
Nov. 20			(+ 20·2)	(149·6)	(+ 2·2)	(451)	(2465)	(1089)
324·427 G		·913	258·7					145
		·913	291·6					111
	13072	·977	249·6	207·7	−19·3	193	1537	737 *c*
	13074	·912	280·6	197·2	+10·4	2	5	163 *c*
	13075	·653	253·2	170·8	− 9·3	57	305	
	13082	·654	308·0	166·3	+25·3	7	20	
	13077	·603	300·5	165·0	+19·4	33	176	
	13080	·498	278·9	161·2	+ 6·1	35	158	
	13081	·451	192·7	137·9	−24·0	12	30	
		·826	73·2					106
		·833	60·0					108
		·907	107·9					237
		·925	97·8					91
		·935	72·1					128
		·944	58·3					147
Nov. 21			(+ 19·7)	(131·7)	(+ 2·0)	(339)	(2231)	(1973)

Group 13079. Nov.16–22. A wide pair of spots (becoming temporarily small clusters on Nov.17), in a considerable area of faculæ.
Group 13080. Nov.17–25. An irregular stream of medium-sized spots.
Group 13081. Nov.19–23. One or two small spots.
Group 13082. Nov.20–24. A small bi-polar group on nearly the same meridian as Groups 13077 and 13080.

POSITIONS AND AREAS OF SUN SPOTS AND FACULÆ FOR EACH DAY IN THE YEAR.

U.T.	Group No.	Measures: Dist.	Measures: Pos. Angle	Position: Long.	Position: Lat.	Area: Umbræ	Area: Whole Spots	Area: Faculæ
			°	°	°			
1938								
325·400		·995	253·2					105
G		·972	281·0					173
		·912	253·1					154
	13075	·803	256·7	171·0	− 9·4	66	324	354 *sf*
	13082	·793	300·9	167·4	+25·2	9	35	168 *c*
	13077	·757	294·0	165·7	+19·2	40	140	115 *c*
	13080	·663	276·9	160·1	+ 6·0	42	270	
	13083	·507	313·1	142·2	+22·0	6	27	
	13081	·538	218·6	140·1	−23·0	8	17	
	13079	·317	326·8	129·2	+17·2	0	5	
	13084	·727	56·6	76·9	+25·0	5	16	178 *c*
	13085	·780	69·0	69·2	+17·5	3	7	200 *f*
		·818	113·4					424
		·903	56·7					307
		·954	73·5					305
Nov. 22			(+ 19·4)	(118·8)	(+ 1·9)	(179)	(841)	(2483)
326·426	13075	·917	259·0	170·9	− 9·3	41	351	497 *sf*
G	13082	·894	295·9	166·6	+23·8	4	17	177 *c*
	13077	·872	291·2	164·5	+19·2	26	108	110 *c*
	13080	·816	276·5	159·7	+ 6·3	44	225	341 *c*
	13081	·683	232·7	141·3	−22·9	5	14	
	13085	·617	63·3	70·1	+17·5	3	8	
	13086	·954	74·7	33·2	+15·1	21	136	405 *c*
		·861	74·0					282
		·951	64·3					390
		·965	107·3					212
Nov. 23			(+ 19·1)	(105·3)	(+ 1·8)	(144)	(859)	(2414)
327·471		·816	295·9					206
G	13075	·985	260·3	170·9	− 9·3	73	375	713 *f*
	13077	·972	289·3	167·5	+19·1	4	15	237 *f*
	13082	·972	294·1	167·1	+23·8	19	100	459 *c*
	13080	·925	276·3	159·0	+ 6·4	49	205	388 *c*
	13087	·343	204·3	99·9	−16·4	4	7	
	13088	·229	26·5	85·5	+13·5	2	9	
	13085	·475	55·0	67·6	+17·3	10	36	
	13086	·848	75·3	34·3	+13·4	98	435	507 *c*
	13089	·882	109·7	31·8	−16·4	2	7	374 *c*
		·808	61·5					161
		·919	61·7					384
		·927	123·7					244
Nov. 24			(+ 18·7)	(91·5)	(+ 1·7)	(261)	(1189)	(3673)
328·446		·983	257·4					301
G		·974	292·1					180
		·969	298·8					88
		·902	249·0					321
1938								
	13080	·981	277·0	157·4	+ 7·2	28	176	378 *c*
	13083	·907	294·6	142·1	+22·9	2	8	246 *c*
	13087	·498	233·6	103·2	−15·7	8	15	
	13088	·239	328·2	86·1	+13·2	5	22	
	13084	·413	7·4	75·3	+25·7	1	2	
	13085	·328	31·8	68·3	+17·6	18	81	
	13086	·701	72·2	35·7	+13·5	214	1192	
	13089	·743	113·6	33·7	−16·1	7	19	318 *f*
		·817	56·8					248
		·908	84·6					116
		·936	127·8					367
		·936	74·3					290
		·941	100·0					239
		·953	58·9					328
Nov. 25			(+ 18·4)	(78·7)	(+ 1·6)	(283)	(1515)	(3420)
329·516		·980	251·4					81
G		·974	293·9					237
		·911	285·6					314
		·844	254·6					203
		·837	242·1					298
		·808	302·2					129
	13087	·677	244·8	103·9	−15·6	6	15	
	13085	·277	352·0	66·9	+17·2	32	140	
	13086	·504	65·2	36·7	+13·4	304	1850	
	13089	·589	122·0	33·3	−16·9	14	62	
		·829	100·3					179
		·845	71·6					409
		·877	56·2					270
		·911	131·2					188
		·937	99·8					159
		·946	75·2					272
Nov. 26			(+ 18·0)	(64·6)	(+ 1·4)	(356)	(2067)	(2739)
330·415		·971	285·9					170
G		·929	256·3					190
		·914	245·9					426
		·913	290·5					250
		·821	243·0					474
	13085	·357	320·5	66·4	+17·2	22	132	
	13086	·365	52·9	35·4	+13·3	374	2090	
	13089	·442	134·6	33·6	−16·8	27	93	
	1139g	·704	105·8	9·4	−10·1	1	3	
	13090	·964	101·5	338·9	−10·7	7	24	308 *f*
		·852	101·3					141
		·853	132·2					249
		·884	74·9					219
		·969	72·1					165
Nov. 27			(+ 17·7)	(52·7)	(+ 1·3)	(431)	(2342)	(2592)

Group 13083. Nov.22–25. A small stream on Nov.22: a single spot on Nov.25.
Group 13084. Nov.22–25. Intermittent: A pair of small spots on Nov.22: a single spot on Nov.25.
Group 13085. Nov.22–30. A small stream of rather slow development, with the largest component in the rear.
Group 13086. Nov.23–Dec.5. An extensive stream, rapid in development, and of approximately normal type. There are vigorous changes, however, altering the appearance of the group from day to day. An extensive lateral offshoot from the leader spot on Nov.26 nearly closes the gap between the leader and follower, and this link, with its train of nuclei, continues for several days as a distinctive feature.
Group 13087. Nov.24–26. A small spot.
Group 13088. Nov.24–25. A tiny cluster.
Group 13089. Nov.24–Dec.4. Initially a small stream of variable spots. A sudden change takes place between Nov.28 and 30, and a large regular spot forms at the head of the stream.
Group 13090. Nov.27–28. One spot on Nov.27: a pair on Nov.28.

POSITIONS AND AREAS OF SUN SPOTS AND FACULÆ FOR EACH DAY IN THE YEAR.

U.T.	Group No.	Measures: Dist.	Measures: Pos. Angle	Position: Long.	Position: Lat.	Area: Umbræ	Area: Whole Spots	Area: Faculæ
			°	°	°			
1938								
331·229		·977	257·1					170
C		·969	289·6					368
		·948	243·8					612
		·860	252·4					224
		·802	280·2					287
	13085	·469	305·2	65·5	+16·7	13	78	
	13086	·252	25·4	35·6	+14·3	346	2302	
	13089	·355	155·2	33·1	−17·5	37	157	
	13090	·900	103·3	338·9	−11·4	7	20	518 *f*
		·927	71·4					272
Nov. 28			(+ 17·4)	(42·0)	(+ 1·2)	(403)	(2557)	(2451)
332·228		·945	243·8					412
C		·892	281·3					543
	13085	·624	295·4	64·6	+16·4	13	51	
	13086	·258	331·9	36·0	+14·2	379	2206	
	13089	·315	190·2	32·1	−16·9	71	505	
	13091	·920	77·9	322·4	+11·5	24	143	606 *c*
		·829	65·0					280
		·850	106·3					494
Nov. 29			(+ 17·0)	(28·8)	(+ 1·1)	(487)	(2905)	(2335)
333·523		·968	283·0					276
G		·943	242·0					321
		·937	256·2					178
		·892	300·8					124
	13085	·811	288·8	64·5	+15·7	3	26	299 *p*
	13086	·456	300·4	35·6	+14·1	306	1947	
	13089	·481	229·9	34·4	−17·1	98	510	
	13091	·773	75·4	322·2	+11·8	20	95	788 *nf*
		·966	66·8					256
Nov. 30			(+ 16·6)	(11·8)	(+ 0·9)	(427)	(2578)	(2242)
334·408		·955	251·6					151
G		·923	288·2					448
		·845	309·2					178
	13086	·617	291·7	36·1	+13·8	273	1774	
	13089	·630	241·3	35·2	−16·9	105	589	
	13091	·633	72·5	322·2	+11·6	22	100	248 *f*
	13092	·964	78·5	285·9	+11·3	13	48	253 *nf*
	13093	·997	100·2	275·0	−10·1	55	396	1012 *p*
		·861	66·5					245
		·942	64·3					782
Dec. 1			(+ 16·2)	(0·1)	(+ 0·8)	(468)	(2907)	(3317)
335·457		·976	286·6					234
G		·952	246·8					167
		·947	257·9					151
		·897	291·9					110
		·897	280·9					92
		·784	301·2					170
	13089	·808	248·0	37·7	−17·2	92	614	335 *c*
	13086	·769	288·2	35·0	+14·3	215	1436	339 *c*
	13094	·676	295·0	27·1	+17·1	1	6	
	13095	·415	50·4	327·9	+15·9	2	5	
	13091	·432	65·4	322·8	+11·0	19	105	
	13092	·874	77·4	286·1	+11·3	9	22	258 *f*
	13093	·954	100·8	274·5	−10·0	149	705	1035 *f*
	13096	·987	68·4	266·3	+21·4	6	21	147 *c*
		·817	62·9					252
		·878	101·0					733
		·922	63·2					339
Dec. 2			(+ 15·8)	(346·3)	(+ 0·7)	(493)	(2914)	(4362)
336·457		·968	290·2					127
G		·968	280·4					127
		·868	300·8					256
	13089	·925	251·0	39·3	−17·3	108	631	608 *c*
	13086	·881	285·8	33·8	+14·1	202	1274 }	756 *c*
	13094	·804	290·0	24·8	+16·2	2	8 }	
	13095	·265	20·8	327·5	+14·8	1	2	
	13091	·239	41·9	323·8	+10·7	22	102	
	13092	·736	75·2	286·8	+11·1	5	13	196 *f*
	13097	·765	104·8	284·4	−10·9	10	45	184 *c*
	13093	·861	102·2	274·5	−10·3	176	731	1213 *f*
	13096	·921	66·3	268·0	+21·9	5	14	149 *f*
		·816	55·6					280
Dec. 3			(+ 15·4)	(333·1)	(+ 0·5)	(531)	(2820)	(3896)
337·469		·928	300·4					245
G	13089	·990	252·2	40·8	−17·5	103	521	511 *f*
	13086	·963	284·4	33·5	+13·9	173	1147	1114 *c*
	13091	·196	336·8	324·3	+10·7	15	97	
	13097	·570	109·0	286·7	−10·3	2	10	
	13093	·725	104·5	274·5	−10·1	189	856	428 *f*
	13096	·815	62·9	268·5	+22·0	6	15	103 *f*
	13098	·968	105·0	245·2	−14·4	4	33	331 *c*
	13099	·981	97·2	241·4	− 7·0	35	284	468 *c*
		·919	84·5					115
		·924	110·8					224
Dec. 4			(+ 15·0)	(319·8)	(+ 0·4)	(527)	(2963)	(3539)

Group 13091. Nov.29–Dec. 7. A regular spot usually with a few companions.
Group 13092. Dec. 1–10. One or two small unstable spots.
Group 13093. Dec. 1–14. Return of Group 13064. A large spot with two main umbræ; there is a "bridge" from north to south between them, and this becomes a line of cleavage by Dec.9.
Group 13094. Dec. 2– 3. One or two small spots in the train of Group 13086.
Group 13095. Dec. 2– 3. A small spot *np* Group 13091.
Group 13096. Dec. 2– 7. A small spot dying out; a companion is present on Dec.6.
Group 13097. Dec. 3–12. A group showing considerable changes between Dec.5 and Dec.11.
Group 13098. Dec. 4– 5. A small spot lasting only two days from the east limb.
Group 13099. Dec. 4–16. Return of Group 13076. A complex spot breaking up completely after Dec.8. One of the parts continues as a small regular spot after Dec.12. (See Group 13106.)

POSITIONS AND AREAS OF SUN SPOTS AND FACULÆ FOR EACH DAY IN THE YEAR.

U.T.	Group No.	Measures: Dist.	Measures: Pos. Angle	Position: Long.	Position: Lat.	Area: Umbræ	Area: Whole Spots	Area: Faculæ
			°	°	°			
1938								
338·511		·979	250·7					259
G		·974	298·4					141
		·940	240·1					151
		·915	253·8					280
		·882	304·4					210
	13086	·994	283·6	29·5	+13·6	57	417	491 *c*
	13091	·348	301·2	323·6	+10·7	19	86	
	1140a	·359	310·3	322·3	+13·7	2	19	
	13097	·370	114·4	286·2	− 8·5	7	58	
	13092	·402	61·4	285·0	+11·4	5	28	
	13093	·545	109·0	274·6	−10·0	146	748	
	13100	·564	96·4	272·0	− 3·4	5	51	
	13096	·673	56·2	269·0	+22·1	3	7	370 *f*
	13098	·881	105·8	245·5	−13·7	2	7	
	13099	·887	97·0	243·9	− 6·1	56	369	372 *f*
		·867	118·1					434
Dec. 5			(+ 14·6)	(306·0)	(+ 0·3)	(302)	(1790)	(2708)
339·500		·976	257·2					146
G		·950	286·4					179
		·948	232·6					175
		·938	301·0					263
		·900	259·1					178
	13101	·633	306·4	326·2	+22·1	11	35	
	13102	·594	240·8	325·6	−16·6	1	2	
	13091	·543	290·2	324·1	+11·0	13	68	
	13092	·224	33·8	285·7	+10·8	5	11	
	13097	·207	139·8	285·3	− 8·9	21	154	
	13093	·363	119·6	274·4	−10·1	126	701	
	13100	·363	103·0	272·3	− 4·5	5	27	
	13103	·489	131·0	270·2	−18·4	2	13	
	13096	·547	46·8	267·6	+22·1	4	8	
	13099	·760	98·8	244·1	− 6·5	40	291	476 *f*
	13104	·943	64·3	224·6	+24·1	6	13	190 *f*
	13105	·987	111·8	213·4	−21·4	53	265	1248 *c*
		·816	112·6					317
Dec. 6			(+ 14·2)	(293·0)	(+ 0·2)	(287)	(1588)	(3172)
340·433		·942	283·2					262
G		·865	255·3					237
	13102	·752	248·0	327·1	−16·3	7	10	264 *p*
	13101	·768	300·0	326·6	+22·5	10	32	
	13091	·697	286·0	323·6	+11·0	6	29	
	13097	·179	210·1	285·9	− 8·9	38	276	
	13092	·225	350·0	283·0	+12·8	0	2	
	13093	·211	148·2	274·2	−10·3	148	646	
1938								
	13103	·344	157·2	272·7	−18·4	1	8	
	13100	·169	115·1	271·9	− 4·1	4	11	
	13096	·450	34·2	265·0	+21·8	1	5	
	13099	·610	100·8	243·8	− 6·5	47	241	
	13106	·758	97·5	231·9	− 5·7	3	10	94 *c*
	13104	·858	62·2	225·1	+23·5	2	4	148 *c*
	13107	·898	108·0	218·2	−16·1	8	19	} 1213 *c*
	13105	·956	111·3	209·2	−20·3	173	689	
		·957	66·8					167
Dec. 7			(+ 13·8)	(280·7)	(0·0)	(448)	(1982)	(2385)
341·236		·941	290·8					128
C		·813	283·5					384
	13102	·861	251·5	328·0	−15·9	4	13	519 *np*
	13101	·855	299·2	325·0	+24·5	4	16	209 *c*
	1140b	·665	260·6	311·2	− 6·3	3	13	
	13097	·319	244·0	286·9	− 8·1	30	214	
	13093	·196	202·1	274·4	−10·5	75	655	
	13099	·456	105·1	243·9	− 6·9	35	200	
	13106	·591	98·9	234·4	− 5·3	8	60	
	13107	·791	110·5	219·8	−16·1	3	17	} 961 *c*
	13105	·920	112·1	205·0	−20·2	136	813	
Dec. 8			(+ 13·5)	(270·1)	(− 0·1)	(298)	(2001)	(2201)
342·421		·969	261·4					66
G		·956	251·3					237
		·947	279·7					534
		·863	281·9					127
		·853	293·6					371
	13101	·949	296·3	323·8	+24·8	6	17	249 *s*
	13097	·555	256·2	287·3	− 7·8	52	289	
	13092	·562	291·1	286·7	+11·5	4	16	
	13093	·378	241·6	274·2	−10·5	117	606	
	1140c	·307	290·5	271·2	+ 6·0	1	6	
	13108	·212	205·0	259·7	−11·2	2	7	
	13099	·196	123·9	245·1	− 6·4	29	96	
	13106	·331	104·4	235·8	− 4·9	40	230	
	13107	·620	116·3	219·3	−16·1	6	13	
	13105	·808	115·1	203·5	−20·1	115	560	1020 *c*
	13109	·787	81·4	203·1	+ 6·6	9	45	79 *c*
	13110	·989	99·3	173·3	− 9·2	56	256	144 *sp*
		·843	72·5					140
		·962	78·5					157
		·986	86·0					158
Dec. 9			(+ 12·9)	(254·5)	(− 0·2)	(437)	(2141)	(3282)

Group 13100. Dec. 5– 7. A short-lived group.
Group 13101. Dec. 6– 9. A small group of stream type.
Group 13102. Dec. 6– 8. A small definite spot.
Group 13103. Dec. 6–14. One or two small spots which have died out by Dec.8. A regular spot with a companion appears in the same place on Dec.11.
Group 13104. Dec. 6– 7. A small spot.
Group 13105. Dec. 6–19. Return of Group 13072. A very long straggling stream in an extensive area of faculæ, headed by a small regular spot. Another regular spot as follower develops a double umbra on Dec.11, and splits up two days later. All the spots have practically died out by the time this great area of disturbance has reached the west limb.
Group 13106. Dec. 7–16. Return of Group 13076. A stream of normal type coming in behind Group 13099. The leader, a regular spot, alone remains by Dec.14.
Group 13107. Dec. 7–15. A pair of small spots, of which one shows unusual persistency for its size, *np* Group 13105. Nothing is seen on Dec.14.
Group 13108. Dec. 9–11. One or two small spots in the wake of Group 13093.
Group 13109. Dec. 9–18. A stream of normal type and of rapid growth. Considerable changes take place between Dec.14 and 15 after which the group rapidly declines.
Group 13110. Dec. 9–21. Return of Group 13075. A stable regular spot with a distant pair of small spots following on Dec.19.

POSITIONS AND AREAS OF SUN SPOTS AND FACULÆ FOR EACH DAY IN THE YEAR.

U.T.	Group No.	MEASURES Dist.	MEASURES Pos. Angle	POSITION Long.	POSITION Lat.	AREA Umbræ	AREA Whole Spots	AREA Faculæ
			°	°	°			
1938								
343·094		·943	284·9					592
K	13092	·693	287·5	287·9	+11·8	6	29	
	13097	·681	258·8	287·8	− 7·8	56	235	
	13093	·506	249·0	274·2	−10·7	91	500	
	13103	·538	230·4	271·7	−20·2	1	5	
	13099	·102	173·3	244·9	− 6·1	23	96	
	13106	·180	116·5	236·3	− 4·9	41	196	
	13107	·516	122·3	218·7	−16·2	5	19	
	13109	·674	80·6	203·8	+ 6·1	32	116	
	13105	·716	118·3	203·6	−20·0	90	471	
	13110	·953	99·6	173·6	− 9·3	52	248	209 *f*
		·962	82·4					648
Dec. 10			(+ 12·7)	(245·6)	(− 0·3)	(397)	(1915)	(1449)
344·528		·950	284·3					103
G		·942	292·1					112
		·883	298·7					173
		·860	309·2					115
		·833	286·2					195
	13097	·882	261·7	288·1	− 7·5	39	175	433 *c*
	13093	·751	256·5	274·4	−10·4	67	420	
	13103	·746	243·3	271·7	−19·9	11	40	
	13108	·547	249·2	258·0	−11·5	2	9	
	13099	·329	252·3	245·0	− 6·2	26	121	
	13106	·204	246·8	237·5	− 5·1	35	129	
	1140d	·385	335·2	236·5	+19·9	5	23	
	13107	·294	151·8	218·5	−15·4	5	18	
	13109	·387	75·0	204·8	+ 5·3	67	345	
	13105	·513	128·9	201·8	−19·1	115	534	
	13110	·805	101·2	173·8	− 9·3	44	243	244 *f*
	13111	·820	77·1	172·6	+10·3	3	10	85 *c*
	13112	·895	79·8	163·9	+ 8·9	14	41	607 *c*
		·796	85·3					107
		·884	58·2					265
		·953	108·4					248
		·966	66·2					165
Dec. 11			(+ 12·0)	(226·7)	(− 0·5)	(433)	(2108)	(2852)
345·461		·953	292·6					212
G		·936	283·5					318
		·933	249·0					133
		·929	303·4					232
		·849	312·4					102
	13097	·964	262·2	288·7	− 7·7	15	62	1032 *c*
	13093	·873	258·3	274·7	−10·5	61	405	477 *c*
	13103	·850	246·5	270·4	−20·1	21	112	361 *nf*
	13099	·526	257·4	245·5	− 7·1	45	249	
	1140e	·431	275·3	239·8	+ 1·8	1	3	
	13106	·410	257·8	238·1	− 5·5	28	127	
	13107	·287	196·6	219·4	−16·5	2	5	
	13109	·154	51·8	207·6	+ 4·9	49	274	
	13105	·390	145·8	201·1	−19·3	137	633	
1938								
	13113	·541	107·4	183·0	− 9·8	11	19	
	13110	·664	103·4	173·8	− 9·3	48	257	
	13112	·760	80·2	165·7	+ 7·0	18	58	259 *c*
		·777	53·4					205
		·868	61·5					238
		·924	108·1					446
		·961	64·6					478
		·983	100·4					85
Dec. 12			(+ 11·6)	(214·5)	(− 0·6)	(436)	(2204)	(4578)
346·449		·978	281·1					153
G		·967	299·4					251
		·966	288·5					124
		·911	279·6					104
		·831	260·3					145
		·820	246·9					76
	13093	·960	259·4	274·7	−10·3	72	347	658 *nf*
	13103	·934	248·7	269·1	−20·1	27	115	398 *nf*
	13099	·698	260·9	245·2	− 6·8	50	313	
	13106	·617	261·6	239·1	− 5·7	24	106	
	13107	·390	226·3	218·4	−16·2	1	4	
	13109	·143	314·9	207·2	+ 5·0	67	248	
	13105	·321	178·5	200·9	−19·4	114	527	
	13113	·342	117·5	183·6	− 9·7	7	14	
	13111	·493	67·0	174·0	+10·4	1	2	
	13110	·484	108·3	173·8	− 9·3	44	236	
	13112	·594	75·8	166·0	+ 7·8	9	19	
	13114	·985	62·9	123·2	+26·5	48	240	118 *s*
		·865	110·7					257
		·899	61·5					319
		·939	101·2					235
		·947	74·8					166
Dec. 13			(+ 11·2)	(201·4)	(− 0·7)	(464)	(2171)	(3004)
347·221	13093	·989	259·9	272·5	−10·1	33	253	429 *f*
C	13103	·975	249·3	267·5	−20·3	18	93	295 *f*
	13099	·817	262·2	245·7	− 6·8	40	205	327 *c*
	13106	·756	262·7	240·0	− 6·0	11	93	
	13109	·300	289·3	207·7	+ 4·9	50	269	
	13105	·358	207·7	201·5	−19·2	82	318	
	13113	·174	146·9	185·8	− 9·1	10	35	
	13110	·334	117·6	173·9	− 9·6	46	233	
	13111	·374	57·7	172·6	+10·7	1	4	
	13112	·479	69·8	164·4	+ 8·8	0	5	
	13114	·944	62·9	123·4	+25·1	94	260	358 *f*
	13115	·995	97·6	107·3	− 7·7	10	29	94 *c*
		·842	61·6					288
		·925	103·7					177
		·951	77·0					251
		·955	115·4					242
Dec. 14			(+ 10·8)	(191·3)	(− 0·8)	(395)	(1797)	(2461)

Group 13111. Dec.11–17. A small spot not seen on Dec.12 and 15.
Group 13112. Dec.11–14. Return of Group 13080. A small group of bi-polar type, the leader being the sole survivor on Dec.4.
Group 13113. Dec.12–19. A pair of small spots becoming a small stream by Dec.5.
Group 13114. Dec.13–25. A stable regular spot with small followers from Dec.15–20.
Group 13115. Dec.14–26. A straggling stream of spots developing as the group comes on to the disk. After Dec.19 the leader grows considerably and there are changes in the other components which markedly alter the appearance of the group within a few days. The stream is rapidly diminishing by the time it reaches the west limb.

POSITIONS AND AREAS OF SUN SPOTS AND FACULÆ FOR EACH DAY IN THE YEAR.

U.T.	Group No.	Measures: Dist.	Measures: Pos. Angle	Position: Long.	Position: Lat.	Area: Umbræ	Area: Whole Spots	Area: Faculæ
			°	°	°			
1938								
348·470		·922	244·6					250
G	13099	·945	263·1	245·4	− 6·8	36	131	585 *c*
	13106	·911	263·5	240·2	− 6·3	20	89	338 *f*
	13107	·738	250·0	220·6	−15·3	0	3	203 *c*
	13109	·559	279·7	208·2	+ 4·6	58	238	
	13105	·522	231·0	200·3	−20·0	54	202	
	13113	·256	235·7	187·1	− 9·3	32	120	
	13110	·150	171·6	173·5	− 9·5	37	234	
	13116	·167	55·3	166·9	+ 4·5	2	6	
	1140f	·639	49·8	142·8	+23·5	3	6	167 *f*
	13114	·846	58·7	121·8	+25·4	48	251	316 *f*
	13117	·879	76·0	114·4	+11·8	4	16	171 *c*
	13115	·920	97·2	108·2	− 7·0	28	105	764 *c*
		·854	109·5					206
		·946	119·0					296
		·978	76·6					204
Dec. 15			(+ 10·3)	(174·8)	(− 1·0)	(322)	(1404)	(3500)
349·333		·860	253·0					305
C	13099	·989	263·5	244·7	− 6·6	26	164 }	431 *f*
	13106	·972	263·7	239·6	− 6·4	17	79 }	
	13109	·738	277·1	210·5	+ 4·5	13	92	
	13105	·615	236·5	196·5	−20·7	24	114	
	13113	·423	250·4	187·1	− 9·1	20	92	
	13110	·227	229·1	173·4	− 9·6	44	234	
	13111	·256	327·7	171·4	+11·3	3	14	
	13114	·754	53·9	121·1	+25·5	62	294	202 *f*
	13117	·730	72·3	118·3	+12·0	6	21	110 *c*
	13115	·823	97·0	108·3	− 6·4	31	122	311 *c*
		·888	118·7					271
		·925	77·0					299
Dec. 16			(+ 9·9)	(163·4)	(− 1·1)	(246)	(1226)	(1929)
350·226	13109	·831	276·2	207·5	+ 4·5	23	128	188 *c*
C	13105	·729	242·8	195·2	−20·2	11	58	1209 *f*
	13113	·592	256·4	187·2	− 9·0	16	84	
	13110	·394	248·4	173·4	− 9·4	34	215	
	13111	·405	302·1	172·1	+11·2	2	6	
	13114	·645	46·2	120·8	+25·4	51	243	
	13117	·587	67·9	118·1	+11·7	7	19	
	13115	·697	96·9	107·8	− 5·6	34	209	120 *c*
		·833	76·8					245
		·958	74·2					179
Dec. 17			(+ 9·5)	(151·7)	(− 1·2)	(178)	(962)	(1941)
351·461	13109	·932	274·8	203·7	+ 4·0	5	38	328 *p*
G	13105	·930	248·7	202·6	−20·2	17	89	1233 *c*
	1140g	·855	275·4	193·7	+ 3·8	4	23	148 *f*
	13113	·796	259·3	187·6	− 9·3	53	190	198 *c*
1938								
	13110	·626	255·9	173·3	− 9·8	36	198	
	13116	·491	285·7	163·7	+ 6·4	4	20	
	13117	·348	47·6	120·2	+12·2	4	19	
	13114	·516	28·0	119·9	+25·7	53	277	
	13115	·464	98·1	108·1	− 5·0	89	455	
		·931	72·0					513
Dec. 18			(+ 8·9)	(135·4)	(− 1·4)	(265)	(1309)	(2420).
352·222		·960	274·4					239
C	13105	·965	249·4	199·5	−20·2	31	94	1154 *s*
	1140h	·913	280·9	190·4	+ 9·3	7	21	59 *f*
	13113	·891	260·3	188·0	− 9·3	28	104	205 *c*
	13118	·824	287·8	179·0	+13·7	4	7	45 *c*
	13110	·751	258·2	173·5	− 9·8	34	198	
	13114	·463	10·7	120·0	+25·5	61	310	
	13115	·279	103·1	109·6	− 5·0	76	384	
	13119	·997	76·3	40·4	+13·5	79	317	343 *p*
		·891	73·9					410
Dec. 19			(+ 8·5)	(125·4)	(− 1·5)	(320)	(1435)	(2455)
353·454		·980	278·6					187
G		·974	259·8					282
		·902	275·6					275
		·865	305·1					257
		·807	283·2					365
	13118	·948	284·3	179·4	+13·0	37	184	299 *f*
	13110	·905	259·7	173·5	−10·0	41	264	134 *f*
	1140i	·908	249·7	173·1	−19·0	11	26	123 *c*
	13114	·484	341·0	119·1	+25·6	52	322	
	13115	·058	178·5	109·0	− 4·9	85	501	
	1140j	·316	46·8	95·6	+10·9	5	23	
	13119	·940	75·3	40·3	+13·2	59	280	
	13120	·918	108·4	43·4	−17·5	16	32 }	496 *c*
	13121	·946	107·8	38·7	−17·3	76	555 }	
	13122	·979	75·6	31·9	+13·7	58	442	794 *c*
		·801	71·6					216
		·890	76·6					615
		·971	65·4					266
Dec. 20			(+ 8·0)	(109·1)	(− 1·6)	(440)	(2629)	(4309)
354·243		·962	250·4					169
C		·924	301·5					203
		·900	279·9					214
	13118	·992	283·8	180·7	+13·4	31	138	288 *f*
	13110	·966	260·3	173·6	− 9·8	36	194	262 *f*
	13114	·557	325·5	119·2	+25·6	43	286	
	13115	·206	254·3	110·2	− 4·9	101	573	
	1140k	·596	108·0	63·5	−11·9	2	5	

Group 13116. Dec.15–18. One or two very small spots seen only on Dec.15 and 18, near the position of Group 13112.
Group 13117. Dec.15–18. A group of unstable spots.
Group 13118. Dec.19–21. A pair of spots developing near the west limb.
Group 13119. Dec.19–31. Return of Group 13086. A spot of nearly regular outline, but with double umbra, closely preceding Group 13122.
Group 13120. Dec.20–26. A small regular spot preceding Group 13121.
Group 13121. Dec.20–Jan.1. Return of Group 13089. A stable regular spot, with a pair of companions south of it until Dec.24.
Group 13122. Dec.20–Jan.1. Return of Group 13086. A fairly large stream of spots in which at first the following component dominates. Later, a regular spot becomes established as the leader.

POSITIONS AND AREAS OF SUN SPOTS AND FACULÆ FOR EACH DAY IN THE YEAR.

U.T.	Group No.	Measures Dist.	Measures Pos. Angle	Position Long.	Position Lat.	Area Umbræ	Area Whole Spots	Area Faculæ
1938			°	°	°			
	13120	·828	110·8	44·5	−18·1	9	58	576 c
	13121	·877	109·5	38·8	−17·8	77	452	
	13119	·867	73·8	40·3	+13·1	46	291	690 c
	13122	·928	74·8	32·0	+13·4	51	298	
		·942	64·7					676
Dec. 21			(+ 7·6)	(98·8)	(− 1·7)	(396)	(2295)	(3078)
355·416 C		·959	277·2					291
		·899	299·0					165
	11401	·792	302·2	130·2	+23·6	11	34	120 c
	13114	·694	310·9	118·7	+25·4	48	248	
	13115	·459	262·4	110·4	− 5·1	100	876	
	13120	·649	116·4	45·7	−18·2	5	32	
	13119	·714	69·5	40·1	+13·1	36	266	251 c
	13122	·818	72·3	30·3	+13·2	61	397	
	13121	·733	113·0	38·3	−17·9	99	484	533 f
		·877	62·9					474
Dec. 22			(+ 7·0)	(83·3)	(− 1·9)	(360)	(2337)	(1834)
356·259 C		·941	245·1					123
		·930	299·8					466
		·802	291·3					95
	13114	·791	304·7	118·0	+25·3	51	225	201 c
	13115	·624	264·7	110·6	− 4·8	105	814	
	13120	·508	123·5	45·9	−18·0	6	28	
	13119	·576	63·7	40·3	+13·0	28	217	
	13121	·605	118·0	38·2	−18·1	59	525	
	13122	·697	68·6	30·6	+13·2	69	467	
		·814	100·9					117
		·898	61·1					236
Dec. 23			(+ 6·6)	(72·2)	(− 2·0)	(318)	(2276)	(1238)
357·234 C		·944	295·0					345
		·860	247·5					223
		·844	287·6					194
	13114	·891	300·4	117·7	+25·7	48	244	311 nf
	13115	·786	265·2	111·1	− 5·0	112	666	251 c
	13123	·359	335·2	68·4	+16·9	3	5	
	13120	·343	139·8	46·1	−17·2	7	17	
	13119	·416	51·6	39·9	+12·9	41	219	
	13121	·448	128·9	38·0	−18·2	88	453	
	1140m	·596	43·9	32·7	+23·5	1	5	
	13122	·546	61·5	30·0	+13·2	129	594	
	13124	·982	92·4	340·5	− 2·8	44	199	145 c
		·901	57·7					155
		·947	74·9					145
		·952	101·6					151
Dec. 24			(+ 6·2)	(59·4)	(− 2·1)	(473)	(2402)	(1920)
358·318 C		·969	252·9					145
		·959	283·5					218
		·894	243·2					300
		·854	284·5					178
1938			°	°	°			
	13114	·965	297·3	116·9	+25·6	32	137	416 nf
	13115	·921	265·8	112·0	− 4·7	79	455	588 c
	13123	·494	303·1	70·2	+13·7	2	6	
	13120	·253	182·4	45·7	−16·7	4	22	
	13119	·275	19·3	39·8	+12·8	28	150	
	13121	·308	156·2	37·6	−18·4	69	379	
	13122	·372	44·1	29·7	+13·3	77	496	424 f
	13124	·905	91·8	340·5	− 2·5	29	116	
		·859	74·9					161
		·867	102·4					250
		·966	75·9					198
Dec. 25			(+ 5·7)	(45·1)	(− 2·2)	(320)	(1761)	(2878)
359·337 C		·952	248·9					267
		·917	236·2					206
		·894	286·5					278
		·843	260·6					96
		·841	248·1					115
	13115	·987	265·2	112·3	− 5·1	37	222	736 f
	13125	·599	301·8	63·6	+16·3	2	17	
	13120	·345	223·3	45·9	−16·8	1	4	
	13119	·294	332·3	39·7	+12·7	26	147	
	13121	·298	199·2	37·6	−18·7	86	409	
	13122	·265	6·5	29·9	+12·8	56	445	
	13124	·778	91·2	340·8	− 2·4	33	156	250 f
		·915	72·0					358
Dec. 26			(+ 5·2)	(31·7)	(− 2·4)	(241)	(1400)	(2306)
360·328 C		·972	242·9					261
		·971	258·1					107
		·961	284·6					147
		·845	287·9					145
	13125	·749	293·7	63·8	+15·7	35	210	
	13126	·558	302·6	47·6	+15·2	4	7	
	13119	·437	305·5	39·9	+12·4	27	151	
	13121	·416	227·3	37·4	−18·7	64	358	
	13122	·344	318·5	32·0	+12·4	70	417	
	13124	·612	90·7	341·0	− 2·4	22	159	
		·901	71·3					285
Dec. 27			(+ 4·7)	(18·6)	(− 2·5)	(222)	(1302)	(945)
361·470 G		·933	284·9					178
	13125	·892	289·4	64·4	+15·9	22	141	325 c
	13126	·741	293·0	48·3	+14·9	3	8	
	13127	·638	288·6	41·3	+ 9·7	18	52	
	13119	·630	294·0	39·6	+12·7	26	116	
	13121	·598	241·2	37·1	−18·8	64	317	
	13122	·531	299·0	31·9	+12·6	79	429	
	1140n	·542	325·9	23·0	+24·1	2	9	
	13124	·385	89·8	341·0	− 2·3	29	137	
		·840	59·2					178
		·937	90·6					228
		·944	100·8					486
		·971	64·9					176
Dec. 28			(+ 4·1)	(3·6)	(− 2·6)	(243)	(1209)	(1571)

Group 13123. Dec.24–25. A single spot on each day differing a couple of degrees in latitude.
Group 13124. Dec.24–Jan.5. A stable regular spot with a tiny distant follower on Dec.29.
Group 13125. Dec.26–29. A pair of spots, the leader being the more stable.
Group 13126. Dec.26–27. A short-lived spot.
Group 13127. Dec.27–30. A pair of spots *sp* Groups 13119 and 13122.

POSITIONS AND AREAS OF SUN SPOTS AND FACULÆ FOR EACH DAY IN THE YEAR.

U.T.	Group No.	MEASURES Dist.	MEASURES Pos. Angle	POSITION Long.	POSITION Lat.	AREA Umbræ	AREA Whole Spots	AREA Faculæ
			°	°	°			
1938								
362·234		·867	286·7					376
C	13125	·958	287·9	65·0	+16·3	10	43	514 *f*
	13127	·769	285·3	42·1	+ 9·9	6	23	
	13119	·750	289·7	39·7	+12·8	20	119	
	13121	·714	245·8	36·8	−18·9	62	335	
	13122	·656	293·2	31·5	+12·8	66	365	
	13124	·221	88·6	340·8	− 2·3	29	147	
	13128	·994	102·2	269·5	−12·4	57	312	315 *p*
		·862	98·2					368
		·908	67·2					296
		·935	108·7					320
		·961	60·2					296
		·962	92·6					225
Dec. 29			(+ 3·8)	(353·5)	(− 2·7)	(250)	(1344)	(2710)
363·468		·974	283·1					399
G		·921	293·0					123
		·814	300·1					372
	13127	·908	282·2	41·2	+ 9·8	11	26	342 *c*
	13119	·899	285·7	39·5	+12·7	17	97	
	13121	·872	249·6	36·9	−19·1	64	329	385 *c*
	13122	·849	286·6	33·4	+12·4	49	267	308 *c*
	13124	·067	275·9	341·0	− 2·5	29	166	
	13128	·930	102·6	268·9	−12·8	88	510 }	815 *c*
	13129	·982	100·2	258·0	−10·5	5	23 }	
		·809	67·7					92
		·820	106·5					338
		·852	93·7					308
		·869	76·6					151
		·875	56·6					445
		·946	112·0					198
Dec. 30			(+ 3·2)	(337·2)	(− 2·9)	(263)	(1418)	(4276)
1938								
364·463		·977	279·0					347
G		·913	295·8					419
	13119	·972	284·0	39·1	+12·8	19	94 }	759 *c*
	13122	·943	284·3	33·1	+12·4	36	204 }	
	13121	·954	250·7	36·3	−19·3	67	312	428 *f*
	13124	·294	270·4	341·1	− 2·8	23	136	
	13128	·826	103·2	268·8	−12·6	97	496	554 *nf*
	13129	·915	100·3	258·0	−10·6	5	18	426 *f*
	13130	·982	105·9	244·9	−16·1	28	150	206 *f*
		·877	114·8					267
		·883	52·2					138
		·980	68·3					133
Dec. 31			(+ 2·7)	(324·1)	(− 3·0)	(275)	(1410)	(3677)

Group 13128. Dec.29–Jan.10. Return of Group 13093: 3rd appearance. A large regular spot with one or more small companions on Jan.1 and 8.
Group 13129. Dec.30–31. A small spot following Group 13128.
Group 13130. Dec.31–Jan.11. A regular spot followed by a composite spot that divides up and becomes a short stream.

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ROYAL OBSERVATORY, GREENWICH.

General Catalogue of Groups of Sun Spots

For the Year

1938

GENERAL CATALOGUE OF GROUPS OF SUN SPOTS FOR THE YEAR 1938.

Groups of Sun Spots, lasting for two or more days, are numbered in the *first* column in continuation of the Group-numbers given in 1937 and the previous years. Groups seen only once are not included in this Catalogue but are given with a distinctive enumeration in a following table on p. C.81.

The *second* column gives the U.T. of the central meridian passage of each group as deduced from its mean longitude (given in the *tenth* column). For those groups, which are in existence at the time of the central meridian passage of their longitude, the time is given to $0^d \cdot 01$, corresponding to $0^\circ \cdot 13$ of solar longitude. In other cases, in which groups disappear before or appear after the central meridian, the deduced time is given to $0^d \cdot 1$.

The *third* column gives the duration of each group in days. Intermittent Groups, *i.e.*, Groups which are not seen upon the photographs of every day between their first and last appearances, are indicated by a fraction, the numeration of which represents the number of days on which they are actually observed, the denominator being the interval in days between the extreme limits of observation.

The *fifth* and *seventh* columns, headed "Longitude from Central Meridian", give, for the days on which each Group was first and last seen respectively, the heliographic longitude from the meridian passing through the centre of the Sun's disk at the time of observation; longitudes west of the centre being reckoned as positive.

The mean Areas for Umbræ and Whole Spots entered in the *eighth* and *ninth* columns are corrected for the effect of foreshortening and are expressed in millionths of the Sun's visible hemisphere.

The *tenth* and *eleventh* columns give the mean heliographic position of the Group in longitude and latitude respectively.

The *twelfth* column gives reference to all Groups contained in Ledgers I and II; for a Group in Ledger I both its recurrent series number and its order in the series are also given.

With reference to the identification both of Recurrent and Revival Groups, it should be noted that longitudes are based on the ephemeris given in the *Nautical Almanac*, assuming a solar rotation period constant at all latitudes. After an interval of one rotation, recurring groups will, therefore, show in general – apart from any proper motion they may have of their own – apparent drifts in longitude varying in amount according to their respective latitudes. The following table derived from the formula $\xi = 14^\circ \cdot 37 - 2^\circ \cdot 60 \sin^2 \phi$ gives the apparent drift in longitude appropriate to corresponding latitudes after an interval of 27 days.

Latitude.	Drift. *forwards.*	Latitude.	Drift. *backwards.*
0°	5°	20°	3°
5°	$4 \cdot 5$	25°	$7 \cdot 5$
10°	3	30°	$12 \cdot 5$
15°	$0 \cdot 5$	35°	18

GENERAL CATALOGUE OF SUN SPOTS

No. of Group	U.T. of Central Meridian Passage	Duration in Days	First Seen		Last Seen		Mean Area Corrected for Foreshortening		Mean Position of Group		Reference to Ledger
			Date	Longitude from Central Meridian	Date	Longitude from Central Meridian	Umbræ	Whole Spots	Longitude	Latitude	
	1938		1938	°	1938	°			°	°	
12662	Jan. 1·3	2	Jan. 1	+ 2	Jan. 2	+14	4	24	90·5	+15·5	
63	7·04	12	2	-64	13	+73	71	407	15·0	+12·8	II.
64	2·6	5	4	+26	8	+73	33	194	73·0	+36·7	
12665	10·2	2/4	5	-63	8	-23	2	6	334·1	+ 7·6	
66	11·44	13	5	-77	17	+79	109	731	317·1	+19·7	II.
67	10·80	10	6	-61	15	+62	18	66	325·5	+ 8·2	II.
68	11·48	8	6	-69	13	+20	6	26	316·6	-14·0	II.
69	10·83	6	7	-47	12	+22	3	17	325·2	+18·5	II.
12670	11·54	5	7	-57	11	+ 1	14	58	315·8	+24·2	
71	13·33	7	9	-50	15	+27	7	30	292·2	-15·3	II.
72	17·52	11	11	-77	21	+49	22	132	237·1	+26·5	I.1219 (2)
73	18·43	13	12	-81	24	+75	520	2955	225·1	+17·1	I.1224 (1)
74	19·5	6	14	-70	19	0	18	87	210·4	+13·4	II.
12675	19·18	6	15	-49	20	+13	4	20	215·2	+18·8	
76	20·7	3	15	-70	17	-44	3	14	194·7	- 9·9	
77	19·5	3	17	-28	19	- 1	1	11	210·4	+ 4·1	
78	23·41	11	18	-72	28	+66	17	81	159·5	-19·8	I.1220 (2)
79	21·60	9	19	-31	27	+79	26	120	183·3	-10·2	II.
12680	24·0	4/5	19	-60	23	- 7	2	11	152·0	-11·8	
81	24·7	4	19	-69	22	-30	8	38	142·9	-13·8	I.1221 (2)
82	26·54	13	20	-79	Feb. 1	+76	28	168	118·3	+20·1	I.1222 (2)
83	21·7	4	22	+ 6	Jan. 25	+49	7	17	181·4	+ 7·0	
84	23·33	7	22	-15	28	+68	12	52	160·5	+11·8	II.
12685	26·4	3	22	-53	24	-28	5	17	120·0	- 7·8	
86	28·0	5	22	-69	26	-21	7	27	99·4	-13·5	I.1223 (2)
87	27·9	3	22	-74	24	-47	6	13	99·8	- 6·4	
88	26·22	3/5	23	-36	27	+17	3	10	122·5	+29·5	
89	29·0	2	23	-75	24	-59	10	40	86·3	+17·8	
12690	26·64	2	26	- 3	27	+11	2	4	117·0	+14·2	
91	29·3	3	26	-38	28	-16	11	31	81·7	+19·5	
92	Jan. 29·3	2	26	-36	27	-25	17	60	82·4	+27·0	
93	Feb. 2·42	13	27	-78	Feb. 8	+80	98	574	27·8	+12·8	I.1225 (1)
94	Jan. 25·8	4	28	+31	Jan. 31	+73	44	218	128·6	+12·3	
12695	Jan. 30·15	3	29	- 8	31	+12	6	19	70·8	+25·8	
96	Feb. 3·60	6/10	29	-69	Feb. 7	+49	7	32	12·2	- 5·3	II.
97	5·58	12	31	-70	11	+77	56	297	346·1	-10·8	II.
98	Jan. 30·6	5	Feb. 1	+22	5	+75	11	37	64·4	+ 8·3	
99	Feb. 8·36	11	2	-79	12	+53	9	34	309·5	-16·7	II.
12700	9·89	10	3	-84	12	+33	22	110	289·4	-20·7	II.
01	1·6	3	4	+37	6	+63	4	14	38·6	-24·5	
02	9·18	8	4	-62	11	+30	2	12	298·7	-19·6	
03	10·14	13	4	-72	16	+81	122	850	286·1	-24·8	I.1226 (1)
04	3·9	2	6	+33	7	+48	6	22	8·9	-17·0	
12705	8·2	2	7	- 8	8	- 1	3	12	311·5	+21·5	
06	13·42	12	7	-79	18	+66	19	106	242·9	+14·5	} I.1224 (2)
07	14·65	13	8	-77	20	+81	75	541	226·8	+15·0	
08	14·79	11	9	-77	19	+64	9	46	224·9	- 5·3	II.
09	8·1	3/4	10	+31	13	+69	2	8	312·4	+12·8	

GENERAL CATALOGUE OF SUN SPOTS

No. of Group	U.T. of Central Meridian Passage	Duration in Days	First Seen		Last Seen		Mean Area Corrected for Foreshortening		Mean Position of Group		Reference to Ledger
			Date	Longitude from Central Meridian	Date	Longitude from Central Meridian	Umbræ	Whole Spots	Longitude	Latitude	
	1938		1938	°	1938	°			°	°	
12710	Feb. 16·34	13	Feb. 10	-79	Feb. 22	+73	39	199	204·4	-10·8	II.
11	17·24	9	11	-74	19	+22	11	56	192·6	-29·5	II.
12	17·19	13	11	-76	23	+85	44	244	193·2	- 8·3	II.
13	17·1	2	12	-64	13	-46	4	16	194·4	-23·4	
14	17·50	11	12	-69	22	+65	13	73	189·2	-10·4	II.
12715	17·49	11	12	-71	22	+70	28	142	189·4	+ 7·2	II.
16	18·08	12	12	-76	23	+71	46	279	181·6	-13·1	II.
17	17·3	5	13	-50	17	0	10	27	192·5	-21·0	
18	15·39	6	14	-12	19	+56	6	32	216·9	- 6·1	
19	16·74	4	14	-30	17	+ 6	3	15	199·2	+13·6	
12720	21·08	8	16	-62	23	+30	8	40	142·0	- 8·3	II.
21	24·19	13	18	-75	Mar. 2	+82	38	228	101·0	-17·4	II.
22	26·94	7/10	21	-76	2	+45	10	38	64·8	+ 5·5	II.
23	18·3	3	22	+51	Feb. 24	+81	32	96	178·2	-27·0	
24	21·2	6	22	+13	27	+82	38	196	140·6	-26·4	II.
12725	23·62	5	22	-18	26	+38	8	27	108·6	-15·2	
26	19·2	3	23	+55	25	+80	28	115	167·0	+ 6·2	
27	Mar. 1·38	8/9	23	-79	Mar. 3	+30	11	54	32·8	+12·0	I.1225 (2)
28	1·4	2/6	24	-63	1	- 2	1	2	33·2	-25·2	
29	Feb. 26·71	7	25	-17	3	+59	24	111	67·9	+22·8	II.
12730	23·5	4	26	+39	1	+76	28	135	109·8	- 7·0	I.1227 (1)
31	27·76	8	27	- 6	6	+83	64	362	54·0	-14·1	I.1228 (1)
32	Mar. 6·78	10/12	Mar. 1	-73	12	+75	8	30	321·6	-18·2	II.
33	9·44	13	3	-78	15	+75	59	286	286·4	-26·0	I.1226 (2)
34	10·17	12	4	-75	15	+68	85	586	276·9	+22·5	II.
12735	5·6	5	6	+11	10	+63	10	36	337·5	+23·9	
36	12·96	12	7	-73	18	+73	27	132	240·2	+ 8·2	II.
37	10·33	3	8	-25	10	+ 3	1	9	274·8	-29·0	
38	12·70	11	8	-62	18	+79	79	411	243·5	- 9·0	I.1229 (1)
39	13·20	4/5	9	-51	13	+ 6	2	8	237·0	+16·6	
12740	13·8	3	9	-56	11	-33	3	8	229·3	+26·3	
41	15·36	13	9	-77	21	+76	17	86	208·6	+23·8	II.
42	10·0	6	10	+ 6	15	+69	20	84	278·7	-23·4	II.
43	16·5	2	11	-68	12	-52	14	66	193·6	-17·8	
44	16·99	11	11	-73	21	+57	25	118	187·1	-23·8	II.
12745	8·6	2	13	+68	14	+76	10	28	298·0	-10·6	
46	17·3	2	13	-47	14	-39	3	12	183·2	+ 9·4	
47	18·7	3/4	13	-66	16	-28	4	13	164·8	-11·0	
48	17·63	4	14	-43	17	+ 1	3	10	178·6	-26·6	
49	13·2	3	15	+28	17	+58	4	23	236·7	+13·1	
12750	14·8	4	16	+20	19	+62	12	47	215·4	+ 5·6	
51	20·3	3	16	-50	18	-24	11	34	143·3	-11·6	
52	21·2	4	16	-62	19	-24	7	14	131·7	+ 6·1	
53	21·5	4/5	16	-66	20	-14	6	16	128·0	+12·1	
54	22·30	12	16	-78	27	+69	42	250	117·0	- 7·5	I.1227 (2)
12755	15·4	4	18	+42	21	+76	22	108	208·4	+27·5	
56	20·2	2	20	+ 1	21	+17	3	17	144·8	- 3·4	
57	26·93	14	20	-77	Apr. 2	+78	253	1365	55·9	-14·6	I.1228 (2)
58	17·6	3	21	+47	Mar. 23	+79	9	24	178·3	+27·1	I.1230 (1)
59	22·7	2	23	+ 9	24	+22	2	12	111·4	- 4·0	

GENERAL CATALOGUE OF SUN SPOTS

No. of Group	U.T. of Central Meridian Passage	Duration in Days	First Seen: Date	First Seen: Longitude from Central Meridian	Last Seen: Date	Last Seen: Longitude from Central Meridian	Mean Area Corrected for Foreshortening: Umbræ	Mean Area Corrected for Foreshortening: Whole Spots	Mean Position of Group: Longitude	Mean Position of Group: Latitude	Reference to Ledger
	1938		1938	°	1938	°			°	°	
12760	26·0	3	Mar. 23	-33	Mar. 25	-10	3	9	68·8	- 4·4	
61	20·6	3	24	+49	26	+76	7	34	138·8	-42·1	II.
62	Apr. 2·36	13	27	-79	Apr. 8	+80	65	340	331·2	-20·6	I.1231 (1)
63	2·62	7/9	28	-68	5	+34	3	17	327·7	-15·7	II.
64	Mar. 29·81	4	29	- 8	1	+36	7	27	18·0	-20·0	
12765	Apr. 3·27	2/8	29	-65	5	+28	1	4	319·2	-20·0	
66	5·79	7	31	-73	6	+ 9	7	26	285·9	+18·5	II.
67	6·64	14	31	-80	13	+85	22	111	274·7	-27·6	I.1226 (3)
68	6·72	9	31	-83	8	+22	42	218	273·6	-22·7	II.
69	5·7	2/5	Apr. 1	-58	5	- 2	2	6	287·6	+15·0	
12770	5·61	7	2	-43	8	+36	6	26	288·3	+ 8·6	II.
71	6·9	2	2	-59	3	-46	2	6	271·3	+25·0	
72	8·40	13	2	-79	14	+79	33	168	251·5	- 9·7	I.1229 (2)
73	9·2	2	3	-75	4	-64	16	33	241·5	+12·0	
74	9·75	5	6	-44	10	+ 8	13	30	233·6	- 6·8	
12775	11·69	12	6	-74	17	+81	77	400	208·0	- 5·4	I.1232 (1)
76	13·51	11	8	-67	18	+64	15	73	184·0	+25·0	II.
77	14·22	13	8	-75	20	+73	188	1098	174·6	+26·6	I.1230 (2)
78	16·27	14	9	-88	22	+78	106	625	147·5	-23·9	I.1233 (1)
79	16·18	13	10	-76	22	+82	52	284	148·8	-11·0	II.
12780	12·2	5	12	+ 2	16	+54	12	45	201·4	+ 8·0	
81	21·27	13	15	-81	27	+83	121	690	81·5	-10·2	I.1234 (1)
82	21·1	2	16	-62	17	-50	6	14	83·6	+25·8	
83	22·75	13	16	-84	28	+75	96	516	62·0	-13·2	I.1228 (3)
84	22·61	8	16	-84	23	+ 9	12	60	63·8	- 8·4	II.
12785	23·79	13	17	-83	29	+73	17	74	48·2	-16·0	I.1228 (3)
86	20·5	2	18	-29	19	-14	8	18	91·4	-16·4	
87	25·0	2	19	-72	20	-60	12	24	32·8	+12·4	
88	18·5	2	21	+38	22	+52	7	28	118·6	+18·6	
89	28·72	12	23	-74	May 4	+76	34	175	343·1	+ 8·2	II.
12790	28·81	8	23	-76	Apr. 30	+21	27	126	342·0	-10·2	II.
91	28·39	11	24	-50	May 4	+81	67	359	347·5	+12·2	II.
92	29·61	12	24	-64	5	+74	18	90	331·4	-18·7	I.1231 (2)
93	27·19	5	25	-21	Apr. 29	+32	10	35	3·2	+23·9	
94	May 3·11	14	26	-84	May 9	+82	85	397	285·0	-28·5	I.1235*(1)
12795	3·18	12	27	-77	8	+70	30	144	284·2	-19·6	II.
96	3·24	13	27	-75	9	+84	38	223	283·4	+23·1	I.1235 (1)
97	3·7	4	28	-70	1	-30	5	20	277·6	-25·3	
98	4·05	5	28	-74	2	-22	15	72	272·6	-30·2	I.1226 (4)
99	4·25	12	28	-78	9	+70	36	184	270·0	+24·3	II.
12800	4·65	13	28	-79	10	+73	29	141	264·7	-22·8	II.
01	3·2	2	May 1	-24	2	-10	6	14	284·2	+11·0	
02	3·79	8	2	-19	9	+76	40	206	276·1	-22·3	II.
03	8·13	8	2	-77	9	+19	17	54	218·7	- 4·6	I.1232 (2)
04	Apr. 29·7	2	4	+63	5	+73	12	50	330·0	+20·5	
12805	May. 6·65	10	4	-31	13	+86	33	151	238·3	-34·6	II.
06	7·32	7	4	-35	10	+36	21	98	229·4	-38·6	II.
07	8·5	2/3	4	-54	6	-28	2	7	213·6	- 8·2	
08	10·36	13	4	-78	16	+79	122	713	189·2	- 7·3	I.1236 (1)
09	9·37	8/9	5	-51	13	+50	6	21	202·2	+23·4	II.

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No. of Group	U.T. of Central Meridian Passage	Duration in Days	First Seen		Last Seen		Mean Area Corrected for Foreshortening		Mean Position of Group		Reference to Ledger
			Date	Longitude from Central Meridian	Date	Longitude from Central Meridian	Umbræ	Whole Spots	Longitude	Latitude	
	1938		1938	°	1938	°			°	°	
12810	May 11·69	12	May 5	-82	May 16	+60	14	69	171·6	+23·8	I.1230 (3)
11	7·8	2	6	-19	7	- 4	2	12	222·6	- 6·0	
12	11·4	2/5	6	-67	10	-13	1	3	175·0	-23·4	
13	8·85	8	7	-18	14	+71	13	48	209·2	+22·4	II.
14	13·03	12	7	-73	18	+67	55	252	153·9	+24·6	II.
12815	10·32	5/6	8	-25	13	+43	5	15	189·8	-10·7	
16	10·87	6	8	-34	13	+32	15	54	182·4	+16·6	II.
17	14·34	13	8	-77	20	+78	50	283	136·6	-23·8	I.1233 (2)
18	12·8	2	9	-42	10	-34	6	17	156·6	-13·0	
19	15·11	13	9	-75	21	+82	23	111	126·4	+15·9	II.
12820	15·50	8	9	-78	16	+12	13	46	121·2	-19·0	II.
21	17·01	14	10	-86	23	+84	88	500	101·0	-11·8	I.1237 (1)
22	18·09	14	11	-84	24	+83	39	202	87·0	- 9·6	I.1234 (2)
23	20·10	13	14	-75	26	+81	64	344	60·4	-14·1	I.1228 (4)
24	20·1	2	16	-49	17	-36	10	28	60·9	-19·0	
12825	21·83	11	17	-58	27	+74	66	306	37·4	-13·3	II.
26	24·76	13	18	-83	30	+78	81	450	358·7	-15·8	II.
27	24·94	10	20	-59	29	+56	23	113	356·4	-25·4	II.
28	26·0	3	21	-61	23	-37	5	9	342·0	-30·3	
29	23·80	9	21	-22	30	+82	205	1090	11·5	+ 8·0	I.1238 (1)
12830	25·7	2	22	-43	23	-31	2	4	346·8	+ 8·6	
31	28·0	4/5	22	-74	26	-24	6	22	315·4	+ 6·2	
32	23·0	5	23	+ 4	27	+56	13	43	21·6	+10·7	
33	23·0	5	23	+ 4	27	+59	14	39	21·3	-28·0	
34	24·4	2	23	-13	24	- 1	2	8	3·8	+ 5·4	
12835	29·4	6	23	-81	28	-12	13	35	297·5	+10·6	II.
36	30·6	3	25	-69	27	-43	9	36	282·0	+16·6	
37	30·52	12	25	-69	June 5	+72	11	45	282·5	+20·5	I.1235 (2)
38	26·69	7	26	- 6	1	+77	40	210	333·2	+20·7	II.
39	31·1	2	26	-62	May 27	-50	5	12	275·4	-29·3	I.1235*(2)
12840	31·00	7	29	-24	June 4	+59	27	131	276·1	- 7·0	II.
41	June 2·53	10	29	-56	7	+71	48	211	242·8	+27·5	II.
42	May 28·1	2	30	+30	May 31	+40	5	17	314·4	+ 9·0	
43	30·63	5	30	- 5	June 3	+50	9	46	281·1	-20·2	
44	June 6·34	13	31	-83	12	-81	50	268	192·3	- 6·4	I.1236 (2)
12845	2·99	4	June 1	-22	4	+19	2	8	236·6	+ 3·4	
46	3·18	3/5	1	-24	5	+30	4	17	234·1	+26·5	
47	3·19	7	1	-25	7	+59	18	76	233·9	+ 4·2	II.
48	8·16	12	2	-79	13	+71	25	108	168·2	-18·5	II.
49	4·95	3	4	- 8	6	+19	10	32	210·6	- 4·8	
12850	9·92	7	5	-56	11	+19	11	32	144·9	+36·9	II.
51	11·55	13	5	-83	17	+80	109	581	123·3	+14·8	I.1239 (1)
52	10·62	11	6	-60	16	+77	14	51	135·6	+12·9	II.
53	6·8	6	7	+10	12	+75	23	103	185·9	+23·3	II.
54	7·71	2	7	- 3	8	+11	4	11	174·2	+19·5	
12855	8·63	3	7	-14	9	+ 9	3	14	161·9	+19·8	
56	11·40	6	7	-56	12	+12	10	32	125·2	+11·3	II.
57	13·0	5	7	-73	11	-21	16	86	104·7	- 9·9	I.1237 (2)
58	3·4	2	8	+69	9	+78	20	50	231·2	- 5·0	
59	12·1	3	8	-47	10	-23	5	22	115·5	+22·1	

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			Date	Longitude from Central Meridian	Date	Longitude from Central Meridian	Umbrae	Whole Spots	Longitude	Latitude	
	1938		1938	°	1938	°			°	°	
12860	June 11·05	2	June 10	- 8	June 11	+ 3	4	8	129·9	+13·7	
61	15·7	5	10	-69	14	-20	11	32	68·3	+16·7	
62	16·53	11	11	-68	21	+65	9	25	57·4	-15·8	I.1228 (5)
63	11·1	3	12	+17	14	+43	11	35	129·6	-24·2	
64	13·2	4/5	13	+ 5	17	+55	3	7	101·0	-12·2	
12865	16·4	4	13	-41	16	- 2	6	16	58·6	-18·6	
66	17·76	8/10	13	-57	22	+59	6	21	41·1	+14·7	II.
67	18·98	13	13	-76	25	+85	74	390	24·9	+ 6·1	I.1238 (2)
68	17·84	8/10	14	-48	23	+72	9	24	40·0	+20·7	II.
69	10·3	2	14	+54	15	+67	4	12	140·3	+ 4·2	
12870	15·3	3	15	+ 2	17	+25	1	7	73·1	+10·5	
71	22·4	3	16	-80	18	-53	9	20	340·3	+ 4·6	
72	20·39	3/5	17	-39	21	+13	3	7	6·3	+13·2	
73	22·54	12	17	-70	28	+81	129	669	337·9	+ 6·1	I.1240 (1)
74	24·6	4/5	19	-71	23	-16	5	15	310·2	+ 8·0	
12875	18·6	2	20	+24	21	+37	2	5	30·2	+ 8·2	
76	21·72	4/6	20	-19	25	+50	2	9	348·6	- 7·6	
77	22·73	9	21	-20	29	+81	71	353	335·3	+22·6	II.
78	22·69	3	21	-20	23	+11	4	8	335·9	+14·0	
79	22·3	4	22	+ 2	25	+40	14	48	341·4	-19·2	
12880	27·50	4	26	-17	29	+28	8	22	272·2	+18·4	
81	July 2·56	13	26	-82	July 8	+78	84	445	205·2	-10·4	II.
82	June 27·0	2	27	+ 8	June 28	+18	3	10	278·4	- 6·1	
83	29·44	6	27	-26	July 2	+41	11	46	246·5	- 6·1	
84	29·95	3/5	27	-32	1	+20	5	14	239·7	+ 3·8	
12885	July 1·37	11	27	-46	7	+74	44	234	221·0	+26·6	II.
86	2·07	12	27	-55	8	+77	75	376	211·7	-21·0	I.1241 (1)
87	3·22	13	27	-74	9	+82	31	166	196·5	- 5·9	I.1236 (3)
88	June 24·8	2	29	+61	June 30	+74	14	45	308·4	+ 8·7	
89	July 5·1	3/4	29	-72	July 2	-37	4	9	171·8	-22·7	
12890	1·70	3	July 1	- 7	3	+22	2	6	216·5	- 6·3	
91	7·75	9	2	-70	10	+35	23	98	136·5	- 5·9	
92	8·36	10/11	2	-79	12	+54	10	38	128·4	+13·6	I.1239 (2)
93	June 28·4	2	3	+65	4	+80	18	74	260·9	- 9·5	I.1242 (1)
94	July 7·24	11	3	-53	13	+82	137	697	143·2	+13·8	II.
12895	10·72	14	4	-81	17	+83	210	1163	97·2	-12·9	I.1243 (1)
96	10·73	13	4	-84	16	+74	34	174	97·1	+15·3	II.
97	5·7	4	6	+ 8	9	+48	7	22	163·1	+18·2	
98	9·48	8	6	-42	13	+52	20	67	113·6	+14·5	II.
99	11·4	5	6	-66	10	-14	19	72	88·0	-13·7	
12900	12·76	12	6	-83	17	+62	70	331	70·2	-15·6	II.
01	12·3	3	7	-66	9	-37	8	17	76·5	+15·9	
02	15·06	14	8	-81	21	+82	312	2122	39·8	-12·1	I.1244 (1)
03	15·70	13	9	-82	21	+75	67	335	31·2	+ 5·3	I.1238 (3)
04	12·09	5	10	-24	14	+34	11	32	79·0	-24·8	
12905	16·0	5	10	-75	14	-18	7	14	27·2	-14·2	
06	10·6	4	11	+13	14	+53	10	35	98·8	+12·7	
07	13·10	2	12	-10	13	+ 3	3	14	65·6	+20·4	
08	13·42	4/5	12	-16	16	+37	3	15	61·5	-20·0	
09	12·8	2	13	+ 7	14	+24	4	18	69·9	+15·4	

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			Date	Longitude from Central Meridian	Date	Longitude from Central Meridian	Umbræ	Whole Spots	Longitude	Latitude	
	1938		1938	°	1938	°			°	°	
12910	July 14·56	3	July 13	-19	July 15	+12	6	16	46·3	+23·9	
11	19·17	13	13	-78	25	+79	22	121	345·3	+ 5·7	I.1240 (2)
12	11·6	4	14	+41	17	+75	12	52	85·8	+18·6	
13	19·23	6	14	-62	19	+ 5	21	72	344·6	-15·8	II.
14	11·9	3	15	+44	17	+74	10	30	81·3	+11·0	
12915	18·61	8/9	15	-44	23	+65	4	14	352·8	+12·2	II.
16	14·7	5	16	+21	20	+79	20	88	44·2	+19·3	
17	18·30	4	16	-24	19	+13	6	14	357·0	-25·2	
18	21·4	5	16	-65	20	-10	6	17	316·5	+ 6·7	
19	23·1	2	18	-61	19	-51	3	8	293·6	+ 8·8	
12920	24·34	12	18	-78	29	+67	32	186	277·0	+16·6	II.
21	18·1	2	19	+16	20	+31	4	12	359·2	+ 6·8	
22	23·53	11	19	-57	29	+79	28	134	286·7	- 6·8	II.
23	24·61	8	19	-70	26	+24	5	18	273·4	- 6·6	II.
24	25·16	12	19	-77	30	+66	21	85	266·1	+20·7	II.
12925	25·54	12	19	-81	30	+64	13	62	261·0	- 9·2	I.1242 (2)
26	19·5	5	20	+12	24	+62	24	92	341·0	+ 8·9	II.
27	26·39	13	20	-80	Aug. 1	+83	25	128	249·9	+ 3·7	I.1245 (1)
28	25·0	3	22	-35	July 24	- 8	6	24	268·0	+17·8	
29	26·8	4	22	-59	25	-20	3	15	244·0	-17·1	
12930	28·24	12	22	-78	Aug. 2	+69	25	127	225·4	- 6·9	II.
31	23·2	7	23	+ 2	July 29	+78	79	418	292·3	+ 6·8	II.
32	23·77	5	23	- 5	27	+47	4	15	284·6	+25·4	
33	29·41	13	23	-76	Aug. 4	+79	81	525	209·8	-21·2	I.1241 (2)
34	30·12	13	24	-76	5	+82	64	382	200·5	- 6·0	I.1236 (4)
12935	July 30·9	3	July 28	-35	July 30	- 6	2	10	189·8	+ 3·0	
36	Aug. 3·83	4/7	29	-72	Aug. 4	+ 7	2	7	138·2	+19·0	II.
37	6·22	12	31	-78	11	+69	15	77	106·7	-10·7	I.1243 (2)
38	July 28·9	2	Aug. 1	+43	2	+62	2	10	216·2	+ 6·6	
39	31·0	2	1	+16	2	+34	3	11	188·6	-25·2	
12940	Aug. 6·46	10	1	-71	10	+50	9	30	103·5	- 1·8	II.
41	7·48	13	1	-80	13	+81	57	275	90·0	+12·6	II.
42	7·58	13	1	-80	13	+78	41	206	88·7	-14·1	I.1243 (2)
43	7·68	13	1	-83	13	+77	44	252	87·4	- 6·1	I.1246 (1)
44	July 29·1	2	2	+58	3	+69	6	20	213·8	-15·4	
12945	Aug. 7·4	3	2	-61	4	-44	7	18	90·5	+17·6	
46	6·45	9	3	-40	11	+65	12	42	103·6	-15·5	II.
47	July 30·9	3	4	+58	6	+84	62	383	189·6	+ 7·7	I.1247 (1)
48	Aug. 10·61	12	4	-77	15	+59	43	241	48·6	-26·4	II.
49	5·86	3	5	- 6	7	+18	5	23	111·3	+18·8	
12950	10·92	13	5	-74	17	+82	141	852	44·5	-14·9	I.1244 (2)
51	11·62	11	5	-81	15	+49	11	52	35·2	+22·8	II.
52	11·78	13	5	-86	17	+74	24	124	33·1	+ 3·9	I.1238 (4)
53	7·2	5	8	+16	12	+70	22	89	93·5	+14·9	
54	14·56	12	8	-77	19	+63	89	595	356·3	-24·9	II.
12955	8·7	2	9	+ 6	10	+20	2	8	73·3	+15·8	
56	15·3	4	10	-68	13	-23	4	10	347·2	+ 7·8	I.1240 (3)
57	10·9	2	11	+ 6	12	+19	2	15	44·6	+22·9	
58	11·0	2	11	+ 4	12	+18	4	15	43·6	+ 6·4	
59	11·38	3	11	- 1	13	+28	3	15	38·4	-20·0	

