GREENWICH
PHOTO-HELIOGRAPHIC
RESULTS.

1924.

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RESULTS OF MEASURES

MADE AT THE

ROYAL OBSERVATORY, GREENWICH

UNDER THE DIRECTION OF

SIR FRANK DYSON, M.A., LL.D., F.R.S.,

ASTRONOMER ROYAL,

OF

PHOTOGRAPHS OF THE SUN

TAKEN

AT GREENWICH, AT THE CAPE, AND IN INDIA

IN THE YEAR

1924.

WITH A

DETERMINATION OF THE SUN'S ROTATION

AND A DISCUSSION OF

THE CHARACTERISTIC MOVEMENTS OF SPOTS

FROM GREENWICH MEASURES, 1878–1923.

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GREENWICH PHOTO-HELIOGRAPHIC RESULTS, 1924.

INTRODUCTION.

§ 1. *Positions and Areas of Sun Spots and Faculæ for each Day in the Year* 1924.

The photographs from which these measures were made were taken at the Royal Observatories of Greenwich or of the Cape; at the Kodaikánal Observatory, Southern India; or at Dehra Dûn, North-West Provinces, India.

The photographs of the Sun obtained at Greenwich were taken either with the Dallmeyer Photo-heliograph, of 4 inches aperture (stopped down to 2·9 inches) or the Thompson Photo-heliograph of 9 inches aperture (usually stopped down to 4 inches). The latter instrument was remounted after its return from Russia on the 26-inch Refractor and was brought into regular use on July 16. Both Photo-heliographs give a solar image of about 10-cm. radius. The two instruments are worked in conjunction; the Dallmeyer Photo-heliograph is of most use in snatching a photograph in breaks on cloudy days, while the Thompson Photo-heliograph is best employed in intervals of good definition.

The photographs from the Cape Observatory were taken under the superintendence of His Majesty's Astronomer at the Cape, Mr. H. Spencer Jones, and those from Kodaikánal under the superintendence of the Director, Dr. T. Royds. The photographs from Dehra Dûn, which have been forwarded by the Solar Physics Committee to fill the gaps in the combined series, were taken under the superintendence of the Deputy Surveyor-General, Trigonometrical Survey of India. At two of the observatories the instrument employed was a Dallmeyer Photo-heliograph giving an image of the Sun about 10 centimetres in radius; at Kodaikánal a Cooke photo-visual object-glass of 6 inches aperture was used, the image of the Sun being on about the same 10-centimetre scale.

Photographs of the Sun were available for measurement upon each day in 1924, those finally selected for measurement being supplied by the different observatories as under :—

Greenwich	212
Cape	147
Kodaikánal	3
Dehra Dûn	4
Total	366

The names of those persons who measured the photographs for the year 1924 are as follows :—

H. W. Newton	Andrina M. Crommelin
H. Barton	Isabel Jackson

At the principal focus of the Photo-heliographs, 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 Photo-heliographs, and respectively perpendicular and parallel to it in the Dehra Dûn, instrument. In the Kodaikánal Photo-heliograph there is one wire fixed parallel to the equator.

The zero of position-angles for the Greenwich, Cape, and Kodaikánal Photo-heliographs 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 photo-heliograph to this line was measured with the position-micrometer, and a small correction for the inclination of the Sun's path was then applied.

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 exactly at right angles to each other. From this angle, when corrected for the Sun's motion in declination, the correction for the zero of position of the wires can be inferred.

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

Determination of the Zero of Position-Angles.

Month 1924.	Greenwich, Dallmeyer.		Greenwich, Thompson.		Cape.	
	Photographic.	Visual.	Photographic.	Visual.	Photographic.	Visual.
	° ′	° ′	° ′	° ′	° ′	° ′
January ..	—	+ 2. 46 (2)			− 0. 29 (2)	− 0. 24 (4)
February ..	+ 2. 48 (1)	+ 2. 42 (2)			− 0. 28 (2)	− 0. 24 (4)
March ..	+ 2. 33 (1)	+ 2. 42 (2)			− 0. 37 (1)	− 0. 21 (4)
April ..	+ 2. 50 (1)	+ 2. 41 (2)			− 0. 26 (2)	− 0. 20 (4)
May	+ 2. 37 (2)	+ 2. 36 (1)			− 0. 22 (2)	− 0. 17 (4)
June	+ 2. 36 (2)	+ 2. 39 (3)			− 0. 15 (2)	− 0. 18 (4)
July	+ 2. 44 (3)	+ 2. 39 (2)	+ 2. 15 (1)	+ 2. 16 (2)	− 0. 15 (2)	− 0. 17 (4)
August ..	+ 2. 39 (1)	+ 2. 37 (1)	+ 2. 22 (1)	+ 2. 18 (3)	− 0. 13 (2)	− 0. 20 (4)
September ..	+ 2. 43 (2)	+ 2. 50 (1)	+ 2. 08 (1)	+ 2. 21 (4)	− 0. 20 (1)	− 0. 19 (4)
October ..	+ 2. 42 (1)	+ 2. 44 (3)	+ 2. 16 (2)	+ 2. 19 (3)	− 0. 25 (2)	− 0. 21 (5)
November ..	—	+ 2. 43 (1)	+ 2. 32 (1)	—	− 0. 20 (2)	− 0. 24 (3)
December ..	+ 2. 39 (2)	+ 2. 45 (3)			{ − 0. 22 (1) / − 0. 38 (1)	− 0. 25 (2) / − 0. 35 (2)

The suffixes indicate the number of zero plates or the number of sets of transits.

New wires were inserted in the Cape Photo-heliograph on December 19.

The zero-corrections used during the year 1924 in the reduction of the photographs taken at Greenwich were as follows :—

		°
Dallmeyer Photo-heliograph	January and February ..	+ 2·75
	March and April	+ 2·7
	May and June..	+ 2·6
	July and August	+ 2·65
	September to December ..	+ 2·7
Thompson Photo-heliograph	July 16—October 31 ..	+ 2·3
	November	+ 2·4

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

	°
January 1 to March 31	− 0·4
April 1 to September 30	− 0·3
October	− 0·35
November 1 to December 18	− 0·4
December 19—31	− 0·6

The zero-corrections adopted during 1924 for the three Kodaikánal photographs were :—

February 18 and March 26, +0°·2 ; July 28, +0°·3.

The adjustment of the wires in the Dehra Dûn Photo-heliograph was usually tested by stopping the driving clock immediately after a photograph had been taken and making a second exposure some two minutes after the first, a portion of a second image of the Sun, just intersecting the first, being thus obtained upon the plate. The Zero-correction adopted was +0°·4.

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 Sun is read off by means of a scale and vernier to 1-250th of an 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.

All photographs are measured independently by two persons, 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 Photo-heliograph 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 disc, 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 disc 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 disc, longitudes west of the centre being reckoned as positive, and χ the position-angle from the Sun's axis,

$$\sin \phi = \cos \rho \sin D + \sin \rho \cos D \cos \chi$$
$$\sin l = -\sin \chi \sin \rho \sec \phi.$$

The position-angle χ is found from the position-angle from the North Point by subtracting P, the position-angle of the N end of the Sun's axis, measured eastward from the North Point of the disc. The heliographic longitude of the spot is $l+L$, where L is the heliographic longitude of the centre of the disc. 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. 557 of the *Nautical Almanac* for 1924.

The inclination of the Sun's axis to the ecliptic is assumed to be 82° 45′, the longitude of the ascending node for 1924·0 to be 74° 42′·0, and the period of the Sun's sidereal rotation to be 25·38 days; the meridian which passed through the ascending node 1854 January 1, Greenwich Mean Noon, being taken as the zero meridian.

§ 2. *General Catalogue of Groups of Sun Spots for* 1924.

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 1923 and previous years. Groups seen only once are not included, but appear in the Daily Results with a distinctive numeration.

During the year 1924, a number of groups of spots have been noted in the Catalogue as "Revivals." These have been tabulated in series in a table following the Catalogue. The respective groups of each series are in the same heliographic position, and are 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* 1924.

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 both the east and 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.

Both in Ledger I and Ledger II, are given the proper motions of spots in longitude, instead of longitudes according to "System II" based on the formula $\xi = 14°{\cdot}44 - 2°{\cdot}13 \sin^2\phi$ as published in these *Results* for the years 1911 to 1923 inclusive. The determination of the Sun's rotation period from long-lived spots, compiled from the *Greenwich Photo-heliographic Results* for the four cycles 1878–1923 is given in § 5 of these *Results*. The deduced daily sidereal-motion is found to be represented by the formula $\xi = 14°{\cdot}37 - 2°{\cdot}60 \sin^2\phi$, which has been adopted in deriving the proper motions in longitude as described on pages D 38 and D 46.

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* 1924.

Particulars relating to this section are given in the headings on pages D 56, 60, and 61.

§ 5. *Determination of the Solar Rotation from Long-lived Spots.*

§ 6. *Characteristic Movements of Sun Spots.*

These two discussions on pages D 65–85 are based on the Greenwich Sunspot measures for the four cycles, 1878–1923.

F. W. DYSON.

Royal Observatory, Greenwich,
1925, *October* 7.

ROYAL OBSERVATORY, GREENWICH.

POSITIONS AND AREAS

OF

SUN SPOTS AND FACULÆ.

FOR EACH DAY IN THE YEAR

1924.

Positions and Areas of Sun Spots and Faculæ for each Day in the Year 1924.

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 observatory—Greenwich (G), Cape of Good Hope (C), Kodaikánal (K), Dehra Dûn (D). (3) Date of photograph (Civil reckoning).

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 the position angle of the Sun's axis from the north point: the heliographic longitude and latitude of the centre of the disc; the total areas of Spots and Faculæ for the day.

POSITIONS and AREAS of SUN SPOTS and FACULÆ for EACH DAY in the YEAR 1924.

G.M.T. (Civil.)	Group No.	MEASURES.		POSITION.		AREA.			G.M.T. (Civil.)	Group No.	MEASURES.		POSITION.		AREA.		
		Dist.	Pos. Angle.	Long.	Lat.	Umbræ.	Whole Spots.	Faculæ.			Dist.	Pos. Angle.	Long.	Lat.	Umbræ.	Whole Spots.	Faculæ.
1924.			°	°	°				1924.			°	°	°			
0·352		·954	263·0					52	8·309		·939	51·7					144
		·953	356·6					46	C								
		·914	301·7					122	Jan. 9			(−1·5)	(163·8)	(−3·9)	(0)	(0)	(144)
C		·904	243·0					189									
		·779	233·8					75									
		·935	50·8					58									
Jan. 1			(+2·4)	(268.6)	(−3·1)	(0)	(0)	(542)	9·459		·855	321·4					81
									C		·860	44·8					108
									Jan. 10			(−2·0)	(148·6)	(−4·1)	(0)	(0)	(189)
1·167		·969	300·0					54									
D		·954	242·8					271									
		·905	47·6					290	10·355		·916	315·5					129
Jan. 2			(+2·0)	(257·9)	(−3·2)	(0)	(0)	(615)	C		·785	40·0					72
									Jan. 11			(−2·4)	(136·9)	(−4·2)	(0)	(0)	(201)
Jan. 3		No	spots or	faculæ.													
									11·338		·961	316·0					74
									C		·972	56·1					40
3·518		·967	306·1					41	Jan. 12			(−2·9)	(123·9)	(−4·3)	(0)	(0)	(114)
C		·935	48·7					81									
		·952	59·8					52									
Jan. 4			(+0·9)	(226·9)	(−3·4)	(0)	(0)	(174)									
									12·359		·912	52·2					34
									C		·984	58·9					82
4·425		·968	231·6					63	Jan. 13			(−3·4)	(110·5)	(−4·4)	(0)	(0)	(116)
C		·947	296·4					32									
	9521	·728	314·0	250·9	+27·5	0	3										
Jan. 5			(+0·4)	(214·9)	(−3·5)	(0)	(3)	(95)									
									13·361		·958	55·9					100
									C								
5·357	9521	·817	310·4	248·1	+29·4	2	5	81s	Jan. 14			(−3·9)	(97·3)	(−4·5)	(0)	(0)	(100)
C																	
Jan. 6			(0·0)	(202·7)	(−3·6)	(2)	(5)	(81)									
									14·332		·896	52·6					184
6·319		·903	302·3					91	C								
C									Jan. 15			(−4·3)	(84·5)	(−4·6)	(0)	(0)	(184)
Jan. 7			(−0·5)	(190·0)	(− 3·7)	(0)	(0)	(91)									
7·487		·972	53·1					199	15·449		·839	48·1					179
C									G		·969	58·8					149
Jan. 8			(−1·1)	(174·6)	(−3·9)	(0)	(0)	(199)	Jan. 16			(−4·9)	(69·8)	(−4·7)	(0)	(0)	(328)

Group 9521. Jan. 5–6. One very small spot.

POSITIONS and AREAS of SUN SPOTS and FACULÆ for EACH DAY in the YEAR 1924.

G.M.T. (Civil.)	Group No.	MEASURES.		POSITION.		AREA.			G.M.T. (Civil.)	Group No.	MEASURES.		POSITION.		AREA.		
		Dist.	Pos. Angle.	Long.	Lat.	Umbræ.	Whole Spots.	Faculæ.			Dist.	Pos. Angle.	Long.	Lat.	Umbræ.	Whole Spots.	Faculæ.
1924.			°	°	°				1924.			°	°	°			
16·319		·789	321·5					60	24·340		·922	309·1					88
		·734	37·7					100			·818	51·3					77
C		·910	55·3					119	C		·903	55·1					103
		·920	178·8					53	Jan. 25			(−8·9)	(312·7)	(− 5·5)	(0)	(0)	(268)
Jan. 17			(−5·3)	(58·3)	(−4·8)	(0)	(0)	(332)									
17·398		·889	314·2					91	25·324		·952	307·0					111
C		·817	48·0					40	C	*941b*	·791	52·0	256·5	+25·0	1	16	104*n*
		·952	114·5					101			·703	45·1					52
Jan. 18			(−5·8)	(44·1)	(−4·9)	(0)	(0)	(232)	Jan. 26			(−9·4)	(299·8)	(−5·6)	(1)	(16)	(267)
18·535		·918	236·2					46	Jan. 27		No	spots or	faculæ.				
C		·855	296·1					116									
		·937	127·7					89									
Jan. 19			(−6·3)	(29·1)	(−5·0)	(0)	(0)	(251)									
									27·443		·871	241·3					188
									C	*941c*	·968	56·1	202·9	+30·7	4	16	91*nf*
									Jan. 28			(−10·3)	(271·9)	(− 5·7)	(4)	(16)	(279)
Jan. 20		No	spots or	faculæ.													
20·391		·954	180·8					46									
C									28·466		·925	244·1					131
Jan. 21			(−7·2)	(4·7)	(−5·2)	(0)	(0)	(46)	C		·922	53·1					82
									Jan. 29			(−10·7)	(258·4)	(− 5·8)	(0)	(0)	(213)
21·343		·957	183·2					36									
C																	
Jan. 22			(−7·6)	(352·2)	(−5·2)	(0)	(0)	(36)	29·328		·961	244·2					85
									C		·840	45·9					87
									Jan. 30			(−11·1)	(247·0)	(−5·9)	(0)	(0)	(172)
22·403		·869	307·3					90									
		·772	317·8					74									
C	*941a*	·279	273·0	354·3	− 4·3	2	12										
		·909	130·0					82	30·407		·756	38·5					60
		·973	62·3					124	C								
Jan. 23			(−8·1)	(338·2)	(−5·3)	(2)	(12)	(370)	Jan. 31			(−11·5)	(232·8)	(− 6·0)	(0)	(0)	(60)
23·320		·882	308·3					210									
C		·857	135·9					96	31·457		·756	311·6					106
		·934	58·7					189	G								
Jan. 24			(−8·5)	(326·1)	(− 5·4)	(0)	(0)	(495)	Feb. 1			(−12·0)	(219·0)	(− 6·0)	(0)	(0)	(106)

POSITIONS and AREAS of SUN SPOTS and FACULÆ for EACH DAY in the YEAR 1924.

G.M.T. (Civil.)	Group No.	MEASURES. Dist.	MEASURES. Pos. Angle.	POSITION. Long.	POSITION. Lat.	AREA. Umbræ.	AREA. Whole Spots.	AREA. Faculæ.
1924.			°	°	°			
32·494		·863	305·2					141
G								
Feb. 2			(−12·4)	(205·3)	(− 6·1)	(0)	(0)	(141)
33·485		·937	302·7					166
G	*941d*	·823	243·4	246·6	−25·3	2	17	70*c*
Feb. 3			(−12·8)	(192·3)	(− 6·2)	(2)	(17)	(236)
34·442		·916	245·0					71
C								
Feb. 4			(−13·2)	(179·7)	(−6·3)	(0)	(0)	(71)
35·346		·974	245·1					80
C								
Feb. 5			(−13·5)	(167·8)	(−6·3)	(0)	(0)	(80)
Feb. 6		No	spots or	faculæ.				
37·327		·888	303·4					31
C		·942	115·7					34
Feb. 7			(−14·3)	(141·7)	(−6·4)	(0)	(0)	(65)
38·339		·908	110·3					57
C								
Feb. 8			(−14·7)	(128·4)	(−6·5)	(0)	(0)	(57)
Feb. 9		No	spots or	faculæ.				
Feb. 10								
Feb. 11								
42·364	*941e*	·861	54·8	24·3	+25·6	0	7	48*f*
C								
Feb. 12			(−16·2)	(75·4)	(−6·7)	(0)	(7)	(48)

G.M.T. (Civil.)	Group No.	MEASURES. Dist.	MEASURES. Pos. Angle.	POSITION. Long.	POSITION. Lat.	AREA. Umbræ.	AREA. Whole Spots.	AREA. Faculæ.
1924.			°	°	°			
43·374		·761	46·3					45
C		·917	49·6					42
Feb. 13			(−16·6)	(62·1)	(−6·7)	(0)	(0)	(87)
Feb. 14		No	spots or	faculæ.				
45·407	9522	·502	347·0	42·3	+22·4	2	6	
G								
Feb. 15			(−17·3)	(35·3)	(−6·8)	(2)	(6)	(0)
46·333	9522	·578	328·0	42·4	+22·7	1	2	92*c*
C	*941f*	·912	113·6	316·8	−24·3	1	24	
Feb. 16			(−17·6)	(23·1)	(−6·9)	(2)	(26)	(92)
Feb. 17		No	spots or	faculæ.				
Feb. 18								
Feb. 19								
50·371		·879	305·3					78
C								
Feb. 20			(−18·9)	(330·0)	(−7·0)	(0)	(0)	(78)
51·356		·932	299·9					58
C								
Feb. 21			(−19·2)	(317·0)	(−7·1)	(0)	(0)	(58)
Feb. 22		No	spots or	faculæ.				
53·504		·959	78·0					56
G								
Feb. 23			(−19·8)	(288·7)	(−7·1)	(0)	(0)	(56)

Group 9522. Feb. 15–16. A single small spot.

POSITIONS and AREAS of SUN SPOTS and FACULÆ for EACH DAY in the YEAR 1924.

G.M.T. (Civil.)	Group No.	MEASURES. Dist.	MEASURES. Pos. Angle.	POSITION. Long.	POSITION. Lat.	AREA. Umbræ.	AREA. Whole Spots.	AREA. Faculæ.
1924			°	°	°			
54·431		·813	47·3					45
C		·893	76·5					63
Feb. 24			(−20·1)	(276·5)	(−7·1)	(0)	(0)	(108)
55·430		·891	242·8					82
C	9523	·697	37·4	235·0	+27·2	30	160	
Feb. 25		·764	72·2					37
			(−20·4)	(263·3)	(− 7·2)	(30)	(160)	(119)
56·411		·941	243·5					165
G	*942a*	·243	242·0	263·1	−13·6	2	5	
	9523	·610	22·4	235·3	+27·2	76	428	
Feb. 26			(−20·7)	(250·4)	(−7·2)	(78)	(433)	(165)
57·321	9523	·577	5·1	235·1	+27·7	78	480	
C								
Feb. 27			(−20·9)	(238·4)	(−7·2)	(78)	(480)	(0)
58·416	9523	·589	345·9	233·3	+27·6	92	479	
G								
Feb. 28			(−21·2)	(224·0)	(−7·2)	(92)	(479)	(0)
59·484	9523	·662	328·1	233·0	+27·5	62	365	
G								
Feb. 29			(−21·5)	(209·9)	(−7·2)	(62)	(365)	(0)
60·399	9523	·751	316·7	233·2	+27·2	54	329	138*c*
G	*942b*	·263	132·0	186·2	−17·1	1	6	
Mar. 1			(−21·7)	(197·9)	(− 7·2)	(55)	(335)	(138)
61·429	9523	·849	308·6	232·4	+27·2	60	273	251*c*
G								
Mar. 2			(−22·0)	(184·3)	(−7·2)	(60)	(273)	(251)

G.M.T. (Civil.)	Group No.	MEASURES. Dist.	MEASURES. Pos. Angle.	POSITION. Long.	POSITION. Lat.	AREA. Umbræ.	AREA. Whole Spots.	AREA. Faculæ.
1924.			°	°	°			
62·459	9523	·933	302·4	232·4	+26·7	37	210	346*c*
G								
Mar. 3			(−22·2)	(170·7)	(− 7·2)	(37)	(210)	(346)
63·410	9523	·985	298·2	233·1	+26·1	42	158	403*f*
G								
Mar. 4			(−22·4)	(158·2)	(−7·2)	(42)	(158)	(403)
64·398		·977	113·6					113
G								
Mar. 5			(−22·7)	(145·2)	(−7·3)	(0)	(0)	(113)
65·609		·901	114·1					67
G								
Mar. 6			(−22·9)	(129·2)	(−7·3)	(0)	(0)	(67)
66·599		·794	115·6					102
G		·961	61·8					57
Mar. 7			(−23·2)	(116·2)	(−7·2)	(0)	(0)	(159)
67·498		·668	119·5					40
G		·896	57·1					103
Mar. 8			(−23·3)	(104·4)	(−7·2)	(0)	(0)	(143)
68·376		·823	51·5					105
G								
Mar. 9			(−23·5)	(92·8)	(−7·2)	(0)	(0)	(105)
Mar. 10	}	No spots or faculæ.						
Mar. 11	}							
71·402		·929	125·5					51
G								
Mar. 12			(−24·1)	(52·9)	(−7·2)	(0)	(0)	(51)

Group 9523. Feb. 25–Mar. 4. An active stream of normal type, rapid in growth and dissolution. The leader, a regular spot, alone survives to the west limb.

POSITIONS and AREAS of SUN SPOTS and FACULÆ for EACH DAY in the YEAR 1924.

G.M.T. (Civil.)	Group No.	MEASURES. Dist.	MEASURES. Pos. Angle.	POSITION. Long.	POSITION. Lat.	AREA. Umbræ.	AREA. Whole Spots.	AREA. Faculæ.
1924.			°	°	°			
Mar. 13 } Mar. 14 }		No	spots or	faculæ.				
74·608		·817	242·1					65
G								
Mar. 15			(−24·6)	(10·7)	(−7·1)	(0)	(0)	(65)
75·471		·902	245·4					87
G								
Mar. 16			(−24·8)	(359·3)	(−7·1)	(0)	(0)	(87)
Mar. 17 } Mar. 18 } Mar. 19 }		No	spots or	faculæ.				
79·402		·954	158·6					54
G		·975	69·3					97
		·983	63·9					101
Mar. 20			(−25·3)	(307·5)	(−7·0)	(0)	(0)	(252)
80·326	*943a*	·049	226·0	297·3	− 9·0	2	5	
C		·914	67·0					66
		·947	59·8					268
Mar. 21			(−25·4)	(295·3)	(−7·0)	(2)	(5)	(334)
81·564	9524	·708	234·0	320·0	−29·8	4	16	72*c*
	9525	·545	38·8	257·9	+18·6	4	15	
		·768	59·6					59
C		·843	53·5					175
		·940	51·7					165
		·976	58·0					61
Mar. 22			(−25·6)	(278·9)	(−6·9)	(8)	(31)	(532)
82·370	9524	·806	238·4	320·0	−29·3	1	8	92*c*
	9525	·472	21·7	257·7	+19·2	3	7	
		·742	48·3					104
C		·889	47·9					164
		·924	54·3					66
Mar. 23			(−25·7)	(268·3)	(−6·9)	(4)	(15)	(426)

G.M.T. (Civil.)	Group No.	MEASURES. Dist.	MEASURES. Pos. Angle.	POSITION. Long.	POSITION. Lat.	AREA. Umbræ.	AREA. Whole Spots.	AREA. Faculæ.
1924.			°	°	°			
83·330		·910	240·8					90
C	9525	·439	352·6	259·0	+18·8	0	4	
		·750	38·4					69
		·846	46·4					60
Mar. 24			(−25·8)	(255·6)	(−6·9)	(0)	(4)	(219)
84·513		·977	241·2					67
C		·741	31·2					153
Mar. 25			(−25·9)	(240·0)	(−6·8)	(0)	(0)	(220)
Mar. 26		No	spots or	faculæ.				
86·330		·940	175·2					30
C								
Mar. 27			(−26·0)	(216·1)	(− 6·7)	(0)	(0)	(30)
87·325		·947	184·1					54
C		·877	297·3					39
		·849	281·7					33
Mar. 28			(−26·1)	(203·0)	(− 6·7)	(0)	(0)	(126)
88·354		·957	293·6					61
C		·951	278·8					35
		·766	312·5					126
Mar. 29			(−26·1)	(189·4)	(−6·6)	(0)	(0)	(222)
89·401		·905	296·4					37
G		·863	306·8					134
		·789	323·2					106
Mar. 30			(−26·2)	(175·6)	(− 6·6)	(0)	(0)	(277)
90·371		·941	301·3					136
C		·860	317·0					148
Mar. 31			(−26·3)	(162·8)	(−6·5)	(0)	(0)	(284)

Group 9524. Mar. 22–23. A pair of very small spots.
Group 9525. Mar. 22–24. A pair of small spots on Mar. 22 and 23; a single spot on Mar. 24.

POSITIONS and AREAS of SUN SPOTS and FACULÆ for EACH DAY in the YEAR 1924.

G.M.T. (Civil.)	Group No.	MEASURES. Dist.	MEASURES. Pos. Angle.	POSITION. Long.	POSITION. Lat.	AREA. Umbræ.	AREA. Whole Spots.	AREA. Faculæ.
1924.			°	°	°			
91·609		·930	309·2					147
G								
Apr. 1			(−26·3)	(146·5)	(− 6·5)	(0)	(0)	(147)
92·486		·967	306·3					96
G		·927	319·7					44
Apr. 2			(−26·3)	(134·9)	(− 6·4)	(0)	(0)	(140)
93·536		·974	313·6					95
G		·804	56·6					32
		·979	53·8					70
Apr. 3			(−26·4)	(121·0)	(− 6·3)	(0)	(0)	(197)
94·337		·940	50·0					29
C								
Apr. 4			(−26·4)	(110·5)	(− 6·3)	(0)	(0)	(29)
Apr. 5		No spots or faculæ.						
96·607	943b	·461	0·3	80·3	+21·1	0	7	
G								
Apr. 6			(−26·4)	(80·5)	(− 6·2)	(0)	(7)	(0)
Apr. 7		No spots or faculæ.						
Apr. 8								
Apr. 9								
100·329	9526	·591	356·2	34·0	+30·1	0	3	
C								
Apr. 10			(−26·4)	(31·4)	(− 5·9)	(0)	(3)	(0)
Apr. 11		No spots or faculæ.						
Apr. 12								
Apr. 13								

G.M.T. (Civil.)	Group No.	MEASURES. Dist.	MEASURES. Pos. Angle.	POSITION. Long.	POSITION. Lat.	AREA. Umbræ.	AREA. Whole Spots.	AREA. Faculæ.
1924.			°	°	°			
104·611	9526	·914	305·6	33·0	+29·2	5	26	90c
G								
Apr. 14			(−26·2)	(334·8)	(−5·6)	(5)	(26)	(90)
105·353		·961	303·8					101
C		·826	42·8					48
Apr. 15			(−26·2)	(325·1)	(− 5·5)	(0)	(0)	(149)
106·405	9527	·846	60·7	259·1	+21·1	3	11	75f
G								
Apr. 16			(−26·1)	(311·2)	(−5·4)	(3)	(11)	(75)
107·353	9527	·742	55·2	258·0	+20·9	17	49	107c
G		·941	62·8					112
Apr. 17			(−26·0)	(298·6)	(−5·4)	(17)	(49)	(219)
108·363	9527	·627	45·9	256·5	+21·1	45	183	
G	9528	·688	127·5	246·9	−28·9	26	125	
		·890	58·5					126
Apr. 18			(−25·9)	(285·3)	(−5·3)	(71)	(308)	(126)
109·459	9527	·508	27·8	256·1	+21.6	39	173	
	9529	·493	142·4	251·0	−27·8	10	21	
G	9528	·552	139·0	246·5	−29·3	42	230	
		·802	50·1					87
Apr. 19			(−25·8)	(270·8)	(−5·2)	(91)	(424)	(87)
110·460	9527	·461	3·6	255·8	+22·1	19	86	
	9529	·395	165·5	251·2	−27·5	9	38	
G	9528	·450	154·6	244·9	−28·8	40	382	
		·937	49·5					141
Apr. 20			(−25·7)	(257·6)	(−5·1)	(68)	(506)	(141)
111·365	9527	·493	341·7	255·2	+22·8	11	48	
	9529	·385	190·5	250·1	−27.1	21	131	
C	9528	·404	175·3	243·4	−28·6	58	413	
		·905	44·6					122
Apr. 21			(−25·7)	(245·6)	(−5·0)	(90)	(592)	(122)

Group 9526. Apr. 10–14. Intermittent. One very small ephemeral spot on Apr. 10; a pair of small spots on Apr. 14.
Group 9527. Apr. 16–22. Revival of Group 9525. A stream of unstable components. The axis of the group is considerably inclined to the solar equator.
Group 9528. Apr. 18–26. A short compact stream appearing near its maximum development almost as a single compound spot. This group closely follows Group 9529 with which it might have been associated as the following component of a large complex stream. A clear separation, however, is usually seen between the two groups, and their respective developments appear, moreover, to be largely independent.
Group 9529. Apr. 19–27. A short stream immediately preceding Group 9528. A small regular spot leading the stream is the only stable component until the appearance of a similar spot at the rear on Apr. 24.

POSITIONS and AREAS of SUN SPOTS and FACULÆ for EACH DAY in the YEAR 1924.

G.M.T. (Civil.)	Group No.	MEASURES. Dist.	MEASURES. Pos. Angle.	POSITION. Long.	POSITION. Lat.	AREA. Umbræ.	AREA. Whole Spots.	AREA. Faculæ.
1924.			°	°	°			
112·449	9527	·589	321·9	254·5	+23·0	2	17	
	9529	·479	217·7	250·4	−26·8	32	220	
G	9528	·437	202·8	242·4	−28·5	45	366	
		·831	38·3					74
Apr. 22			(−25·5)	(231·3)	(− 4·9)	(79)	(603)	(74)
113·510		·732	306·2					145
C	9529	·629	231·3	250·6	−27·1	34	147	
	9528	·546	222·5	241·9	−28·0	46	299	
Apr. 23			(−25·4)	(217·3)	(− 4·8)	(80)	(446)	(145)
114·353		·831	301·7					226
C	9529	·742	236·6	250·4	−27·4	53	334	
	9528	·656	231·3	241·5	−28·0	22	180	
Apr. 24			(−25·3)	(206·2)	(− 4·7)	(75)	(514)	(226)
115·479		·938	296·1					333
G	9529	·875	240·5	250·5	−27·8	54	331	148*c*
	9528	·798	237·6	241·0	−28·3	16	157	80*c*
Apr. 25			(−25·2)	(191·3)	(− 4·6)	(70)	(488)	(561)
116·328		·982	294·6					300
C	9529	·953	241·7	252·3	−28·3	36	282	} 425*c*
	9528	·889	239·6	241·1	−29·0	8	56	}
Apr. 26			(−25·0)	(180·1)	(− 4·5)	(44)	(338)	(725)
117·339		·917	297·5					145
G	9529	·976	242·0	244·3	−28·2	18	133	559*c*
Apr. 27			(−24·9)	(166·7)	(− 4·4)	(18)	(133)	(704)
118·354		·992	240·7					214
G	*944a*	·701	319·9	184·1	+28·6	2	8	
Apr. 28			(−24·7)	(153·3)	(− 4·3)	(2)	(8)	(214)
119·363		·813	310·6					71
G		·948	160·0					34
Apr. 29			(−24·6)	(140·0)	(− 4·2)	(0)	(0)	(105)

G.M.T. (Civil.)	Group No.	MEASURES. Dist.	MEASURES. Pos. Angle.	POSITION. Long.	POSITION. Lat.	AREA. Umbræ.	AREA. Whole Spots.	AREA. Faculæ.
1924.			°	°	°			
120·372		·940	311·6					145
C		·897	305·1					63
Apr. 30			(−24·4)	(126·6)	(−4·1)	(0)	(0)	(208)
121·418		·969	304·3					111
C		·954	61·6					118
May 1			(−24·2)	(112·8)	(−4·0)	(0)	(0)	(229)
122·450		·880	59·8					75
G		·970	57·7					113
May 2			(−24·0)	(99·2)	(−3·9)	(0)	(0)	(188)
123·462		·909	54·6					86
G								
May 3			(−23·8)	(85·8)	(− 3·8)	(0)	(0)	(86)
124·413	*944b*	·855	50·2	23·6	+30·7	1	2	99*p*
G		·961	53·5					88
May 4			(−23·6)	(73·2)	(− 3·7)	(1)	(2)	(187)
125·351		·735	41·7					115
G		·893	50·2					92
May 5			(−23·5)	(60·8)	(− 3·6)	(0)	(0)	(207)
126·347	*944c*	·576	333·6	64·4	+27·6	1	4	
C		·821	44·8					63
May 6			(−23·2)	(47·7)	(− 3·5)	(1)	(4)	(63)
127·360	9530	·711	36·2	4·7	+31·9	13	63	
G								
May 7			(−23·0)	(34·3)	(− 3·4)	(13)	(63)	(0)
128·450	9530	·625	22·1	3·8	+32·1	21	179	
G								
May 8			(−22·8)	(19·9)	(− 3·3)	(21)	(179)	(0)

Group 9530. May 7–14. A short stream showing a brief conformity to the normal type and then rapidly dissipating.