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			Date	Longitude from Central Meridian	Date	Longitude from Central Meridian	Umbræ	Whole Spots	Longitude	Latitude	
	1938		1938	°	1938	°			°	°	
12960	Aug. 16·73	12	Aug. 11	-69	Aug. 22	+73	34	197	327·7	-20·7	II.
61	14·18	3	13	- 8	15	+14	5	19	1·4	-21·8	
62	16·1	2	13	-34	14	-23	5	16	336·2	-16·9	
63	18·15	5/7	14	-50	20	+31	6	21	308·9	+10·3	
64	20·68	12	15	-73	26	+80	23	109	275·5	+10·8	I.1248 (1)
12965	21·4	4	15	-77	18	-43	12	32	265·8	-17·1	
66	21·68	12	15	-83	26	+63	18	99	262·3	+ 2·6	I.1245 (2)
67	19·04	10	16	- 30	25	+81	13	44	297·1	+18·0	II.
68	20·8	5	16	-57	20	- 2	11	34	274·4	+16·2	
69	22·72	5/9	19	-40	27	+64	3	12	248·5	-24·1	
12970	20·04	3/4	19	- 6	22	+31	3	13	283·9	+18·6	
71	25·86	8/9	20	-72	28	+34	5	15	207·0	-20·5	I.1241 (3)
72	26·64	7	21	-68	27	+12	4	10	196·8	+ 9·2	I.1247 (2)
73	28·0	5	22	-75	26	-19	5	13	179·2	+ 7·0	
74	22·5	2/4	23	+12	26	+52	1	2	251·8	+24·3	
12975	23·59	7	23	- 5	29	+75	53	255	237·1	-17·1	II.
76	26·6	2	25	-17	26	- 2	3	5	197·0	+16·8	
77	28·92	6	25	-47	30	+19	21	77	166·6	+12·6	II.
78	31·4	7	25	-76	31	- 3	21	81	133·7	+27·7	II.
79	31·17	4/10	26	-63	Sept. 4	+55	4	11	136·8	-14·9	II.
12980	Sept. 3·13	12	27	-85	7	+64	69	343	97·7	+13·3	II.
81	Aug. 31·98	9	29	-39	6	+75	20	78	126·1	-13·8	I.1249 (1)
82	Sept. 3·8	4	29	-75	1	-31	6	16	89·4	- 5·1	I.1246 (2)
83	3·79	12	29	-76	9	+72	56	269	89·1	-13·6	I.1243 (3)
84	4·27	6/7	29	-81	4	+ 3	4	13	82·7	+18·2	II.
12985	2·34	4/5	30	-40	3	+12	5	21	108·2	-20·0	
86	5·54	13	30	-82	11	+77	145	850	65·9	+11·4	I.1250 (1)
87	Aug. 31·7	2	Sept. 1	+10	2	+22	6	12	130·4	+28·6	
88	Sept. 2·5	2	1	-15	2	- 2	2	4	105·7	+16·2	
89	7·16	13	1	-75	13	+81	43	203	44·5	-18·5	I.1244 (3)
12990	7·1	3	1	-76	3	-49	10	37	45·6	-12·8	I.1244 (3)
91	6·8	2	2	-59	3	-45	4	12	49·8	+15·6	
92	8·64	12	2	-85	13	+62	24	116	25·0	+10·6	II.
93	2·2	5	3	+14	7	+70	9	35	110·0	+11·5	
94	3·2	2	4	+16	5	+29	2	5	96·7	-23·1	
12995	10·8	3/6	5	-72	10	- 3	2	7	357·0	+19·2	
96	14·08	10	8	-73	17	+41	16	74	313·2	+11·7	II.
97	13·9	3	10	-48	12	-19	4	12	315·9	+17·4	
98	16·68	9	10	-84	18	+23	10	48	278·9	+10·2	I.1248 (2)
99	16·65	12	11	-72	22	+77	43	232	279·2	+ 7·2	II.
13000	21·27	13	15	-81	27	+80	37	185	218·3	+21·9	I.1251 (1)
01	12·5	2	16	+50	17	+64	15	46	333·6	+17·5	
02	18·38	2/3	17	-13	19	+13	2	4	256·4	- 3·0	
03	20·9	2	17	-47	18	-33	2	12	222·9	+22·8	
04	14·9	3/4	18	+48	21	+84	6	30	302·8	+14·6	I.1252 (1)
13005	24·8	2	19	-72	20	-56	3	8	172·0	-24·0	
06	25·50	13	19	-82	Oct. 1	+79	86	584	162·5	- 9·6	II.
07	27·10	13	21	-74	3	+82	75	383	141·3	-11·0	I.1253 (1)
08	24·9	2	22	-34	Sept. 23	-20	2	6	170·4	- 9·6	
09	27·80	12	22	-74	Oct. 3	+79	109	666	132·1	-12·0	I.1249 (2)

GENERAL CATALOGUE OF SUN SPOTS

No. of Group	U.T. of Central Meridian Passage	Duration in Days	First Seen		Last Seen		Mean Area Corrected for Foreshortening		Mean Position of Group		Reference to Ledger
			Date	Longitude from Central Meridian	Date	Longitude from Central Meridian	Umbræ	Whole Spots	Longitude	Latitude	
	1938		1938	°	1938	°			°	°	
13010	Sept. 28·6	5/6	Sept. 23	-70	Sept. 28	- 4	8	27	122·1	+29·9	II.
11	30·02	8	24	-75	Oct. 1	+18	14	68	102·8	+11·7	II.
12	30·01	11	24	-76	4	+61	14	61	102·9	+14·2	II.
13	25·3	5	26	+13	Sept. 30	+70	15	64	164·9	+13·8	
14	27·19	8	26	-10	Oct. 3	+85	52	248	140·2	+17·0	II.
13015	Oct. 1·20	6	26	-62	1	+ 3	7	20	87·3	-12·2	I.1243 (4)
16	2·14	10/12	26	-80	7	+67	13	59	74·8	+12·5	I.1250 (2)
17	2·80	6	27	-74	2	- 3	10	44	66·0	- 7·5	II.
18	4·77	12	29	-70	10	+75	26	125	40·2	+20·0	II.
19	4·90	10	29	-71	8	+45	14	64	38·4	-16·1	I.1244 (4)
13020	1·7	2	30	-18	1	- 4	2	13	80·5	+13·6	
21	2·5	2	Oct. 4	+24	5	+40	6	16	70·2	-14·0	
22	5·50	8	4	-16	11	+79	53	271	30·4	+11·3	I.1254 (1)
23	9·2	3	4	-65	6	-36	4	14	341·6	+ 5·4	
24	11·93	14	5	-83	18	+79	352	2654	305·7	+17·0	I.1252 (2)
13025	7·94	6	7	-12	12	+62	14	47	358·3	+ 7·8	II.
26	4·8	4	8	+46	11	+84	28	112	39·9	+14·1	I.1255 (1)
27	9·76	6	9	- 8	14	+63	16	58	334·3	+12·4	II.
28	14·97	9	9	-75	17	+33	28	133	265·5	- 6·0	II.
29	5·8	2	10	+62	11	+72	9	29	26·1	+27·2	I.1256 (1)
13030	7·2	2	11	+56	12	+68	8	28	8·3	-21·8	
31	12·64	5	11	-16	15	+34	10	42	296·3	+13·3	
32	15·8	2	12	-46	13	-30	6	16	254·6	-10·8	
33	18·3	5	12	-81	16	-25	8	28	221·6	+24·8	I.1251 (2)
34	17·5	4	13	-56	16	-16	7	23	231·5	- 6·2	
13035	21·39	6/8	15	-79	22	+14	3	11	180·9	+25·6	II.
36	15·5	5	17	+23	21	+77	26	147	258·8	-10·7	
37	24·49	12	18	-79	29	+64	24	117	139·9	-10·8	I.1253 (2)
38	25·71	12	20	-70	31	+73	47	246	123·9	+25·3	II.
39	26·03	9	20	-73	28	+31	30	161	119·7	+13·7	II.
13040	22·1	6	22	+ 2	27	+71	5	16	171·1	+12·1	II.
41	26·90	10	23	-50	Nov. 1	+78	77	361	108·3	-13·8	II.
42	29·04	4/7	23	-72	Oct. 29	+ 5	2	6	80·0	-13·9	II.
43	26·68	3/7	24	-31	30	+50	2	7	111·1	- 2·8	II.
44	26·33	3/4	25	-13	28	+30	2	7	115·7	-18·9	
13045	27·31	8	25	-24	Nov. 1	+67	25	118	102·8	-23·3	II.
46	31·74	13	25	-83	6	+74	23	114	44·3	+14·1	I.1255 (2)
47	Nov. 1·58	12	26	-80	6	+63	30	160	33·3	+25·1	I.1256 (2)
48	Oct. 29·08	4	27	-21	Oct. 30	+16	8	20	79·5	-31·2	
49	Nov. 1·6	2	27	-69	28	-54	3	4	33·0	+13·4	I.1254 (2)
13050	2·2	4	27	-75	30	-39	7	24	24·8	+ 9·8	
51	Oct. 28·90	6/7	28	- 4	Nov. 3	+73	12	49	81·8	+14·6	II.
52	28·89	3	28	- 6	Oct. 30	+20	7	23	82·0	+ 8·9	
53	Nov. 3·52	9	28	-80	Nov. 5	+25	14	44	7·7	+16·5	II.
54	4·16	13	29	-77	10	+86	27	143	359·2	- 7·1	II.
13055	4·78	11	29	-81	8	+50	24	103	351·1	+12·1	II.
56	1·80	3/5	31	-21	4	+38	1	5	30·4	+13·3	
57	Oct. 29·0	2	Nov. 1	+46	2	+59	6	18	80·8	+25·0	
58	Nov. 2·47	6/8	1	-13	8	+78	7	32	21·6	-14·0	II.
59	7·70	11	1	-81	11	+49	11	42	312·6	+16·5	I.1252 (3)

GENERAL CATALOGUE OF SUN SPOTS

No. of Group	U.T. of Central Meridian Passage	Duration in Days	First Seen		Last Seen		Mean Area Corrected for Foreshortening		Mean Position of Group		Reference to Ledger
			Date	Longitude from Central Meridian	Date	Longitude from Central Meridian	Umbræ	Whole Spots	Longitude	Latitude	
	1938		1938	°	1938	°			°	°	
13060	Nov. 3·30	8	Nov. 2	-12	Nov. 9	+77	39	220	10·6	+ 8·3	II.
61	5·6	2	2	-41	3	-30	6	18	340·3	- 3·5	
62	7·30	4/6	2	-64	7	+ 3	3	8	317·9	-30·2	
63	9·7	2	4	-69	5	-57	4	12	285·6	+11·6	
64	10·78	14	4	-81	17	+79	347	1990	272·0	- 8·5	I.1257 (1)
13065	7·9	2	5	-33	6	-21	4	14	309·6	+10·1	
66	6·2	7	6	+ 2	12	+80	42	238	332·9	+15·0	II.
67	7·39	5	6	-12	10	+40	9	28	316·7	+ 9·7	
68	11·98	12	6	-74	17	+71	40	188	256·1	-16·6	II.
69	8·71	3/6	7	-15	12	+48	2	6	299·3	+21·6	II.
13070	12·3	3	7	-65	9	-43	9	31	251·3	-19·6	
71	13·23	12	7	-77	18	+68	50	292	239·7	-17·0	II.
72	15·70	11	11	-56	21	+76	92	594	207·1	-18·0	I.1258 (1)
73	16·5	2	11	-67	12	-54	3	12	196·2	- 7·3	
74	16·51	10	12	-53	21	+66	15	56	196·5	+10·6	II.
13075	18·46	13	12	-79	24	+79	63	322	170·8	- 9·0	I.1259 (1)
76	13·49	7	13	- 4	19	+79	83	493	236·2	- 6·0	I.1260 (1)
77	18·91	12	13	-74	24	+76	32	159	164·8	+19·6	II.
78	16·35	6	14	-28	19	+44	8	25	198·6	+18·1	II.
79	21·75	5/7	16	-72	22	+10	5	23	127·4	+16·0	
13080	19·22	9	17	-24	25	+79	33	159	160·7	+ 6·3	I.1261 (1)
81	20·87	4/5	19	-21	23	+36	5	13	139·0	-23·6	
82	18·7	5	20	+19	24	+76	8	37	167·2	+24·7	
83	20·6	2/4	22	+23	25	+63	2	9	142·2	+22·4	
84	25·6	2/4	22	-42	25	- 3	2	4	76·1	+25·4	
13085	26·33	9	22	-50	30	+53	13	62	67·0	+17·0	II.
86	28·75	13	23	-72	Dec. 5	+84	242	1482	35·1	+14·0	I.1262 (1)
87	23·7	3	24	+ 8	Nov. 26	+39	6	12	102·3	-15·9	
88	24·91	2	24	- 6	25	+ 7	4	16	85·8	+13·4	
89	28·80	11	24	-60	Dec. 4	+81	56	319	34·4	-16·9	I.1263 (1)
13090	Dec. 3·0	2	27	-74	Nov. 28	-63	7	22	338·9	-11·0	
91	4·21	9	29	-66	Dec. 7	+43	18	92	323·2	+11·1	II.
92	7·04	8/10	Dec. 1	-74	10	+42	5	17	285·9	+11·5	II.
93	7·91	14	1	-85	14	+81	118	610	274·4	-10·3	I.1257 (2)
94	Nov. 29·4	2	2	+41	3	+52	2	7	26·0	+16·6	
13095	Dec. 3·9	2	2	-18	3	- 6	2	4	327·7	+15·4	
96	8·4	6	2	-80	7	-16	4	10	267·6	+22·0	II.
97	6·98	10	3	-49	12	+74	27	152	286·7	- 8·6	II.
98	10·1	2	4	-75	5	-60	3	20	245·4	-14·0	
99	10·18	13	4	-78	16	+81	38	217	244·5	- 6·6	I.1260 (2)
13100	8·1	3	5	-34	7	- 9	5	30	272·1	- 4·0	
01	4·0	4	6	+33	9	+69	8	25	325·4	+23·5	
02	3·9	3	6	+33	8	+58	4	8	326·9	-16·3	
03	8·21	7/9	6	-23	14	+76	9	43	270·5	-19·6	II.
04	11·7	2	6	-68	7	-56	4	8	224·8	+23·8	
13105	13·44	14	6	-80	19	+74	85	392	201·6	-19·9	I.1258 (2)
06	10·73	10	7	-49	16	+76	23	112	237·3	- 5·6	I.1260 (2)
07	12·11	8/9	7	-62	15	+46	3	11	219·1	-16·0	II.
08	9·1	2/3	9	+ 5	11	+31	1	5	258·8	-11·4	
09	13·07	10	9	-51	18	+68	37	179	206·4	+ 5·0	II

GENERAL CATALOGUE OF SUN SPOTS

No. of Group	U.T. of Central Meridian Passage	Duration in Days	First Seen		Last Seen		Mean Area Corrected for Foreshortening		Mean Position of Group		Reference to Ledger
			Date	Longitude from Central Meridian	Date	Longitude from Central Meridian	Umbræ	Whole Spots	Longitude	Latitude	
	1938-39		1938	°	1938-39	°			°	°	
13110	Dec. 15·56	13	Dec. 9	-81	Dec. 21	+75	41	230	173·6	- 9·6	I.1259 (2)
11	15·64	5/7	11	-54	17	+20	1	5	172·5	+10·8	II.
12	16·2	4	11	-63	14	-27	10	31	165·0	+ 8·1	I.1261 (2)
13	14·61	8	12	-32	19	+63	22	82	186·2	- 9·3	II.
14	19·63	13	13	-78	25	+72	53	257	120·0	+25·6	II.
13115	20·42	13	14	-84	26	+81	76	469	109·6	- 5·3	II.
16	16·19	2/4	15	- 8	18	+28	2	6	165·3	+ 5·4	
17	19·8	4	15	-60	18	-15	5	19	117·8	+11·9	
18	15·1	3	19	+54	21	+82	20	96	179·2	+13·4	
19	25·72	13	19	-85	31	+75	31	179	39·8	+12·8	I.1262 (2)
13120	25·30	7	20	-66	26	+14	7	28	45·3	-17·5	II.
21	25·88	13	20	-70	Jan. 1	+84	73	409	37·6	-18·4	I.1263 (2)
22	26·36	13	20	-77	1	+79	62	375	31·4	+12·9	I.1262 (2)
23	23·5	2	24	+ 9	Dec. 25	+25	3	6	69·3	+15·3	
24	30·18	13	24	-79	Jan. 5	+81	29	144	341·0	- 2·6	II.
13125	23·9	4	26	+32	Dec. 29	+72	17	103	64·2	+16·0	
26	25·1	2	27	+29	28	+45	4	8	48·0	+15·0	
27	25·6	3	28	+38	30	+64	12	34	41·5	+ 9·8	
28	Jan. 4·65	13	29	-84	Jan. 10	+74	95	485	269·0	-12·4	I.1257 (3)
29	5·5	2	30	-79	Dec. 31	-66	5	20	258·0	-10·6	
13130	6·73	12	31	-79	Jan. 11	+58	32	165	241·6	-17·0	II.

C.B.H. 17737-Wt. 3504-Dd. 109-495-12/49

GENERAL CATALOGUE OF SUN SPOTS - *continued.*

SUNSPOTS SEEN ON ONE DAY ONLY.

The groups of sunspots tabulated below were seen on one day only and appear in the *Daily Results* with a distinctive enumeration, comprising the number of the Rotation during which each was observed and a letter given in order of appearance. These short-lived groups are usually composed of one or two very small spots. The deduced time of central meridian passage of each spot is given in the fourth colum of the table.

No. of Group	Date	Longitude from Central Meridian	U.T. of Central Meridian Passage	Area Corrected for Foreshortening		Position of Group	
				Umbræ	Whole Spots	Longitude	Latitude
		°				°	°
1127c	Jan. 5	-58·7	Jan. 9·8	5	19	339·2	+ 6·5
1128a	Jan. 8	+52·4	Jan. 4·5	2	11	49·1	+ 4·5
b	8	-23·7	10·2	1	3	333·0	-18·9
c	14	+80·0	8·2	6	11	359·7	- 3·2
d	18	+67·9	13·1	3	10	295·0	-15·5
e	19	-19·5	20·9	2	10	192·1	+ 7·9
f	21	- 6·3	21·8	2	8	180·9	-12·8
g	22	-23·5	24·2	2	8	149·4	-16·0
h	23	-18·8	24·9	2	19	140·4	-17·8
i	25	+17·4	24·0	3	15	152·3	- 8·2
j	26	-33·7	29·0	5	16	86·2	- 9·6
k	28	- 8·4	28·8	2	9	89·0	+15·4
1129a	Feb. 7	- 5·4	Feb. 7·9	2	14	316·0	+17·2
b	9	-67·0	14·5	5	11	229·1	-19·0
c	10	+41·7	7·5	3	9	321·4	+ 5·3
d	12	- 8·6	13·0	2	8	247·8	-26·7
e	14	- 4·4	14·8	2	5	225·0	+ 4·5
f	14	-56·9	18·8	2	4	172·5	+14·4
g	19	+63·6	14·6	6	28	227·8	+27·1
h	23	+48·3	19·7	2	5	160·0	-16·9
i	23	+28·8	21·2	1	2	140·5	-15·4
1130a	Mar. 5	-20·4	Mar. 6·9	1	3	319·7	+26·1
b	11	+67·3	6·3	2	5	328·3	-15·8
c	11	+21·2	9·8	2	11	282·2	+16·6
d	11	-50·2	15·2	6	17	210·8	+ 6·9
e	12	- 2·5	12·7	2	9	243·3	+ 0·7
f	13	+58·2	9·2	4	10	289·6	-10·3
g	15	+76·6	9·6	4	14	284·9	-20·8
h	21	-55·1	25·6	2	4	74·1	+22·0
i	22	+51·2	18·5	2	6	167·2	-27·7
j	22	+26·4	20·4	2	5	142·4	-20·9
k	22	+ 8·7	21·7	1	4	124·7	- 6·5
l	22	- 3·9	22·7	6	32	112·1	-26·4
m	24	+70·8	19·0	3	6	160·3	+ 5·9
n	24	+26·0	22·4	5	11	115·5	+12·4
o	26	+ 6·1	25·9	2	4	69·9	-11·1
p	27	+11·7	26·5	1	9	62·0	-19·1
1131a	Apr. 1	-23·3	Apr. 3·2	1	6	320·1	+23·7
b	2	+ 9·3	1·7	2	5	339·9	-27·4
c	8	+80·2	2·3	11	59	331·8	-12·3
d	8	-43·4	11·7	2	3	208·2	+22·5
e	10	+18·3	9·0	1	5	243·4	+18·1
f	10	+ 7·0	9·9	4	10	232·1	+13·8
g	10	-52·5	14·4	7	15	172·6	-19·3
h	11	+64·1	6·5	7	24	276·8	-31·5
i	11	+63·7	6·5	3	9	276·4	+20·6
j	12	+58·7	7·9	2	9	257·6	- 7·2
k	16	+64·4	11·5	5	18	210·5	+12·8
l	16	+32·4	13·9	16	43	178·5	-23·3
m	19	+23·6	17·6	2	10	129·3	-11·5
n	20	+45·8	17·0	5	16	138·1	- 4·2
1131o	Apr. 20	-20·8	Apr. 22·0	5	15	71·5	-12·8
p	21	-33·1	23·9	1	2	47·2	+ 7·3
q	22	+54·9	18·2	4	15	122·2	- 4·2
1132a	Apr. 29	+23·4	Apr. 27·6	3	6	357·8	+24·5
b	29	-37·3	May 2·2	3	12	297·1	+14·5
c	May 2	-52·0	6·3	4	8	242·5	+18·1
d	2	-72·8	7·9	3	12	221·7	- 6·1
e	7	+73·0	2·0	8	30	300·2	- 9·1
f	10	-22·6	12·1	1	3	166·4	+32·8
g	13	-15·1	14·5	3	7	134·6	-11·1
h	19	+20·2	17·8	1	5	90·5	- 7·1
i	20	+41·3	17·2	3	12	98·3	-15·4
j	20	-20·5	21·9	3	5	36·5	+18·2
k	23	-37·9	26·2	1	6	339·6	+10·1
l	24	-56·2	28·6	0	8	308·1	-10·0
1133a	May 25	+62·4	May 20·6	2	8	53·4	+21·9
b	June 2	+70·7	28·0	6	31	315·9	+ 8·6
c	5	+75·1	30·7	4	9	280·4	+25·9
d	6	+34·0	June 3·8	0	6	225·7	+25·3
e	8	-33·1	11·1	5	14	129·1	+24·6
f	12	+ 1·4	12·3	3	16	113·2	+18·8
g	13	+65·6	8·4	3	8	165·2	+45·6
h	14	-79·4	20·3	14	25	7·0	+ 7·2
i	16	-61·7	21·0	0	10	358·2	+20·4
1134a	June 21	+12·8	June 20·4	1	3	6·5	+10·0
b	22	- 7·7	22·9	1	5	332·8	-24·1
c	29	+28·9	27·2	3	9	276·1	+ 6·5
d	30	+65·7	25·4	6	20	299·9	- 6·3
e	July 1	+ 9·8	30·6	1	3	231·2	-10·1
f	6	-28·5	July 8·6	1	4	125·8	+24·7
g	10	+30·2	8·1	2	18	131·7	+18·1
h	16	-29·0	18·6	3	4	353·5	- 3·1
i	17	+33·8	14·9	9	29	41·5	+21·7
j	17	+29·5	15·3	3	5	37·2	+11·1
1135a	July 18	+78·4	July 12·5	11	29	74·1	- 8·1
b	18	-39·3	21·4	2	7	316·4	-26·2
c	19	+22·9	17·6	1	4	6·1	+13·7
d	19	- 3·3	19·6	0	12	339·9	+20·8
e	20	+22·2	18·8	1	5	350·3	+21·3
f	21	+70·9	16·1	3	8	26·3	+23·7
g	23	+59·0	18·9	2	7	348·9	+23·1
h	25	+59·7	20·8	5	18	323·4	+21·8
i	26	+21·7	24·8	3	13	270·9	-16·3
j	26	-26·4	28·4	3	9	222·8	-20·6
k	28	- 3·0	28·7	1	11	219·8	-27·6
l	29	+ 9·1	28·7	1	36	219·6	+24·8
m	29	- 1·2	29·5	2	18	209·3	+31·4
n	Aug. 1	-22·4	Aug. 3·0	1	4	148·9	+13·2
o	2	+20·0	1·0	3	4	176·3	+ 6·9
p	2	-31·7	4·9	3	7	124·6	+22·6
q	2	-54·1	6·6	2	4	102·2	+16·9

GENERAL CATALOGUE OF SUN SPOTS

SUNSPOTS SEEN ON ONE DAY ONLY.

No. of Group	Date	Longitude from Central Meridian	U.T. of Central Meridian Passage	Area Corrected for Foreshortening		Position of Group	
				Umbræ	Whole Spots	Longitude	Latitude
		°				°	°
1135r	Aug. 3	−21·8	Aug. 5·0	1	3	122·9	+13·7
s	4	+34·2	1·8	3	5	165·7	+11·7
t	4	− 1·6	4·4	3	23	129·9	+31·9
u	5	+61·8	July 31·7	2	5	180·0	+10·3
v	11	− 3·0	Aug. 11·6	3	4	35·9	− 8·5
w	12	−75·0	18·0	0	4	310·8	− 3·3
x	13	+61·6	8·8	6	20	72·0	+ 8·2
y	13	+59·5	9·0	2	10	69·9	−21·3
z	13	+24·3	11·7	3	9	34·7	−24·0
1136a	Aug. 17	−22·4	Aug. 19·0	4	22	297·1	+ 8·3
b	19	+41·0	16·5	6	17	330·5	+25·1
c	19	+ 2·0	19·5	3	7	291·5	− 9·4
d	21	−40·2	24·4	5	15	226·2	+27·3
e	22	−58·1	26·8	5	11	194·7	−27·4
f	23	+65·9	18·4	6	14	306·2	− 6·6
g	23	−19·8	24·8	3	10	220·5	−14·5
h	26	+21·6	24·8	3	5	220·7	+24·0
i	26	−24·5	28·3	3	8	174·6	+11·5
j	26	−57·2	30·8	5	7	141·9	−11·1
k	27	+31·4	25·1	3	7	217·0	−19·0
l	28	+ 3·4	28·1	2	8	177·1	−16·0
m	28	−31·3	30·8	4	13	142·4	+ 6·8
n	30	+64·5	25·5	2	6	212·3	+22·2
o	30	+11·7	29·5	3	8	159·5	+14·6
p	31	−33·3	Sept. 2·9	5	38	100·3	−17·9
q	Sept. 3	+12·8	2·4	3	9	107·8	−12·8
r	5	+35·2	2·7	3	6	103·0	+18·2
s	5	+21·3	3·8	1	4	89·1	−22·5
t	5	− 2·0	5·6	1	3	65·8	−21·4
u	5	− 6·9	5·9	1	3	60·9	−18·5
1137a	Sept. 16	−20·0	Sept. 17·9	1	3	263·3	+27·3
b	16	−30·7	18·7	1	3	252·6	+17·3
c	18	−13·4	19·4	1	4	242·7	+ 9·7
d	19	+69·3	14·1	11	31	312·7	+12·1
e	19	−67·8	24·5	5	18	175·6	+24·1
f	20	+46·9	17·0	1	3	274·8	+20·5
g	21	−15·8	22·6	2	14	201·2	+16·1
h	22	+21·1	20·7	2	8	225·2	−19·3
i	26	−66·0	Oct. 1·5	5	15	83·4	+12·6
j	27	−48·0	1·0	3	14	90·1	+32·4
k	29	− 7·1	Sept. 29·9	1	4	103·9	−17·0
l	29	−22·2	Oct. 1·1	2	5	88·8	−16·6
m	Oct. 1	−62·9	6·2	4	10	21·5	+14·0
n	3	+45·9	Sept. 29·9	4	19	104·4	+15·5
o	3	− 1·0	Oct. 3·5	2	7	57·5	−11·4
p	4	+73·2	Sept. 28·8	7	22	118·5	+11·0
q	5	+63·1	30·7	5	23	93·5	−22·5
1138a	Oct. 8	+59·4	Oct. 3·9	12	32	51·6	−16·2
b	10	−17·8	11·8	5	15	307·1	+22·4
c	14	+ 1·9	14·2	2	12	275·3	+11·9
d	20	− 9·2	21·2	0	2	184·0	− 7·9
e	20	−54·5	24·6	0	2	138·7	−17·8
f	21	+41·8	18·2	6	9	222·9	+25·6
g	22	−55·4	26·6	0	2	112·4	+ 4·8
h	24	+35·5	21·7	2	5	176·2	+ 7·4
i	25	−10·0	26·2	1	5	117·4	+ 9·3
j	27	+ 4·8	27·0	12	38	106·2	−18 5
k	28	− 8·1	29·1	1	4	79·7	+13·2
l	28	−25·3	30·4	5	18	62·5	−14·7
m	Nov. 2	+ 7·2	Nov. 1·9	1	5	29·4	−15·9
n	2	−48·0	6·1	2	6	334·2	−28·2
1139a	Nov. 4	−60·4	Nov. 9·1	2	9	294·1	+14·7
b	7	+75·0	1·8	15	49	30·8	−17·6
c	7	+36·1	4·7	3	5	351·9	−13·4
d	7	−15·5	8·6	2	5	300·3	+25·3
e	14	−51·8	18·3	2	7	172·3	+18·9
f	16	− 1·2	16·3	2	15	198·8	+13·3
g	27	−43·3	30·7	1	3	9·4	−10·1
1140a	Dec. 5	+16·3	Dec. 4·3	2	19	322·3	+13·7
b	8	+41·1	5·1	3	13	311·2	− 6·3
c	9	+16·7	8·2	1	6	271·2	+ 6·0
d	11	+ 9·8	10·8	5	23	236·5	+19·9
e	12	+25·3	10·5	1	3	239·8	+ 1·8
f	15	−32·0	17·9	3	6	142·8	+23·5
g	18	+58·3	14·0	4	23	193·7	+ 3·8
h	19	+65·0	14·3	7	21	190·4	+ 9·3
i	20	+64·0	15·6	11	26	173·1	−19·0
j	20	−13·5	21·5	5	23	95·6	+10·9
k	21	−35·3	23·9	2	5	63·5	−11·9
l	22	+46·9	18·9	11	34	130·2	+23·6
m	24	−26·7	26·3	1	5	32·7	+23·5
n	28	+19·4	27·0	2	9	23·0	+24·1

KEVIVAL GROUPS OF SUN SPOTS.

Groups of spots occupying the same heliographic position in consecutive rotations of the Sun but with definite breaks in their history are termed "Revivals". Such groups have been abstracted from the preceding Catalogue and are grouped in series in the following table. When a "Recurrent" series forms part of a "Revival" series, a reference is given in the last column of the table. Groups that are given in detail in Ledger II are also indicated.

No.	No. of Group	U.T. of Central Meridian Passage	Rotation	Duration in Days	First Seen		Last Seen		Area	Mean Position		Reference to Ledger
					Date	Longitude from Central Meridian	Date	Longitude from Central Meridian		Longitude	Latitude	
		1938			1938	°	1938	°		°	°	
1	12662	Jan. 1·3	1127	2	Jan. 1	+ 2	Jan. 2	+14	24	90	+16	
	89	29·0	1128	2	Jan. 23	-75	Jan. 24	-59	40	86	+18	
2	12666	Jan. 11·44	1128	13	Jan. 5	-77	Jan. 17	+79	731	317	+20	II.
	705	Feb. 8·2	1129	2	Feb. 7	- 8	Feb. 8	- 1	12	312	+22	
3	12676	Jan. 20·7	1128	3	Jan. 15	-70	Jan. 17	-44	14	195	-10	
	712	Feb. 17·19	1129	13	Feb. 11	-76	Feb. 23	+85	244	193	- 8	II.
4	12679	Jan. 21·60	1128	9	Jan. 19	-31	Jan. 27	+79	120	183	-10	II.
	714	Feb. 17·50	1129	11	Feb. 12	-69	Feb. 22	+65	73	189	-10	II.
5	12701	Feb. 1·6	1128	3	Feb. 4	+37	Feb. 6	+63	14	39	-25	
	28	Mar. 1·4	1129	2/6	Feb. 24	-63	Mar. 1	+ 2	2	33	-25	
6	12713	Feb. 17·1	1129	2	Feb. 12	-64	Feb. 13	-46	16	194	-23	}
	17	Feb. 17·3	1129	5	Feb. 13	-50	Feb. 17	0	27	192	-21	
	44	Mar. 16·99	1130	11	Mar. 11	-73	Mar. 21	+57	118	187	-24	II.
7	12723	Feb. 18·3	1129	3	Feb. 22	+51	Feb. 24	+81	96	178	-27	
	48	Mar. 17·63	1130	4	Mar. 14	-43	Mar. 17	+ 1	10	179	-27	
8	12742	Mar. 10·0	1130	6	Mar. 10	+ 6	Mar. 15	+69	84	279	-23	II.
	68	Apr. 6·72	1131	9	Mar. 31	-83	Apr. 8	+22	218	274	-23	II.
	800	May 4·65	1132	13	Apr. 28	-79	May 10	+73	141	265	-23	II. }
	02	May 3·79	1132	8	May 2	-19	May 9	+76	206	276	-22	II. }
9	12749	Mar. 13·2	1130	3	Mar. 15	+28	Mar. 17	+58	23	237	+13	
	73	Apr. 9·2	1131	2	Apr. 3	-75	Apr. 4	-64	33	242	+12	
10	12751	Mar. 20·3	1130	3	Mar. 16	-50	Mar. 18	-24	34	143	-12	
	79	Apr. 16·18	1131	13	Apr. 10	-76	Apr. 22	+82	284	149	-11	II.
11	12770	Apr. 5·61	1131	7	Apr. 2	-43	Apr. 8	+36	26	288	+ 9	II.
	801	May 3·2	1132	2	May 1	-24	May 2	-10	14	284	+11	
12	12771	Apr. 6·9	1131	2	Apr. 2	-59	Apr. 3	-46	6	271	+25	
	99	May 4·25	1132	12	Apr. 28	-78	May 9	+70	184	270	+24	II.
13	12789	Apr. 28·72	1132	12	Apr. 23	-74	May 4	+76	175	343	+ 8	II.
	830	May 25·7	1133	2	May 22	-43	May 23	-31	4	347	+ 9	
14	12804	Apr. 29·7	1132	2	May 4	+63	May 5	+73	50	330	+20	
	38	May 26·69	1133	7	May 26	- 6	June 1	+77	210	333	+21	II.
	77	June 22·73	1134	9	June 21	-20	June 29	+81	353	335	+23	II.
15	12795	May 3·18	1132	12	Apr. 27	-77	May 8	+70	144	284	-20	II.
	843	May 30·63	1133	5	May 30	- 5	June 3	+50	46	281	-20	

KEVIVAL GROUPS OF SUN SPOTS.

No.	No. of Group	U.T. of Central Meridian Passage	Rotation	Duration in Days	First Seen: Date	First Seen: Longitude from Central Meridian	Last Seen: Date	Last Seen: Longitude from Central Meridian	Area	Mean Position: Longitude	Mean Position: Latitude	Reference to Ledger
		1938			1938	°	1938	°		°	°	
16	12811	May. 7·8	1132	2	May 6	-19	May. 7	- 4	12	223	- 6	
	58	June 3·4	1133	2	June 8	+69	June 9	+78	50	231	- 5	
17	12819	May 15·11	1132	13	May 9	-75	May 21	+82	111	126	+16	II.
	51	June 11·55	1133	13	June 5	-83	June 17	+80	581	123	+15	} I.1239
	92	July 8·36	1134	10/11	July 2	-79	July 12	+54	38	128	+14	
18	12824	May 20·1	1132	2	May 16	-49	May 17	-36	28	61	-19	
	65	June 16·4	1133	4	June 13	-41	June 16	- 2	16	59	-19	
	908	July 13·42	1134	4/5	July 12	-16	July 16	+37	15	61	-20	
19	12831	May 28·0	1133	4/5	May 22	-74	May 26	-24	22	315	+ 6	}
	42	May 28·1	1133	2	May 30	+30	May 31	+40	17	314	+ 9	
	74	June 24·6	1134	4/5	June 19	-71	June 23	-16	15	310	+ 8	}
	88	June 24·8	1134	2	June 29	+61	June 30	+74	45	308	+ 9	
	918	July 21·4	1135	5	July 16	-65	July 20	-10	17	317	+ 7	
	63	Aug. 18·15	1136	5/7	Aug. 14	-50	Aug. 20	+31	21	309	+10	
	96	Sept. 14·08	1137	10	Sept. 8	-73	Sept. 17	+41	74	313	+12	II.
20	12840	May 31·00	1133	7	May 29	-24	June 4	+59	131	276	- 7	II.
	82	June 27·0	1134	2	June 27	+ 8	June 28	+18	10	278	- 6	
21	12845	June 2·99	1133	4	June 1	-22	June 4	+19	8	237	+ 3	}
	47	June 3·19	1133	7	June 1	-25	June 7	+59	76	234	+ 4	II.
	84	June 29·95	1134	3/5	June 27	-32	July 1	+20	14	240	+ 4	
22	12846	June 3·18	1133	3/5	June 1	-24	June 5	+30	17	234	+26	
	85	July 1·37	1134	11	June 27	-46	July 7	+74	234	221	+27	II.
23	12849	June 4·95	1133	3	June 4	- 8	June 6	+19	32	211	- 5	
	90	July 1·70	1134	3	July 1	- 7	July 3	+22	6	217	- 6	
24	12855	June 8·63	1133	3	June 7	-14	June 9	+ 9	14	162	+20	
	97	July 5·7	1134	4	July 6	+ 8	July 9	+48	22	163	+18	
25	12852	June 10·62	1133	11	June 6	-60	June 16	+77	51	136	+13	II.
	94	July 7·24	1134	11	July 3	-53	July 13	+82	697	143	+14	II.
26	12870	June 15·3	1133	3	June 15	+ 2	June 17	+25	7	73	+10	
	914	July 11·9	1134	3	July 15	+44	July 17	+74	30	81	+11	
	941	Aug. 7·48	1135	13	Aug. 1	-80	Aug. 13	+81	275	90	+13	II.
27	12861	June 15·7	1133	5	June 10	-69	June 14	-20	32	68	+17	
	901	July 12·3	1134	3	July 7	-66	July 9	-37	17	76	+16	}
	09	July 12·8	1134	2	July 13	+ 7	July 14	+24	18	70	+15	
	55	Aug. 8·7	1135	2	Aug. 9	+ 6	Aug. 10	+20	8	73	+16	
28	12868	June 17·84	1133	8/10	June 14	-48	June 23	+72	24	40	+21	II.
	916	July 14·7	1134	5	July 16	+21	July 20	+79	88	44	+19	
29	12880	June 27·50	1134	4	June 26	-17	June 29	+28	22	272	+18	
	920	July 24·34	1135	12	July 18	-78	July 29	+67	186	277	+17	II.
	968	Aug. 20·8	1136	5	Aug. 16	-57	Aug. 20	- 2	34	274	+16	
30	12898	July 9·48	1134	8	July 6	-42	July 13	+52	67	114	+15	II.
	949	Aug. 5·86	1135	3	Aug. 5	- 6	Aug. 7	+18	23	111	+19	
	988	Sept. 2·5	1136	2	Sept. 1	-15	Sept. 2	- 2	4	106	+16	

REVIVAL GROUPS OF SUN SPOTS.

No.	No. of Group	U.T. of Central Meridian Passage	Rotation	Duration in Days	First Seen: Date	First Seen: Longitude from Central Meridian	Last Seen: Date	Last Seen: Longitude from Central Meridian	Area	Mean Position: Longitude	Mean Position: Latitude	Reference to Ledger
		1938			1938	°	1938	°		°	°	
31	12896	July 10·73	1134	13	July 4	-84	July 16	+74	174	97	+15	II.
	906	July 10·6	1134	4	July 11	+13	July 14	+53	35	99	+13	
	53	Aug. 7·2	1135	5	Aug. 8	+16	Aug. 12	+70	89	94	+15	
	80	Sept. 3·13	1136	12	Aug. 27	-85	Sept. 7	+64	343	98	+13	II.
	13011	Sept. 30·02	1137	8	Sept. 24	-75	Oct. 1	+18	68	103	+12	II.
	12	Sept. 30·01	1137	11	Sept. 24	-76	Oct. 4	+61	61	103	+14	II.
32	12912	July 11·6	1134	4	July 14	+41	July 17	+75	52	86	+19	
	45	Aug. 7·4	1135	3	Aug. 2	-61	Aug. 4	-44	18	91	+18	
	84	Sept. 4·27	1136	6/7	Aug. 29	-81	Sept. 4	+ 3	13	83	+18	II.
33	12910	July 14·56	1134	3	July 13	-19	July 15	+12	16	46	+24	
	51	Aug. 11·62	1135	11	Aug. 5	-81	Aug. 15	+49	52	35	+23	II.
	57	Aug. 10·9	1135	2	Aug. 11	+ 6	Aug. 12	+19	15	45	+23	
34	12917	July 18·30	1135	4	July 16	-24	July 19	+13	14	357	-25	
	54	Aug. 14·56	1136	12	Aug. 8	-77	Aug. 19	+63	595	356	-25	II.
35	12929	July 26·8	1135	4	July 22	-59	July 25	-20	15	244	-17	
	75	Aug. 23·59	1136	7	Aug. 23	- 5	Aug. 29	+75	255	237	-17	II.
36	12977	Aug. 28·92	1136	6	Aug. 25	-47	Aug. 30	+19	77	167	+13	II.
	13013	Sept. 25·3	1137	5	Sept. 26	+13	Sept. 30	+70	64	165	+14	
	40	Oct. 22·1	1138	6	Oct. 22	+ 2	Oct. 27	+71	16	171	+12	II.
37	12978	Aug. 31·4	1136	7	Aug. 25	-76	Aug. 31	- 3	81	134	+28	II.
	87	Aug. 31·7	1136	2	Sept. 1	+10	Sept. 2	+22	12	130	+29	
	13010	Sept. 28·6	1137	5/6	Sept. 23	-70	Sept. 28	- 4	27	122	+30	II.
38	12992	Sept. 8·64	1136	12	Sept. 2	-85	Sept. 13	+62	116	25	+11	II.
	13022	Oct. 5·50	1137	8	Oct. 4	-16	Oct. 11	+79	271	30	+11	I.1254
	49	Nov. 1·6	1138	2	Oct. 27	-69	Oct. 28	-54	4	33	+13	
39	13015	Oct. 1·20	1137	6	Sept. 26	-62	Oct. 1	+ 3	20	87	-12	I.1243(4)
	42	Oct. 29·04	1138	4/7	Oct. 23	-72	Oct. 29	+ 5	6	80	-14	II.
40	13020	Oct. 1·7	1137	2	Sept. 30	-18	Oct. 1	- 4	13	80	+14	
	51	Oct. 28·90	1138	6/7	Oct. 28	- 4	Nov. 3	+73	49	82	+15	II.
	88	Nov. 24·91	1139	2	Nov. 24	- 6	Nov. 25	+ 7	16	86	+13	
41	13027	Oct. 9·76	1138	6	Oct. 9	- 8	Oct. 14	+63	58	334	+12	II.
	66	Nov. 6·2	1139	7	Nov. 6	+ 2	Nov. 12	+80	238	333	+15	II.
	95	Dec. 3·9	1140	2	Dec. 2	-18	Dec. 3	- 6	4	328	+15	
42	13039	Oct. 26·03	1138	9	Oct. 20	-73	Oct. 28	+31	161	120	+14	II.
	79	Nov. 21·75	1139	5/7	Nov. 16	-72	Nov. 22	+10	23	127	+16	
43	13041	Oct. 26·90	1138	10	Oct. 23	-50	Nov. 1	+78	361	108	-14	II.
	87	Nov. 23·7	1139	3	Nov. 24	+ 8	Nov. 26	+39	12	102	-16	
44	13057	Oct. 29·0	1138	2	Nov. 1	+46	Nov. 2	+59	18	81	+25	
	84	Nov. 25·6	1139	2/4	Nov. 22	-42	Nov. 25	- 3	4	76	+25	
45	13067	Nov. 7·39	1139	5	Nov. 6	-12	Nov. 10	+40	28	317	+10	
	91	Dec. 4·21	1140	9	Nov. 29	-66	Dec. 7	+43	92	323	+11	II.

REVIVAL GROUPS OF SUN SPOTS.

No.	No. of Group	U.T. of Central Meridian Passage	Rotation	Duration in Days	First Seen: Date	First Seen: Longitude from Central Meridian	Last Seen: Date	Last Seen: Longitude from Central Meridian	Area	Mean Position: Longitude	Mean Position: Latitude	Reference to Ledger
		1938-39			1938-39	°	1938-39	°		°	°	
46	13063	Nov. 9·7	1139	2	Nov. 4	-69	Nov. 5	-57	12	286	+12	
	92	Dec. 7·04	1140	8/10	Dec. 1	-74	Dec. 10	+42	17	286	+12	II.
47	13071	Nov. 13·23	1139	12	Nov. 7	-77	Nov. 18	+68	292	240	-17	II.
	98	Dec. 10·1	1140	2	Dec. 4	-75	Dec. 5	-60	20	245	-14	
	130	Jan. 6·73	1141	12	Dec. 31	-79	Jan. 11	+58	165	242	-17	II.
48	13085	Nov. 26·33	1139	9	Nov. 22	-50	Nov. 30	+53	62	67	+17	II.
	123	Dec. 23·5	1140	2	Dec. 24	+ 9	Dec. 25	+25	6	69	+15	
49	13108	Dec. 9·1	1140	2/3	Dec. 9	+ 5	Dec. 11	+31	5	259	-11	
	129	Jan. 5·5	1141	2	Dec. 30	-79	Dec. 31	-66	20	258	-11	}
	135	Jan. 5·45	1141	3	Jan. 4	-16	Jan. 6	+12	18	258	-10	}
	163	Feb. 1·28	1142	12	Jan. 26	-78	Feb. 6	+70	187	265	-11	I.1257(4) }
	167	Feb. 1·95	1142	3	Feb. 1	- 6	Feb. 3	+21	16	256	-12	
50	13111	Dec. 15·64	1140	5/7	Dec. 11	-54	Dec. 17	+20	5	173	+11	II.
	136	Jan. 11·2	1141	5	Jan. 5	-78	Jan. 9	-25	26	183	+10	
51	13115	Dec. 20·42	1140	13	Dec. 14	-84	Dec. 26	+81	469	110	- 5	II.
	149	Jan. 16·68	1141	2	Jan. 16	- 4	Jan. 17	+ 8	8	111	- 7	
52	13120	Dec. 25·30	1140	7	Dec. 20	-66	Dec. 26	+14	28	45	-18	II.
	153	Jan. 21·69	1141	4	Jan. 20	-18	Jan. 23	+21	46	45	-19	
53	13121	Dec. 25·88	1140	13	Dec. 20	-70	Jan. 1	+84	409	38	-18	I.1263(2)
	151	Jan. 22·67	1141	5/7	Jan. 18	-56	Jan. 24	+25	13	32	-20	II.
54	13127	Dec. 25·6	1140	3	Dec. 28	+38	Dec. 30	+64	34	42	+10	
	148	Jan. 21·37	1141	13	Jan. 15	-79	Jan. 27	+79	157	49	+ 9	II.

ROYAL OBSERVATORY, GREENWICH.

Ledgers of Groups of Sun Spots

For the Year

1938

Ledger I.—Recurrent Groups

LEDGER I - RECURRENT GROUPS OF SUN SPOTS FOR THE YEAR 1938.

The time (U.T.) at which the photograph was taken is expressed in the *first* column by the Day of the Year and decimal of a day reckoned from Greenwich Mean Midnight.

The place where the photograph was taken is also indicated in the *first* column. A photograph taken at Greenwich is indicated by the letter G, and those taken at the Cape and Kodaikánal by the letters C and K respectively.

The Projected Area of the Umbræ and Whole Spots, given in the *second* and *third* columns, is the area as it is measured on the photograph, uncorrected for the effect of foreshortening, and expressed in millionths of the Sun's apparent disk.

The area corrected for foreshortening given in the *fourth* and *fifth* columns is expressed in millionths of the Sun's visible hemisphere.

The longitude given in the *sixth* column is based on the ephemeris given in the *Nautical Almanac*, assuming a daily sidereal motion of $14^\circ \cdot 18$, due to the Sun's rotation, constant at all latitudes; this corresponds to Carrington's assumed rotation period of 25·38 days.

The proper motion given in the *seventh* column is derived from the difference of longitude thus computed from the measured positions on any given day and the first day on which the group of spots or single spot is visible, after the correction for the motion appropriate to the latitude has been applied according to the formula, $\xi = 14^\circ \cdot 37 - 2^\circ \cdot 60 \sin^2 \phi$. A *plus* sign indicates a motion forwards; a *minus* sign a motion backwards relative to the position on the first day.

The remaining columns correspond to those with similar headings in the preceding Section.

When a group is 80° or more from the Sun's central meridian, the measures for that day are not included in taking the mean area, longitude and latitude of the group. In such cases of close proximity to the Sun's limb, the addition of brackets denotes that only part of the group is visible.

LEDGER I. - RECURRENT GROUPS OF SUN SPOTS FOR THE YEAR.

No. 1224. Latitude +15°·5.

Group 12673 in Rotation 1128
" 12706 } " " 1129
" 12707 }

Group 12673. Jan.12–24. A great spot containing a series of umbræ. A medium-sized regular spot, *a*, appears as an off-shoot between Jan.13 and 14. A lane of bright photospheric matter begins to invade the central part of the great spot on Jan.18–19 and is a conspicuous feature along its major axis on Jan. 20–22.

Date U.T. Place	Projected Area Umbra	Projected Area Whole Spots	Corrected Area Umbra	Corrected Area Whole Spots	Longitude and Proper Motion		Latitude	Long. from C.M.
d					°	°	°	°
11·360 K	36	266	138	1016	224·1	..	+16·2	-80·9
12·112 K	200	1026	340	1744	224·5	0·0	+16·6	-70·6
13·283 C	388	2489	350	2287	226·2	+ 1·7	+16·6	-53·5
14·427 G	579	4365	402	3019	227·5	+ 3·0	+16·7	-37·1
15·376 C	875	5221	524	3116	225·9	+ 1·4	+17·0	-26·2
16·442 G	1186	5772	655	3179	226·0	+ 1·5	+17·3	-12·1
17·282 C	1153	6043	628	3292	225·5	+ 1·0	+17·3	- 1·6
18·453 G	1244	5721	698	3217	225·1	+ 0·6	+17·3	+13·5
19·415 G	918	5538	560	3379	225·1	+ 0·6	+17·2	+26·1
20·307 C	865	5189	605	3627	224·4	- 0·1	+16·9	+37·2
21·391 G	581	3588	517	3196	224·0	- 0·5	+17·3	+51·1
22·436 G	321	2085	474	2983	224·1	- 0·4	+17·3	+64·9
23·280 C	193	1032	480	2423	223·1	- 1·4	+17·9	+75·0
Means ..	..	..	520	2955	225·1	..	+17·1	..

Spot *a*

13·283 C	33	199	24	147	236·3	0·0	+15·1	-43·4
14·427 G	65	449	39	269	237·8	+ 1·5	+15·0	-26·8
15·376 C	63	479	34	259	238·6	+ 2·3	+14·5	-13·5
16·442 G	58	428	31	227	238·8	+ 2·5	+14·3	+ 0·7
17·282 C	75	426	41	230	239·0	+ 2·7	+13·9	+11·9
18·453 G	52	315	31	189	239·3	+ 3·0	+13·9	+27·7
19·415 G	54	285	38	200	239·6	+ 3·3	+13·9	+40·6
20·307 C	46	268	40	236	239·5	+ 3·2	+13·8	+52·3
21·391 G	28	163	25	147	239·2	+ 2·9	+13·8	+66·3
22·436 G	13	54	50	206	240·0	..	+13·8	+80·8

Group 12706. Feb.7–18. A stable regular spot, *a* of Group 12673.

37·457 G	9	52	28	164	242·7	+ 6·3	+14·6	-78·7
38·315 C	17	101	25	147	242·9	+ 6·5	+15·1	-67·2
39·382 G	28	148	26	136	242·9	+ 6·5	+15·0	-53·2
40·623 G	26	196	18	133	242·9	+ 6·5	+15·1	-36·8
41·391 G	37	209	23	127	242·8	+ 6·4	+15·2	-26·8
42·398 G	35	201	19	111	242·7	+ 6·3	+15·0	-13·7
43·435 G	59	240	32	130	243·0	+ 6·6	+14·5	+ 0·3
44·445 G	33	187	18	103	243·0	+ 6·6	+14·1	+13·6
45·334 C	21	122	12	72	243·0	+ 6·6	+13·9	+25·3
46·373 C	15	106	10	73	242·9	+ 6·5	+13·7	+38·9
47·301 C	11	72	10	63	243·0	+ 6·6	+13·7	+51·2
48·412 G	2	9	3	12	243·2	+ 6·8	+13·7	+66·0
Means ..	..	..	19	106	242·9	..	+14·5	..

No. 1224 — *continued.*

Group 12707. Feb.8–20. A stream apparently in its declining stages within an extensive area of faculæ. The chief components are at the rear; throughout there are considerable changes.

d					°	°	°	°
38·315 C	10	46	(26	122	233·0	..	+13·7)	-77·1
39·382 G	61	340	101	596	224·6	0·0	+15·8	-71·5
40·623 G	110	517	102	485	226·6	+ 2·0	+15·8	-53·1
41·391 G	84	569	66	439	226·8	+ 2·2	+15·7	-42·8
42·398 G	107	916	67	582	225·3	+ 0·7	+15·3	-31·1
43·435 G	122	1155	68	644	225·4	+ 0·8	+14·7	-17·3
44·445 G	152	1179	81	629	227·0	+ 2·4	+14·2	- 2·4
45·334 C	109	875	59	481	226·8	+ 2·2	+14·9	+ 9·1
46·373 C	99	941	58	559	227·5	+ 2·9	+14·8	+23·5
47·301 C	108	869	73	583	228·1	+ 3·5	+14·8	+36·3
48·412 G	96	602	83	518	227·5	+ 2·8	+14·7	+50·3
49·394 C	51	346	64	440	228·8	+ 4·1	+14·4	+64·6
50·438 G	8	34	(29	139	231·3	..	+14·1)	+80·8
Means ..	..	..	75	541	226·8	..	+15·0	..

No. 1225. Latitude +12°·4.

Group 12693 in Rotation 1128
" 12727 " " 1129

Group 12693. Jan.27–Feb.8. A large stream of normal type. *a* is the leader spot: *b* the follower, and *c* a small spot in an intermediate position.

26·457 G	9	35	(25	99	28·7	..	+12·2)	-77·6
27·131 K	46	236	81	410	26·4	0·0	+12·6	-71·0
28·402 G	126	627	121	602	25·5	- 1·0	+12·9	-55·1
29·384 C	156	822	113	590	26·8	+ 0·2	+13·5	-40·9
30·278 C	178	1124	110	690	27·5	+ 0·9	+12·7	-28·4
31·393 G	178	1230	98	679	27·2	+ 0·5	+12·7	-14·1
32·288 C	206	1232	110	656	27·8	+ 1·0	+12·6	- 1·7
33·468 G	237	1200	130	657	28·0	+ 1·2	+12·4	+14·1
34·479 G	151	1070	90	643	28·2	+ 1·3	+12·6	+27·6
35·438 G	163	929	115	661	28·1	+ 1·1	+13·0	+40·1
36·334 C	93	626	84	555	28·1	+ 1·1	+12·9	+51·9
37·457 G	44	300	68	477	30·0	+ 2·9	+13·0	+68·6
38·315 C	17	80	58	274	29·9	+ 2·7	+12·9	+79·8
Means ..	..	..	98	574	27·8	..	+12·8	..

Spot *a*

26·457 G	9	35	25	99	28·7	..	+12·2	-77·6
27·131 K	16	90	23	129	30·1	0·0	+13·3	-67·3
28·402 G	52	245	44	208	29·9	- 0·3	+13·6	-50·7
29·384 C	59	365	40	245	29·9	- 0·4	+13·9	-37·8
30·278 C	84	561	50	331	30·9	+ 0·6	+13·5	-25·0
31·393 G	95	668	51	361	30·8	+ 0·4	+12·9	-10·5
32·288 C	134	781	71	414	30·7	+ 0·2	+12·6	+ 1·2
33·468 G	156	898	86	494	30·1	- 0·4	+12·8	+16·2
34·479 G	109	831	66	507	30·1	- 0·5	+12·8	+29·5
35·438 G	122	738	89	539	30·9	+ 0·2	+12·9	+42·9
36·334 C	76	475	71	442	31·0	+ 0·3	+12·7	+54·8
37·457 G	37	278	60	453	31·3	+ 0·5	+12·8	+69·9
38·315 C	17	80	58	274	29·9	- 1·0	+12·9	+79·8

LEDGER I. – RECURRENT GROUPS OF SUN SPOTS FOR THE YEAR.

No. 1225: Group 12693 — *continued.*

Spot *b*

Date U.T. Place	Projected Area Umbra	Projected Area Whole Spots	Corrected Area Umbra	Corrected Area Whole Spots	Longitude and Proper Motion		Latitude	Long. from C.M.
d					°	°	°	°
27·131 K	12	56	27	126	22·0	0·0	+13·5	-75·4
28·402 G	59	308	63	326	21·5	- 0·6	+13·4	-59·1
29·384 C	67	315	52	246	21·4	- 0·8	+13·4	-46·3
30·278 C	63	391	41	254	21·3	- 0·9	+13·5	-34·6
31·393 G	61	473	35	270	21·4	- 0·9	+13·7	-19·9
32·288 C	59	382	32	206	21·5	- 0·9	+13·6	- 8·0
33·468 G	72	267	39	144	21·2	- 1·2	+13·6	+ 7·3
34·479 G	35	213	20	121	20·8	- 1·7	+13·7	+20·2
35·438 G	39	182	25	116	21·0	- 1·6	+13·7	+33·0
36·334 C	17	151	13	113	20·4	- 2·2	+13·7	+44·2
37·457 G	7	22	8	24	20·8	- 1·9	+14·2	+59·4

Spot *c*

27·131 K	18	90	31	155	26·0	0·0	+11·4	-71·4
28·402 G	15	74	14	68	25·6	- 0·5	+10·6	-55·0
29·384 C	17	71	12	50	25·7	- 0·5	+11·0	-42·0
30·278 C	23	101	14	62	25·6	- 0·6	+11·1	-30·3
31·393 G	22	89	12	48	25·6	- 0·7	+11·3	-15·7
32·288 C	13	69	7	36	25·9	- 0·5	+11·3	- 3·6
33·468 G	9	35	5	19	26·0	- 0·4	+11·5	+12·1
34·479 G	7	26	4	15	26·0	- 0·5	+11·4	+25·4
35·438 G	2	9	1	6	25·2	- 1·4	+12·8	+37·2

Group 12727. Feb.23–Mar.3. A regular spot (*a* of Group 12693) disappearing rapidly after Feb.27. Two or three small companion spots are seen on Feb.28, March 1 and 3.

53·384 G	9	44	30	144	32·3	+ 0·4	+12·2	-79·4
54·389 G	15	88	20	120	32·4	+ 0·4	+12·3	-66·1
55·465 G	26	110	23	98	31·7	- 0·4	+12·2	-52·6
56·426 G	18	64	13	45	31·6	- 0·6	+12·1	-40·0
57·384 G	13	50	8	30	31·5	- 0·7	+12·3	-27·5
58·401 C	4	28	2	15	33·8	+ 1·5	+12·3	-11·8
59·378 G	10	50	5	27	32·7	+ 0·3	+12·2	0·0
60·433 G	0	0	0	0	..	..	..	..
61·378 G	4	13	2	8	36·0	+ 3·5	+10·8	+29·6
Means ..	..	..	11	54	32·8	..	+12·0	..

No. 1226. Latitude -26°·8.

Group 12703 in Rotation 1129
" 12733 " " 1130
" 12767 " " 1131
" 12798 " " 1132

Group 12703. Feb.4–16. A very large stream of spots beginning as a tiny spot on Feb.4. The stream is approximately of normal type, (with *a* as leader) but it becomes somewhat complex after Feb.9. The rear portion is dying out rapidly as the west limb is approached.

34·479 G	2	4	3	6	288·6	0·0	-23·8	-72·0
35·438 G	22	78	26	90	283·1	- 5·2	-24·9	-64·9
36·334 C	36	157	30	134	284·5	- 3·5	-22·8	-51·7

No. 1226: Group 12703 — *continued.*

d					°	°	°	°
37·457 G	135	803	88	526	284·2	- 3·4	-25·1	-37·2
38·315 C	210	1798	122	1042	285·2	- 2·1	-25·0	-24·9
39·382 G	380	1920	204	1031	287·1	+ 0·2	-25·2	- 9·0
40·623 G	366	2322	196	1242	286·3	- 0·2	-24·6	+ 6·6
41·391 G	367	2114	204	1170	285·4	- 0·9	-25·5	+15·8
42·398 G	244	2045	152	1255	286·7	+ 0·8	-25·3	+30·3
43·435 G	224	1596	168	1183	287·8	+ 2·2	-25·5	+45·1
44·445 G	174	1334	171	1292	287·2	+ 2·0	-25·0	+57·8
45·334 C	77	899	106	1234	287·5	+ 2·6	-25·0	+69·8
46·373 C	34	346	93	948	285·4	..	-24·8	+81·4
Means ..	..	..	122	850	286·1	..	-24·8	..

Spot *a*

36·334 C	15	71	12	58	285·7	0·0	-24·8	-50·5
37·457 G	61	391	38	246	287·4	+ 2·1	-24·4	-34·0
38·315 C	139	1214	79	692	287·6	+ 2·6	-24·6	-22·5
39·382 G	244	1190	129	631	289·8	+ 5·1	-24·5	- 6·3
40·623 G	222	1184	120	639	291·2	+ 7·0	-24·4	+11·5
41·391 G	166	922	95	526	291·4	+ 7·4	-23·7	+21·8
42·398 G	153	881	98	564	291·7	+ 8·1	-25·0	+35·3
43·435 G	148	948	115	739	291·4	+ 8·1	-25·5	+48·7
44·445 G	122	780	127	811	290·9	+ 7·9	-25·3	+61·5
45·334 C	46	519	69	784	289·6	+ 6·9	-25·5	+71·9

Group 12733. March 3–15. A stable regular spot, *a* of Group 12703. Group 12742 forms closely *nf* on Mar.10.

61·378 G	40	176	82	361	288·5	+ 1·3	-25·6	-77·9
62·380 G	70	312	80	359	288·4	+ 1·5	-25·6	-64·8
63·375 G	77	385	64	320	288·1	+ 1·5	-25·8	-52·0
64·433 G	92	458	61	302	287·8	+ 1·6	-25·7	-38·3
65·383 G	106	532	61	309	287·7	+ 1·8	-25·7	-25·9
66·388 G	114	543	62	293	287·1	+ 1·6	-25·9	-13·3
67·383 G	110	530	58	281	286·6	+ 1·4	-26·0	- 0·7
68·384 G	77	513	42	277	286·2	+ 1·3	-25·9	+12·1
69·380 G	88	433	51	251	285·7	+ 1·2	-26·0	+24·7
70·529 G	70	376	47	252	285·3	+ 1·2	-26·2	+39·5
71·625 C	60	265	51	225	284·8	+ 1·0	-26·4	+53·4
72·381 G	53	238	57	257	284·1	+ 0·6	-26·4	+62·7
73·375 G	26	132	46	232	283·5	+ 0·3	-26·5	+75·2
Means ..	..	..	59	286	286·4	..	-26·0	..

Group 12767. Mar.31–Apr.13. A stable regular spot (*a* of Group 12703) with an occasional small companion.

89·381 G	13	67	32	165	277·1	..	-26·8	-80·1
90·428 G	16	129	20	157	277·4	+10·0	-26·9	-66·0
91·399 G	40	169	35	147	276·7	+ 9·6	-27·1	-53·9
92·421 G	40	183	28	128	276·1	+ 9·4	-27·3	-41·0
93·381 G	51	241	31	145	276·0	+ 9·6	-27·4	-28·5
94·408 G	31	205	17	113	275·6	+ 9·5	-27·5	-15·3
95·381 G	40	197	22	106	275·4	+ 9·7	-27·6	- 2·7
96·386 G	36	179	20	98	274·9	+ 9·5	-27·6	+10·1
97·388 G	27	141	16	82	274·3	+ 9·2	-27·6	+22·7
98·334 C	34	146	23	95	273·2	+ 8·5	-28·0	+34·1
99·392 G	25	112	20	87	273·0	+ 8·6	-27·7	+47·9
100·337 G	18	89	18	91	272·3	+ 8·2	-28·0	+59·6

LEDGER I. – RECURRENT GROUPS OF SUN SPOTS FOR THE YEAR.

No. 1226: Group 12767 — *continued.*

Date U.T. Place	Projected Area Umbrae	Projected Area Whole Spots	Corrected Area Umbrae	Corrected Area Whole Spots	Longitude and Proper Motion	Latitude	Long. from C.M.
d					°	°	°	°
101·380 G	9	49	15	80	271·7	+ 8·0	-27·9	+72·8
102·340 G	4	13	16	53	271·2	..	-28·1	+85·0
Means ..	..	..	22	111	274·7	..	-27·6	..

Group 12798. Apr.28–May 2. A small regular spot, with a companion on April 29 and May 1, *f* Group 12794. More probably a revival rather than a return of Group 12767.

117·391 G	14	54	28	103	273·1	+14·8	-30·1	-74·3
118·376 G	13	86	15	97	272·7	+14·7	-30·2	-61·7
119·337 G	16	82	13	68	272·7	+15·1	-30·3	-49·0
120·400 C	20	88	13	59	271·9	+14·6	-31·1	-35·8
121·397 C	13	59	8	35	272·7	+15·8	-29·1	-21·8
Means ..	..	..	15	72	272·6	..	-30·2	..

No. 1227. Latitude -7°·3.

Group 12730 in Rotation 1129
" 12754 " " 1130

Group 12730. Feb.26–Mar.1. Smallish spots in stream formation.

56·426 G	24	140	15	90	110·7	0·0	- 7·5	+39·1
57·384 G	53	188	41	147	109·7	- 1·1	- 6·9	+50·7
58·401 C	25	161	28	182	109·9	- 1·1	- 6·9	+64·3
59·378 G	13	61	26	121	108·8	- 2·3	- 6·8	+76·1
Means ..	..	..	28	135	109·8	..	- 7·0	..

Group 12754. Mar.16–27. A compact stream in which the components are almost touching on Mar.16–19.

74·507 G	37	201	85	456	115·7	+ 2·3	- 7·6	-77·7
75·618 G	69	483	75	522	116·0	+ 2·5	- 8·0	-62·7
76·425 G	79	548	64	443	116·0	+ 2·3	- 7·5	-52·1
77·375 G	85	595	55	386	115·3	+ 1·5	- 7·7	-40·3
78·366 G	95	564	53	313	115·9	+ 1·9	- 7·6	-26·6
79·374 G	93	597	47	306	116·0	+ 1·9	- 7·6	-13·2
80·379 G	64	309	32	155	117·1	+ 2·9	- 8·0	+ 1·1
81·454 G	60	296	31	154	117·7	+ 3·3	- 7·8	+15·9
82·383 G	36	187	20	106	118·1	+ 3·6	- 7·6	+28·6
83·329 C	26	82	18	54	118·5	+ 3·8	- 7·3	+41·4
84·338 G	11	87	10	75	118·7	+ 3·9	- 6·8	+54·9
85·360 C	6	26	8	35	119·0	+ 4·0	- 6·6	+68·7
Means ..	..	..	42	250	117·0	..	- 7·5	..

No. 1228. Latitude -14°·4.

Group 12731 in Rotation 1129
" 12757 " " 1130
" 12783 " " 1131
" 12823 " " 1132
" 12862 " " 1133

Group 12731. Feb.27–Mar.6. A stream of normal type. *a* and *b* are leader and follower spots respectively.

Date U.T. Place	Projected Area Umbrae	Projected Area Whole Spots	Corrected Area Umbrae	Corrected Area Whole Spots	Longitude and Proper Motion	Latitude	Long. from C.M.
d					°	°	°	°
57·384 G	26	110	14	56	52·6	0·0	-14·5	- 6·4
58·401 C	107	644	54	328	53·6	+ 1·0	-14·1	+ 8·0
59·378 G	128	808	69	438	53·7	+ 1·0	-13·9	+21·0
60·433 G	97	737	61	455	54·2	+ 1·5	-14·3	+35·4
61·378 G	100	565	75	427	54·3	+ 1·6	-13·9	+47·9
62·380 G	79	461	80	485	54·7	+ 1·9	-14·0	+61·5
63·375 G	44	163	94	346	55·1	+ 2·3	-14·1	+75·0
64·433 G	9	44	(31	151	49·3	..	-15·5)	+83·2
Means ..	..	..	64	362	54·0	..	-14·1	..

Spot *a*

57·384 G	13	31	7	16	54·6	0·0	-14·5	- 4·4
58·401 C	42	259	21	132	57·0	+ 2·4	-13·8	+11·4
59·378 G	50	302	28	169	58·4	+ 3·7	-14·4	+25·7
60·433 G	53	275	35	182	59·4	+ 4·7	-14·0	+40·6
61·378 G	37	202	31	170	60·5	+ 5·8	-13·2	+54·1
62·380 G	20	150	26	195	61·6	+ 6·8	-12·9	+68·4
63·375 G	18	62	59	203	62·7	..	-12·4	+82·6

Spot *b*

57·384 G	13	79	7	40	51·7	0·0	-14·4	- 7·3
58·401 C	61	343	31	175	51·3	- 0·4	-13·5	+ 5·7
59·378 G	74	473	39	251	51·0	- 0·8	-13·5	+18·3
60·433 G	40	436	24	257	51·3	- 0·5	-14·0	+32·5
61·378 G	59	323	41	226	51·0	- 0·8	-14·0	+44·6
62·380 G	53	251	48	228	50·7	- 1·2	-14·5	+57·5
63·375 G	26	92	35	125	49·7	- 2·2	-15·4	+69·6
64·433 G	9	44	31	151	49·3	..	-15·5	+83·2

Group 12757. Mar.20–Apr.2. A pair of very large regular spots, *a* and *b* respectively, which are widely separated in longitude. On most days, there is an absence of companion spots. A small part of *b* tends to break away after Mar.27.