POSITIONS and AREAS of SUN SPOTS and FACULÆ for EACH DAY in the YEAR 1924.

G.M.T. (Civil.)	Group No.	MEASURES.		POSITION.		AREA.			G.M.T. (Civil.)	Group No.	MEASURES.		POSITION.		AREA.		
		Dist.	Pos. Angle.	Long.	Lat.	Umbræ.	Whole Spots.	Faculæ.			Dist.	Pos. Angle.	Long.	Lat.	Umbræ.	Whole Spots.	Faculæ.
1924.			°	°	°				1924.			°	°	°			
129·355	9530	·576	7·9	2·6	+31·5	20	124		135·491		·972	303·8					339
G											·927	238·6					41
May 9			(−22·6)	(7·9)	(− 3·2)	(20)	(124)	(0)		9531	·320	191·7	290·7	−20·7	83	495	
										9532	·727	130·0	247·0	−29·7	7	27	365*f*
									C	9533	·857	120·0	230·7	−26·8	2	6	302*s*
											·744	46·2					286
130·457		·944	303·1					67			·881	59·5					38
G	9530	·584	348·5	1·1	+31·7	24	103				·943	64·0					67
		·902	110·9					77	May 15			(−21·0)	(286·7)	(− 2·5)	(92)	(528)	(1438)
May 10			(−22·3)	(353·3)	(− 3·1)	(24)	(103)	(144)									
									136·348		·973	240·2					60
										9531	·393	216·0	289·6	−20·8	92	646	
131·398		·988	301·5					142		9532	·628	137·9	246·5	−29·8	4	10	178*f*
G	9530	·633	333·3	0·3	+31·5	15	44		C	9533	·761	124·0	230.6	−26·8	2	5	247*s*
	9531	·786	115·1	291·2	−21·4	13	40				·875	60·8					80
May 11			(−22·1)	(340·9)	(− 3·0)	(28)	(84)	(142)			·936	68·6					63
									May 16			(−20·8)	(275·4)	(− 2·4)	(98)	(661)	(628)
132·382		·878	312·0					81	137·354	9531	·538	233·1	289·4	−20·8	99	542	
	9530	·728	319·9	0·9	+31·3	4	18	220*c*		9532	·522	152·5	246·1	−29·7	4	8	
G	9531	·658	120·2	290·3	−21·5	57	207		G	9534	·995	112·9	177·7	−23 0	0	34	
	9532	·981	120·0	249·4	−29·9	5	33	170*s*			·744	55·2					93
		·962	64·6					423			·836	64·7					128
May 12			(−21·8)	(327·8)	(−2 ·9)	(66)	(258)	(894)	May 17			(−20·5)	(262·1)	(− 2·3)	(103)	(584)	(221)
									138·475	9531	·705	241·3	288·7	−21·4	61	376	120*c*
133·627		·966	304·9					95		9532	·465	176·5	245·4	−29·8	1	4	
	9530	·857	310·1	1·7	+31·8	2	8	314*c*	G	9535	·953	49·4	181·8	+37·4	7	24	126*sf*
	9531	·455	133·5	290·8	−20·7	50	313			9534	·950	113·2	176.4	−22·7	16	47	161*c*
G	9532	·910	121·6	248·5	−29·7	18	64	214*s*	May 18			(−20·1)	(247·3)	(− 2·2)	(85)	(451)	(407)
		·876	59·8					398									
		·972	118·3					188									
		·987	72·1					67	139·351		·812	305·6					71
May 13			(−21·5)	(311·4)	(− 2·7)	(70)	(385)	(1276)		9531	·823	245·2	288·9	−21·4	36	296	215*c*
									G	9535	·901	46·3	181·0	+37·2	8	18	297*sf*
										9534	·873	114·9	176·9	−22·6	12	85	203*f*
											·971	81·5					61
									May 19			(−19·9)	(235·7)	(− 2·1)	(56)	(399)	(847)
134·352	9530	·915	306·5	1·3	+31·6	0	7	225*c*									
	9531	·360	149·9	290·7	−20·8	54	327										
G	9532	·846	124·0	248·1	−29·8	9	48	172*f*	140·606		·933	299·5					77
	9533	·947	117·5	231·8	−26·8	2	12	220*c*		9531	·951	248·8	290·3	−20·7	28	187	482*c*
		·795	55·8					202	G	9535	·799	38·5	180·7	+37·1	5	15	238*f*
		·950	71·9					57		9534	·723	119·5	176·5	−22·2	13	66	107*f*
May 14			(−21·3)	(301·8)	(− 2·7)	(65)	(394)	(876)	May 20			(−19·5)	(219·1)	(− 1·9)	(46)	(268)	(904)

Group 9531. May 11–21. Two spots 5° apart in longitude. The leader survives after changes of structure between May 14 and 17. The follower, however, is more unstable and is succeeded by a cluster represented latterly by an indefinitely formed spot.
Group 9532. May 12–24. Return of Group 9529. Intermittent. A small regular spot diminishing to a dot on May 18. Nothing is then visible until May 22, when a few small spots make their appearance in the faculæ marking the disturbed region.
Group 9533. May 14–16. Revival near the place of Group 9528. A single very small spot.
Group 9534. May 17–27. A small regular spot gradually dying out. A small follower is seen on May 23 and 24.
Group 9535. May 18–28. Intermittent. A small but persistent spot, in high northern latitude, followed by faculæ in which small spots appear on May 21. The group has disappeared by May 25, but three ephemeral spots are seen on May 28.

POSITIONS and AREAS of SUN SPOTS and FACULÆ for EACH DAY in the YEAR 1924.

G.M.T. (Civil.)	Group No.	Measures. Dist.	Measures. Pos. Angle.	Position. Long.	Position. Lat.	Area. Umbræ.	Area. Whole Spots.	Area. Faculæ.
1924.			°	°	°			
141·353		·781	303·1					126
	9531	·992	249·8	291·8	−20·2	4	160	295*f*
G	9534	·614	125·3	176·6	−22·2	11	59	
	9535	·782	36·1	173·8	+37·6	17	63	127*c*
May 21			(−19·3)	(209·2)	(−1·8)	(32)	(282)	(548)
142·360		·887	298·7					271
		·836	308·7					56
	9532	·820	231·3	244·6	−31·9	0	3	207*p*
G	9534	·468	137·9	176·2	−21·8	10	48	
	9535	·699	26·5	173·0	+37·0	19	92	
	945a	·553	71·5	164·0	+ 8·6	1	2	
May 22			(−18·9)	(195·9)	(−1·7)	(30)	(145)	(534)
143·364		·950	295·6					133
		·915	303·7					63
G	9532	·907	237·1	244·2	−30·2	16	59	292*c*
	9534	·363	161·2	175·4	−21·6	6	28	
	9535	·645	11·3	173·5	+37·5	18	67	
May 23			(−18·6)	(182·6)	(−1·6)	(40)	(154)	(488)
144·411		·976	301·3					101
		·882	240·1					148
G	9532	·972	238·3	243·3	−31·0	6	38	396*c*
	9534	·355	195·9	174·7	−21·4	6	25	
	9535	·629	353·8	173·6	+37·1	7	24	
May 24			(−18·3)	(168·7)	(−1·5)	(19)	(87)	(645)
145·461		·990	234·3					117
		·933	236·7					170
G		·690	337·7					55
	9534	·469	222·1	174·5	−21·6	6	10	
May 25			(−17·9)	(154·8)	(− 1·4)	(6)	(10)	(342)
146·352		·961	237·4					80
		·945	292·8					33
G		·726	330·2					145
	9534	·597	233·8	174·1	−21·6	4	6	
May 26			(−17·6)	(143·0)	(− 1·2)	(4)	(6)	(258)
147·382		·793	3 3·3					304
C	9534	·743	241·5	173·8	−21·5	1	6	107*c*
	9536	·358	16·9	123·1	+18·9	10	47	
May 27			(−17·3)	(129·4)	(− 1·1)	(11)	(53)	(411)
148·359		·846	243·8					79
G	9535	·884	314·9	168·8	+37·9	8	29	167*c*
	9536	·366	342·3	123·2	+19·3	3	32	
May 28			(−16·9)	(116·5)	(− 1·0)	(11)	(61)	(246)
149·364		·936	312·0					316
		·924	246·3					110
G		·883	280·9					59
	9536	·496	310·9	126·3	+18·0	0	8	
	9537	·998	58·9	18·6	+30·9	74	442	
May 29			(−16·5)	(103·2)	(− 0·9)	(74)	(450)	(485)
150·378		·967	309·6					207
G	9537	·982	57·5	13·6	+31·7	127	969	355*c*
May 30			(−16·2)	(89·8)	(− 0·8)	(127)	(969)	(562)
151·450		·785	295·8					108
	945b	·358	28·4	65·3	+17·7	1	3	
C	9537	·923	55·2	13·1	+31·4	108	934	483*c*
	9538	·965	119·8	3·0	−28·8	2	9	102*p*
May 31			(−15·8)	(75·6)	(− 0·6)	(111)	(946)	(693)
152·446		·893	292·4					155
		·886	222·4					90
C	9539	·181	284·4	72·5	+ 2·0	1	4	
	9537	·836	50·7	13·2	+31·5	106	868	465*c*
June 1			(−15·4)	(62·4)	(− 0·5)	(107)	(872)	(710)
153·593		·972	290·4					117
	9539	·391	280·7	69·7	+ 3·8	1	4	
G	9537	·727	43·2	11·6	+31·5	123	878	
	9538	·771	130·0	4·4	−29·9	0	7	64*nf*
June 2			(−15·0)	(47·2)	(− 0·4)	(124)	(889)	(181)

Group 9536. May 27–29. A few unstable spots.
Group 9537. May 29–June 11. A very large stream, 14° in length, of which the leader is the predominating spot. The other components are mostly unstable aggregations of indefinite markings, showing a tendency on some days to condense to definite spots.
Group 9538. May 31–June 2. A very small spot seen on May 31 and June 2.
Group 9539. June 1–2. A very small spot.

POSITIONS and AREAS of SUN SPOTS and FACULÆ for EACH DAY in the YEAR 1924.

G.M.T. (Civil.)	Group No.	MEASURES. Dist.	MEASURES. Pos. Angle.	POSITION. Long.	POSITION. Lat.	AREA. Umbræ.	AREA. Whole Spots.	AREA. Faculæ.
1924.			°	°	°			
154·422	9537	·645	34·6	10·9	+31·6	160	892	
G								
June 3			(−14·7)	(36·3)	(− 0·3)	(160)	(892)	(0)
155·391		·740	273·3					100
C	9537	·558	19·4	10·9	+31·4	123	1013	
June 4			(−14·3)	(23·4)	(− 0·2)	(123)	(1013)	(100)
156·412		·869	272·8					62
G	9537	·520	0·5	9·6	+31·3	130	1076	
		·984	112·3					310
June 5			(−13·9)	(9·9)	(0·0)	(130)	(1076)	(372)
157·370		·957	272·3					76
		·938	293·1					80
G	9537	·549	341·5	8·9	+31·2	135	1101	
		·939	113·9					602
		·959	64·3					40
June 6			(−13·5)	(357·2)	(+0·1)	(135)	(1101)	(798)
158·439	9537	·633	325·1	8·1	+31·3	148	984	
C	9540	·830	115·9	290·1	−21·1	1	5	497*s*
		·971	68·5					92
June 7			(−13·1)	(343·1)	(+0·2)	(149)	(989)	(589)
159·303	9537	·729	314·3	8·9	+30·7	111	728	276*c*
		·737	122·1					259
G		·922	66·2					51
		·968	115·5					55
June 8			(−12·7)	(331·7)	(+ 0·3)	(111)	(728)	(641)
160·375	9537	·843	306·9	8·9	+30·6	94	630	362*c*
G		·937	117·1					96
June 9			(−12·3)	(317·5)	(+ 0·4)	(94)	(630)	(458)
161·364	9537	·930	303·1	9·1	+30·7	77	506	553*c*
	9541	·662	55·9	268·2	+22·2	1	4	
G		·865	121·5					84
		·971	113·8					70
June 10			(−11·9)	(304·4)	(+ 0·6)	(78)	(510)	(707)
162·585	9537	·990	301·1	8·9	+30·9	70	544	633*nf*
	9540	·387	183·4	289·6	−22·0	0	3	
	9541	·482	40·2	268·6	+22·2	3	15	
G		·891	117·6					118
		·923	131·1					146
		·934	66·0					70
		·970	123·2					81
June 11			(−11·4)	(288·2)	(+0·7)	(73)	(562)	(1048)
163·360		·982	303·9					471
	9541	·397	23·7	268·1	+22·0	4	24	
	946a	·850	64·1	222·6	+22·1	1	5	55*c*
G		·731	135·1					74
		·814	121·2					53
		·900	133·5					58
		·925	123·7					58
June 12			(−11·1)	(278·0)	(+ 0·8)	(5)	(29)	(769)
164·375	9541	·366	350·2	268·3	+22·0	14	64	
	9542	·526	146·8	246·0	−25·1	9	26	
C		·791	129·4					164
		·799	140·1					103
June 13			(−10·6)	(264·5)	(+0·9)	(23)	(90)	(267)
165·467		·734	234·4					128
	9541	·462	322·0	267·9	+22·3	24	148	
G	9542	·441	172·0	246·2	−24·7	10	34	
June 14			(−10·2)	(250·1)	(+1·1)	(34)	(182)	(128)
166·387		·806	239·6					372
	9541	·615	306·9	270·0	+22·7	39	223	
G	9542	·462	198·0	246·9	−24·7	8	41	
June 15			(− 9·8)	(237·9)	(+ 1·2)	(47)	(264)	(372)

Group 9540. June 7–11. A single small spot seen only on June 7 and 11, representing a feeble revival in the faculæ accompanying Group 9531 of the previous rotation.
Group 9541. June 10–18. Two or three small spots on June 10–13, becoming a short-lived stream of normal type.
Group 9542. June 13–19. At first a few small spots in a stream, which later shows a tendency to normal type near the west limb.

POSITIONS and AREAS of SUN SPOTS and FACULÆ for EACH DAY in the YEAR 1924.

G.M.T. (Civil.)	Group No.	MEASURES. Dist.	MEASURES. Pos. Angle.	POSITION. Long.	POSITION. Lat.	AREA. Umbræ.	AREA. Whole Spots.	AREA. Faculæ.
1924.			°	°	°			
167·345		·900	243·2					310
	9541	·760	299·1	271·0	+22·5	36	199	136*c*
G	9542	·559	217·7	247·2	−24·9	7	22	
		·961	47·5					110
June 16			(−9·3)	(225·2)	(+ 1·3)	(43)	(221)	(556)
168·570		·963	243·6					291
		·939	307·8					16
G	9541	·912	294·6	273·0	+22·9	40	185	284*f*
	9542	·714	231·8	247·1	−25·0	14	71	
		·908	44·9					100
June 17			(−8·8)	(209·0)	(+ 1·4)	(54)	(256)	(691)
169·506	9541	·973	293·4	272·4	+23·1	17	89	343*f*
	9542	·827	237·8	247·0	−25·1	19	91	194*c*
G		·839	39·0					98
		·946	48·5					52
June 18			(−8·4)	(196·6)	(+ 1·5)	(36)	(180)	(687)
170·397		·988	292·3					195
G	9542	·919	241·6	247·8	−25·1	12	72	324*c*
	9543	·832	45·4	137·3	+36·7	13	44	81*c*
June 19			(−8·0)	(184·8)	(+ 1·6)	(25)	(116)	(600)
171·583		·974	242·4					234
		·880	225·0					77
G		·829	238·4					111
	9544	·422	352·7	172·5	+26·4	3	9	
	9543	·716	35·5	137·8	+37·1	17	99	
June 20			(−7·5)	(169·1)	(+ 1·8)	(20)	(108)	(422)
172·360		·929	240·6					114
G	9544	·468	333·8	172·1	+26·5	5	18	
	9543	·650	25·8	138·0	+37·4	11	102	
June 21			(−7·2)	(158·8)	(+1·9)	(16)	(120)	(114)
173·395		·961	240·0					101
	9544	·582	316·5	171·6	+26·6	2	4	
G	9543	·579	6·1	140·7	+36·9	17	86	
		·966	65·3					44
June 22			(−6·7)	(145·1)	(+ 2·0)	(19)	(90)	(145)
174·359		·716	306·3					114
	9543	·581	349·9	139·7	+36·8	12	83	
G	*946b*	·887	62·7	72·2	+25·0	0	2	58*s*
		·930	68·9					72
June 23			(−6·3)	(132·4)	(+ 2·1)	(12)	(85)	(244)
175·395	9544	·846	300·6	173·1	+26·8	1	13	129*c*
G	9543	·640	333·0	139·9	+36·7	15	93	
June 24			(−5·8)	(118·7)	(+ 2·2)	(16)	(106)	(129)
176·301	9544	·921	298·6	171·8	+27·1	6	23	233*c*
G	9543	·718	322·8	139·4	+36·7	13	86	
June 25			(−5·4)	(106·7)	(+ 2·3)	(19)	(109)	(233)
177·304	9544	975	297·9	169·9	+27·7	0	43	320*c*
G	9543	809	314·9	138·7	+36·5	14	85	155*f*
June 26			(−4·9)	(93·4)	(+ 2·5)	(14)	(128)	(475)
178·367	9543	·899	310·1	138·1	+36·7	17	68	219*f*
G	9545	·988	58·5	358·5	+31·5	50	413	300*c*
June 27			(−4·5)	(79·3)	(+ 2·6)	(67)	(481)	(519)
179·304	9543	·955	307·6	136·9	+36·5	2	5	215*f*
G	9545	·949	57·0	357·3	+32·0	64	392	499*c*
		·992	111·8					34
June 28			(−4·0)	(66·9)	(+ 2·7)	(66)	(397)	(748)
180·422		·969	308·9					295
G	9545	·868	53·8	356·3	+32·3	60	316	739*c*
		·935	114·0					110
June 29			(−3·5)	(52·1)	(+ 2·8)	(60)	(316)	(1144)
181·421	9545	·772	48·9	355·5	+32·5	39	271	407*f*
G		·844	118·4					73
		·953	63·1					139
June 30			(−3·1)	(38·9)	(+ 2·9)	(39)	(271)	(619)

Group 9543. June 19–28. A group of "stream" type, in high northern latitude, consisting of a small regular spot followed by a tiny cluster which has disappeared by June 24.

Group 9544. June 20–26. A small group of insignificant spots; none are seen on June 23.

Group 9545. June 27–July 9. Return of Group 9537. A pair of nearly regular spots about 2½° apart in longitude, with occasional very small companions. The following spot shows instability from July 1–3, but it regains its normal appearance before finally disappearing as a tiny spot after July 7. The two spots partake of a common retrograde motion in longitude. The position given on July 9 is that of an ephemeral companion spot.

POSITIONS and AREAS of SUN SPOTS and FACULÆ for EACH DAY in the YEAR 1924.

G.M.T. (Civil.)	Group No.	MEASURES. Dist.	MEASURES. Pos. Angle.	POSITION. Long.	POSITION. Lat.	AREA. Umbræ.	AREA. Whole Spots.	AREA. Faculæ.
1924			°	°	°			
182·368	9545	·674	41·4	354·4	+32·8	37	226	447*f*
G	9546	·851	71·2	328·9	+17·5	2	16	47*c*
	9547	·868	61·4	328·5	+26·1	18	89	170*c*
July 1			(−2·6)	(26·3)	(+ 3·0)	(57)	(331)	(664)
183·478	9545	·563	27·7	353·6	+32·7	28	208	
	9546	·712	66·5	328·3	+18·7	6	32	
G	9547	·744	57·7	327·7	+25·6	18	79	
		·986	116·2					108
July 2			(−2·1)	(11·7)	(+ 3·1)	(52)	(319)	(108)
184·435	9545	·504	9·7	353·2	+32·8	35	191	
	9546	·525	58·3	331·0	+18·8	9	36	
G	9547	·618	49·6	327·5	+26·2	16	57	
		·949	118·2					126
July 3			(−1·7)	(359·0)	(+ 3·2)	(60)	(284)	(126)
185·497	9545	·502	348·2	351·9	+32·6	29	172	
	9546	·366	41·6	330·1	+19·0	16	47	
	9547	·486	37·2	325·9	+25·8	14	26	
C		·849	123·8					169
		·930	118·9					144
		·974	68·0					135
July 4			(−1·2)	(344·9)	(+ 3·3)	(59)	(245)	(448)
186·368	9545	·558	332·2	351·3	+32·7	34	149	
	9546	·281	16·1	328·7	+18·9	25	132	
	9547	·403	18·8	325·2	+25·7	5	21	
G	9548	·851	118·4	279·8	−21·8	0	4	188*s*
		·783	128·9					145
		·913	66·6					194
		·986	116·7					280
July 5			(−0·8)	(333·4)	(+3·4)	(64)	(306)	(807)
187·402	9545	·673	317·8	352·1	+32·9	20	119	114*c*
	9546	·335	327·2	330·8	+19·8	24	122	
	9548	·715	125·3	281·0	−21·5	5	17	65*s*
	9549	·990	68·4	237·5	+21·8	34	213	192*f*
G		·833	64·1					189
		·934	84·6					55
		·937	118·6					529
		·983	118·7					468
July 6			(−0·3)	(319·7)	(+3·6)	(83)	(471)	(1612)
1924.			°	°	°			
188·570		·673	329·9					190
	9545	·789	309·0	350·6	+32·3	7	39	335*n*
	9546	·534	302·3	332·8	+19·8	24	120	
	9548	·578	138·6	280·0	−22·2	0	16	
G	9550	·897	121·5	246·2	−26·0	1	17	1022*f*
	9549	·930	67·6	236·4	+22·1	83	527	296*c*
		·818	85·7					53
		·978	116·8					94
July 7			(+0·2)	(304·3)	(+3·7)	(115)	(719)	(1990)
189·308		·924	300·8					95
		·768	315·3					239
	9545	·854	305·9	349·1	+32·2	1	13	375*n*
	9546	·659	296·5	333·2	+19·9	23	121	
	947a	·509	339·8	306·4	+32·1	1	8	
G	9548	·498	151·9	279·9	−22·4	0	20	
	9550	·825	125·4	246·2	−26·1	1	7	508*f*
	9549	·860	66·7	236·4	+21·8	82	476	261*c*
		·759	129·1					397
		·947	118·7					176
July 8			(+0·5)	(294·5)	(+ 3·7)	(108)	(645)	(2051)
190·350		·843	312·6					199
		·746	302·6					136
	9545	·970	304·6	355·9	+34·4	0	20	685*f*
	9546	·812	292·0	333·7	+20·0	17	99	323*c*
G	9551	·616	140·0	255·0	−24·7	1	9	
	9552	·494	86·0	251·2	+ 5·3	18	44	
	9550	·741	132·9	243·2	−27·2	4	13	399*f*
	9549	·728	63·2	236·4	+21·8	87	426	210*c*
		·879	122·0					241
July 9			(+1·0)	(280·7)	(+3·8)	(127)	(611)	(2193)
191·307		·958	305·1					372
		·838	298·3					217
		·870	311·4					172
	9546	·915	290·6	333·8	+20·4	14	97	
G	9551	·526	154·4	253·6	−24·4	0	4	
	9552	·292	86·4	251·1	+ 4·7	16	94	
	9550	·641	143·6	242·7	−27·5	4	22	
	9549	·586	57·7	236·0	+21·4	57	392	271*f*
		·856	128·9					104
July 10			(+ 1·4)	(268·0)	(+3·9)	(91)	(609)	(1136)

Group 9546. July 1–11. A few unstable spots in a stream from which a small regular spot emerges as the leader on July 6.
Group 9547. July 1–5. A small unstable stream on the same meridian as Group 9546.
Group 9548. July 5–8. Two or three very small spots in the northern part of a region of dispersing faculæ.
Group 9549. July 6–19. A stream of normal type, but in which the leader shows signs of being somewhat unstable, and the follower, which, although small, is unusually persistent.
Group 9550. July 7–12. Revival of Group 9542. One or two very small spots in conspicuous faculæ.
Group 9551. July 9–10. One or two small spots in faculæ *p* Group 9550.
Group 9552. July 9–17. A large stream of normal type in low latitude, developing rapidly from a few spots seen on July 9 in a position lightly marked by faculæ at the east limb on July 6 and 7. The leader, when completely developed, is a well-defined regular spot; the follower, as usual, is composite and is very short-lived. The appearance of so large a group in equatorial latitudes within a year of the minimum is abnormal.

POSITIONS and AREAS of SUN SPOTS and FACULÆ for EACH DAY in the YEAR 1924.

G.M.T. (Civil.)	Group No.	Measures. Dist.	Measures. Pos. Angle.	Position. Long.	Position. Lat.	Area. Umbræ.	Area. Whole Spots.	Area. Faculæ.
1924.			°	°	°			
192·349		·971	307·2					152
		·942	297·3					184
		·799	308·6					99
	9546	·984	290·1	334·5	+20·5	19	99	243*f*
G	*9476*	·337	326·3	265·6	+20·1	1	3	
	9552	·028	21·7	253·6	+ 5·5	54	278	
	9550	·557	160·5	242·1	−27·6	4	14	
	9549	·424	43·1	236·1	+21·7	58	345	
		·987	62·7					103
July 11			(+1·9)	(254·2)	(+4·0)	(136)	(739)	(781)
193·306		·992	288·1					130
		·981	297·5					43
		·892	304·7					68
		·884	242·9					60
G	9552	·218	276·7	254·1	+ 5·5	98	496	
	9550	·531	180·5	241·9	−27·9	0	5	
	9549	·313	17·3	235·9	+21·4	43	240	
		·964	60·7					220
July 12			(+2·3)	(241·6)	(+4·1)	(141)	(741)	(521)
194·367		·982	353·4					28
		·972	302·4					142
		·880	239·4					435
C	9552	·457	273·4	254·6	+ 5·3	91	497	
	9549	·331	334·7	236·2	+21·5	38	197	
		·895	59·5					251
July 13			(+2·8)	(227·5)	(+4·2)	(129)	(694)	(856)
195·306		·935	241·6					150
		·754	227·4					302
G	9552	·639	272·9	254·8	+ 5·2	76	452	
	9549	·445	313·5	235·4	+21·8	41	243	
		·806	56·0					143
July 14			(+3·2)	(215·1)	(+4·3)	(117)	(695)	(595)
196·307		·976	243·1					139
		·873	292·5					156
		·853	233·9					345
G		·723	219·5					171
	9552	·804	273·2	255·4	+ 5·2	59	388	236*c*
	9549	·607	300·9	235·9	+21·8	32	231	
July 15			(+3·7)	(201·9)	(+4·4)	(91)	(619)	(1047)
1924.			°	°	°			
197·517		·941	239·2					521
		·860	230·6					275
G	9552	·945	274·0	256·9	+ 5·3	48	269	472*c*
	9549	·777	294·2	235·3	+21·5	51	314	204*c*
		·979	48·6					67
July 16			(+ 4·2)	(185·9)	(+ 4·6)	(99)	(583)	(1539)
198·305		·970	241·0					291
		·890	233·8					452
G	9552	·991	274·9	257·7	+ 5·5	58	238	421*f*
	9549	·870	292·6	235·1	+21·9	44	297	599*c*
		·935	47·9					96
July 17			(+4·6)	(175·4)	(+4·6)	(102)	(535)	(1859)
199·405		·984	237·5					101
		·915	238·3					73
G	9549	·962	291·5	235·5	+22·0	38	220	555*c*
		·903	44·5					116
July 18			(+5·1)	(160·9)	(+ 4·7)	(38)	(220)	(845)
200·374	9549	·995	292·0	233·8	+22·4	0	207	161*c*
	9476	·491	48·3	124·7	+23·4	0	2	
G		·803	43·3					146
		·958	98·9					101
July 19			(+5·5)	(148·1)	(+ 4·8)	(0)	(209)	(408)
201·347	9553	·920	71·1	68·2	+19·2	1	8	186*sf*
G		·911	112·5					48
July 20			(+5·9)	(135·2)	(+ 4·9)	(1)	(8)	(234)
202·453	9554	·729	305·0	163·2	+28·3	2	8	149*c*
G	9555	·579	47·3	92·1	+27·5	4	18	
	9553	·790	68·6	69·3	+19·9	4	13	89*sf*
July 21			(+6·4)	(120·6)	(+ 5·0)	(10)	(39)	(238)
203·357	9554	·856	298·2	165·9	+26·6	12	40	254*f*
	9555	·473	35·6	90·6	+27·4	18	53	
G	9553	·653	65·1	69·7	+19·9	1	3	55*sf*
		·931	16·0					69
July 22			(+6·8)	(108·6)	(+ 5·1)	(31)	(96)	(378)

Group 9553. July 20–24. A very small but definite spot.
Group 9554. July 21–23. Revival of Group 9544 of the previous rotation. Two small spots in the preceding part of a faculous area. There is also a very small companion on July 21 in the rear of the disturbed area.
Group 9555. July 21–29. A stream of generally insignificant spots.

POSITIONS and AREAS of SUN SPOTS and FACULÆ for EACH DAY in the YEAR 1924.