78·366 G	55	285	(115	596	65·1	..	-12·9)	-77·4
79·374 G	163	899	251	1417	58·1	+ 4·9	-15·1	-71·1
80·379 G	283	1507	270	1453	58·5	+ 5·2	-14·5	-57·5
81·454 G	397	2110	284	1512	57·1	+ 3·8	-14·7	-44·7
82·383 G	463	2404	277	1443	57·3	+ 4·0	-14·7	-32·2
83·329 C	511	2778	278	1514	57·2	+ 3·8	-14·7	-19·9
84·338 G	510	2722	261	1390	56·0	+ 2·6	-14·1	- 7·8
85·360 C	479	2631	246	1354	56·5	+ 3·1	-14·5	+ 6·2
86·453 G	475	2500	257	1349	55·3	+ 1·9	-14·8	+19·4
87·376 G	395	2193	237	1310	54·5	+ 1·0	-14·9	+30·8
88·386 G	326	1739	232	1226	53·8	+ 0·3	-14·7	+43·4
89·381 G	254	1325	248	1246	52·9	- 0·6	-14·6	+55·7

LEDGER I. - RECURRENT GROUPS OF SUN SPOTS FOR THE YEAR.

Date U.T. Place	Projected Area Umbrae	Projected Area Whole Spots	Corrected Area Umbrae	Corrected Area Whole Spots	Longitude and Proper Motion		Latitude	Long. from C.M.
No. 1228: Group 12757 — *continued.*								
d					°	°	°	°
90·428 G	127	765	196	1180	53·7	+ 0·1	-14·2	+70·3
91·399 G	40	219	(87	475	48·6	..	-16·0)	+78·0
Means ..	..	..	253	1365	55·9	..	-14·6	..
Spot *a*								
78·366 G	55	285	115	596	65·1	+ 9·9	-12·9	-77·4
79·374 G	110	583	124	659	65·0	+ 9·8	-12·9	-64·2
80·379 G	168	857	134	686	64·4	+ 9·1	-12·9	-51·6
81·454 G	194	1034	122	651	64·4	+ 9·1	-13·1	-37·4
82·383 G	233	1192	128	656	64·2	+ 8·9	-13·1	-25·3
83·329 C	275	1389	143	722	64·4	+ 9·0	-13·0	-12·7
84·338 G	222	1212	111	606	64·4	+ 9·0	-12·8	+ 0·6
85·360 C	204	1178	106	613	64·3	+ 8·9	-12·8	+14·0
86·453 G	200	970	114	553	64·1	+ 8·7	-12·6	+28·2
87·376 G	151	821	100	542	64·4	+ 8·9	-12·6	+40·7
88·386 G	120	591	100	491	64·0	+ 8·5	-12·4	+53·6
89·381 G	98	415	122	515	64·3	+ 8·8	-12·5	+67·1
90·428 G	31	185	85	507	64·0	..	-12·4	+80·6
Spot *b*								
79·374 G	53	316	127	758	49·8	- 2·5	-16·1	-79·4
80·379 G	115	650	136	767	50·2	- 2·2	-16·1	-65·8
81·454 G	203	1076	162	861	50·0	- 2·4	-15·8	-51·8
82·383 G	226	1194	147	776	49·8	- 2·6	-15·8	-39·7
83·329 C	236	1389	135	792	49·6	- 2·9	-15·4	-27·5
84·338 C	281	1474	146	766	49·5	- 3·0	-15·7	-14·3
85·360 C	275	1453	140	741	49·2	- 3·3	-15·8	- 1·1
86·453 G	275	1530	143	796	49·1	- 3·4	-15·8	+13·2
87·376 G	244	1372	137	768	49·3	- 3·3	-16·1	+25·6
88·386 G	206	1148	132	735	49·0	- 3·6	-16·0	+38·6
89·381 G	152	888	122	710	48·9	- 3·7	-16·0	+51·7
90·428 G	96	580	111	673	48·6	- 4·1	-15·6	+65·2
91·399 G	40	219	87	475	48·6	- 4·1	-16·0	+78·0
Group 12783. Apr.16–28. A large spot (probably *a* of Group 12757) regular in structure except for a bulge on its eastern side.								
105·379 G	40	126	153	481	62·5	..	-12·9	-83·6
106·346 G	63	441	97	679	61·5	+ 5·5	-12·9	-71·8
107·334 G	119	747	114	716	61·3	+ 5·2	-13·4	-59·0
108·437 G	184	986	129	690	61·2	+ 5·1	-13·4	-44·5
109·452 G	207	1152	122	680	61·6	+ 5·5	-13·1	-30·7
110·360 G	227	1136	121	603	61·9	+ 5·8	-13·2	-18·4
111·348 G	172	990	88	505	62·0	+ 5·8	-13·1	- 5·3
112·193 K	178	838	91	427	62·2	+ 6·0	-13·1	+ 6·1
113·641 G	147	728	82	408	62·3	+ 6·1	-13·2	+25·3
114·586 G	124	601	79	385	62·4	+ 6·1	-13·2	+37·9
115·529 G	95	493	74	385	62·3	+ 6·0	-13·3	+50·3
116·413 G	72	330	77	353	62·6	+ 6·3	-13·5	+62·3
117·391 G	41	199	75	367	62·4	+ 6·1	-13·5	+75·0
Means ..	..	..	96	516	62·0	..	-13·2	..

Date U.T. Place	Projected Area Umbrae	Projected Area Whole Spots	Corrected Area Umbrae	Corrected Area Whole Spots	Longitude and Proper Motion		Latitude	Long. from C.M.
No. 1228 — *continued.*								
Group 12823. May 14–26. A group of stream type with the largest component, *b*, (a regular spot) as follower. *b* alone remains after May 22. Perhaps a revival and not a true return of Group 12783.								
d					°	°	°	°
133·341 G	50	246	96	475	61·4	+ 4·6	-14·2	-75·2
134·358 G	77	467	81	488	62·0	+ 5·2	-14·4	-61·1
135·341 G	105	621	80	473	61·7	+ 4·8	-14·2	-48·4
136·343 C	155	714	96	444	61·5	+ 4·6	-14·4	-35·2
137·361 G	141	808	78	443	61·5	+ 4·6	-14·3	-21·9
138·348 G	96	570	50	297	60·9	+ 3·9	-13·9	- 9·4
139·358 G	127	577	65	295	60·4	+ 3·4	-13·9	+ 3·4
140·343 G	82	468	45	252	59·9	+ 2·9	-13·9	+16·0
141·424 G	89	458	53	271	59·6	+ 2·6	-13·9	+30·0
142·340 G	59	328	40	223	59·2	+ 2·1	-14·1	+41·7
143·335 G	46	269	40	237	58·9	+ 1·8	-14·1	+54·6
144·341 C	31	175	40	228	58·0	+ 0·9	-14·1	+67·0
145·333 G	14	66	42	200	58·5	..	-14·4	+80·6
Means ..	..	..	64	344	60·4	..	-14·1	..
Spot *b*								
133·341 G	50	246	96	475	61·4	+ 4·6	-14·2	-75·2
134·358 G	66	394	71	422	61·1	+ 4·3	-14·2	-62·0
135·341 G	91	543	70	418	61·2	+ 4·3	-14·1	-48·9
136·343 C	84	400	53	252	60·4	+ 3·5	-13·5	-36·3
137·361 G	91	488	50	268	60·4	+ 3·5	-13·7	-23·0
138·348 G	68	451	35	235	60·2	+ 3·2	-13·7	-10·1
139·358 G	109	504	56	257	60·0	+ 3·0	-13·8	+ 3·0
140·343 G	73	438	39	232	59·8	+ 2·8	-13·9	+15·9
141·424 G	80	417	47	246	59·3	+ 2·3	-13·9	+29·7
142·340 G	59	328	40	223	59·2	+ 2·1	-14·1	+41·7
143·335 G	46	269	40	237	58·9	+ 1·8	-14·1	+54·6
144·341 C	31	175	40	228	58·0	+ 0·9	-14·1	+67·0
145·333 G	14	66	42	200	58·5	..	-14·4	+80·6
Group 12862. June 11–21. A small group, long-lived for its size.								
161·385 G	5	7	7	10	57·0	- 0·6	-15·5	-68·5
162·415 G	5	9	5	8	56·8	- 0·9	-15·2	-55·0
163·337 G	9	21	6	15	56·9	- 0·8	-15·3	-42·7
164·339 G	9	21	5	13	56·8	- 0·9	-15·0	-29·6
165·338 G	12	28	7	15	55·9	- 1·8	-15·4	-17·3
166·337 G	12	34	6	18	56·4	- 1·4	-14·9	- 3·5
167·418 G	39	115	21	62	57·9	+ 0·1	-16·4	+12·3
168·343 G	28	94	16	55	57·6	- 0·2	-16·6	+24·2
169·387 C	14	42	10	29	58·8	+ 0·9	-17·2	+39·2
170·373 G	9	32	8	28	59·0	+ 1·1	-16·1	+52·5
171·336 G	9	18	11	22	58·5	+ 0·6	-16·0	+64·8
Means ..	..	..	9	25	57·4	..	-15·8	..

LEDGER I. - RECURRENT GROUPS OF SUN SPOTS FOR THE YEAR.

No. 1229. Latitude -9°·4.

Group 12738 in Rotation 1130
" 12772 " " 1131

Group 12738. Mar.8–18. A fairly large group of stream type containing spots that individually undergo considerable day to day changes. By March 16, the leader, *a*, has finally stabilized as a regular spot.

Date U.T. Place	Projected Area Umbrae	Projected Area Whole Spots	Corrected Area Umbrae	Corrected Area Whole Spots	Longitude and Proper Motion	Latitude	Long. from C.M.
d					°	°	°	°
66·388 G	28	77	29	80	238·5	0·0	- 8·7	-61·9
67·383 G	68	271	50	199	240·0	+ 1·4	- 9·4	-47·3
68·384 G	73	306	44	181	241·6	+ 2·9	- 9·3	-32·5
69·380 G	92	384	49	202	243·4	+ 4·5	- 9·5	-17·6
70·529 G	128	645	65	323	242·8	+ 3·8	- 9·1	- 3·0
71·625 C	167	1033	85	527	243·1	+ 4·0	- 9·4	+11·7
72·381 G	172	1064	93	582	244·6	+ 5·4	- 9·1	+23·2
73·375 G	233	1159	146	722	244·8	+ 5·4	- 8·8	+36·5
74·507 G	141	783	115	635	245·7	+ 6·2	- 8·8	+52·3
75·618 G	74	424	99	576	246·9	+ 7·3	- 8·3	+68·2
76·425 G	35	203	90	495	247·3	+ 7·6	- 8·9	+79·2
Means ..	..	..	79	411	243·5	..	- 9·0	..

Spot *a*

66·388 G	13	40	13	40	240·3	0·0	- 8·6	-60·1
67·383 G	35	165	25	117	241·8	+ 1·4	- 8·8	-45·5
68·384 G	40	198	23	115	243·4	+ 2·9	- 8·9	-30·7
69·380 G	48	260	25	135	245·0	+ 4·3	- 9·5	-16·0
70·529 G	62	304	31	152	246·2	+ 5·4	- 9·8	+ 0·4
71·625 C	86	509	45	265	247·0	+ 6·1	- 9·5	+15·6
72·381 G	97	651	54	365	247·8	+ 6·8	- 9·5	+26·4
73·375 G	92	440	61	290	249·1	+ 7·9	- 9·4	+40·8
74·507 G	53	283	47	252	249·9	+ 8·6	- 9·5	+56·5
75·618 G	35	208	52	312	250·0	+ 8·6	- 8·9	+71·3
76·425 G	22	110	67	333	249·8	..	- 9·0	+81·7

Group 12772. Apr.2–14. A stable regular spot, *a* of Group 12738.

91·399 G	22	80	54	197	251·6	+ 8·3	- 9·2	-79·0
92·421 G	31	163	37	192	251·6	+ 8·1	- 9·1	-65·5
93·381 G	47	219	39	180	251·7	+ 8·1	- 9·3	-52·8
94·408 G	49	290	31	186	251·8	+ 8·1	- 9·5	-39·1
95·381 G	49	296	27	166	251·6	+ 7·8	- 9·7	-26·5
96·386 G	63	309	32	158	251·5	+ 7·6	- 9·7	-13·3
97·388 G	78	323	39	162	251·4	+ 7·3	- 9·7	- 0·2
98·334 C	65	336	33	171	251·3	+ 7·1	- 9·8	+12·2
99·392 G	54	262	30	147	251·2	+ 6·9	- 9·9	+26·1
100·337 G	45	255	29	163	251·3	+ 6·9	-10·4	+38·6
101·380 G	31	197	25	160	251·3	+ 6·8	-10·3	+52·4
102·340 G	29	125	34	146	251·5	+ 6·8	-10·0	+65·3
103·376 G	9	61	23	154	251·8	+ 7·0	- 9·9	+79·3
Means ..	..	..	33	168	251·5	..	- 9·7	..

No. 1230. Latitude +25°·6.

Group 12758 in Rotation 1130
" 12777 " " 1131
" 12810 " " 1132

Group 12758. Mar.21–23. One or two small spots.

d					°	°	°	°
79·374 G	4	11	4	10	176·3	0·0	+27·4	+47·1
80·379 G	4	20	6	28	177·8	+ 1·8	+27·3	+61·8
81·454 G	4	8	18	34	180·8	+ 5·1	+26·7	+79·0
Means ..	..	..	9	24	178·3	..	+27·1	..

Group 12777. Apr.8–20. A stream with well-defined leader and follower spots (*a* and *b* respectively). After April 14, *b* shows a pronounced elongation in longitude and is itself drawn out into a short stream of spots which practically touch each other. The decrease in area of *a* between April 12 and 13 represents a partial disruption of the original spot, after which the measures relate to the leading portion. The axis of the whole group is inclined considerably to the sun's equator.

97·388 G	100	540	272	1468	176·5	+ 5·5	+26·7	-75·1
98·334 C	176	1032	246	1470	176·1	+ 5·4	+26·7	-63·0
99·392 G	235	1538	222	1472	175·8	+ 5·4	+26·5	-49·3
100·337 G	361	1980	275	1512	175·3	+ 5·2	+27·0	-37·4
101·380 G	366	2034	240	1323	175·4	+ 5·6	+26·7	-23·5
102·340 G	372	1573	225	1373	174·8	+ 5·3	+26·7	-11·4
103·376 G	308	1952	182	1158	173·8	+ 4·6	+26·8	+ 1·3
104·105 K	297	1730	179	1045	173·9	+ 4·9	+26·9	+11·0
105·379 G	232	1330	155	887	172·8	+ 4·2	+26·6	+26·7
106·346 G	130	896	103	704	172·9	+ 4·6	+26·9	+39·6
107·334 G	81	443	83	456	173·4	+ 5·4	+26·1	+53·1
108·437 G	41	169	76	313	174·3	+ 6·6	+26·0	+68·6
109·452 G	7	32	(17	79	165·5	..	+30·0)	+73·2
Means ..	..	..	188	1098	174·6	..	+26·6	..

Spot *a*

97·388 G	60	325	119	647	181·0	0·0	+25·5	-70·6
98·334 C	100	516	121	624	179·8	- 0·9	+25·8	-59·3
99·392 G	132	750	115	652	179·0	- 1·4	+25·9	-46·1
100·337 G	184	1021	132	735	178·6	- 1·5	+26·0	-34·1
101·380 G	220	1335	139	841	177·3	- 2·5	+25·9	-21·6
102·340 G	130	746	75	433	178·5	- 1·0	+24·6	- 7·7
103·376 G	126	756	73	438	178·3	- 0·9	+24·8	+ 5·8
104·105 K	123	653	74	392	178·0	- 1·0	+24·9	+15·1
105·379 G	99	446	67	303	177·6	- 1·0	+24·7	+31·5
106·346 G	76	378	62	310	177·5	- 0·9	+24·9	+44·2
107·334 G	45	261	50	287	177·2	- 0·9	+24·8	+56·9
108·437 G	32	133	64	265	177·0	- 0·7	+24·8	+71·3

Spot *b*

97·388 G	40	215	153	821	173·2	0·0	+27·3	-78·4
98·334 C	76	516	125	846	172·7	- 0·2	+27·6	-66·4
99·392 G	103	788	107	820	172·0	- 0·6	+28·0	-53·1

continued

LEDGER I. - RECURRENT GROUPS OF SUN SPOTS FOR THE YEAR.

No. 1230: Group 12777 — *continued.*

Spot *b* — *continued.*

Date U.T. Place	Projected Area Umbræ	Projected Area Whole Spots	Corrected Area Umbræ	Corrected Area Whole Spots	Longitude and Proper Motion		Latitude	Long. from C.M.
d					°	°	°	°
100·337 G	177	959	143	777	172·0	− 0·3	+28·2	−40·7
101·380 G	146	699	101	482	171·6	− 0·4	+28·6	−27·3
102·340 G	157	797	99	502	170·5	− 1·2	+28·8	−15·7
103·376 G	110	688	67	420	169·9	− 1·5	+28·7	− 2·6
104·105 K	112	636	68	388	169·8	− 1·4	+28·8	+ 6·9
105·379 G	101	495	67	327	169·5	− 1·3	+28·4	+23·4
106·346 G	54	518	41	394	170·2	− 0·4	+28·0	+36·9
107·334 G	36	182	33	169	168·9	− 1·4	+28·4	+48·6
108·437 G	9	36	12	48	166·5	− 3·4	+29·7	+60·8
109·452 G	7	32	17	79	165·5	− 4·1	+30·0	+73·2

Group 12810. May 5–16. A diminishing regular spot – *a* of Group 12777.

124·338 G	5	11	24	53	173·8	..	+23·5	−81·8
125·453 G	18	79	28	125	172·8	+ 0·1	+23·5	−68·1
126·487 G	18	114	18	112	173·0	+ 0·6	+23·3	−54·2
127·374 G	32	155	25	119	172·7	+ 0·6	+23·3	−42·8
128·509 C	40	196	25	123	172·9	+ 1·1	+23·6	−27·6
129·376 G	32	155	19	91	172·0	+ 0·4	+23·5	−17·0
130·601 G	16	96	9	53	171·8	+ 0·6	+23·5	− 1·0
131·334 G	11	62	6	35	171·7	+ 0·7	+24·0	+ 8·6
132·348 G	14	59	8	35	170·7	0·0	+24·2	+21·0
133·341 G	11	39	7	27	170·5	+ 0·1	+24·2	+33·9
134·358 G	7	23	6	19	170·0	− 0·1	+24·4	+46·9
135·341 G	5	14	6	16	169·7	− 0·1	+24·5	+59·6
Means ..	..	..	14	69	171·6	..	+23·8	..

No. 1231. Latitude −19°·7.

Group 12762 in Rotation 1131
" 12792 " " 1132

Group 12762. Mar.27–Apr.8. A regular spot, *a*, near which companions form and disappear between March 30 and April 4–5, leaving the original spot unaltered. On April 6 another formation appears just southwards, and this time *a* is absorbed into the new large spot, a_1, with its double umbra that results.

85·360 C	22	90	51	207	331·2	0·0	−20·4	−79·1
86·453 G	47	220	53	246	331·7	+ 0·6	−20·1	−64·2
87·376 G	67	324	55	266	331·4	+ 0·4	−20·1	−52·3
88·386 G	86	443	57	291	331·1	+ 0·2	−20·7	−39·3
89·381 G	105	620	60	357	330·4	− 0·4	−20·7	−26·8
90·428 G	141	651	75	344	331·2	+ 0·5	−20·8	−12·2
91·399 G	91	482	47	247	331·3	+ 0·7	−20·4	+ 0·7
92·421 G	85	462	46	245	331·2	+ 0·7	−20·4	+14·1
93·381 G	58	343	33	196	331·3	+ 0·9	−20·2	+26·8
94·408 G	61	326	41	218	331·2	+ 1·0	−20·3	+40·3
95·381 G	105	525	88	441	331·4	+ 1·3	−21·3	+53·3
96·386 G	85	544	106	667	331·2	+ 1·2	−21·2	+66·4
97·388 G	54	282	129	697	331·1	+ 1·2	−21·3	+79·5
Means ..	..	..	65	340	331·2	..	−20·6	..

No. 1231: Group 12762 — *continued.*

Spot *a* becoming a_1.

d					°	°	°	°
85·360 C	22	90	51	207	331·2	0·0	−20·4	−79·1
86·453 G	47	220	53	246	331·7	+ 0·6	−20·1	−64·2
87·376 G	67	324	55	266	331·4	+ 0·4	−20·1	−52·3
88·386 G	64	309	42	201	331·5	+ 0·6	−20·1	−38·9
89·381 G	67	386	38	220	331·3	+ 0·5	−20·1	−25·9
90·428 G	83	430	44	228	331·3	+ 0·6	−20·0	−12·1
91·399 G	80	413	41	211	331·3	+ 0·7	−20·2	+ 0·7
92·421 G	58	379	31	201	331·2	+ 0·7	−20·2	+14·1
93·381 G	58	343	33	196	331·3	+ 0·9	−20·2	+26·8
94·408 G	54	308	36	206	331·2	+ 1·0	−20·2	+40·3
95·381 G	36	211	30	175	331·1	+ 1·0	−20·2	+53·0
96·386 G	58	430	68	507	330·2	+ 0·2	−21·6	+65·4
97·388 G	45	215	98	467	329·7	− 0·2	−21·7	+78·1

Group 12792. Apr.24–May 5. A stable regular spot representing a_1 of Group 12762.

113·641 G	18	118	21	135	332·8	+ 4·6	−19·1	−64·2
114·586 G	32	172	26	141	332·5	+ 4·4	−18·7	−52·0
115·529 G	32	156	21	105	332·3	+ 4·3	−18·8	−39·7
116·413 G	36	183	21	106	332·1	+ 4·2	−18·5	−28·2
117·391 G	32	167	17	90	331·8	+ 4·0	−18·7	−15·6
118·376 G	36	159	19	83	331·4	+ 3·7	−18·6	− 3·0
119·337 G	29	152	15	79	331·1	+ 3·5	−18·8	+ 9·4
120·400 C	29	132	16	74	330·8	+ 3·3	−18·8	+23·1
121·397 C	24	114	15	73	330·6	+ 3·2	−18·8	+36·1
122·398 C	22	128	17	100	330·1	+ 2·8	−18·7	+48·9
123·337 G	14	59	15	63	330·6	+ 3·4	−18·7	+61·8
124·338 G	5	14	9	26	330·1	+ 3·0	−18·7	+74·5
Means ..	..	..	18	90	331·4	..	−18·7	..

No. 1232. Latitude −5°·0.

Group 12775 in Rotation 1131
" 12803 " " 1132

Group 12775. Apr.6–17. A stream led by a regular spot *a*; the train is of diminishing importance and has died out by Apr.16.

95·381 G	62	300	111	550	203·7	0·0	− 6·2	−74·4
96·386 G	82	455	82	448	205·7	+ 1·8	− 6·0	−59·1
97·388 G	148	819	106	596	205·6	+ 1·6	− 6·0	−46·0
98·334 C	130	738	77	442	206·2	+ 2·0	− 6·0	−32·9
99·392 G	112	834	60	440	206·4	+ 2·0	− 5·7	−18·7
100·337 G	208	850	104	425	207·7	+ 3·2	− 5·0	− 5·0
101·380 G	162	862	82	438	207·8	+ 3·1	− 5·7	+ 8·9
102·340 G	143	670	77	364	208·9	+ 4·0	− 4·9	+22·7
103·376 G	105	449	67	286	210·2	+ 5·1	− 5·5	+37·7
104·105 K	54	272	41	209	212·3	+ 7·1	− 4·4	+49·4
105·379 G	32	158	41	204	213·7	+ 8·3	− 4·4	+67·6
106·346 G	11	65	35	205	214·5	..	− 4·0	+81·2
Means ..	..	..	77	400	208·0	..	− 5·4	..

LEDGER I. – RECURRENT GROUPS OF SUN SPOTS FOR THE YEAR.

No. 1232: Group 12775 — *continued.*

Spot *a*

Date U.T. Place	Projected Area Umbrae	Projected Area Whole Spots	Corrected Area Umbrae	Corrected Area Whole Spots	Longitude and Proper Motion		Latitude	Long. from C.M.
d					°	°	°	°
95·381 G	49	224	78	358	205·9	0·0	− 5·3	−72·2
96·386 G	60	356	55	328	207·3	+ 1·2	− 5·0	−57·5
97·388 G	112	564	77	389	208·1	+ 1·9	− 4·7	−43·5
98·334 C	69	369	39	210	209·9	+ 3·5	− 4·5	−29·2
99·392 G	76	520	40	270	210·2	+ 3·6	− 4·5	−14·9
100·337 G	119	533	60	266	210·7	+ 4·0	− 4·5	− 2·0
101·380 G	99	506	50	258	211·2	+ 4·3	− 4·5	+12·3
102·340 G	87	439	48	241	211·7	+ 4·6	− 4·4	+25·5
103·376 G	83	333	54	216	212·3	+ 5·0	− 4·5	+39·8
104·105 K	44	245	34	189	212·7	+ 5·3	− 4·5	+49·8
105·379 G	32	158	41	204	213·7	+ 6·1	− 4·4	+67·6
106·346 G	11	65	35	205	214·5	..	− 4·0	+81·2

Group 12803. May 2–9. A single spot (*a* of Group 12775) on May 2 breaking up into a pair of components between May 2 and 3.

121·397 C	22	73	50	162	217·9	+ 7·6	− 3·7	−76·6
122·398 C	22	70	24	76	218·6	+ 8·1	− 4·1	−62·6
123·337 G	32	107	25	83	218·8	+ 8·1	− 4·1	−50·0
124·338 G	25	70	16	43	219·2	+ 8·4	− 4·4	−36·4
125·453 G	18	59	10	32	218·7	+ 7·7	− 4·5	−22·2
126·487 G	18	39	9	20	218·3	+ 7·1	− 4·9	− 8·9
127·374 G	9	23	4	12	218·2	+ 6·9	− 4·7	+ 2·7
128·509 C	2	4	1	2	219·6	+ 8·1	− 6·7	+19·1
Means ..	..	..	17	54	218·7	..	− 4·6	..

No. 1233. Latitude −23°·9.

Group 12778 in Rotation 1131
" 12817 " " 1132

Group 12778. Apr.9–22. A large spot nearly regular in structure.

98·334 C	22	95	162	699	151·2	..	−24·0	−87·9
99·392 G	60	390	109	703	150·6	0·0	−24·0	−74·5
100·337 G	132	695	146	768	149·6	− 0·8	−23·5	−63·1
101·380 G	136	773	108	612	149·3	− 0·8	−23·6	−49·6
102·340 G	210	1014	137	660	149·1	− 0·8	−23·7	−37·1
103·376 G	248	1282	141	731	148·4	− 1·3	−23·7	−24·1
104·105 K	200	1400	108	756	148·0	− 1·5	−23·9	−14·9
105·379 G	189	1318	100	699	147·2	− 2·0	−23·9	+ 1·1
106·346 G	189	1192	102	644	146·8	− 2·1	−23·8	+13·5
107·334 G	180	1017	104	590	146·3	− 2·4	−24·1	+26·0
108·437 G	135	886	92	602	145·9	− 2·6	−24·0	+40·2
109·452 G	104	621	89	534	145·4	− 2·8	−23·8	+53·1
110·360 G	63	374	75	445	145·3	− 2·7	−24·0	+65·0
111·348 G	32	170	71	376	145·3	− 2·5	−24·5	+78·0
Means ..	..	..	106	625	147·5	..	−23·9	..

No. 1233: — *continued.*

Group 12817. May 8–20. A stable regular spot.

Date U.T. Place	Projected Area Umbrae	Projected Area Whole Spots	Corrected Area Umbrae	Corrected Area Whole Spots	Longitude and Proper Motion		Latitude	Long. from C.M.
d					°	°	°	°
127·374 G	23	148	52	333	138·1	− 5·9	−24·6	−77·4
128·509 C	48	290	53	321	138·6	− 5·1	−24·4	−61·9
129·376 G	69	351	58	295	137·7	− 5·8	−24·1	−51·3
130·601 G	87	420	57	273	137·6	− 5·6	−24·0	−35·2
131·334 G	82	461	48	272	137·2	− 5·8	−23·6	−25·9
132·348 G	87	483	48	266	136·8	− 6·0	−23·6	−12·9
133·341 G	100	515	54	278	136·7	− 5·8	−23·6	+ 0·1
134·358 G	100	502	55	276	136·0	− 6·3	−23·6	+12·9
135·341 G	91	461	54	272	135·8	− 6·3	−23·6	+25·7
136·343 C	62	382	42	260	135·4	− 6·4	−23·6	+38·7
137·361 G	48	369	41	317	135·4	− 6·2	−23·5	+52·0
138·348 G	36	233	44	287	135·1	− 6·3	−23·6	+64·8
139·358 G	18	96	43	230	134·8	− 6·3	−23·8	+77·8
Means ..	..	..	50	283	136·6	..	−23·8	..

No. 1234. Latitude −9°·9.

Group 12781 in Rotation 1131
" 12822 " " 1132

Group 12781. Apr.15–27. A large spot, *a*, with a short train developing as the disk is crossed. Part of the train is shed from *a*, complete separation being denoted by the decrease in area of *a* between April 18 and 19. The train has gone by April 25.

104·105 K	37	193	(104	544	82·3	..	−11·1)	−80·6
105·379 G	95	702	117	877	79·6	0·0	−10·5	−66·5
106·346 G	126	1031	104	851	80·8	+ 1·1	−10·4	−52·5
107·334 G	244	1314	159	853	80·4	+ 0·6	−10·8	−39·9
108·437 G	306	1571	170	876	80·6	+ 0·6	−10·8	−25·1
109·452 G	290	1652	149	850	80·8	+ 0·7	−10·5	−11·5
110·360 G	270	1440	135	720	81·4	+ 1·2	−10·6	+ 1·1
111·348 G	227	1171	118	606	82·0	+ 1·7	−10·3	+14·7
112·193 K	174	907	97	506	82·7	+ 2·3	−10·1	+26·6
113·641 G	152	719	108	510	81·9	+ 1·4	− 9·8	+44·9
114·586 G	97	511	92	483	82·7	+ 2·1	− 9·6	+58·2
115·529 G	54	301	82	458	83·2	+ 2·4	− 9·3	+71·2
116·413 G	20	131	72	473	82·9	..	− 9·6	+82·6
Means ..	..	..	121	690	81·5	..	−10·2	..

Spot *a*

104·105 K	37	193	104	544	82·3	..	−11·1	−80·6
105·379 G	81	580	93	667	81·4	0·0	−11·0	−64·7
106·346 G	112	896	90	717	81·8	+ 0·3	−10·8	−51·5
107·334 G	212	1170	136	749	81·3	− 0·3	−11·1	−39·0
108·437 G	180	891	99	490	82·5	+ 0·7	−10·6	−23·2
109·452 G	200	986	102	503	82·6	+ 0·7	−10·4	− 9·7
110·360 G	198	956	99	478	82·7	+ 0·7	−10·4	+ 2·4
111·348 G	190	918	99	477	82·8	+ 0·7	−10·3	+15·5
112·193 K	157	817	88	458	82·8	+ 0·6	−10·1	+26·7
113·641 G	129	601	93	433	83·0	+ 0·7	− 9·5	+46·0
114·586 G	90	466	86	447	83·4	+ 1·0	− 9·6	+58·9
115·529 G'	54	301	82	458	83·2	+ 0·6	− 9·3	+71·2
116·413 G	20	131	72	473	82·9	..	− 9·6	+82·6

LEDGER I. – RECURRENT GROUPS OF SUN SPOTS FOR THE YEAR.

No. 1234 — *continued.*

Group 12822. May 11–24. A pair of regular spots, apparently representing *a* of Group 12781. The larger spot leads.

Date U.T. Place	Projected Area Umbræ	Projected Area Whole Spots	Corrected Area Umbræ	Corrected Area Whole Spots	Longitude and Proper Motion		Latitude	Long. from C.M.
d					°	°	°	°
130·601 G	7	34	31	149	89·0	..	− 8·7	−83·8
131·334 G	21	123	43	252	86·9	+ 2·6	− 9·6	−76·2
132·348 G	41	212	44	229	87·2	+ 2·7	− 9·6	−62·5
133·341 G	60	339	46	261	87·3	+ 2·7	− 9·5	−49·3
134·358 G	62	347	38	214	87·5	+ 2·8	− 9·6	−35·6
135·341 G	84	451	46	247	87·1	+ 2·3	− 9·7	−23·0
136·343 C	82	371	42	191	86·8	+ 1·9	− 9·7	− 9·9
137·361 G	96	405	49	207	87·0	+ 2·0	− 9·8	+ 3·6
138·348 G	73	405	38	213	86·5	+ 1·4	−10·0	+16·2
139·358 G	54	329	31	190	86·4	+ 1·2	− 9·8	+29·4
140·343 G	46	205	31	140	86·9	+ 1·5	− 9·5	+43·0
141·424 G	30	151	28	141	87·0	+ 1·5	− 9·5	+57·4
142·340 G	23	94	33	136	87·3	+ 1·7	− 9·4	+69·8
143·335 G	9	50	37	204	87·3	..	− 9·3	+83·0
Means ..	..	..	39	202	87·0	..	− 9·6	..

No. 1235. Latitude +21°·8.

Group 12796 in Rotation 1132
" 12837 " " 1133

Group 12796. Apr.27–May 9. A regular spot from which a part breaks away on its *f* side and becomes a stream in miniature. The main spot has completely regained its regular outline by May 4.

116·413 G	14	72	35	181	284·9	0·0	+23·3	−75·4
117·391 G	23	151	30	199	283·9	− 0·8	+23·1	−63·5
118·376 G	48	300	44	272	284·1	− 0·5	+23·5	−50·3
119·337 G	82	388	59	279	283·7	− 0·7	+22·8	−38·0
120·400 C	97	515	60	319	283·5	− 0·7	+22·8	−24·2
121·397 C	70	477	40	272	283·4	− 0·7	+22·8	−11·1
122·398 C	40	376	22	211	283·2	− 0·7	+22·5	+ 2·0
123·337 G	79	365	46	212	283·3	− 0·4	+22·9	+14·5
124·338 G	54	295	34	186	283·1	− 0·5	+22·9	+27·5
125·453 G	41	252	31	192	282·8	− 0·6	+23·3	+41·9
126·487 G	27	182	27	182	282·3	− 0·9	+23·6	+55·1
127·374 G	18	114	27	169	282·2	− 0·8	+23·5	+66·7
128·509 C	9	62	40	272	284·9	..	+24·4	+84·4
Means ..	..	..	38	223	283·4	..	+23·1	..

Group 12837. May 25–June 5. A regular spot with a distant follower on May 26, 28 and 29; new spots come on June 2.

144·341 C	2	9	3	14	281·6	+ 1·4	+21·2	−69·4
145·333 G	23	75	23	76	280·6	+ 0·6	+21·0	−57·3
146·340 G	16	82	11	58	283·6	+ 3·8	+20·3	−41·0
147·336 C	17	100	11	61	284·3	+ 4·6	+20·3	−27·1
148·396 C	22	98	12	54	284·4	+ 4·9	+20·2	−13·0
149·409 G	14	73	7	39	285·8	+ 6·5	+19·9	+ 1·8
150·105 K	13	45	7	25	286·1	+ 6·9	+20·1	+11·4
151·439 G	7	18	4	11	286·0	+ 7·0	+20·5	+28·9
152·339 C	22	76	14	50	280·6	+ 1·8	+20·4	+35·4
153·333 G	23	91	19	72	279·4	+ 0·7	+20·5	+47·3
154·349 C	13	54	15	60	279·6	+ 1·1	+21·0	+61·0
155·351 C	4	9	7	16	277·6	− 0·7	+20·7	+72·3
Means ..	..	..	11	45	282·5	..	+20·5	..

No. 1235* Latitude −28°·9.

Group 12794 in Rotation 1132
" 12839 " " 1133

Group 12794. April 26–May 9. A spot with double umbra, which finally separates into two parts on May 6–7.

Date U.T. Place	Projected Area Umbræ	Projected Area Whole Spots	Corrected Area Umbræ	Corrected Area Whole Spots	Longitude and Proper Motion		Latitude	Long. from C.M.
d					°	°	°	°
115·529 G	18	95	73	387	287·6	..	−27·9	−84·4
116·413 G	68	330	120	583	286·8	0·0	−28·0	−73·5
117·391 G	109	443	116	472	287·1	+ 0·7	−28·2	−60·3
118·376 G	104	586	82	463	287·0	+ 1·0	−28·1	−47·4
119·337 G	148	599	98	395	287·4	+ 1·8	−28·2	−34·3
120·400 C	150	658	88	388	286·0	+ 0·9	−28·0	−21·7
121·397 C	125	664	69	365	285·5	+ 0·8	−27·9	− 9·0
122·398 C	172	794	95	437	284·6	+ 0·3	−28·4	+ 3·4
123·337 G	123	672	70	383	284·1	+ 0·2	−28·6	+15·3
124·338 G	123	549	76	340	283·6	+ 0·1	−28·9	+28·0
125·453 C	84	415	62	307	283·1	+ 0·1	−29·1	+42·2
126·487 G	68	325	64	309	282·5	− 0·1	−29·3	+55·3
127·374 G	57	237	78	323	282·7	+ 0·5	−29·4	+67·2
128·509 C	18	80	58	258	282·5	..	−29·5	+82·0
Means ..	..	..	85	397	285·0	..	−28·5	..

Group 12839. May 26–27. One or two small spots.

145·333 G	5	9	6	11	275·7	+ 1·0	−29·3	−62·2
146·340 G	5	14	4	12	275·1	+ 0·8	−29·3	−49·5
Means ..	..	..	5	12	275·4	..	−29·3	..

No. 1236. Latitude −6°·5.

Group 12808 in Rotation 1132
" 12844 " " 1133
" 12887 " " 1134
" 12934 " " 1135

Group 12808. May 4–16. A growing compact stream when first seen. From May 8–13 the penumbræ of its components merge to form one very long spot but with two distinct nuclei. (These have opposite magnetic polarities according to the Mount Wilson Observations).

123·337 G	25	77	56	173	191·2	0·0	− 8·3	−77·6
124·338 G	81	390	98	474	190·9	− 0·5	− 7·8	−64·7
125·453 G	152	868	123	705	189·2	− 2·3	− 7·5	−51·7
126·487 G	250	1458	160	931	188·2	− 3·5	− 7·3	−39·0
127·374 G	305	1742	170	974	188·7	− 3·1	− 7·5	−26·8
128·509 C	376	1982	193	1019	189·3	− 2·7	− 7·4	−11·2
129·376 G	326	1947	163	973	188·4	− 3·8	− 7·2	− 0·6
130·601 G	269	1758	141	925	188·8	− 3·5	− 7·1	+16·0
131·334 G	214	1539	120	862	188·9	− 3·6	− 6·9	+25·8
132·348 G	187	1090	122	708	188·9	− 3·7	− 7·1	+39·2
133·341 G	89	607	74	499	189·4	− 3·4	− 7·2	+52·8
134·358 G	73	476	90	571	188·5	− 4·4	− 6·8	+65·4
135·341 G	29	180	76	458	188·9	− 4·2	− 6·9	+78·8
Means ..	..	..	122	713	189·2	..	− 7·3	..

LEDGER I. — RECURRENT GROUPS OF SUN SPOTS FOR THE YEAR.

No. 1236 — *continued.*

Group 12844. May 31–June 12. A stable regular spot with occasional tiny companions.

Date U.T. Place	Projected Area: Umbrae	Projected Area: Whole Spots	Corrected Area: Umbrae	Corrected Area: Whole Spots	Longitude and Proper Motion		Latitude	Long. from C.M.
d					°	°	°	°
150·105 K	13	68	53	277	191·8	..	− 6·1	−82·9
151·439 G	41	229	50	277	191·6	− 4·0	− 6·3	−65·5
152·339 C	71	343	60	292	191·6	− 4·2	− 6·6	−53·6
153·333 G	85	412	56	272	192·0	− 3·9	− 6·4	−40·1
154·349 C	112	629	63	352	191·9	− 4·2	− 6·4	−26·7
155·351 C	109	611	57	318	192·2	− 4·0	− 6·4	−13·1
156·379 G	94	563	47	282	192·6	− 3·8	− 6·3	+ 0·9
157·442 G	96	490	50	255	192·6	− 4·0	− 6·1	+14·9
158·614 G	92	424	53	245	192·3	− 4·4	− 6·5	+30·1
159·340 G	69	386	45	255	192·5	− 4·4	− 6·5	+40·0
160·340 G	41	244	35	207	192·9	− 4·1	− 6·4	+53·6
161·385 G	28	145	38	194	193·3	− 3·9	− 6·3	+67·8
162·415 G	18	76	59	249	192·9	..	− 6·2	+81·1
Means ..	..	..	50	268	192·3	..	− 6·4	..

Group 12887. June 27–July 9. A stable regular spot.

177·657 G	14	92	26	168	196·4	− 3·3	− 6·3	−73·7
178·407 G	25	141	29	165	196·0	− 3·9	− 6·2	−64·2
179·384 G	37	213	30	173	196·2	− 3·8	− 6·1	−51·0
180·366 G	49	263	31	168	196·4	− 3·8	− 6·1	−37·8
181·337 G	55	291	31	163	196·6	− 3·7	− 5·9	−24·8
182·364 G	62	333	32	173	196·7	− 3·8	− 5·9	−11·1
183·251 K	49	288	25	146	196·6	− 4·0	− 5·9	+ 0·6
184·377 G	60	342	31	178	196·5	− 4·3	− 5·5	+15·4
185·390 G	55	282	32	164	196·6	− 4·3	− 5·6	+28·9
186·406 G	42	254	29	175	196·6	− 4·5	− 5·6	+42·3
187·333 G	37	176	33	155	196·6	− 4·7	− 5·7	+54·6
188·554 G	28	106	44	166	196·8	− 4·6	− 5·5	+70·9
189·351 G	9	42	32	152	197·0	..	− 5·7	+81·7
Means ..	..	..	31	166	196·5	..	− 5·9	..

Group 12934. July 24–Aug.5. An active bi-polar group in which the following component is much the larger. A cluster of spots appears after July 27 near the follower, which itself is breaking up into several components. The complete continuity with Group 12887 is doubtful. In any case, the present group has obviously developed anew.

204·371 G	28	225	59	516	200·2	− 3·7	− 6·7	−76·4
205·340 G	46	368	53	431	200·6	− 3·5	− 6·4	−63·1
206·438 G	87	489	69	388	200·2	− 4·0	− 6·7	−49·0
207·364 C	123	642	79	412	200·8	− 3·6	− 6·4	−36·2
208·439 C	123	674	67	373	200·6	− 4·0	− 6·2	−22·2
209·368 C	173	833	89	433	199·8	− 4·9	− 6·1	−10·7
210·340 C	127	692	64	354	200·6	− 4·3	− 5·7	+ 3·0
211·397 G	96	515	51	273	199·7	− 5·3	− 5·5	+16·1
212·328 G	106	708	62	411	199·6	− 5·6	− 5·1	+28·3
213·464 G	101	584	73	420	200·7	− 4·7	− 5·3	+44·4
214·344 G	71	444	66	413	201·0	− 4·5	− 5·8	+56·3
215·342 G	21	103	34	165	202·4	− 3·2	− 6·0	+70·9
216·342 G	5	9	19	34	200·1	..	− 5·6	+81·9
Means ..	..	..	64	382	200·5	..	− 6·0	..

No. 1236: Group 12934 — *continued.*

Spot *a*

d					°	°	°	°
204·371 G	14	64	24	110	204·3	0·0	− 6·6	−72·3
205·340 G	18	110	18	111	204·3	− 0·2	− 6·0	−59·4
206·438 G	18	87	13	62	205·8	+ 1·2	− 6·6	−43·4
207·364 C	20	98	12	58	206·4	+ 1·6	− 6·6	−30·6
208·439 C	31	134	16	71	206·9	+ 2·0	− 6·7	−15·9
209·368 C	22	71	11	36	207·9	+ 2·8	− 6·9	− 2·6
210·340 C	18	38	9	20	208·0	+ 2·8	− 6·7	+10·4
211·397 G	2	9	1	5	208·2	+ 2·8	− 6·5	+24·6
212·328 G	5	9	3	6	208·4	+ 2·8	− 6·5	+37·1

Spot *b*

204·371 G	14	161	35	406	198·7	0·0	− 6·8	−77·9
205·340 G	28	258	35	320	198·4	− 0·5	− 6·5	−65·3
206·438 G	69	402	56	326	198·6	− 0·4	− 6·7	−50·6
207·364 C	103	544	67	354	198·8	− 0·4	− 6·6	−38·2
208·439 C	83	491	46	275	198·4	− 0·9	− 6·3	−24·4
209·368 C	89	526	46	274	198·6	− 0·9	− 6·0	−11·9
210·340 C	71	464	36	237	198·8	− 0·8	− 5·4	+ 1·2

No. 1237. Latitude −11°·2.

Group 12821 in Rotation 1132
" 12857 " " 1133

Group 12821. May 10–23. A typical bi-polar group with well-defined regular spots, *a* and *b*, as leader and follower respectively. There is an occasional small attendant spot in between. On May 11 a bright photospheric streak partly obscures the preceding edge of *a*; the change in area between May 12 and 13 appears to be real.

129·376 G	14	41	85	250	103·1	..	−11·9	−85·9
130·601 G	63	411	106	677	100·2	0·0	−11·5	−72·6
131·334 G	112	657	120	704	101·3	+ 1·0	−11·8	−61·8
132·348 G	146	762	112	588	101·0	+ 0·6	−11·5	−48·7
133·341 G	155	871	95	540	101·3	+ 0·8	−11·7	−35·3
134·358 G	169	987	93	545	101·0	+ 0·4	−11·8	−22·1
135·341 G	183	935	95	480	101·2	+ 0·6	−12·0	− 8·9
136·343 C	174	955	89	487	101·1	+ 0·4	−11·9	+ 4·4
137·361 G	169	882	90	471	101·5	+ 0·7	−11·8	+18·1
138·348 G	105	652	62	387	100·9	0·0	−11·9	+30·6
139·358 G	94	572	66	403	101·2	+ 0·2	−12·1	+44·2
140·343 G	78	399	73	373	100·9	− 0·2	−11·7	+57·0
141·424 G	32	216	50	345	100·6	− 0·6	−11·5	+71·0
142·340 G	19	89	97	452	101·2	..	−11·4	+83·7
Means ..	..	..	88	500	101·0	..	−11·8	..

Spot *a*

129·376 G	14	41	85	250	103·1	..	−11·9	−85·9
130·601 G	36	251	51	354	103·3	0·0	−12·2	−69·5

continued

LEDGER I. – RECURRENT GROUPS OF SUN SPOTS FOR THE YEAR.

Date U.T. Place	Projected Area		Corrected Area		Longitude and Proper Motion		Latitude	Long. from C.M.
	Umbræ	Whole Spots	Umbræ	Whole Spots				
No. 1237: Group 12821 —*continued.*								
Spot *a* —*continued.*								
d					°	°	°	°
131·334 G	78	456	77	451	103·5	+ 0·1	−12·1	−59·6
132·348 G	91	479	66	350	103·5	0·0	−12·2	−46·2
133·341 G	119	586	71	352	103·6	0·0	−11·9	−33·0
134·358 G	107	588	58	318	103·8	+ 0·1	−11·9	−19·3
135·341 G	105	593	54	302	103·9	+ 0·2	−12·0	− 6·2
136·343 C	117	599	60	305	103·6	− 0·2	−11·8	+ 6·9
137·361 G	100	577	54	312	103·6	− 0·3	−11·8	+20·2
138·348 G	64	397	39	242	103·5	− 0·5	−11·9	+33·2
139·358 G	62	390	45	285	103·5	− 0·6	−11·9	+46·5
140·343 G	46	264	46	261	103·3	− 0·9	−11·8	+59·4
141·424 G	18	147	32	259	103·1	− 1·2	−11·7	+73·5
142·340 G	14	64	85	390	102·9	..	−11·4	+85·4
Spot *b*								
130·601 G	27	160	55	323	96·8	0·0	−10·7	−76·0
131·334 G	34	201	43	253	96·5	− 0·4	−10·4	−66·6
132·348 G	46	228	39	194	96·0	− 1·0	−10·6	−53·7
133·341 G	36	285	24	188	96·5	− 0·6	−11·1	−40·1
134·358 G	62	399	35	227	96·3	− 0·9	−11·5	−26·8
135·341 G	78	342	41	178	96·8	− 0·4	−11·8	−13·3
136·343 C	57	356	29	182	96·8	− 0·5	−11·9	+ 0·1
137·361 G	64	287	33	149	96·8	− 0·6	−12·1	+13·4
138·348 G	41	255	23	145	96·8	− 0·7	−12·1	+26·5
139·358 G	32	182	21	118	96·3	− 1·3	−11·9	+39·3
140·343 G	32	135	27	112	96·3	− 1·4	−11·5	+52·4
141·424 G	14	69	18	86	95·9	− 1·9	−11·2	+66·3
142·340 G	5	25	12	62	95·9	− 2·0	−11·2	+78·4
Group 12857. June 7–11. A regular spot (*a* of Group 12821) disappearing rapidly.								
157·442 G	18	82	31	139	105·1	− 0·7	− 9·9	−72·6
158·614 G	18	119	17	112	104·9	− 1·0	−10·3	−57·3
159·340 G	18	156	14	119	104·7	− 1·2	−10·1	−47·8
160·340 G	23	78	14	48	104·5	− 1·5	− 9·7	−34·8
161·385 G	5	18	3	10	104·3	− 1·7	− 9·7	−21·2
Means ..	..	..	16	86	104·7	..	− 9·9	..
No. 1238. Latitude +5°·8.								
Group 12829 in Rotation 1132								
" 12867 " " 1133								
" 12903 " " 1134								
" 12952 " " 1135								
Group 12829. May 22–30. A large active stream of rapid initial growth. *a* and *b*, the leader and follower spots respectively, show a great development with accompanying change of position during the first few days when they are represented by clusters condensing later to distinct spots.								
141·424 G	7	14	4	8	8·7	0·0	+ 8·5	−20·9
142·340 G	151	461	77	235	11·4	+ 2·5	+ 9·0	− 6·1
143·335 G	399	1947	205	1001	11·4	+ 2·4	+ 8·3	+ 7·1
144·341 C	461	2182	252	1191	12·3	+ 3·1	+ 8·2	+21·3
145·333 G	457	2153	281	1324	11·8	+ 2·5	+ 7·4	+33·9

Date U.T. Place	Projected Area		Corrected Area		Longitude and Proper Motion		Latitude	Long. from C.M.
	Umbræ	Whole Spots	Umbræ	Whole Spots				
No. 1238: Group 12829 — *continued.*								
d					°	°	°	°
146·340 G	364	1813	275	1392	12·8	+ 3·3	+ 7·6	+48·2
147·336 C	247	1482	261	1577	11·9	+ 2·2	+ 7·6	+60·5
148·396 C	151	1022	286	1996	11·6	+ 1·8	+ 7·7	+74·2
149·409 G	30	147	(108	531	5·9	..	+ 8·9)	+81·9
Means ..	..	..	205	1090	11·5	..	+ 8·0	..
Spot *a*								
141·424 G	2	5	1	3	11·3	0·0	+ 9·1	−18·3
142·340 G	46	114	23	58	14·3	+ 2·8	+ 8·9	− 3·2
143·335 G	166	771	86	401	15·2	+ 3·6	+ 7·9	+10·9
144·341 C	242	1112	136	623	16·5	+ 4·7	+ 6·8	+25·5
145·333 G	215	1017	140	661	17·1	+ 5·2	+ 5·9	+39·2
146·340 G	119	632	102	544	19·0	+ 6·9	+ 4·9	+54·4
147·336 C	62	384	86	530	20·0	+ 7·7	+ 4·8	+68·6
148·396 C	13	94	57	413	20·8	..	+ 5·6	+83·4
Spot *b*								
141·424 G	5	9	3	5	7·2	0·0	+ 8·3	−22·4
142·340 G	105	347	54	177	10·3	+ 2·9	+ 8·7	− 7·2
143·335 G	233	1176	119	600	8·6	+ 1·1	+ 8·9	+ 4·3
144·341 C	206	970	109	514	6·9	− 0·8	+ 8·6	+15·9
145·333 G	224	1017	130	590	6·4	− 1·4	+ 8·5	+28·5
146·340 G	181	769	123	523	6·2	− 1·8	+ 8·6	+41·6
147·336 C	118	636	103	553	5·7	− 2·5	+ 8·6	+54·3
148·396 C	80	468	110	646	5·8	− 2·5	+ 7·9	+68·4
149·409 G	30	147	108	531	5·9	..	+ 8·9	+81·9
Group 12867. June 13–25. A large stable spot (*a* of Group 12829) completely regular in structure.								
163·337 G	37	207	75	418	23·8	+ 8·9	+ 6·3	−75·8
164·339 G	74	373	79	399	24·4	+ 9·4	+ 5·9	−62·0
165·338 G	124	557	94	423	24·3	+ 9·1	+ 5·7	−48·9
166·337 G	117	667	73	414	24·5	+ 9·1	+ 5·8	−35·4
167·418 G	138	747	75	404	24·7	+ 9·2	+ 6·0	−20·9
168·343 G	147	810	75	413	24·8	+ 9·1	+ 6·1	− 8·6
169·387 C	157	784	78	392	24·7	+ 8·8	+ 6·4	+ 5·1
170·373 G	138	676	73	358	24·9	+ 8·9	+ 6·3	+18·4
171·336 G	113	584	67	345	24·9	+ 8·7	+ 6·1	+31·2
172·341 G	104	554	74	393	25·5	+ 9·2	+ 6·2	+45·0
173·343 G	65	393	62	377	25·8	+ 9·3	+ 6·0	+58·6
174·399 C	40	202	68	343	26·2	+ 9·5	+ 6·2	+73·0
175·374 G	9	55	48	293	25·1	..	+ 5·9	+84·8
Means ..	..	..	74	390	24·9	..	+ 6·1	..
Group 12903. July 9–21. A stable regular spot, *b*, (*a* of Group 12829) preceded by small spots scattered over an extensive area and dying out by July 16.								
189·351 G	28	82	123	345	33·0	..	+ 7·2	−82·3
190·392 C	70	332	97	481	32·1	+12·8	+ 6·7	−69·4
191·584 G	120	605	101	509	32·4	+12·9	+ 6·5	−53·4
192·395 C	143	627	98	431	31·7	+12·1	+ 6·9	−43·3

LEDGER I. – RECURRENT GROUPS OF SUN SPOTS FOR THE YEAR.

Date U.T. Place	Projected Area		Corrected Area		Longitude and Proper Motion		Latitude	Long. from C.M.
	Umbrae	Whole Spots	Umbrae	Whole Spots				
No. 1238: Group 12903 —*continued.*								
d					°	°	°	°
193·334 G	134	670	77	388	32·5	+12·7	+ 6·1	-30·1
194·607 G	111	577	58	299	31·7	+11·7	+ 5·1	-14·1
195·364 G	120	647	60	323	32·7	+12·6	+ 5·3	- 3·0
196·361 G	90	529	45	264	30·0	+ 9·7	+ 4·5	+ 7·5
197·481 G	79	471	43	254	30·1	+ 9·7	+ 4·4	+22·4
198·393 C	92	412	56	251	30·2	+ 9·6	+ 4·5	+34·5
199·332 G	76	370	56	270	30·6	+ 9·9	+ 4·8	+47·4
200·478 G	51	275	55	294	30·6	+ 9·7	+ 4·6	+62·5
201·437 G	28	134	53	255	30·4	+ 9·3	+ 4·5	+75·0
Means ..	..	..	67	335	31·2	..	+ 5·3	..
Spot *b* (*a* of Group 12829)								
189·351 G	14	32	74	170	30·3	..	+ 5·1	-85·0
190·392 C	31	193	50	309	29·5	+10·2	+ 4·9	-72·0
191·584 G	60	344	53	306	30·0	+10·5	+ 4·5	-55·8
192·395 C	76	381	54	271	29·6	+10·0	+ 4·6	-45·4
193·334 G	83	471	49	278	30·0	+10·2	+ 4·4	-32·6
194·607 G	92	513	48	267	30·1	+10·1	+ 4·3	-15·7
195·364 G	92	513	46	256	30·1	+10·0	+ 4·4	- 5·6
196·361 G	90	529	45	264	30·0	+ 9·7	+ 4·5	+ 7·5
197·481 G	79	471	43	254	30·1	+ 9·7	+ 4·4	+22·4
198·393 C	92	412	56	251	30·2	+ 9·6	+ 4·5	+34·5
199·332 G	76	370	56	270	30·6	+ 9·9	+ 4·8	+47·4
200·478 G	51	275	55	294	30·6	+ 9·7	+ 4·6	+62·5
201·437 G	28	134	53	255	30·4	+ 9·3	+ 4·5	+75·0
Group 12952. Aug. 5–17. A stable regular spot slowly decreasing – *a* of Group 12829.								
216·342 G	5	23	30	140	32·6	..	+ 3·4	-85·6
217·365 C	20	112	32	177	32·9	+ 9·2	+ 3·6	-71·8
218·320 C	22	152	21	147	32·8	+ 9·0	+ 3·6	-59·3
219·459 G	44	247	31	173	32·6	+ 8·6	+ 3·6	-44·4
220·387 G	34	238	20	140	32·5	+ 8·3	+ 3·8	-32·2
221·099 K	62	279	33	151	32·6	+ 8·3	+ 4·0	-22·7
222·344 G	41	256	20	128	33·0	+ 8·5	+ 4·1	- 5·9
223·339 G	62	238	31	119	33·1	+ 8·4	+ 4·0	+ 7·3
224·497 G	46	211	25	114	33·2	+ 8·4	+ 4·1	+22·8
225·373 C	22	171	13	104	33·5	+ 8·5	+ 4·0	+34·7
226·367 G	25	124	18	92	33·6	+ 8·4	+ 4·1	+47·9
227·568 G	18	62	20	69	33·5	+ 8·2	+ 4·1	+63·7
228·348 G	14	39	25	70	33·7	+ 8·2	+ 4·0	+74·2
Means ..	..	..	24	124	33·1	..	+ 3·9	..

No. 1239. Latitude +14°·2.

Group 12851 in Rotation 1133
" 12892 " " 1134

Group 12851. June 5–17. A large regular spot, *a*, behind which a compound train is forming; this decreases for a few days but comes in with renewed activity on June 13. Meanwhile *a* has broken into two components by June 12, the leading one, a_1, representing the original necleus, becomes the new leader of the stream and alone survives on June 17.

Date U.T. Place	Projected Area		Corrected Area		Longitude and Proper Motion		Latitude	Long. from C.M.
	Umbrae	Whole Spots	Umbrae	Whole Spots				
155·351 C	29	116	118	472	122·7	..	+13·8	-82·6
156·379 G	74	381	106	549	122·6	0·0	+13·9	-69·1
157·442 G	115	731	102	663	122·2	- 0·4	+14·4	-55·5
No. 1239: Group 12851 —*continued.*								
d					°	°	°	°
158·614 G	201	1208	134	815	122·6	- 0·1	+14·5	-39·6
159·340 G	193	1169	114	695	122·5	- 0·2	+15·0	-30·0
160·340 G	177	971	95	521	122·9	+ 0·2	+14·7	-16·4
161·385 G	189	1136	97	586	122·5	- 0·3	+15·0	- 3·0
162·415 G	221	898	116	473	124·2	+ 1·4	+15·0	+12·4
163·337 G	251	1165	143	664	123·6	+ 0·8	+15·7	+24·0
164·339 G	194	911	126	592	124·2	+ 1·3	+15·3	+37·8
165·338 G	123	658	101	530	123·5	+ 0·6	+15·0	+50·3
166·337 G	88	392	104	459	123·7	+ 0·8	+14·7	+63·8
167·418 G	25	152	70	429	125·4	+ 2·4	+13·9	+79·8
Means ..	..	..	109	581	123·3	..	+14·8	..
Spot *a*: a_1.								
155·351 C	29	116	118	472	122·7	..	+13·8	-82·6
156·379 G	60	305	81	412	124·2	0·0	+13·4	-67·5
157·442 G	92	497	79	427	124·2	0·0	+13·5	-53·5
158·614 G	128	563	83	366	124·6	+ 0·3	+13·7	-37·6
159·340 G	129	603	75	350	124·5	+ 0·2	+14·1	-28·0
160·340 G	122	593	65	314	124·6	+ 0·3	+14·1	-14·7
161·385 G	129	662	66	338	125·0	+ 0·6	+14·2	- 0·5
162·415 G	80	308	42	163	126·6	+ 2·2	+14·5	+14·8
163·337 G	67	317	39	184	127·1	+ 2·7	+14·1	+27·5
164·339 G	51	246	35	167	127·3	+ 2·8	+13·6	+40·9
165·338 G	32	129	28	112	127·4	+ 2·9	+13·5	+54·2
166·337 G	30	106	40	140	127·2	+ 2·7	+13·7	+67·3
167·418 G	25	152	70	429	125·4	+ 0·8	+13·9	+79·8
Group 12892. July 2–12. A small regular spot, a_1 of Group 12851, decreasing to a tiny marking.								
182·364 G	14	42	34	103	129·2	+ 4·1	+13·4	-78·6
183·251 K	19	70	24	89	129·1	+ 4·0	+13·2	-66·9
184·377 G	18	79	15	65	128·9	+ 3·8	+13·2	-52·2
185·390 G	28	111	18	72	128·8	+ 3·6	+13·2	-38·9
186·406 G	16	79	9	44	128·9	+ 3·7	+13·5	-25·4
187·333 G	14	42	7	22	128·8	+ 3·6	+13·5	-13·2
188·554 G	2	5	1	3	128·9	+ 3·6	+13·7	+ 3·0
189·351 G	2	14	1	7	126·3	+ 1·0	+13·7	+11·0
190·392 C	2	9	1	5	126·1	+ 0·8	+14·7	+24·6
191·584 G	0	0	0	0	..	..	..	..
192·395 C	4	11	3	9	129·5	+ 4·1	+14·3	+54·5
Means ..	..	..	10	38	128·4	..	+13·6	..

No. 1240. Latitude +6°·3.

Group 12873 in Rotation 1134
" 12911 " " 1135
" 12956 " " 1136

Group 12873. June 17–28. A large stream of normal type with conspicuous components in the central part about June 21. *a* is the leader spot and *b* the follower.

Date U.T. Place	Projected Area		Corrected Area		Longitude and Proper Motion		Latitude	Long. from C.M.
	Umbrae	Whole Spots	Umbrae	Whole Spots				
167·418 G	57	223	83	323	335·4	0·0	+ 5·6	-70·2
168·343 G	109	467	101	434	336·0	+ 0·4	+ 5·5	-57·4
169·387 C	219	1125	152	784	335·5	- 0·2	+ 5·7	-44·1

LEDGER I. – RECURRENT GROUPS OF SUN SPOTS FOR THE YEAR.

Date U.T. Place	Projected Area Umbræ	Projected Area Whole Spots	Corrected Area Umbræ	Corrected Area Whole Spots	Longitude and Proper Motion		Latitude	Long. from C.M.
No. 1240: Group 12873 —*continued.*								
d					°	°	°	°
170·373 G	255	1497	148	870	336·3	+ 0·4	+ 6·0	-30·2
171·336 G	323	1806	169	945	336·8	+ 0·8	+ 6·3	-16·9
172·341 G	350	1694	176	855	336·9	+ 0·7	+ 6·3	- 3·6
173·343 G	348	1588	178	816	338·3	+ 2·0	+ 6·3	+11·1
174·399 C	248	1362	138	762	339·4	+ 2·9	+ 6·6	+26·2
175·374 G	148	908	97	589	339·6	+ 2·9	+ 6·0	+39·3
176·398 C	124	737	103	614	340·8	+ 4·0	+ 6·5	+54·0
177·657 G	44	229	69	368	341·5	+ 4·5	+ 6·4	+71·4
178·407 G	19	106	65	375	340·8	..	+ 5·9	+80·6
Means ..	..	..	129	669	337·9	..	+ 6·1	..
Spot *a*								
167·418 G	41	163	57	225	336·8	0·0	+ 5·2	-68·8
168·343 G	69	290	61	255	338·1	+ 1·1	+ 4·8	-55·3
169·387 C	121	506	80	334	338·7	+ 1·6	+ 4·9	-40·9
170·373 G	138	722	77	404	339·9	+ 2·6	+ 5·2	-26·6
171·336 G	110	598	56	305	340·7	+ 3·3	+ 5·2	-13·0
172·341 G	139	628	70	314	341·6	+ 4·0	+ 5·3	+ 1·1
173·343 G	194	882	101	459	342·0	+ 4·3	+ 5·5	+14·8
174·399 C	155	945	88	539	342·1	+ 4·2	+ 6·0	+28·9
175·374 G	116	665	78	446	342·4	+ 4·3	+ 6·1	+42·1
176·398 C	63	388	57	349	342·9	+ 4·7	+ 5·9	+56·1
177·657 G	37	201	62	338	343·0	+ 4·6	+ 6·1	+72·9
178·407 G	14	83	57	338	343·4	..	+ 6·0	+83·2
Spot *b*								
168·343 G	28	115	29	121	331·9	0·0	+ 6·2	-61·5
169·387 C	76	332	57	249	331·2	- 0·9	+ 6·1	-48·4
170·373 G	85	421	52	257	331·2	- 1·0	+ 6·3	-35·3
171·336 G	80	442	43	239	331·1	- 1·3	+ 6·0	-22·6
172·341 G	92	490	47	250	331·3	- 1·2	+ 6·1	- 9·2
173·343 G	69	351	34	176	331·4	- 1·3	+ 6·0	+ 4·2
174·399 C	67	287	36	152	331·5	- 1·4	+ 5·7	+18·3
175·374 G	32	243	19	143	331·8	- 1·2	+ 5·9	+31·5
176·398 C	36	197	26	140	331·8	- 1·4	+ 6·0	+45·0
177·657 G	7	28	7	30	332·3	- 1·1	+ 6·2	+62·2
178·407 G	5	23	8	37	332·5	- 1·0	+ 5·9	+72·3
Group 12911. July 13–25. A stable regular spot, *a* of Group 12873. A new spot appears in the faculæ following on July 25.								
193·334 G	9	55	21	126	344·9	+ 4·0	+ 4·8	-77·7
194·607 G	18	127	18	130	344·9	+ 3·8	+ 5·1	-60·9
195·364 G	37	180	29	142	344·7	+ 3·5	+ 5·8	-51·0
196·361 G	37	187	23	118	344·8	+ 3·4	+ 5·7	-37·7
197·481 G	42	213	23	115	344·9	+ 3·3	+ 5·8	-22·8
198·393 C	47	255	24	130	345·1	+ 3·4	+ 5·8	-10·6
199·332 G	51	259	26	130	345·4	+ 3·5	+ 6·0	+ 2·2
200·478 G	49	222	25	115	345·5	+ 3·4	+ 5·9	+17·4
201·437 G	44	231	26	134	345·8	+ 3·6	+ 6·0	+30·4
202·398 C	29	181	20	123	345·8	+ 3·4	+ 5·9	+43·1
203·366 G	18	111	16	99	345·9	+ 3·4	+ 6·0	+56·0
204·371 G	14	62	19	86	346·0	+ 3·3	+ 6·0	+69·4
205·340 G	10	55	(25	148	342·4	..	+ 6·5)	+78·7
Means ..	..	..	22	121	345·3	..	+ 5·7	..

Date U.T. Place	Projected Area Umbræ	Projected Area Whole Spots	Corrected Area Umbræ	Corrected Area Whole Spots	Longitude and Proper Motion		Latitude	Long. from C.M.
No. 1240 — *continued.*								
Group 12956. Aug.10–13. A small faint spot, probably *a* of Group 12873.								
d					°	°	°	°
221·099 K	6	17	8	22	347·3	+ 1·9	+ 7·4	-68·1
222·344 G	5	9	4	7	347·1	+ 1·6	+ 7·8	-51·8
223·339 G	5	9	3	6	347·4	+ 1·7	+ 7·8	-38·4
224·497 G	5	9	3	5	347·2	+ 1·3	+ 8·2	-23·2
Means ..	..	..	4	10	347·2	..	+ 7·8	..
No. 1241. Latitude -20°·9								
Group 12886 in Rotation 1134 " 12933 " " 1135 " 12971 " " 1136								
Group 12886. June 27–July 8. An active stream of the same general appearance as Group 12881, near which it is situated. After July 4, the leader *a* and follower *b* stand out as regular spots widely separated in longitude.								
177·657 G	5	9	5	9	215·5	0·0	-20·5	-54·6
178·407 G	58	187	47	151	213·9	- 1·5	-20·6	-46·3
179·384 G	113	512	74	335	213·7	- 1·6	-20·9	-33·5
180·366 G	171	860	100	506	212·9	- 2·2	-21·3	-21·3
181·337 G	227	1076	127	598	211·9	- 3·1	-20·9	- 9·5
182·364 G	239	1148	132	631	210·9	- 3·9	-21·1	+ 3·1
183·251 K	145	805	82	457	211·4	- 3·3	-21·0	+15·4
184·377 G	124	656	81	422	210·9	- 3·6	-20·8	+29·8
185·390 G	83	486	64	377	210·2	- 4·2	-21·3	+42·5
186·406 G	60	332	61	348	209·5	- 4·8	-21·5	+55·2
187·333 G	32	184	52	305	207·5	- 6·6	-21·5	+65·5
188·554 G	14	67	(37	178	202·7	..	-22·1)	+76·8
Means ..	..	..	75	376	211·7	..	-21·0	..
Spot *a*								
177·657 G	5	9	5	9	215·5	0·0	-20·5	-54·6
178·407 G	23	90	18	70	214·5	- 0·9	-20·7	-45·7
179·384 G	44	189	28	119	216·6	+ 1·3	-20·5	-30·6
180·366 G	37	148	21	84	218·0	+ 2·9	-21·0	-16·2
181·337 G	23	97	13	53	219·0	+ 4·0	-21·0	- 2·4
182·364 G	74	349	41	192	217·6	+ 2·8	-20·1	+ 9·8
183·251 K	34	149	20	88	218·3	+ 3·6	-20·5	+22·3
184·377 G	51	259	36	181	218·9	+ 4·4	-20·5	+37·8
185·390 G	32	185	28	165	219·3	+ 4·9	-20·5	+51·6
186·406 G	18	120	24	161	219·3	+ 5·0	-20·6	+65·0
187·333 G	9	55	25	151	219·4	+ 5·3	-21·0	+77·4
Spot *b*								
178·407 G	35	97	29	81	212·0	0·0	-21·2	-48·2
179·384 G	69	323	46	216	211·8	- 0·1	-21·2	-35·4
180·366 G	79	453	47	272	210·6	- 1·1	-21·6	-23·6
181·337 G	139	665	78	372	209·4	- 2·2	-21·3	-12·0
182·364 G	116	568	64	312	207·7	- 3·7	-21·3	- 0·1
183·251 K	58	424	32	237	205·8	- 5·5	-21·8	+ 9·8
184·377 G	55	314	33	188	204·9	- 6·3	-21·7	+23·8

continued.

LEDGER I. – RECURRENT GROUPS OF SUN SPOTS FOR THE YEAR.