G.M.T. (Civil.)	Group No.	MEASURES. Dist.	MEASURES. Pos. Angle.	POSITION. Long.	POSITION. Lat.	AREA. Umbræ.	AREA. Whole Spots.	AREA. Faculæ.
1924.			°	°	°			
204·370	9554	·949	296·4	167·0	+26·7	19	80	309*f*
	947d	·827	324·4	138·9	+46·0	2	5	37*s*
G	9555	·387	7·6	91·9	+27·6	9	33	
	9553	·486	55·9	69·9	+20·4	1	3	
July 23			(+7·2)	(95·2)	(+ 5·2)	(31)	(121)	(346)
205·364		·953	299·8					269
		·898	319·0					114
G	9555	·434	335·5	93·8	+28·3	20	85	
	9553	·324	36·9	70·1	+20·1	1	5	
July 24			(+7·6)	(82·0)	(+ 5·3)	(21)	(90)	(383)
206·397	9555	·528	319·6	91·2	+28·6	7	26	
	9556	·967	55·5	352·9	+34·7	0	6	106*n*
G		·988	53·7					135
July 25			(+8·1)	(68·4)	(+ 5·3)	(7)	(32)	(241)
207·392	9555	·646	309·1	89·8	+28·4	7	19	125*c*
	9556	·896	53·7	354·0	+34·7	15	54	185*c*
		·955	53·8					372
G		·980	67·9					130
		·980	72·3					91
July 26			(+8·5)	(55·2)	(+ 5·4)	(22)	(73)	(903)
208·315		·813	319·1					87
	9555	·775	302·1	90·9	+28·0	4	14	172*c*
	9556	·794	49·5	355·8	+34·8	46	183	133*c*
		·888	51·5					249
G		·937	68·1					159
		·956	52·4					190
		·961	74·9					50
July 27			(+8·9)	(43·0)	(+ 5·5)	(50)	(197)	(1040)
209·188		·886	314·7					108
	9555	·840	298·1	87·1	+26·5	12	68	286*c*
	9556	·686	42·8	357·0	+34·8	31	159	
K		·850	49·2					321
		·851	67·0					172
July 28			(+ 9·2)	(31·4)	(+ 5·6)	(43)	(227)	(887)

G.M.T. (Civil.)	Group No.	MEASURES. Dist.	MEASURES. Pos. Angle.	POSITION. Long.	POSITION. Lat.	AREA. Umbræ.	AREA. Whole Spots.	AREA. Faculæ.
1924.			°	°	°			
210·369		·950	313·5					152
		·788	291·3					91
	9555	·949	295·1	87·7	+25·5	20	128	423*c*
	9556	·559	28·2	357·1	+34·7	34	153	
		·716	62·3					136
G		·729	41·0					140
		·837	46·3					121
		·839	64·5					83
		·893	55·1					70
		·953	46·7					104
July 29			(+ 9·7)	(15·8)	(+ 5·6)	(54)	(281)	(1320)
211·411		·988	296·4					151
		·911	290·2					109
	9556	·499	9·8	356·2	+34·9	30	162	
G	9557	·986	50·6	280·5	+39·7	0	18	213*s*
		·781	44·5					162
July 30			(+10·2)	(2·1)	(+ 5·7)	(30)	(180)	(635)
212·363	9556	·499	349·2	356·0	+35·0	25	171	
	9557	·945	52·3	279·5	+37·4	4	25	268*n*
G		·869	40·7					75
July 31			(+10·5)	(349·5)	(+ 5·8)	(29)	(196)	(343)
213·383	9556	·564	330·3	355·8	+34·8	25	192	
	9557	·874	49·5	279·0	+37·8	3	24	154*c*
	9558	·961	85·9	261·9	+ 5·5	53	308	353*f*
C		·807	33·1					71
		·908	123·7					119
		·922	67·5					115
Aug. 1			(+10·9)	(336·0)	(+ 5·9)	(81)	(524)	(812)
214·427	9556	·670	317·0	355·6	+34·3	40	180	
	9557	·785	44·0	278·1	+38·6	8	18	187*c*
	9558	·871	86·8	261·5	+ 5·7	43	251	534*f*
G		·910	67·6					57
		·961	120·9					255
		·989	69·1					174
Aug. 2			(+11·4)	(322·2)	(+ 5·9)	(91)	(449)	(1207)

Group *947d*. July 23. A very small distinct spot in high latitude, visible also on the Cape photograph taken 30 minutes earlier.
Group 9556. July 25–Aug. 6. A stream pertaining to the normal type in which the following component is never conspicuous. This group, which is an entirely new formation, precedes a well-defined area of faculæ, which represents the place of Group 9545.
Group 9557. July 30–Aug. 4. A short stream of small components, of which one at the rear alone remains on Aug. 4.
Group 9558. Aug. 1–13. Return of Group 9552. A small regular spot, with a few tiny companions on Aug. 7, 8, and 11.

POSITIONS and AREAS of SUN SPOTS and FACULÆ for EACH DAY in the YEAR 1924.

G.M.T. (Civil.)	Group No.	Measures. Dist.	Measures. Pos. Angle.	Position. Long.	Position. Lat.	Area. Umbræ.	Area. Whole Spots.	Area. Faculæ.
1924.			°	°	°			
215·362	9556	·780	310·1	355·9	+34·4	31	153	241*f*
	948a	·583	333·3	328·9	+36·9	1	2	190*p*
	9557	·698	37·2	277·2	+38·8	3	8	103*c*
G	9558	·749	87·6	261·2	+ 5·8	49	253	300*f*
	9559	·925	61·9	242·3	+28·2	8	25	130*c*
	9560	·973	66·3	232·0	+24·4	21	89	277*c*
		·929	123·8					470
Aug. 3			(+11·7)	(309·8)	(+ 6·0)	(113)	(530)	(1711)
216·387		·728	316·7					272
	9556	·880	306·3	355·6	+34·6	37	134	406*f*
	9557	·642	27·5	273·5	+40·2	1	2	97*c*
G	9558	·573	88·5	261·3	+ 5·8	46	226	
	9559	·817	59·9	243·4	+27·9	9	33	122*f*
	9560	·907	65·6	231·2	+24·7	13	80	452*c*
		·873	127·7					624
Aug. 4			(+12·1)	(296·3)	(+ 6·1)	(106)	(475)	(1973)
217·352		·820	294·7					134
		·798	312·4					291
	9556	·948	304·3	354·7	+34·3	26	109	382*f*
	9558	·375	89·5	261·5	+ 5·8	60	265	
G	9559	·690	54·9	243·9	+28·0	4	10	117*f*
	9560	·807	63·9	230·9	+24·5	17	67	335*c*
		·736	137·7					268
		·860	128·5					300
Aug. 5			(+12·5)	(283·5)	(+ 6·1)	(107)	(451)	(1827)
218·482		·916	292·7					124
		·774	313·7					228
	9556	·993	304·1	354·2	+34·5	20	110	531*f*
	9558	·126	92·1	261·3	+ 5·8	57	230	
G	9559	·534	43·3	244·0	+28·4	1	7	
	9560	·654	59·7	230·4	+24·1	14	61	234*f*
		·656	152·3					239
		·793	135·3					323
Aug. 6			(+12·9)	(268·5)	(+ 6·2)	(92)	(408)	(1679)
219·615		·982	292·6					65
		·961	306·6					181
		·845	311·0					89
G	9561	·518	215·8	272·2	−18·8	1	5	
	9558	·135	268·4	261·4	+ 6·0	45	257	
	9560	·484	48·4	230·3	+24·4	11	46	
		·754	144·9					138
Aug. 7			(+13·4)	(253·6)	(+ 6·3)	(57)	(308)	(473)
220·366		·919	306·1					253
		·670	325·8					249
	9561	·642	230·3	274·9	−18·8	3	8	
G	9558	·304	270·0	261·3	+ 6·0	55	218	
	9560	·384	35·0	229·7	+24·3	8	21	
		·951	61·6					254
Aug. 8			(+13·6)	(243·6)	(+ 6·3)	(66)	(247)	(756)
221·377		·927	307·6					133
		·762	318·9					245
		·622	199·2					217
	9561	·778	239·1	275·0	−19·0	8	32	89*c*
G	9558	·519	271·2	261·6	+ 6·1	50	227	
	9560	·306	2·8	229·4	+24·1	5	18	
		·615	170·1					100
		·925	60·6					227
Aug. 9			(+14·0)	(230·3)	(+ 6·4)	(63)	(277)	(1011)
222·417		·966	306·4					70
		·845	315·0					221
		·718	216·0					168
	9561	·889	245·2	274·7	−18·6	0	13	121*c*
G	9558	·712	272·2	262·0	+ 6·1	43	204	144*sf*
	9560	·364	327·8	228·7	+24·1	1	4	
		·800	56·0					105
		·927	61·4					168
Aug. 10			(+14·4)	(216·5)	(+ 6·4)	(44)	(221)	(997)
223·391		·963	248·2					106
		·913	311·8					243
		·880	238·0					115
		·806	223·4					258
G		·684	207·0					166
	9558	·852	273·2	262·2	+ 6·1	41	223	301*sf*
	9560	·510	303·2	230·9	+22·0	0	3	
		·852	59·1					121
Aug. 11			(+14·8)	(203·6)	(+ 6·5)	(41)	(226)	(1310)
224·373		·963	311·1					196
		·936	242·1					57
		·890	231·0					264
G		·734	219·1					82
	9558	·947	274·3	262·2	+ 6·1	46	257	181*sf*
	9562	·780	229·3	231·5	−25·6	6	13	31*c*
Aug. 12			(+15·1)	(190·7)	(+ 6·6)	(52)	(270)	(811)

Group 9559. Aug. 3–6. A small definite spot with a companion on Aug. 3.
Group 9560. Aug. 3–11. Return of Group 9549. A small regular spot, decreasing to a tiny marking before extinction.
Group 9561. Aug. 7–10. A related pair of small spots in faculæ, showing no development.
Group 9562. Aug. 12–14. A small group, developing towards the west limb, near the place occupied in the previous rotation by Group 9550.

POSITIONS and AREAS of SUN SPOTS and FACULÆ for EACH DAY in the YEAR 1924.

G.M.T. (Civil.)	Group No.	MEASURES. Dist.	MEASURES. Pos. Angle.	POSITION. Long.	POSITION. Lat.	AREA. Umbræ.	AREA. Whole Spots.	AREA. Faculæ.
1924.			°	°	°			
225·370		·977	313·4					83
		·960	265·6					30
		·947	233·4					234
G		·857	227·2					64
		·831	294·7					210
	9558	·995	275·4	262·1	+ 6·0	43	153	186*sf*
	9562	·870	235·6	230·0	−25·4	17	65	163*c*
Aug. 13			(+15·4)	(177·5)	(+ 6·6)	(60)	(218)	(970)
226·399		·986	236·3					123
		·931	233·5					93
		·894	294·2					306
G		·882	225·3					123
	9562	·947	240·4	229·3	−25·3	23	100	241*c*
		·948	63·8					229
Aug. 14			(+15·8)	(163·9)	(+ 6·6)	(23)	(100)	(1115)
227·367		·990	242·5					93
		·927	230·1					84
		·917	296·0					157
G	9563	·981	74·6	71·0	+16·4	35	279	439*c*
		·899	64·1					359
		·958	48·8					83
Aug. 15			(+16·1)	(151·1)	(+ 6·7)	(35)	(279)	(1215)
228·380		·969	298·9					74
		·949	231·5					108
G	9563	·925	74·6	69·3	+16·8	51	359	384*c*
		·810	61·5					252
		·927	46·1					77
Aug. 16			(+16·5)	(137·7)	(+ 6·7)	(51)	(359)	(895)
229·609	9563	·786	73·8	69·5	+16·9	60	357	179*c*
G								
Aug. 17			(+16·9)	(121·4)	(+ 6·8)	(60)	(357)	(179)
230·575		·995	251·2					125
G	9563	·642	71·2	69·4	+17·2	49	301	
Aug. 18			(+17·2)	(108·7)	(+ 6·8)	(49)	(301)	(125)

G.M.T. (Civil.)	Group No.	MEASURES. Dist.	MEASURES. Pos. Angle.	POSITION. Long.	POSITION. Lat.	AREA. Umbræ.	AREA. Whole Spots.	AREA. Faculæ.
1924.			°	°	°			
231·394		·862	300·3					129
	9563	·489	66·7	70·0	+17·2	61	298	
G		·953	63·5					147
Aug. 19			(+17·5)	(97·9)	(+ 6·9)	(61)	(298)	(276)
232·448		·907	300·9					175
	9563	·262	50·0	71·8	+16·4	40	203	
G		·877	61·8					136
Aug. 20			(+17·8)	(83·9)	(+ 6·9)	(40)	(203)	(311)
233·379		·928	297·0					104
G	9563	·161	341·3	74·7	+15·7	33	176	
Aug. 21			(+18·1)	(71·6)	(+ 7·0)	(33)	(176)	(104)
234·363	9563	·313	298·6	75·1	+15·3	30	149	
		·940	55·0					191
G		·956	65·2					79
Aug. 22			(+18·4)	(58·6)	(+ 7·0)	(30)	(149)	(270)
235·416	9563	·507	287·5	74·6	+14·9	31	169	
		·909	65·9					151
G		·916	53·4					214
Aug. 23			(+18·7)	(44·7)	(+ 7·0)	(31)	(169)	(365)
236·229		·809	299·4					187
	9563	·653	284·9	74·6	+15·0	28	176	
D		·853	64·6					123
		·865	53·3					302
Aug. 24			(+19·0)	(34·0)	(+ 7·0)	(28)	(176)	(612)
237·376		·895	295·7					416
	9563	·824	283·1	74·7	+14·8	26	165	302*f*
C		·820	49·6					156
		·940	52·5					154
Aug. 25			(+19·3)	(18·8)	(+ 7·1)	(26)	(165)	(1028)

Group 9563. Aug. 15–27. A stream of normal type, of which the first stages of its development have taken place when it comes into view at the east limb. The leader preserves its regular form until it reaches the west limb, when it has apparently divided into two parts. This division is preceded by the appearance of a "bright" bridge, seen first on Aug. 22. The follower, 12° behind the leader, has diminished to a dot on Aug. 21; it has disappeared on Aug. 22, but reappears temporarily on Aug. 23 and 24.

POSITIONS and AREAS of SUN SPOTS and FACULÆ for EACH DAY in the YEAR 1924.

G.M.T. (Civil.)	Group No.	MEASURES. Dist.	MEASURES. Pos. Angle.	POSITION. Long.	POSITION. Lat.	AREA. Umbræ.	AREA. Whole Spots.	AREA. Faculæ.
1924.			°	°	°			
238·358		·944	294·2					335
C	9563	·926	282·8	74·4	+14·5	10	140	415*f*
Aug. 26			(+19·6)	(5·8)	(+ 7·1)	(10)	(140)	(750)
239·387	9563	·988	283·5	74·5	+14·4	16	82	376*f*
G								
Aug. 27			(+19·9)	(352·2)	(+ 7·1)	(16)	(82)	(376)
240·331		·985	290·0					282
	9564	·548	62·5	308·6	+20·8	14	60	
C	9565	·971	86·8	263·5	+ 4·8	57	211	314*c*
		·977	49·9					255
Aug. 28			(+20·1)	(339·8)	(+ 7·1)	(71)	(271)	(851)
241·462	9564	·369	44·5	308·7	+22·1	113	624	
G	9565	·876	88·5	263·6	+ 4·8	52	197	321*f*
Aug. 29			(+20·5)	(324·8)	(+ 7·2)	(165)	(821)	(321)
242·475	*949a*	·614	214·3	333·5	−23·7	0	2	
	9564	·262	11·1	308·3	+22·0	216	990	
G	9565	·735	90·4	264·1	+ 4·6	37	185	278*f*
		·927	120·7					117
		·950	43·5					141
Aug. 30			(+20·7)	(311·4)	(+ 7·2)	(253)	(1177)	(536)
243·564	9564	·315	325·3	308·1	+22·0	220	1159	
	9565	·541	92·8	264·4	+ 4·6	34	184	
G		·884	41·0					106
		·929	127·7					186
		·970	115·8					79
Aug. 31			(+21·0)	(297·1)	(+ 7·2)	(254)	(1343)	(371)
244·575		·863	234·7					66
	9564	·455	304·9	307·2	+21·7	222	1220	
	949b	·491	358·3	284·7	+36·4	2	5	
G	9565	·334	96·9	264·4	+ 4·5	32	180	
		·864	133·5					253
		·935	120·9					171
Sept. 1			(+21·3)	(283·7)	(+ 7·2)	(256)	(1405)	(490)
245·328		·923	238·5					86
		·891	308·5					128
		·882	295·0					210
	9564	·578	297·7	307·0	+21·6	214	1281	
C	9565	·172	104·7	264·2	+ 4·6	30	180	
		·806	139·9					336
		·888	124·9					336
		·987	110·5					88
Sept. 2			(+21·5)	(273·8)	(+ 7·2)	(244)	(1461)	(1184)
246·622		·917	309·1					144
	9564	·772	291·6	306·9	+21·2	177	1275	348*c*
	9565	·139	251·9	264·3	+ 4·7	32	176	
G		·729	150·2					223
		·739	135·2					249
		·915	113·2					213
		·927	129·4					187
Sept. 3			(+21·8)	(256·7)	(+ 7·2)	(209)	(1451)	(1364)
247·343	9564	·858	290·7	306·6	+21·4	124	1180	569*c*
	9565	·301	262·8	264·6	+ 4·7	31	173	
C		·863	116·6					190
		·879	136·0					156
		·985	70·4					158
Sept. 4			(+22·0)	(247·2)	(+ 7·2)	(155)	(1353)	(1073)
248·441		·946	304·1					88
	9564	·949	289·7	305·4	+20·9	142	837	676*c*
G	9565	·526	267·2	264·3	+ 4·7	25	160	
	9566	·582	186·3	236·7	−28·0	1	2	
		·938	68·8					270
Sept. 5			(+22·2)	(232·6)	(+ 7·2)	(168)	(999)	(1034)
249·428		·698	191·5					140
	9564	·985	290·0	301·5	+21·0	52	381	371*c*
	9565	·708	269·4	264·7	+ 4·7	31	173	
G	9566	·636	208·0	239·1	−27·2	4	14	
		·847	68·4					195
		·911	57·1					114
Sept. 6			(+22·4)	(219·6)	(+ 7·2)	(87)	(568)	(820)

Group 9564. Aug. 28–Sept. 6. A very large group of the " stream " type, developing with extreme rapidity from two small spots or close clusters of spots photographed on Aug. 28. Both the leading and following spots are very large and somewhat composite in character ; the leader becomes increasingly unstable, and has broken up into several components by Sept. 4. A cluster of small spots is prominent on Aug. 30, and, although this practically disappears, a chain of spots is formed later in its place from disintegrated portions of the two large spots.