No. 1241: Group 12886 — *continued.*

Spot *b* — *continued.*

Date U.T. Place	Projected Area Umbrae	Projected Area Whole Spots	Corrected Area Umbrae	Corrected Area Whole Spots	Longitude and Proper Motion		Latitude	Long. from C.M.
d					°	°	°	°
185·390 G	42	259	29	179	204·3	- 6·7	-22·1	+36·6
186·406 G	37	189	32	164	203·9	- 7·0	-22·3	+49·6
187·333 G	23	129	27	154	203·4	- 7·3	-22·2	+61·4
188·554 G	14	67	37	178	202·7	- 7·9	-22·1	+76·8

Group 12933. July 23–Aug.4. A large spot with multiple umbræ followed by small scattered spots. A part of the spot *a* breaks away on July 29 from its following side. This group is considered as a return of Group 12886, for although individual spots do not return, continuity of activity on the invisible hemisphere must have been practically complete.

203·366 G	23	194	(61	516	213·5	..	-20·9)	-76·4
204·371 G	72	460	110	696	209·8	- 1·9	-21·7	-66·8
205·340 G	110	895	108	888	210·4	- 1·2	-21·3	-53·3
206·438 G	119	947	88	693	209·6	- 1·8	-21·5	-39·6
207·364 C	176	1128	110	711	210·6	- 0·7	-21·1	-26·4
208·439 C	191	928	110	534	210·0	- 1·2	-21·3	-12·8
209·368 C	192	1175	108	664	208·7	- 2·3	-21·3	- 1·8
210·340 C	162	954	94	552	209·0	- 1·9	-21·1	+11·4
211·397 G	98	597	61	373	210·5	- 0·2	-20·7	+26·9
212·328 G	92	544	67	395	208·4	- 2·2	-21·8	+37·1
213·464 G	58	313	57	311	210·8	+ 0·4	-20·9	+54·5
214·344 G	27	183	39	265	210·3	0·0	-21·0	+65·6
215·342 G	7	64	24	220	210·1	- 0·1	-21·3	+78·6
Means ..	..	..	81	525	209·8	..	-21·2	..

Spot *a*

203·366 G	23	194	(61	516	213·5	..	-20·9)	-76·4
204·371 G	58	377	78	509	212·4	0·0	-20·8	-64·2
205·340 G	92	720	85	662	212·1	- 0·2	-20·7	-51·6
206·438 G	101	823	72	584	211·5	- 0·6	-20·8	-37·7
207·364 C	163	1030	101	639	211·8	- 0·2	-20·7	-25·2
208·439 C	169	816	96	465	211·7	- 0·1	-20·7	-11·1
209·368 C	138	845	77	473	211·7	0·0	-20·5	+ 1·2
210·340 C	118	678	68	393	211·6	0·0	-20·6	+14·0
211·397 G	87	524	55	330	211·3	- 0·1	-20·5	+27·7
212·328 G	71	442	53	327	211·1	- 0·2	-21·1	+39·8
213·464 G	53	301	53	301	210·8	- 0·3	-20·9	+54·5
214·344 G	27	183	39	265	210·3	- 0·7	-21·0	+65·6
215·342 G	7	64	24	220	210·1	- 0·7	-21·3	+78·6

Group 12971. Aug.20–28. One or two spots, small but distinctive on Aug.25–27: probably the remains of *a* of Group 12933.

231·362 C	4	13	9	28	207·3	- 0·6	-21·3	-72·4
232·369 C	4	18	5	21	206·6	- 1·2	-21·7	-59·8
233·395 C	0	0	0	0	..	..	..	..
234·342 G	5	14	3	10	205·9	- 1·6	-19·9	-34·4
235·342 G	5	14	3	9	205·6	- 1·8	-19·6	-21·5
236·340 G	16	50	9	28	206·8	- 0·4	-20·7	- 7·1
237·457 G	11	32	6	18	208·0	+ 0·9	-20·3	+ 8·9
238·482 G	9	16	5	10	208·0	+ 1·1	-20·3	+22·4
239·381 C	7	18	5	12	208·0	+ 1·2	-20·4	+34·3
Means ..	..	..	5	15	207·0	..	-20·5	..

No. 1242. Latitude -9°·3.

Group 12893 in Rotation 1134
" 12925 " " " 1135

Group 12893. July 3–4. A spot near the west limb.

Date U.T. Place	Projected Area Umbrae	Projected Area Whole Spots	Corrected Area Umbrae	Corrected Area Whole Spots	Longitude and Proper Motion		Latitude	Long. from C.M.
d					°	°	°	°
183·251 K	6	49	7	59	260·6	0·0	- 9·3	+64·6
184·377 G	9	28	28	88	261·2	+ 0·5	- 9·7	+80·1
Means ..	..	..	18	74	260·9	..	- 9·5	..

Group 12925. July 19–30. A small regular spot dying slowly out; there are two small followers on July 27.

199·332 G	5	23	18	83	262·0	..	- 9·7	-81·2
200·478 G	18	74	24	97	261·9	- 0·8	- 9·7	-66·2
201·437 G	18	106	16	93	261·5	- 1·3	- 9·5	-53·9
202·398 C	22	138	15	95	261·3	- 1·6	- 9·4	-41·4
203·366 G	32	143	19	84	261·0	- 2·1	- 9·2	-28·9
204·371 G	23	147	12	79	260·8	- 2·4	- 9·2	-15·8
205·340 G	28	106	15	55	260·7	- 2·6	- 9·0	- 3·0
206·438 G	18	120	10	64	260·8	- 2·6	- 9·1	+11·6
207·364 C	17	64	9	36	260·0	- 3·5	- 9·5	+23·0
208·439 C	13	65	9	43	261·2	- 2·5	- 9·2	+38·4
209·368 C	9	27	7	22	260·9	- 2·9	- 9·0	+50·4
210·340 C	4	16	5	19	261·4	- 2·5	- 9·0	+63·8
Means ..	..	..	13	62	261·0	..	- 9·2	..

No. 1243. Latitude -12°·9.

Group 12895 in Rotation 1134
" 12937 } " " 1135
" 12942 }
" 12983 " " 1136
" 13015 " " 1137

Group 12895. July 4–17. A large active stream in which the two principal components – leader and follower – are clusters or composite spots. By July 12, the follower, *b*, has condensed to a large spot with multiple umbræ. From the preceding part of the leader *a*, a pair of nearly regular spots, a_1 and a_2, emerge on July 10.

184·377 G	12	42	43	152	100·0	..	-12·9	-81·1
185·390 G	58	273	88	422	98·3	0·0	-13·1	-69·4
186·406 G	125	721	118	694	97·6	- 0·8	-12·8	-56·7
187·333 G	189	1128	139	831	98·1	- 0·3	-12·6	-43·9
188·554 G	315	1792	186	1068	98·1	- 0·4	-12·7	-27·8
189·351 G	400	2428	218	1356	97·7	- 0·8	-13·2	-17·6
190·392 C	518	2699	272	1415	98·9	+ 0·3	-12·9	- 2·6
191·584 G	526	2816	282	1514	97·7	- 1·0	-12·9	+11·9
192·395 C	468	2464	265	1398	97·0	- 1·7	-13·1	+22·0
193·334 G	405	2312	262	1484	96·9	- 1·9	-12·8	+34·3
194·607 G	304	1748	260	1471	96·1	- 2·7	-12·7	+50·3
195·364 G	199	1166	217	1291	94·8	- 4·1	-13·4	+59·1
196·361 G	101	518	212	1016	95·3	- 3·7	-12·8	+72·8
197·481 G	16	83	77	398	90·3	..	-14·4	+82·6
Means ..	..	..	210	1163	97·2	..	-12·9	..

LEDGER I. – RECURRENT GROUPS OF SUN SPOTS FOR THE YEAR.

No. 1243: Group 12895 — *continued.*

Spot *a*

Date U.T. Place	Projected Area Umbra	Projected Area Whole Spots	Corrected Area Umbra	Corrected Area Whole Spots	Longitude and Proper Motion		Latitude	Long. from C.M.
d					°	°	°	°
184·377 G	12	42	43	152	100·0	..	−12·9	−81·1
185·390 G	42	185	57	252	100·6	0·0	−12·6	−67·1
186·406 G	74	372	64	324	101·2	+ 0·5	−11·8	−53·1
187·333 G	97	550	67	380	101·6	+ 0·9	−12·1	−40·4
188·554 G	176	875	100	499	102·2	+ 1·4	−12·1	−23·7
189·351 G	215	1130	114	599	102·2	+ 1·4	−11·9	−13·1

Spot a_1

190·392 C	116	426	60	222	104·3	0·0	−11·1	+ 2·8
191·584 G	106	554	58	305	105·0	+ 0·6	−11·4	+19·2
192·395 C	76	390	46	234	105·1	+ 0·7	−11·1	+30·1
193·334 G	88	356	62	253	105·2	+ 0·7	−11·1	+42·6
194·607 G	55	224	57	231	105·2	+ 0·6	−11·0	+59·4
195·364 G	23	148	36	229	105·6	+ 1·0	−11·1	+69·9
196·361 G	14	51	61	224	105·0	..	−10·8	+82·5

Spot a_2

190·392 C	69	314	36	163	102·5	0·0	−10·5	+ 1·0
191·584 G	51	282	28	152	102·7	+ 0·1	−10·2	+16·9
192·395 C	43	282	25	164	102·7	+ 0·1	−10·3	+27·7
193·334 G	37	263	25	179	102·5	− 0·2	−10·4	+39·9
194·607 G	32	166	30	158	102·5	− 0·3	−10·1	+56·7
195·364 G	21	122	28	165	102·5	− 0·3	−10·4	+66·8
196·361 G	9	37	28	117	102·3	− 0·6	−10·2	+79·8

Spot *b*

185·390 G	16	88	31	170	94·1	0·0	−13·8	−73·6
186·406 G	51	349	54	370	94·3	+ 0·1	−13·4	−60·0
187·333 G	92	578	72	451	94·4	+ 0·2	−13·4	−47·6
188·554 G	139	917	86	569	93·9	− 0·4	−13·2	−32·0
189·351 G	185	1298	104	757	95·0	+ 0·7	−13·5	−20·3
190·392 C	222	1165	118	617	94·1	− 0·3	−13·7	− 7·4
191·584 G	263	1243	139	659	93·2	− 1·3	−13·4	+ 7·4
192·395 C	269	1259	148	692	92·9	− 1·6	−13·2	+17·9
193·334 G	180	1058	110	645	92·3	− 2·3	−13·7	+29·7
194·607 G	134	806	102	613	91·6	− 3·0	−13·6	+45·8
195·364 G	125	642	119	610	91·4	− 3·3	−13·9	+55·7
196·361 G	69	388	104	586	91·2	− 3·6	−14·3	+68·7

Group 12937. July 31–Aug.11. A stable regular spot, probably the return of a_1 of Group 12895.

211·397 G	7	32	18	83	106·1	+ 0·5	−10·4	−77·5
212·328 G	14	64	18	83	105·7	+ 0·1	−10·4	−65·6
213·464 G	23	101	19	83	106·1	+ 0·4	−10·8	−50·2
214·344 G	23	124	15	83	106·4	+ 0·7	−10·7	−38·3
215·342 G	30	137	17	79	106·7	+ 0·9	−10·7	−24·8
216·342 G	27	147	14	78	106·8	+ 0·9	−10·8	−11·4
217·365 C	18	167	9	87	107·0	+ 1·1	−10·5	− 2·3
218·320 C	31	132	17	71	107·0	+ 1·0	−10·7	+14·9
219·459 G	25	114	15	68	106·7	+ 0·7	−10·8	+29·7
220·387 G	18	114	13	81	106·8	+ 0·7	−10·8	+42·1
221·099 K	17	70	15	60	107·2	+ 1·1	−11·1	+51·9
222·344 G	9	46	14	69	107·5	+ 1·3	−11·0	+68·6
Means ..	..	..	15	77	106·7	..	−10·7	..

No. 1243 — *continued.*

Group 12942. Aug.1–13. A stable regular spot, *b* of Group 12895, with a cluster *sp* until Aug.9.

d					°	°	°	°
212·328 G	21	83	(94	366	91·1	..	−18·2)	−80·2
213·464 G	37	175	54	253	89·8	− 6·0	−15·7	−66·5
214·344 G	51	272	51	267	88·8	− 7·0	−15·0	−55·9
215·342 G	59	280	43	208	88·7	− 7·2	−14·4	−42·8
216·342 G	59	314	36	194	88·1	− 7·9	−14·2	−30·1
217·365 C	69	375	38	210	88·6	− 7·4	−14·1	−16·1
218·320 C	69	459	37	244	88·9	− 7·2	−14·3	− 3·2
219·459 G	71	368	39	200	89·0	− 7·1	−13·5	+12·0
220·387 G	64	318	37	184	88·4	− 7·8	−13·4	+23·7
221·099 K	70	311	45	199	88·5	− 7·8	−13·7	+33·2
222·344 G	41	215	34	178	88·5	− 7·8	−13·6	+49·6
223·339 G	27	156	32	187	88·6	− 7·8	−13·5	+62·8
224·497 G	14	50	41	146	88·5	− 7·9	−13·3	+78·1
Means ..	..	..	41	206	88·7	..	−14·1	..

Group 12983. Aug.29–Sept.9. A stable regular spot; a companion, also of regular structure, suddenly appears in front between Aug.30–31. This spot is very close in position to *b* of Group 12895, but can scarcely be identical with it.

240·105 K	27	86	65	206	88·4	− 9·0	−13·7	−75·8
241·341 G	41	201	44	215	88·8	− 8·7	−13·6	−59·0
242·415 C	99	455	75	344	89·6	− 7·9	−14·1	−44·0
243·388 G	89	513	57	325	89·6	− 8·0	−13·8	−31·2
244·344 G	109	495	62	281	89·8	− 7·8	−13·7	−18·4
245·340 G	98	483	53	260	89·5	− 8·2	−13·6	− 5·5
246·399 G	100	550	54	297	89·1	− 8·7	−13·5	+ 8·1
247·402 G	100	483	58	279	89·3	− 8·5	−13·5	+21·5
248·453 C	91	442	61	296	89·9	− 8·0	−13·8	+36·0
249·433 G	62	361	50	292	88·8	− 9·1	−13·5	+47·8
250·360 C	42	220	46	240	88·5	− 9·5	−13·5	+59·8
251·339 G	27	107	50	198	87·7	−10·4	−13·5	+71·9
Means ..	..	..	56	269	89·1	..	−13·6	..

Group 13015. Sept.26–Oct.1. A small regular spot.

268·485 G	9	27	10	31	87·6	−11·5	−12·1	−61·8
269·346 G	9	45	8	38	87·8	−11·3	−12·0	−50·3
270·350 G	13	25	9	17	86·9	−12·3	−12·3	−37·9
271·397 G	11	29	6	17	87·3	−12·0	−12·2	−23·7
272·340 G	7	13	4	7	86·9	−12·4	−12·2	−11·7
273·417 G	7	18	4	10	87·2	−12·2	−12·3	+ 2·8
Means ..	..	..	7	20	87·3	..	−12·2	..

No. 1244. Latitude −14°·7.

Group 12902 in Rotation 1134
" 12950 " " 1135
" 12989 } " " 1136
" 12990 }
" 13019 " " 1137

Group 12902. July 8–21. A great spot, developing first as a stream when it comes into view around the east limb. In a few days other spots are forming southwards, and these grow and

continued.

LEDGER I. – RECURRENT GROUPS OF SUN SPOTS FOR THE YEAR.

No. 1244. Group 12903 —*continued.*

amalgamate with the original spots to form a great composite spot roughly rectangular in shape on July 15 and 16. A few days later, the lower half of this extensive formation is breaking up as the group passes round the west limb. Meanwhile discrete parts of the northern half of the spot become linked up by penumbræ on July 19, thus giving a temporary increase in area.

Date U.T. Place	Projected Area Umbra	Projected Area Whole Spots	Corrected Area Umbra	Corrected Area Whole Spots	Longitude and Proper Motion	Latitude	Long. from C.M.
d					°	°	°	°
188·554 G	28	122	(101	440	44·6	..	- 9·7)	-81·3
189·351 G	80	388	193	836	39·9	0·0	-10·3	-75·4
190·392 C	179	1207	198	1352	39·9	0·0	-10·4	-61·6
191·584 G	349	2449	263	1845	40·3	+ 0·3	-10·8	-45·5
192·395 C	454	3040	290	1944	39·5	- 0·5	-11·2	-35·5
193·334 G	664	4121	377	2330	39·7	- 0·3	-11·7	-22·9
194·607 G	677	4618	357	2431	40·0	0·0	-12·1	- 5·8
195·364 G	713	4639	373	2436	39·9	- 0·1	-12·7	+ 4·2
196·361 G	645	3934	355	2168	39·9	- 0·2	-12·9	+17·4
197·481 G	434	3127	272	1954	39·7	- 0·4	-12·5	+32·0
198·393 C	387	3102	288	2322	39·7	- 0·4	-13·4	+44·0
199·332 G	411	2541	401	2473	39·4	- 0·7	-13·3	+56·2
200·478 G	210	1941	377	3379	39·7	- 0·5	-13·8	+71·6
201·437 G	53	441	(224	1876	37·6	..	-12·5)	+82·2
Means ..	..	..	312	2122	39·8	..	-12·1	..

Group 12950. Aug.5–17. A group consisting of a regular spot, *a* as leader, another spot, *b*, (less perfectly formed) as the follower, and a few small companions. The axis of the group is considerably inclined to the sun's equator; the leader spot, contrary to the normal position, being in the higher latitude.

216·342 G	87	495	185	1090	44·1	+ 3·6	-15·1	-74·1
217·365 C	149	1032	165	1143	45·2	+ 4·7	-15·4	-59·5
218·320 C	181	1298	147	1051	44·5	+ 3·9	-15·2	-47·6
219·459 G	257	1443	163	920	45·0	+ 4·4	-15·0	-32·0
220·387 G	262	1465	150	835	44·8	+ 4·2	-15·0	-19·9
221·099 K	262	1549	143	842	44·8	+ 4·2	-15·0	-10·5
222·344 G	284	1562	153	839	44·4	+ 3·7	-14·6	+ 5·5
223·339 G	252	1406	144	804	44·1	+ 3·4	-14·9	+18·3
224·497 G	192	1182	127	774	44·2	+ 3·5	-14·8	+33·8
225·373 C	133	992	104	769	43·8	+ 3·1	-14·4	+45·0
226·367 G	101	568	108	608	44·2	+ 3·4	-14·7	+58·5
227·568 G	44	240	105	544	44·7	+ 3·9	-14·7	+74·9
228·348 G	9	59	(43	283	41·7	..	-12·8)	+82·2
Means ..	..	..	141	852	44·5	..	-14·9	..

Spot *a*

216·342 G	41	156	77	293	46·7	0·0	-18·3	-71·5
217·365 C	60	323	64	342	47·0	+ 0·3	-18·2	-57·7
218·320 C	69	433	55	342	46·9	+ 0·1	-17·8	-45·2
219·459 G	96	513	60	323	47·2	+ 0·4	-17·6	-29·8
220·387 G	101	572	58	326	47·2	+ 0·4	-17·7	-17·5
221·099 K	111	556	61	306	47·3	+ 0·5	-17·6	- 8·0
222·344 G	112	559	62	307	47·2	+ 0·4	-17·2	+ 8·3
223·339 G	96	563	57	332	47·0	+ 0·1	-17·2	+21·2
224·497 G	98	479	68	331	46·8	- 0·1	-17·2	+36·4
225·373 C	49	317	41	263	46·9	0·0	-17·3	+48·1
226·367 G	41	222	48	262	46·8	- 0·1	-17·5	+61·1
227·568 G	21	80	59	226	46·9	- 0·1	-17·3	+77·1

No. 1244: Group 12950—*continued.*

Spot *b*

d					°	°	°	°
216·342 G	46	339	108	797	42·6	0·0	-14·2	-75·6
217·365 C	89	709	101	801	43·6	+ 1·0	-13·5	-61·1
218·320 C	112	865	92	709	43·5	+ 0·8	-13·7	-48·6
219·459 G	147	802	94	513	43·5	+ 0·8	-13·1	-33·5
220·387 G	147	813	84	463	43·0	+ 0·3	-13·3	-21·7
221·099 K	151	993	82	536	42·9	+ 0·2	-13·4	-12·4
222·344 G	172	1003	91	532	42·8	+ 0·1	-13·4	+ 3·9
223·339 G	156	843	87	472	42·7	- 0·1	-13·5	+16·9
224·497 G	94	703	59	443	42·6	- 0·2	-13·4	+32·2
225·373 C	84	675	63	506	42·7	- 0·1	-13·3	+43·9
226·367 G	60	346	60	346	42·6	- 0·2	-12·9	+56·9
227·568 G	23	160	46	318	43·2	+ 0·3	-12·9	+73·4
228·348 G	9	59	43	283	41·7	..	-12·8	+82·2

Group 12989. Sept.1–13. A stable regular spot, probably *a* of Group 12950, with one or two small companions on Sept.4–7 and on Sept.10.

243·388 G	14	78	34	192	45·8	- 1·5	-18·3	-75·0
244·344 G	34	159	43	200	45·8	- 1·5	-18·2	-62·4
245·340 G	45	209	39	182	45·7	- 1·7	-18·3	-49·3
246·399 G	66	352	46	251	43·8	- 3·6	-19·7	-37·2
247·402 G	92	361	56	219	44·9	- 2·5	-19·0	-22·9
248·453 C	89	379	49	214	44·9	- 2·5	-19·1	- 9·0
249·433 G	65	332	36	186	44·8	- 2·7	-18·4	+ 3·8
250·360 C	66	304	38	176	44·4	- 3·1	-18·2	+15·7
251·339 G	66	318	42	200	44·3	- 3·2	-18·2	+28·5
252·345 G	77	337	57	250	43·2	- 4·3	-18·3	+40·7
253·487 G	45	185	46	191	43·5	- 4·1	-18·1	+56·1
254·412 G	16	108	26	173	43·2	- 4·4	-18·4	+68·0
255·361 G	9	72	40	316	43·4	..	-18·4	+80·7
Means ..	..	..	43	203	44·5	..	-18·5	..

Group 12990. Sept.1–3. A small spot, probably the end of *b* of Group 12950.

243·388 G	5	27	12	63	45·2	+ 2·0	-12·5	-75·6
244·344 G	9	25	11	30	45·6	+ 2·4	-12·7	-62·6
245·340 G	9	20	7	17	45·9	+ 2·6	-13·2	-49·1
Means ..	..	..	10	37	45·6	..	-12·8	..

Group 13019. Sept.29–Oct.8. A slowly diminishing regular spot, perhaps the ending of *a* of Group 12950.

271·397 G	13	60	24	111	39·6	- 8·4	-15·9	-71·4
272·340 G	18	72	20	78	39·4	- 8·6	-16·0	-59·2
273·417 G	22	125	17	98	39·1	- 8·9	-16·0	-45·3
274·455 C	17	84	11	54	38·8	- 9·2	-16·1	-31·9
275·377 G	22	129	13	75	38·7	- 9·4	-16·1	-19·8
276·378 G	27	103	15	57	38·5	- 9·6	-16·0	- 6·8
277·509 C	17	104	9	57	38·1	-10·0	-16·1	+ 7·7
278·380 G	18	80	10	46	37·8	-10·3	-15·7	+18·9
279·122 K	14	72	9	45	36·5	-11·6	-16·5	+27·4
280·400 G	9	27	7	21	37·0	-11·2	-16·4	+44·8
Means ..	..	..	14	64	38·4	..	-16·1	..

LEDGER I. - RECURRENT GROUPS OF SUN SPOTS FOR THE YEAR.

No. 1245. Latitude +3°·2.

Group 12927 in Rotation 1135
" 12966 " " 1136

Group 12927. July 20–Aug.1. A stream led by a small regular spot, *a*. Fresh activity occurs on July 28–29 and a new leader spot, a_1, forms.

Date U.T. Place	Projected Area Umbrae	Projected Area Whole Spots	Corrected Area Umbrae	Corrected Area Whole Spots	Longitude and Proper Motion		Latitude	Long. from C.M.
d					°	°	°	°
200·478 G	0	2	0	5	248·5	0·0	+ 2·6	−79·6
201·437 G	5	23	7	30	247·6	− 1·1	+ 3·2	−67·8
202·398 C	4	16	4	15	245·9	− 3·0	+ 3·3	−56·8
203·366 G	23	122	16	84	246·3	− 2·7	+ 3·6	−43·6
204·371 G	37	225	21	128	247·2	− 2·0	+ 3·7	−29·4
205·340 G	46	271	23	141	248·9	− 0·5	+ 4·2	−14·8
206·338 G	53	271	26	136	250·3	+ 0·7	+ 4·4	+ 1·1
207·364 C	35	172	18	89	252·8	+ 3·0	+ 4·3	+15·8
208·439 C	43	141	25	82	252·7	+ 2·7	+ 3·9	+29·9
209·368 C	42	165	28	111	252·5	+ 2·4	+ 4·3	+42·0
210·340 C	71	344	63	306	253·3	+ 3·0	+ 3·8	+55·7
211·397 G	50	283	73	411	253·1	+ 2·6	+ 3·4	+69·5
212·328 G	11	62	52	301	254·0	..	+ 3·1	+82·7
Means ..	..	..	25	128	249·9	..	+ 3·7	..

Spot *a*: a_1

205·340 G	32	170	16	87	250·9	0·0	+ 4·4	−12·8
206·438 G	25	156	12	78	252·4	+ 1·3	+ 4·5	+ 3·2
207·364 C	31	156	16	81	253·4	+ 2·1	+ 4·2	+16·4
208·439 C	36	116	21	68	254·4	+ 2·9	+ 3·9	+31·6
209·368 C	42	158	29	109	254·1	+ 2·5	+ 4·0	+43·6
210·340 C	51	241	47	222	254·9	+ 3·1	+ 3·7	+57·3
211·397 G	34	184	54	291	255·4	+ 3·4	+ 3·3	+71·8
212·328 G	9	53	48	282	256·3	..	+ 2·8	+85·0

Group 12966. Aug.15–26. A regular spot (a_1 of Group 12927) dying out as it approaches the west limb.

226·367 G	7	39	28	159	262·5	..	+ 2·8	−83·2
227·568 C	18	105	24	142	261·5	+ 6·5	+ 2·3	−68·3
228·348 G	23	132	21	123	262·1	+ 7·0	+ 2·8	−57·4
229·459 G	27	160	18	109	262·0	+ 6·7	+ 2·8	−42·8
230·622 G	36	189	20	106	262·3	+ 6·8	+ 2·9	−27·2
231·362 C	40	201	21	105	262·5	+ 6·9	+ 3·0	−17·2
232·369 C	35	225	18	112	262·6	+ 6·8	+ 2·9	− 3·8
233·395 C	38	203	19	104	262·6	+ 6·6	+ 2·8	+ 9·8
234·342 G	36	214	19	116	262·5	+ 6·3	+ 2·4	+22·2
235·342 G	32	146	20	91	262·6	+ 6·2	+ 2·3	+35·5
236·340 G	18	87	14	66	262·4	+ 5·9	+ 2·5	+48·5
237·457 G	7	18	8	20	262·3	+ 5·5	+ 2·5	+63·2
Means ..	..	..	18	99	262·3	..	+ 2·6	..

No. 1246. Latitude −5°·8.

Group 12943 in Rotation 1135
" 12982 " " 1136

Group 12943. Aug.1–13. A stable regular spot.

212·328 C	9	55	43	263	88·0	..	− 6·5	−83·3
213·464 G	37	202	53	289	87·8	0·0	− 6·5	−68·5
214·344 G	60	305	57	290	87·7	− 0·2	− 6·4	−57·0

No. 1246: Group 12943 —*continued.*

d					°	°	°	°
215·342 G	69	403	49	286	87·5	− 0·6	− 6·3	−44·0
216·342 G	76	472	46	283	87·3	− 1·0	− 6·4	−30·9
217·365 C	71	504	38	272	87·2	− 1·2	− 6·3	−17·5
218·320 C	87	515	44	263	87·3	− 1·3	− 6·3	− 4·8
219·459 G	92	524	48	272	87·1	− 1·7	− 6·2	+10·1
220·387 G	66	467	36	257	87·1	− 1·8	− 6·1	+22·4
221·099 K	83	415	50	249	87·2	− 1·9	− 6·0	+31·9
222·344 G	55	286	42	220	87·2	− 2·1	− 5·6	+48·3
223·339 G	34	153	37	167	87·6	− 1·8	− 5·5	+61·8
224·497 G	11	73	26	172	87·4	− 2·2	− 5·3	+77·0
Means ..	..	..	44	252	87·4	..	− 6·1	..

Group 12982. Aug.29–Sept.1. A small regular spot of the previous rotation dying out.

240·105 K	4	13	8	27	89·1	− 3·0	− 5·1	−75·1
241·341 G	7	14	7	14	89·3	− 3·0	− 5·1	−58·5
242·415 C	7	18	5	13	89·5	− 3·0	− 5·0	−44·1
243·388 G	5	18	3	11	89·5	− 3·2	− 5·1	−31·3
Means ..	..	..	6	16	89·4	..	− 5·1	..

No. 1247. Latitude +8°·7.

Group 12947 in Rotation 1135
" 12972 " " 1136

Group 12947. Aug.4–6. A group developing rapidly near the west limb; subsequent development is lost to view but the finish of the Group is probably represented by Group 12972.

215·342 G	46	195	42	179	189·1	0·0	+ 6·9	+57·6
216·342 G	54	376	83	587	190·2	+ 1·0	+ 8·5	+72·0
217·365 C	17	139	74	613	188·4	− 1·0	+ 8·2	+83·7
Means ..	..	..	62	383	189·6	..	+ 7·7	..

Group 12972. Aug.21–27. A small spot, replaced temporarily on Aug.26 by another following the original position.

232·369 C	4	13	5	17	197·9	+ 6·6	+ 9·1	−68·5
233·395 C	4	20	3	17	197·7	+ 6·2	+ 9·4	−55·1
234·342 G	9	18	6	12	197·6	+ 6·0	+ 9·4	−42·7
235·342 G	9	16	5	9	197·7	+ 6·0	+ 9·7	−29·4
236·340 G	9	14	5	7	197·7	+ 5·9	+ 9·9	−16·2
237·457 G	5	11	3	6	191·1	− 0·9	+ 7·1	− 8·0
238·482 G	2	9	1	5	197·6	+ 5·5	+10·0	+12·0
Means ..	..	..	4	10	196·8	..	+ 9·2	..

LEDGER I. – RECURRENT GROUPS OF SUN SPOTS FOR THE YEAR.

No. 1248. Latitude +10°·5.

Group 12964 in Rotation 1136
" 12998 " " 1137

Group 12964. Aug.15–26. A variable stream.

Date U.T. Place	Projected Area Umbrae	Projected Area Whole Spots	Corrected Area Umbrae	Corrected Area Whole Spots	Longitude and Proper Motion		Latitude	Long. from C.M.
d					°	°	°	°
226·367 G	23	91	39	149	272·5	0·0	+11·3	-73·2
227·568 G	27	188	25	171	272·7	+ 0·1	+11·2	-57·1
228·348 G	48	260	34	185	273·7	+ 1·0	+11·4	-45·8
229·459 G	64	242	37	140	274·1	+ 1·3	+11·1	-30·7
230·622 C	38	212	20	111	273·7	+ 0·8	+11·3	-15·8
231·362 C	18	93	9	46	276·1	+ 3·1	+11·1	- 3·6
232·369 C	22	133	11	68	276·1	+ 3·0	+11·1	+ 9·7
233·395 C	29	115	16	63	277·2	+ 4·0	+11·0	+24·4
234·342 G	46	164	29	102	276·7	+ 3·4	+10·1	+36·4
235·342 G	23	123	18	97	278·3	+ 4·9	+ 9·4	+51·2
236·340 G	14	62	16	72	279·3	+ 5·8	+ 9·9	+65·4
237·457 G	5	9	13	24	279·2	..	+ 9·5	+80·1
Means ..	..	..	23	109	275·5	..	+10·8	..

Group 12998. Sept.10–18. A small regular spot preserving its identity with respect to a new group, Group 12999, which develops just southwards. Complete continuity with Group 12964 in the previous rotation is somewhat doubtful.

252·345 G	5	9	20	37	278·4	..	+10·7	-84·1
253·487 G	14	54	19	73	278·4	+ 3·1	+10·5	-69·0
254·412 G	16	68	14	61	278·4	+ 3·0	+10·7	-56·8
255·361 G	16	81	11	56	278·7	+ 3·2	+10·4	-44·0
256·355 G	20	86	12	50	279·1	+ 3·5	+10·3	-30·5
257·338 G	14	106	7	55	279·0	+ 3·3	+10·0	-17·6
258·340 G	16	70	8	35	278·9	+ 3·1	+10·0	- 4·4
259·376 G	14	68	7	35	279·4	+ 3·5	+ 9·9	+ 9·7
260·404 C	9	35	5	19	279·2	+ 3·2	+ 9·8	+23·1
Means ..	..	..	10	48	278·9	..	+10·2	..

No. 1249. Latitude -12°·9.

Group 12981 in Rotation 1136
" 13009 " " 1137

Group 12981. Aug.29–Sept.6. A small variable stream.

240·105 K	13	48	9	34	125·1	0·0	-14·2	-39·1
241·341 G	16	25	9	14	126·1	+ 0·9	-14·1	-21·7
242·415 C	18	66	10	36	124·5	- 0·7	-14·4	- 9·1
243·388 G	9	27	5	15	126·4	+ 1·1	-15·4	+ 5·6
244·344 G	21	79	12	45	125·7	+ 0·3	-13·7	+17·5
245·340 G	9	36	6	22	126·4	+ 1·0	-11·9	+31·4
246·399 G	68	193	52	147	125·7	+ 0·2	-12·9	+44·7
247·402 G	50	220	52	231	126·5	+ 1·0	-12·8	+58·7
248·453 C	9	70	21	161	128·9	+ 3·3	-15·0	+75·0
Means ..	..	..	20	78	126·1	..	-13·8	..

No. 1249 —*continued.*

Group 13009. Sept.22–Oct.3. A compact stream that diminishes rather rapidly, leaving the leader (a regular spot) on Oct.2 and 3.

d					°	°	°	°
264·344 G	88	621	176	1297	129·7	+ 3·1	-12·0	-74·4
265·334 G	197	1255	223	1432	129·9	+ 3·3	-12·0	-61·1
266·357 G	224	1418	176	1129	129·6	+ 2·9	-11·8	-47·9
267·173 K	194	1569	128	1046	130·1	+ 3·4	-11·4	-36·6
268·485 G	336	1510	188	846	130·4	+ 3·6	-11·6	-19·0
269·346 G	249	1402	133	747	130·6	+ 3·7	-11·7	- 7·5
270·350 G	170	980	91	521	130·7	+ 3·8	-11·9	+ 5·9
271·397 G	101	595	58	340	131·8	+ 4·8	-11·8	+20·8
272·340 G	74	312	47	204	133·3	+ 6·3	-12·0	+34·7
273·417 G	37	175	31	148	134·2	+ 7·1	-12·5	+49·8
274·455 C	22	106	31	152	137·9	+10·7	-12·6	+67·2
275·377 G	9	40	28	126	137·5	+10·3	-12·9	+79·0
Means ..	..	..	109	666	132·1	..	-12·0	..

Spot *a*

264·344 G	43	198	75	345	133·1	0·0	-12·8	-71·0
265·334 G	81	439	83	448	133·2	0·0	-12·2	-57·8
266·357 G	112	536	83	397	133·5	+ 0·3	-12·2	-44·0
267·173 K	100	526	63	331	133·7	+ 0·4	-12·2	-33·0
268·485 G	108	502	59	276	134·7	+ 1·3	-12·2	-14·7
269·346 G	101	457	54	242	135·3	+ 1·9	-12·3	- 2·8
270·350 G	85	349	46	188	135·7	+ 2·2	-12·4	+10·9
271·397 G	40	264	24	156	136·2	+ 2·7	-12·5	+25·2
272·340 G	36	186	24	126	136·4	+ 2·8	-12·7	+37·8
273·417 G	20	119	18	105	136·8	+ 3·2	-12·6	+52·4
274·455 C	22	106	31	152	137·9	+ 4·2	-12·6	+67·2
275·377 G	9	40	28	126	137·5	+ 3·7	-12·9	+79·0

No. 1250. Latitude +12°·0.

Group 12986 in Rotation 1136
" 13016 " " 1137

Group 12986. Aug.30–Sept.11. A large stream of normal type seen from its initial development near the east limb.

241·341 G	2	5	7	16	65·3	..	+12·3	-82·5
242·415 C	11	51	15	69	64·1	0·0	+12·2	-69·5
243·388 G	82	339	72	297	65·5	+ 1·3	+12·0	-55·3
244·344 G	195	1021	135	704	64·5	+ 0·2	+11·7	-43·7
245·340 G	271	1405	157	812	65·2	+ 0·9	+11·8	-29·8
246·399 G	238	1625	124	844	65·0	+ 0·6	+11·7	-16·0
247·402 G	370	1862	186	937	66·1	+ 1·6	+11·6	- 1·7
248·453 C	420	2594	218	1342	66·8	+ 2·2	+11·4	+12·9
249·433 G	334	2113	188	1167	65·9	+ 1·3	+11·1	+24·9
250·360 C	286	2041	189	1319	66·5	+ 1·8	+10·9	+37·8
251·339 G	218	1228	182	1014	67·3	+ 2·5	+10·7	+51·5
252·345 G	97	659	134	848	68·0	+ 3·1	+10·5	+65·5
253·487 G	21	133	(43	270	64·2	..	+ 9·9)	+76·8
Means ..	..	..	145	850	65·9	..	+11·4	..

LEDGER I. – RECURRENT GROUPS OF SUN SPOTS FOR THE YEAR.

No. 1250: Group 12986 —*continued*

Spot *a*

Date U.T. Place	Projected Area Umbræ	Projected Area Whole Spots	Corrected Area Umbræ	Corrected Area Whole Spots	Longitude and Proper Motion		Latitude	Long. from C.M.
d					°	°	°	°
241·341 G	2	5	7	16	65·3		+12·3	−82·5
242·415 C	7	32	9	40	66·4	0·0	+12·1	−67·2
243·388 G	43	189	36	157	67·1	+ 0·6	+12·3	−53·7
244·344 G	104	581	69	383	67·4	+ 0·8	+11·9	−40·8
245·340 G	132	742	74	416	68·8	+ 2·2	+11·8	−26·2
246·399 G	154	826	79	421	70·3	+ 3·6	+11·8	−10·7
247·402 G	134	654	67	327	71·3	+ 4·5	+11·8	+ 3·5
248·453 C	185	953	98	505	72·5	+ 5·6	+11·7	+18·6
249·433 G	132	611	78	360	73·9	+ 7·0	+11·9	+32·9
250·360 C	123	651	89	469	75·0	+ 8·0	+12·2	+46·3
251·339 G	59	320	60	323	76·8	+ 9·7	+12·3	+61·0
252·345 G	41	203	75	371	77·7	+10·5	+12·1	+75·2

Spot *b*

244·344 G	91	440	66	321	60·9	0·0	+11·5	−47·3
245·340 G	125	590	75	354	60·8	− 0·2	+11·6	−34·2
246·399 G	84	799	45	423	60·6	− 0·4	+11·5	−20·4
247·402 G	123	563	63	287	60·4	− 0·7	+11·5	− 7·4
248·453 C	169	1214	86	619	62·0	+ 0·8	+11·2	+ 8·1
249·433 G	120	1121	64	594	61·6	+ 0·3	+10·7	+20·6
250·360 C	108	1003	65	602	61·8	+ 0·5	+10·5	+33·1
251·339 G	73	508	52	361	61·8	+ 0·4	+ 9·6	+46·0
252·345 G	36	298	35	286	61·6	+ 0·1	+ 9·1	+59·1
253·487 G	16	106	28	188	62·0	+ 0·4	+ 9·1	+74·6

Group 13016. Sept.26–Oct.7. A small spot (possibly *a* of Group 12986) that disappears after the second day. A small stream of variable spots then appears on Sept.30.

268·485 G	0	9	0	23	69·4	..	+13·0	−80·0
269·346 G	4	8	5	10	70·1	+ 1·6	+12·5	−68·0
270·350 G	0	0	0	0	..	..	..	..
271·397 G	0	0	0	0	..	..	..	..
272·340 G	18	49	10	27	73·4	+ 4·7	+13·2	−25·2
273·417 G	31	90	16	46	74·3	+ 5·5	+13·4	−10·1
274·455 C	15	97	8	49	75·0	+ 6·1	+13·6	+ 4·3
275·377 G	20	125	11	66	76·1	+ 7·2	+13·7	+17·6
276·378 G	27	100	16	59	76·6	+ 7·6	+11·8	+31·3
277·509 C	54	259	38	184	76·2	+ 7·1	+11·1	+45·8
278·380 G	29	158	26	142	75·5	+ 6·3	+11·8	+56·6
279·122 K	8	49	11	61	76·4	+ 7·2	+11·5	+67·3
Means ..	..	..	13	59	74·8	..	+12·5	..

No. 1251. Latitude +22°·8.

Group 13000 in Rotation 1137
" 13033 " " 1138

Group 13000. Sept.15–27. A large regular spot with a pair of followers that have disappeared by Sept.19. Between Sept.17 and 18, the regular spot divides into two parts which separate in longitude; the new leader alone remains on Sept.26.

257·338 G	22	151	56	370	215·4	..	+21·9	−81·2
258·340 G	59	323	76	413	215·5	0·0	+22·0	−67·8
259·376 G	87	356	72	296	216·9	+ 1·6	+21·8	−52·8

No. 1251: Group 13000 —*continued.*

d					°	°	°	°
260·404 C	74	445	48	289	217·6	+ 2·5	+21·2	−38·5
261·369 G	104	448	59	255	217·7	+ 2·8	+21·2	−25·7
262·538 G	67	337	35	177	218·1	+ 3·4	+21·5	− 9·8
263·364 C	65	303	34	158	218·6	+ 4·1	+22·1	+ 1·6
264·344 G	40	202	21	108	219·7	+ 5·4	+22·0	+15·6
265·334 G	31	146	18	86	219·5	+ 5·4	+22·3	+28·5
266·357 G	24	119	16	82	219·8	+ 5·9	+22·4	+42·3
267·173 K	15	114	12	95	219·3	+ 5·6	+22·1	+52·6
268·485 G	13	58	18	78	218·6	+ 5·1	+22·0	+69·2
269·346 G	9	31	22	76	218·1	..	+22·0	+80·0
Means ..	..	..	37	185	218·3	..	+21·9	..

Group 13033. Oct.12–16. A small definite spot. Identification with Group 13000 is a little doubtful.

284·378 G	4	9	11	24	218·6	..	+25·1	−81·1
285·411 C	9	34	11	41	220·2	+10·1	+24·5	−65·9
286·378 G	13	33	11	27	221·9	+12·0	+24·7	−51·5
287·376 G	9	40	6	26	222·3	+12·6	+25·0	−37·9
288·377 C	6	30	3	17	222·1	+12·6	+25·0	−24·9
Means ..	..	..	8	28	221·6	..	+24·8	..

No. 1252. Latitude +16°·7.

Group 13004 in Rotation 1137
" 13024 " " 1138
" 13059 " " 1139

Group 13004. Sept.18–21. A small spot.

260·404 C	4	39	3	29	304·1	0·0	+14·1	+48·0
261·369 G	0	0	0	0	..	..	..	..
262·538 G	9	36	15	60	301·6	− 2·4	+15·0	+73·7
263·364 C	9	35	32	126	300·7	..	+14·8	+83·7
Means ..	..	..	6	30	302·8	..	+14·6	..

Group 13024. Oct.5–18. A giant group. Near the east limb, it appears as a single composite spot, but on a fuller presentation it is seen to be composed of two separate complex spots, almost touching one another. The following spot breaks up into a cluster when the group nears the west limb.

277·509 C	43	544	141	1784	307·8	..	+16·0	−82·6
278·380 G	165	1606	251	2441	307·0	+ 3·4	+16·7	−71·9
279·122 K	416	2707	451	2980	305·6	+ 2·0	+16·5	−63·5
280·400 G	503	4023	371	2952	306·4	+ 2·8	+16·9	−45·8
281·399 C	522	4810	320	2952	305·1	+ 1·5	+17·0	−33·9
282·470 G	697	5319	378	2881	305·4	+ 1·9	+16·9	−19·5
283·378 G	835	5385	430	2768	305·8	+ 2·3'	+16·6	− 7·1
284·378 G	664	5835	342	3003	304·8	+ 1·3	+16·9	+ 5·1
285·411 C	685	4742	368	2555	306·6	+ 3·1	+16·5	+20·5
286·378 G	606	4508	365	2724	305·3	+ 1·9	+17·5	+31·9

LEDGER I. – RECURRENT GROUPS OF SUN SPOTS FOR THE YEAR.

Date U.T. Place	Projected Area Umbra	Projected Area Whole Spots	Corrected Area Umbra	Corrected Area Whole Spots	Longitude and Proper Motion		Latitude	Long. from C.M.
No. 1252: Group 13024 —*continued.*								
d					°	°	°	°
287·376 G	502	3397	363	2458	305·9	+ 2·5	+16·3	+45·7
288·377 C	330	2275	312	2220	305·6	+ 2·2	+17·7	+58·6
289·372 G	182	1218	273	1916	304·7	+ 1·3	+18·3	+70·8
290·423 G	22	155	(55	394	299·4	..	+17·8)	+79·4
Means ..	..	..	352	2654	305·7	..	+17·0	..
Spot *a*								
279·122 K	249	1405	249	1405	309·0	0·0	+16·2	−60·1
280·400 G	265	2003	183	1382	308·6	− 0·4	+16·7	−43·6
281·399 C	277	2535	163	1496	308·8	− 0·1	+16·6	−30·2
282·470 G	315	2680	167	1420	308·9	0·0	+17·0	−16·0
283·378 G	404	2739	206	1397	308·8	− 0·1	+17·3	− 4·1
284·378 G	291	2731	151	1420	308·9	0·0	+17·4	+ 9·2
285·411 C	320	2290	176	1259	308·7	− 0·1	+17·8	+22·6
286·378 G	342	2626	212	1628	308·2	− 0·6	+17·8	+34·8
287·376 G	293	1985	223	1509	308·7	− 0·1	+17·8	+48·5
288·377 C	171	1451	181	1538	309·2	+ 0·4	+17·9	+62·2
289·372 G	88	738	161	1351	309·1	+ 0·4	+18·2	+75·2
Spot *b*								
279·122 K	167	1302	202	1575	302·5	0·0	+16·7	−66·6
280·400 G	129	1311	101	1023	302·2	− 0·3	+17·2	−50·0
281·399 C	245	2275	157	1456	300·9	− 1·5	+17·6	−38·1
282·470 G	333	2231	186	1249	301·3	− 1·1	+17·6	−23·6
283·378 G	369	2158	192	1122	300·9	− 1·5	+17·2	−12·0
284·378 G	315	2531	161	1291	300·5	− 1·9	+17·3	+ 0·8
285·411 C	258	1514	134	787	299·2	− 3·1	+17·6	+13·1
286·378 G	206	1416	117	807	299·0	− 3·3	+18·2	+25·6
287·376 G	169	1015	110	660	298·8	− 3·5	+18·1	+38·6
288·377 C	86	407	72	342	300·7	− 1·6	+17·5	+53·7
289·372 G	53	221	67	278	301·1	− 1·1	+17·4	+67·2
Group 13059. Nov.1–11. A small diminishing regular spot (representing *a* of Group 13024 greatly diminished) with an occasional companion. There is an extensive area of faculae associated with the group.								
304·471 G	4	22	12	67	313·4	..	+16·3	−81·3
305·424 G	13	46	18	63	313·2	+ 4·9	+16·0	−69·0
306·344 C	15	59	14	54	313·3	+ 5·0	+16·0	−56·7
307·524 G	20	123	14	84	312·5	+ 4·2	+16·0	−42·0
308·439 G	26	118	15	70	312·8	+ 4·5	+16·1	−29·6
309·381 C	21	70	11	38	312·8	+ 4·6	+16·6	−17·2
310·457 G	15	35	8	18	312·1	+ 3·9	+16·5	− 3·7
311·332 C	17	55	9	29	311·2	+ 3·0	+16·6	+ 6·9
312·107 K	30	79	16	43	312·7	+ 4·5	+17·5	+18·6
313·395 G	9	22	6	14	312·4	+ 4·3	+16·8	+35·3
314·400 G	2	13	2	10	312·6	+ 4·5	+16·7	+48·8
Means ..	..	..	11	42	312·6	..	+16·5	..

Date U.T. Place	Projected Area Umbra	Projected Area Whole Spots	Corrected Area Umbra	Corrected Area Whole Spots	Longitude and Proper Motion		Latitude	Long. from C.M.
No. 1253. Latitude −10°·9. Group 13007 in Rotation 1137; " 13037 " " 1138								
Group 13007. Sept.21–Oct.3. A large stable regular spot.								
d					°	°	°	°
263·364 C	26	135	53	277	142·9	0·0	−11·0	−74·1
264·344 C	45	284	51	321	142·7	− 0·3	−10·7	−61·4
265·334 G	72	508	58	411	142·0	− 1·1	−10·9	−49·0
266·357 G	144	594	94	386	141·9	− 1·3	−10·8	−35·6
267·173 K	160	718	93	416	141·6	− 1·7	−11·0	−25·1
268·485 G	165	717	87	380	141·0	− 2·4	−11·1	− 8·4
269·346 G	148	712	78	377	141·0	− 2·5	−10·9	+ 2·9
270·350 G	143	699	79	384	140·3	− 3·3	−11·0	+15·5
271·397 G	143	735	87	448	140·4	− 3·3	−11·1	+29·4
272·340 G	85	582	60	413	140·4	− 3·4	−11·2	+41·8
273·417 G	81	390	78	374	140·4	− 3·5	−11·2	+56·0
274·455 C	48	255	77	411	140·8	− 3·2	−11·0	+70·1
275·377 G	13	80	53	326	140·0	..	−11·0	+81·5
Means ..	..	..	75	383	141·3	..	−11·0	..
Group 13037. Oct.18–29. A stable regular spot; there are small companions on Oct.25.								
290·423 G	9	49	26	143	141·2	− 4·3	−10·3	−78·8
291·430 G	29	124	39	165	140·4	− 5·2	−10·5	−66·3
292·455 G	35	177	31	156	140·2	− 5·5	−10·7	−53·0
293·374 G	40	214	28	148	140·5	− 5·3	−10·6	−40·6
294·380 G	44	243	26	144	140·1	− 5·8	−10·4	−27·7
295·416 G	35	239	19	129	140·3	− 5·7	−10·7	−13·9
296·434 G	53	241	28	125	140·1	− 6·0	−11·0	− 0·6
297·447 G	58	242	32	130	139·3	− 6·9	−10·7	+11·9
298·437 G	40	194	23	113	139·7	− 6·6	−11·1	+25·4
299·413 G	24	119	16	79	139·5	− 6·9	−11·1	+38·1
300·446 G	15	48	13	40	139·2	− 7·3	−11·2	+51·4
301·435 G	4	22	5	27	138·8	− 7·8	−11·4	+64·0
Means ..	..	..	24	117	139·9	..	−10·8	..
No. 1254. Latitude +11°·3. Group 13022 in Rotation 1137; " 13049 " " 1138								
Group 13022. Oct.4–11. A stream of normal type with rapid rise and decline.								
276·378 G	33	107	17	56	29·7	0·0	+11·5	−15·6
277·509 C	175	803	87	402	29·7	− 0·1	+11·7	− 0·7
278·380 G	160	899	82	458	29·6	− 0·3	+11·7	+10·7
279·122 K	218	916	117	491	29·9	− 0·1	+11·7	+20·8
280·400 G	54	444	34	281	29·7	− 0·4	+11·7	+37·5
281·399 C	43	215	35	173	30·6	+ 0·4	+11·1	+51·6
282·470 G	22	107	28	135	32·1	+ 1·8	+10·7	+67·2
283·378 G	9	71	22	175	32·1	+ 1·8	+10·5	+79·2
Means ..	..	..	53	271	30·4	..	+11·3	..

LEDGER I. – RECURRENT GROUPS OF SUN SPOTS FOR THE YEAR.

No. 1254: Group 13022 —*continued*

Spot *a*

Date U.T. Place	Projected Area Umbrae	Projected Area Whole Spots	Corrected Area Umbrae	Corrected Area Whole Spots	Longitude and Proper Motion		Latitude	Long. from C.M.
d					°	°	°	°
276·378 G	20	71	10	37	30·6	0·0	+11·2	-14·7
277·509 C	78	419	39	210	31·9	+ 1·2	+11·4	+ 1·5
278·380 G	98	504	50	257	31·9	+ 1·1	+11·4	+13·0
279·122 K	115	494	62	267	31·8	+ 0·9	+11·2	+22·7
280·400 G	27	263	18	171	31·9	+ 0·9	+11·1	+39·7
281·399 C	39	181	32	148	31·6	+ 0·5	+10·9	+52·6
282·470 G	22	107	28	135	32·1	+ 0·9	+10·7	+67·2
283·378 G	9	71	22	175	32·1	+ 0·9	+10·5	+79·2

Spot *b*

276·378 G	13	36	7	19	28·3	0·0	+11·9	-17·0
277·509 C	97	384	48	192	27·6	- 0·8	+12·0	- 2·8
278·380 G	62	395	32	201	27·0	- 1·5	+12·1	+ 8·1
279·122 K	103	422	55	224	26·9	- 1·7	+12·2	+17·8
280·400 G	27	181	16	110	27·1	- 1·6	+12·7	+34·9
281·399 C	4	34	3	25	26·9	- 1·9	+12·0	+47·9

Group 13049. Oct.27–28. A tiny spot, possibly *a* of Group 13022 *f* Group 13046, probably the return of Group 13022.

299·413 G	2	4	3	5	32·8	+ 0·1	+13·5	-68·6
300·446 C	2	4	2	3	33·3	+ 0·5	+13·3	-54·5
Means ..	..	..	3	4	33·0	..	+13·4	..

No. 1255. Latitude +14°·1.

Group 13026 in Rotation 1138
" 13046 " " 1138

Group 13026. Oct.8–11. A group originating near the west limb.

280·400 G	22	83	16	59	37·9	0·0	+14·2	+45·7
281·399 C	44	183	43	180	38·9	+ 1·0	+14·0	+59·9
282·470 G	11	44	24	97	42·9	+ 4·9	+14·0	+78·0
283·378 G	4	7	(15	27	36·5	..	+11·9)	+83·6
Means ..	..	..	28	112	39·9	..	+14·1	..

Group 13046. Oct.25–Nov.6. A stable regular spot.

297·447 G	9	44	32	159	44·4	..	+14·4	-83·0
298·437 G	18	92	26	132	44·3	+ 5·7	+14·4	-70·0
299·413 G	26	128	24	118	44·3	+ 5·7	+14·6	-57·1
300·446 G	42	172	29	119	44·4	+ 5·8	+14·6	-43·4
301·435 G	40	202	24	119	44·4	+ 5·7	+14·4	-30·4
302·389 C	47	198	25	105	44·4	+ 5·7	+14·1	-17·8
303·337 C	43	234	22	119	44·4	+ 5·7	+14·0	- 5·3
304·471 G	48	253	25	132	44·6	+ 5·8	+14·2	+ 9·9
305·424 G	31	189	17	104	44·6	+ 5·8	+14·1	+22·4

No. 1255: Group 13046 —*continued*.

d					°	°	°	°
306·344 C	34	172	21	105	44·4	+ 5·6	+14·1	+34·4
307·524 G	22	123	17	96	44·2	+ 5·3	+13·8	+49·7
308·439 G	15	74	16	78	44·3	+ 5·4	+13·7	+61·9
309·381 C	15	78	26	136	43·7	+ 4·8	+13·5	+73·7
Means ..	..	..	23	114	44·3	..	+14·1	..

No. 1256. Latitude +25°·1.

Group 13029 in Rotation 1138
" 13047 " " 1138

Group 13029. Oct.10–11. A group developing near the west limb.

282·470 G	7	22	8	24	27·4	0·0	+26·9	+62·5
283·378 G	7	22	(11	34	24·8	..	+27·5)	+71·9
Means ..	..	..	9	29	26·1	..	+27·2	..

Group 13047. Oct.26–Nov.6. A close pair of spots becoming a cluster which slowly dies out. Identification with Group 13029 uncertain, but probable.

298·437 G	18	86	47	223	34·3	..	+26·4	-80·0
299·413 G	40	145	53	191	33·9	+11·2	+26·2	-67·5
300·446 G	62	286	55	251	34·5	+12·1	+26·2	-53·3
301·435 G	75	308	52	213	34·5	+12·4	+26·2	-40·3
302·389 C	60	341	36	205	33·8	+11·9	+25·0	-28·4
303·337 C	60	465	33	257	33·4	+11·8	+24·6	-16·3
304·471 G	66	486	35	258	33·7	+12·4	+24·8	- 1·0
305·424 G	40	308	22	166	33·0	+12·0	+25·7	+10·8
306·344 C	53	252	31	146	32·4	+11·6	+25·0	+22·4
307·524 G	13	44	9	29	31·7	+11·3	+24·6	+37·2
308·439 G	9	33	7	27	32·4	+12·2	+24·5	+50·0
309·381 C	2	11	2	13	33·4	+13·5	+23·4	+63·4
Means ..	..	..	30	160	33·3	..	+25·1	..

No. 1257. Latitude -10°·8.

Group 13064 in Rotation 1139
" 13093 " " 1140
" 13128 " " 1141
" 13160 } " " 1142
" 13163 }

Group 13064. Nov.4–17. A great composite spot. When fully presented on the disk, it can be considered as one main spot, *a*, with a compact train and other companions. The nucleus of this chief spot is crossed by a well defined "bridge" which is eventually broken by Nov.14. Starting as a subsidiary nucleus,

continued

LEDGER I. - RECURRENT GROUPS OF SUN SPOTS FOR YEAR 1938-39.

No. 1257: Group 13064 — *continued.*

a part of the northern boundary of the spot separates as a partially-formed regular spot, c, and drifts forward in longitude.

Date U.T. Place	Projected Area Umbra	Projected Area Whole Spots	Corrected Area Umbra	Corrected Area Whole Spots	Longitude and Proper Motion		Latitude	Long. from C.M.
d					°	°	°	°
307·524 G	57	282	(206	1018	273·2	..	- 8·9)	-81·3
308·439 G	171	1318	279	2148	271·2	0·0	- 8·3	-71·2
309·381 C	324	2005	315	2037	271·2	- 0·1	- 8·3	-58·8
310·457 G	531	2950	381	2119	271·0	- 0·4	- 8·2	-44·8
311·332 C	606	3573	365	2175	272·0	+ 0·5	- 8·2	-32·3
312·107 K	739	3856	409	2133	271·6	0·0	- 7·9	-22·5
313·395 G	791	4144	405	2120	272·3	+ 0·6	- 8·1	- 4·8
314·400 G	676	4352	349	2245	272·1	+ 0·3	- 8·6	+ 8·3
315·471 G	643	3869	357	2149	272·0	+ 0·1	- 8·8	+22·3
316·370 C	606	3126	375	1939	272·1	+ 0·1	- 8·4	+34·2
317·414 G	436	2294	340	1790	272·6	+ 0·5	- 8·9	+48·5
318·237 C	299	1597	307	1643	272·9	+ 0·7	- 9·0	+59·7
319·239 C	154	768	275	1377	273·2	+ 0·9	- 9·7	+73·2
320·409 G	2	9	(6	25	264·0	..	- 7·4)	+79·4
Means ..	..	..	347	1990	272·0	..	- 8·5	..
Spot *a*								
309·381 C	237	941	225	894	273·1	0·0	- 9·0	-56·9
310·457 G	359	1708	251	1196	272·6	- 0·6	- 9·6	-43·2
311·332 C	409	1623	245	974	273·5	+ 0·2	- 8·7	-30·8
312·107 K	467	1855	257	1020	273·2	- 0·2	- 8·9	-20·9
313·395 G	491	1967	250	1003	273·3	- 0·2	- 8·8	- 3·8
314·400 G	399	2098	207	1091	273·2	- 0·4	- 9·0	+ 9·4
315·471 G	442	2698	248	1511	273·1	- 0·6	- 8·8	+23·4
316·370 C	477	2296	296	1423	272·8	- 1·0	- 8·6	+34·9
317·414 G	368	1953	287	1523	272·9	- 1·0	- 9·2	+48·8
318·237 C	266	1435	271	1464	272·8	- 1·2	- 9·1	+59·6
319·239 C	150	760	270	1368	273·2	- 0·9	- 9·7	+73·2
Spot *c*								
309·381 C	42	314	39	295	273·0	0·0	- 5·8	-57·0
310·457 G	70	504	48	343	273·9	+ 0·8	- 5·7	-41·9
311·332 C	87	542	50	314	274·8	+ 1·6	- 5·4	-29·5
312·107 K	108	759	58	410	275·1	+ 1·8	- 5·5	-19·0
313·395 G	70	464	36	237	277·1	+ 3·7	- 5·4	0·0
314·400 C	77	473	40	246	278·0	+ 4·5	- 5·7	+14·2
315·471 G	61	344	35	200	278·9	+ 5·3	- 5·9	+29·2
316·370 C	49	363	33	247	279·3	+ 5·6	- 6·1	+41·4
317·414 G	31	155	28	140	279·7	+ 5·9	- 6·3	+55·6
318·237 C	21	101	27	129	279·6	+ 5·7	- 6·4	+66·4

Group 13093. Dec.1-14. A large spot (*a* of Group 13064) with two main umbræ; there is a "bridge" from north to south between them and this becomes a line of cleavage by Dec.9.

Date U.T. Place	Projected Area Umbra	Projected Area Whole Spots	Corrected Area Umbra	Corrected Area Whole Spots	Longitude and Proper Motion		Latitude	Long. from C.M.
334·408 G	9	65	55	396	275·0	..	-10·1	-85·1
335·457 G	91	430	149	705	274·5	- 1·2	-10·0	-71·8
336·457 G	180	746	176	731	274·5	- 1·3	-10·3	-58·6
337·469 G	262	1187	189	856	274·5	- 1·4	-10·1	-45·3
338·511 G	243	1246	146	748	274·6	- 1·4	-10·0	-31·4
339·500 G	234	1298	126	701	274·4	- 1·7	-10·1	-18·6
340·433 G	291	1267	148	646	274·2	- 2·0	-10·3	- 6·5

No. 1257: Group 13093 — *continued.*

Date U.T. Place	Projected Area Umbra	Projected Area Whole Spots	Corrected Area Umbra	Corrected Area Whole Spots	Longitude and Proper Motion		Latitude	Long. from C.M.
d					°	°	°	°
341·236 C	147	1285	75	655	274·4	- 1·9	-10·5	+ 4·3
342·421 G	217	1122	117	606	274·2	- 2·2	-10·5	+19·7
343·094 K	158	862	91	500	274·2	- 2·2	-10·7	+28·6
344·528 G	89	560	67	420	274·4	- 2·2	-10·4	+47·7
345·461 G	60	397	61	405	274·7	- 2·0	-10·5	+60·2
346·449 G	41	197	72	347	274·7	- 2·1	-10·3	+73·3
347·221 C	10	77	33	253	272·5	..	-10·1	+81·2
Means ..	..	..	118	610	274·4	..	-10·3	..

Group 13128. Dec.29-Jan.10. A large regular spot (*a* of Group 13064) with one or more small companions on Jan.1 and 8.

Date U.T. Place	Projected Area Umbra	Projected Area Whole Spots	Corrected Area Umbra	Corrected Area Whole Spots	Longitude and Proper Motion		Latitude	Long. from C.M.
362·234 C	13	71	57	312	269·5	..	-12·4	-84·0
363·468 G	65	378	88	510	268·9	- 9·6	-12·8	-68·3
364·463 G	110	564	97	496	268·8	- 9·8	-12·6	-55·3
0·339 C	140	702	99	492	268·7	- 9·9	-12·5	-43·9
1·332 C	179	869	106	513	268·8	- 9·9	-12·5	-30·7
2·430 G	174	996	92	528	268·8	-10·1	-12·4	-16·3
3·289 C	177	1148	90	585	268·7	-10·2	-12·3	- 5·1
4·279 C	178	1039	91	530	268·9	-10·1	-12·2	+ 8·2
5·272 C	167	905	90	489	268·8	-10·3	-12·4	+21·2
6·296 C	165	752	101	459	269·0	-10·2	-12·4	+34·9
7·459 G	125	577	99	456	269·5	- 9·8	-12·0	+50·7
8·255 C	102	410	105	422	269·3	-10·1	-12·0	+61·0
9·246 C	44	194	78	343	269·5	-10·0	-12·3	+74·2
Means ..	..	..	95	485	269·0	..	-12·4	..

Group 13160. Jan.25-Feb.6. A nearly circular spot with double and, later, triple umbræ; it is breaking up after Feb.3. This spot closely south-precedes Group 13161.

Date U.T. Place	Projected Area Umbra	Projected Area Whole Spots	Corrected Area Umbra	Corrected Area Whole Spots	Longitude and Proper Motion		Latitude	Long. from C.M.
24·294 C	6	29	37	177	270·8	..	-12·5	-86·4
25·277 C	17	94	28	156	271·0	-10·0	-12·7	-73·2
26·252 C	53	260	53	260	270·9	-10·3	-12·4	-60·5
27·280 C	86	414	63	302	270·9	-10·4	-12·7	-46·9
28·552 C	101	437	59	253	270·7	-10·7	-12·7	-30·4
29·280 C	90	512	49	276	270·9	-10·6	-12·7	-20·6
30·512 G	98	482	50	246	270·7	-10·9	-12·7	- 4·6
31·549 G	56	493	29	251	270·8	-10·9	-12·8	+ 9·2
32·501 G	95	473	51	255	270·8	-11·0	-12·8	+21·7
33·531 G	52	291	32	178	270·8	-11·1	-12·7	+35·3
34·295 C	55	271	39	192	270·8	-11·2	-12·6	+45·3
35·438 G	39	165	39	163	270·6	-11·5	-12·5	+60·2
36·406 G	14	76	23	128	271·2	-11·0	-13·5	+73·5
Means ..	..	..	43	222	270·8	..	-12·7	..

Group 13163. Jan.26-Feb.6. A stream in which the following part, though not developed until about Jan.30, is the first to disappear.

Date U.T. Place	Projected Area Umbra	Projected Area Whole Spots	Corrected Area Umbra	Corrected Area Whole Spots	Longitude and Proper Motion		Latitude	Long. from C.M.
25·277 C	4	21	9	48	266·0	-15·0	-11·1	-78·2
26·252 C	25	139	30	167	265·4	-15·8	-11·4	-66·0
27·280 C	65	319	54	263	265·0	-16·3	-11·5	-52·8

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No. 1257: Group 13163 —*continued.*

Date U.T. Place	Projected Area Umbræ	Projected Area Whole Spots	Corrected Area Umbræ	Corrected Area Whole Spots	Longitude and Proper Motion		Latitude	Long. from C.M.
d					°	°	°	°
28·552 C	44	277	27	172	264·4	-17·0	-11·5	-36·7
29·280 C	111	590	62	330	264·3	-17·2	-11·2	-27·2
30·512 G	150	672	77	345	264·1	-17·5	-11·4	-11·2
31·549 G	92	495	46	246	264·9	-16·8	-11·3	+ 3·3
32·501 G	96	481	50	252	264·3	-17·5	-11·3	+15·2
33·531 G	65	367	37	210	264·3	-17·6	-11·0	+28·8
34·295 C	42	165	27	107	265·2	-16·8	-10·7	+39·7
35·438 G	23	91	21	81	266·5	-15·6	-10·0	+56·1
36·406 G	4	13	6	19	268·1	-14·1	- 8·8	+70·4
Means ..	..	..	37	187	265·2	..	-10·9	..

Spot *a*

25·277 C	4	21	9	48	266·0	0·0	-11·1	-78·2
26·252 C	0	0	0	0	..	..	..	..
27·280 C	50	250	40	200	266·2	0·0	-11·0	-51·6
28·552 C	0	0	0	0	..	..	..	..
29·280 C	0	0	0	0	..	..	..	..
30·512 G	48	206	24	105	266·9	+ 0·4	-10·1	- 8·4
31·549 G	37	189	18	94	267·2	+ 0·6	- 9·5	+ 5·6
32·501 G	35	171	19	91	267·4	+ 0·7	- 9·6	+18·3
33·531 G	26	139	15	82	267·4	+ 0·6	- 9·3	+31·9
34·295 C	23	74	15	50	267·8	+ 0·9	- 9·3	+42·3
35·438 G	15	63	14	58	268·0	+ 1·0	- 9·0	+57·6
36·406 G	4	13	6	19	268·1	+ 1·0	- 8·8	+70·4

No. 1258. Latitude -19°·0.

Group 13072 in Rotation 1139
" 13105 " " 1140

Group 13072. Nov.11–21. A large group of unusual development. The early growth is that of an ordinary bi-polar group, but in a few days the group is of irregular type lacking distinctive components. A rapid growth then ensues between Nov.18 and 19, when the component parts, embracing a number of nuclei, are crowded together.

314·400 G	0	13	0	12	208·2	0·0	-16·5	-55·6
315·471 G	35	125	26	93	206·3	- 1·8	-18·2	-43·4
316·370 C	40	272	25	169	207·5	- 0·5	-18·1	-30·4
317·414 G	57	224	32	126	206·8	- 1·1	-18·2	-17·3
318·237 C	65	360	36	194	206·6	- 1·3	-18·0	- 6·6
319·239 C	114	647	62	349	207·7	- 0·1	-18·1	+ 7·7
320·409 G	170	831	99	481	206·2	- 1·5	-17·9	+21·6
321·462 G	122	839	82	557	207·0	- 0·6	-17·9	+36·3
322·453 G	200	1535	166	1265	206·8	- 0·7	-18·0	+49·1
323·111 K	292	1720	296	1754	207·0	- 0·4	-18·4	+57·4
324·427 G	88	667	193	1537	207·7	+ 0·4	-19·3	+76·0
Means ..	..	..	92	594	207·1	..	-18·0	..

Group 13105. Dec.6–19. A very long straggling stream in an extensive area of faculæ, headed by a small regular spot. Another regular spot as follower develops a double umbra on

continued

No. 1258: Group 13105 —*continued.*

Dec.11 and splits up two days later. All the spots have practically died out by the time this great area of disturbance has reached the west limb.

d					°	°	°	°
339·500 G	18	83	(53	265	213·4	..	-21·4)	-79·6
340·433 G	76	319	173	689	209·2	+ 3·2	-20·3	-71·5
341·236 C	104	616	136	813	205·0	- 0·9	-20·2	-65·1
342·421 G	137	659	115	560	203·5	- 2·3	-20·1	-51·0
343·094 K	122	638	90	471	203·6	- 2·1	-20·0	-42·0
344·528 G	194	905	115	534	201·8	- 3·8	-19·1	-24·9
345·461 G	251	1167	137	633	201·1	- 4·4	-19·3	-13·4
346·449 G	213	994	114	527	200·9	- 4·5	-19·4	- 0·5
347·221 C	154	592	82	318	201·5	- 3·9	-19·2	+10·2
348·470 G	89	340	54	202	200·3	- 5·0	-20·0	+25·5
349·333 C	36	173	24	114	196·5	- 8·7	-20·7	+33·1
350·226 C	15	79	11	58	195·2	- 9·9	-20·2	+43·5
351·461 G	13	68	17	89	202·6	- 2·4	-20·2	+67·2
352·222 C	14	39	31	94	199·5	- 5·4	-20·2	+74·1
Means ..	..	..	85	392	201·6	..	-19·9	..

No. 1259. Latitude -9°·8.

Group 13075 in Rotation 1139
" 13110 " " 1140
" 13138 " " 1141

Group 13075. Nov.12–24. A stable regular spot with a small companion on Nov.13 and 17.

315·471 G	20	118	55	323	170·8	0·0	- 8·5	-78·9
316·370 C	48	244	65	328	170·7	- 0·2	- 8·9	-67·2
317·414 G	78	396	67	337	171·0	0·0	- 8·6	-53·1
318·237 C	99	464	68	320	170·8	- 0·3	- 8·8	-42·4
319·239 C	101	496	60	293	170·6	- 0·7	- 9·0	-29·4
320·409 G	139	541	74	287	170·4	- 1·0	- 9·0	-14·2
321·462 G	111	626	57	319	170·5	- 1·0	- 9·0	- 0·2
322·453 G	118	576	61	300	170·5	- 1·1	- 9·0	+12·8
323·111 K	135	599	74	329	171·2	- 0·5	- 9·3	+21·6
324·427 G	87	462	57	305	170·8	- 1·0	- 9·3	+39·1
325·400 G	79	390	66	324	171·0	- 0·9	- 9·4	+52·2
326·426 G	33	283	41	351	170·9	- 1·2	- 9·3	+65·6
327·471 G	26	133	73	375	170·9	- 1·3	- 9·3	+79·4
Means ..	..	..	63	322	170·8	..	- 9·0	..

Group 13110. Dec.9–21. A stable regular spot with a distant pair of small spots following on Dec.19.

342·421 G	17	78	56	256	173·3	..	- 9·2	-81·2
343·094 K	32	152	52	248	173·6	- 0·4	- 9·3	-72·0
344·528 G	52	289	44	243	173·8	- 0·3	- 9·3	-52·9
345·461 G	71	384	48	257	173·8	- 0·4	- 9·3	-40·7
346·449 G	78	414	44	236	173·8	- 0·6	- 9·3	-27·6
347·221 C	86	439	46	233	173·9	- 0·5	- 9·6	-17·4
348·470 G	72	458	37	234	173·5	- 1·1	- 9·5	- 1·3
349·333 C	86	458	44	234	173·4	- 1·3	- 9·6	+10·0
350·226 C	63	399	34	215	173·4	- 1·4	- 9·4	+21·7
351·461 G	56	310	36	198	173·3	- 1·6	- 9·8	+37·9

LEDGER I. - RECURRENT GROUPS OF SUN SPOTS FOR THE YEAR 1938-39.

Date U.T. Place	Projected Area Umbrae	Projected Area Whole Spots	Corrected Area Umbrae	Corrected Area Whole Spots	Longitude and Proper Motion		Latitude	Long. from C.M.
No. 1259: Group 13110 — *continued.*								
d					°	°	°	°
352·222 C	46	265	34	198	173·5	- 1·5	- 9·8	+48·1
353·454 G	35	228	41	264	173·5	- 1·7	-10·0	+64·4
354·243 C	19	102	36	194	173·6	- 1·7	- 9·8	+74·8
Means ..	..	..	41	230	173·6	..	- 9·6	..
Group 13138. Jan.6-17. A stable regular spot.								
5·272 C	23	94	41	166	173·5	- 3·6	-10·1	-74·1
6·296 C	17	138	18	142	173·0	- 4·2	-10·2	-61·1
7·459 G	41	203	29	144	173·2	- 4·2	-10·2	-45·6
8·255 C	54	270	33	165	173·1	- 4·3	-10·5	-35·2
9·246 C	44	245	24	132	173·1	- 4·5	-10·4	-22·2
10·241 C	63	631	32	322	173·2	- 4·5	-10·4	- 9·0
11·246 C	54	276	27	138	173·2	- 4·6	-10·5	+ 4·2
12·433 G	50	244	26	129	173·0	- 4·9	-10·7	+19·7
13·234 C	42	188	24	109	172·9	- 5·1	-10·8	+30·1
14·444 G	32	153	23	109	172·4	- 5·8	-11·1	+45·6
15·408 G	17	95	16	89	172·2	- 6·1	-11·5	+58·0
16·248 C	19	67	26	92	172·3	- 6·1	-11·9	+69·2
Means ..	..	..	26	145	172·9	..	-10·7	..
No. 1260. Latitude -6°·3.								
Group 13076 in Rotation 1139								
" 13099 } " " 1140								
" 13106 }								
" 13131 " " 1141								
Group 13076. Nov.13-19. A large stream developing from a pair of tiny spots on Nov.13. *a* and *b* are the leading and following spots respectively.								
316·370 C	8	34	4	17	234·0	0·0	- 5·0	- 3·9
317·414 G	18	59	9	30	234·9	+ 0·7	- 5·6	+10·8
318·237 C	87	363	48	200	236·3	+ 2·0	- 6·2	+23·1
319·239 C	177	1043	112	666	237·0	+ 2·5	- 6·4	+37·0
320·409 G	190	1164	159	994	237·3	+ 2·7	- 6·4	+52·7
321·462 G	113	698	143	917	236·9	+ 2·1	- 6·4	+66·2
322·453 G	35	214	105	629	237·1	+ 2·1	- 6·3	+79·4
Means ..	..	..	83	493	236·2	..	- 6·0	..
Spot *a*								
317·414 G	18	59	9	30	234·9	0·0	- 5·6	+10·8
318·237 C	57	241	32	135	237·4	+ 2·4	- 6·9	+24·2
319·239 C	93	591	61	390	239·7	+ 4·5	- 7·4	+39·7
320·409 G	83	606	77	564	241·3	+ 5·9	- 7·6	+56·7
321·462 G	39	327	60	504	241·2	+ 5·7	- 7·3	+70·5
322·453 G	13	74	57	325	241·0	..	- 6·7	+83·3

Date U.T. Place	Projected Area Umbrae	Projected Area Whole Spots	Corrected Area Umbrae	Corrected Area Whole Spots	Longitude and Proper Motion		Latitude	Long. from C.M.
No. 1260: Group 13076 — *continued.*								
Spot *b*								
d					°	°	°	°
318·237 C	33	139	18	75	233·9	0·0	- 5·1	+20·7
319·239 C	84	452	51	276	233·4	- 0·7	- 5·1	+33·4
320·409 G	107	558	82	430	233·5	- 0·8	- 5·3	+48·9
321·462 G	70	362	78	402	233·6	- 0·8	- 5·2	+62·9
322·453 G	22	140	48	304	234·1	- 0·5	- 5·3	+76·4
Group 13099. Dec.4-16. A complex spot (probably *a* of Group 13076) breaking up completely after Dec.8. One of the parts continues as a small regular spot after Dec.12. Group 13106 forms behind on Dec.7.								
337·469 G	15	115	35	284	241·4	+ 3·3	- 7·0	-78·4
338·511 G	52	345	56	369	243·9	+ 5·6	- 6·1	-62·1
339·500 G	52	378	40	291	244·1	+ 5·7	- 6·5	-48·9
340·433 G	74	382	47	241	243·8	+ 5·2	- 6·5	-36·9
341·236 C	63	357	35	200	243·9	+ 5·2	- 6·9	-26·2
342·421 G	56	189	29	96	245·1	+ 6·2	- 6·4	- 9·4
343·094 K	46	192	23	96	244·9	+ 5·9	- 6·1	- 0·7
344·528 G	50	228	26	121	245·0	+ 5·8	- 6·2	+18·3
345·461 G	76	422	45	249	245·5	+ 6·1	- 7·1	+31·0
346·449 G	72	447	50	313	245·2	+ 5·7	- 6·8	+43·8
347·221 C	46	238	40	205	245·7	+ 6·1	- 6·8	+54·4
348·470 G	24	89	36	134	245·4	+ 5·6	- 6·8	+70·6
349·333 C	8	50	26	164	244·7	..	- 6·6	+81·3
Means ..	..	..	38	217	244·5	..	- 6·6	..
Group 13106. Dec.7-16. A stream of normal type (marking the position of spot *b* of Group 13076) coming in behind Group 13099. The leader, a regular spot, alone remains by Dec.14.								
340·433 G	4	13	3	10	231·9	- 5·5	- 5·7	-48·8
341·236 C	13	97	8	60	234·4	- 3·2	- 5·3	-35·7
342·421 G	75	434	40	230	235·8	- 1·9	- 4·9	-18·7
343·094 K	80	384	41	196	236·3	- 1·5	- 4·9	- 9·3
344·528 G	69	256	35	129	237·5	- 0·6	- 5·1	+10·8
345·461 G	50	231	28	127	238·1	- 0·1	- 5·5	+23·6
346·449 G	39	167	24	106	239·1	+ 0·7	- 5·7	+37·7
347·221 C	15	123	11	93	240·0	+ 1·5	- 6·0	+48·7
348·470 G	17	74	20	89	240·2	+ 1·5	- 6·3	+65·4
349·333 C	8	38	17	79	239·6	+ 0·8	- 6·4	+76·2
Means ..	..	..	23	112	237·3	..	- 5·6	..
Spot *a*								
341·236 C	4	25	2	15	237·4	0·0	- 4·6	-32·7
342·421 G	33	197	17	102	238·3	+ 0·7	- 5·0	-16·2
343·094 K	52	216	27	110	238·4	+ 0·7	- 5·2	- 7·2
344·528 G	52	187	27	95	239·0	+ 1·1	- 5·2	+12·3
345·461 G	41	192	23	106	239·4	+ 1·3	- 5·6	+24·9
346·449 G	35	152	22	97	239·8	+ 1·6	- 5·6	+38·4
347·221 C	15	123	11	93	240·0	+ 1·6	- 6·0	+48·7
348·470 G	17	74	20	89	240·2	+ 1·6	- 6·3	+65·4
349·333 C	8	38	17	79	239·6	+ 0·9	- 6·4	+76·2

LEDGER I. - RECURRENT GROUPS OF SUN SPOTS FOR THE YEAR 1938-39.

No. 1260: Group 13106 — *continued.*

Spot *b*

Date U.T. Place	Projected Area Umbræ	Projected Area Whole Spots	Corrected Area Umbræ	Corrected Area Whole Spots	Longitude and Proper Motion		Latitude	Long. from C.M.
d					°	°	°	°
341·236 C	12	75	7	48	232·5	0·0	- 5·6	-37·6
342·421 G	35	202	19	109	233·0	+ 0·3	- 4·8	-21·5
343·094 K	28	168	14	86	233·4	+ 0·6	- 4·6	-12·2
344·528 G	17	69	8	34	232·9	- 0·1	- 4·6	+ 6·2
345·461 G	9	39	5	21	232·9	- 0·3	- 4·7	+18·4

Group 13131. Jan.1–6. A small spot.

0·339 C	4	15	6	21	243·1	+ 0·6	- 7·2	-69·5
1·332 C	4	10	4	9	243·5	+ 0·8	- 7·3	-56·0
2·430 G	4	11	3	7	243·9	+ 1·0	- 7·1	-41·2
3·289 C	6	15	3	9	244·2	+ 1·2	- 7·3	-29·6
4·279 C	4	17	2	9	244·7	+ 1·6	- 7·7	-16·0
5·272 C	4	8	2	4	245·1	+ 1·8	- 8·5	- 2·5
Means ..	..	..	3	10	244·1	..	- 7·5	..

No. 1261. Latitude +6°·9.

Group 13080 in Rotation 1139
" 13112 " " 1140

Group 13080. Nov.17–25. An irregular stream of medium-sized spots.

320·409 G	22	65	12	36	160·5	0·0	+ 6·6	-24·1
321·462 G	21	96	11	49	161·3	+ 0·6	+ 6·6	- 9·4
322·453 G	50	232	25	116	162·3	+ 1·5	+ 6·6	+ 4·6
323·111 K	92	415	47	213	161·7	+ 0·8	+ 6·1	+12·1
324·427 G	61	273	35	158	161·2	+ 0·1	+ 6·1	+29·5
325·400 G	63	403	42	270	160·1	- 1·2	+ 6·0	+41·3
326·426 G	50	257	44	225	159·7	- 1·7	+ 6·3	+54·4
327·471 G	37	152	49	205	159·0	- 2·6	+ 6·4	+67·5
328·446 G	11	70	(28	176	157·4	..	+ 7·2)	+78·7
Means ..	..	..	33	159	160·7	..	+ 6·3	..

Group 13112. Dec.11–14. A small group of bi-polar type, the leader being the sole survivor on Dec.14.

344·528 G	13	37	14	41	163·9	- 0·3	+ 8·9	-62·8
345·461 G	23	77	18	58	165·7	+ 1·4	+ 7·0	-48·8
346·449 G	15	30	9	19	166·0	+ 1·5	+ 7·8	-35·4
347·221 C	0	8	0	5	164·4	- 0·2	+ 8·8	-26·9
Means ..	..	..	10	31	165·0	..	+ 8·1	..

No. 1262. Latitude +13°·2.

Group 13086 in Rotation 1139
" 13119 } " " 1140
" 13122 }

Group 13086. Nov.23–Dec.5. An extensive stream, rapid in development and of approximately normal type. There are vigorous changes altering the appearance of the group from day to day. An extensive lateral offshoot from the leader spot, *a*, on Nov.26 nearly closes the gap between the leader and follower, and this link with its train of nuclei continues for several days as a distinctive feature.

d					°	°	°	°
326·426 G	13	83	21	136	33·2	0·0	+15·1	-72·1
327·471 G	104	465	98	435	34·3	+ 1·0	+13·4	-57·2
328·446 G	303	1689	214	1192	35·7	+ 2·4	+13·5	-43·0
329·516 G	520	3157	304	1850	36·7	+ 3·3	+13·4	-27·9
330·415 G	697	3872	374	2090	35·4	+ 2·0	+13·3	-17·3
331·229 C	669	4464	346	2302	35·6	+ 2·1	+14·3	- 6·4
332·228 C	730	4231	379	2206	36·0	+ 2·5	+14·2	+ 7·2
333·523 G	542	3449	306	1947	35·6	+ 2·0	+14·1	+23·8
334·408 G	427	2787	273	1774	36·1	+ 2·5	+13·8	+36·0
335·457 G	273	1807	215	1436	35·0	+ 1·3	+14·3	+48·7
336·457 G	188	1142	202	1274	33·8	+ 0·1	+14·1	+60·7
337·469 G	91	597	173	1147	33·5	- 0·3	+13·9	+73·7
338·511 G	13	95	(57	417	29·5	..	+13·6)	+83·5
Means ..	..	..	242	1482	35·1	..	+14·0	..

Spot *a*

327·471 G	39	216	35	192	36·4	0·0	+13·4	-55·1
328·446 G	190	1066	129	725	37·5	+ 1·0	+13·7	-41·2
329·516 G	244	1365	137	764	39·7	+ 3·2	+13·1	-24·9
330·415 G	275	1230	143	640	41·0	+ 4·4	+14·0	-11·7
331·229 C	278	1840	142	938	40·9	+ 4·3	+14·1	- 1·1
332·228 C	265	1625	140	861	41·4	+ 4·7	+13·8	+12·6
333·523 G	213	1280	126	755	41·5	+ 4·8	+13·4	+29·7
334·408 G	200	1183	136	804	41·3	+ 4·5	+13·7	+41·2
335·457 G	95	720	85	641	41·4	+ 4·6	+13·5	+55·1
336·457 G	54	447	75	617	41·4	+ 4·5	+13·2	+68·3
337·469 G	22	152	69	479	40·4	..	+13·3	+80·6

Group 13119. Dec.19–31. A spot of nearly regular outline, (*a* of Group 13086) but with double umbra, closely preceding Group 13122.

352·222 C	13	52	79	317	40·4	..	+13·5	-85·0
353·454 G	41	193	59	280	40·3	+ 2·5	+13·2	-68·8
354·243 C	46	291	46	291	40·3	+ 2·4	+13·1	-58·5
355·416 C	50	374	36	266	40·1	+ 2·2	+13·1	-43·2
356·259 C	46	355	28	217	40·3	+ 2·3	+13·0	-31·9
357·234 C	75	399	41	219	39·9	+ 1·9	+12·9	-19·5
358·318 C	54	289	28	150	39·8	+ 1·7	+12·8	- 5·3
359·337 C	50	283	26	147	39·7	+ 1·6	+12·7	+ 8·0
360·328 C	48	270	27	151	39·9	+ 1·7	+12·4	+21·3
361·470 G	41	181	26	116	39·6	+ 1·4	+12·7	+36·0
362·234 C	27	159	20	119	39·7	+ 1·4	+12·8	+46·2
363·468 G	15	86	17	97	39·5	+ 1·2	+12·7	+62·3
364·463 G	9	45	19	94	39·1	+ 0·7	+12·8	+75·0
Means ..	..	..	31	179	39·8	..	+12·8	..

LEDGER I. - RECURRENT GROUPS OF SUN SPOTS FOR THE YEAR 1938-39.

No. 1262 — *continued.*

Group 13122. Dec.20-Jan.1. A fairly large stream of spots in which at first the following component dominates. Later a regular spot, *a*, becomes stablized as the leader.

Date U.T. Place	Projected Area Umbrae	Projected Area Whole Spots	Corrected Area Umbrae	Corrected Area Whole Spots	Longitude and Proper Motion	Latitude	Long. from C.M.
d					°	°	°	°
353·454 G	24	184	58	442	31·9	- 2·8	+13·7	-77·2
354·243 C	38	224	51	298	32·0	- 2·7	+13·4	-66·8
355·416 C	72	462	61	397	30·3	- 4·5	+13·2	-53·0
356·259 C	98	667	69	467	30·6	- 4·2	+13·2	-41·6
357·234 C	216	997	129	594	30·0	- 4·9	+13·2	-29·4
358·318 C	143	924	77	496	29·7	- 5·2	+13·3	-15·4
359·337 C	108	855	56	445	29·9	- 5·1	+12·8	- 1·8
360·328 C	131	780	70	417	32·0	- 3·0	+12·4	+13·4
361·470 G	136	725	79	429	31·9	- 3·2	+12·6	+28·3
362·234 C	98	548	66	365	31·5	- 3·6	+12·8	+38·0
363·468 G	52	283	49	267	33·4	- 1·8	+12·4	+56·2
364·463 G	24	138	36	204	33·1	- 2·2	+12·4	+69·0
0·339 C	0	16	0	49	31·4	- 3·9	+12·4	+78·8
Means ..	..	..	62	375	31·4	..	+12·9	..

Spot *a*

358·318 C	37	283	20	150	33·7	0·0	+13·2	-11·4
359·337 C	27	304	14	158	34·2	+ 0·4	+12·5	+ 2·5
360·328 C	62	327	33	177	35·5	+ 1·7	+12·1	+16·9
361·470 G	48	346	29	211	35·8	+ 1·9	+12·2	+32·2
362·234 C	29	199	21	141	36·0	+ 2·1	+12·5	+42·5
363·468 G	30	177	30	177	35·5	+ 1·5	+12·4	+58·3
364·463 G	15	82	25	136	35·5	+ 1·5	+12·3	+71·4
0·339 C	0	8	0	31	34·3	..	+12·7	+81·7

Spot *b*

355·416 C	59	403	51	351	30·0	0·0	+13·3	-53·3
356·259 C	88	598	62	419	29·8	- 0·3	+13·3	-42·4
357·234 C	161	688	97	413	28·7	- 1·4	+13·3	-30·7
358·318 C	106	641	57	346	28·3	- 1·9	+13·3	-16·8
359·337 C	81	551	42	287	28·7	- 1·5	+13·0	- 3·0
360·328 C	52	291	28	154	28·3	- 2·0	+13·4	+ 9·7
361·470 G	71	315	40	180	28·1	- 2·2	+13·4	+24·5
362·234 C	50	245	32	154	28·1	- 2·3	+13·4	+34·6

No. 1263. Latitude -17°·6.

Group 13089 in Rotation 1139
" 13121 " " 1140

Group 13089. Nov.24-Dec.4. Initially a small stream of variable spots. A sudden change takes place between Nov.28 and 30, and a large regular spot, *a*, forms at the head of the stream.

Date U.T. Place	Projected Area Umbrae	Projected Area Whole Spots	Corrected Area Umbrae	Corrected Area Whole Spots	Longitude and Proper Motion	Latitude	Long. from C.M.
d					°	°	°	°
327·471 G	2	7	2	7	31·8	0·0	-16·4	-59·7
328·446 G	9	26	7	19	33·7	+ 2·0	-16·1	-45·0
329·516 G	22	100	14	62	33·3	+ 1·6	-16·9	-31·3
330·415 G	48	166	27	93	33·6	+ 1·9	-16·8	-19·1
331·229 C	69	292	37	157	33·1	+ 1·5	-17·5	- 8·9
332·228 C	134	953	71	505	32·1	+ 0·5	-16·9	+ 3·3
333·523 G	169	890	98	510	34·4	+ 2·9	-17·1	+22·6
334·408 G	161	909	105	589	35·2	+ 3·7	-16·9	+35·1
335·457 G	110	710	92	614	37·7	+ 6·3	-17·2	+51·4
336·457 G	82	473	108	631	39·3	+ 7·9	-17·3	+66·2
337·469 G	30	152	103	521	40·8	..	-17·5	+81·0
Means ..	..	..	56	319	34·4	..	-16·9	..

Spot *a*

333·523 G	108	408	64	241	39·0	0·0	-17·2	+27·2
334·408 G	76	425	52	289	39·7	+ 0·7	-17·0	+39·6
335·457 G	65	521	59	474	40·7	+ 1·8	-17·2	+54·4
336·457 G	65	395	91	553	41·0	+ 2·1	-17·3	+67·9

Group 13121. Dec.20-Jan.1. A stable regular spot (*a* of Group 13089) with a pair of companions south of it until Dec.24.

353·454 G	50	365	76	555	38·7	+ 0·7	-17·3	-70·4
354·243 C	75	439	77	452	38·8	+ 0·8	-17·8	-60·0
355·416 C	136	663	99	484	38·3	+ 0·4	-17·9	-45·0
356·259 C	94	834	59	525	38·2	+ 0·3	-18·1	-34·0
357·234 C	157	809	88	453	38·0	+ 0·1	-18·2	-21·4
358·318 C	131	716	69	379	37·6	- 0·2	-18·4	- 7·5
359·337 C	166	786	86	409	37·6	- 0·2	-18·7	+ 5·9
360·328 C	116	651	64	358	37·4	- 0·3	-18·7	+18·8
361·470 G	104	512	64	317	37·1	- 0·6	-18·8	+33·5
362·234 C	88	472	62	335	36·8	- 0·8	-18·9	+43·3
363·468 G	63	326	64	329	36·9	- 0·7	-19·1	+59·7
364·463 G	41	190	67	312	36·3	- 1·2	-19·3	+72·2
0·339 C	17	71	75	312	36·7	..	-19·3	+84·1
Means ..	..	..	73	409	37·6	..	-18·4	

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ROYAL OBSERVATORY, GREENWICH.

Ledgers of Groups of Sun Spots

For the Year

1938

Ledger II.—Non-Recurrent Groups

LEDGER II - NON-RECURRENT GROUPS OF SUN SPOTS FOR THE YEAR 1938.

The time (U.T.) at which the photograph was taken is expressed in the *first* column by the Day of the Year and decimal of a day, reckoned from Greenwich Mean Midnight.

The place where the photograph was taken is also indicated in the *first* column. A photograph taken at Greenwich is indicated by the letter G, and those taken at the Cape and Kodaikanal by the letters C and K, respectively.

The projected Area of the Umbræ and Whole Spots, given in the *second* and *third* columns, is the area as it is measured on the photograph uncorrected for the effect of foreshortening, and expressed in millionths of the Sun's apparent disk.

The area corrected for foreshortening given in the *fourth* and *fifth* columns is expressed in millionths of the Sun's visible hemisphere.

The longitude given in the *sixth* column is based on the ephemeris given in the *Nautical Almanac,* assuming a daily sidereal motion of $14^{\circ}\cdot18$, due to the Sun's rotation, constant at all latitudes; this corresponds to Carrington's assumed rotation period of 25·38 days.

The proper motion given in the *seventh* column is derived from the difference of longitude thus computed from the measured positions on any given day and the first day on which the group of spots or single spot is visible, after the correction for the motion appropriate to the latitude has been applied according to the formula, $\zeta = 14^{\circ}\cdot37 - 2^{\circ}\cdot60 \sin^2 \phi$. A *plus* sign indicates a motion forwards, a *minus* sign a motion backwards relative to the position on the first day.

The remaining columns correspond to those with similar headings in the preceding Section.

When a group is 80° or more from the Sun's central meridian, the measures for that day are not included in taking the mean area, longitude, and latitude of the group. In such cases of close proximity to the Sun's limb, the addition of brackets denotes that only part of the group is visible.

LEDGER II. - NON-RECURRENT GROUPS OF SUN SPOTS FOR THE YEAR.

Group 12663.

Jan.2–13. One or two small spots on Jan.2–3, developing (not entirely on normal lines) into a very long stream of medium-sized spots. *a* is counted as the leader, although on Jan. 5–6 small spots before and after it are included in its measurement. *a* receives an increase of area by accretion on Jan.10 –11.

Date U.T. Place	Projected Area Umbra	Projected Area Whole Spots	Corrected Area Umbra	Corrected Area Whole Spots	Longitude and Proper Motion		Latitude	Long. from C.M.
d					°	°	°	°
1·353 C	4	10	5	12	12·9	0·0	+12·6	-63·9
2·292 C	21	148	17	123	13·8	+ 0·8	+13·8	-50·6
3·321 C	46	337	30	219	14·8	+ 1·8	+13·2	-36·1
4·305 C	83	614	47	349	14·7	+ 1·6	+12·7	-23·2
5·289 C	123	618	65	327	15·1	+ 2·0	+12·9	- 9·9
6·297 C	155	699	81	367	15·6	+ 2·4	+12·9	+ 3·9
7·433 G	197	1244	109	689	14·7	+ 1·4	+12·9	+18·0
8·522 G	208	1197	133	758	15·1	+ 1·8	+12·8	+32·7
9·404 G	154	799	119	609	15·6	+ 2·2	+12·7	+44·8
10·406 G	84	540	90	570	16·6	+ 3·1	+12·3	+59·0
11·360 K	42	226	82	453	16·6	+ 3·1	+11·8	+71·6
12·112 K	6	34	(11	64	8·3	..	+11·7)	+73·2
Means ..	..	..	71	407	15·0	..	+12·8	..

Spot *a*

4·305 C	52	447	29	250	16·5	0·0	+12·5	-21·4
5·289 C	71	355	37	185	18·3	+ 1·7	+12·5	- 6·7
6·297 C	59	332	31	176	19·8	+ 3·2	+12·4	+ 8·1
7·433 G	52	320	30	186	21·7	+ 5·0	+12·4	+25·0
8·522 G	52	268	36	185	22·8	+ 6·0	+12·2	+40·4
9·404 G	39	246	33	209	22·7	+ 5·9	+11·7	+51·9
10·406 G	39	231	48	284	22·0	+ 5·1	+11·7	+64·4
11·360 K	22	128	57	332	22·7	+ 5·8	+11·3	+77·7

Group 12666.

Jan.5–17. A large group of stream type with comparatively slow rise to maximum development. *a* and *b* the leader and follower respectively, are not established until Jan.12.

4·305 C	4	8	10	21	320·9	0·0	+18·7	-77·0
5·289 C	10	96	13	122	321·1	+ 0·3	+19·2	-63·9
6·297 C	21	143	21	143	318·5	- 2·2	+19·4	-53·2
7·433 G	69	302	50	217	316·8	- 3·8	+20·2	-39·9
8·522 G	86	462	52	282	316·8	- 3·7	+19·6	-25·6
9·404 G	104	594	58	333	316·9	- 3·5	+19·8	-13·9
10·406 G	190	1017	104	558	315·9	- 4·4	+19·8	- 1·7
11·360 K	262	1704	146	947	315·6	- 4·6	+19·9	+10·6
12·112 K	336	1908	198	1125	315·4	- 4·7	+20·2	+20·3
13·283 C	234	1743	157	1183	315·6	- 4·4	+19·8	+35·9
14·427 G	182	1704	160	1526	315·7	- 4·1	+19·9	+51·1
15·376 C	146	1112	191	1485	316·5	- 3·2	+20·1	+64·4
16·442 G	86	497	259	1564	316·8	- 2·8	+19·9	+78·7
Means ..	..	..	109	731	317·1	..	+19·7	..

Group 12666 —*continued.*

Spot *a*

d					°	°	°	°
11·360 K	126	816	71	457	318·4	0·0	+19·6	+13·4
12·112 K	160	914	96	548	318·2	- 0·1	+19·7	+23·1
13·283 C	100	991	70	694	318·0	- 0·2	+19·6	+38·3
14·427 C	91	1039	86	987	318·6	+ 0·5	+19·4	+54·0
15·376 C	75	665	111	984	319·2	+ 1·2	+19·7	+67·1
16·442 G	24	160	128	851	320·7	..	+19·4	+82·6

Spot *b*

11·360 K	126	820	69	451	312·5	0·0	+20·0	+ 7·5
12·112 K	172	982	100	570	312·4	0·0	+20·7	+17·3
13·283 C	134	752	87	489	311·4	- 0·9	+20·6	+31·7
14·427 G	91	665	74	539	311·1	- 1·1	+20·5	+46·5
15·376 C	71	447	80	501	311·3	- 0·8	+20·8	+59·2
16·442 G	39	199	82	416	311·7	- 0·3	+19·4	+73·6

Group 12667.

Jan.6–15. A pair of spots with an occasional companion remaining much the same from day to day. Revival of 12635.

5·289 C	13	77	14	82	324·1	0·0	+ 8·3	-60·9
6·297 C	33	144	25	111	323·3	- 0·9	+ 8·3	-48·4
7·433 G	43	134	26	80	324·6	+ 0·2	+ 8·3	-32·1
8·522 G	39	119	21	64	325·2	+ 0·7	+ 8·0	-17·2
9·404 G	30	73	15	37	325·6	+ 0·9	+ 8·0	- 5·2
10·406 G	35	117	18	61	326·0	+ 1·2	+ 8·0	+ 8·4
11·360 K	18	98	10	54	326·7	+ 1·8	+ 8·2	+21·7
12·112 K	20	58	12	35	326·7	+ 1·7	+ 8·0	+31·6
13·283 C	33	109	25	82	326·2	+ 1·0	+ 9·0	+46·5
14·427 C	13	52	15	58	326·8	+ 1·4	+ 8·4	+62·2
Means ..	..	..	18	66	325·5	..	+ 8·2	..

Group 12668

Jan.6–13. A few small spots individually unstable but continuing to mark a small disturbed area.

5·289 C	2	8	3	11	316·2	0·0	-14·2	-68·8
6·297 C	2	17	2	15	316·8	+ 0·6	-14·5	-54·9
7·433 G	4	13	3	8	317·9	+ 1·6	-15·0	-38·8
8·522 G	4	22	2	12	318·1	+ 1·8	-13·4	-24·3
9·404 G	35	134	18	70	316·6	+ 0·2	-13·5	-14·2
10·406 G	11	30	6	15	316·3	- 0·1	-13·8	- 1·3
11·360 K	20	90	10	47	316·6	+ 0·2	-13·9	+11·6
12·112 K	12	50	6	27	314·7	- 1·8	-14·1	+19·6
Means ..	..	..	6	26	316·6	..	-14·0	..

LEDGER II. - NON-RECURRENT GROUPS OF SUN SPOTS FOR THE YEAR.

Group 12669

Jan.7–12. A small definite spot preceding group 12666.

Date U.T. Place	Projected Area: Umbræ	Projected Area: Whole Spots	Corrected Area: Umbræ	Corrected Area: Whole Spots	Longitude and Proper Motion		Latitude	Long. from C.M.
d					°	°	°	°
6·297 C	8	69	6	56	324·4	0·0	+19·4	-47·3
7·433 G	9	28	6	18	324·3	0·0	+19·5	-32·4
8·522 G	4	11	2	6	324·5	+ 0·3	+19·0	-17·9
9·404 G	4	15	2	8	324·2	0·0	+17·7	- 6·6
10·406 G	6	17	3	9	327·1	+ 3·0	+18·0	+ 9·5
11·360 K	2	8	1	5	327·0	+ 3·0	+17·4	+22·0
Means ..	..	..	3	17	325·2	..	+18·5	..

Group 12671

Jan.9–15. A stream of small unstable spots.

8·522 G	17	60	13	47	292·4	0·0	-14·5	-50·0
9·404 G	13	43	8	28	292·9	+ 0·5	-14·8	-37·9
10·406 G	9	26	5	15	292·6	+ 0·2	-14·7	-25·0
11·360 K	6	26	3	14	290·8	- 1·6	-16·0	-14·2
12·112 K	22	118	11	60	292·5	+ 0·1	-15·7	- 2·6
13·283 C	17	75	9	39	292·5	+ 0·1	-15·3	+12·8
14·427 G	4	17	2	10	292·0	- 0·5	-16·0	+27·4
Means ..	..	..	7	30	292·2	..	-15·3	.

Group 12674

Jan.14–19. A diminishing regular spot with a double nucleus.

13·283 C	21	79	34	126	210·2	0·0	+13·5	-69·5
14·427 G	24	134	22	125	209·5	- 0·8	+13·6	-55·1
15·376 C	33	178	23	126	209·9	- 0·4	+13·2	-42·2
16·442 G	22	134	13	79	210·7	+ 0·3	+13·4	-27·4
17·282 C	21	96	12	53	211·0	+ 0·6	+13·2	-16·1
18·453 G	6	22	3	12	211·2	+ 0·7	+13·2	- 0·4
Means ..	..	..	18	87	210·4	..	+13·4	..

Group 12679

Jan.19–27. A typical stream of normal type; there is less than the normal separation in longitude between the leader and follower spots.

18·453 G	11	63	6	37	180·8	0·0	- 9·9	-30·8
19·415 G	30	145	16	75	182·2	+ 1·3	- 9·5	-16·8
20·307 C	54	213	27	106	182·5	+ 1·5	- 9·7	- 4·7
21·391 G	130	527	66	269	183·2	+ 2·1	-10·0	+10·3
22·436 G	71	367	39	202	184·0	+ 2·8	- 9·8	+24·8
23·280 C	46	294	29	180	183·3	+ 2·0	-10·4	+35·2
24·283 C	29	122	22	92	183·3	+ 1·9	-10·4	+48·4
25·422 G	15	78	17	90	184·8	+ 3·2	-10·8	+64·9
26·457 G	4	11	10	28	185·7	+ 4·0	-11·0	+79·4
Means ..	..	..	26	120	183·3	..	-10·2	..

Group 12679 — *continued*

Spot *a*

Date U.T. Place	Projected Area: Umbræ	Projected Area: Whole Spots	Corrected Area: Umbræ	Corrected Area: Whole Spots	Longitude and Proper Motion		Latitude	Long. from C.M.
d					°	°	°	°
19·415 G	13	80	7	42	183·8	0·0	- 9·9	-15·2
20·307 C	21	98	10	49	184·5	+ 0·6	-10·0	- 2·7
21·391 G	65	269	33	137	185·6	+ 1·6	- 9·8	+12·7
22·436 G	41	224	23	125	186·2	+ 2·1	- 9·8	+27·0
23·280 C	33	167	21	105	185·6	+ 1·4	-10·5	+37·5
24·283 C	21	84	16	65	184·8	+ 0·5	-10·5	+49·9
25·422 G	11	69	13	81	185·2	+ 0·7	-11·0	+65·3
26·457 G	4	11	10	28	185·7	+ 1·1	-11·0	+79·4

Group 12684.

Jan.22–28. Small ephemeral spots in a stream which lengthens rapidly.

21·391 G	13	65	7	35	157·7	0·0	+11·6	-15·2
22·436 G	41	145	22	77	157·5	- 0·3	+12·4	- 1·7
23·280 C	21	86	11	46	157·4	- 0·5	+12·7	+ 9·3
24·283 C	18	117	11	66	159·3	+ 1·4	+11·8	+24·4
25·422 G	17	81	13	58	161·9	+ 3·9	+11·5	+42·0
26·457 G	13	56	13	58	165·0	+ 6·9	+11·4	+58·7
27·131 K	4	16	6	23	164·9	+ 6·7	+11·2	+67·5
Means ..	..	..	12	52	160·5	..	+11·8	..

Group 12696.

Jan.29–Feb.7. A small group which has disappeared by Feb.3; a small spot reappears on Feb.7.

28·402 G	20	78	28	108	11·5	0·0	- 5·6	-69·1
29·384 C	11	76	10	66	12·4	+ 0·7	- 5·5	-55·3
30·278 C	13	44	9	29	14·2	+ 2·4	- 5·3	-41·7
31·393 G	17	99	9	57	12·7	+ 0·7	- 5·2	-28·6
32·288 C	21	113	11	59	11·7	- 0·5	- 5·3	-17·8
33·468 G	0	0	0	0	..	..	..	..
34·479 G	0	0	0	0	..	..	..	..
35·438 G	0	0	0	0	..	..	..	..
36·334 C	0	0	0	0	..	..	..	..
37·457 G	2	7	2	5	10·4	- 2·6	- 4·9	+49·0
Means ..	..	..	7	32	12·2	..	- 5·3	..

Group 12697

Jan.31–Feb.11. A regular spot preceded by small companions increasing to a small stream about Feb.4. The regular spot partly breaks up on Feb.7–8, but continues to the west limb.

30·278 C	17	120	24	172	345·7	0·0	-11·2	-70·2
31·393 G	44	254	38	225	345·3	- 0·5	-11·4	-56·0
32·288 C	71	351	50	245	344·8	- 1·1	-11·3	-44·7
33·468 G	134	668	76	379	345·7	- 0·3	-11·2	-28·2
34·479 G	115	638	59	331	346·1	0·0	-11·2	-14·5

LEDGER II. - NON-RECURRENT GROUPS OF SUN SPOTS FOR THE YEAR.

Date U.T. Place	Projected Area Umbrae	Projected Area Whole Spots	Corrected Area Umbrae	Corrected Area Whole Spots	Longitude and Proper Motion		Latitude	Long. from C.M.
Group 12697 —*continued*								
d					°	°	°	°
35·438 G	119	551	59	276	345·7	− 0·5	−11·1	− 2·3
36·334 C	130	542	66	277	345·7	− 0·6	−11·3	+ 9·5
37·457 G	143	775	79	429	345·9	− 0·5	−11·1	+24·5
38·315 C	128	777	80	479	346·1	− 0·4	−10·7	+36·0
39·382 G	76	398	61	314	347·3	+ 0·7	−10·1	+51·2
40·623 G	40	201	54	278	348·7	+ 2·0	− 9·3	+69·0
41·391 G	13	78	27	163	346·6	− 0·2	− 9·6	+77·0
Means ..	..	..	56	297	346·1	..	−10·8	..
Spot *b*								
30·278 C	13	95	19	140	345·0	0·0	−11·2	−70·9
31·393 G	35	230	31	205	344·8	− 0·3	−11·4	−56·5
32·288 C	67	334	47	234	344·8	− 0·4	−11·3	−44·7
33·468 G	95	503	54	287	345·0	− 0·3	−11·2	−28·9
34·479 G	87	482	45	251	345·0	− 0·4	−11·2	−15·6
35·438 G	78	347	39	174	345·2	− 0·3	−10·6	− 2·8
36·334 C	92	361	47	184	345·4	− 0·2	−10·7	+ 9·2
37·457 G	104	549	57	302	345·5	− 0·2	−10·5	+24·1
38·315 C	88	609	54	371	345·3	− 0·5	−10·3	+35·2
39·382 G	52	320	40	246	346·2	+ 0·3	−10·1	+50·1
40·623 G	31	140	38	172	346·5	+ 0·5	− 9·4	+66·8
41·391 G	13	78	27	163	346·6	+ 0·5	− 9·6	+77·0
Group 12699.								
Feb.2–12. A small regular spot gradually dying out; there is an occasional small companion.								
32·288 C	4	21	10	50	310·3	0·0	−16·7	−79·2
33·468 G	9	39	10	44	309·7	− 0·6	−16·7	−64·2
34·479 G	13	52	11	41	309·7	− 0·5	−17·1	−50·9
35·438 G	22	69	14	44	309·5	− 0·7	−16·7	−38·5
36·334 C	27	92	15	53	309·2	− 1·0	−16·9	−27·0
37·457 G	24	89	12	47	308·8	− 1·4	−16·9	−12·6
38·315 C	17	71	9	36	309·1	− 1·0	−16·6	− 1·0
39·382 G	13	37	7	19	309·2	− 0·9	−16·5	+13·1
40·623 G	9	26	5	15	309·6	− 0·5	−16·7	+29·9
41·391 G	2	22	1	15	309·6	− 0·5	−16·7	+40·0
42·398 G	2	9	2	7	309·7	− 0·3	−16·6	+53·3
Means ..	..	..	9	34	309·5	..	−16·7	..
Group 12700.								
Feb.3–12. A regular spot disappearing rather suddenly. Group 12703 develops closely south following.								
33·468 G	9	52	32	188	290·0	..	−21·0	−83·9
34·479 G	26	89	38	130	289·7	0·0	−21·1	−70·9
35·438 G	28	139	27	132	289·4	− 0·2	−20·8	−58·6
36·334 C	32	181	24	134	289·4	0·0	−20·5	−46·8
37·457 G	48	239	29	143	289·3	0·0	−20·7	−32·1
38·315 C	27	227	15	125	289·2	0·0	−20·3	−20·9
39·382 G	50	246	26	128	289·3	+ 0·3	−20·7	− 6·8
40·623 G	26	153	14	80	289·2	+ 0·3	−20·8	+ 9·5
Group 12700 —*continued*								
d					°	°	°	°
41·391 G	24	146	13	80	289·2	+ 0·4	−20·9	+19·6
42·398 G	13	59	8	36	289·7	+ 1·1	−20·9	+33·3
Means ..	..	..	22	110	289·4	..	−20·7	..
Group 12708.								
Feb.9–19. One or two small spots becoming a small stream from Feb.14–16.								
39·382 G	2	9	4	20	218·7	0·0	− 5·7	−77·4
40·623 G	13	94	12	85	223·3	+ 4·4	− 5·0	−56·4
41·391 G	13	59	9	41	224·8	+ 5·8	− 5·2	−44·8
42·398 G	9	70	5	41	225·9	+ 6·7	− 5·8	−30·5
43·435 G	4	26	2	14	225·2	+ 5·8	− 5·8	−17·5
44·445 G	13	61	7	31	223·8	+ 4·2	− 5·1	− 5·6
45·334 C	23	87	12	44	223·7	+ 4·0	− 5·0	+ 6·0
46·373 C	38	232	20	123	224·5	+ 4·6	− 4·8	+20·5
47·301 C	21	101	13	62	227·0	+ 7·0	− 5·3	+35·2
48·412 G	9	35	7	28	228·4	+ 8·2	− 5·3	+51·2
49·394 C	4	11	5	13	228·5	+ 8·1	− 5·5	+64·3
Means ..	..	..	9	46	224·9	..	− 5·3	..
Group 12710.								
Feb.10–22. A stream in which both components – leader and follower – are double on Feb.12 and 13.								
40·623 G	6	22	16	56	200·5	0·0	−11·0	−79·2
41·391 G	22	101	29	135	201·6	+ 1·0	−10·8	−68·0
42·398 G	48	214	40	180	202·4	+ 1·7	−10·8	−54·0
43·435 G	98	549	63	356	203·0	+ 2·2	−11·0	−39·7
44·445 G	118	531	66	298	204·6	+ 3·7	−11·0	−24·8
45·334 C	100	464	52	240	205·3	+ 4·3	−10·8	−12·4
46·373 C	84	375	42	187	204·9	+ 3·8	−10·4	+ 0·9
47·301 C	63	394	32	203	206·1	+ 4·9	−10·4	+14·3
48·412 G	76	375	44	216	206·4	+ 5·1	−10·4	+29·2
49·394 C	44	226	31	155	207·0	+ 5·6	−10·6	+42·8
50·438 G	43	225	36	191	204·7	+ 3·2	−11·1	+54·2
51·402 C	12	127	15	171	206·3	+ 4·7	−11·2	+68·5
52·301 C	4	21	(6	34	198·8	..	−11·0)	+72·8
Means ..	..	..	39	199	204·4	..	−10·8	..
Spot *a*								
40·623 G	2	9	4	17	203·9	0·0	−10·8	−75·8
41·391 G	13	44	15	49	205·5	+ 1·5	−10·9	−64·1
42·398 G	33	118	26	93	205·2	+ 1·1	−10·7	−51·2
43·435 G	57	296	35	184	206·2	+ 2·0	−10·9	−36·5
44·445 G	74	340	40	184	207·1	+ 2·8	−11·0	−22·3
45·334 C	68	329	35	168	207·8	+ 3·4	−10·7	− 9·9
46·373 C	59	253	30	126	208·4	+ 3·9	−10·4	+ 4·4
47·301 C	42	314	22	163	208·9	+ 4·3	−10·1	+17·1
48·412 G	59	270	35	159	209·6	+ 4·9	−10·0	+32·4
49·394 C	36	173	26	123	209·8	+ 5·0	−10·3	+45·6

continued

LEDGER II. - NON-RECURRENT GROUPS OF SUN SPOTS FOR THE YEAR.

Group 12710 —*continued*

Spot *a* —*continued*

Date U.T. Place	Projected Area Umbræ	Projected Area Whole Spots	Corrected Area Umbræ	Corrected Area Whole Spots	Longitude and Proper Motion		Latitude	Long. from C.M.
d					°	°	°	°
50·438 G	17	94	16	90	209·9	+ 5·0	−10·4	+59·4
51·402 C	4	68	6	107	210·3	+ 5·3	−11·0	+72·5

Spot *b*

40·623 G	4	13	12	39	198·1	..	−11·0	−81·6
41·391 G	9	57	14	86	198·0	0·0	−10·8	−71·6
42·398 G	15	96	14	87	198·9	+ 0·8	−11·2	−57·5
43·435 G	41	253	28	172	199·5	+ 1·3	−11·0	−43·2
44·445 G	44	196	26	114	199·5	+ 1·2	−11·2	−29·9
45·334 C	32	135	17	72	199·7	+ 1·3	−10·8	−18·0
46·373 C	25	122	12	61	199·0	+ 0·5	−10·7	− 5·0
47·301 C	21	80	10	40	198·6	0·0	−11·1	+ 6·8
48·412 G	17	105	9	57	199·5	+ 0·8	−11·1	+22·3
49·394 C	8	53	5	32	198·8	0·0	−11·2	+34·6
50·438 G	26	131	20	101	200·7	+ 1·8	−11·5	+50·2
51·402 C	8	59	9	64	201·0	+ 2·0	−11·5	+63·2
52·301 C	4	21	6	34	198·8	− 0·3	−11·0	+72·8

Group 12711.

Feb.11–19. A wide pair of spots of which the follower is represented by a cluster on Feb.18.

41·391 G	4	11	7	19	195·1	0·0	−28·4	−74·5
42·398 G	21	105	23	115	193·9	− 0·8	−29·1	−62·5
43·435 G	31	153	25	124	193·2	− 1·0	−29·5	−49·5
44·445 G	21	116	14	76	194·0	+ 0·2	−29·6	−35·4
45·334 C	21	106	12	63	194·7	+ 1·3	−29·6	−23·0
46·373 C	15	93	8	51	193·6	+ 0·7	−29·4	−10·4
47·301 C	13	44	7	24	193·0	+ 0·5	−29·8	+ 1·2
48·412 G	9	33	5	18	190·2	− 1·8	−29·9	+13·0
49·394 C	4	17	2	10	185·9	− 5·7	−29·9	+21·7
Means ..	..	..	11	56	192·6	..	−29·5	..

Group 12712.

Feb.11–23. A typical example of a bipolar group; the following component has died out by Feb.21.

41·391 G	17	61	(34	123	193·2	..	− 8·3)	−76·4
42·398 G	48	240	54	274	191·6	0·0	− 8·2	−64·8
43·435 G	74	453	57	362	191·3	− 0·4	− 8·3	−51·4
44·445 G	104	563	65	353	191·7	− 0·2	− 8·3	−37·7
45·334 C	103	582	56	320	192·0	0·0	− 8·3	−25·7
46·373 C	112	591	57	303	192·6	+ 0·5	− 8·0	−11·4
47·301 C	85	451	42	226	192·8	+ 0·5	− 8·2	+ 1·0
48·412 G	74	384	39	199	193·7	+ 1·3	− 8·2	+16·5
49·394 C	62	303	36	175	194·1	+ 1·5	− 8·3	+29·9
50·438 G	43	253	30	175	194·8	+ 2·1	− 8·2	+44·3
51·402 C	21	154	20	143	195·7	+ 2·9	− 8·6	+57·9
52·301 C	21	118	29	160	195·2	+ 2·2	− 8·3	+69·2
53·384 G	9	35	43	168	196·7	..	− 8·0	+85·0
Means ..	..	..	44	244	193·2	..	− 8·3	..

Group 12712 —*continued*

Spot *a*

Date U.T. Place	Projected Area Umbræ	Projected Area Whole Spots	Corrected Area Umbræ	Corrected Area Whole Spots	Longitude and Proper Motion		Latitude	Long. from C.M.
d					°	°	°	°
41·391 G	17	61	34	123	193·2	0·0	− 8·3	−76·4
42·398 G	39	170	43	185	193·0	− 0·3	− 8·1	−63·4
43·435 G	57	257	43	195	193·7	+ 0·2	− 8·3	−49·0
44·445 G	78	358	48	218	193·8	+ 0·2	− 8·5	−35·6
45·334 C	80	386	43	208	194·2	+ 0·5	− 8·7	−23·5
46·373 C	93	418	47	213	194·2	+ 0·3	− 8·5	− 9·8
47·301 C	72	291	36	146	194·4	+ 0·4	− 8·6	+ 2·6
48·412 G	57	288	30	150	195·0	+ 0·8	− 8·7	+17·8
49·394 C	51	257	30	149	195·1	+ 0·8	− 8·5	+30·9
50·438 G	39	222	27	155	195·2	+ 0·8	− 8·3	+44·7
51·402 C	21	154	20	143	195·7	+ 1·1	− 8·6	+57·9
52·301 C	21	118	29	160	195·2	+ 0·5	− 8·3	+69·2
53·384 G	9	35	43	168	196·7	..	− 8·0	+85·0

Spot *b*

42·398 G	9	70	11	89	188·9	0·0	− 8·1	−67·5
43·435 G	17	196	14	167	188·3	− 0·7	− 8·2	−54·4
44·445 G	26	205	17	135	188·8	− 0·4	− 7·9	−40·6
45·334 C	23	196	13	112	189·0	− 0·3	− 7·8	−28·7
46·373 C	19	173	10	90	189·5	+ 0·1	− 7·1	−14·5
47·301 C	13	160	6	80	189·8	+ 0·2	− 7·1	− 2·0
48·412 G	17	96	9	49	190·5	+ 0·8	− 7·0	+13·3
49·394 C	11	46	6	26	191·0	+ 1·1	− 6·9	+26·8
50·438 G	4	31	3	20	190·6	+ 0·6	− 7·8	+40·1

Group 12714.

Feb.12–22. A spot almost in contact with the following component of Group 12712. This spot becomes temporarily a short stream.

42·398 G	13	83	18	114	187·0	0·0	− 9·8	−69·4
43·435 G	26	177	22	152	187·5	+ 0·4	− 9·8	−55·2
44·445 G	26	192	17	129	187·8	+ 0·6	− 9·7	−41·6
45·334 C	27	139	15	79	188·4	+ 1·1	− 9·4	−29·3
46·373 C	38	165	20	86	189·1	+ 1·7	− 9·4	−14·9
47·301 C	25	156	12	78	188·9	+ 1·4	−10·0	− 2·9
48·412 G	22	113	11	58	190·4	+ 2·8	−10·8	+13·2
49·394 C	17	99	10	55	190·4	+ 2·7	−11·3	+26·2
50·438 G	11	48	7	31	190·7	+ 2·9	−11·2	+40·2
51·402 C	4	21	3	17	190·8	+ 2·8	−11·6	+53·0
52·301 C	4	8	5	9	190·8	+ 2·8	−11·7	+64·8
Means ..	..	..	13	73	189·2	..	−10·4	..

Group 12715.

Feb.12–22. A vigorous stream of spots that individually are not distinctive.

42·398 G	9	33	15	54	185·7	0·0	+ 9·6	−70·7
43·435 G	4	26	4	24	187·3	+ 1·4	+ 9·1	−55·4
44·445 G	28	83	20	59	186·8	+ 0·8	+ 7·5	−42·6
45·334 C	59	270	35	159	188·6	+ 2·5	+ 6·5	−29·1

LEDGER II. - NON-RECURRENT GROUPS OF SUN SPOTS FOR THE YEAR.

Group 12715 —*continued*

Date U.T. Place	Projected Area Umbrae	Projected Area Whole Spots	Corrected Area Umbrae	Corrected Area Whole Spots	Longitude and Proper Motion		Latitude	Long. from C.M.
d					°	°	°	°
46·373 C	76	578	40	306	188·7	+ 2·4	+ 6·0	-15·3
47·301 C	132	635	68	327	188·2	+ 1·8	+ 6·6	- 3·6
48·412 G	87	406	46	212	188·0	+ 1·4	+ 7·2	+10·8
49·394 C	49	280	28	160	188·8	+ 2·1	+ 7·3	+24·6
50·438 G	31	150	21	101	190·1	+ 3·2	+ 7·2	+39·6
51·402 C	13	68	12	65	195·0	+ 8·0	+ 6·2	+57·2
52·301 C	12	63	18	96	195·7	+ 8·5	+ 5·7	+69·7
Means ..	..	..	28	142	189·4	..	+ 7·2	..

Group 12716.

Feb.12–23. A bi-polar group. While the following member breaks up into a cluster, the leader becomes larger for a few days.

42·398 G	4	35	8	68	180·4	0·0	-13·2	-76·0
43·435 G	57	274	62	288	180·8	+ 0·3	-13·7	-61·9
44·445 G	91	563	69	424	181·0	+ 0·5	-13·6	-48·4
45·334 C	101	524	63	327	181·4	+ 0·8	-13·4	-36·3
46·373 C	139	743	76	405	181·2	+ 0·6	-12·7	-22·8
47·301 C	111	840	57	430	181·5	+ 0·8	-12·9	-10·3
48·412 G	114	902	56	450	181·8	+ 1·1	-12·9	+ 4·6
49·394 C	118	623	62	330	181·9	+ 1·1	-13·0	+17·7
50·438 G	74	464	44	274	182·1	+ 1·2	-13·1	+31·6
51·402 C	21	241	15	169	182·4	+ 1·5	-13·1	+44·6
52·301 C	23	135	20	119	182·0	+ 1·0	-13·1	+56·0
53·384 G	11	44	16	64	182·5	+ 1·5	-12·8	+70·8
Means ..	..	..	46	279	181·6	..	-13·1	..

Group 12720.

Feb.16–23. A small stream.

46·373 C	4	34	4	36	141·8	0·0	- 8·2	-62·2
47·301 C	13	51	10	38	144·0	+ 2·1	- 8·6	-47·8
48·412 G	22	122	13	74	142·1	0·0	- 8·7	-35·1
49·394 C	27	97	14	52	140·9	- 1·3	- 8·5	-23·3
50·438 G	35	126	18	64	139·6	- 2·8	- 8·2	-10·9
51·402 C	8	55	4	28	143·1	+ 0·6	- 7·6	+ 5·3
52·301 C	4	11	2	6	143·2	+ 0·6	- 9·9	+17·2
53·384 G	4	35	2	20	141·3	- 1·5	- 6·4	+29·6
Means ..	..	..	8	40	142·0	..	- 8·3	..

Group 12721.

Feb.18–Mar.2. A regular spot with small companions on Feb. 22–24. A sudden decrease in area occurs between Feb.27 and March 1.

48·412 G	20	131	35	231	102·4	0·0	-16·7	-74·8
49·394 C	38	245	40	255	102·0	- 0·4	-16·6	-62·2

Group 12721 —*continued*

Date U.T. Place	Projected Area Umbrae	Projected Area Whole Spots	Corrected Area Umbrae	Corrected Area Whole Spots	Longitude and Proper Motion		Latitude	Long. from C.M.
d					°	°	°	°
50·438 G	48	320	36	243	101·7	- 0·6	-16·9	-48·8
51·402 C	80	477	50	301	101·2	- 1·1	-17·2	-36·6
52·301 C	93	591	52	331	101·0	- 1·2	-17·0	-25·0
53·384 G	96	556	50	289	100·8	- 1·4	-17·4	-10·9
54·389 G	92	491	47	250	100·6	- 1·5	-17·6	+ 2·1
55·465 G	83	451	44	239	100·5	- 1·6	-17·8	+16·2
56·426 G	61	359	35	208	100·4	- 1·7	-18·0	+28·8
57·384 G	59	298	40	200	100·7	- 1·3	-17·8	+41·7
58·401 C	21	142	18	122	100·4	- 1·6	-18·1	+54·8
59·378 G	9	57	12	73	100·7	- 1·2	-17·8	+68·0
60·433 G	2	9	6	25	100·3	..	-17·8	+81·5
Means ..	..	..	38	228	101·0	..	-17·4	..

Group 12722.

Feb.21–Mar.2. A regular spot with a follower on Feb.21–23, breaking up on Feb.22–23 and dying out by Feb.26. Three days later a few tiny ephemeral spots appear in the same area.

51·402 C	6	23	13	52	61·8	0·0	+ 5·5	-76·0
52·301 C	21	84	23	91	64·4	+ 2·4	+ 4·8	-61·6
53·384 G	37	99	28	75	65·0	+ 2·9	+ 4·8	-46·7
54·389 G	26	70	16	42	66·7	+ 4·4	+ 4·8	-31·8
55·465 G	26	140	14	76	66·4	+ 3·9	+ 5·0	-17·9
56·426 G	0	0	0	0	..	..	..	..
57·384 G	0	0	0	0	..	..	..	..
58·401 C	0	0	0	0	..	..	..	..
59·378 G	8	53	4	32	65·4	+ 2·3	+ 6·2	+32·7
60·433 G	2	13	1	10	63·8	+ 0·5	+ 7·5	+45·0
Means ..	..	..	10	38	64·8	..	+ 5·5	..

Group 12724.

Feb.22–27. A stream of normal type developing near the west limb.

52·301 C	11	53	6	29	138·6	0·0	-26·3	+12·6
53·384 G	7	31	4	19	139·6	+ 1·4	-27·2	+27·9
54·389 G	59	226	42	162	142·0	+ 4·1	-26·0	+43·5
55·465 G	59	399	57	381	141·9	+ 4·3	-26·0	+57·6
56·426 G	57	284	83	391	140·8	+ 3·5	-26·6	+69·2
57·384 G	8	99	28	304	140·7	..	-26·2	+81·7
Means ..	..	..	38	196	140·6	..	-26·4	..

Spot a

52·301 C	6	19	3	10	142·2	0·0	-25·6	+16·2
53·384 G	4	9	2	5	142·4	+ 0·6	-26·0	+30·7
54·389 G	37	147	27	107	143·5	+ 2·0	-25·4	+45·0
55·465 G	31	215	32	219	145·1	+ 3·9	-25·0	+60·8
56·426 G	35	118	57	192	145·2	+ 4·3	-24·6	+73·6
57·384 G	4	35	19	168	145·7	..	-24·4	+86·7

LEDGER II. - NON-RECURRENT GROUPS OF SUN SPOTS FOR THE YEAR.

Group 12724 — *continued.*

Spot *b*

Date U.T. Place	Projected Area: Umbræ	Projected Area: Whole Spots	Corrected Area: Umbræ	Corrected Area: Whole Spots	Longitude and Proper Motion		Latitude	Long. from C.M.
d					°	°	°	°
53·384 G	4	13	2	8	139·0	0·0	-27·5	+27·3
54·389 G	22	79	15	55	139·4	+ 0·7	-26·9	+40·9
55·465 G	28	184	25	162	138·6	+ 0·3	-27·8	+54·3
56·426 G	22	166	26	199	137·5	- 0·5	-28·0	+65·9
57·384 G	4	64	9	136	137·2	- 0·5	-27·7	+78·2

Group 12729

Feb.25–Mar.3. A stream passing rapidly through its phases of development and decay.

Date U.T. Place	Projected Area: Umbræ	Projected Area: Whole Spots	Corrected Area: Umbræ	Corrected Area: Whole Spots	Longitude and Proper Motion		Latitude	Long. from C.M.
55·465 G	40	160	24	97	67·2	0·0	+22·8	-17·1
56·426 G	63	294	38	176	67·3	+ 0·3	+22·4	- 4·3
57·384 G	62	268	36	157	67·0	+ 0·2	+22·8	+ 8·0
58·401 C	35	206	23	130	69·0	+ 2·4	+22·8	+23·4
59·378 G	35	145	26	107	70·1	+ 3·7	+22·8	+37·4
60·433 G	18	92	17	86	69·0	+ 2·8	+22·9	+50·2
61·378 G	4	22	5	26	65·6	- 0·4	+23·3	+59·2
Means ..	..	..	24	111	67·9	..	+22·8	..

Group 12732

Mar.1–12. Two or more small spots not seen on March 8 and 9. The group, reviving on March 10, contains a larger spot as follower.

Date U.T. Place	Projected Area: Umbræ	Projected Area: Whole Spots	Corrected Area: Umbræ	Corrected Area: Whole Spots	Longitude and Proper Motion		Latitude	Long. from C.M.
59·378 G	8	18	13	29	319·6	0·0	-18·5	-73·1
60·433 G	8	22	8	20	320·6	+ 1·1	-18·4	-58·2
61·378 G	9	48	6	34	321·6	+ 2·1	-18·2	-44·8
62·380 G	7	40	4	24	322·1	+ 2·7	-18·1	-31·1
63·375 G	13	55	7	30	320·4	+ 1·1	-18·1	-19·7
64·433 G	9	35	5	18	321·5	+ 2·2	-18·1	- 4·6
65·383 G	8	42	4	21	323·9	+ 4·7	-17·2	+10·3
66·388 C	0	0	0	0	..	..	..	..
67·383 G	0	0	0	0	..	..	..	..
68·384 G	2	4	2	3	323·6	+ 4·6	-18·1	+49·5
69·380 G	18	62	18	62	321·8	+ 2·8	-18·4	+60·8
70·529 G	15	64	28	119	321·2	+ 2·3	-18·7	+75·4
Means ..	..	..	8	30	321·6	..	-18·2	..

Group 12734

Mar.4–15. A large single spot with marked changes in its umbra. A nebulous cluster of spots closely follows.

Date U.T. Place	Projected Area: Umbræ	Projected Area: Whole Spots	Corrected Area: Umbræ	Corrected Area: Whole Spots	Longitude and Proper Motion		Latitude	Long. from C.M.
62·380 G	26	154	69	410	278·3	0·0	+23·1	-74·9
63·375 G	48	356	62	463	278·3	+ 0·2	+22·8	-61·8
64·433 G	84	546	76	491	277·7	- 0·2	+23·0	-48·4
65·383 G	97	722	70	520	277·5	- 0·2	+22·6	-36·1
66·388 G	156	836	98	527	277·4	- 0·1	+22·6	-23·0

Group 12734 — *continued*

Date U.T. Place	Projected Area: Umbræ	Projected Area: Whole Spots	Corrected Area: Umbræ	Corrected Area: Whole Spots	Longitude and Proper Motion		Latitude	Long. from C.M.
d					°	°	°	°
67·383 G	194	1298	114	766	276·6	- 0·7	+22·6	-10·7
68·384 G	189	1318	110	764	276·8	- 0·3	+22·6	+ 2·7
69·380 G	172	1188	103	713	276·4	- 0·6	+22·5	+15·4
70·529 G	141	1043	94	699	276·1	- 0·6	+22·6	+30·3
71·625 C	98	805	80	660	275·7	- 0·8	+22·1	+44·3
72·381 G	79	519	81	535	275·9	- 0·5	+21·9	+54·5
73·375 G	37	288	62	482	276·1	- 0·1	+21·7	+67·8
Means ..	..	..	85	586	276·9	..	+22·5	..

Group 12736.

Mar.7–18. A regular spot of which the northern part breaks away as an entity, and separates in latitude.

Date U.T. Place	Projected Area: Umbræ	Projected Area: Whole Spots	Corrected Area: Umbræ	Corrected Area: Whole Spots	Longitude and Proper Motion		Latitude	Long. from C.M.
65·383 G	22	134	42	255	240·4	0·0	+ 9·1	-73·2
66·388 G	48	222	51	238	240·4	- 0·1	+ 9·1	-60·0
67·383 G	53	268	41	206	240·2	- 0·5	+ 9·0	-47·1
68·384 G	66	323	42	203	240·0	- 0·8	+ 8·7	-34·1
69·380 G	70	271	39	152	240·0	- 1·0	+ 8·3	-21·0
70·529 G	53	194	28	101	240·2	- 0·9	+ 8·5	- 5·6
71·625 C	30	214	16	111	240·0	- 1·3	+ 7·9	+ 8·6
72·381 G	35	172	19	95	240·1	- 1·3	+ 7·5	+18·7
73·375 G	22	123	13	75	240·1	- 1·4	+ 7·5	+31·8
74·507 G	15	69	11	52	240·1	- 1·6	+ 7·5	+46·7
75·618 G	9	38	10	42	240·2	- 1·6	+ 7·7	+61·5
76·425 G	4	27	7	49	240·7	- 1·2	+ 7·6	+72·6
Means ..	..	..	27	132	240·2	..	+ 8·2	..

Group 12741.

Mar.9–21. A small, stable regular spot. Group 12755 forms *n* of its position on Mar.18.

Date U.T. Place	Projected Area: Umbræ	Projected Area: Whole Spots	Corrected Area: Umbræ	Corrected Area: Whole Spots	Longitude and Proper Motion		Latitude	Long. from C.M.
67·383 G	9	26	28	82	210·7	0·0	+23·8	-76·6
68·384 G	18	46	26	66	210·4	- 0·1	+24·0	-63·7
69·380 G	15	103	14	99	210·1	- 0·1	+24·1	-50·9
70·529 G	24	152	18	111	210·0	0·0	+24·1	-35·8
71·625 C	26	124	16	78	210·0	+ 0·3	+24·0	-21·4
72·381 G	26	156	15	94	209·2	- 0·3	+23·6	-12·2
73·375 G	31	165	18	96	208·7	- 0·6	+23·5	+ 0·4
74·507 G	27	133	16	80	208·2	- 0·8	+23·7	+14·8
75·618 G	18	106	12	71	207·7	- 1·1	+23·7	+29·0
76·425 G	22	119	17	90	207·3	- 1·3	+23·5	+39·2
77·375 G	15	106	15	103	207·1	- 1·3	+23·6	+51·5
78·366 G	11	46	16	66	206·6	- 1·5	+23·8	+64·1
79·374 G	4	27	12	79	205·2	- 2·7	+23·7	+76·0
Means ..	..	..	17	86	208·6	..	+23·8	..

Group 12742.

Mar.10–15. A short stream appearing *nf* Group 12733; one spot remains on Mar.12.

Date U.T. Place	Projected Area: Umbræ	Projected Area: Whole Spots	Corrected Area: Umbræ	Corrected Area: Whole Spots	Longitude and Proper Motion		Latitude	Long. from C.M.
68·384 G	13	66	7	34	279·9	0·0	-22·0	+ 5·8
69·380 G	62	273	34	150	280·3	+ 0·6	-22·4	+19·3

LEDGER II. - NON-RECURRENT GROUPS OF SUN SPOTS FOR THE YEAR.

Group 12742 — *continued*

Date U.T. Place	Projected Area: Umbrae	Projected Area: Whole Spots	Corrected Area: Umbrae	Corrected Area: Whole Spots	Longitude and Proper Motion		Latitude	Long. from C.M.
d					°	°	°	°
70·529 G	51	229	32	142	279·5	+ 0·1	−23·0	+33·7
71·625 C	30	109	22	81	278·0	− 1·2	−24·0	+46·6
72·381 G	11	75	10	68	277·4	− 1·6	−24·5	+56·0
73·375 G	9	22	12	29	277·2	− 1·6	−24·6	+68·9
Means ..	..	..	20	84	278·7	..	−23·4	..

Group 12744.

Mar.11–21. A stream of changing spots.

69·380 G	9	26	14	42	187·6	0·0	−24·0	−73·4
70·529 G	48	198	46	188	187·7	+ 0·4	−23·9	−58·1
71·625 C	40	225	28	158	188·2	+ 1·1	−24·2	−43·2
72·381 G	57	288	35	179	187·8	+ 0·9	−24·1	−33·6
73·375 G	60	317	33	176	187·5	+ 0·8	−24·1	−20·8
74·507 G	57	340	30	178	186·7	+ 0·3	−23·8	− 6·7
75·618 G	49	307	25	162	185·7	− 0·4	−23·6	+ 7·0
76·425 G	55	188	30	102	185·8	− 0·1	−23·8	+17·7
77·375 G	15	58	9	35	186·8	+ 1·1	−23·6	+31·2
78·366 G	9	24	6	17	187·4	+ 1·9	−23·3	+44·9
79·374 G	17	62	16	57	186·6	+ 1·3	−23·2	+57·4
Means ..	..	..	25	118	187·1	..	−23·8	..

Group 12761.

Mar.24–26. A small group in high southern latitude.

82·383 G	4	18	4	16	138·4	0·0	−42·2	+48·9
83·329 C	13	60	14	69	138·5	+ 1·0	−42·2	+61·4
84·338 G	2	9	4	17	139·4	+ 2·9	−42·0	+75·6
Means ..	..	..	7	34	138·8	..	−42·1	..

Group 12763.

Mar.28–April 5. A very small group, not seen on April 2 and 3. *n* Group 12762.

86·453 G	4	22	5	29	327·4	0·0	−16·2	−68·5
87·376 G	7	36	6	30	330·3	+ 2·9	−15·0	−53·4
88·386 G	13	44	9	30	327·8	+ 0·4	−15·1	−42·6
89·381 G	9	76	5	43	328·5	+ 1·1	−15·5	−28·7
90·428 G	4	22	2	11	329·6	+ 2·2	−14·6	−13·8
91·399 G	0	0	0	0	..	..	..	..
92·421 G	0	0	0	0	..	..	..	..
93·381 G	4	13	2	7	324·9	− 2·5	−16·7	+20·4
94·408 G	2	9	1	5	325·4	− 2·0	−16·6	+34·5
Means ..	..	..	3	17	327·7	..	−15·7	..

Group 12766.

Mar.31–April 6. A feeble but persistently disturbed area represented by a few tiny spots on each day.

d					°	°	°	°
89·381 G	2	4	4	9	284·1	0·0	+19·9	−73·1
90·428 G	4	18	4	20	284·8	+ 0·8	+19·5	−58·6
91·399 G	15	60	12	48	285·8	+ 1·9	+17·6	−44·8
92·421 G	11	31	7	20	286·4	+ 2·5	+18·1	−30·7
93·381 G	13	51	7	29	287·8	+ 4·0	+16·9	−16·7
94·408 G	20	80	11	44	285·4	+ 1·7	+18·6	− 5·5
95·381 G	4	22	2	12	287·2	+ 3·5	+18·8	+ 9·1
Means ..	..	..	7	26	285·9	..	+18·5	..

Group 12768.