Group 9565. Aug. 28–Sept. 9. Return of Group 9558, third apparition. A stable regular spot.

Group 9566. Sept. 5–10. A small stream of unimportant spots, of which only the leader is seen on Sept. 9.

POSITIONS and AREAS of SUN SPOTS and FACULÆ for EACH DAY in the YEAR 1924.

G.M.T. (Civil.)	Group No.	MEASURES. Dist.	MEASURES. Pos. Angle.	POSITION. Long.	POSITION. Lat.	AREA. Umbræ.	AREA. Whole Spots.	AREA. Faculæ.
1924.			°	°	°			
250·233		·987	292·0					52
		·809	292·6					62
		·711	201·8					127
D	9565	·829	270·8	265·1	+ 4·7	27	158	133*f*
	9566	·711	218·6	238·8	−27·3	13	50	131*c*
		·753	66·3					144
		·847	56·6					125
Sept. 7			(+22·6)	(209·0)	(+ 7·3)	(40)	(208)	(774)
251·382		·949	311·2					41
		·922	291·9					81
		·797	212·7					103
G	9565	·945	272·3	264·8	+ 4·5	29	171	277*f*
	9566	·817	228·6	237·4	−27·5	9	41	243*c*
Sept. 8			(+22·9)	(193·8)	(+ 7·3)	(38)	(212)	(745)
252·437		·974	292·7					171
		·901	285·2					36
		·874	221·1					166
		·829	321·3					164
G		·782	228·5					185
	9565	·996	273·7	265·1	+ 4·4	11	250	155*f*
	9566	·937	238·5	242·6	−26·1	6	21	377*f*
		·934	64·9					94
Sept. 9			(+23·1)	(179·9)	(+ 7·2)	(17)	(271)	(1348)
253·361		·969	285·6					44
		·933	225·9					212
		·860	234·7					102
G	9566	·966	239·8	236·7	−26·7	0	21	407*f*
	9567	·808	67·1	114·2	+22·7	17	81	81*c*
		·964	129·4					67
Sept. 10			(+23·3)	(167·7)	(+ 7·2)	(17)	(102)	(913)
254·412		·978	229·9					110
		·939	237·5					101
		·924	297·4					36
		·776	239·2					141
G	9567	·677	62·3	113·0	+23·8	39	277	
		·902	134·4					77
		·948	61·1					73
		·967	76·9					257
Sept. 11			(+23·5)	(153·8)	(+ 7·2)	(39)	(277)	(795)
255·326		·965	242·1					115
		·908	222·3					163
		·832	241·7					154
	9567	·518	55·7	114·1	+23·3	61	328	
C		·833	138·2					95
		·888	78·0					220
		·895	59·6					123
		·951	69·3					238
Sept. 12			(+23·7)	(141·7)	(+ 7·2)	(61)	(328)	(1108)
256·422		·961	247·4					74
	9567	·348	37·7	114·0	+23·0	60	331	
G		·741	79·1					144
		·849	68·3					135
Sept. 13			(+23·9)	(127·3)	(+ 7·2)	(60)	(331)	(353)
257·378	9567	·264	3·2	113·7	+22·4	42	225	
G								
Sept. 14			(+24·0)	(114·6)	(+ 7·2)	(42)	(225)	(0)
258·507		·824	294·4					98
	9567	·361	317·9	114·8	+22·4	33	238	
G		·984	66·2					58
Sept. 15			(+24·2)	(99·7)	(+ 7·2)	(33)	(238)	(156)
259·377		·922	292·9					241
	9567	·514	301·8	116·3	+22·1	13	97	
G		·937	66·1					182
Sept. 16			(+24·4)	(88·3)	(+ 7·2)	(13)	(97)	(423)
260·340		·961	291·9					147
	9567	·686	294·5	117·6	+21·8	21	124	
C		·871	64·3					239
Sept. 17			(+24·5)	(75·5)	(+ 7·2)	(21)	(124)	(386)
261·329	9567	·836	291·7	119·2	+22·0	16	88	349*f*
C	9568	·947	117·7	356·8	−23·3	3	6	113*s*
Sept. 18			(+24·7)	(62·5)	(+ 7·1)	(19)	(94)	(462)

Group 9567. Sept. 10–19. A group of the stream type, developing from two spot centres seen on Sept. 10 in a position lightly marked by faculæ on the previous day. A quasi-regular spot has appeared as the leader by Sept. 12, after which the following members decrease. The axis of the group is considerably inclined to the sun's equator.

Group 9568. Sept. 18–27. Two small spots, appearing from a compact mass of faculæ at the sun's south-east limb. These fail to develop, but small variable spots or clusters of spots continue to mark their place at the two extremities of the disturbance which lengthens out considerably as shown by a comparison of the faculæ on Sept. 18 and 27.

POSITIONS and AREAS of SUN SPOTS and FACULÆ for EACH DAY in the YEAR 1924.

G.M.T. (Civil.)	Group No.	MEASURES.		POSITION.		AREA.			G.M.T. (Civil.)	Group No.	MEASURES.		POSITION.		AREA.		
		Dist.	Pos. Angle.	Long.	Lat.	Umbræ.	Whole Spots.	Faculæ.			Dist.	Pos. Angle.	Long.	Lat.	Umbræ.	Whole Spots.	Faculæ.
1924.			°	°	°				1924.			°	°	°			
262·321	9567	·933	291·0	119·2	+22·1	6	31	400*f*	267·393		·950	295·6					131
C	9568	·866	123·3	357·1	−24·1	27	107	100*c*		9569	·579	303·7	14·3	+24·7	4	11	
		·968	58·4					206		9568	·565	200·3	354·8	−25·0	26	145	
Sept. 19			(+24·8)	(49·4)	(+ 7·1)	(33)	(138)	(706)	G	9570	·975	85·5	264·8	+ 6·0	20	183	107*c*
											·700	63·3					335
											·829	67·3					240
											·907	78·5					67
									Sept. 24			(+25·5)	(342·4)	(+ 7·0)	(50)	(339)	(880)
263·336		·958	294·0					378									
		·938	226·2					34									
	9569	·451	47·2	14·8	+24·4	3	14		268·366	9569	·706	300·9	12·0	+26·4	0	6	
C	9568	·758	130·8	357·2	−24·1	18	118	142*c*		9568	·649	216·5	354·7	−25·1	19	87	
		·927	52·2					102	C	9571	·256	335·6	336·0	+20·2	2	11	
		·985	66·8					513		9570	·901	86·3	265·1	+ 6·4	29	137	194*nf*
Sept. 20			(+25·0)	(36·0)	(+ 7·1)	(21)	(132)	(1169)	Sept. 25			(+25·6)	(329·6)	(+ 6·9)	(50)	(241)	(194)
									269·348		·837	295·7					149
										9568	·757	228·1	354·9	−24·9	11	44	325*c*
264·380		·814	283·5					123	C	9570	·785	87·4	264·7	+ 6·3	20	140	143*nf*
	9569	·297	10·4	18·9	+24·0	0	5				·976	120·1					115
G	9568	·656	142·5	356·2	−24·9	37	136		Sept. 26			(+25·7)	(316·6)	(+ 6·9)	(31)	(184)	(732)
		·944	68·1					891									
Sept. 21			(+25·1)	(22·2)	(+ 7·1)	(37)	(141)	(1014)									
									270·420		·940	350·2					68
											·939	294·4					167
										9568	·853	232·2	351·6	−27·1	0	6	566*np*
										9570	·608	88·8	265·0	+ 6·1	14	92	
									G	*950a*	·955	61·5	228·8	+29·2	2	13	130*f*
265·414		·933	299·1					129			·922	124·4					253
		·924	281·1					147			·942	1·3					79
		·800	292·9					349			·973	121·4					155
G	9569	·337	330·3	19·1	+23·8	0	10		Sept. 27			(+25·8)	(302·5)	(+ 6·8)	(16)	(111)	(1418)
	9568	·568	159·8	356·1	−25·3	51	252										
		·878	66·6					1366									
Sept. 22			(+25·3)	(8·6)	(+ 7·0)	(51)	(262)	(1991)									
									271·430		·941	238·9					475
										9571	·723	291·7	334·7	+20·3	3	13	
										950b	·287	314·2	301·6	+18·1	0	2	
										9572	·244	359·3	289·4	+20·8	2	15	
										9570	·404	89·5	265·3	+ 6·4	30	153	
									G	9573	·966	68·7	212·8	+22·3	46	257	336*f*
266·648		·926	292·0					183			·846	130·8					139
	9568	·537	185·2	355·4	−25·2	31	233				·900	60·2					107
G		·760	65·0					788			·942	125·2					122
		·911	70·8					137			·944	103·8					42
Sept. 23			(+25·4)	(352·3)	(+ 7·0)	(31)	(233)	(1108)	Sept. 28			(+25·9)	(289·2)	(+ 6·8)	(81)	(440)	(1221)

Group 9569. Sept. 20–25. Intermittent. A small disturbed area containing two or three ephemeral spots; none are seen on Sept. 23.
Group 9570. Sept. 24–Oct. 4. Return of Group 9565; fourth and last apparition. A small regular spot diminishing appreciably after Sept. 29. After Sept. 26, small unstable spots appear in close proximity following the spot, and one, which is rather more persistent, is seen some distance *np* it from Sept. 28–Oct. 1. The region is represented but sparsely by faculæ at the west limb.
Group 9571. Sept. 25–30. Intermittent. A pair of very small spots on Sept. 25. On Sept. 28–30 a few small spots in a short stream.
Group 9572. Sept. 28–30. A slight, short-lived disturbance shown by two or three very small unstable spots: no representative faculæ is seen at the west limb.
Group 9573. Sept. 28–Oct. 10. A stable regular spot, slowly diminishing with two distant followers on Oct. 2 and 3.

POSITIONS and AREAS of SUN SPOTS and FACULÆ for EACH DAY in the YEAR 1924.

G.M.T. (Civil.)	Group No.	MEASURES. Dist.	MEASURES. Pos. Angle.	POSITION. Long.	POSITION. Lat.	AREA. Umbræ.	AREA. Whole Spots.	AREA. Faculæ.
1924.			°	°	°			
272·420		·989	240·8					256
	9571	·869	289·2	336·7	+20·0	9	52	180*c*
	9572	·339	323·6	288·6	+22·4	2	4	
	9570	·198	92·8	264·7	+ 6·1	24	150	
G	9573	·892	68·2	212·7	+22·4	29	229	439*f*
		·752	139·0					158
		·796	56·7					111
		·842	131·9					115
		·920	121·9					176
		·953	134·4					186
Sept. 29			(+26·0)	(276·1)	(+ 6·8)	(64)	(435)	(1621)
273·425		·800	297·5					267
	9571	·971	288·0	340·1	+19·0	2	14	202*f*
	9572	·414	309·5	282·8	+21·4	4	18	
	9570	·035	259·9	264·8	+ 6·4	14	52	
G	9573	·782	66·2	212·2	+22·7	28	192	312*f*
	950c	·943	81·6	191·7	+10·2	0	7	87*p*
		·787	138·4					139
		·849	125·1					88
		·917	134·9					141
Sept. 30			(+26·1)	(262·8)	(+ 6·7)	(48)	(283)	(1236)
274·362		·988	291·9					79
		·887	295·7					293
		·846	309·2					122
		·759	296·1					141
C	9570	·245	270·7	264·7	+ 6·6	9	61	
	9573	·648	62·5	212·1	+22·7	38	217	164*f*
	9574	·958	65·3	176·2	+25·5	19	127	369*f*
		·767	131·1					115
Oct. 1			(+26·1)	(250·5)	(+ 6·7)	(66)	(405)	(1283)
275·334		·949	297·0					403
		·937	308·4					116
		·869	293·8					471
	950d	·857	302·0	295·1	+30·6	9	21	106*c*
C	9570	·423	272·9	262·8	+ 7·2	13	56	
	9573	·508	55·2	211·0	+22·8	51	244	
	9574	·886	64·4	175·5	+25·7	15	110	440*f*
		·920	131·8					83
Oct. 2			(+26·2)	(237·7)	(+ 6·6)	(88)	(431)	(1619)
1924.			°	°	°			
276·452		·943	294·7					229
	9570	·636	273·6	262·5	+ 7·4	12	46	
G	9573	·338	33·4	211·3	+22·7	36	200	
	9574	·763	61·5	174·9	+25·8	16	85	338*f*
	9575	·988	119·1	146·8	−27·3	28	252	161*c*
Oct. 3			(+20·2)	(222·9)	(+ 6·6)	(92)	(583)	(728)
277·327		·976	295·9					270
	9570	·780	273·9	262·8	+ 7·2	2	22	70*c*
	9573	·284	359·5	211·6	+23·0	38	194	
C	*950e*	·424	78·8	186·5	+10·6	1	4	
	9574	·644	56·7	174·8	+25·9	17	73	268*f*
	9575	·974	121·3	140·3	−28·5	55	487	781*c*
		·881	65·5					92
Oct. 4			(+26·3)	(211·4)	(+ 6·5)	(113)	(780)	(1481)
278·510		·923	275·6					190
		·906	284·9					128
		·803	224·3					181
C	9573	·384	320·0	211·2	+23·2	32	189	
	9574	·480	43·3	174·2	+26·4	12	49	
	9575	·914	125·5	137·8	−28·5	63	513	493*c*
		·970	65·9					111
Oct. 5			(+26·3)	(195·7)	(+ 6·4)	(107)	(751)	(1103)
279·413		·981	277·0					169
		·971	285·9					98
		·889	231·9					213
	950f	·824	296·2	238·3	+25·1	0	3	45*p*
G	9573	·515	305·8	210·7	+23·2	34	186	
	9574	·369	24·0	174·2	+26·0	5	18	
	9575	·846	130·2	136·5	−28·7	86	502	798*c*
		·941	63·9					317
Oct. 6			(+26·4)	(183·8)	(+ 6·4)	(125)	(709)	(1640)
280·429		·930	293·6					49
		·930	234·5					159
	9573	·671	298·4	210·3	+23·4	33	176	
G	9574	·347	353·4	172·9	+26·4	4	23	
	9575	·747	138·4	136·1	−28·7	67	439	599*c*
		·851	63·8					181
		·950	85·6					36
Oct. 7			(+26·4)	(170·4)	(+ 6·3)	(104)	(638)	(1024)

Group 9574. Oct. 1–8. A regular spot, diminishing to a very small marking before disappearing after Oct. 8. There is a small distant follower on Oct. 5 and a few close ones on Oct. 7 and 8. The group evidently represents the last phases of a stream which completed its first phases on the invisible hemisphere.

Group 9575. Oct. 3–15. A stream of roughly normal type, but of remarkable length, the greatest distance between the leading and following spots being 17°. The group is a few days old when first seen at the sun's east limb. The leader appears throughout as a small contracting regular spot; the last definite trace of the follower is visible on Oct. 11, although one or two of the small spots, which have hitherto preceded it, continue until Oct. 14.

POSITIONS and AREAS of SUN SPOTS and FACULÆ for EACH DAY in the YEAR 1924.