Mar.31–April 8. A spot breaking up after April 2 into three components that slightly separate in longitude.

89·381 G	11	76	35	239	274·5	..	−21·8	−82·7
90·428 G	38	261	51	351	274·4	0·0	−22·5	−69·0
91·399 G	49	406	45	369	273·9	− 0·3	−22·5	−56·7
92·421 G	80	406	57	288	273·2	− 0·8	−22·6	−43·9
93·381 G	120	549	72	329	273·5	− 0·3	−22·9	−31·0
94·408 G	114	455	63	250	273·7	+ 0·1	−23·0	−17·2
95·381 G	63	222	33	115	273·3	− 0·1	−22·9	− 4·8
96·386 G	18	58	10	31	273·7	+ 0·5	−22·6	+ 8·9
97·388 G	4	13	2	7	273·1	+ 0·1	−22·6	+21·5
Means ..	..	..	42	218	273·6	..	−22·7	..

Group 12770.

April 2–8. A small spot becoming a diminutive stream on April 4.

91·399 G	7	22	5	16	287·9	0·0	+ 8·1	−42·7
92·421 G	11	27	6	16	289·0	+ 1·0	+ 8·2	−28·1
93·381 G	4	27	2	15	289·0	+ 0·8	+ 8·3	−15·5
94·408 G	7	25	4	13	289·3	+ 1·0	+ 8·4	− 1·6
95·381 G	16	85	8	44	287·1	− 1·3	+ 8·9	+ 9·0
96·386 G	18	67	10	38	288·3	− 0·3	+ 8·9	+23·5
97·388 G	8	63	6	40	287·6	− 1·1	+ 9·1	+36·0
Means ..	..	..	6	26	288·3	..	+ 8·6	..

Group 12776.

April 8–18. A small regular spot in front of Group 12777.

97·388 G	9	29	15	48	184·2	0·0	+24·3	−67·4
98·334 C	17	100	18	108	183·3	− 0·6	+25·0	−55·8
99·392 G	22	101	18	81	183·2	− 0·4	+25·1	−41·9
100·337 G	27	166	18	113	183·1	− 0·3	+25·2	−29·6

LEDGER II. - NON-RECURRENT GROUPS OF SUN SPOTS FOR THE YEAR.

Group 12776 — *continued*

Date U.T. Place	Projected Area: Umbræ	Projected Area: Whole Spots	Corrected Area: Umbræ	Corrected Area: Whole Spots	Longitude and Proper Motion		Latitude	Long. from C.M.
d					°	°	°	°
101·380 G	29	175	17	105	183·5	+ 0·4	+25·0	−15·4
102·340 G	20	108	12	63	184·0	+ 1·2	+24·7	− 2·2
103·376 G	32	104	19	61	184·3	+ 1·7	+25·0	+11·8
104·105 K	21	131	13	83	184·7	+ 2·3	+25·1	+21·8
105·379 G	20	79	15	59	184·9	+ 2·9	+25·0	+38·8
106·346 G	9	38	9	36	184·9	+ 3·2	+25·3	+51·6
107·334 G	9	32	13	45	184·5	+ 3·0	+25·0	+64·2
Means ..	..	..	15	73	184·0	..	+25·0	..

Group 12779.

April 10–22. A large regular spot breaking on April 15 into two parts of unequal size.

Date U.T. Place	Projected Area: Umbræ	Projected Area: Whole Spots	Corrected Area: Umbræ	Corrected Area: Whole Spots	Longitude and Proper Motion		Latitude	Long. from C.M.
99·392 G	29	204	58	406	148·8	0·0	−12·1	−76·3
100·337 G	67	336	74	373	148·8	− 0·1	−11·5	−63·9
101·380 G	76	468	59	365	148·6	− 0·4	−11·6	−50·3
102·340 G	99	564	62	355	148·7	− 0·4	−11·3	−37·5
103·376 G	166	722	91	397	148·6	− 0·6	−11·0	−23·9
104·105 K	119	676	62	352	148·6	− 0·7	−10·8	−14·3
105·379 G	124	682	62	342	147·9	− 1·5	−11·3	+ 1·8
106·346 G	76	508	40	264	148·6	− 0·9	−10·4	+15·3
107·334 G	63	342	36	195	149·0	− 0·6	−10·4	+28·7
108·437 G	45	234	31	161	149·5	− 0·2	−10·5	+43·8
109·452 G	29	130	26	118	149·2	− 0·6	−10·4	+56·9
110·360 G	16	58	22	78	149·2	− 0·6	−10·5	+68·9
111·348 G	5	14	16	46	149·3	..	−10·9	+82·0
Means ..	..	..	52	284	148·8	..	−11·0	..

Group 12784.

April 16–23. A small regular spot *np* Group 12783.

Date U.T. Place	Projected Area: Umbræ	Projected Area: Whole Spots	Corrected Area: Umbræ	Corrected Area: Whole Spots	Longitude and Proper Motion		Latitude	Long. from C.M.
105·379 G	4	14	16	57	62·4	..	− 8·1	−83·7
106·346 G	9	56	13	83	62·5	0·0	− 7·8	−70·8
107·334 G	14	68	11	55	63·3	+ 0·7	− 7·9	−57·0
108·437 G	22	117	15	78	63·7	+ 0·9	− 8·3	−42·0
109·452 G	32	130	18	74	63·8	+ 0·9	− 8·2	−28·5
110·360 G	18	112	9	58	64·1	+ 1·1	− 8·6	−16·2
111·348 G	18	97	9	48	64·4	+ 1·2	− 8·9	− 2·9
112·193 K	15	44	8	22	64·8	+ 1·5	− 9·0	+ 8·7
Means ..	..	..	12	60	63·8	..	− 8·4	..

Group 12789.

April 23–May 4. A stable regular spot with a tiny companion on April 27 and 28.

Date U.T. Place	Projected Area: Umbræ	Projected Area: Whole Spots	Corrected Area: Umbræ	Corrected Area: Whole Spots	Longitude and Proper Motion		Latitude	Long. from C.M.
112·193 K	15	84	29	165	341·8	0·0	+ 7·8	−74·3
113·641 G	36	194	32	175	342·1	+ 0·1	+ 7·5	−54·9
114·586 G	54	235	37	162	342·3	+ 0·2	+ 7·8	−42·2

Group 12789 — *continued*

Date U.T. Place	Projected Area: Umbræ	Projected Area: Whole Spots	Corrected Area: Umbræ	Corrected Area: Whole Spots	Longitude and Proper Motion		Latitude	Long. from C.M.
d					°	°	°	°
115·529 G	59	280	35	165	342·6	+ 0·3	+ 8·1	−29·4
116·413 G	77	352	42	190	342·8	+ 0·4	+ 8·5	−17·5
117·391 G	72	357	37	182	342·8	+ 0·3	+ 8·5	− 4·6
118·376 G	73	354	38	184	343·1	+ 0·4	+ 8·5	+ 8·7
119·337 G	68	331	37	182	343·4	+ 0·6	+ 8·5	+21·7
120·400 C	53	282	33	178	343·5	+ 0·6	+ 8·4	+35·8
121·397 C	40	216	32	171	344·0	+ 0·9	+ 8·3	+49·5
122·398 C	31	132	35	148	343·7	+ 0·5	+ 8·5	+62·5
123·337 G	11	91	24	201	345·0	+ 1·7	+ 8·2	+76·2
Means ..	..	..	34	175	343·1	..	+ 8·2	..

Group 12790.

April 23–30. A regular spot followed closely by a smaller one.

Date U.T. Place	Projected Area: Umbræ	Projected Area: Whole Spots	Corrected Area: Umbræ	Corrected Area: Whole Spots	Longitude and Proper Motion		Latitude	Long. from C.M.
112·193 K	14	79	30	163	340·1	0·0	−11·0	−76·0
113·641 G	63	265	58	240	340·2	− 0·1	−10·9	−56·8
114·586 G	41	271	29	187	341·4	+ 1·0	−10·4	−43·1
115·529 G	68	303	39	176	342·4	+ 1·9	−10·1	−29·6
116·413 G	52	235	28	125	342·9	+ 2·3	− 9·8	−17·4
117·391 G	32	138	16	69	343·1	+ 2·4	− 9·8	− 4·3
118·376 G	23	73	12	37	342·4	+ 1·6	− 9·8	+ 8·0
119·337 G	5	18	3	10	343·1	+ 2·2	−10·1	+21·4
Means ..	..	..	27	126	342·0	..	−10·2	..

Group 12791.

April 24–May 4. A stream of normal type.

Date U.T. Place	Projected Area: Umbræ	Projected Area: Whole Spots	Corrected Area: Umbræ	Corrected Area: Whole Spots	Longitude and Proper Motion		Latitude	Long. from C.M.
113·641 G	50	249	41	207	346·6	0·0	+12·1	−50·4
114·586 G	115	459	76	302	345·9	− 0·8	+12·1	−38·6
115·529 G	140	737	80	421	348·4	+ 1·7	+12·1	−23·6
116·413 G	147	868	79	466	348·3	+ 1·5	+12·2	−12·0
117·391 G	181	869	95	456	347·3	+ 0·4	+12·2	− 0·1
118·376 G	152	744	82	399	347·7	+ 0·7	+12·1	+13·3
119·337 G	109	604	63	351	347·0	0·0	+12·4	+25·3
120·400 C	95	506	65	348	347·6	+ 0·5	+12·4	+39·9
121·397 C	66	337	58	301	348·2	+ 1·0	+12·4	+53·7
122·398 C	26	253	35	342	347·8	+ 0·5	+12·3	+66·6
123·337 G	14	59	51	213	349·8	..	+12·4	+81·0
Means ..	..	..	67	359	347·5	..	+12·2	..

Spot *a*

Date U.T. Place	Projected Area: Umbræ	Projected Area: Whole Spots	Corrected Area: Umbræ	Corrected Area: Whole Spots	Longitude and Proper Motion		Latitude	Long. from C.M.
113·641 G	23	127	18	102	348·5	0·0	+11·9	−48·5
114·586 G	70	267	45	171	349·7	+ 1·1	+11·8	−34·8
115·529 G	90	520	50	291	350·0	+ 1·4	+12·0	−22·0
116·413 G	95	529	50	280	350·3	+ 1·6	+11·8	−10·0
117·391 G	88	515	46	268	349·7	+ 0·9	+ 9·9	+ 2·3
118·376 G	98	499	53	269	349·7	+ 0·8	+11·8	+15·3
119·337 G	82	431	48	254	349·2	+ 0·3	+12·1	+27·5
120·400 C	73	400	51	280	348·9	− 0·1	+12·4	+41·2
121·397 C	53	286	48	260	348·9	− 0·2	+12·4	+54·4
122·398 C	22	220	30	304	348·4	− 0·8	+12·5	+67·2
123·337 G	14	59	51	213	349·8	+ 0·6	+12·4	+81·0

LEDGER II. - NON-RECURRENT GROUPS OF SUN SPOTS FOR THE YEAR.

Group 12791 — *continued*

Spot *b*

Date U.T. Place	Projected Area Umbrae	Projected Area Whole Spots	Corrected Area Umbrae	Corrected Area Whole Spots	Longitude and Proper Motion		Latitude	Long. from C.M.
d					°	°	°	°
113·641 G	27	122	23	105	345·0	0·0	+12·2	−52·0
114·586 G	36	163	25	112	344·0	− 1·1	+12·5	−40·5
115·529 G	50	217	30	130	343·6	− 1·5	+12·6	−28·4
116·413 G	38	276	21	152	343·5	− 1·7	+12·7	−16·8
117·391 G	68	307	36	163	342·7	− 2·6	+13·5	− 4·7
118·376 G	54	245	29	130	343·4	− 2·0	+12·6	+ 9·0
119·337 G	27	173	15	97	343·3	− 2·1	+12·6	+21·6
120·400 C	22	106	14	68	343·5	− 2·0	+12·6	+35·8
121·397 C	13	51	10	41	343·4	− 2·2	+12·2	+48·9
122·398 C	4	33	5	38	343·5	− 2·2	+11·8	+62·3

Group 12795.

April 27–May 8. A regular spot on April 27, nearly cleft in two on April 28, and finally dividing within the next 24 hours. The two parts separate in longitude; the leading part surviving as a small regular spot after May 5.

116·413 G	29	138	62	294	283·2	0·0	−19·6	−77·1
117·391 G	45	242	52	278	283·1	0·0	−19·4	−64·3
118·376 G	57	322	47	264	283·0	0·0	−19·3	−51·4
119·337 G	57	270	38	178	283·2	+ 0·3	−19·8	−38·5
120·400 C	70	286	40	163	283·5	+ 0·7	−20·2	−24·2
121·397 C	49	202	26	108	284·5	+ 1·8	−19·9	−10·0
122·398 C	39	202	20	105	285·0	+ 2·4	−19·4	+ 3·8
123·337 G	32	161	18	87	284·9	+ 2·4	−19·4	+16·1
124·338 G	29	168	17	98	283·8	+ 1·4	−19·7	+28·2
125·453 G	23	98	17	71	285·4	+ 3·1	−19·6	+44·5
126·487 G	14	57	14	55	285·3	+ 3·1	−19·6	+58·1
127·374 G	7	23	10	33	285·2	+ 3·1	−19·6	+69·7
Means ..	..	..	30	144	284·2	..	−19·6	..

Group 12799.

April 28–May 9. A regular spot becoming unstable after April 30. The spot is elongated on May 2 and part of it breaks away on the following day.

117·391 G	14	77	42	233	269·8	0·0	+23·8	−77·6
118·376 G	34	195	47	267	269·9	+ 0·4	+23·6	−64·5
119·337 G	59	288	56	274	269·3	0·0	+23·6	−52·4
120·400 C	84	378	61	276	269·2	+ 0·2	+24·6	−38·5
121·397 C	81	396	51	249	269·5	+ 0·7	+24·6	−25·0
122·398 C	55	400	32	232	269·4	+ 0·9	+24·7	−11·8
123·337 G	59	327	34	186	270·0	+ 1·7	+25·0	+ 1·2
124·338 G	54	270	32	159	270·4	+ 2·3	+24·9	+14·8
125·453 G	41	175	27	116	270·5	+ 2·7	+24·7	+29·6
126·487 G	32	145	25	113	270·4	+ 2·9	+24·3	+43·2
127·374 G	16	68	16	69	270·8	+ 3·5	+24·3	+55·3
128·509 C	4	18	7	31	270·4	+ 3·4	+23·8	+69·9
Means ..	..	..	36	184	270·0	..	+24·3	..

Group 12800.

April 28–May 10. A regular spot with a few small followers, which are represented by a single spot after May 3.

d					°	°	°	°
117·391 G	14	50	35	126	268·0	0·0	−22·4	−79·4
118·376 G	28	161	39	212	267·5	− 0·3	−22·1	−66·9
119·337 G	46	225	43	205	266·5	− 1·1	−22·1	−55·2
120·400 C	74	300	51	211	266·3	− 1·1	−22·6	−41·4
121·397 C	53	304	32	185	265·2	− 2·0	−23·0	−29·3
122·398 C	74	297	40	164	265·1	− 1·9	−23·1	−16·1
123·337 G	55	279	29	149	264·5	− 2·3	−23·1	− 4·3
124·338 G	41	238	22	128	264·1	− 2·5	−22·9	+ 8·5
125·453 G	36	202	20	115	262·3	− 4·1	−23·1	+21·4
126·487 G	20	161	13	104	263·0	− 3·2	−23·0	+35·8
127·374 G	23	109	18	85	263·1	− 2·9	−23·0	+47·6
128·509 C	18	66	20	75	263·1	− 2·7	−23·4	+62·6
129·376 G	9	43	16	76	262·4	− 3·2	−23·1	+73·4
Means ..	..	..	29	141	264·7	..	−22·8	..

Group 12802.

May 2–9. A stream of approximately normal type suddenly forming between Groups 12795 and 12800.

121·397 C	22	141	12	78	275·6	0·0	−22·4	−18·9
122·398 C	114	553	60	293	276·0	+ 0·6	−22·0	− 5·2
123·337 G	157	686	82	364	276·2	+ 1·0	−22·0	+ 7·4
124·338 G	108	549	61	308	276·1	+ 1·0	−23·1	+20·5
125·453 G	70	349	46	226	276·0	+ 1·2	−22·0	+35·1
126·487 G	45	255	36	203	275·4	+ 0·7	−22·0	+48·2
127·374 G	16	123	16	132	277·0	+ 2·5	−22·1	+61·5
128·509 C	4	20	8	42	276·7	+ 2·4	−22·5	+76·2
Means ..	..	..	40	206	276·1	..	−22·3	..

Group 12805.

May 4–13. A stream of spots arising with Group 12806.

123·337 G	18	41	12	28	237·5	0·0	−35·6	−31·3
124·338 G	18	54	11	33	238·3	+ 1·5	−35·1	−17·3
125·453 G	41	184	24	108	235·9	− 0·2	−34·9	− 5·0
126·487 G	93	352	55	207	237·4	+ 1·9	−34·3	+10·2
127·374 G	73	340	46	220	238·2	+ 3·3	−34·6	+22·7
128·509 C	66	330	49	244	239·3	+ 5·2	−34·1	+38·8
129·376 G	41	223	36	195	238·9	+ 5·3	−34·1	+49·9
130·601 G	20	124	26	166	238·2	+ 5·4	−34·1	+65·4
131·334 G	14	66	34	162	240·7	+ 8·4	−34·5	+77·6
132·348 G	7	25	43	152	235·9	..	−34·6	+86·2
Means ..	..	..	33	151	238·3	..	−34·6	..

Spot *a*

124·338 G	18	54	11	33	238·3	0·0	−35·1	−17·3
125·453 G	9	36	5	21	239·5	+ 1·9	−34·4	− 1·4
126·487 G	59	243	35	143	239·0	+ 2·1	−33·8	+11·8

continued

LEDGER II. - NON-RECURRENT GROUPS OF SUN SPOTS FOR THE YEAR.

Group 12805 —*continued*

Spot *a* —*continued*

Date U.T. Place	Projected Area Umbrae	Projected Area Whole Spots	Corrected Area Umbrae	Corrected Area Whole Spots	Longitude and Proper Motion		Latitude	Long. from C.M.
d					°	°	°	°
127·374 G	41	230	26	147	240·5	+ 4·2	-33·8	+25·0
128·509 C	48	264	36	198	240·0	+ 4·4	-34·0	+39·5
129·376 G	36	214	32	188	238·8	+ 3·8	-34·1	+49·8
130·601 G	18	119	24	161	238·3	+ 4·1	-33·8	+65·5
131·334 G	14	66	34	162	240·7	+ 6·9	-34·5	+77·6

Group 12806

May 4–10. A composite spot in high latitude from the fusion of a pair of spots near Group 12805.

123·337 G	18	64	13	47	233·5	0·0	-37·5	-35·3
124·338 G	45	168	29	109	232·2	- 0·5	-37·7	-23·4
125·453 G	77	318	48	197	230·7	- 1·1	-39·0	-10·2
126·487 G	50	302	30	184	229·8	- 1·1	-38·4	+ 2·6
127·374 G	27	150	17	94	228·0	- 2·2	-39·0	+12·5
128·509 C	9	62	6	43	226·8	- 2·5	-39·3	+26·3
129·376 G	5	14	4	11	225·0	- 3·5	-39·6	+36·0
Means ..	..	..	21	98	229·4	..	-38·6	..

Group 12809.

May 5–13. A group of slight but persistent activity. Group 12813 comes immediately in front on May 7.

124·338 G	9	18	8	17	204·2	0·0	+23·4	-51·4
125·453 G	0	0	0	0	..	..	..	..
126·487 G	11	32	7	19	205·4	+ 1·7	+22·8	-21·8
127·374 G	14	46	8	26	203·3	- 0·2	+23·5	-12·2
128·509 C	18	53	10	30	202·6	- 0·7	+23·4	+ 2·1
129·376 G	9	32	5	18	201·0	- 2·1	+23·5	+12·0
130·601 G	14	59	9	37	199·6	- 3·2	+22·0	+26·8
131·334 G	11	50	8	36	202·0	- 0·7	+24·3	+38·9
132·348 G	2	5	2	4	199·9	- 2·5	+24·4	+50·2
Means ..	..	..	6	21	202·2	..	+23·4	..

Group 12813.

May 7–14. A small stream, feebly developed.

126·487 G	2	9	1	5	209·5	0·0	+21·7	-17·7
127·374 G	18	78	10	44	206·9	- 2·4	+23·2	- 8·6
128·509 C	24	73	13	41	208·5	- 0·6	+22·1	+ 8·0
129·376 G	44	128	26	76	208·9	- 0·1	+22·0	+19·9
130·601 G	18	62	13	43	210·1	+ 1·4	+21·7	+37·3
131·334 G	5	11	4	9	212·8	+ 4·2	+22·5	+49·7
132·348 G	23	73	25	80	208·8	+ 0·4	+22·3	+59·1
133·341 G	7	46	13	83	207·7	- 0·5	+23·7	+71·1
Means ..	..	..	13	48	209·2	..	+22·4	..

Group 12814.

May 7–18. A stream in which the following components are more prominent than the leader.

Date U.T. Place	Projected Area Umbrae	Projected Area Whole Spots	Corrected Area Umbrae	Corrected Area Whole Spots	Longitude and Proper Motion		Latitude	Long. from C.M.
d					°	°	°	°
126·487 G	21	79	41	160	154·6	0·0	+24·6	-72·6
127·374 G	48	205	56	248	154·6	+ 0·2	+24·6	-60·9
128·509 C	75	315	61	257	155·5	+ 1·4	+24·5	-45·0
129·376 G	118	492	81	336	154·7	+ 0·9	+24·1	-34·3
130·601 G	151	867	89	506	155·9	+ 2·4	+24·0	-16·9
131·334 G	146	860	83	489	155·8	+ 2·5	+24·1	- 7·3
132·348 G	140	610	79	345	155·4	+ 2·3	+24·0	+ 5·7
133·341 G	83	394	49	233	154·1	+ 1·3	+25·1	+17·5
134·358 G	84	348	56	225	153·1	+ 0·6	+24·5	+30·0
135·341 G	46	155	35	120	151·9	- 0·4	+25·0	+41·8
136·343 C	18	88	18	86	150·9	- 1·1	+25·1	+54·2
137·361 G	5	9	7	13	150·1	- 1·7	+25·4	+66·7
Means ..	..	..	55	252	153·9	..	+24·6	..

Group 12816.

May 8–13. A small stream.

127·374 G	14	41	9	26	181·7	0·0	+16·9	-33·8
128·509 C	33	130	18	73	183·2	+ 1·5	+16·4	-17·3
129·376 G	55	233	30	126	181·9	+ 0·2	+16·6	- 7·1
130·601 G	36	100	19	54	183·0	+ 1·4	+16·0	+10·2
131·334 G	18	62	10	35	183·2	+ 1·6	+16·8	+20·1
132·348 G	9	21	6	13	181·5	- 0·1	+16·6	+31·8
Means ..	..	..	15	54	182·4	..	+16·6	..

Group 12819.

May 9–21. A regular spot having temporarily a double umbra on May 12–13. There is a small follower on May 10–11, 13 and 14.

128·509 C	4	13	8	27	125·9	0·0	+16·1	-74·6
129·376 G	26	87	34	110	124·4	- 1·5	+16·3	-64·6
130·601 G	26	151	20	117	126·0	+ 0·1	+15·7	-46·8
131·334 G	32	178	21	117	127·0	+ 1·1	+15·8	-36·1
132·348 G	64	285	36	163	126·8	+ 0·9	+15·9	-22·9
133·341 C	48	242	26	129	127·1	+ 1·2	+15·6	- 9·5
134·358 G	46	237	24	126	127·2	+ 1·3	+15·8	+ 4·1
135·341 G	36	155	20	85	127·0	+ 1·1	+15·8	+16·9
136·343 C	40	186	24	113	126·4	+ 0·5	+16·2	+29·7
137·361 G	41	153	30	110	126·5	+ 0·6	+15·9	+43·1
138·348 G	18	121	17	115	126·5	+ 0·7	+16·0	+56·2
139·358 G	14	82	21	125	126·4	+ 0·6	+16·0	+69·4
140·343 G	9	30	37	122	126·0	..	+16·0	+82·1
Means ..	..	..	23	111	126·4	..	+15·9	..

LEDGER II. - NON-RECURRENT GROUPS OF SUN SPOTS FOR THE YEAR.

Group 12820.

May 9–16. A cluster of small spots.

Date U.T. Place	Projected Area Umbrae	Projected Area Whole Spots	Corrected Area Umbrae	Corrected Area Whole Spots	Longitude and Proper Motion		Latitude	Long. from C.M.
d					°	°	°	°
128·509 C	9	53	21	122	122·7	0·0	-18·8	-77·8
129·376 G	27	73	36	96	121·5	- 1·1	-18·8	-67·5
130·601 G	23	82	19	67	121·6	- 0·9	-19·4	-51·2
131·334 G	7	25	5	18	120·4	- 2·1	-19·2	-42·7
132·348 G	23	50	14	30	119·6	- 2·8	-18·8	-30·1
133·341 G	9	27	5	15	120·6	- 1·7	-19·2	-16·0
134·358 G	7	23	4	12	120·9	- 1·3	-19·1	- 2·2
135·341 G	5	14	3	7	122·2	+ 0·1	-18·8	+12·1
Means ..	..	..	13	46	121·2	..	-19·0	..

Group 12825.

May 17–27. A stream in rapid change until about May 24.

Date U.T. Place	Projected Area Umbrae	Projected Area Whole Spots	Corrected Area Umbrae	Corrected Area Whole Spots	Longitude and Proper Motion		Latitude	Long. from C.M.
136·343 C	29	131	27	127	38·2	0·0	-12·7	-58·5
137·361 G	56	260	41	188	37·9	- 0·4	-12·9	-45·5
138·348 G	133	519	81	315	38·0	- 0·3	-12·8	-32·3
139·358 G	198	830	108	455	36·2	- 2·2	-13·4	-20·8
140·343 G	208	867	108	447	36·6	- 1·8	-13·6	- 7·3
141·424 G	185	1005	96	518	36·5	- 2·0	-13·7	+ 6·9
142·340 G	142	707	78	384	36·9	- 1·6	-13·9	+19·4
143·335 G	75	367	46	225	37·2	- 1·4	-13·1	+32·9
144·341 C	64	262	48	195	37·4	- 1·2	-13·2	+46·4
145·333 G	48	236	51	242	38·3	- 0·4	-13·5	+60·4
146·340 G	23	146	41	275	38·8	+ 0·1	-13·2	+74·2
Means ..	..	..	66	306	37·4	..	-13·3	..

Group 12826.

May 18–30. A stream of variable spots.

Date U.T. Place	Projected Area Umbrae	Projected Area Whole Spots	Corrected Area Umbrae	Corrected Area Whole Spots	Longitude and Proper Motion		Latitude	Long. from C.M.
137·361 G	9	55	(34	210	0·6	..	-15·7)	-82·8
138·348 G	77	383	135	705	357·3	0·0	-16·2	-73·0
139·358 G	108	681	111	707	357·1	- 0·2	-16·0	-59·9
140·343 G	146	784	110	591	357·2	- 0·1	-15·9	-46·7
141·424 G	199	998	121	610	357·9	+ 0·6	-15·8	-31·7
142·340 G	185	962	103	530	357·7	+ 0·4	-15·9	-19·8
143·335 G	185	935	98	492	356·8	- 0·5	-16·2	- 7·5
144·341 C	151	917	79	482	357·5	+ 0·2	-16·1	+ 6·5
145·333 G	110	639	61	354	358·7	+ 1·4	-15·7	+20·8
146·340 G	96	442	61	282	0·1	+ 2·8	-15·6	+35·5
147·336 C	60	361	48	285	0·7	+ 3·4	-15·6	+49·3
148·396 C	24	160	28	187	1·1	+ 3·8	-15·7	+63·7
149·409 G	5	74	13	179	2·4	+ 5·1	-15·5	+78·4
Means ..	..	..	81	450	358·7	..	-15·8	..

Spot *a*

Date U.T. Place	Projected Area Umbrae	Projected Area Whole Spots	Corrected Area Umbrae	Corrected Area Whole Spots	Longitude and Proper Motion		Latitude	Long. from C.M.
137·361 G	9	55	34	210	0·6	..	-15·7	-82·8
138·348 G	41	164	57	230	1·4	0·0	-15·1	-68·9
139·358 G	46	264	40	232	2·3	+ 0·9	-14·7	-54·7

continued

Group 12826 —*continued*

Spot *a* —*continued*

Date U.T. Place	Projected Area Umbrae	Projected Area Whole Spots	Corrected Area Umbrae	Corrected Area Whole Spots	Longitude and Proper Motion		Latitude	Long. from C.M.
d					°	°	°	°
140·343 G	66	337	45	229	2·3	+ 0·9	-14·7	-41·6
141·424 G	87	435	50	252	2·6	+ 1·2	-15·1	-27·0
142·340 G	73	447	39	237	2·4	+ 1·0	-15·4	-15·1
143·335 G	78	392	41	204	2·2	+ 0·8	-15·5	- 2·1
144·341 C	89	473	47	251	1·9	+ 0·5	-15·6	+10·9
145·333 G	57	428	32	240	1·6	+ 0·2	-15·5	+23·7
146·340 G	73	360	47	234	1·6	+ 0·2	-15·5	+37·0
147·336 C	56	328	45	262	1·6	+ 0·2	-15·5	+50·2
148·396 C	20	147	24	175	2·0	+ 0·6	-15·5	+64·6
149·409 G	5	71	13	179	2·4	+ 1·0	-15·5	+78·4

Spot *b*

Date U.T. Place	Projected Area Umbrae	Projected Area Whole Spots	Corrected Area Umbrae	Corrected Area Whole Spots	Longitude and Proper Motion		Latitude	Long. from C.M.
138·348 G	36	219	78	475	353·7	0·0	-16·8	-76·6
139·358 G	62	417	71	475	353·6	- 0·1	-16·6	-63·4
140·343 G	80	447	65	362	353·1	- 0·6	-16·9	-50·8
141·424 G	94	490	60	314	353·3	- 0·4	-16·8	-36·3
142·340 G	105	488	60	278	353·6	- 0·1	-16·7	-23·9
143·335 G	107	543	57	288	353·6	- 0·1	-16·4	-10·7
144·341 C	62	444	32	231	353·1	- 0·6	-16·7	+ 2·1
145·333 G	53	211	29	114	352·9	- 0·8	-16·5	+15·0
146·340 G	23	82	14	48	353·4	- 0·3	-15·8	+28·8
147·336 C	4	33	3	23	353·5	- 0·2	-15·7	+42·1
148·396 C	4	13	4	12	352·8	- 0·9	-17·3	+55·4

Group 12827

May 20–29. A small stream of normal type of which the leader alone remains after May 25.

Date U.T. Place	Projected Area Umbrae	Projected Area Whole Spots	Corrected Area Umbrae	Corrected Area Whole Spots	Longitude and Proper Motion		Latitude	Long. from C.M.
139·358 G	7	18	7	19	357·9	0·0	-25·3	-59·1
140·343 G	27	182	21	140	359·1	+ 1·5	-25·7	-44·8
141·424 G	73	364	47	235	357·5	+ 0·2	-25·5	-32·1
142·340 G	71	344	42	202	357·2	+ 0·2	-25·7	-20·3
143·335 G	64	326	35	180	356·8	+ 0·1	-25·5	- 7·5
144·341 C	49	226	27	124	356·6	+ 0·1	-25·5	+ 5·6
145·333 G	27	183	16	106	356·2	0·0	-25·3	+18·3
146·340 G	27	101	17	65	355·2	- 0·7	-25·3	+30·6
147·336 C	16	62	12	46	354·1	- 1·5	-25·1	+42·7
148·396 C	4	11	4	11	353·3	- 2·0	-25·2	+55·9
Means ..	..	..	23	113	356·4	..	-25·4	..

Spot *a*

Date U.T. Place	Projected Area Umbrae	Projected Area Whole Spots	Corrected Area Umbrae	Corrected Area Whole Spots	Longitude and Proper Motion		Latitude	Long. from C.M.
139·358 G	5	16	5	17	358·1	0·0	-25·5	-58·9
140·343 G	23	137	17	104	359·5	+ 1·7	-25·7	-44·4
141·424 G	32	183	20	115	359·8	+ 2·3	-25·7	-29·8
142·340 G	48	228	28	132	358·9	+ 1·7	-25·5	-18·6
143·335 G	46	237	25	130	358·2	+ 1·3	-25·5	- 6·1
144·341 C	40	204	22	112	357·1	+ 0·4	-25·5	+ 6·1
145·333 G	27	183	16	106	356·2	- 0·2	-25·3	+18·3
146·340 G	27	101	17	65	355·2	- 0·9	-25·3	+30·6
147·336 C	16	62	12	46	354·1	- 1·7	-25·1	+42·7
148·396 C	4	11	4	11	353·3	- 2·2	-25·2	+55·9

LEDGER II. - NON-RECURRENT GROUPS OF SUN SPOTS FOR THE YEAR.

Group 12827 —*continued*

Spot *b*

Date U.T. Place	Projected Area Umbræ	Projected Area Whole Spots	Corrected Area Umbræ	Corrected Area Whole Spots	Longitude and Proper Motion		Latitude	Long. from C.M.
d					°	°	°	°
139·358 G	2	5	2	6	355·2	0·0	−25·6	−61·8
140·343 G	5	14	4	11	356·1	+ 1·2	−25·1	−47·8
141·424 G	27	147	18	98	354·0	− 0·6	−25·7	−35·6
142·340 C	23	116	14	70	353·4	− 0·9	−26·0	−24·1
143·335 G	18	89	10	50	353·4	− 0·6	−25·9	−10·9
144·341 C	9	22	5	12	352·7	− 1·1	−25·7	+ 1·7

Group 12835.

May 23–28. A pair of spots.

142·340 G	10	23	31	74	296·8	..	+10·7	−80·7
143·335 G	18	54	24	75	296·4	0·0	+11·0	−67·9
144·341 C	22	49	19	43	297·3	+ 0·8	+10·5	−53·7
145·333 G	16	34	11	23	296·6	0·0	+11·0	−41·3
146·340 G	10	23	6	13	297·7	+ 1·0	+10·5	−26·9
147·336 C	9	36	5	19	299·4	+ 2·6	+10·1	−12·0
Means ..	..	..	13	35	297·5	..	+10·6	..

Group 12838.

May 26–June 1. A stream of rapid rise and decline led by a regular spot.

145·333 G	5	23	3	12	331·5	0·0	+20·8	− 6·4
146·340 G	41	113	23	62	332·4	+ 1·0	+21·7	+ 7·8
147·336 C	109	685	64	401	333·8	+ 2·6	+21·3	+22·4
148·396 C	113	591	76	396	333·5	+ 2·4	+20·9	+36·1
149·409 G	60	314	50	265	333·6	+ 2·7	+20·5	+49·6
150·105 K	41	195	44	208	333·5	+ 2·6	+20·2	+58·8
151·439 G	9	50	22	127	334·1	+ 3·4	+19·2	+77·0
Means ..	..	..	40	210	333·2	..	+20·7	..

Group 12840

May 29 – June 4. A stream of rapid rise and decline.

148·396 C	18	89	10	49	272·9	0·0	− 6·1	−24·5
149·409 G	64	287	33	147	274·5	+ 1·4	− 6·7	− 9·5
150·105 K	91	439	44	219	275·0	+ 1·8	− 7·0	+ 0·3
151·439 G	59	293	31	157	277·1	+ 3·7	− 7·1	+20·0
152·339 C	58	245	35	147	277·5	+ 4·0	− 7·3	+32·3
153·333 G	32	163	23	117	277·7	+ 4·0	− 7·5	+45·6
154·349 C	16	85	16	84	277·9	+ 4·1	− 7·0	+59·3
Means ..	..	..	27	131	276·1	..	− 7·0	..

Group 12841.

May 29–June 7. A long stream in which the follower develops first, but is survived by the leader as is usually the case.

d					°	°	°	°
148·396 C	4	11	4	11	240·9	0·0	+28·1	−56·5
149·409 G	37	119	29	94	240·8	+ 0·3	+28·0	−43·2
150·105 K	91	373	63	259	241·0	+ 0·7	+27·8	−33·7
151·439 G	112	554	65	325	241·8	+ 2·0	+27·8	−15·3
152·339 C	114	491	65	281	241·2	+ 1·7	+27·6	− 4·0
153·333 G	113	536	65	309	242·4	+ 3·3	+27·5	+10·3
154·349 C	131	542	81	338	242·9	+ 4·2	+27·7	+24·3
155·351 C	57	339	42	244	242·3	+ 3·9	+28·0	+37·0
156·379 G	48	157	46	154	245·4	+ 7·4	+26·5	+53·7
157·442 G	9	55	15	95	248·9	+11·3	+26·0	+71·2
Means ..	..	..	48	211	242·8	..	+27·5	..

Spot *a*

149·409 G	9	23	7	17	244·4	0·0	+26·9	−39·6
150·105 K	25	102	16	67	244·4	+ 0·3	+27·3	−30·3
151·439 G	46	206	26	117	246·9	+ 3·2	+27·0	−10·2
152·339 C	40	152	22	85	248·4	+ 5·1	+26·9	+ 3·2
153·333 G	46	188	27	110	248·8	+ 5·8	+26·7	+16·7
154·349 C	62	250	40	162	249·2	+ 6·6	+26·8	+30·6
155·351 C	31	161	24	124	249·1	+ 6·9	+26·4	+43·8
156·379 G	32	119	33	124	249·4	+ 7·5	+26·0	+57·7
157·442 G	9	55	15	95	248·9	+ 7·4	+26·0	+71·2

Spot *b*

148·396 C	4	11	4	11	240·9	0·0	+28·1	−56·5
149·409 G	23	87	18	70	239·8	− 0·7	+28·4	−44·2
150·105 K	66	271	47	192	238·9	− 1·4	+28·2	−35·8
151·439 G	50	298	30	179	238·3	− 1·5	+28·3	−18·8
152·339 C	58	288	34	167	237·3	− 2·2	+28·7	− 7·9
153·333 G	44	238	25	136	237·5	− 1·6	+28·7	+ 5·4
154·349 C	45	203	27	121	236·7	− 2·0	+29·1	+18·1
155·351 C	22	156	15	105	235·8	− 2·6	+29·1	+30·5
156·379 G	11	27	9	21	235·0	− 3·0	+28·4	+43·3

Group 12847.

June 1–7. A small stream of unstable spots coming into brief prominence on June 4.

151·439 G	14	41	8	23	232·0	0·0	+ 4·4	−25·1
152·339 C	25	89	13	46	231·7	− 0·5	+ 4·1	−13·5
153·333 G	30	164	15	82	232·9	+ 0·6	+ 4·2	+ 0·8
154·349 C	80	324	42	170	234·0	+ 1·5	+ 4·4	+15·4
155·351 C	27	127	16	74	234·9	+ 2·2	+ 4·1	+29·6
156·379 G	34	156	23	108	235·1	+ 2·2	+ 4·1	+43·4
157·442 G	11	32	11	31	236·7	+ 3·6	+ 3·9	+59·0
Means ..	..	..	18	76	233·9	..	+ 4·2	..

LEDGER II. - NON-RECURRENT GROUPS OF SUN SPOTS FOR THE YEAR.

Group 12848.

June 2–13. A typical bi-polar group in which the two components are of nearly equal size.

Date U.T. Place	Projected Area: Umbræ	Projected Area: Whole Spots	Corrected Area: Umbræ	Corrected Area: Whole Spots	Longitude and Proper Motion	Latitude	Long. from C.M.
d					°	°	°	°
152·339 C	9	40	(32	131	166·2	..	-19·4)	-79·0
153·333 G	18	80	24	108	166·4	0·0	-19·4	-65·7
154·349 C	33	150	29	128	167·2	+ 0·9	-19·3	-51·4
155·351 C	22	96	15	64	167·3	+ 1·1	-19·1	-38·0
156·379 G	30	124	17	71	168·7	+ 2·5	-18·1	-23·0
157·442 G	92	387	50	207	166·6	+ 0·5	-17·9	-11·1
158·614 G	75	338	40	179	167·0	+ 1·0	-18·1	+ 4·8
159·340 G	65	290	36	160	167·6	+ 1·6	-18·3	+15·1
160·340 G	41	239	24	145	167·8	+ 1·9	-18·4	+28·5
161·385 G	26	124	19	91	168·8	+ 3·0	-18·6	+43·3
162·415 G	9	18	9	19	171·2	+ 5·5	-18·5	+59·4
163·337 G	5	9	8	15	171·0	+ 5·3	-18·2	+71·4
Means ..	..	..	25	108	168·2	..	-18·5	..

Group 12850

June 5–11. A group long-lived for its small size.

Date U.T. Place	Projected Area: Umbræ	Projected Area: Whole Spots	Corrected Area: Umbræ	Corrected Area: Whole Spots	Longitude and Proper Motion	Latitude	Long. from C.M.
155·351 C	4	9	5	10	148·9	0·0	+37·3	-56·4
156·379 G	30	64	26	56	147·0	- 1·1	+36·4	-44·7
157·442 G	22	64	16	47	145·3	- 2·0	+36·6	-32·4
158·614 G	16	70	10	46	143·1	- 3·4	+36·6	-49·1
159·340 G	16	65	10	42	143·0	- 2·9	+37·0	- 9·5
160·340 G	14	28	9	18	142·6	- 2·6	+37·2	+ 3·3
161·385 G	2	7	1	5	144·2	- 0·2	+37·1	+18·7
Means ..	..	..	11	32	144·9	..	+36·9	..

Group 12852

June 6–16. A small stream in which the leader survives as a regular spot after June 9. A tiny new cluster appears on June 13.

Date U.T. Place	Projected Area: Umbræ	Projected Area: Whole Spots	Corrected Area: Umbræ	Corrected Area: Whole Spots	Longitude and Proper Motion	Latitude	Long. from C.M.
156·379 G	2	5	2	5	131·2	0·0	+12·5	-60·5
157·442 G	16	44	11	33	131·3	0·0	+12·9	-46·4
158·614 G	39	121	23	71	133·6	+ 2·3	+12·6	-28·6
159·340 G	41	159	22	84	136·4	+ 5·0	+12·5	-16·1
160·340 G	51	184	26	94	137·2	+ 5·8	+12·8	- 2·1
161·385 G	23	124	12	64	137·4	+ 5·9	+12·9	+11·9
162·415 G	28	143	16	82	137·0	+ 5·4	+13·2	+25·2
163·337 G	23	94	15	60	136·3	+ 4·7	+13·1	+36·7
164·339 G	9	32	7	26	137·1	+ 5·4	+13·3	+50·7
165·338 G	5	14	6	16	137·5	+ 5·8	+13·1	+64·3
166·337 G	5	14	11	31	136·7	+ 4·9	+13·4	+76·8
Means ..	..	..	14	51	135·6	..	+12·9	..

Group 12853.

June 7–12. A stream developing towards the west limb.

Date U.T. Place	Projected Area: Umbræ	Projected Area: Whole Spots	Corrected Area: Umbræ	Corrected Area: Whole Spots	Longitude and Proper Motion	Latitude	Long. from C.M.
d					°	°	°	°
157·442 G	2	5	1	3	187·3	0·0	+23·1	+ 9·6
158·614 G	23	60	14	35	184·5	- 2·5	+23·8	+22·3
159·340 G	23	118	15	77	185·9	- 1·0	+23·3	+33·4
160·340 G	46	170	35	131	184·8	- 1·9	+23·5	+45·5
161·385 G	32	167	35	185	186·2	- 0·2	+23·1	+60·7
162·415 G	19	89	40	188	186·7	+ 0·5	+22·8	+74·9
Means ..	..	..	23	103	185·9	..	+23·3	..

Group 12856.

June 7–12. A few small spots s group 12851.

Date U.T. Place	Projected Area: Umbræ	Projected Area: Whole Spots	Corrected Area: Umbræ	Corrected Area: Whole Spots	Longitude and Proper Motion	Latitude	Long. from C.M.
157·442 G	14	50	13	46	122·0	0·0	+11·4	-55·7
158·614 G	11	32	7	20	126·3	+ 4·2	+11·1	-35·9
159·340 G	9	23	5	13	126·9	+ 4·7	+11·7	-25·6
160·340 G	30	69	16	36	125·3	+ 3·0	+11·1	-14·0
161·385 G	18	69	9	35	126·8	+ 4·4	+11·0	+ 1·3
162·415 G	14	76	7	40	124·2	+ 1·7	+11·7	+12·4
Means ..	..	..	10	32	125·2	..	+11·3	..

Group 12866

June 13–22. A small stream not seen on June 19 and 20.

Date U.T. Place	Projected Area: Umbræ	Projected Area: Whole Spots	Corrected Area: Umbræ	Corrected Area: Whole Spots	Longitude and Proper Motion	Latitude	Long. from C.M.
163·337 G	5	18	5	17	42·5	0·0	+15·0	-57·1
164·339 G	5	12	4	9	38·8	- 3·7	+16·1	-47·6
165·338 G	19	35	11	21	41·5	- 1·1	+13·1	-31·7
166·337 G	12	46	6	25	41·7	- 0·9	+13·8	-18·2
167·418 G	23	131	12	67	42·0	- 0·6	+14·4	- 3·6
168·343 G	16	83	8	43	41·9	- 0·7	+14·1	+ 8·5
169·387 C	0	0	0	0	..	..	..	..
170·373 G	0	0	0	0	..	..	..	..
171·336 G	9	28	7	21	40·5	- 2·2	+15·4	+46·8
172·341 G	2	5	2	5	39·8	- 2·9	+16·0	+59·3
Means ..	..	..	6	21	41·1	..	+14·7	..

Group 12868.

June 14–23. A small group n Group 12866; new spots come in on June 20.

Date U.T. Place	Projected Area: Umbræ	Projected Area: Whole Spots	Corrected Area: Umbræ	Corrected Area: Whole Spots	Longitude and Proper Motion	Latitude	Long. from C.M.
164·339 G	16	46	12	37	38·6	0·0	+21·8	-47·8
165·338 G	5	14	3	9	40·3	+ 1·8	+20·4	-32·9
166·337 G	9	32	5	18	39·5	+ 1·2	+20·7	-20·4
167·418 G	10	25	6	13	40·0	+ 1·8	+20·7	- 5·6
168·343 G	0	0	0	0	..	..	..	..
169·387 C	0	0	0	0	..	..	..	..
170·373 G	14	34	9	22	41·2	+ 3·4	+20·4	+34·7
171·336 G	37	115	28	88	40·4	+ 2·8	+20·4	+46·7
172·341 G	14	37	15	39	41·0	+ 3·5	+20·5	+60·5
173·343 G	5	9	8	15	39·4	+ 2·0	+20·4	+72·2
Means ..	..	..	9	24	40·0	..	+20·7	..

LEDGER II. - NON-RECURRENT GROUPS OF SUN SPOTS FOR THE YEAR.

Group 12877

June 21–29. A stream of normal type.

Date U.T. Place	Projected Area Umbræ	Projected Area Whole Spots	Corrected Area Umbræ	Corrected Area Whole Spots	Longitude and Proper Motion		Latitude	Long. from C.M.
d					°	°	°	°
171·336 G	17	58	10	33	334·2	0·0	+22·7	−19·5
172·341 G	115	372	62	198	335·7	+ 1·7	+22·3	− 4·8
173·343 G	199	749	108	405	336·4	+ 2·6	+22·2	+ 9·2
174·399 C	143	870	82	501	335·5	+ 1·9	+22·4	+22·3
175·374 G	134	725	87	475	335·0	+ 1·6	+22·8	+34·7
176·398 C	94	513	74	410	335·3	+ 2·1	+23·0	+48·5
177·657 G	49	333	61	413	334·5	+ 1·5	+22·7	+64·4
178·407 G	39	183	81	386	335·5	+ 2·7	+22·7	+75·3
179·384 G	7	21	(22	67	328·3	..	+22·4)	+81·1
Means ..	..	..	71	353	335·3	..	+22·6	..

Spot *a*

171·336 G	12	44	7	25	334·9	0·0	+22·7	−18·8
172·341 G	69	238	37	126	337·6	+ 2·9	+22·1	− 2·9
173·343 G	125	527	68	285	338·4	+ 3·9	+21·8	+11·2
174·399 C	67	426	40	251	339·0	+ 4·7	+22·0	+25·8
175·374 G	65	434	44	295	338·9	+ 4·8	+22·4	+38·6
176·398 C	49	300	42	255	338·7	+ 4·8	+22·2	+51·9
177·657 G	28	199	39	275	338·2	+ 4·5	+22·4	+68·1
178·407 G	23	118	57	290	338·5	+ 5·0	+22·3	+78·3
179·384 G	7	21	22	67	328·3	..	+22·4	+81·1

Group 12881.

June 26–July 8. A long stream of unstable components. Poor photograph on July 3.

176·398 C	7	27	(28	110	204·4	..	− 9·5)	−82·4
177·657 G	55	383	71	505	203·6	0·0	−10·5	−66·5
178·407 G	62	550	58	521	203·8	+ 0·1	−10·4	−56·4
179·384 G	129	559	91	395	204·9	+ 1·1	− 9·6	−42·3
180·366 G	169	821	98	480	206·1	+ 2·2	− 9·7	−28·1
181·337 G	193	797	103	426	205·8	+ 1·8	− 9·7	−15·6
182·364 G	226	1104	116	566	206·8	+ 2·7	− 9·4	− 1·0
183·251 K	105	645	55	339	204·4	+ 0·2	−10·9	+ 8·4
184·377 G	247	1077	141	616	206·0	+ 1·7	−10·1	+24·9
185·390 G	171	887	112	584	205·6	+ 1·2	−10·6	+37·9
186·406 G	102	476	87	403	206·2	+ 1·7	−10·8	+51·9
187·333 G	37	272	44	316	204·4	− 0·2	−11·4	+62·4
188·554 G	11	65	31	185	204·3	− 0·4	−11·5	+78·4
Means ..	..	..	84	445	205·2	..	−10·4	..

Group 12885.

June 27–July 7. A stream in which the following part shows fresh activity on July 4–5, while the original leader is decreasing.

177·657 G	25	106	19	83	223·7	0·0	+26·3	−46·4
178·407 G	37	203	25	137	223·8	+ 0·4	+26·4	−36·4
179·384 G	55	231	33	138	224·4	+ 1·3	+26·2	−22·8

Group 12885 —*continued*

d					°	°	°	°
180·366 G	54	295	30	163	224·3	+ 1·5	+26·0	− 9·9
181·337 G	46	182	25	98	223·1	+ 0·6	+26·3	+ 1·7
182·364 G	32	178	18	10[illegible]	223·0	+ 0·9	+26·4	+15·2
183·251 K	51	215	31	129	220·2	− 1·6	+26·2	+24·2
184·377 G	67	307	46	210	217·8	− 3·7	+27·1	+36·7
185·390 G	116	531	98	445	217·3	− 3·8	+27·2	+49·6
186·406 G	79	497	95	596	217·4	− 3·4	+27·3	+63·1
187·333 G	37	240	68	479	215·6	− 4·9	+27·5	+73·6
Means ..	..	..	44	234	221·0	..	+26·6	..

Group 12894

July 3–13. A large typical bi-polar group in which the leader becomes elongated, develops a double umbra and is dividing into two parts when near the west limb.

183·251 K	64	198	54	168	142·6	0·0	+14·2	−53·4
184·377 G	251	1185	161	759	144·1	+ 1·4	+14·1	−37·0
185·390 G	314	1617	174	899	144·1	+ 1·4	+13·8	−23·6
186·406 G	347	1885	179	975	143·8	+ 1·1	+13·8	−10·5
187·333 G	369	1678	188	855	143·1	+ 0·3	+13·8	+ 1·1
188·554 G	301	1594	161	850	143·0	+ 0·2	+13·8	+17·1
189·351 G	277	1423	160	819	142·7	− 0·2	+13·7	+27·4
190·392 C	164	1030	111	688	142·3	− 0·6	+13·6	+40·8
191·584 G	95	578	90	541	143·0	0·0	+14·1	+57·2
192·395 C	62	302	88	420	143·2	+ 0·2	+13·6	+68·2
193·334 G	23	134	73	462	144·2	..	+13·3	+81·6
Means ..	..	..	137	697	143·2	..	+13·8	..

Spot *a*

183·251 K	32	92	26	75	144·8	0·0	+14·8	−51·2
184·377 G	159	695	99	431	146·6	+ 1·7	+14·8	−34·5
185·390 G	189	975	102	526	146·8	+ 1·9	+13·9	−20·9
186·406 G	236	1210	120	617	146·5	+ 1·6	+13·8	− 7·8
187·333 G	240	1040	122	530	146·2	+ 1·2	+13·7	+ 4·2
188·554 G	229	1067	124	576	146·0	+ 1·0	+13·8	+20·1
189·351 G	185	906	109	535	145·8	+ 0·7	+13·7	+30·5
190·392 C	119	618	83	433	145·7	+ 0·6	+13·8	+44·2
191·584 G	72	393	72	393	146·0	+ 0·8	+13·7	+60·2
192·395 C	49	215	74	327	146·2	+ 1·0	+13·6	+71·2
193·334 G	14	97	57	395	146·3	..	+13·5	+83·7

Spot *b*

183·251 K	32	106	28	93	140·8	0·0	+13·5	−55·2
184·377 G	92	490	62	328	139·9	− 1·0	+13·5	−41·2
185·390 G	125	642	72	373	138·8	− 2·1	+13·6	−28·9
186·406 G	111	675	59	358	138·2	− 2·7	+13·8	−16·1
187·333 G	129	638	66	325	137·9	− 3·1	+13·6	− 4·1
188·554 G	72	527	37	274	137·2	− 3·8	+13·9	+11·3
189·351 G	92	517	51	284	137·1	− 4·0	+14·0	+21·8
190·392 C	45	412	28	255	136·8	− 4·3	+13·8	+35·3
191·584 G	23	185	18	148	137·0	− 4·2	+13·8	+51·2
192·395 C	13	87	14	93	137·2	− 4·0	+13·4	+62·2
193·334 G	9	37	16	67	137·0	− 4·2	+13·1	+74·4

LEDGER II. - NON-RECURRENT GROUPS OF SUN SPOTS FOR THE YEAR.

Group 12896.

July 4–16. A spot with double umbrae diminishing fairly rapidly after July 10. There are occasional small followers and a cluster on July 10–11.

Date U.T. Place	Projected Area Umbrae	Projected Area Whole Spots	Corrected Area Umbrae	Corrected Area Whole Spots	Longitude and Proper Motion		Latitude	Long. from C.M.
d					°	°	°	°
184·377 G	9	72	37	293	97·5	..	+14·9	-83·6
185·390 G	28	182	43	277	96·7	0·0	+14·7	-71·0
186·406 G	44	261	41	243	96·7	0·0	+15·4	-57·6
187·333 G	53	344	39	250	96·8	+ 0·1	+15·0	-45·2
188·554 G	67	374	39	217	97·1	+ 0·4	+15·1	-28·8
189·351 G	60	383	33	210	97·3	+ 0·6	+15·0	-18·0
190·392 C	99	515	50	263	96·8	0·0	+15·4	- 4·7
191·584 G	117	446	61	232	97·2	+ 0·4	+15·6	+11·4
192·395 C	58	313	32	172	97·1	+ 0·3	+15·5	+22·1
193·334 G	39	182	24	113	97·4	+ 0·6	+15·5	+34·8
194·607 G	25	74	20	60	97·6	+ 0·8	+15·4	+51·8
195·364 G	12	28	13	30	97·6	+ 0·8	+15·4	+61·9
196·361 G	5	14	9	25	97·0	+ 0·2	+15·2	+74·5
Means ..	..	..	34	174	97·1	..	+15·3	..

Group 12898.

July 6–13. A stream of unimportant spots.

186·406 G	37	109	25	74	112·0	0·0	+14·9	-42·3
187·333 G	35	106	20	61	112·8	+ 0·8	+14·4	-29·2
188·554 G	83	259	43	135	112·3	+ 0·2	+14·8	-13·6
189·351 G	88	298	44	152	111·8	- 0·3	+14·7	- 3·5
190·392 C	40	141	21	73	112·8	+ 0·7	+14·2	+11·3
191·584 G	9	42	5	25	116·8	+ 4·7	+13·4	+31·0
192·395 C	4	16	2	11	116·1	+ 3·9	+14·8	+41·1
193·334 G	2	5	2	4	114·5	+ 2·3	+14·8	+51·9
Means ..	..	..	20	67	113·6	..	+14·5	..

Group 12900.

July 6–17. Two regular spots slowly diverging; the following one dies out after July 13, while the leader divides into two parts on July 14–15. There are usually tiny companions.

186·406 G	12	65	57	311	71·3	..	-15·8	-83·0
187·333 G	57	289	101	512	70·4	0·0	-15·9	-71·6
188·554 G	116	552	110	525	70·5	+ 0·1	-15·5	-55·4
189·351 G	134	679	102	514	70·2	- 0·2	-15·6	-45·1
190·392 C	133	746	83	465	70·1	- 0·3	-15·6	-31·4
191·584 G	168	836	92	462	69·8	- 0·6	-15·8	-16·0
192·395 C	157	748	84	401	69·9	- 0·5	-15·8	- 5·1
193·334 G	168	670	91	361	70·1	- 0·3	-16·1	+ 7·5
194·607 G	97	377	57	221	70·1	- 0·3	-15·5	+24·3
195·364 G	46	132	30	86	71·0	+ 0·6	-15·0	+35·3
196·361 G	18	83	14	66	70·7	+ 0·3	-14·8	+48·2
197·481 G	7	32	8	37	69·4	- 1·0	-16·3	+61·7
Means ..	..	..	70	331	70·2	..	-15·6	..

Group 12900 — *continued*

Spot *a*, a_1.

d					°	°	°	°
186·406 G	12	65	57	311	71·3	..	-15·8	-83·0
187·333 G	18	90	29	144	71·9	0·0	-14·9	-70·1
188·554 G	44	185	39	165	72·5	+ 0·6	-14·8	-53·4
189·351 G	37	194	27	140	72·6	+ 0·7	-14·8	-42·7
190·392 C	52	249	32	152	72·2	+ 0·3	-14·8	-29·3
191·584 G	69	300	37	162	72·1	+ 0·2	-15·0	-13·7
192·395 C	58	300	31	159	71·5	- 0·4	-15·0	- 3·5
193·334 G	69	346	37	187	71·5	- 0·4	-15·1	+ 8·9
194·607 G	65	266	38	157	71·3	- 0·6	-15·1	+25·5
195·364 G	46	132	30	86	71·0	- 0·9	-15·0	+35·3
196·361 G	18	83	14	66	70·7	- 1·2	-14·8	+48·2
197·481 G	5	18	6	21	70·2	- 1·7	-14·8	+62·5

Spot a_2

187·333 G	39	199	72	368	69·5	0·0	-16·1	-72·5
188·554 G	72	367	71	360	69·4	- 0·1	-15·9	-56·5
189·351 G	92	476	71	367	69·1	- 0·4	-15·9	-46·2
190·392 C	81	497	51	313	68·9	- 0·6	-16·0	-32·6
191·584 G	99	536	55	300	68·5	- 1·0	-16·3	-17·3
192·395 C	99	448	53	242	68·4	- 1·1	-16·5	- 6·6
193·334 G	53	199	29	107	68·0	- 1·5	-16·7	+ 5·4
194·607 G	32	111	19	64	68·2	- 1·3	-16·6	+22·4

Group 12913.

July 14–19. A small group of bi-polar type; the follower has died out by July 18; and there is a new short-lived companion to the leader.

194·607 G	35	88	42	105	343·4	0·0	-16·6	-62·4
195·364 G	43	171	38	154	342·9	- 0·5	-16·5	-52·8
196·361 G	37	148	26	104	342·7	- 0·7	-16·1	-39·8
197·481 G	18	69	10	41	343·7	+ 0·3	-16·1	-24·0
198·393 C	13	40	7	22	347·0	+ 3·6	-14·6	- 8·7
199·332 G	5	12	3	6	348·0	+ 4·6	-15·0	+ 4·8
Means ..	..	..	21	72	344·6	..	-15·8	..

Group 12915.

July 15–23. A small group *np* Group 12911.

195·364 G	5	23	4	16	351·5	0·0	+11·9	-44·2
196·361 G	9	23	5	14	351·1	- 0·5	+11·8	-31·4
197·481 G	2	9	1	5	352·0	+ 0·3	+12·5	-15·7
198·393 C	2	9	1	4	351·6	- 0·1	+11·4	- 4·1
199·332 G	16	42	8	21	354·1	+ 2·3	+12·7	+10·9
200·478 G	9	55	5	31	354·0	+ 2·1	+12·4	+25·9
201·437 G	9	37	6	23	353·0	+ 1·0	+12·2	+37·6
202·398 C	0	0	0	0	..	..	..	..
203·366 G	5	14	6	16	354·8	+ 2·7	+13·0	+64·9
Means ..	..	..	4	14	352·8	..	+12·2	..

LEDGER II. - NON-RECURRENT GROUPS OF SUN SPOTS FOR THE YEAR.

Group 12920.

July 18–29. A large regular spot showing signs of breaking up about July 22. Three days later division into two parts has actually taken place, and complete extinction soon follows.

Date U.T. Place	Projected Area: Umbræ	Projected Area: Whole Spots	Corrected Area: Umbræ	Corrected Area: Whole Spots	Longitude and Proper Motion		Latitude	Long. from C.M.
d					°	°	°	°
198·393 C	22	130	49	287	277·9	0·0	+16·6	-77·8
199·332 G	37	245	44	289	278·0	+ 0·1	+16·6	-65·2
200·478 G	69	360	55	284	277·5	- 0·3	+16·4	-50·6
201·437 G	79	430	51	275	277·4	- 0·4	+16·4	-38·0
202·398 C	76	457	43	256	277·1	- 0·7	+16·4	-25·6
203·366 G	95	536	49	279	276·8	- 1·0	+16·3	-13·1
204·371 G	64	444	33	226	276·5	- 1·3	+16·4	- 0·1
205·340 G	46	297	24	154	276·3	- 1·4	+16·8	+12·6
206·438 G	48	209	27	119	276·3	- 1·4	+16·8	+27·1
207·364 C	13	51	9	34	276·6	- 1·1	+17·0	+39·6
208·439 C	4	27	3	23	277·0	- 0·7	+16·8	+54·2
209·368 C	2	4	2	5	277·1	- 0·6	+16·6	+66·6
Means ..	..	..	32	186	277·0	..	+16·6	..

Group 12922.

July 19–29. A small changing group showing renewed activity on July 27.

199·332 G	2	5	2	5	285·8	0·0	- 7·7	-57·4
200·478 G	32	106	23	75	284·2	- 1·8	- 6·1	-43·9
201·437 G	37	116	22	68	285·0	- 1·1	- 6·3	-30·4
202·398 C	16	56	9	30	283·3	- 3·0	- 5·6	-19·4
203·366 G	37	134	19	68	286·2	- 0·2	- 5·9	- 3·7
204·371 G	28	124	15	64	286·9	+ 0·3	- 5·4	+10·3
205·340 G	21	111	12	62	287·2	+ 0·5	- 6·2	+23·5
206·438 G	41	235	27	157	288·9	+ 2·0	- 7·7	+39·7
207·364 C	96	538	80	451	288·1	+ 1·1	- 7·3	+51·1
208·439 C	42	254	55	333	289·1	+ 1·9	- 7·9	+66·3
209·368 C	12	51	40	163	289·3	+ 1·9	- 8·3	+78·8
Means ..	..	..	28	134	286·7	..	- 6·8	..

Group 12923.

July 19–26. A small persistent group.

199·332 G	5	9	7	13	273·4	0·0	+ 6·4	-69·8
200·478 G	5	14	4	12	273·6	0·0	+ 6·6	-54·5
201·437 G	9	32	6	21	273·3	- 0·4	+ 6·6	-42·1
202·398 C	11	29	6	17	273·7	- 0·2	+ 6·5	-29·0
203·366 G	18	60	9	31	273·5	- 0·5	+ 6·3	-16·4
204·371 G	7	46	4	23	272·4	- 1·8	+ 6·7	- 4·2
205·340 G	5	23	3	12	274·3	0·0	+ 6·7	+10·6
206·438 G	7	32	4	18	273·3	- 1·2	+ 6·8	+24·1
Means ..	..	..	5	18	273·4	..	+ 6·6	..

Group 12924.

July 19–30. A small stream lengthened on July 24–25 by the addition of new spots that might possibly represent a separate group.

d					°	°	°	°
199·332 G	0	7	0	14	266·5	0·0	+20·7	-76·7
200·478 G	2	5	2	5	266·5	+ 0·2	+20·8	-61·6
201·437 G	18	55	15	45	264·0	- 2·2	+21·5	-51·4
202·398 C	27	92	18	62	264·1	- 2·0	+21·5	-38·6
203·366 G	69	236	40	137	264·0	- 2·0	+21·0	-25·9
204·371 G	85	379	45	200	265·8	0·0	+20·9	-10·8
205·340 G	87	433	45	225	268·5	+ 2·8	+20·2	+ 4·8
206·438 G	30	111	17	62	270·6	+ 5·1	+19·4	+21·4
207·364 C	32	114	20	69	269·3	+ 3·9	+19·8	+32·3
208·439 C	42	172	30	121	265·7	+ 0·4	+20·7	+42·9
209·368 C	16	65	14	56	263·9	- 1·2	+21·0	+53·4
210·340 C	6	15	7	19	263·8	- 1·2	+20·7	+66·2
Means ..	..	..	21	85	266·1	..	+20·7	..

Group 12926.

July 20–24. A small bi-polar group of rapid rise and decay.

200·478 G	16	85	9	44	340·0	0·0	+ 9·7	+11·9
201·437 G	67	314	38	175	341·7	+ 1·6	+ 8·8	+26·3
202·398 C	62	207	40	133	341·7	+ 1·4	+ 8·9	+39·0
203·366 G	25	81	20	66	342·4	+ 2·0	+ 9·0	+52·5
204·371 G	14	41	15	43	339·0	- 1·5	+ 8·1	+62·4
Means ..	..	..	24	92	341·0	..	+ 8·9	..

Group 12930.

July 22–Aug.2. A regular spot with a pair of small followers on July 23–25.

202·398 C	25	51	(63	129	224·9	..	- 7·3)	-77·8
203·366 G	35	176	44	220	224·6	0·0	- 7·8	-65·3
204·371 G	49	282	41	190	225·6	+ 0·8	- 7·4	-51·0
205·340 G	51	257	34	168	225·5	+ 0·6	- 7·1	-38·2
206·438 G	51	264	29	148	225·8	+ 0·7	- 6·6	-23·4
207·364 C	45	250	23	130	225·7	+ 0·5	- 6·5	-11·3
208·439 C	47	256	24	131	225·5	+ 0·1	- 6·4	+ 2·7
209·368 C	31	176	16	93	225·3	- 0·2	- 6·5	+14·8
210·340 C	27	149	16	86	225·4	- 0·3	- 6·4	+27·8
211·397 G	28	126	19	87	225·3	- 0·5	- 6·8	+41·7
212·328 G	16	90	14	79	225·1	- 0·9	- 7·1	+53·8
213·464 G	12	46	18	68	225·4	- 0·7	- 6·9	+69·1
Means ..	..	..	25	127	225·4	..	- 6·9	..

Group 12931.

July 23–29. A large stream of normal type developing rapidly.

203·366 G	60	206	30	103	291·6	0·0	+ 6·3	+ 1·7
204·371 G	128	647	65	332	291·2	- 0·6	+ 6·5	+14·6

LEDGER II. - NON-RECURRENT GROUPS OF SUN SPOTS FOR THE YEAR.

Date U.T. Place	Projected Area Umbræ	Projected Area Whole Spots	Corrected Area Umbræ	Corrected Area Whole Spots	Longitude and Proper Motion		Latitude	Long. from C.M.
Group 12931 — *continued*								
d					°	°	°	°
205·340 G	147	773	83	437	292·2	+ 0·3	+ 6·8	+28·5
206·438 G	156	799	107	549	292·2	+ 0·1	+ 7·1	+43·0
207·364 C	112	700	100	624	292·5	+ 0·3	+ 6·9	+55·5
208·439 C	56	290	88	460	294·3	+ 1·9	+ 6·9	+71·5
209·368 C	20	87	(46	200	288·6	..	+ 8·1)	+78·1
Means ..	..	..	79	418	292·3	..	+ 6·8	..
Spot *a*								
203·366 G	60	206	30	103	291·6	0·0	+ 6·3	+ 1·7
204·371 G	41	235	21	122	294·4	+ 2·6	+ 6·2	+17·8
205·340 G	87	398	50	231	295·1	+ 3·2	+ 6·1	+31·4
206·438 G	69	373	50	272	296·4	+ 4·3	+ 6·5	+47·2
207·364 C	45	290	45	290	297·4	+ 5·2	+ 6·4	+60·4
208·439 C	29	163	55	306	297·8	+ 5·4	+ 6·4	+75·0
Spot *b*								
204·371 G	87	412	44	210	289·4	0·0	+ 6·7	+12·8
205·340 G	60	375	33	206	289·2	− 0·4	+ 7·3	+25·5
206·438 G	87	426	57	277	288·8	− 0·9	+ 7·4	+39·6
207·364 C	49	339	39	271	288·5	− 1·4	+ 7·5	+51·5
208·439 C	27	127	33	154	288·8	− 1·2	+ 8·3	+66·0
209·368 C	20	87	46	200	288·6	− 1·6	+ 8·1	+78·1
Group 12936.								
July 29–Aug.4. One or two very small intermittent spots.								
209·368 C	4	9	6	14	138·5	0·0	+19·1	−72·0
210·340 C	4	9	4	9	137·8	− 0·6	+19·0	−59·8
211·397 G	0	0	0	0	..	..	..	..
212·328 G	5	9	3	5	137·5	− 0·7	+19·3	−33·8
213·464 G	0	0	0	0	..	..	..	..
214·344 G	0	0	0	0	..	..	..	..
215·342 G	5	37	3	19	138·9	+ 0·9	+18·8	+ 7·4
Means ..	..	..	2	7	138·2	..	+19·0	..
Group 12940.								
Aug.1–10. A small regular spot decreasing; a small spot follows on Aug.7.								
212·328 G	16	32	24	49	100·7	0·0	− 1·3	−70·6
213·464 G	9	62	8	55	101·4	+ 0·5	− 1·3	−54·9
214·344 G	14	82	10	57	102·1	+ 1·0	− 1·4	−42·6
215·342 G	18	73	10	42	102·9	+ 1·6	− 1·8	−28·6
216·342 G	14	57	7	30	103·8	+ 2·3	− 1·6	−14·4
217·365 C	18	27	9	14	104·9	+ 3·3	− 1·7	+ 0·2
Group 12940 — *continued*								
d					°	°	°	°
218·320 C	13	34	7	17	102·6	+ 0·8	− 1·9	+10·5
219·459 G	9	14	5	8	106·0	+ 4·0	− 2·0	+29·0
220·387 G	9	27	6	18	104·8	+ 2·6	− 2·6	+40·1
221·099 K	4	13	3	10	105·6	+ 3·3	− 2·8	+50·3
Means ..	..	..	9	30	103·5	..	− 1·8	..
Group 12941.								
Aug.1–13. A stable regular spot with a small train of companions.								
212·328 G	18	76	49	208	90·8	..	+13·0	−80·5
213·464 G	65	293	81	366	89·7	0·0	+12·6	−66·6
214·344 G	94	444	83	390	89·4	− 0·4	+12·8	−55·3
215·342 G	91	536	61	362	89·5	− 0·3	+12·7	−42·0
216·342 G	94	529	53	299	90·4	+ 0·5	+12·7	−27·8
217·365 C	78	455	41	236	91·0	+ 1·0	+12·5	−13·7
218·320 C	74	397	37	198	91·3	+ 1·3	+12·7	− 0·8
219·459 G	96	415	50	216	90·2	+ 0·1	+12·8	+13·2
220·387 G	89	492	50	272	89·2	− 1·0	+12·5	+24·5
221·099 K	104	478	64	290	89·1	− 1·1	+12·5	+33·8
222·344 G	78	274	60	215	89·4	− 0·9	+12·5	+50·5
223·339 G	37	160	42	183	90·3	− 0·1	+12·2	+64·5
224·497 G	14	60	38	164	91·0	..	+12·2	+80·6
Means ..	..	..	57	275	90·0	..	+12·6	..
Spot *a*								
212·328 G	18	76	49	208	90·8	..	+13·0	−80·5
213·464 G	51	237	61	282	90·4	0·0	+13·0	−65·9
214·344 G	66	316	55	265	90·7	+ 0·2	+13·1	−54·0
215·342 G	71	387	47	255	91·1	+ 0·6	+13·1	−40·4
216·342 G	78	398	44	223	91·[illegible]	+ 0·5	+12·9	−27·1
217·365 C	67	410	35	213	91·[illegible]	+ 0·5	+12·8	−13·5
218·320 C	74	397	37	198	91·3	+ 0·6	+12·7	− 0·8
219·459 G	73	353	38	184	91·4	+ 0·6	+12·8	+14·4
220·387 G	62	316	35	177	91·3	+ 0·4	+12·7	+26·6
221·099 K	64	288	40	179	91·5	+ 0·6	+12·5	+36·2
222·344 G	41	169	33	137	91·2	+ 0·2	+12·4	+52·3
223·339 G	32	151	37	175	91·0	− 0·1	+12·2	+65·2
224·497 G	14	60	38	164	91·0	..	+12·2	+80·6
Group 12946.								
Aug.3–11. A small variable group *s* of Group 12937.								
214·344 G	14	37	10	26	104·6	0·0	−15·5	−40·1
215·342 G	18	85	11	52	103·4	− 1·2	−16·0	−28·1
216·342 G	23	89	13	50	102·7	− 1·9	−16·1	−15·5
217·365 C	13	27	7	15	103·8	− 0·8	−15·2	− 0·9
218·320 C	22	112	12	62	104·5	− 0·1	−15·5	+12·4
219·459 G	44	132	26	80	103·2	− 1·4	−15·7	+26·2
220·387 G	23	78	16	55	103·[illegible]	− 0·7	−15·7	+39·2
221·099 K	6	34	5	28	102·[illegible]	− 1·8	−15·1	+47·5
222·344 G	5	7	6	9	[illegible]3·6	− 1·0	−14·3	+64·7
Means ..	..	..	12	42	103·6	..	−15·5	..

LEDGER II. - NON-RECURRENT GROUPS OF SUN SPOTS FOR THE YEAR.

Group 12948.

Aug.4–15. A bi-polar group consisting of two regular spots the following one surviving the leader by a few days.

Date U.T. Place	Projected Area Umbræ	Projected Area Whole Spots	Corrected Area Umbræ	Corrected Area Whole Spots	Longitude and Proper Motion		Latitude	Long. from C.M.
d					°	°	°	°
215·342 G	9	69	(27	209	54·8	..	−24·9)	−76·7
216·342 G	45	296	75	493	51·6	0·0	−25·9	−66·6
217·365 C	71	417	74	437	51·4	+ 0·1	−25·7	−53·3
218·320 C	80	519	65	422	50·6	− 0·4	−26·0	−41·5
219·459 G	100	549	67	366	50·3	− 0·3	−25·5	−26·7
220·387 G	101	555	61	336	50·1	− 0·2	−25·5	−14·6
221·099 K	87	426	52	254	49·6	− 0·5	−25·9	− 5·7
222·344 G	51	280	31	170	47·6	− 2·1	−26·4	+ 8·7
223·339 G	46	172	30	112	47·0	− 2·3	−26·8	+21·2
224·497 G	9	41	7	31	45·8	− 3·2	−27·3	+35·4
225·373 C	9	18	8	16	45·5	− 3·2	−27·5	+46·7
226·367 G	5	14	6	18	45·0	− 3·3	−27·6	+59·3
Means ..	..	..	43	241	48·6	..	−26·4	..

Group 12951.

Aug.5–15. A regular spot slowly diminishing; a pair of ephemeral companions appear on Aug.15.

216·342 G	9	44	24	117	37·5	..	+22·8	−80·7
217·365 C	18	103	23	133	36·8	0·0	+22·8	−67·9
218·320 C	18	120	16	108	36·4	− 0·2	+23·1	−55·7
219·459 G	27	114	18	78	36·2	− 0·2	+23·1	−40·8
220·387 G	23	128	14	76	35·8	− 0·4	+23·2	−28·9
221·099 K	26	87	14	48	35·5	− 0·5	+23·0	−19·8
222·344 G	14	44	7	23	34·9	− 0·9	+22·8	− 4·0
223·339 G	9	44	5	23	33·8	− 1·8	+22·6	+ 8·0
224·497 G	5	18	3	10	33·8	− 1·6	+22·8	+23·4
225·373 C	7	24	4	15	34·4	− 0·8	+23·3	+35·6
226·367 G	5	9	4	7	34·6	− 0·4	+21·7	+48·9
Means ..	..	..	11	52	35·2	..	+22·8	..

Group 12954.

Aug.8–19. A pair of spots; the follower, at first a regular spot, becomes elongated and partly breaks up on Aug.15.

219·459 G	30	279	107	953	359·6	0·0	−24·0	−77·4
220·387 G	76	600	117	955	359·0	− 0·3	−23·8	−65·7
221·099 K	109	837	122	918	359·2	0·0	−23·6	−56·1
222·344 G	155	989	122	776	358·4	− 0·4	−23·9	−40·5
223·339 G	174	971	117	651	357·4	− 1·1	−24·3	−28·4
224·497 G	153	1092	92	658	356·3	− 1·9	−24·4	−14·1
225·373 C	160	992	93	582	355·6	− 2·4	−24·9	− 3·2
226·367 G	151	939	91	563	355·0	− 2·7	−25·3	+ 9·3
227·568 G	98	625	65	410	354·6	− 2·8	−26·2	+24·8
228·348 G	94	508	69	373	353·9	− 3·3	−26·0	+34·4
229·459 G	50	228	47	214	353·7	− 3·2	−25·9	+48·9
230·622 G	16	59	24	87	352·9	− 3·7	−26·7	+63·4
Means ..	..	..	89	595	356·3	..	−24·9	..

Group 12954 — *continued*

Spot *a*

Date U.T. Place	Projected Area Umbræ	Projected Area Whole Spots	Corrected Area Umbræ	Corrected Area Whole Spots	Longitude and Proper Motion		Latitude	Long. from C.M.
d					°	°	°	°
219·459 G	16	169	40	26	2·4	0·0	−22·8	−74·6
220·387 G	53	362	73	496	1·1	− 1·0	−23·0	−63·6
221·099 K	49	475	49	480	1·3	− 0·7	−23·0	−54·0
222·344 G	82	504	61	373	0·5	− 1·1	−23·1	−38·4
223·339 G	78	453	51	294	0·2	− 1·1	−23·6	−25·6
224·497 G	64	412	38	243	359·1	− 1·9	−24·0	−11·3
225·373 C	49	273	28	158	358·6	− 2·2	−24·5	− 0·2
226·367 G	55	247	33	148	357·9	− 2·6	−24·9	+12·2
227·568 G	34	167	23	112	357·6	− 2·6	−25·5	+27·8
228·348 G	27	157	21	121	357·6	− 2·4	−25·8	+38·1
229·459 G	18	82	19	84	357·7	− 2·0	−25·7	+52·9
230·622 G	7	27	12	46	356·9	− 2·5	−25·7	+67·4

Spot *b*

219·459 G	14	110	67	527	356·6	..	−25·0	−80·4
220·387 G	23	238	44	457	354·5	0·0	−25·3	−70·2
221·099 K	60	362	73	438	355·9	+ 1·6	−24·8	−59·4
222·344 G	73	485	61	403	355·3	+ 1·3	−24·7	−43·6
223·339 G	96	518	66	357	355·2	+ 1·5	−25·0	−30·6
224·497 G	89	680	54	415	354·6	+ 1·2	−24·7	−15·8
225·373 C	111	719	65	424	354·4	+ 1·3	−25·0	− 4·4
226·367 G	96	692	58	415	353·6	+ 0·7	−25·3	+ 7·9
227·568 G	37	197	24	126	351·7	− 0·8	−25·8	+21·9
228·348 G	46	196	32	137	351·3	− 1·0	−25·7	+31·8
229·459 G	32	146	28	130	351·2	− 0·8	−26·0	+46·4
230·622 G	9	32	12	41	350·1	− 1·6	−26·0	+60·6

Group 12960.

Aug.11–22. A stable regular spot.

222·344 G	18	124	31	213	329·9	0·0	−21·1	−69·0
223·339 G	37	202	39	214	329·3	− 0·5	−21·0	−56·5
224·497 G	46	284	35	219	328·5	− 1·1	−20·9	−41·9
225·373 C	53	329	35	217	328·4	− 1·1	−20·7	−30·4
226·367 G	64	408	38	241	328·1	− 1·3	−20·3	−17·6
227·568 G	50	332	28	186	328·0	− 1·2	−20·6	− 1·8
228·348 G	46	328	26	187	327·6	− 1·5	−20·4	+ 8·1
229·459 G	59	315	36	192	327·2	− 1·7	−20·3	+22·4
230·622 G	46	219	33	158	326·8	− 2·0	−20·4	+37·3
231·362 C	55	252	46	212	326·6	− 2·1	−20·5	+46·9
232·369 C	27	137	32	162	326·2	− 2·3	−20·9	+59·8
233·395 C	13	69	30	159	326·2	− 2·2	−21·2	+73·4
Means ..	..	..	34	197	327·7	..	−20·7	..

Group 12967.

Aug.16–25. A small unstable stream reforming on Aug.19–20.

227·568 G	34	126	20	74	299·9	0·0	+17·3	−29·9
228·348 G	34	194	19	105	300·4	+ 0·6	+17·7	−19·1
229·459 G	23	75	12	39	297·1	− 2·7	+18·1	− 7·7
230·622 G	5	9	3	5	299·1	− 0·6	+18·5	+ 9·6
231·362 C	38	110	20	58	294·3	− 5·4	+17·9	+14·6

LEDGER II. - NON-RECURRENT GROUPS OF SUN SPOTS FOR THE YEAR.

Group 12967 — *continued*

Date U.T. Place	Projected Area Umbra	Projected Area Whole Spots	Corrected Area Umbra	Corrected Area Whole Spots	Longitude and Proper Motion		Latitude	Long. from C.M.
d					°	°	°	°
232·369 C	29	73	17	42	294·8	− 4·8	+18·0	+28·4
233·395 C	22	62	15	42	295·2	− 4·4	+18·3	+42·4
234·342 G	11	27	9	23	295·1	− 4·4	+18·1	+54·8
235·342 G	2	5	3	7	298·4	− 1·0	+17·8	+71·3
236·340 G	12	36	32	98	294·7	..	+17·9	+80·8
Means ..	..	..	13	44	297·1	..	+18·0	..

Group 12975.

Aug.23–29. A stream of sudden growth. The follower is the first important component to form; the leader, represented by a cluster, develops a few days later.

234·342 G	77	223	43	123	235·5	0·0	−17·0	− 4·8
235·342 G	93	497	51	273	235·1	− 0·4	−17·2	+ 8·0
236·340 G	132	521	77	307	235·8	+ 0·4	−16·8	+21·9
237·457 G	100	433	71	305	236·2	+ 0·8	−16·7	+37·1
238·482 G	52	319	49	303	238·2	+ 2·8	−17·5	+52·6
239·381 C	20	168	27	249	239·6	+ 4·3	−17·3	+65·9
240·105 K	21	88	52	223	239·0	+ 3·7	−17·3	+74·8
Means ..	..	..	53	255	237·1	..	−17·1	..

Spot *b*

234·342 G	41	141	23	78	234·4	0·0	−16·4	− 5·9
235·342 G	93	497	51	273	235·1	+ 0·7	−17·2	+ 8·0
236·340 G	71	264	41	153	233·4	− 0·9	−16·9	+19·5
237·457 G	36	180	24	121	232·7	− 1·6	−17·8	+33·6
238·482 G	25	132	21	110	232·9	− 1·4	−18·1	+47·3
239·381 C	9	35	10	39	232·6	− 1·6	−17·7	+58·9
240·105 K	2	10	3	16	232·5	− 1·7	−18·0	+68·3

Group 12977.

Aug.25–30. A small stream.

236·340 G	20	61	15	44	167·0	0·0	+12·5	−46·9
237·457 G	64	196	38	118	165·7	− 1·4	+12·7	−33·4
238·482 G	48	164	25	87	166·5	− 0·6	+12·4	−19·1
239·381 C	38	183	19	93	167·0	− 0·2	+12·7	− 6·7
240·105 K	40	166	20	83	166·8	− 0·5	+12·6	+ 2·6
241·341 G	16	73	8	39	166·9	− 0·4	+12·5	+19·1
Means ..	..	..	21	77	166·6	..	+12·6	..

Group 12978.

Aug.25–31. A small stream of which the following part is the last to die out. (Continued for two days longer as Group 12987).

236·340 G	10	23	19	42	138·1	0·0	+27·6	−75·8
237·457 G	28	76	32	86	135·0	− 2·7	+27·6	−64·1
238·482 G	28	117	24	96	134·0	− 3·3	+27·5	−51·6

Group 12978. — *continued*

d					°	°	°	°
239·381 C	28	173	18	120	133·1	− 3·9	+27·7	−40·6
240·105 K	38	189	24	117	133·7	− 3·0	+27·3	−30·5
241·341 G	32	123	18	69	131·2	− 5·0	+28·2	−16·6
242·415 C	22	75	12	40	130·6	− 5·2	+28·2	− 3·0
Means ..	..	..	21	81	133·7	..	+27·7	..

Group 12979.

Aug.26–Sept.4. A pair of spots on Aug.26–27; a small single spot on Sept. 2 and 4.

237·457 G	20	50	24	63	136·4	0·0	−15·1	−62·7
238·482 G	9	32	7	27	136·9	+ 0·5	−15·1	−48·7
239·381 C	0	0	0	0	..	..	..	..
240·105 K	0	0	0	0	..	..	..	..
241·341 G	0	0	0	0	..	..	..	..
242·415 C	0	0	0	0	..	..	..	..
243·388 G	0	0	0	0	..	..	..	..
244·344 G	2	5	1	3	138·1	+ 1·6	−13·5	+29·9
245·340 G	0	0	0	0	..	..	..	..
246·399 G	5	18	5	18	136·0	− 0·6	−16·0	+55·0
Means ..	..	..	4	11	136·8	..	−14·9	..

Group 12980.

Aug.27–Sept.7. A long irregular stream; the largest and most persistent individual spot following.

238·482 G	16	59	(65	239	100·6	..	+13·2)	−85·0
239·381 C	37	177	73	376	98·6	0·0	+14·0	−75·1
240·105 K	103	475	135	618	97·8	− 0·8	+13·5	−66·4
241·341 G	146	673	117	544	95·9	− 2·8	+13·4	−51·9
242·415 C	150	824	93	514	97·0	− 1·8	+13·4	−36·6
243·388 G	145	646	81	359	96·5	− 2·3	+13·4	−24·3
244·344 G	175	892	92	460	95·9	− 3·0	+12·9	−12·3
245·340 G	128	594	64	299	95·6	− 3·3	+13·7	+ 0·6
246·399 G	64	429	33	225	96·7	− 2·3	+13·2	+15·7
247·402 G	59	277	34	158	96·0	− 3·0	+13·4	+28·2
248·453 C	35	171	24	123	99·8	+ 0·7	+12·6	+45·9
249·433 G	14	82	16	92	105·2	+ 6·1	+12·5	+64·2
Means ..	..	..	69	343	97·7	..	+13·3	..

Group 12984.

Aug.29–Sept.4. A few small spots in the wake of Group 12980.

240·105 K	2	10	5	27	83·0	..	+17·2	−81·2
241·341 G	9	32	11	38	81·7	0·0	+17·5	−66·1
242·415 C	4	18	3	15	81·6	0·0	+17·7	−52·0
243·388 G	2	5	1	3	83·1	+ 1·5	+18·1	−37·7
244·344 G	5	32	3	18	82·8	+ 1·3	+17·8	−25·4
245·340 G	0	0	0	0	..	..	..	..
246·399 G	5	9	3	5	84·1	+ 2·7	+19·8	+ 3·1
Means ..	..	..	4	13	82·7	..	+18·2	..

LEDGER II. - NON-RECURRENT GROUPS OF SUN SPOTS FOR THE YEAR.

Group 12992.

Sept.2–13. A regular spot disappearing rather quickly as it approaches the west limb.

Date U.T. Place	Projected Area Umbræ	Projected Area Whole Spots	Corrected Area Umbræ	Corrected Area Whole Spots	Longitude and Proper Motion	Latitude	Long. from C.M.
d					°	°	°	°
244·344 G	5	41	22	180	23·6	..	+11·0	-84·6
245·340 G	20	109	29	157	24·4	0·0	+11·1	-70·6
246·399 G	34	154	30	137	24·7	+ 0·2	+10·7	-56·3
247·402 G	45	200	31	136	25·0	+ 0·4	+10·8	-42·8
248·453 C	53	253	30	144	24·6	- 0·1	+10·6	-29·3
249·433 G	50	268	26	139	25·2	+ 0·4	+10·5	-15·8
250·360 C	37	257	18	128	25·2	+ 0·3	+10·6	- 3·5
251·339 G	45	250	23	128	25·2	+ 0·2	+10·8	+ 9·4
252·345 G	45	199	24	107	25·1	0·0	+10·5	+22·6
253·487 G	32	154	20	97	25·3	+ 0·1	+10·3	+37·9
254·412 G	23	81	18	62	25·1	- 0·2	+10·3	+49·9
255·361 G	9	41	10	43	25·2	- 0·2	+10·3	+62·5
Means ..	..	..	24	116	25·0	..	+10·6	..

Group 12996.

Sept.8–17. A small stream.

250·360 C	15	53	26	87	315·4	0·0	+11·3	-73·3
251·339 G	23	125	24	129	314·8	- 0·7	+11·0	-61·0
252·345 G	25	107	19	79	314·8	- 0·8	+11·0	-47·7
253·487 G	29	124	18	76	312·8	- 2·9	+11·3	-34·6
254·412 G	41	124	22	67	313·3	- 2·4	+11·1	-21·9
255·361 G	27	208	14	106	313·4	- 2·4	+10·8	- 9·3
256·355 G	23	131	12	66	313·2	- 2·7	+11·1	+ 3·6
257·338 G	34	176	18	92	312·1	- 3·9	+12·3	+15·5
258·340 G	11	59	6	34	311·7	- 4·4	+12·5	+28·4
259·376 G	4	9	3	6	310·8	- 5·4	+14·5	+41·1
Means ..	..	..	16	74	313·2	..	+11·7	..

Group 12999.

Sept.11–22. A bi-polar group in which the leader shows a sudden increase on Sept.14 to 15, in taking its final form as a regular spot.

253·487 G	5	18	8	28	275·3	0·0	+ 7·8	-72·1
254·412 G	11	54	10	50	277·7	+ 2·3	+ 7·7	-57·5
255·361 G	29	131	20	92	278·0	+ 2·4	+ 7·4	-44·7
256·355 G	50	244	30	144	277·3	+ 1·6	+ 7·8	-32·3
257·338 G	97	496	51	260	278·5	+ 2·6	+ 7·6	-18·1
258·340 G	126	735	63	368	278·4	+ 2·4	+ 7·5	- 4·9
259·376 G	112	652	56	331	279·3	+ 3·1	+ 6·9	+ 9·6
260·404 C	107	633	59	347	280·5	+ 4·2	+ 7·0	+24·4
261·369 G	104	513	65	322	281·0	+ 4·5	+ 6·9	+37·6
262·538 G	67	342	56	287	281·6	+ 4·9	+ 6·7	+53·7
263·364 C	44	262	50	299	281·4	+ 4·6	+ 6·8	+64·4
264·344 G	20	117	43	254	281·5	+ 4·6	+ 6·7	+77·4
Means ..	..	..	43	232	279·2	..	+ 7·2	..

Group 13006.

Sept.19–Oct.1. A large spot with a piece detatched on its following side and showing little or no tendency to drift away from the parent spot.

d					°	°	°	°
261·369 G	22	126	90	513	161·8	..	- 9·8	-81·6
262·538 G	79	518	108	710	161·1	0·0	- 9·8	-66·8
263·364 C	105	796	99	748	161·5	+ 0·3	- 9·8	-55·5
264·344 G	137	1019	97	723	161·9	+ 0·6	- 9·6	-42·2
265·334 G	169	1030	101	618	161·7	+ 0·3	- 9·8	-29·3
266·357 G	178	1269	96	685	161·9	+ 0·3	- 9·1	-15·6
267·173 K	119	1050	62	546	162·4	+ 0·7	- 9·6	- 4·3
268·485 G	157	851	85	460	162·7	+ 0·9	- 9·5	+13·3
269·346 G	125	802	71	457	162·6	+ 0·7	- 9·6	+24·5
270·350 G	125	874	82	577	162·6	+ 0·6	- 9·6	+37·8
271·397 G	92	591	78	502	164·1	+ 1·9	- 9·4	+53·1
272·340 G	67	421	86	543	164·1	+ 1·8	- 9·6	+65·5
273·417 G	22	150	64	438	163·1	+ 0·7	- 9·8	+78·7
Means ..	..	..	86	584	162·5	..	- 9·6	..

Group 13010.

Sept.23–28. A small unstable group, not seen on Sept.24.

265·334 G	6	13	9	18	121·1	0·0	+29·9	-69·9
266·357 G	0	0	0	0	..	..	..	..
267·173 K	23	90	17	67	122·3	+ 2·0	+30·0	-44·4
268·485 G	17	45	11	27	123·3	+ 3·6	+29·8	-26·1
269·346 G	11	49	6	27	123·2	+ 3·9	+29·7	-14·9
270·350 G	9	38	5	21	120·4	+ 1·6	+30·1	- 4·4
Means ..	..	..	8	27	122·1	..	+29·9	..

Group 13011.

Sept.24–Oct.1. A diminishing regular spot. Group 13012 forms closely north of it.

266·357 G	18	76	32	137	102·5	0·0	+11·7	-75·0
267·173 K	17	100	19	113	102·2	- 0·4	+11·8	-64·5
268·485 G	29	143	21	103	102·6	- 0·1	+11·5	-46·8
269·346 G	31	143	19	87	103·1	+ 0·3	+11·7	-35·0
270·350 G	27	101	15	55	103·0	+ 0·2	+11·5	-21·8
271·397 G	9	40	5	20	103·3	+ 0·4	+12·1	- 7·7
272·340 G	4	11	2	6	103·0	0·0	+12·6	+ 4·4
273·417 G	4	40	2	21	102·4	- 0·7	+10·5	+18·0
Means ..	..	..	14	68	102·8	..	+11·7	..

Group 13012.

Sept.24–Oct.4. A small stream, long-lived for its size.

266·357 G	4	9	8	18	101·1	0·0	+13·9	-76·4
267·173 K	4	10	5	11	101·8	+ 0·7	+13·8	-64·9
268·485 G	13	60	10	46	100·4	- 0·8	+14·5	-49·0
269·346 G	31	123	19	77	100·4	- 0·8	+14·8	-37·7

LEDGER II. - NON-RECURRENT GROUPS OF SUN SPOTS FOR THE YEAR.

Date U.T. Place	Projected Area Umbrae	Projected Area Whole Spots	Corrected Area Umbrae	Corrected Area Whole Spots	Longitude and Proper Motion		Latitude	Long. from C.M.
Group 13012 — *continued*								
d					°	°	°	°
270·350 G	33	112	18	60	103·8	+ 2·6	+14·4	-21·0
271·397 G	31	146	16	74	103·1	+ 1·8	+13·9	- 7·9
272·340 G	43	267	22	136	103·2	+ 1·9	+14·7	+ 4·6
273·417 G	49	215	26	114	102·9	+ 1·6	+14·4	+18·5
274·455 C	28	130	17	77	103·1	+ 1·7	+14·1	+32·4
275·377 G	11	49	8	36	106·1	+ 4·7	+13·9	+47·6
276·378 G	7	27	7	27	106·1	+ 4·7	+13·4	+60·8
Means ..	..	..	14	61	102·9	..	+14·2	..
Group 13014.								
Sept.26-Oct.3. A stream led by a regular spot.								
268·485 G	117	480	60	248	139·2	0·0	+17·0	-10·2
269·346 G	134	591	68	301	139·2	0·0	+17·0	+ 1·1
270·350 G	162	724	85	379	138·8	- 0·3	+17·0	+14·0
271·397 G	90	529	52	306	138·8	- 0·3	+17·3	+27·8
272·340 G	63	344	43	232	139·7	+ 0·6	+17·3	+41·1
273·417 G	26	155	25	146	142·3	+ 3·3	+17·0	+57·9
274·455 C	17	78	28	127	143·3	+ 4·3	+16·6	+72·6
275·377 G	7	36	31	158	143·6	..	+16·6	+85·1
Means ..	..	..	52	248	140·2	..	+17·0	..
Group 13017.								
Sept.27-Oct.2. A diminishing regular spot with occasional companions.								
269·346 G	9	40	17	77	64·3	0·0	- 7·3	-73·8
270·350 G	11	58	11	59	65·7	+ 1·2	- 7·4	-59·1
271·397 G	13	72	9	53	66·0	+ 1·4	- 7·5	-45·0
272·340 G	11	54	7	33	65·9	+ 1·2	- 8·0	-32·7
273·417 G	9	18	5	10	67·1	+ 2·2	- 7·2	-17·3
274·455 C	17	65	9	34	67·3	+ 2·2	- 7·5	- 3·4
Means ..	..	..	10	44	66·0	..	- 7·5	..
Group 13018.								
Sept.29-Oct.10. A typical bi-polar group; the leader outliving the follower as is usual.								
271·397 G	4	18	6	25	41·1	0·0	+20·1	-69·9
272·340 G	17	81	16	75	41·1	+ 0·1	+20·2	-57·5
273·417 G	65	254	46	177	41·0	+ 0·1	+20·4	-43·4
274·455 C	82	363	49	217	40·1	- 0·6	+20·1	-30·6
275·377 G	76	395	41	214	39·5	- 1·1	+20·0	-19·0
276·378 G	54	317	28	165	39·5	- 1·0	+19·6	- 5·8
277·509 C	77	330	40	171	39·7	- 0·7	+20·1	+ 9·3
278·380 G	58	232	32	128	39·6	- 0·7	+20·2	+20·7
279·122 K	37	200	22	118	39·9	- 0·3	+20·1	+30·8
280·400 G	22	149	17	113	40·3	+ 0·2	+20·0	+48·1
Group 13018 — *continued*								
d					°	°	°	°
281·399 C	13	73	13	75	40·1	+ 0·1	+19·9	+61·1
282·470 G	2	9	4	16	40·1	+ 0·3	+19·4	+75·2
Means ..	..	..	26	125	40·2	..	+20·0	..
Spot *a*								
271·397 G	4	18	6	25	41·1	0·0	+20·1	-69·9
272·340 G	13	72	12	66	41·6	+ 0·6	+20·4	-57·0
273·417 G	52	202	36	139	41·6	+ 0·7	+20·5	-42·8
274·455 C	39	242	23	143	41·4	+ 0·7	+20·3	-29·3
275·377 G	45	210	24	113	41·1	+ 0·5	+20·2	-17·4
276·378 G	27	183	14	95	40·7	+ 0·2	+19·8	- 4·6
277·509 C	60	287	31	149	40·5	+ 0·1	+20·1	+10·1
278·380 G	51	205	28	113	40·2	- 0·1	+20·1	+21·3
279·122 K	37	200	22	118	39·9	- 0·3	+20·1	+30·8
280·400 G	22	149	17	113	40·3	+ 0·2	+20·0	+48·1
281·399 C	13	73	13	75	40·1	+ 0·1	+19·9	+61·1
282·470 G	2	9	4	16	40·1	+ 0·3	+19·4	+75·2
Group 13025.								
Oct.7-12. A small stream of a few spots.								
279·122 K	4	14	2	7	356·8	0·0	+ 8·0	-12·3
280·400 G	49	152	24	76	356·8	- 0·2	+ 8·0	+ 4·6
281·399 C	56	181	29	94	356·7	- 0·4	+ 7·4	+17·7
282·470 G	16	84	9	50	357·7	+ 0·4	+ 7·6	+32·8
283·378 G	16	36	12	26	0·2	+ 2·8	+ 7·7	+47·3
284·378 G	9	29	9	30	1·6	+ 4·1	+ 8·0	+61·9
Means ..	..	..	14	47	358·3	..	+ 7·8	..
Group 13027.								
Oct.9-14. A small stream.								
281·399 C	13	30	7	15	331·1	0·0	+12·1	- 7·9
282·470 G	16	56	8	29	333·1	+ 1·9	+12·2	+ 8·2
283·378 G	18	44	10	24	334·8	+ 3·6	+12·4	+21·9
284·378 G	58	269	35	164	333·9	+ 2·6	+12·4	+34·2
285·411 C	30	108	23	85	336·0	+ 4·6	+12·7	+49·9
286·378 G	13	31	15	34	336·8	+ 5·3	+12·7	+63·4
Means ..	..	..	16	58	334·3	..	+12·4	..
Group 13028.								
Oct.9-17. A typical bi-polar group, the follower dies out after Oct.12.								
281·399 C	28	124	66	273	263·8	0·0	- 6·9	-75·2
282·470 G	45	249	50	274	264·0	0·0	- 6·8	-60·9
283·378 G	56	237	44	184	264·7	+ 0·6	- 6·6	-48·2

LEDGER II. - NON-RECURRENT GROUPS OF SUN SPOTS FOR THE YEAR.

Group 13028 — *continued*

Date U.T. Place	Projected Area Umbræ	Projected Area Whole Spots	Corrected Area Umbræ	Corrected Area Whole Spots	Longitude and Proper Motion		Latitude	Long. from C.M.
d					°	°	°	°
284·378 G	48	258	30	161	265·2	+ 0·9	− 6·3	−34·5
285·411 C	47	194	26	107	265·8	+ 1·3	− 6·0	−20·3
286·378 G	24	144	12	73	266·0	+ 1·4	− 5·6	− 7·4
287·376 G	24	120	12	61	266·2	+ 1·4	− 5·6	+ 6·0
288·377 C	21	81	11	44	266·6	+ 1·7	− 5·2	+19·6
289·372 G	9	27	5	16	267·2	+ 2·1	− 5·4	+33·3
Means ..	..	..	28	133	265·5	..	− 6·0	..

Group 13035.

Oct.15–22. A small spot which has died out by Oct.19; another small spot appears on Oct.21–22.

287·376 G	4	9	9	21	181·3	0·0	+26·8	−78·9
288·377 C	6	32	8	38	182·5	+ 1·5	+26·3	−64·5
289·372 G	7	24	6	20	181·7	+ 1·0	+25·9	−52·2
290·423 G	0	4	0	3	179·0	− 1·4	+25·3	−41·0
291·430 G	0	0	0	0	..	..	..	..
292·455 G	0	0	0	0	..	..	..	..
293·374 G	0	4	0	2	178·8	− 0·7	+23·0	− 2·3
294·380 G	2	4	1	2	181·9	+ 2·7	+26·5	+14·1
Means ..	...	..	3	11	180·9	..	+25·6	..

Group 13038.

Oct.20–31. A spot not always of regular structure, followed by a companion which expands into a cluster for a few days.

292·455 G	13	51	18	71	123·6	0·0	+24·1	−69·6
293·374 G	87	393	83	370	124·0	+ 0·7	+24·5	−57·1
294·380 G	100	506	72	365	124·2	+ 1·2	+24·6	−43·6
295·416 G	97	579	59	350	124·9	+ 2·1	+25·1	−29·3
296·434 G	95	537	52	297	125·3	+ 2·8	+25·2	−15·4
297·447 G	101	510	53	270	125·1	+ 2·9	+25·1	− 2·3
298·437 G	82	517	45	279	124·1	+ 2·2	+25·1	+ 9·8
299·413 G	88	493	50	281	123·4	+ 1·8	+25·4	+22·0
300·446 G	68	339	44	220	123·3	+ 2·0	+25·5	+35·5
301·435 G	31	229	24	181	123·0	+ 2·0	+26·0	+48·2
302·389 C	34	141	36	149	122·9	+ 2·1	+26·4	+60·7
303·337 C	17	68	30	118	123·1	+ 2·6	+26·8	+73·4
Means ..	..	..	47	246	123·9	..	+25·3	..

Spot *a*

292·455 G	13	51	18	71	123·6	0·0	+24·1	−69·6
293·374 G	49	287	45	264	124·9	+ 1·6	+25·0	−56·2
294·380 G	71	351	50	249	125·7	+ 2·7	+25·1	−42·1
295·416 G	62	442	37	265	125·9	+ 3·1	+25·5	−28·3
296·434 G	77	407	42	224	126·1	+ 3·6	+25·5	−14·6
297·447 G	70	374	37	198	125·7	+ 3·5	+25·7	− 1·7
298·437 G	64	337	35	182	125·3	+ 3·4	+25·5	+11·0
299·413 G	88	493	50	281	123·4	+ 1·8	+25·4	+22·0
300·446 G	68	339	44	220	123·3	+ 2·0	+25·5	+35·5
301·435 G	31	229	24	181	123·0	+ 2·0	+26·0	+48·2
302·389 C	34	141	36	149	122·9	+ 2·1	+26·4	+60·7
303·337 C	17	68	30	118	123·1	+ 2·6	+26·8	+73·4

Group 13039

Oct.20–28. A regular spot with double umbra. New spots appear closely *np* on October 24, but the whole group dwindles rapidly.

Date U.T. Place	Projected Area Umbræ	Projected Area Whole Spots	Corrected Area Umbræ	Corrected Area Whole Spots	Longitude and Proper Motion		Latitude	Long. from C.M.
d					°	°	°	°
292·455 G	22	164	36	269	120·2	0·0	+13·7	−73·0
293·374 G	49	256	49	259	120·3	+ 0·1	+13·8	−60·8
294·380 G	62	327	46	245	119·6	− 0·7	+13·8	−48·2
295·416 G	53	298	32	182	119·3	− 1·0	+13·8	−34·9
296·434 G	71	373	38	201	119·9	− 0·5	+14·1	−20·8
297·447 G	70	301	36	154	120·0	− 0·4	+14·4	− 7·4
298·437 G	35	128	18	65	119·5	− 1·0	+13·8	+ 5·2
299·413 G	24	106	13	56	119·4	− 1·1	+13·1	+18·0
300·446 G	4	24	2	14	119·1	− 1·5	+12·9	+31·3
Means ..	..	..	30	161	119·7	..	+13·7	..

Group 13040.

Oct.22–27. A miniature stream fully formed on one day only (Oct.23); one spot remains after Oct.24.

294·380 G	4	13	2	6	169·5	0·0	+11·9	+ 1·7
295·416 G	22	73	11	38	170·4	+ 0·8	+12·2	+16·2
296·434 G	9	40	5	23	170·7	+ 1·0	+12·1	+30·0
297·447 G	4	13	3	9	171·7	+ 2·0	+12·2	+44·3
298·437 G	4	9	4	8	172·2	+ 2·4	+12·2	+57·9
299·413 G	4	9	6	13	172·2	+ 2·3	+12·1	+70·8
Means ..	..	..	5	16	171·1	..	+12·1	..

Group 13041.

Oct.23–Nov.1. A vigorous stream with a rapid development between Oct.25 and 26. The head of the stream alone survives as the west limb is approached.

295·416 G	4	11	3	9	103·7	0·0	−14·1	−50·5
296·434 G	15	38	10	24	106·9	+ 3·2	−15·0	−33·8
297·447 G	59	156	34	89	105·9	+ 2·1	−14·7	−21·5
298·437 G	237	933	126	494	106·3	+ 2·5	−13·5	− 8·0
299·413 G	246	1294	130	682	106·8	+ 2·9	−13·5	+ 5·4
300·446 G	262	1092	147	616	108·1	+ 4·2	−13·7	+20·3
301·435 G	163	814	104	524	109·6	+ 5·6	−13·3	+34·8
302·389 C	125	621	101	518	110·9	+ 6·9	−13·1	+48·7
303·337 C	60	307	69	361	112·0	+ 8·0	−13·4	+62·3
304·471 G	18	110	50	293	112·4	+ 8·3	−13·6	+77·7
Means ..	..	..	77	361	108·3	..	−13·8	..

Spot *a*

296·434 G	11	31	7	20	107·6	0·0	−14·8	−33·1
297·447 G	37	103	21	58	108·2	+ 0·6	−15·0	−19·2
298·437 G	145	629	77	333	108·8	+ 1·1	−14·5	− 5·5
299·413 G	97	539	52	291	109·9	+ 2·2	−15·2	+ 8·5

continued

LEDGER II. - NON-RECURRENT GROUPS OF SUN SPOTS FOR THE YEAR.

Group 13041 — *continued*

Spot *a* — *continued*

Date U.T. Place	Projected Area: Umbrae	Projected Area: Whole Spots	Corrected Area: Umbrae	Corrected Area: Whole Spots	Longitude and Proper Motion		Latitude	Long. from C.M.
d					°	°	°	°
300·446 G	128	524	74	304	111·8	+ 4·0	−14·5	+24·0
301·435 G	84	444	56	297	112·8	+ 5·0	−14·1	+38·0
302·389 C	68	375	58	319	113·5	+ 5·6	−13·4	+51·3
303·337 C	36	213	45	266	114·0	+ 6·1	−13·8	+64·3
304·471 G	11	66	35	208	114·1	+ 6·2	−14·4	+79·4

Spot *b*

295·416 G	4	11	3	9	103·7	0·0	−14·1	−50·5
296·434 G	4	9	3	6	104·4	+ 0·7	−15·4	−36·3
297·447 G	18	44	11	26	101·8	− 2·0	−14·1	−25·6
298·437 G	51	176	28	95	99·6	− 4·2	−12·1	−14·7
299·413 G	48	238	25	124	99·3	− 4·6	−12·1	− 2·1
300·446 G	44	136	23	72	99·5	− 4·4	−11·9	+11·7
301·435 G	18	62	10	36	100·1	− 3·9	−11·8	+25·3
302·389 C	4	19	3	13	100·0	− 4·0	−11·6	+37·8

Spot *c*

298·437 G	42	128	21	66	103·3	0·0	−10·4	−11·0
299·413 G	53	189	28	98	105·3	+ 2·0	−10·7	+ 3·9
300·446 G	35	150	19	82	106·6	+ 3·2	−11·0	+18·8
301·435 G	26	132	16	82	107·4	+ 4·0	−11·0	+32·6
302·389 C	17	68	12	51	108·1	+ 4·6	−11·1	+45·9
303·337 C	13	47	13	48	108·5	+ 5·0	−11·1	+58·8
304·471 G	7	31	15	65	109·7	+ 6·1	−11·4	+75·0

Group 13042.

Oct.23–29. One or two small intermittent spots.

295·416 G	2	4	4	7	82·2	0·0	−14·0	−72·0
296·434 G	0	0	0	0	..	..	..	..
297·447 G	2	4	2	3	78·9	− 3·4	−15·0	−48·5
298·437 G	0	0	0	0	..	..	..	..
299·413 G	0	0	0	0	..	..	..	..
300·446 G	15	53	8	28	79·1	− 3·3	−13·2	− 8·7
301·435 G	2	11	1	6	79·8	− 2·6	−13·4	+ 5·0
Means ..	..	..	2	6	80·0	..	−13·9	..

Group 13043

Oct.24–30. A pair of tiny spots on Oct.24. Nothing is then seen of this group until it revives on Oct.29–30, as a small cluster.

296·434 G	9	13	5	8	110·0	0·0	− 2·8	−30·7
297·447 G	0	0	0	0	..	..	..	..
298·437 G	0	0	0	0	..	..	..	..
299·413 G	0	0	0	0	..	..	..	..

Group 13043 — *continued*

d					°	°	°	°
300·446 G	0	0	0	0	..	..	..	..
301·435 G	4	26	3	16	111·1	+ 0·2	− 3·1	+36·3
302·389 C	11	36	9	28	112·2	+ 1·1	− 2·6	+50·0
Means ..	..	..	2	7	111·1	..	− 2·8	..

Group 13045.

Oct.25–Nov.1. A small variable stream *s* Group 13041.

297·447 G	4	11	3	7	103·7	0·0	−23·7	−23·7
298·437 G	18	62	10	36	102·7	− 0·8	−23·8	−11·6
299·413 G	26	81	15	46	102·6	− 0·7	−24·1	+ 1·2
300·446 G	44	165	26	97	104·1	+ 1·1	−22·6	+16·3
301·435 G	75	356	49	233	104·0	+ 1·2	−22·9	+29·2
302·389 C	49	268	38	200	102·2	− 0·4	−23·2	+40·0
303·337 C	36	194	34	182	101·7	− 0·7	−23·1	+52·0
304·471 G	16	90	25	143	101·8	− 0·4	−22·7	+67·1
Means ..	..	..	25	118	102·8	..	−23·3	..

Group 13051.

Oct.28–Nov.3. A pair of spots.

300·446 G	4	11	2	6	83·6	0·0	+15·4	− 4·2
301·435 G	53	145	27	73	80·2	− 3·4	+14·7	+ 5·4
302·389 C	32	136	17	73	81·0	− 2·7	+14·5	+18·8
303·337 C	21	79	12	48	81·7	− 2·0	+14·5	+32·0
304·471 G	0	0	0	0	..	..	..	..
305·424 G	20	75	20	74	81·8	− 1·9	+13·9	+59·6
306·344 C	4	42	7	68	82·6	− 1·2	+14·4	+72·6
Means ..	..	..	12	49	81·8	..	+14·6	..

Group 13053.

Oct.28–Nov.5. A small regular spot with a companion that has died out by Nov.2. A cluster of new tiny companions comes on Nov.5.

300·446 G	7	26	19	69	7·8	..	+17·5	−80·0
301·435 G	13	40	16	50	7·8	0·0	+17·7	−67·0
302·389 C	23	70	21	61	7·0	− 0·8	+17·3	−55·2
303·337 C	32	111	22	76	7·3	− 0·5	+17·0	−42·4
304·471 G	26	106	15	60	7·5	− 0·2	+16·4	−27·2
305·424 G	26	90	14	48	8·0	+ 0·3	+16·0	−14·2
306·344 C	15	34	8	17	7·9	+ 0·2	+15·6	− 2·1
307·524 G	18	35	9	18	8·3	+ 0·6	+15·2	+13·8
308·439 G	13	42	7	24	7·6	− 0·1	+16·9	+25·2
Means ..	..	..	14	44	7·7	..	+16·5	..

LEDGER II. - NON-RECURRENT GROUPS OF SUN SPOTS FOR THE YEAR.

Group 13054.

Oct.29–Nov.10. A regular spot slowly diminishing with small companions on Nov.1–2, 5 and 8.

Date U.T. Place	Projected Area Umbræ	Projected Area Whole Spots	Corrected Area Umbræ	Corrected Area Whole Spots	Longitude and Proper Motion		Latitude	Long. from C.M.
d					°	°	°	°
301·435 G	22	101	52	238	357·6	0·0	− 7·9	−77·2
302·389 C	30	192	36	232	357·5	− 0·2	− 7·7	−64·7
303·337 C	38	221	32	185	357·5	− 0·4	− 7·5	−52·2
304·471 G	67	306	43	195	358·0	− 0·1	− 7·5	−36·7
305·424 G	52	282	28	155	359·1	+ 0·9	− 7·2	−23·1
306·344 C	53	276	28	144	359·5	+ 1·2	− 6·9	−10·5
307·524 G	37	242	19	123	0·0	+ 1·5	− 6·9	+ 5·5
308·439 G	39	241	21	128	359·6	+ 0·9	− 7·2	+17·2
309·381 C	25	189	15	112	0·1	+ 1·3	− 6·9	+30·1
310·457 G	18	92	13	65	0·3	+ 1·3	− 6·8	+44·5
311·332 C	17	89	16	82	0·5	+ 1·4	− 6·3	+56·2
312·107 K	12	47	16	61	0·9	+ 1·6	− 6·5	+66·8
313·395 G	0	13	0	96	2·9	..	− 6·9	+85·8
Means ..	..	..	27	143	359·2	..	− 7·1	..

Group 13055.

Oct.29–Nov.8. A regular spot without companions at first; on Nov.1, new spots (perhaps a new group) appear; but these are out-lived by the original spot.

301·435 G	13	48	38	140	354·0	..	+12·2	−80·8
302·389 C	15	89	21	122	353·1	0·0	+11·9	−69·1
303·337 C	30	179	27	161	353·5	+ 0·3	+12·1	−56·2
304·471 G	84	293	60	204	350·7	− 2·6	+11·6	−44·0
305·424 G	70	282	42	167	350·7	− 2·6	+11·4	−31·5
306·344 C	49	235	26	126	349·8	− 3·6	+11·8	−20·2
307·524 G	61	228	31	116	349·2	− 4·3	+11·9	− 5·3
308·439 G	22	87	11	45	351·0	− 2·6	+12·4	+ 8·6
309·381 C	16	106	8	56	349·8	− 3·8	+12·3	+19·8
310·457 G	11	33	6	20	349·3	− 4·4	+11·7	+33·5
311·332 C	4	11	3	9	354·1	+ 0·3	+13·5	+49·8
Means ..	..	..	24	103	351·1	..	+12·1	..

Group 13058.

Nov.1–8. A small group on Nov.1–2, one or two small spots on Nov.4–5; a pair of definite spots on Nov.7, of which one remains on the next day.

304·471 G	20	84	11	45	21·4	0·0	−12·9	−13·3
305·424 G	13	62	7	33	21·8	+ 0·4	−12·8	− 0·4
306·344 C	0	0	0	0	..	..	..	..
307·524 G	13	26	8	15	21·5	0·0	−14·8	+27·0
308·439 G	4	9	3	6	20·5	− 1·1	−14·3	+38·1
309·381 C	0	0	0	0	..	..	..	..
310·457 G	18	46	24	61	21·7	+ 0·1	−14·5	+65·9
311·332 C	0	34	0	93	22·5	+ 0·8	−14·5	+78·2
Means ..	..	..	7	32	21·6	..	−14·0	..

Group 13060.

Nov.2–9. A group of bi-polar type in which the following component has gone by Nov.5. The leader develops a double nucleus but does not divide into two parts until Nov.8, when the northern part continues as a regular spot and the southern half rapidly disappears.

Date U.T. Place	Projected Area Umbræ	Projected Area Whole Spots	Corrected Area Umbræ	Corrected Area Whole Spots	Longitude and Proper Motion		Latitude	Long. from C.M.
d					°	°	°	°
305·424 G	46	121	23	62	9·8	0·0	+ 8·0	−12·4
306·344 C	96	437	48	218	10·2	+ 0·3	+ 8·3	+ 0·2
307·524 G	83	586	43	304	10·5	+ 0·4	+ 8·1	+16·0
308·439 G	81	512	46	292	10·9	+ 0·7	+ 8·2	+28·5
309·381 C	55	445	36	294	10·7	+ 0·4	+ 8·4	+40·7
310·457 G	53	272	46	237	10·9	+ 0·4	+ 8·3	+55·1
311·332 C	23	152	29	190	11·1	+ 0·5	+ 8·5	+66·8
312·107 K	18	79	38	165	10·7	0·0	+ 8·9	+76·6
Means ..	..	..	39	220	10·6	..	+ 8·3	..

Group 13066.

Nov.6–12. A typical bi-polar group.

309·381 C	12	53	6	27	331·9	0·0	+15·6	+ 1·9
310·457 G	103	394	55	211	332·8	+ 0·9	+15·1	+17·0
311·332 C	61	441	35	256	333·4	+ 1·5	+14·7	+29·1
312·107 K	87	521	58	343	333·8	+ 1·9	+15·0	+39·7
313·395 G	53	346	47	313	332·9	+ 0·9	+14·7	+55·8
314·400 G	35	197	49	279	332·6	+ 0·6	+14·8	+68·8
315·471 G	7	42	(20	118	330·0	..	+15·4)	+80·3
Means ..	..	..	42	238	332·9	..	+15·0	..

Spot *a*

309·381 C	8	38	4	19	332·4	0·0	+15·9	+ 2·4
310·457 G	57	245	31	132	334·6	+ 2·2	+14·7	+18·8
311·332 C	36	249	21	147	335·4	+ 3·0	+14·2	+31·1
312·107 K	65	302	44	205	335·8	+ 3·4	+14·7	+41·7
313·395 G	22	162	21	157	336·0	+ 3·5	+14·2	+58·9
314·400 G	13	92	21	147	335·8	+ 3·3	+14·2	+72·0

Spot *b*

309·381 C	4	15	2	8	330·2	0·0	+15·0	+ 0·2
310·457 G	46	149	24	79	330·6	+ 0·4	+15·4	+14·8
311·332 C	25	192	14	109	330·6	+ 0·4	+15·2	+26·3
312·107 K	22	219	14	138	330·7	+ 0·5	+15·5	+36·6
313·395 G	31	184	26	156	330·6	+ 0·3	+15·1	+53·5
314·400 G	22	105	28	132	330·3	0·0	+15·0	+66·5
315·471 G	7	42	20	118	330·0	..	+15·4	+80·3

LEDGER II. - NON-RECURRENT GROUPS OF SUN SPOTS FOR THE YEAR.

Group 13068.

Nov.6–17. A stable regular spot; there is a small follower on Nov.9.

Date U.T. Place	Projected Area Umbrae	Projected Area Whole Spots	Corrected Area Umbrae	Corrected Area Whole Spots	Longitude and Proper Motion		Latitude	Long. from C.M.
d					°	°	°	°
309·381 C	27	92	57	192	256·0	0·0	−16·9	−74·0
310·457 G	35	188	37	197	256·8	+ 0·8	−16·2	−59·0
311·332 C	54	268	43	213	256·3	+ 0·3	−16·1	−48·0
312·107 K	89	298	60	201	256·5	+ 0·6	−16·5	−37·6
313·395 G	70	302	40	172	256·5	+ 0·6	−16·1	−20·6
314·400 G	61	383	33	207	256·4	+ 0·5	−16·4	− 7·4
315·471 G	61	364	32	193	256·2	+ 0·3	−16·1	+ 6·5
316·370 C	72	331	40	185	256·0	+ 0·2	−16·3	+18·1
317·414 G	68	307	43	193	255·9	+ 0·1	−16·7	+31·8
318·237 C	46	228	34	166	255·8	0·0	−16·9	+42·6
319·239 C	34	190	32	180	255·5	− 0·3	−17·1	+55·5
320·409 G	17	92	29	156	255·8	0·0	−17·3	+71·2
Means ..	..	..	40	188	256·1	..	−16·6	..

Group 13069.

Nov.7–12. A very small spot seen only on Nov.7, 10 and 12.

310·457 G	4	24	2	13	300·8	0·0	+19·6	−15·0
311·332 C	0	0	0	0	..	..	..	..
312·107 K	0	0	0	0	..	..	..	..
313·395 G	9	35	5	20	299·1	− 1·2	+21·6	+22·0
314·400 G	0	0	0	0	..	..	..	..
315·471 G	2	7	2	6	298·0	− 2·0	+23·7	+48·3
Means ..	..	..	2	6	299·3	..	+21·6	..

Group 13071.

Nov.7–18. A compact stream in rapid change.

310·457 G	35	265	82	653	239·2	0·0	−16·9	−76·6
311·332 C	67	482	89	626	239·9	+ 0·7	−16·9	−64·4
312·107 K	119	614	111	578	239·8	+ 0·7	−17·0	−54·3
313·395 G	131	650	88	438	240·0	+ 0·9	−16·6	−37·1
314·400 G	91	596	53	348	240·2	+ 1·1	−17·1	−23·6
315·471 G	88	515	47	277	240·3	+ 1·3	−16·6	− 9·4
316·370 C	90	409	47	217	240·6	+ 1·6	−16·8	+ 2·7
317·414 G	44	241	25	135	240·6	+ 1·6	−17·0	+16·5
318·237 C	38	165	23	98	240·0	+ 1·1	−16·4	+26·8
319·239 C	19	84	13	59	239·5	+ 0·6	−17·5	+39·5
320·409 G	17	65	15	59	238·5	− 0·4	−17·3	+53·9
321·462 G	4	9	6	13	238·3	− 0·5	−18·2	+67·6
Means ..	..	..	50	292	239·7	..	−17·0	..

Group 13074.

Nov.12–21. A small stream with the larger component – a regular spot – surviving after Nov.15. The axis of this group is inclined to the sun's equator in the opposite direction to the normal.

Date U.T. Place	Projected Area Umbrae	Projected Area Whole Spots	Corrected Area Umbrae	Corrected Area Whole Spots	Longitude and Proper Motion		Latitude	Long. from C.M.
d					°	°	°	°
315·471 G	4	26	3	22	196·8	0·0	+11·0	−52·9
316·370 C	42	101	28	68	196·7	− 0·2	+10·7	−41·2
317·414 G	72	243	41	137	196·7	− 0·3	+11·2	−27·4
318·237 C	38	203	20	107	196·5	− 0·6	+10·7	−16·7
319·239 C	42	194	21	99	195·7	− 1·5	+10·1	− 4·3
320·409 G	31	140	16	71	195·9	− 1·4	+10·0	+11·3
321·462 G	13	48	7	27	195·9	− 1·5	+10·5	+25·2
322·453 G	9	20	6	13	196·5	− 1·0	+10·6	+38·8
323·111 K	4	18	3	14	197·2	− 0·4	+10·5	+47·6
324·427 G	2	4	2	5	197·2	− 0·5	+10·4	+65·5
Means ..	..	..	15	56	196·5	..	+10·6	..

Group 13077.

Nov.13–24. A stream in which the leader, a regular spot, predominates. Between Nov.21 and 22, this spot splits into two parts which repel one another.

316·370 C	19	92	37	173	163·7	0·0	+20·1	−74·2
317·414 G	46	239	51	265	162·4	− 1·2	+20·2	−61·7
318·237 C	48	283	39	226	163·8	+ 0·3	+20·0	−49·4
319·239 C	59	320	37	203	164·9	+ 1·5	+19·9	−35·1
320·409 G	70	299	39	164	165·0	+ 1·7	+19·6	−19·6
321·462 G	52	281	28	149	165·0	+ 1·8	+19·4	− 5·7
322·453 G	52	266	28	141	164·9	+ 1·8	+19·6	+ 7·2
323·111 K	52	267	28	144	165·5	+ 2·5	+19·3	+15·9
324·427 G	52	279	33	176	165·0	+ 2·1	+19·4	+33·3
325·400 G	53	184	40	140	165·7	+ 2·9	+19·2	+46·9
326·426 G	26	107	26	108	164·5	+ 1·8	+19·2	+59·2
327·471 G	2	7	4	15	167·5	+ 4·9	+19·1	+76·0
Means ..	..	..	32	159	164·8	..	+19·6	..

Group 13078.

Nov.14–19. A small stream of unimportant spots.

317·414 G	9	35	5	21	195·6	0·0	+19·1	−28·5
318·237 C	23	82	12	44	197·1	+ 1·6	+18·2	−16·1
319·239 C	23	87	12	45	198·6	+ 3·1	+18·2	− 1·4
320·409 G	13	22	7	12	198·9	+ 3·5	+18·1	+14·3
321·462 G	11	35	6	21	199·5	+ 4·2	+17·6	+28·8
322·453 G	4	9	3	6	201·8	+ 6·5	+17·5	+44·1
Means ..	..	..	8	25	198·6	..	+18·1	..

LEDGER II. NON-RECURRENT GROUPS OF SUN SPOTS FOR THE YEAR.

Group 13085.

Nov.22–30. A small stream, of rather slow development, with the largest component in the rear.

Date U.T. Place	Projected Area Umbræ	Projected Area Whole Spots	Corrected Area Umbræ	Corrected Area Whole Spots	Longitude and Proper Motion		Latitude	Long. from C.M.
d					°	°	°	°
325·400 G	4	9	3	7	69·2	0·0	+17·5	−49·6
326·426 G	4	13	3	8	70·1	+ 0·9	+17·5	−35·2
327·471 G	17	63	10	36	67·6	− 1·5	+17·3	−23·9
328·446 G	33	153	18	81	68·3	− 0·8	+17·6	−10·4
329·516 G	61	270	32	140	66·9	− 2·2	+17·2	+ 2·3
330·415 G	41	249	22	132	66·4	− 2·6	+17·2	+13·7
331·229 C	23	136	13	78	65·5	− 3·5	+16·7	+23·5
332·228 C	21	80	13	51	64·6	− 4·4	+16·4	+35·8
333·523 G	4	30	3	26	64·5	− 4·4	+15·7	+52·7
Means ..	..	..	13	62	67·0	..	+17·0	..

Group 13091.

Nov.29–Dec.7. A regular spot usually with a few companions.

332·228 C	19	113	24	143	322·4	0·0	+11·5	−66·4
333·523 G	26	122	20	95	322·2	− 0·3	+11·8	−49·6
334·408 G	35	156	22	100	322·2	− 0·4	+11·6	−37·9
335·457 G	35	191	19	105	322·8	+ 0·1	+11·0	−23·5
336·457 G	43	200	22	102	323·8	+ 1·0	+10·7	− 9·3
337·469 G	30	191	15	97	324·3	+ 1·4	+10·7	+ 4·5
338·511 G	35	163	19	86	323·6	+ 0·6	+10·7	+17·6
339·500 G	22	115	13	68	324·1	+ 1·0	+11·0	+31·1
340·433 G	9	41	6	29	323·6	+ 0·4	+11·0	+42·9
Means ..	..	..	18	92	323·2	..	+11·1	..

Group 13092.

Dec.1–10. One or two small unstable spots.

334·408 G	7	26	13	48	285·9	0·0	+11·3	−74·2
335·457 G	9	22	9	22	286·1	+ 0·1	+11·3	−60·2
336·457 G	7	17	5	13	286·8	+ 0·7	+11·1	−46·3
337·469 G	0	0	0	0	..	..	..	..
338·511 G	9	50	5	28	285·0	− 1·3	+11·4	−21·0
339·500 G	9	22	5	11	285·7	− 0·6	+10·8	− 7·3
340·433 G	0	4	0	2	283·0	− 3·4	+12·8	+ 2·3
341·236 C	0	0	0	0	..	..	..	..
342·421 G	7	26	4	16	286·7	+ 0·1	+11·5	+32·2
343·094 K	8	42	6	29	287·9	+ 1·2	+11·8	+42·3
Means ..	..	..	5	17	285·9	..	+11·5	..

Group 13096.

Dec.2–7. A small spot dying out; a companion is present on Dec.6.

335·457 G	2	7	6	21	266·3	..	+21·4	−80·0
336·457 G	4	11	5	14	268·0	0·0	+21·9	−65·1
337·469 G	7	17	6	15	268·5	+ 0·7	+22·0	−51·3

Group 13096 — *continued*

d					°	°	°	°
338·511 G	4	11	3	7	269·0	+ 1·4	+22·1	−37·0
339·500 G	7	13	4	8	267·6	+ 0·1	+22·1	−25·4
340·433 G	2	9	1	5	265·0	− 2·3	+21·8	−15·7
Means ..	..	..	4	10	267·6	..	+22·0	..

Group 13097.

Dec.3–12. A group showing considerable changes between Dec.5 and Dec.11

336·457 G	13	59	10	45	284·4	0·0	−10·9	−48·7
337·469 G	4	17	2	10	286·7	+ 2·2	−10·3	−33·1
338·511 G	13	108	7	58	286·2	+ 1·5	− 8·5	−19·8
339·500 G	41	302	21	154	285·3	+ 0·5	− 8·9	− 7·7
340·433 G	74	542	38	276	285·9	+ 1·0	− 8·9	+ 5·2
341·236 C	57	403	30	214	286·9	+ 1·9	− 8·1	+16·8
342·421 G	87	482	52	289	287·3	+ 2·1	− 7·8	+32·8
343·094 K	82	346	56	235	287·8	+ 2·5	− 7·8	+42·2
344·528 G	37	167	39	175	288·1	+ 2·6	− 7·5	+61·4
345·461 G	8	34	15	62	288·7	+ 3·1	− 7·7	+74·2
Means ..	..	..	27	152	286·7	..	− 8·6	..

Group 13103.

Dec.6–14. One or two small spots which have died out by Dec.8. A regular spot with a companion appear in the same place on Dec.10.

339·500 G	4	22	2	13	270·2	0·0	−18·4	−22·8
340·433 G	2	15	1	8	272·7	+ 2·6	−18·4	− 8·0
341·236 C	0	0	0	0	..	..	..	..
342·421 G	0	0	0	0	..	..	..	..
343·094 K	2	8	1	5	271·7	+ 1·9	−20·2	+26·1
344·528 G	15	54	11	40	271·7	+ 2·0	−19·9	+45·0
345·461 G	22	119	21	112	270·4	+ 0·8	−20·1	+55·9
346·449 G	19	83	27	115	269·1	− 0·4	−20·1	+67·7
347·221 C	8	42	18	93	267·5	− 1·9	−20·3	+76·2
Means ..	..	..	9	43	270·5	..	−19·6	..

Group 13107.

Dec.7–15. A pair of small spots, of which one shows unusual persistency for its size, *np* Group 13105. Nothing is seen on Dec.14

340·433 G	7	17	8	19	218·2	0·0	−16·1	−62·5
341·236 C	4	21	3	17	219·8	+ 1·6	−16·1	−50·3
342·421 G	9	20	6	13	219·3	+ 1·1	−16·1	−35·2
343·094 K	8	32	5	19	218·7	+ 0·5	−16·2	−26·9
344·528 G	9	35	5	18	218·5	+ 0·3	−15·4	− 8·2
345·461 G	4	9	2	5	219·4	+ 1·2	−16·5	+ 4·9

LEDGER II. - NON-RECURRENT GROUPS OF SUN SPOTS FOR THE YEAR.

Group 13107 — *continued*

Date U.T. Place	Projected Area Umbræ	Projected Area Whole Spots	Corrected Area Umbræ	Corrected Area Whole Spots	Longitude and Proper Motion		Latitude	Long. from C.M.
d					°	°	°	°
346·449 G	2	7	1	4	218·4	+ 0·2	−16·2	+17·0
347·221 C	0	0	0	0	..	..	..	..
348·470 G	0	4	0	3	220·6	+ 2·5	−15·3	+45·8
Means ..	..	..	3	11	219·1	..	−16·0	..

Group 13109.

Dec.9–18. A stream of normal type and of rapid growth. Considerable changes take place between Dec.14 and 15, after which the group rapidly declines.

342·421 G	11	56	9	45	203·1	0·0	+ 6·6	−51·4
343·094 K	46	170	32	116	203·8	+ 0·6	+ 6·1	−41·8
344·528 G	124	634	67	345	204·8	+ 1·3	+ 5·3	−21·9
345·461 G	97	540	49	274	207·6	+ 4·0	+ 4·9	− 6·9
346·449 G	131	491	67	248	207·2	+ 3·4	+ 5·0	+ 5·8
347·221 C	94	498	50	269	207·7	+ 3·8	+ 4·9	+16·4
348·470 G	96	390	58	238	208·2	+ 4·1	+ 4·6	+33·4
349·333 C	18	125	13	92	210·5	+ 6·2	+ 4·5	+47·1
350·226 C	27	145	23	128	207·5	+ 3·1	+ 4·5	+55·8
351·461 G	4	28	5	38	203·7	− 0·9	+ 4·0	+68·3
Means ..	..	..	37	179	206·4	..	+ 5·0	..

Spot *a*

342·421 G	7	28	5	22	204·9	0·0	+ 6·4	−49·6
343·094 K	12	70	8	46	206·2	+ 1·2	+ 5·4	−39·4
344·528 G	61	250	32	132	208·9	+ 3·6	+ 4·6	−17·8
345·461 G	58	328	29	164	210·2	+ 4·8	+ 4·4	− 4·3
346·449 G	72	282	37	144	211·1	+ 5·5	+ 4·2	+ 9·7
347·221 C	48	291	27	163	211·7	+ 6·0	+ 4·6	+20·4
348·470 G	46	197	29	124	212·4	+ 6·5	+ 4·5	+37·6
349·333 C	10	84	8	64	212·2	+ 6·1	+ 4·8	+48·8
350·226 C	6	38	6	39	212·1	+ 5·9	+ 5·0	+60·4

Spot *b*

342·421 G	4	17	3	14	201·1	0·0	+ 6·8	−53·4
343·094 K	34	100	24	70	201·8	+ 0·6	+ 6·4	−43·8
344·528 G	43	289	24	162	201·7	+ 0·2	+ 6·3	−25·0
345·461 G	39	212	20	110	202·2	+ 0·6	+ 6·1	−12·3
346·449 G	50	161	25	80	202·1	+ 0·3	+ 5·9	+ 0·7
347·221 C	46	207	23	106	202·7	+ 0·8	+ 5·5	+11·4
348·470 G	13	82	7	47	201·7	− 0·4	+ 6·0	+26·9
349·333 C	2	8	1	5	202·9	+ 0·6	+ 5·2	+39·5

Group 13111.

Dec.11–17. A small spot not seen on Dec.12 and 15.

344·528 G	4	11	3	10	172·6	0·0	+10·3	−54·1
345·461 G	0	0	0	0	..	..	..	..
346·449 G	2	4	1	2	174·0	+ 1·2	+10·4	−27·4
347·221 C	2	8	1	4	172·6	− 0·3	+10·7	−18·7

Group 13111 — *continued*

Date U.T. Place	Projected Area Umbræ	Projected Area Whole Spots	Corrected Area Umbræ	Corrected Area Whole Spots	Longitude and Proper Motion		Latitude	Long. from C.M.
d					°	°	°	°
348·470 G	0	0	0	0	..	..	..	..
349·333 C	6	27	3	14	171·4	− 1·7	+11·3	+ 8·0
350·226 C	4	10	2	6	172·1	− 1·1	+11·2	+20·4
Means ..	..	..	1	5	172·5	..	+10·8	..

Group 13113.

Dec.12–19. A pair of small spots becoming a small stream by Dec.15.

345·461 G	19	32	11	19	183·0	0·0	− 9·8	−31·5
346·449 G	13	26	7	14	183·6	+ 0·5	− 9·7	−17·8
347·221 C	19	69	10	35	185·8	+ 2·6	− 9·1	− 5·5
348·470 G	61	230	32	120	187·1	+ 3·7	− 9·3	+12·3
349·333 C	36	167	20	92	187·1	+ 3·6	− 9·1	+23·7
350·226 C	25	136	16	84	187·2	+ 3·6	− 9·0	+35·5
351·461 G	65	232	53	190	187·6	+ 3·9	− 9·3	+52·2
352·222 C	26	94	28	104	188·0	+ 4·2	− 9·3	+62·6
Means ..	..	..	22	82	186·2	..	− 9·3	..

Group 13114.

Dec.13–25. A stable regular spot with small followers from Dec.15–20.

346·449 G	17	85	48	240	123·2	0·0	+26·5	−78·2
347·221 C	63	173	94	260	123·4	+ 0·4	+25·1	−67·9
348·470 G	52	269	48	251	121·8	− 0·8	+25·4	−53·0
349·333 C	83	389	62	294	121·1	− 1·2	+25·5	−42·3
350·226 C	79	372	51	243	120·8	− 1·3	+25·4	−30·9
351·461 G	91	475	53	277	119·9	− 1·8	+25·7	−15·5
352·222 C	109	552	61	310	120·0	− 1·5	+25·5	− 5·4
353·454 G	93	564	52	322	119·1	− 2·0	+25·6	+10·0
354·243 C	71	477	43	286	119·2	− 1·7	+25·6	+20·4
355·416 C	69	359	48	248	118·7	− 1·8	+25·4	+35·4
356·259 C	63	278	51	225	118·0	− 2·3	+25·3	+45·8
357·234 C	44	224	48	244	117·7	− 2·3	+25·7	+58·3
358·318 C	17	73	32	137	116·9	− 2·8	+25·6	+71·8
Means ..	..	..	53	257	120·0	..	+25·6	..

Group 13115.

Dec.14–26. A straggling stream of spots developing as the group comes on to the disk. After Dec.19 the leader grows considerably and there are changes in the other components which markedly alter the appearance of the group within a few days. The stream is rapidly diminishing by the time it reaches the west limb.

347·221 C	2	6	10	29	107·3	..	− 7·7	−84·0
348·470 G	22	83	28	105	108·2	0·0	− 7·0	−66·6
349·333 C	35	142	31	122	108·3	0·0	− 6·4	−55·1

LEDGER II. - NON-RECURRENT GROUPS OF SUN SPOTS FOR THE YEAR 1938-39.

Group 13115 — *continued*

Date U.T. Place	Projected Area Umbræ	Projected Area Whole Spots	Corrected Area Umbræ	Corrected Area Whole Spots	Longitude and Proper Motion		Latitude	Long. from C.M.
d					°	°	°	°
350·226 C	48	299	34	209	107·8	− 0·7	− 5·6	−43·9
351·461 G	159	809	89	455	108·1	− 0·6	− 5·0	−27·3
352·222 C	146	738	76	384	109·6	+ 0·8	− 5·0	−15·8
353·454 G	170	1003	85	501	109·0	0·0	− 4·9	− 0·1
354·243 C	196	1112	101	573	110·2	+ 1·0	− 4·9	+11·4
355·416 C	179	1568	100	876	110·4	+ 1·0	− 5·1	+27·1
356·259 C	165	1279	105	814	110·6	+ 1·1	− 4·8	+38·4
357·234 C	138	819	112	666	111·1	+ 1·4	− 5·0	+51·7
358·318 C	63	354	79	455	112·0	+ 2·1	− 4·7	+66·9
359·337 C	12	72	37	222	112·3	..	− 5·1	+80·6
Means ..	..	..	76	469	109·6	..	− 5·3	..

Spot *a*

352·222 C	86	389	44	198	112·5	0·0	− 5·1	−12·9
353·454 G	111	532	56	266	112·5	− 0·2	− 5·1	+ 3·4
354·243 C	123	667	64	347	112·6	− 0·2	− 5·0	+13·8
355·416 C	102	997	58	568	112·6	− 0·4	− 5·4	+29·3
356·259 C	98	790	65	521	113·1	− 0·1	− 5·1	+40·9
357·234 C	79	487	67	414	113·2	− 0·1	− 4·8	+53·8
358·318 C	48	310	63	409	112·9	− 0·6	− 4·9	+67·8
359·337 C	10	62	33	203	113·1	..	− 5·1	+81·4

Group 13120.

Dec.20-26. A small regular spot preceeding Group 13121.