G.M.T. (Civil.)	Group No.	MEASURES. Dist.	MEASURES. Pos. Angle.	POSITION. Long.	POSITION. Lat.	AREA. Umbræ.	AREA. Whole Spots.	AREA. Faculæ.
1924.			°	°	°			
281·627		·901	235·2					125
	9573	·832	294·0	210·3	+23·4	24	187	207*f*
	9574	·441	320·7	172·6	+25·9	3	11	
G	9575	·627	153·1	135·9	−27·9	73	434	157*f*
		·777	58·6					130
		·943	74·7					138
Oct. 8			(+26·4)	(154·6)	(+ 6·3)	(100)	(632)	(757)
282·432		·942	238·0					96
		·910	221·6					80
G	9573	·913	293·0	210·1	+23·4	21	160	274*f*
	9575	·579	167·7	136·0	−28·2	50	261	
		·924	73·2					139
Oct. 9			(+26·4)	(144·0)	(+ 6·2)	(71)	(421)	(589)
283·405	9573	·974	292·9	209·2	+23·7	11	126	287*f*
G	9575	·568	190·4	137·8	−27·7	36	180	
		·922	64·6					91
Oct. 10			(+26·4)	(131·2)	(+ 6·1)	(47)	(306)	(378)
284·347		·775	301·0					198
C	9575	·622	205·8	136·5	−28·1	27	221	
		·853	62·8					114
Oct. 11			(+26·4)	(118·7)	(+ 6·1)	(27)	(221)	(312)
285·369		·892	298·6					240
C	9575	·728	221·1	138·0	−28·2	34	206	244*c*
Oct. 12			(+26·4)	(105·3)	(+ 6·0)	(34)	(206)	(484)
286·447		·961	298·3					274
	9575	·865	233·7	142·3	−27·1	18	117	827*c*
G	9576	·989	67·8	8·2	+22·7	39	344	241*c*
		·972	113·6					96
Oct. 13			(+26·4)	(91·0)	(+ 5·9)	(57)	(461)	(1438)
287·467		·937	292·8					68
		·937	250·1					56
	9575	·943	238·7	142·1	−26·9	25	100	1067*c*
G	9576	·948	66·8	5·6	+23·8	73	505	794*c*
		·886	115·2					159
Oct. 14			(+26·4)	(77·6)	(+ 5·9)	(98)	(605)	(2144)

G.M.T. (Civil.)	Group No.	MEASURES. Dist.	MEASURES. Pos. Angle.	POSITION. Long.	POSITION. Lat.	AREA. Umbræ.	AREA. Whole Spots.	AREA. Faculæ.
1924.			°	°	°			
288·368	9575	·989	241·9	142·9	−26·6	13	79	608*f*
	9576	·869	65·9	5·9	+23·7	117	572	374*c*
C		·815	122·9					94
		·958	119·4					150
Oct. 15			(+26·3)	(65·7)	(+5·8)	(130)	(651)	(1226)
289·339		·967	235·3					575
		·926	291·7					106
		·807	301·9					132
C	9576	·745	64·3	6·4	+22·7	95	562	329*c*
		·901	123·9					253
		·958	68·0					83
Oct. 16			(+26·3)	(52·9)	(+ 5·7)	(95)	(562)	(1478)
290·339		·979	235·4					91
		·880	298·8					147
	9576	·594	58·8	6·4	+22·6	82	559	
C		·846	130·2					303
		·979	67·2					274
		·982	67·8					85
Oct. 17			(+26·2)	(39·7)	(+ 5·6)	(82)	(559)	(900)
291·405		·953	300·2					161
	9576	·430	45·6	6·2	+22·7	84	553	
G		·790	137·6					289
		·946	63·6					593
Oct. 18			(+26·2)	(25·6)	(+ 5·5)	(84)	(553)	(1043)
292·383	9576	·317	19·5	6·1	+22·7	76	523	
C		·891	61·9					392
Oct. 19			(+26·1)	(12·7)	(+ 5·5)	(76)	(523)	(392)
293·352		·962	284·6					86
		·876	293·7					240
	9576	·314	344·2	5·3	+22·8	88	556	
C		·830	56·1					150
		·865	68·0					274
		·966	60·0					186
Oct. 20			(+26·0)	(0·0)	(+ 5·4)	(88)	(556)	(936)

Group 9576. Oct. 13–26. Revival near Group 9569 of the previous rotation. A very large regular spot, showing minor changes both of umbra and penumbra. A following spot seen at the east limb divides into two by Oct. 16, and so disappears, but a number of very small markings are evidence of continued activity in the faculæ following the leader.

POSITIONS and AREAS of SUN SPOTS and FACULÆ for EACH DAY in the YEAR 1924.

G.M.T. (Civil.)	Group No.	Measures. Dist.	Measures. Pos. Angle.	Position. Long.	Position. Lat.	Area. Umbræ.	Area. Whole Spots.	Area. Faculæ.
1924.			°	°	°			
294·319		·955	8·2					81
		·947	293·8					125
	951a	·867	298·4	45·9	+27·1	3	13	83*c*
	9576	·417	317·5	4·9	+22·9	85	431	
C		·754	50·6					308
		·813	66·6					184
		·921	58·2					246
		·932	16·5					95
		·981	79·6					96
Oct. 21			(+26·0)	(347·2)	(+ 5·3)	(88)	(444)	(1218)
295·620	9576	·615	301·1	4·7	+22·7	62	463	
G		·798	54·4					126
Oct. 22			(+25·9)	(330·0)	(+ 5·2)	(62)	(463)	(126)
296·438	9577	·806	295·8	11·5	+23·7	4	31	55*c*
G	9576	·735	296·7	4·5	+22·8	75	450	
	951b	·956	67·9	245·9	+22·6	0	7	207*f*
Oct. 23			(+25·8)	(319·3)	(+ 5·1)	(79)	(488)	(262)
297·509		·966	245·1					93
		·837	234·5					207
		·771	218·3					126
C	9577	·931	293·8	13·6	+24·0	16	42	161*c*
	9576	·868	293·9	4·5	+23·1	98	438	432*nf*
		·894	66·1					185
		·960	121·7					86
Oct. 24			(+25·7)	(305·1)	(+ 5·0)	(114)	(480)	(1290)
298·322		·916	239·0					219
		·846	226·5					176
	9577	·984	293·4	15·0	+23·9	0	14	130*f*
	9576	·937	292·8	3·9	+23·0	62	402	566*nf*
C	9578	·535	56·2	266·0	+21·5	7	29	
	9579	·995	68·6	209·2	+21·7	0	134	102*p*
		·789	63·7					122
		·931	126·6					167
		·966	59·9					97
Oct. 25			(+25·6)	(294·4)	(+ 4·9)	(69)	(579)	(1579)
1924.			°	°	°			
299·357		·968	242·5					127
		·911	229·8					181
	9576	·992	292·6	4·8	+23·0	42	416	829*nf*
C	9578	·369	39·0	266·4	+21·3	41	168	
	9579	·949	69·0	209·0	+21·4	16	75	234*nf*
		·869	130·6					108
Oct. 26			(+25·5)	(280·8)	(+ 4·9)	(99)	(659)	(1479)
300·393		·805	300·5					99
G	9578	·291	2·6	266·3	+21·6	50	201	
	9579	·858	68·3	208·7	+21·0	12	62	136*f*
Oct. 27			(+25·3)	(267·1)	(+ 4·8)	(62)	(263)	(235)
301·516		·880	299·2					314
		·765	314·7					216
G	9578	·381	320·6	267·3	+21·4	36	168	
	9579	·715	64·9	208·6	+20·9	9	60	126*nf*
Oct. 28			(+25·2)	(252·3)	(+ 4·6)	(45)	(228)	(656)
302·323		·937	293·8					220
		·936	359·3					91
		·843	307·0					178
C	9578	·507	306·3	267·6	+21·5	26	116	
	9579	·595	60·1	208·3	+21·1	7	27	
		·888	67·9					127
		·960	60·3					143
Oct. 29			(+25·1)	(241·7)	(+ 4·6)	(33)	(143)	(759)
303·368		·933	304·8					229
		·916	291·9					218
	9578	·673	297·0	267·8	+21·2	16	104	
C	9579	·427	48·1	208·1	+20·8	4	19	
		·901	135·0					62
		·935	57·3					246
Oct. 30			(+24·9)	(227·9)	(+ 4·5)	(20)	(123)	(755)
304·549		·960	295·8					67
		·902	309·3					161
C	9578	·845	291·7	269·1	+20·5	19	74	259*nf*
	9580	·958	119·3	143·6	−26·4	2	28	259*c*
		·801	53·9					152
Oct. 31			(+24·7)	(212·3)	(+ 4·3)	(21)	(102)	(898)

Group 9577. Oct. 23–25. A very small group forming in front of Group 9576.
Group 9578. Oct. 25–Nov. 2. A group of the stream type, arising from two close pairs of tiny spots seen on Oct. 25. The rapid separation in longitude of the two spot centres is very marked.
Group 9579. Oct. 25–30. Return of Group 9573. A small regular spot, disappearing suddenly.
Group 9580. Oct. 31–Nov. 1. Revival of Group 9575. A single small spot.

POSITIONS and AREAS of SUN SPOTS and FACULÆ for EACH DAY in the YEAR 1924.

G.M.T. (Civil.)	Group No.	MEASURES. Dist.	MEASURES. Pos. Angle.	POSITION. Long.	POSITION. Lat.	AREA. Umbræ.	AREA. Whole Spots.	AREA. Faculæ.
1924.			°	°	°			
305·411		·917	280·6					79
		·909	306·3					140
	9578	·915	290·8	266·8	+20·8	10	63	327*c*
C	9580	·898	122·2	143·1	−26·3	0	12	181*c*
		·957	64·8					73
		·957	122·5					357
Nov. 1			(+24·6)	(200·9)	(+4·3)	(10)	(75)	(1157)
306·415	9578	·985	290·2	268·4	+20·6	6	48	304*nf*
	951c	·735	231·8	226·7	−23·7	2	10	
		·796	128·6					110
C		·906	127·2					239
		·962	73·8					261
		·966	123·0					287
Nov. 2			(+24·4)	(187·7)	(+4·2)	(8)	(58)	(1201)
307·413		·992	293·9					145
		·912	296·0					36
		·855	238·2					49
G		·792	132·5					233
		·889	71·8					147
		·912	126·0					196
Nov. 3			(+24·2)	(174·5)	(+4·1)	(0)	(0)	(806)
308·472		·936	242·4					174
		·722	141·1					225
G		·762	69·7					142
		·864	133·2					363
Nov. 4			(+24·0)	(160·6)	(+3·9)	(0)	(0)	(904)
309·359		·988	245·4					170
		·861	293·6					116
C		·776	304·2					135
	951d	·472	320·4	168·2	+24·8	1	4	
		·810	140·0					300
Nov. 5			(+23·8)	(148·9)	(+3·8)	(1)	(4)	(721)
310·398		·950	292·3					93
G		·872	300·2					98
		·777	147·8					229
Nov. 6			(+23·6)	(135·2)	(+3·7)	(0)	(0)	(420)

G.M.T. (Civil.)	Group No.	MEASURES. Dist.	MEASURES. Pos. Angle.	POSITION. Long.	POSITION. Lat.	AREA. Umbræ.	AREA. Whole Spots.	AREA. Faculæ.
1924.			°	°	°			
311·330		·954	296·3					228
C	*951e*	·292	30·3	114·0	+18·0	1	11	
Nov. 7			(+23·4)	(122·9)	(+3·6)	(1)	(11)	(228)
312·396		·832	308·0					96
C		·686	327·5					104
Nov. 8			(+23·2)	(108·8)	(+3·5)	(0)	(0)	(200)
313·406		·907	304·4					89
G		·800	234·0					169
		·994	67·5					110
Nov. 9			(+23·0)	(95·5)	(+3·4)	(0)	(0)	(368)
314·331		·896	239·1					161
		·822	307·1					61
C		·760	223·5					330
		·946	65·7					211
		·985	66·5					135
Nov. 10			(+22·7)	(83·3)	(+3·3)	(0)	(0)	(898)
315·403		·961	242·4					172
		·879	230·1					296
G	9581	·853	66·7	12·1	+21·4	8	24	143*n*
		·930	114·3					65
		·946	63·8					302
Nov. 11			(+22·5)	(69·2)	(+3·2)	(8)	(24)	(978)
316·255		·904	232·1					339
		·831	290·9					154
		·830	218·0					149
D	*951f*	·638	312·4	90·1	+28·0	1	5	
	9581	·743	63·1	12·7	+21·8	8	30	136*c*
		·882	63·4					499
		·933	119·7					96
Nov. 12			(+22·3)	(58·0)	(+3·1)	(9)	(35)	(1373)
317·447		·940	290·4					139
		·938	233·8					566
C		·823	308·6					150
		·782	56·0					266
		·931	63·8					130
Nov. 13			(+22·0)	(42·2)	(+2·9)	(0)	(0)	(1251)

Group 9581. Nov. 11–16. Revival of Group 9577. A small stream not seen on Nov. 13. Only the rear spot remains on Nov. 16.

POSITIONS and AREAS of SUN SPOTS and FACULÆ for EACH DAY in the YEAR 1924.

G.M.T. (Civil.)	Group No.	MEASURES. Dist.	MEASURES. Pos. Angle.	POSITION. Long.	POSITION. Lat.	AREA. Umbræ.	AREA. Whole Spots.	AREA. Faculæ.
1924.			°	°	°			
318·310		·979	288·9					65
		·961	232·5					237
		·933	218·3					81
C	9581	·461	46·3	10·1	+21·1	16	63	
	9582	·790	60·5	341·9	+24·7	1	6	48*c*
		·967	63·7					77
Nov. 14			(+21·7)	(30·9)	(+2·8)	(17)	(69)	(508)
319·316								
		·892	296·3					158
	9581	·341	20·5	10·3	+21·3	11	29	
C.	9583	·463	27·1	4·0	+26·9	6	33	
	9584	·985	72·5	297·4	+17·7	62	555	255*c*
		·859	133·2					109
		·924	59·3					165
Nov. 15			(+21·5)	(17·6)	(+2·7)	(79)	(617)	(687)
320·608	9581	·353	340·8	7·8	+22·0	1	16	
	9583	·419	352·3	4·2	+27·0	7	88	
C	9584	·898	71·4	297·5	+17·8	53	565	320*c*
		·852	57·1					143
		·956	52·7					118
Nov. 16			(+21·1)	(0·6)	(+2·6)	(61)	(669)	(581)
321·424		·913	295·9					129
	9583	·470	333·9	3·2	+27·3	26	144	
	952a	·450	1·7	348·9	+29·1	1	3	
	9582	·381	15·1	343·6	+24·0	1	5	
G	*952b*	·760	57·3	304·7	+25·9	2	7	92*c*
	9584	·811	69·7	297·0	+17·8	121	525	250*c*
		·940	50·3					132
		·993	68·9					130
Nov. 17			(+20·9)	(349·8)	(+2·5)	(151)	(684)	(733)
322·321		·964	182·4					17
	9583	·575	318·2	3·5	+27·5	11	77	
	9584	·676	66·2	297·7	+17·8	90	511	256*c*
C	9585	·984	66·2	258·6	+23·8	63	504	835*c*
		·877	48·1					170
		·982	169·4					28
Nov. 18			(+20·6)	(338·0)	(+2·4)	(164)	(1092)	(1306)

G.M.T. (Civil.)	Group No.	MEASURES. Dist.	MEASURES. Pos. Angle.	POSITION. Long.	POSITION. Lat.	AREA. Umbræ.	AREA. Whole Spots.	AREA. Faculæ.
1924.			°	°	°			
323·343		·993	297·1					627
	9583	·692	309·5	1·5	+27·8	7	58	191*c*
C	9584	·507	57·1	298·0	+17·8	90	444	
	9585	·930	65·2	257·5	+23·7	87	778	629*c*
Nov. 19			(+20·3)	(324·5)	(+2·2)	(184)	(1280)	(1447)
324·327		·874	293·2					212
	9583	·814	301·8	2·2	+26·7	2	15	335*c*
C	9584	·355	40·1	297·8	+17·8	76	492	
	9585	·853	62·2	255·7	+24·6	114	770	605*c*
		·987	115·9					130
Nov. 20			(+20·0)	(311·6)	(+2·1)	(192)	(1277)	(1282)
325·406		·956	292·7					153
		·894	300·4					437
C	9584	·280	2·2	296·7	+18·1	107	711	384*c*
	9585	·731	57·2	254·9	+24·7	124	752	
		·955	117·4					442
Nov. 21			(+19·6)	(297·3)	(+2·0)	(231)	(1463)	(1416)
326·308		·975	297·5					248
		·846	300·3					188
	9584	·342	326·8	296·8	+18·4	119	762	
C	9585	·612	49·8	254·6	+24·8	93	724	
	9586	·880	117·3	227·7	−22·7	2	4	395*s*
		·980	64·9					79
Nov. 22			(+19·3)	(285·5)	(+1·9)	(214)	(1490)	(910)
	9582	·964	294·2	345·1	+23·7	2	17	330*nf*
327·365	9584	·487	307·1	295·6	+18·6	143	866	
	9585	·482	34·7	254·0	+24·8	87	705	
C	9586	·767	122·5	227·0	−23·1	1	7	666*s*
		·916	63·0					121
Nov. 23			(+19·0)	(271·5)	(+1·7)	(233)	(1595)	(1117)
328·496		·972	299·7					73
		·933	233·6					125
	9584	·664	296·4	295·2	+18·3	81	636	
	9585	·399	7·1	253·5	+24·8	81	618	
C	*952c*	·357	189·4	260·1	−18·9	0	3	
	952d	·590	140·4	232·1	−25·4	0	2	
	952e	·685	132·1	222·3	−25·9	0	3	
		·787	62·2					104
Nov. 24			(+18·6)	(256·6)	(+1·6)	(162)	(1262)	(302)

Group 9582. Nov. 14–23. Intermittent. A very small spot, seen only on Nov. 14, 17, and 23.
Group 9583. Nov. 15–20. A small group of stream type, composed generally of two small clusters of spots at the front and rear respectively.
Group 9584. Nov. 15–28. A large active stream of spots. At first a simple grouping of a large regular spot and a smaller double spot 7° following in longitude. Small unstable followers then appear after Nov. 17 in increasing numbers, which give the stream a complex appearance, especially on Nov. 23, when it has nearly doubled its original length. On Nov. 26, a large spot has developed near the place of the original follower and another, of a more composite character, at the rear of the stream; meanwhile, the original leader has decreased considerably.
Group 9585. Nov. 18–Dec. 1. A large and somewhat irregularly shaped spot in the following portion of an extensive area of faculæ. It is preceded by a small companion suggestive of a larger spot when on the invisible hemisphere. Other small companions appear from time to time, in general preceding the chief spot. Retrograde motion in longitude is very marked.
Group 9586. Nov. 22–23. A very small spot in the preceding part of a conspicuous area of faculæ. The one-day spots, *952d* and *952e* also occur in the same region.