353·454 G	13	26	16	32	43·4	0·0	−17·5	−65·7
354·243 C	10	65	9	58	44·5	+ 1·1	−18·1	−54·3
355·416 C	8	48	5	32	45·7	+ 2·4	−18·2	−37·6
356·259 C	10	48	6	28	45·9	+ 2·6	−18·0	−26·3
357·234 C	13	33	7	17	46·1	+ 2·9	−17·2	−13·3
358·318 C	8	42	4	22	45·7	+ 2·5	−16·7	+ 0·6
359·337 C	2	8	1	4	45·9	+ 2·8	−16·8	+14·2
Means ..	..	..	7	28	45·3	..	−17·5	..

Group 13124.

Dec.24-Jan.5. A stable regular spot with a tiny distant follower on Dec.29.

357·234 C	17	77	44	199	340·5	0·0	− 2·8	−78·9
358·318 C	25	100	29	116	340·5	− 0·2	− 2·5	−64·6

Group 13124 — *continued*

Date U.T. Place	Projected Area Umbræ	Projected Area Whole Spots	Corrected Area Umbræ	Corrected Area Whole Spots	Longitude and Proper Motion		Latitude	Long. from C.M.
d					°	°	°	°
359·337 C	42	198	33	156	340·8	− 0·1	− 2·4	−50·9
360·328 C	35	252	22	159	341·0	− 0·1	− 2·4	−37·6
361·470 G	54	253	29	137	341·0	− 0·3	− 2·3	−22·6
362·234 C	56	288	29	147	340·8	− 0·6	− 2·3	−12·7
363·468 G	58	333	29	166	341·0	− 0·7	− 2·5	+ 3·8
364·463 G	45	261	23	136	341·1	− 0·7	− 2·8	+17·0
0·339 C	44	257	25	146	341·3	− 0·7	− 2·8	+28·7
1·332 C	56	202	39	140	341·2	− 1·0	− 2·7	+41·7
2·430 G	24	122	22	110	341·4	− 1·0	− 3·0	+56·3
3·289 C	21	92	27	119	341·2	− 1·4	− 3·1	+67·4
4·279 C	10	59	32	186	341·7	..	− 3·0	+81·0
Means ..	..	..	29	144	341·0	..	− 2·6	..

Group 13130.

Dec.31-Jan.11. A regular spot followed by a composite spot that divides up and becomes a short stream.

364·463 G	11	58	(28	150	244·9	..	−16·1)	−79·2
0·339 C	19	142	28	207	242·9	0·0	−16·7	−69·7
1·332 C	31	183	29	168	244·0	+ 1·1	−17·1	−55·5
2·430 G	41	284	28	196	243·5	+ 0·7	−16·9	−41·6
3·289 C	95	445	58	274	240·2	− 2·6	−17·3	−33·6
4·279 C	153	656	83	361	240·4	− 2·4	−17·5	−20·3
5·272 C	92	468	48	242	239·9	− 2·8	−17·2	− 7·7
6·296 C	64	255	33	133	240·6	− 2·1	−17·5	+ 6·5
7·459 G	24	166	14	93	242·7	0·0	−17·0	+23·9
8·255 C	29	142	18	88	242·7	+ 0·1	−16·9	+34·4
9·246 C	16	56	12	41	240·7	− 1·9	−17·3	+45·4
10·241 C	2	8	2	8	240·6	− 2·0	−15·9	+58·4
Means ..	..	..	32	165	241·6	..	−17·0	..

Spot *a*

364·463 G	11	58	(28	150	244·9	..	−16·1)	−79·2
0·339 C	13	100	17	129	245·4	0·0	−16·7	−67·2
1·332 C	23	135	20	116	246·0	+ 0·6	−17·1	−53·5
2·430 G	28	193	18	127	246·3	+ 1·0	−17·0	−38·8
3·289 C	35	181	20	105	246·1	+ 0·8	−17·3	−27·7
4·279 C	65	182	34	96	246·0	+ 0·7	−17·3	−14·7
5·272 C	44	173	23	90	245·4	+ 0·2	−17·4	− 2·2
6·296 C	33	113	17	59	245·2	0·0	−17·3	+11·1
7·459 G	15	123	9	70	245·0	− 0·2	−16·6	+26·2
8·255 C	23	109	14	69	244·5	− 0·6	−16·6	+36·2
9·246 C	8	25	6	19	244·2	− 0·9	−17·0	+48·9

ROYAL OBSERVATORY, GREENWICH.

Total Areas of Sun Spots and Faculæ

Projected and Corrected for Foreshortening
for each Day, and

Mean Areas and Mean Heliographic Latitude of Sun Spots and Faculæ

for each Rotation of the Sun
and for the Year

1938

TOTAL AREAS OF SUN SPOTS AND FACULÆ FOR EACH DAY IN THE YEAR 1938.

The Mean Time (U.T.) at which the photograph was taken is expressed by the month, day of month, and decimal of a day, reckoned from Greenwich Mean Midnight.

The place where the photograph was taken is indicated in the second column. A photograph taken at Greenwich is indicated by the letter G, and those taken at the Cape and Kodaikanal, by the letters C and K respectively.

The Projected Area is the area as it is measured on the photograph, uncorrected for the effect of foreshortening and expressed in millionths of the Sun's apparent disk.

The Area Corrected for Foreshortening is expressed in millionths of the Sun's visible hemisphere.

U.T.		Place	Projected Area			Area Corrected for Foreshortening		
			Umbræ	Whole Spots	Faculæ	Umbræ	Whole Spots	Faculæ
1938	d							
January	1·372	C	391	1843	1997	294	1426	2537
	2·353	C	327	2015	1588	294	1795	2013
	3·292	C	242	1383	1340	220	1401	1778
	4·321	C	240	1320	1104	201	1158	1512
	5·305	C	170	1087	2300	130	730	2939
	6·289	C	213	1157	2143	155	872	2681
	7·297	C	302	1477	2051	236	1222	2574
	8·433	G	366	1954	920	264	1422	1160
	9·522	G	410	2066	696	257	1295	719
	10·404	G	381	1891	1423	246	1232	1625
	11·406	G	348	1810	1364	254	1377	1537
	12·360	K	416	2622	2270	437	2853	3186
	13·112	K	646	3502	1750	634	3412	2456
	14·283	C	737	4775	2179	614	3946	2415
	15·427	G	836	6446	2651	626	4863	2939
	16·376	C	1095	6767	2607	764	4887	3128
	17·442	G	1345	6669	2293	957	4983	3066
	18·282	C	1215	6343	2293	671	3505	3024
	19·453	G	1338	6081	2145	771	3504	2511
	20·415	G	1021	6136	1505	643	3931	1622
	21·307	C	994	5810	2519	695	4092	2659
	22·391	G	840	4676	2671	674	3860	3131
	23·436	G	563	3176	3174	631	3682	4146
	24·280	C	387	1997	2882	601	3022	3406
	25·283	C	154	720	1928	96	443	2227
	26·422	G	176	786	1637	121	538	2127
	27·457	G	126	508	1785	109	427	2261
	28·131	K	162	731	1979	160	743	2445
	29·402	G	303	1321	2369	263	1167	2778
	30·384	C	241	1373	2112	194	1126	2418
	31·278	C	258	1560	1964	213	1296	2255
February	1·393	G	276	1741	3156	188	1181	3947
	2·288	C	336	1837	3165	202	1086	3762
	3·468	G	400	1989	2853	257	1293	3289
	4·479	G	324	1900	2588	216	1191	2800
	5·438	G	362	1799	1163	250	1242	1379
	6·334	C	330	1652	2566	227	1190	2823
	7·457	G	433	2380	2263	323	1860	2697
	8·315	C	434	3147	1822	339	2250	2337
	9·382	G	618	3149	3454	436	2275	4837
	10·623	G	606	3581	4328	423	2404	4555
	11·391	G	589	3396	4758	417	2330	5284
	12·398	G	561	4047	4419	418	2870	4803
	13·435	G	710	4684	4019	513	3311	5276
	14·445	G	816	5054	3494	562	3531	4236
1938	d							
February	15·334	C	704	4244	2338	455	3111	2384
	16·373	C	690	4396	1767	447	3177	2449
	17·301	C	592	3667	1705	329	2063	1968
	18·412	G	535	3134	2971	345	2031	3080
	19·394	C	420	2277	4876	300	1683	5367
	20·438	G	293	1620	3220	221	1218	4188
	21·402	C	165	1166	2156	132	946	2458
	22·301	C	214	1177	3381	177	942	4054
	23·384	G	241	1079	2745	239	996	3821
	24·389	G	275	1223	1990	235	1123	2656
	25·465	G	247	1300	2260	169	936	2856
	26·426	G	227	1159	1858	187	922	2285
	27·384	G	221	1013	2596	167	894	3182
	28·401	C	192	1181	1135	125	777	1186
March	1·378	G	215	1212	2261	157	837	3091
	2·433	G	127	873	2365	93	596	2869
	3·378	G	157	824	3066	170	856	3690
	4·380	G	182	967	3634	233	1278	4551
	5·375	G	184	963	4034	228	1162	4176
	6·433	G	216	1136	3286	186	993	3737
	7·383	G	259	1571	2471	194	1195	3478
	8·388	G	368	1742	2298	256	1183	3055
	9·383	G	446	2439	4289	303	1573	5187
	10·384	G	446	2604	3516	280	1552	4807
	11·380	G	562	2898	4001	354	1822	4714
	12·529	G	549	2972	3885	372	1985	4798
	13·625	C	478	2864	3675	325	1925	3795
	14·381	G	443	2543	2884	322	1842	3196
	15·375	G	439	2281	2846	345	1869	3777
	16·507	G	387	1910	2887	332	1655	4241
	17·618	G	280	1589	3955	264	1543	4569
	18·425	G	252	1240	3377	249	1289	4101
	19·375	G	157	937	2722	120	703	3974
	20·366	G	191	1055	2404	216	1163	3110
	21·374	G	299	1658	3578	361	1982	4414
	22·379	G	370	1921	2392	319	1683	2737
	23·454	G	476	2481	2795	341	1736	3698
	24·383	G	522	2653	1357	313	1594	1865
	25·329	C	552	2926	2104	311	1640	2258
	26·338	G	527	2827	3581	277	1486	3941
	27·360	C	509	2764	2055	306	1605	2892
	28·453	G	526	2742	2052	315	1624	2802
	29·376	G	477	2591	2476	305	1639	2829
	30·386	G	438	2301	2603	305	1586	3064
	31·381	G	416	2226	2677	396	2091	3276

TOTAL AREAS OF SUN SPOTS AND FACULÆ FOR EACH DAY IN THE YEAR.

U.T.		Place	Projected Area			Area Corrected for Foreshortening		
			Umbræ	Whole Spots	Faculæ	Umbræ	Whole Spots	Faculæ
1938	d							
April	1·428	G	349	1917	3056	361	2112	3722
	2·399	G	270	1451	2668	289	1509	3594
	3·421	G	269	1297	2778	202	933	3726
	4·381	G	308	1465	1748	200	929	2281
	5·408	G	297	1439	2101	175	856	2267
	6·381	G	359	1692	1992	305	1466	2404
	7·386	G	346	1686	3241	286	1484	3892
	8·388	G	456	2290	3278	609	3190	4295
	9·334	C	466	2534	4097	570	3029	5367
	10·392	G	557	3490	4763	530	3368	5562
	11·337	G	866	4398	2195	674	3478	2722
	12·380	G	815	4576	5384	550	3097	5943
	13·340	G	922	4237	3872	587	3104	4450
	14·376	G	904	4698	2621	544	2863	3092
	15·105	K	743	4473	1300	517	3037	1883
	16·379	G	774	4515	3157	691	3694	3979
	17·346	G	624	4285	4563	537	3665	5554
	18·334	G	737	4094	2966	552	3082	3394
	19·437	G	789	4148	2925	564	2880	3621
	20·452	G	729	3950	2203	465	2503	2567
	21·360	G	645	3317	2371	393	2025	2489
	22·348	G	515	2668	3133	340	1724	4025
	23·193	K	429	2130	481	272	1374	646
	24·641	G	502	2409	2316	361	1746	2803
	25·586	G	486	2362	2323	352	1723	2569
	26·529	G	489	2447	2507	418	2147	2993
	27·413	G	556	2802	2942	561	2872	4018
	28·391	G	628	2892	3015	581	2687	4135
	29·376	G	601	3075	4189	454	2358	5262
	30·337	G	624	2975	4246	429	2034	5208
May	1·400	C	676	3161	3105	429	2026	3098
	2·397	C	589	3047	3403	410	2044	4036
	3·398	C	595	3205	2652	380	2108	2767
	4·337	G	651	3056	3001	490	2267	3592
	5·338	G	604	2812	2446	451	2009	3332
	6·453	G	613	3040	1895	445	2223	2534
	7·487	G	679	3500	2787	510	2650	3433
	8·374	G	705	3618	3734	565	2911	4415
	9·509	C	774	3799	5236	602	3013	6562
	10·376	G	787	3847	5188	600	2670	6356
	11·601	G	748	4205	3239	548	3088	3865
	12·334	G	691	4158	1801	512	3027	2381
	13·348	G	757	3719	3130	548	2641	4266
	14·341	G	612	3326	1065	465	2540	1550
	15·358	G	625	3410	2550	447	2476	3115
	16·341	G	609	3041	3490	433	2201	4245
	17·343	C	564	2849	3162	341	1722	3411
	18·361	G	565	2941	1875	370	1959	2538
	19·348	G	540	2892	1791	428	2324	2595
	20·358	G	630	3212	3509	458	2441	4332
	21·343	G	601	2944	2293	431	2075	2841
	22·424	G	634	3245	2114	420	2180	2551
	23·340	G	702	3136	2333	530	2326	3349
	24·335	G	884	4248	2707	536	2592	3267
	25·341	C	846	4051	3359	516	2455	4076
	26·333	G	770	3600	4372	543	2486	5343
	27·340	G	603	2800	1856	456	2218	2443
	28·336	C	458	2726	2803	401	2389	2978
	29·396	C	336	1982	2809	420	2704	3396
	30·409	G	229	1165	4348	250	1337	5569
	31·105	K	289	1292	1727	233	1083	2313

U.T.		Place	Projected Area			Area Corrected for Foreshortening		
			Umbræ	Whole Spots	Faculæ	Umbræ	Whole Spots	Faculæ
1938	d							
June	1·439	G	270	1315	1272	197	996	1749
	2·339	C	320	1357	2096	236	1009	2432
	3·333	G	311	1482	933	208	984	1516
	4·349	G	438	1998	4521	274	1248	5076
	5·351	C	280	1380	3149	278	1243	4281
	6·379	G	319	1482	3934	271	1243	4872
	7·442	G	406	1979	3092	306	1540	3626
	8·614	G	510	2505	2551	328	1630	3450
	9·340	G	454	2430	1863	294	1527	2392
	10·340	G	451	2075	1509	274	1260	1877
	11·385	G	349	1850	1600	239	1226	2179
	12·415	G	388	1562	2893	298	1216	3692
	13·337	G	381	1661	2574	287	1288	3298
	14·339	G	331	1464	3095	259	1142	4008
	15·338	G	309	1377	3208	235	1057	3911
	16·337	G	264	1245	3154	229	1025	3801
	17·418	G	315	1455	3007	286	1347	4192
	18·343	G	310	1486	1254	207	968	1490
	19·387	C	394	1964	1100	246	1225	1326
	20·373	G	441	2320	1543	256	1336	1832
	21·336	G	534	2684	1997	308	1497	2512
	22·341	G	617	2742	2123	346	1533	2540
	23·343	G	659	2872	2438	380	1685	3008
	24·399	C	465	2542	2099	309	1672	2531
	25·374	G	310	1789	3003	246	1430	3648
	26·398	C	245	1335	2112	216	1166	2612
	27·657	G	252	1322	2319	284	1639	2938
	28·407	G	287	1546	2349	330	1827	3234
	29·384	G	416	1807	1826	302	1283	2751
	30·366	G	489	2413	1330	293	1443	1791
July	1·337	G	567	2494	1993	313	1371	2116
	2·364	G	608	2920	1171	370	1716	1721
	3·251	K	482	2413	1342	322	1530	1547
	4·377	G	830	3982	3539	607	2922	4153
	5·390	G	904	4565	2421	659	3356	3412
	6·406	G	940	5000	3691	753	4078	4238
	7·333	G	927	4800	3655	738	4013	4648
	8·554	G	1088	5310	2608	831	3996	3796
	9·351	G	1143	5985	2583	944	4534	3731
	10·392	C	1262	6881	2883	873	4876	3700
	11·584	G	1442	7989	2692	931	5257	3405
	12·395	C	1434	7742	2590	911	4915	2986
	13·334	G	1524	8452	3563	973	5438	4931
	14·607	G	1301	7704	3269	832	4776	3925
	15·364	G	1223	7136	3668	800	4589	4023
	16·361	G	1015	5692	3095	745	3993	3678
	17·481	G	661	4196	2435	484	2963	3013
	18·393	C	642	4348	3264	492	3336	4155
	19·332	G	669	3699	2899	618	3463	3710
	20·478	G	481	3214	3624	594	4399	4896
	21·437	G	369	1924	3166	467	3003	5173
	22·398	C	281	1265	1426	224	892	2019
	23·366	G	463	2099	3659	344	1759	4759
	24·371	G	577	3144	4021	454	2644	5130
	25·340	G	621	3669	3446	441	2774	3975
	26·438	G	629	3537	1735	416	2371	2264
	27·364	C	653	3677	2505	451	2570	2613
	28·439	C	567	2838	1941	414	2119	2530
	29·368	C	511	2721	2539	361	1832	4019
	30·340	C	405	2188	3102	255	1349	3864
	31·397	G	279	1553	2614	222	1227	3800

TOTAL AREAS OF SUN SPOTS AND FACULÆ FOR EACH DAY IN THE YEAR.

U.T.		Place	Projected Area			Area Corrected for Foreshortening		
			Umbræ	Whole Spots	Faculæ	Umbræ	Whole Spots	Faculæ
1938	d							
August	1·328	G	324	1774	3674	435	2192	5223
	2·464	G	365	1839	5383	381	1898	5919
	3·344	G	377	1954	4820	354	1856	5397
	4·342	G	388	2046	3395	331	1859	4712
	5·342	G	509	2895	2667	592	3420	4458
	6·365	C	558	3436	3672	518	3378	4544
	7·320	C	601	3754	3849	405	2592	4035
	8·459	G	800	4213	1845	572	3341	2384
	9·387	G	790	4574	1563	534	3260	2276
	10·099	K	895	4804	1916	591	3252	2255
	11·344	G	821	4335	4110	573	3034	5120
	12·339	G	721	3680	2899	513	2606	3807
	13·497	G	531	3131	3067	423	2376	4279
	14·373	C	403	2604	4050	268	1750	4990
	15·367	G	398	2252	4512	352	1892	5176
	16·568	G	304	1733	3275	305	1664	4894
	17·348	G	312	1653	1937	271	1422	2820
	18·459	G	277	1219	1813	180	803	2197
	19·622	G	224	969	1920	148	626	2804
	20·362	C	190	762	3165	123	499	3558
	21·369	C	137	665	3426	98	461	4091
	22·395	C	123	514	1982	100	428	2477
	23·342	G	226	808	2017	140	489	2231
	24·342	G	176	840	1569	108	512	2272
	25·340	G	246	888	2368	197	685	3096
	26·457	G	267	883	2234	214	676	3040
	27·482	G	171	732	3466	182	781	4661
	28·381	C	141	756	973	148	871	1346
	29·105	K	248	1075	2100	318	1335	3056
	30·341	G	290	1222	3835	236	1004	4481
	31·415	C	318	1564	3614	218	1069	4356
September	1·388	G	376	1721	2157	279	1304	3387
	2·344	G	581	2835	3857	397	1971	5242
	3·340	G	604	2936	3345	370	1797	3918
	4·399	G	601	3402	3394	359	1966	3452
	5·402	G	757	3538	2296	446	2056	2789
	6·453	C	714	3973	4033	419	2339	4882
	7·433	G	530	3170	2542	323	1895	3218
	8·360	C	446	2875	3365	317	1950	4739
	9·339	G	379	2028	3544	321	1669	4565
	10·345	G	263	1384	3980	264	1366	4694
	11·487	G	153	679	2824	158	741	3681
	12·412	G	112	444	3388	93	418	4356
	13·361	G	90	533	3276	95	613	4495
	14·355	G	93	461	1311	54	260	1952
	15·338	G	167	929	1381	132	777	1890
	16·340	G	241	1267	2774	175	911	3561
	17·376	G	236	1153	1757	154	726	2039
	18·404	C	200	1179	2684	118	700	2940
	19·369	G	248	1137	1589	236	1153	2314
	20·538	G	226	1244	2129	217	1245	2641
	21·364	C	253	1557	2523	270	1622	3074
	22·344	G	336	2261	2172	391	2714	3161
	23·334	G	479	2966	3454	411	2573	4554
	24·357	G	592	3485	2128	422	2437	2830
1938	d							
September	25·173	K	532	3651	167	336	2294	(212)*
	26·485	G	905	4195	2066	518	2404	3022
	27·346	G	800	4130	3030	469	2379	3923
	28·350	G	706	3651	2309	403	2098	2675
	29·397	G	522	2851	2491	352	1923	2931
	30·340	G	422	2251	2091	334	1802	2625
October	1·417	G	361	1670	2858	320	1608	3630
	2·455	C	246	1178	3271	230	1121	3771
	3·377	G	168	894	3039	191	1027	3685
	4·378	G	167	707	2320	100	412	3150
	5·509	C	383	2107	2675	330	2657	3427
	6·380	G	434	2995	2375	403	3227	3115
	7·122	K	697	3958	1133	612	3702	1355
	8·400	G	670	4907	2533	481	3534	3204
	9·399	C	719	5616	2558	513	3762	2958
	10·470	G	825	5917	1486	514	3521	1967
	11·378	G	956	5849	1738	552	3271	2473
	12·378	G	839	6591	976	467	3515	1460
	13·411	C	820	5287	1859	458	2913	2178
	14·378	G	685	4827	1144	420	2923	1387
	15·376	G	556	3633	1527	400	2606	1803
	16·377	C	367	2429	1762	336	2325	2180
	17·372	G	220	1357	3323	297	2002	3896
	18·423	G	39	244	1706	87	565	2520
	19·430	G	56	257	1675	62	279	2064
	20·455	G	97	661	1895	120	845	2542
	21·374	G	203	953	2523	218	991	3457
	22·380	G	212	1095	2569	147	764	2951
	23·416	G	213	1204	2635	128	715	3249
	24·434	G	256	1251	2685	140	683	3306
	25·447	G	316	1308	3804	200	836	4004
	26·437	G	457	2047	3300	303	1364	3618
	27·413	G	513	2480	1888	332	1541	2523
	28·446	G	573	2379	2548	380	1576	2865
	29·435	G	548	2440	3180	426	1904	3620
	30·389	C	452	2183	2226	356	1735	2430
	31·337	C	341	1867	2909	283	1512	3461
November	1·471	G	353	1772	1390	279	1414	2109
	2·424	G	339	1542	2354	217	947	3177
	3·344	C	329	1545	2024	189	899	2763
	4·524	G	336	1727	1749	367	1837	2371
	5·439	G	391	2465	2825	415	2844	3621
	6·381	C	517	3133	2672	487	2953	2965
	7·457	G	882	4475	2677	703	3749	3280
	8·332	C	873	5181	1728	606	3726	2058
	9·107	K	1122	5593	2080	724	3582	2555
	10·395	G	1072	5538	1290	597	3190	1850
	11·400	G	867	5567	1056	489	3118	1085
	12·471	G	864	5075	2038	545	3189	2524
	13·370	C	925	4609	1220	621	3096	1852
	14·414	G	830	4047	2289	615	3041	2664
	15·237	C	743	3745	2292	587	2998	2287
	16·239	C	735	3885	2628	639	3329	3550

* Poor plate.

TOTAL AREAS OF SUN SPOTS AND FACULÆ FOR EACH DAY IN THE YEAR.

U.T.		Place	Projected Area			Area Corrected for Foreshortening		
			Umbræ	Whole Spots	Faculæ	Umbræ	Whole Spots	Faculæ
1938	d							
November	17·409	G	684	3294	2772	468	2349	3489
	18·462	G	458	2693	2836	348	2096	3547
	19·453	G	476	2872	2305	398	2482	3060
	20·111	K	581	3039	945	451	2465	1089
	21·427	G	323	1769	1453	339	2231	1973
	22·400	G	241	1135	2481	179	841	2483
	23·426	G	137	778	2079	144	859	2414
	24·471	G	208	905	3009	261	1189	3673
	25·446	G	382	2019	2483	283	1515	3420
	26·516	G	612	3549	2454	356	2067	2739
	27·415	G	792	4304	2168	431	2342	2592
	28·229	C	767	4909	1815	403	2557	2451
	29·228	C	904	5377	2037	487	2905	2335
	30·523	G	741	4491	1615	427	2578	2242
December	1·408	G	639	3943	2409	468	2907	3317
	2·457	G	526	3185	3650	493	2914	4362
	3·457	G	521	2661	3661	531	2820	3896
	4·469	G	441	2293	2512	527	2963	3539
	5·511	G	384	2145	1979	302	1790	2708
	6·500	G	419	2350	2259	287	1588	3172
	7·433	G	570	2689	1941	448	1982	2385
	8·236	C	400	2828	2020	298	2001	2201

U.T.		Place	Projected Area			Area Corrected for Foreshortening		
			Umbræ	Whole Spots	Faculæ	Umbræ	Whole Spots	Faculæ
1938	d							
December	9·421	G	626	3101	2735	437	2141	3282
	10·094	K	584	2826	870	397	1915	1449
	11·528	G	669	3235	2518	433	2108	2852
	12·461	G	683	3418	3694	436	2204	4578
	13·449	G	642	2945	2224	464	2171	3004
	14·221	C	499	2273	1734	395	1797	2461
	15·470	G	445	1972	2830	322	1404	3500
	16·333	C	324	1597	1798	246	1226	1929
	17·226	C	271	1470	1901	178	962	1941
	18·461	G	406	2016	1996	265	1309	2420
	19·222	C	364	1765	1786	320	1435	2455
	20·454	G	468	2747	3319	440	2629	4309
	21·243	C	467	2754	2372	396	2295	3078
	22·416	C	528	3516	1860	360	2337	1834
	23·259	C	476	3461	1140	318	2276	1238
	24·234	C	668	3376	1673	473	2402	1920
	25·318	C	445	2508	2277	320	1761	2878
	26·337	C	384	2229	1809	241	1400	2306
	27·328	C	382	2244	666	222	1302	945
	28·470	G	391	1904	1242	243	1209	1571
	29·234	C	296	1593	1974	250	1344	2710
	30·468	G	264	1437	3749	263	1418	4276
	31·463	G	244	1271	2765	275	1410	3677

MEAN AREAS OF SUN SPOTS AND FACULÆ FOR EACH ROTATION OF THE SUN, FROM 1938, JAN. 8 TO DEC. 28.

The Mean Areas have been formed by taking the means of the areas for each day of observation throughout each Rotation of the Sun, the Projected Areas being the areas as measured on the photographs and expressed in millionths of the Sun's apparent disk, and the Areas Corrected for Foreshortening being expressed in millionths of the Sun's visible hemisphere.

The Rotations adopted in the following table (which is in continuation of those years 1873-1937 printed in the Greenwich Observations for 1884 and succeeding years) correspond to the synodic rotation of the Sun, and the commencement of each is defined by the coincidence of the assumed prime meridian with the central meridian, the assumed prime meridian being that meridian which passed through the ascending node of the Sun's equator on the ecliptic at mean noon on January 1, 1854, and the assumed period of the Sun's sidereal rotation being 25·38 days. The numeration of the rotations is in continuation of Carrington's series (*Observations of Solar Spots made at Redhill* by R. C. Carrington, F.R.S.), No. 1 being the rotation commencing 1853 November 9. The dates of commencement of the rotations are given in U.T.

No. of Rotation	Date of Commencement of each Rotation	No. of Days on which Photographs were taken	Mean of Daily Area					
			Projected			Corrected for Foreshortening		
			Umbræ	Whole Spots	Faculæ	Umbræ	Whole Spots	Faculæ
1128	1938 January 8·19	28	560	3114	2174	420	2370	2609
1129	February 4·53	27	406	2386	2777	291	1717	3326
1130	March 3·86	27	390	2095	3006	286	1530	3695
1131	March 31·17	28	558	2964	2845	439	2356	3469
1132	April 27·44	27	655	3309	2961	475	2392	3668
1133	May 24·66	27	399	1926	2579	297	1451	3227
1134	June 20·86	27	801	4232	2548	559	2944	3207
1135	July 18·06	27	549	3049	3067	444	2548	3975
1136	August 14·28	28	346	1750	2885	254	1260	3658
1137	September 10·53	27	362	1983	2341	279	1613	3000
1138	October 7·81	27	443	2653	2230	308	1813	2747
1139	November 4·11	28	647	3572	2122	458	2573	2624
1140	December 1·42	27	481	2574	2165	352	1939	2675

MEAN AREAS OF SUN SPOTS AND FACULÆ FOR THE YEAR.

The Mean Projected Areas are expressed in millionths of the Sun's apparent disk.

The Mean Areas Corrected for Foreshortening are expressed in millionths of the Sun's visible hemisphere.

Year	No. of Days on which Photographs were taken	Mean of Daily Areas					
		Projected			Corrected for Foreshortening		
		Umbræ	Whole Spots	Faculæ	Umbræ	Whole Spots	Faculæ
1938	365	501	2706	2578	371	2019	3205

MEAN HELIOGRAPHIC LATITUDE OF SUN SPOTS FOR EACH ROTATION OF THE SUN, FROM 1938, JAN. 8 TO DEC. 28.

The numbers given in the accompanying table have been formed as follows:-

The Heliographic Latitude of each Spot for each day has been multiplied by its area (corrected for foreshortening), and the sum of the products, for Spots North of the Equator, has been divided by the sum of the corresponding areas to form Mean Heliographic Latitude of Spotted Area North of Equator; similarly for Spots South of the Equator. In forming the Mean Heliographic Latitude of entire Spotted Area, the algebraic sum of the products for spots north and south of the Equator has been divided by the sum of the areas; and for the Mean Distance from the Equator of all Spots the numerical sum of the products, without regard to the sign of the latitude, has been similarly divided.

The Mean Areas have been formed by dividing the sum of the Daily Areas (corrected for foreshortening) by the number of days of observation for each Rotation of the Sun and are expressed in millionths of the Sun's visible hemisphere.

No. of Rotation	Date of Commencement of each Rotation	No. of Days on which Photographs were taken	Spots North of the Equator		Spots South of the Equator		Mean Heliographic Latitude of entire Spotted Area	Mean Distance from Equator of all Spots
			Mean of Daily Areas	Mean Heliographic Latitude	Mean of Daily Areas	Mean Heliographic Latitude		
1128	1938 January 8·19	28	2187	17·15	183	13·46	+ 14·78	16·86
1129	February 4·53	27	486	13·55	1232	17·82	- 8·95	16·62
1130	March 3·86	27	405	20·26	1125	15·16	- 5·78	16·52
1131	March 31·17	28	617	24·05	1739	15·40	- 5·06	17·66
1132	April 27·44	27	617	18·64	1776	16·44	- 7·39	17·01
1133	May 24·66	27	1065	12·54	386	12·18	+ 5·96	12·45
1134	June 20·86	27	953	12·02	1992	13·35	- 5·14	12·92
1135	July 18·06	27	698	10·63	1851	14·98	- 7·97	13·79
1136	August 14·28	28	727	11·82	533	17·92	- 0·76	14·40
1137	September 10·53	27	789	15·13	824	11·17	+ 1·70	13·11
1138	October 7·81	27	1453	17·37	360	12·42	+ 11·46	16·39
1139	November 4·11	28	1078	14·72	1495	10·00	+ 0·35	11·98
1140	December 1·42	27	650	14·92	1288	11·57	- 2·69	12·70

MEAN HELIOGRAPHIC LATITUDE OF SUN SPOTS FOR THE YEAR.

Year	No. of Days on which Photographs were taken	Spots North of the Equator		Spots South of the Equator		Mean Heliographic Latitude of entire Spotted Area	Mean Distance from Equator of All Spots
		Mean of Daily Areas	Mean Heliographic Latitude	Mean of Daily Areas	Mean Heliographic Latitude		
1938	365	899	15·55	1120	14·17	- 0·94	14·79

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ROYAL OBSERVATORY, GREENWICH.

Observations of Solar Flocculi

Made with the

Spectrohelioscope

In the Year

1938

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OBSERVATIONS OF SOLAR FLOCCULI MADE WITH THE SPECTROHELIOSCOPE IN THE YEAR 1938.

The following observations relate to dark filaments or flocculi visible on the Sun's disk in the light of Hα in the immediate vicinity of sunspots, the object of the measures being to determine the motion of these hydrogen flocculi in the line of sight*.

The observations were made at the Royal Observatory, Greenwich, with a spectrohelioscope lent by the Mount Wilson Observatory and described by Dr. Hale in the *Astrophysical Journal*, **70**, 265-311, 1929. The spectrum is formed by a Rowland grating ruled with 14,438 lines to the inch, the observations being made in the light of Hα. The portion of the grating covered by the solar beam contains about 43,000 lines. The first order spectrum was used throughout the year, the scale being 1mm. = 4·35 A. The width of the second slit was usually 0·1mm. The diameter of the monochromatic image of the Sun's disk at the second slit is about 50 mm., of which a strip 6 mm. wide and 28 mm. long is rendered visible by the rotating rectangular prisms. The eyepiece used magnifies twice.

Measures of radial velocity are taken with the "line-shifter", whose scale from 0 - 10 divisions = 0·37 A. = 17 km./sec. at Hα. The zero of the Hα line is determined from measures of the darkest part of the line in an undisturbed portion of the Sun near the centre of the disk. The purpose of the observations being to locate large radial velocities, measured displacements are interpreted as being due to Doppler effects.

The probable error of a single measure of radial velocity, as determined from a number of successive readings, is about 3 km./sec., including the probable error of the zero determination. Three or four measures being generally made on each flocculus, the probable errors of the tabulated values in the third column of the following Table do not usually exceed 2 km./sec., except, perhaps in the case of the larger velocities which have accordingly been rounded off to the nearest 5 km./sec. The systematic error for the smallest velocities observed is less than 0·5 km./sec., as is shown by measures of the Sun's equatorial rotation taken at the limbs.

In the following Table, the headings of which are self-explanatory, particulars are given of each dark flocculus as follows -

* An analysis of the radial velocities of dark Hα markings near sunspots, observed at the Royal Observatory, Greenwich, 1930 - 33, is given in *Monthly Notices*, **94**, 472, 1934.

(1) The measured component of the radial velocity in km./sec., + indicating motion inwards to the Sun and - outwards from the Sun.

Where two values are given it is to be understood, unless otherwise stated in the footnotes, that different velocities were observed along the length of the flocculus, and that the tabulated values are the extreme velocities measured, which in nearly all cases correspond to the opposite ends of the marking. In those cases in which one end of a flocculus, showing progressive velocities along its length, appeared to touch a sunspot, the radial velocity observed at that extremity of the flocculus is printed in heavy italics.

(2) (a) The apparent length of the flocculus in minutes of arc, read by means of a scale inserted in the field. An asterisk denotes that the marking was small and roughly circular in shape. The diameters of these circular markings are of the order of 10".

(b) The apparent least distance in minutes of arc from the centre of the nearest sunspot or group of spots. In those cases (indicated by dots in the appropriate column) it was not possible to obtain a measure

(c) The position of the flocculus relative to the group of associated sunspots or to a single component of the group. In cases where a sunspot has been designated in the *Ledgers* in the preceding *Results*, the appropriate letter *a* (the leader of the group) or *b* (the follower) has been added. The abbreviations *n*, *s*, *f*, *p*, *c*, stand respectively for, north, south, following, preceding, central.

(3) Particulars of the associated group of sunspots, abstracted from the *General Catalogue*, including the longitude from the Sun's central meridian at the time of observing the flocculus (deduced from the mean longitude of the sunspots).

Notes have been added of unusual features seen at the time of observation. Flocculi which were apparently descending into sunspots with progressive velocities and which showed a definite curvature of shape are also noted.

OBSERVATIONS OF SOLAR FLOCCULI MADE WITH THE SPECTROHELIOSCOPE IN THE YEAR.

Dark Hα Flocculi							Associated Group of Sunspots					
Reference Number	Date and Time U.T.		Measured Radial Velocity km./sec.	Length	Least Distance from Sunspot	Position relative to Sunspot or Group	Number of Group	Longitude from Central Meridian	Central Meridian Passage		Latitude	Area
	d	h		′	′			°	d		°	
1	Jan. 7	10·1	+27	0·5	0·5	s b	12666	−53	Jan.	11·44	+20	731
2	7	10·1	+ 1	2·0	0·5	s	63	+ 5		7·04	+13	407
3	17	11·7	−11 to +38	0·2	0·1	p a	73	−12		18·43	+17	2955
4	19	10·7	−37	2·0	1·0	p a	73	+13				
5	Jan. 19	12·0	−28 to +26	0·6	1·8	p a	12673	+14	Jan.	18·43	+17	2955
6	23	10·6	−40 to +46	1·0	0·5	s a	73	+66				
7	Feb. 9	9·8	− 9	1·0	2·0	f	706	−53	Feb.	13·42	+14	106
8	9	11·7	−45 to +55	0·3	0·7	p a	03	− 9		10·14	−25	850
9	10	15·3	+40	1·2	1·7	s	08	−55		14·79	− 5	46
10	Feb. 11	9·7	−46 to +26	1·6	0·0	n	12707	−43	Feb.	14·65	+15	541
11	11	9·8	−36 to +18	1·0	0·0	s		−43				
12	11	9·8	−38 to +38	1·2	1·0	s		−43				
13	11	10·0	−31 to +20	1·0	0·4	s	03	+17	Feb.	10·14	−25	850
14	11	10·1	−36 to +30	0·8	1·4	n	03	+17				
15	Feb. 11	12·5	−39 to +60	1·4	0·3	n	12707	−41	Feb.	14·65	+15	541
16	12	10·2	+50	0·3	0·2	s	03	+30		10·14	−25	850
17	12	10·3	−15 to +48	3·0	0·7	n	07	−29		14·65	+15	541
17	12	12·2	−16 to +49					−28				
18	13	10·8	−50 to +47	1·2	1·5	sf	03	+44	Feb.	10·14	−25	850
19	13	12·1	−44 to +80	2·7	0·3			+44				
20	Feb. 13	12·1	+12	2·3	0·3	p	12707	−15	Feb.	14·65	+15	541
21	14	12·6	−12 to +43	5·0	0·2	n	07	− 2				
22	18	11·3	−22 to +41	2·6	0·2	p	16	+ 5	Feb.	18·08	−13	279
22	18	12·4	−21 to +55					+ 6				
23	18	14·5	−16 to +52	3·0	0·5	n	07	+52	Feb.	14·65	+15	541
24	18	12·3	−37 to +44	4·0	...	n	11	+17		17·24	−29	56
25	Feb. 18	14·8	−41 to +43	1·3	1·5	n	12707	+52	Feb.	14·65	+15	541
26	23	10·2	−18 to +20	0·6	0·2	n	21	−10		24·19	−17	228
27	24	10·2	+24 to +60	1·2	0·0	sp a	24	+43		21·2	−26	196
28	25	11·6	−23 to +55	0·5	0·3	f a	24	+57				
29	26	12·3	−17 to +50	2·3	0·6	sp	21	+31	Feb.	24·19	−17	228
30	Mar. 1	9·7	+42	0·2	0·7	s b	12731	+22	Feb.	27·76	−14	362
31	1	12·5	−7 to +52	1·8	1·6	n	31	+23				
32	1	14·6	−100 to +55	0·3	0·8	f b	31	+24				
33	2	11·3	+37	*	1·2	f a	31	+36				
34	2	14·5	+46	*	0·8	f a	31	+37				
35	Mar. 2	14·6	−22 to +37	*	1·6	sf a	12731	+38	Feb.	27·76	−14	362
36	3	9·5	−47 to +70	1·5	1·1	s b	31	+48				
37	3	10·8	+52	*	0·8	n	33	−79	Mar.	9·44	−26	286
38	5	10·9	+46	*	0·2	s b	31	+75	Feb.	27·76	−14	362
39	7	10·8	+25	2·3	1·5	p	34	−36	Mar.	10·17	+23	586
40	Mar. 8	10·1	+ 1	3·5	0·0	f	12734	−23	Mar.	10·17	+23	586
41	8	10·2	+ 3	3·0	1·0	n	33	−13		9·44	−26	286
42	8	10·3	−26 to +55	1·1	0·0	s	36	−60		12·96	+ 8	132
43	8	11·2	−35 to +60	1·2	0·0	p	34	−22				
44	9	10·0	− 4	0·5	1·0	p	34	−10		10·17	+23	586
45	Mar. 9	10·3	+34	*	1·5	n f	12736	−46	Mar.	12·96	+ 8	132
46	9	14·7	−34 to +70	1·0	0·0	p a	38	−41		12·70	− 9	411
47	9	14·8	−49 to +49	0·6	0·0	f	38	−41				
48	11	13·0	−34 to +60	1·2	0·2	f	34	+19		10·17	+23	586
49	14	9·7	−36 to +49	*	0·7	f	34	+56				
50	Mar. 14	9·8	+38	1·3	0·8	s	12734	+56	Mar.	10·17	+23	586
51	14	10·0	−25 to +80	0·2	0·0	f a	38	+23		12·70	− 9	411
52	15	9·8	−30	0·4	1·0	n	38	+36		12·70	− 9	411
53	15	10·0	+50	*	1·0	s p	34	+69		10·17	+23	586
54	15	11·7	−30	1·5	0·3	f	34	+70		10·17	+23	586

OBSERVATIONS OF SOLAR FLOCCULI MADE WITH THE SPECTROHELIOSCOPE IN THE YEAR.

Dark Hα Flocculi						Associated Group of Sunspots				
Reference Number	Date and Time U.T.	Measured Radial Velocity km./sec.	Length	Least Distance from Sunspot	Position relative to Sunspot or Group	Number of Group	Longitude from Central Meridian	Central Meridian Passage	Latitude	Area
	d h		′	′			°	d	°	
55	Mar. 17 15·0	−38 to +55	0·6	0·5	*p*	12754	−62	Mar. 22·30	− 8	250
56	17 15·1	−55 to +55	*	3·6	*s*	54	−62			
57	18 12·2	−40	2·3	1·8	*sf*	54	−50			
58	18 12·4	−46 to +39	2·2	1·5	*f*	54	−50			
59	19 9·5	−33 to +24	0·8	0·3	*sf*	54	−38			
60	Mar. 19 9·6	−50 to +42	2·2	2·3	*f*	12754	−38	Mar. 22·30	− 8	250
61	19 9·6	−50 to +23	1·5	2·0	*f*	54	−38			
62	19 9·9	−35 to +23	1·2	0·3	*nf*	54	−38			
63	21 10·1	−44	0·4	1·2	*sp a*	57	−76	Mar. 26·93	−15	1365
64	24 9·8	−36	*	0·9	*p a*	57	−33			
65	Mar. 24 10·0	−27 }	1·7	1·5	*n a*	12757	−33	Mar. 26·93	−15	1365
65	24 10·1	+28 }					−33			
66	24 10·0	+37	1·5	1·1	*f a*	57	−33			
67	24 10·8	−26	*	1·7	*nf a*	57	−33			
68	26 9·7	−20 to +47	0·7	0·0	*n b*	57	− 7			
69	26 9·9	+ 5	3·5	2·1	*s b*	57	− 7			
70	Mar. 26 10·2	+28 to +75	1·2	1·3	*p b*	12757	− 7	Mar. 26·93	−15	1365
71	26 12·7	−50 to +44	0·8	1·1	*p b*	57	− 5			
72	29 9·6	+ 8	0·7	0·8	*p b*	57	+32			
73	29 10·9	− 3 to +50	...	0·0	*p b*	57	+33			
74	30 10·0	+42	0·4	0·8	*n a*	57	+46			
75	Mar. 30 10·1	+36	*	0·2	*n*	12764	+ 8	Mar. 29·81	−20	27
76	30 10·7	−24	0·9	0·8	*s b*	57	+46	26·93	−15	1365
77	30 12·8	+30	**	0·7	*f a*	57	+48			
78	31 10·1	− 5 to +41 }	1·6	0·0	*n b*	57	+59			
78	31 10·1	−65 to +50 }					+59			
79	31 10·5	−11 to +30	0·4	0·2	*f b*	57	+59			
80	Mar. 31 10·6	−29 to −90	1·0	0·8	*sp a*	12757	+60	Mar. 26·93	−15	1365
81	31 11·4	+44	0·3	1·4	*p b*	57	+60			
82	31 15·1	−27 to +130	1·8	0·2	*n b*	57	+62			
83	31 15·1	−46 to +65	0·3	0·8	*p b*	57	+62			
84	Apr. 2 10·5	−23 to +28	1·2	0·0	*p*	72	−79	Apr. 8·40	−10	168
85	Apr. 2 10·6	−37 to +21	1·1	0·3	*f*	12772	−79	Apr. 8·40	−10	168
86	2 10·7	−27 to +50	0·6	3·7	*n f*	62	+ 1	2·36	−21	340
87	2 10·7	−33 to +43	2·5	0·3	*s f*	62	+ 1			
88	2 10·8	−19 to +37	0·2	0·7	*s p*	72	−78	Apr. 8·40	−10	168
89	3 10·7	−21 to +30	0·6	0·3	*f*	68	−43	6·72	−23	218
90	Apr. 4 9·9	−37 to +30	0·6	0·1	*p*	12768	−32	Apr. 6·72	−23	218
91	4 10·2	−36 to +47	1·3	0·7	*sp*	68	−30			
91	4 10·3	−25 to +115	1·1	0·8	*sp*	68	−30			
92	4 11·3	−54 to +85	1·0	0·2	*p*	68	−30			
93	6 11·1	−28 to +40	1·1	0·3	*nf a*	62	+54	Apr. 2·36	−21	340
94	7 11·3	+105 to +150	1·2	0·0	*nf* a_1	62	+68			
95	Apr. 7 15·1	+60	**	0·0	*n* a_1	12762	+70	Apr. 2·36	−21	340
96	8 14·6	−41 to +65	0·6	0·0	*c*	77	−74	14·22	+27	1098
97	8 14·7	−41 to +42	0·4	0·6	*f a*	75	−41	11·69	− 5	400
98	11 9·5	−50	0·3	1·2	*nf b*	77	−37	14·22	+27	1098
99	11 9·9	−55 to +55	1·1	0·9	*s a*	77	−37			
100	Apr. 11 10·4	+43 to +120	0·7	0·4	*s a*	12777	−37	Apr. 14·22	+27	1098
101	11 13·7	−45	3·3	1·6	*f*	77	−35			
102	11 14·8	0 to +65	0·3	0·5	*s a*	77	−34			
103	11 14·9	+ 3 to +27	3·5	2·0	*sf a*	77	−34			
104	11 15·5	−33	4·5	1·9	*s a*	77	−34			
105	Apr. 11 15·5	+125	0·3	2·6	*s a*	12777	−34	Apr. 14·22	+27	1098
106	12 9·1	+36	1·2	1·6	*f b*	77	−24			
107	12 9·3	+ 3 to +65	0·7	0·2	*s a*	77	−24			
108	12 11·2	−140	*	2·0	*f*	77	−23			
108	12 11·7	−28 to +95	4·0	1·2	*f*	77	−23			
109	12 11·8	−26 to +60	0·4	0·2	*f a*	75	+11	Apr. 11·69	− 5	400

OBSERVATIONS OF SOLAR FLOCCULI MADE WITH THE SPECTROHELIOSCOPE IN THE YEAR.

Dark Hα Flocculi								Associated Group of Sunspots					
Reference Number	Date and Time U.T.			Measured Radial Velocity km./sec.	Length	Least Distance from Sunspot	Position relative to Sunspot or Group	Number of Group	Longitude from Central Meridian	Central Meridian Passage		Latitude	Area
		d	h		′	′			°		d	°	
110	Apr.	12	11·8	+130	1·2	0·2	f b	12777	-23	Apr.	14·22	+27	1098
111		12	13·7	-36 to +29	1·3	0·8	f a	77	-22				
112		12	13·8	+ 2	1·2	0·5	sp a	77	-22				
113		12	14·8	+23	1·0	0·2	p b	77	-21				
114		12	15·2	-140 to +65	3·0	0·2	s a	77	-21				
114		12	15·3	-35 to +150	3·0	0·2	s a	77	-21				
115	Apr.	12	15·4	-43 to +90	2·0	0·2	sp a	12777	-21	Apr.	14·22	+27	1098
116		13	10·1	+100	0·4	2·2	f a	77	-11				
117		13	10·2	+65	1·2	0·8	p b	77	-11				
118		13	11·1	-85 to +145	1·4	0·1	s b	77	-10				
119		14	9·7	-48 to +70	1·1	0·1	p	79	-23	Apr.	16·18	-11	284
120	Apr.	18	8·3	-37 to +65	1·5	0·2	f a	12781	-39	Apr.	21·27	-10	690
121		19	11·7	-75 to +55	1·3	0·4	sf a	81	-24				
122		28	10·1	+55	*	0·6	n	95	-63	May	3·18	-20	144
123		29	9·1	-65 to +43	1·0	0·4	p	96	-51		3·24	+23	223
124		29	10·9	-160	0·3	0·5	s	96	-50				
125	Apr.	29	11·4	+26 to +85	0·9	0·6	s	12796	-50	May	3·24	+23	223
126		29	11·5	-39	*	0·4	s	96	-50				
127		30	8·8	-46 to +70	2·5	1·1	f	95	-37	May	3·18	-20	144
128		30	9·8	-70 to +45	1·2	0·0	p	99	-51		4·25	+24	184
129	May	4	9·0	-29 to +50	0·3	0·2	f	12805	-30	May	6·65	-35	151
130	May	4	10·6	-36 to +45	2·5	1·4	f	12802	+ 9	May	3·79	-22	206
131		4	12·0	-80 to +43	0·6	0·3	p	799	+ 3		4·25	+24	184
132		4	12·0	-65 to +90	2·5	0·4	f	799	+ 3				
133		4	13·4	-55 to +60	1·0	0·4	p	799	+ 4				
134		6	14·1	-80 to +95	1·3	1·0	sf	806	-10	May	7·32	-39	98
135	May	6	14·3	-43 to +39	0·8	0·0	c	12805	- 1	May	6·65	-35	151
136		8	10·2	+ 5 to +55	2·0	0·1	c	08	-26		10·36	- 7	713
137		8	9·9	-36 to +45	*	1·6	n	02	+62		3·79	-22	206
138		9	10·7	+39	*	0·1	p	08	-12		10·36	- 7	713
139		9	10·8	+1	1·2	0·6	p	08	-12				
140	May	9	11·0	-33 to +45	1·3	1·1	s	12817	-65	May	14·34	-24	283
141		9	11·5	-36	0·5	1·8	f	05	+37		6·65	-35	151
142		10	8·6	-44 to +50 }	1·0	0·4	f	17	-53		14·34	-24	283
142		10	9·6	-27 to +50 }					-52				
143		10	9·5	- 3	3·5	1·5	f	10	-17	May	11·69	+24	69
144		11	9·4	-12 to +50	1·5	0·7	n	17	-39		14·34	-24	283
145	May	11	9·6	0 to +27	1·6	0·1	n	12808	+14	May	10·36	- 7	713
146		12	8·7	-40 to +49	1·2	0·2	n	08	+26		10·36	- 7	713
147		12	9·2	-40 to +42	0·6	0·7	s	14	- 9		13·03	+25	252
148		12	10·0	-17 to +55	1·4	0·2	n	14	- 8				
149		12	10·2	-14 to +49	*	1·0	s	22	-75	May	18·09	-10	202
150	May	12	10·4	- 3 to +65 }	0·6	0·2	c	12814	- 8	May	13·03	+25	252
150		12	12·8	-30 to +60 }					- 7				
151		12	14·7	-11 to +60	2·2	0·2	f a	21	-58	May	17·01	-12	500
152		14	9·0	-50 to +41	1·3	0·4	f a	21	-35				
153		19	15·5	+18 to +60	0·4	0·2	c	25	-29	May	21·83	-13	306
154		20	13·7	-23 to +29	0·5	0·6	f	25	-17				
155	May	21	9·3	-44	0·3	0·4	s	12827	-47	May	24·94	-25	113
156		21	10·6	-25 to +40	1·0	0·6	f	27	-46				
157		23	9·1	-19	0·3	1·2	n a	26	-18	May	24·76	-16	450
158		24	10·2	-38 to +55	0·3	1·5	c	29	+ 8		23·80	+ 8	1090
159		24	14·0	+11 to +55	1·1	0·0	s a	29	+10				
160	May	24	14·1	- 2	*	0·5	n b	12829	+10	May	23·80	+ 8	1090
161		24	16·2	- 8 to +65	1·8	0·8	s b	26	- 1		24·76	-16	450
162		26	9·0	-60 to +49	*	0·3	f a	29	+34		23·80	+ 8	1090
163	June	3	12·0	+39	2·0	0·4	s a	41	+13	June	2·53	+27	211
164		9	8·6	- 2	0·3	2·0	n a	51	-29		11·55	+15	581

OBSERVATIONS OF SOLAR FLOCCULI MADE WITH THE SPECTROHELIOSCOPE IN THE YEAR.

Dark Hα Flocculi						Associated Group of Sunspots				
Reference Number	Date and Time U.T.	Measured Radial Velocity km./sec.	Length	Least Distance from Sunspot	Position relative to Sunspot or Group	Number of Group	Longitude from Central Meridian	Central Meridian Passage	Latitude	Area
	d h		′	′			°	d	°	
165	June 9 9·9	−23 to +35	1·8	0·8	s	12844	+41	June 6·34	− 6	268
166	9 10·0	0	2·8	1·4	n	44	+41			
167	10 11·2	−105 to +60	0·7	2·2	s a	51	−14	June 11·55	+15	581
168	13 13·9	− 5 to +55	0·6	0·3	c	51	+27			
169	13 15·6	+40	0·4	1·3	s a	51	+28			
170	June 14 9·6	−28 to +37	1·4	0·2	f a	12851	+38	June 11·55	+15	581
171	14 15·9	−27	0·4	1·3	f	67	−57	18·98	+ 6	390
172	15 8·7	−33 to +32	1·0	0·4	p a	51	+51	11·55	+15	581
173	15 8·8	+ 3 to +60	0·5	0·2	c	51	+51			
174	15 8·8	−30 to +30	1·1	0·2	p	67	−48	June 18·98	+ 6	390
175	June 16 9·2	−50 to −5	0·5	0·1	f	12851	+64	June 11·55	+15	581
176	17 10·2	+11	*	0·4	f	73	−68	22·54	+ 6	669
177	17 10·7	−27	0·8	2·0	n	73	−67			
178	20 9·4	+33	*	0·8	c	73	−28			
179	20 10·7	−26 to +55	...	0·0	c	73	−28			
180	June 21 8·6	+10	0·3	0·7	c	12873	−16	June 22·54	+ 6	669
181	21 8·7	−20 to +28	0·7	0·4	s	67	+31	18·98	+ 6	390
182	21 9·4	−16 to +20	1·0	0·6	n	67	+32			
183	29 13·9	−60 to +55	1·1	1·2	s	86	−33	July 2·07	−21	376
184	July 1 8·8	+39	0·4	0·6	s	85	0	1·37	+27	234
185	July 1 8·9	+23 to +65	0·5	0·0	n	12885	0	July 1·37	+27	234
186	1 9·9	+55 to +135	1·2	0·0	s	85	+ 1			
187	5 9·5	−32 to +43	0·6	0·1	s b	94	−25	July 7·24	+14	697
188	6 15·8	−30 to +46	1·1	0·0	p a	94	− 8			
189	7 10·5	+23	*	0·4	c	95	− 3	July 10·72	−13	1163
190	July 13 9·1	−49 to +70	0·6	0·7	n b	12895	+35	July 10·72	−13	1163
191	13 9·4	−35 to +35	0·7	0·5	n a_1	95	+35			
192	13 11·1	−41 to +55 }	0·7	0·8	n b	95	+36			
192	13 11·2	−32 to +70 }					+36			
193	16 11·6	−17	0·5	0·6	n	902	+19	July 15·06	−12	2122
194	19 10·6	−30 to +70	0·6	0·3	s	902	+58			
195	July 21 10·2	+47	0·3	0·5	p	12920	−39	July 24·34	+17	186
196	25 8·7	− 7 to +70	*	0·2	f a	31	+29	23·2	+ 7	418
197	25 11·5	+41	1·0	0·2	p a	31	+30			
198	Aug. 3 8·9	−34 to +28	0·6	1·5	s	43	−57	Aug. 7·68	− 6	252
199	3 10·3	−14 to +49	0·9	0·2	s	34	+57	July 30·12	− 6	382
200	Aug. 4 8·7	−25 to +20	0·3	0·1	n	12947	+58	July 30·9	+ 8	383
201	4 9·3	−34 to +46	0·5	0·3	c	47	+59			
202	8 15·0	−18 to +32	1·1	0·7	f a	50	−30	Aug. 10·92	−15	852
203	8 15·1	−27 to +45	0·3	0·2	s b	50	−30			
204	23 9·1	+15 to +46	0·6	...	c	69	+ 9	Aug. 22·72	−24	12
205	Aug. 25 9·4	−30	0·3	1·4	f	12964	+62	Aug. 20·68	+11	109
206	25 11·2	−12 to +55	1·2	0·3	n	75	+25	23·59	−17	255
207	Sept. 1 8·8	+24	0·3	0·2	n	85	−13	Sept. 2·34	−20	21
208	2 9·5	−29	0·5	0·7	n b	86	−42	5·54	+11	850
209	13 9·0	−27 to +32	0·4	0·3	f	99	−43	16·65	+ 7	231
210	Sept. 14 9·0	+42	0·3	0·6	c	12999	−30	Sept. 16·65	+ 7	232
211	15 9·4	− 4 to +42	0·5	0·7	c	99	−17			
212	22 9·1	−22 to +47	1·3	0·5	n	13006	−41	Sept. 25·50	−10	584
212	22 10·3	+49	...	0·5	n	6	−41			
213	22 15·2	+12 to +55	0·6	0·7	f	7	−59	Sept. 27·10	−11	383
214	23 9·0	−265 to +85	4·0	1·2	n	7	−49			
215	Sept. 23 10·4	−33 to +34 }	2·3	0·6	s	13009	−58	Sept. 27·80	−12	666
215	23 10·6	+54 }					−57	27·10	−11	383
216	23 12·3	−38 to +41	3·0	1·6	s p	7	−47			
217	23 12·4	+70	2·4	1·2	p	7	−47			
218	24 8·9	−38	1·0	0·9	n	11	−75	Sept. 30·02	+12	68
219	27 15·4	− 1 to +45	2·3	5·0	s	6	+28	Sept. 25·50	−10	584

OBSERVATIONS OF SOLAR FLOCCULI MADE WITH THE SPECTROHELIOSCOPE IN THE YEAR.

Dark Hα Flocculi							Associated Group of Sunspots				
Reference Number	Date and Time U.T.		Measured Radial Velocity km./sec.	Length	Least Distance from Sunspot	Position relative to Sunspot or Group	Number of Group	Longitude from Central Meridian	Central Meridian Passage	Latitude	Area
	d	h		′	′			°	d	°	
220	Sept. 30	8·9	− 8 to +19	*	0·5	f	13018	−58	Oct. 4·77	+20	125
221	30	9·3	−31	0·6	1·4	s	07	+43	Sept. 27·10	−11	383
222	30	9·4	+36	*	1·2	nf	07	+43			
223	30	10·2	−30 to +30	1·8	...	c	17	+44	Oct. 2·80	− 7	44
224	Oct. 1	11·1	−25 to +70	0·9	0·1	f	18	−44	4·77	+20	125
225	Oct. 6	9·8	−35 to +39	2·5	0·1	n	13016	+56	Oct. 2·14	+13	59
226	6	10·2	−42 to +33	0·2	1·0	p	24	−73	11·93	+17	2654
227	11	9·7	−41 to +44	2·0	3·0	s b	24	− 7	11·93	+17	2654
228	12	10·9	+47	*	0·8	n a	24	+ 7			
229	12	11·0	−32	1·2	3·0	s a	24	+ 7			
230	Oct. 14	9·7	−22	2·3	1·3	s a	13024	+33	Oct. 11·93	+17	2654
231	14	10·2	−43 to +41	*	2·0	f b	24	+33			
232	15	9·9	−18	1·0	0·6	p b	24	+46			
233	17	10·3	−41	0·9	1·0	n a	24	+73			
234	22	10·2	+36	0·2	0·6	c	38	−43	Oct. 25·71	+25	246
235	Oct. 26	10·5	+22 to +55	*	0·2	s a	13041	− 6	Oct. 26·90	−14	361
236	26	11·3	+34 }	0·7	0·5	f	38	+10	25·71	+25	246
236	26	11·4	+55 }					+10			
237	Nov. 5	12·4	− 2	1·1	1·2	s	64	−69	Nov. 10·78	− 9	1990
238	10	13·5	− 7	2·0	1·0	s	64	− 3			
239	11	10·1	−20 to +140	0·9	0·3	c.	64	+ 8			
240	Nov. 11	10·8	−39 to + 5	4·0	1·5	n	13064	+ 9	Nov. 10·78	− 9	1990
241	11	11·6	−36 to +50	0·2	1·2	s	64	+ 9			
242	12	11·3	− 1	2·8	1·0	s	64	+22			
243	12	11·4	+17	1·2	1·0	p	64	+22			
244	12	11·5	− 4 to +70	1·4	0·0	n	64	+22			
245	Nov. 12	11·6	−65 to −125	*	...	...	13064	+22	Nov. 10·78	− 9	1990
246	14	11·2	−10 to +26	1·3	0·6	f	64	+49			
247	19	9·9	−48 to +47	1·3	0·7	f	72	+49	Nov. 15·70	−18	594
248	19	11·1	+41 }	2·5	1·2	s	72	+50			
248	19	11·2	−30 to +41 }					+50			
249	24	12·2	+33	1·5	0·3	n	86	−56	Nov. 28·75	+14	1482
250	Nov. 24	14·3	+38	0·4	1·2	sp	13086	−55	Nov. 28·75	+14	1482
251	Dec. 2	10·0	−54	0·6	0·5	c	86	+48			
252	6	11·8	−50 to +32	*	1·1	sp	93	−19	Dec. 7·91	−10	610
253	31	12·5	−42 to +60	**	0·4	p	128	−54	Jan. 4·65	−12	485

NOTES

Reference Number

4. Associated with a bright chromospheric eruption of intensity 1.

6. Associated with a bright eruption of intensity 2.

10. } 11. } The outward velocity is measured over the sunspot.

15. Associated with a bright eruption of intensity 1, from $12^h\ 18^m$ to $12^h\ 30^m$.

16. Associated with a bright eruption of intensity 2.

18. Associated with a bright eruption of intensity 1.

20. This measure of velocity relates to two separated markings.

22. Direction of motion − inwards clockwise to sunspot.

24. Another measure at $12^h\ 32^m$ gives −24 to +38 km./sec.

Reference Number

25. Associated with a bright eruption of intensity 1. The separate measures are:−

$14^h\ 43^m$ −41 km./sec.
14 49 +37
14 55 +43

36. Subsequent measures give:−

$9^h\ 50^m$ +41 : $10^h\ 58^m$ +40

40. This long marking appears to touch a sunspot.

41. Associated with a bright eruption (Solar bomb), of intensity 1.

46. } 47. } Associated with a bright eruption of intensity 1.

48. A repeat measure at 14 33 gives −30 to +40 and another at $15^h\ 47^m$ −25 to +40 km./sec.

OBSERVATIONS OF SOLAR FLOCCULI MADE WITH THE SPECTROHELIOSCAPE IN THE YEAR.

NOTES - *continued.*

Reference Number

54. The mean of 12 consistent measures taken between 11^h 24^m and 12^h 1^m is 30·2 ±0·5 km./sec. Between 12^h 1^m and 12^h 15^m, the marking becomes very faint; the mean velocity being -20 km./sec. No outward (+) component is visible in the near vicinity although searched for.

58. Associated in time and position with a bright eruption approaching intensity 3, lasting from 12^h 13^m to 12^h 37^m. The inward velocity of +39 km./sec. came in suddenly between 12^h 21^m (when -46 km./sec. was measured.) and 12^h 25^m.

59. A repeat measure 54 minutes later gives -27 to +38 km./sec.

60. A repeat measure 19 minutes later gives -60 to +39 km./sec.

78. Only 2^m separates these two measures showing a rapid change in velocity. A previous measure at 9^h 52^m gives -6 to + 32 km./sec.

80. A dot travels along a path 1′·0 in length as the "line-shifter" is turned from positions indicating -29 to -90 km./sec.

88. Associated with a bright eruption of intensity 1.

91. Note the considerable change in + component of velocity from +47 to +115 km./sec. within 6 minutes. A further measure at 10^h 34^m shows a + component only of +50 km./sec. Nos. 90, 91 and 92 are associated with a bright eruption approaching intensity 3 with which there was a synchronous fade-out.

95. Associated with a bright eruption approaching intensity 3.

96. Running between two sunspots *a* and *b* of Group 12777.

98.
99. } Associated with a minor bright eruption of intensity 1.

100. A pair of parallel markings.

103. At +3 km./sec., a marking 1′·8 in lentth is seen; at +27 km./sec., a longer marking curved at its *n* end appears to take its place 0′·4 eastwards.

104.
105. } These two markings appear in conjunction with each other; 0′·3 apart.

108. Between 11^h 10^m (-140 km./sec.) and 11^h 40^m (-28 to +95 km./sec.,) the marking has grown from a dot to a series of three markings covering an extensive area. An intermediate measure at 11^h 20^m gives -60 to +80 km./sec. These markings come with a bright eruption of intensity 2.

109. At -26 km./sec., the marking is a dot: at +60 km./sec. a short marking touching the penumbra of the sunspot.

110. A straight marking touching the outer edge of the penumbra of the sunspot.

114.
115. } Associated with a bright eruption of intensity 2. No. 115 has an inward motion clockwise into the sunspot. The extreme measured values are tabulated, the individual values being:-

15^h	17^m	-22 to +64	km./sec.
15	22	-29 to +90	"
15	31	-43 to +75	"

Reference Number

116.
117.
118.
} Associated with two successive eruptions of intensity 3 and 2 respectively, visible in *H*β as well as in *H*α.

118. Extreme velocities tabulated: the separate measures are:-

11^h	2^m	-84 km./sec.
11	3	-73
11	7	-40 to +144
11	13	+21 to +127

124. Associated with a bright eruption of intensity 1.

125. Direction of motion - inwards clockwise to sunspot.

128. Direction of motion - counterclockwise into sunspot.

133. Associated with a bright eruption of intensity 2.

134. *The greatest range is tabulated, the separate measures* giving:-

13^h	56^m	-1 to +66 km./sec.
13	59	-50 to +97
14	10	-81 to +19
14	17	disappeared

Associated with a bright eruption of itensity 1.

137. Associated with a bright eruption of intensity 1. The measures of this marking are included in a discussion of Characteristic Radial Motions of *H*α Absorption Markings *Monthly Notices 102*, table 1 p.6, 1942. The unsmoothed observations are as follows:-

Time U.T.			
09^h	49^m	-28 km./sec.	
	49½	-36	
	50	-31	
	52	-36	
	52½	-32	
	53½		+41 First appearance of + component.
	57	-25	+41
	59	-20	+30
10	01	-14	+45
	06	-17	+41

138. A dot on the outer edge of the sunspot penumbra.

146. The end with + velocity almost reaches the outer edge of the sunspot penumbra.

158. Appearing after a bright eruption of intensity 2 .

161. Associated with a bright eruption of intensity 1.

162. At -60 km./sec., a short streak 0′·3 in length: at +49 km./sec. a blob 0′·4 in diameter comparable in size with the umbra of the sunspot. Associated with a bright eruption of intensity 1.

167. Associated with a bright eruption of intensity 1. The tabulated velocities (-105 to +60 km./sec.) represent the measured range between 11^h 0^m and 11^h 20^m. The individual measures are as follows:-

11^h	0^m	-33 to +48	
11	2½	-93	
11	3	-104	A dot giving the maximum velocity of the marking.
11	6½	-82	
11	10	-43	Bright eruption ends at 11^h 8^m.

continued

OBSERVATIONS OF SOLAR FLOCCULI MADE WITH THE SPECTROHELIOSCAPE IN THE YEAR.

NOTES - *continued.*

Reference Number

167 - *continued*

11 12	+41	-component has gone.
11 15	+61	
11 18	+53	
11 20	+45	+component nearly gone.

174. A pair of markings.

175. The outward motion appears to come from a small sunspot.

182. The end of the marking giving -16 km./sec. is the nearer to the sunspot.

183. A pair of markings, the one with + velocity being nearer the sunspot. At 14^h 40^m, only the - component measuring -33 km./sec. is present.

186. Direction of motion - clockwise into sunspot.

190. Maximum velocities are tabulated; the separate measures are:-

8^h 43^m	-49 to +33	km./sec.
9 13	-40 to +44	
9 33	-28 to +71	

Associated with a bright eruption of intensity 2.

192. Associated with a bright eruption of intensity 2.

193. Associated with a bright eruption of intensity 1.

194. Associated with a bright eruption of intensity 2.

196. A dot on the outer edge of the penumbra of a sunspot.

200. Appears to be projected from a small patch of enhanced emission seen in projection over a sunspot.

201. Associated with a bright eruption of intensity 1.

207. Associated with a bright eruption of intensity 1.

212. Direction of motion - inwards counterclockwise into edge of umbra of large sunspot.

213. Associated with a bright eruption of intensity 1.

214. The range of measured velocities is tabulated, the individual unsmoothed readings being as follows:-

8^h 49^m 30^s	-177 km./sec.	
51 0 >	-286	
52 45	-181	
53 45	-166	(Bulk of marking gives -51 km./sec.)
55 0	-162	
57 30	- 33	

continued.

Reference Number

214 - *continued*

9^h 0^m		+49
9 5		+83
9 6	- 55	+57
9 8	- 37	+44
9 10	- 33	+41
9 18	- 30	+36
9 47	- 27	+24

215. Associated with a bright eruption of intensity 1.

220. Two minutes later, the - component has gone, the + component now measuring +29 km./sec.

228. A dot on the outer edge of a big sunspot.

231. - and + components of velocity practically in same place. Associated with a bright eruption of intensity 1.

233. Associated with a bright eruption of intensity 1.

235. A dot giving a measured velocity of +55 km./sec. at the outer edge of the penumbra of a sunspot.

239. Associated with a bright eruption of intensity 2. The separate measures are:-

09^h 50^m	+92 km./sec.	
09 53	- 16 to +138	
(09 58		bright eruption has ceased).
10 18	-20 to + 74	

241. Associated with a bright eruption of intensity 1.

245. Associated with a bright eruption of intensity 2. Range in measured velocities is tabulated, the individual measures being:-

11^h 34^m	-72 km./sec.	
11 35½	-125	Also a + component glimpsed through cloud.
11 40	-65	
11 42	-88	

246. Ends at outer edge of penumbra of sunspot.

249. Some enhanced emission nearby.

251. A bright eruption of intensity 2 closely precedes the dark marking which itself appears projected on the outer edge of the penumbra of a sunspot.

253. The + component slightly south-east of the - component. The markings appear projected on the outer edge of the penumbra of the sunspot.

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