POSITIONS and AREAS of SUN SPOTS and FACULÆ for EACH DAY in the YEAR 1924.

G.M.T. (Civil.)	Group No.	MEASURES.		POSITION.		AREA.			G.M.T. (Civil.)	Group No.	MEASURES.		POSITION.		AREA.		
		Dist.	Pos. Angle.	Long.	Lat.	Umbræ.	Whole Spots.	Faculæ.			Dist.	Pos. Angle.	Long.	Lat.	Umbræ.	Whole Spots.	Faculæ.
1924.			°	°	°				1924.			°	°	°			
329·308	9584	·764	292·9	293·5	+18·3	127	798		337·493	9587	·429	317·8	155·7	+18·9	9	53	
C	9585	·406	345·0	252·5	+24·4	52	474		C		·833	56·0					372
Nov. 25			(+18·3)	(245·9)	(+1·5)	(179)	(1272)	(0)			·916	136·3					112
									Dec. 3			(+15·2)	(138·0)	(+0·5)	(9)	(53)	(484)
330·327	9584	·881	290·9	292·8	+19·0	141	1142	668*c*									
C	9585	·497	322·5	251·8	+24·4	64	321		338·405	9587	·578	303·9	156·4	+18·9	4	16	
Nov. 26			(+18·0)	(232·5)	(+1·4)	(205)	(1463)	(668)	C		·765	50·1					270
											·858	138·1					179
									Dec. 4			(+14·9)	(126·0)	(+0·3)	(4)	(16)	(449)
331·527	9584	·981	289·2	294·9	+18·7	132	1387	1047*c*									
G	9585	·651	306·7	251·3	+23·8	75	376	336*p*	339·480	9587	·759	293·8	158·6	+17·9	0	7	
Nov. 27			(+17·5)	(216·7)	(+1·2)	(207)	(1763)	(1383)	G		·913	56·1					83
									Dec. 5			(+14·4)	(111·9)	(+0·2)	(0)	(7)	(83)
332·508	9584	·991	290·0	285·7	+20·0	7	300	186*c*	340·500		·855	291·4					112
G	9585	·777	300·2	250·7	+23·7	56	389	606*p*	G								
		·920	119·4					149	Dec. 6			(+14·0)	(98·4)	(+0·1)	(0)	(0)	(112)
Nov. 28			(+17·2)	(203·7)	(+1·1)	(63)	(689)	(941)									
									341·373		·940	289·0					116
									C		·824	233·3					116
333·322	9585	·868	297·2	250·4	+23·9	56	416	1215*sp*		9588	·962	68·1	14·2	+21·0	25	200	500*nf*
C		·890	122·6					75	Dec. 7			(+13·7)	(86·9)	(0·0)	(25)	(200)	(732)
Nov. 29			(+16·9)	(193·0)	(+1·0)	(56)	(416)	(1290)									
									342·349		·924	239·6					116
334·369		·773	234·9					463	C	*952f*	·503	38·2	54·4	+23·0	1	5	
C	9585	·952	294·7	249·8	+23·7	47	337	870*c*		9588	·887	66·2	14·1	+20·8	24	151	498*nf*
		·944	120·7					104	Dec. 8			(+13·2)	(74·1)	(−0·2)	(25)	(156)	(614)
Nov. 30			(+16·5)	(179·2)	(+0·9)	(47)	(337)	(1437)									
									343·437	9588	·755	61·6	14·6	+20·8	21	105	184*f*
335·446		·888	241·7					440	G	9589	·897	58·6	0·1	+27·6	7	25	317*c*
		·860	302·5					83	Dec. 9			(+12·8)	(59·7)	(−0·3)	(28)	(130)	(501)
	9585	·995	293·6	248·6	+23·5	62	244	227*f*									
G		·875	127·9					331									
		·915	51·6					46									
		·979	62·0					295	344·321		·853	291·4					40
Dec. 1			(+16·0)	(165·0)	(+0·7)	(62)	(244)	(1422)			·849	230·2					194
										9588	·631	54·8	14·7	+20·9	14	92	
									C	*952g*	·776	49·4	5·4	+29·9	2	6	42*s*
336·404		·947	243·9					302		9589	·805	54·6	0·6	+27·5	19	82	112*c*
C		·948	59·3					205			·930	58·1					150
Dec. 2			(+15·7)	(152·4)	(+0·6)	(0)	(0)	(507)	Dec. 10			(+12·4)	(48·1)	(−0·4)	(35)	(180)	(538)

Group 9587. Dec. 3–5. A pair of spots, of which the leader remains alone on Dec. 5.
Group 9588. Dec. 7–16. Revival near the place of Group 9581. A small regular spot with double umbra, which has divided into two components on Dec. 8–9. The leading spot remains on Dec. 15 as a small but perfectly defined umbral spot. There is a tiny distant follower on Dec. 12.
Group 9589. Dec. 9–15. A small stream *nf* Group 9588.

POSITIONS and AREAS of SUN SPOTS and FACULÆ for EACH DAY in the YEAR 1924.

G.M.T. (Civil.)	Group No.	Measures. Dist.	Measures. Pos. Angle.	Position. Long.	Position. Lat.	Area. Umbræ.	Area. Whole Spots.	Area. Faculæ.
1924.			°	°	°			
345·329		·944	288·0					95
		·935	234·6					139
		·771	312·8					230
C	9588	·485	41·0	15·0	+20·8	17	97	
	9589	·684	47·0	0·7	+27·2	17	130	
		·868	55·4					106
Dec. 11			(+12·0)	(34·8)	(−0·6)	(34)	(227)	(570)
346·353		·996	287·3					112
		·948	237·2					130
		·894	305·1					258
C		·848	222·3					79
	9588	·386	16·0	14·8	+21·0	14	52	
	9589	·587	35·4	358·8	+27·9	17	67	
	9590	·980	68·1	304·2	+21·3	24	135	492*c*
Dec. 12			(+11·5)	(21·3)	(−0·7)	(55)	(254)	(1071)
347·313		·934	300·7					175
	9588	·389	344·2	15·2	+21·1	10	35	
C	9589	·492	16·0	0·0	+27·3	13	65	
	9590	·941	67·4	300·6	+20·8	70	259	663*c*
		·900	58·5					96
Dec. 13			(+11·1)	(8·7)	(−0·8)	(93)	(359)	(934)
348·468		·940	223·4					132
	9588	·510	316·4	15·4	+20·8	13	25	
G	9589	·496	351·1	358·4	+28·3	2	40	
	9590	·842	64·4	299·3	+20·8	42	239	1203*c*
Dec. 14			(+10·6)	(353·4)	(−0·9)	(57)	(304)	(1335)
349·341		·918	299·2					125
	9588	·649	305·3	16·3	+21·1	8	16	
	9589	·550	336·8	356·2	+29·1	1	12	
C	9590	·739	60·0	298·9	+20·8	42	243	347*c*
	9591	·852	66·8	286·2	+18·9	1	3	674*n*
		·982	67·7					575
Dec. 15			(+10·2)	(341·9)	(−1·1)	(52)	(274)	(1721)
350·335		·974	299·5					137
	9588	·790	298·1	16·9	+21·0	3	10	127*nf*
	9590	·614	51·6	297·8	+21·3	31	193	
C	9591	·724	62·7	286·3	+18·5	1	3	417*n*
		·925	66·3					563
		·987	65·3					161
Dec. 16			(+9·7)	(328·8)	(−1·2)	(35)	(206)	(1405)
1924.								
351·315		·867	296·2					359
		·750	312·0					261
	9590	·478	38·0	297·6	+20·8	30	147	
C	9592	·532	59·8	287·7	+14·4	·2	8	
		·832	63·6					475
		·949	64·8					414
		·974	57·2					126
Dec. 17			(+9·2)	(315·9)	(−1·3)	(32)	(155)	(1635)
352·510		·951	292·7					298
		·867	306·1					351
	9590	·387	5·8	297·8	+21·1	29	160	
G	9592	·346	39·9	287·0	+13·8	7	30	
	9593	·852	60·7	246·1	+23·7	1	6	352*c*
		·921	53·3					136
		·972	119·4					178
Dec. 18			(+8·7)	(300·2)	(−1·5)	(37)	(196)	(1315)
353·616		·956	300·5					363
		·817	306·0					132
	9590	·436	335·1	296·9	+21·6	24	168	
	9592	·276	353·0	287·6	+14·3	1	11	341*f*
C	9591	·355	3·2	284·4	+19·1	4	44	
	9593	·727	54·0	245·7	+24·0	1	9	
		·871	43·6					122
		·904	124·2					86
		·919	115·4					126
Dec. 19			(+8·2)	(285·6)	(−1·6)	(30)	(232)	(1170)
354·430		·980	301·4					150
		·873	301·4					98
	9590	·512	319·0	295·9	+21·1	33	176	
	9592	·340	323·5	286·9	+14·0	1	5	
	9591	·375	336·0	284·1	+18·3	10	25	
G	*953a*	·457	340·2	284·6	+23·7	1	2	
		·694	47·4					272
		·837	116·8					169
		·848	128·0					160
		·853	46·8					56
		·948	61·1					124
		·978	107·8					75
Dec. 20			(+7·8)	(274·9)	(−1·7)	(45)	(208)	(1104)

Group 9590. Dec. 12–23. Return of Group 9584. Two regular spots, about 9° apart in longitude. The preceding one disappears as a dot on Dec. 21, two days before the extinction of the follower. There are occasional small companions, chiefly near the follower on Dec. 19 and 20.

Group 9591. Dec. 15–22. Intermittent. One or two very small spots on Dec. 15 and 16; on Dec. 19 a double spot which breaks up into a faint cluster by Dec. 21.

Group 9592. Dec. 17–24. A few small unstable spots in the extreme southern portion of a large faculous area immediately following Group 9590, in which Groups 9591 and *953a* are also contained.

Group 9593. Dec. 18–28. Intermittent. Revival of Group 9585. A single small spot in a disturbed area on each of the days, Dec. 18, 19, 24, and 28.

POSITIONS and AREAS of SUN SPOTS and FACULÆ for EACH DAY in the YEAR 1924.

G.M.T. (Civil.)	Group No.	MEASURES. Dist.	MEASURES. Pos. Angle.	POSITION. Long.	POSITION. Lat.	AREA. Umbræ.	AREA. Whole Spots.	AREA. Faculæ.
1924.			°	°	°			
355·380		·960	301·3					83
	9590	·643	307·7	295·4	+21·6	16	88	
C	9592	·515	300·9	289·3	+13·7	5	18	
	9591	·492	313·9	284·3	+18·3	1	10	
	9594	·410	201·5	271·8	−24·1	27	155	
Dec. 21			(+7·3)	(262·4)	(−1·8)	(49)	(271)	(83)
356·328		·948	296·9					98
		·832	291·4					209
		·682	311·9					287
	9590	·764	300·2	294·8	+21·2	11	58	368*c*
C	9592	·673	292·9	289·4	+13·6	6	26	63*c*
	9591	·626	304·7	282·8	+19·2	0	3	
	9594	·516	221·5	271·9	−24·4	74	432	
	9595	·414	335·9	260·2	+20·2	3	15	
	953b	·499	338·5	261·6	+25·7	1	3	
Dec. 22			(+6·9)	(249·9)	(−1·9)	(95)	(537)	(1025)
357·402		·795	301·4					390
	9590	·912	295·8	298·1	+22·4	3	12	617*s*
C	9592	·808	288·8	287·4	+13·7	19	59	121*c*
	9594	·660	233·6	271·3	−24·7	89	453	
	9595	·545	312·6	260·8	+19·6	17	68	
Dec. 23			(+6·4)	(235·7)	(−2·1)	(128)	(592)	(1128)
358·421		·968	292·4					480
		·875	297·9					427
		·731	308·1					241
G	9592	·909	286·1	286·1	+13·6	4	21	147*p*
	9594	·785	239·6	270·4	−24·8	79	423	288*c*
	9595	·692	301·5	260·9	+19·4	0	11	67*p*
	9593	·532	322·8	242·7	+22·9	0	5	
Dec. 24			(+5·9)	(222·3)	(−2·2)	(83)	(460)	(1650)
359·437		·989	285·0					279
		·962	296·0					508
G		·837	296·1					407
	9594	·901	243·6	271·3	−24·7	60	356	394*c*
Dec. 25			(+5·4)	(208·9)	(−2·3)	(60)	(356)	(1588)

G.M.T. (Civil.)	Group No.	MEASURES. Dist.	MEASURES. Pos. Angle.	POSITION. Long.	POSITION. Lat.	AREA. Umbræ.	AREA. Whole Spots.	AREA. Faculæ.
1924.			°	°	°			
360·515		·942	292·8					556
		·904	323·2					99
		·818	300·9					321
G		·797	317·7					105
	9594	·976	245·0	271·8	−25·0	38	274	567*c*
		·986	67·4					149
Dec. 26			(+4·9)	(194·7)	(−2·5)	(38)	(274)	(1797)
361·331		·984	295·1					521
		·895	298·3					375
		·872	311·1					165
C	9594	·989	248·3	265·6	−21·8	3	36	216*s*
		·941	63·0					123
		·948	70·6					155
Dec. 27			(+4·5)	(184·0)	(−2·6)	(3)	(36)	(1555)
362·454		·955	184·7					15
		·945	306·6					249
		·869	299·1					78
		·806	234·3					233
G	9393	·975	297·4	243·2	+25·9	0	9	370*sf*
		·866	61·5					533
		·959	120·8					97
Dec. 28			(+4·0)	(169·2)	(−2·7)	(0)	(9)	(1575)
363·430		·986	304·1					85
		·906	236·2					193
	953c	·799	121·6	107·0	−26·5	0	6	41*f*
G		·730	48·1					117
		·756	61·1					299
		·906	128·7					118
Dec. 29			(+3·5)	(156·3)	(−2·8)	(0)	(6)	(853)
364·360		·958	244·0					108
		·945	233·7					199
		·843	252·6					43
C		·891	126·8					144
		·955	61·0					96
Dec. 30			(+3·0)	(144·1)	(−2·9)	(0)	(0)	(590)
365·335	*953d*	·917	245·1	196·6	−24·0	1	7	79*n*
	953e	·566	23·8	116·3	+28·2	1	11	
C		·883	58·2					73
Dec. 31			(+2·5)	(131·3)	(−3·0)	(2)	(18)	(152)

Group 9594. Dec. 21–27. A stream of normal type, developing with great rapidity and breaking up prematurely.
Group 9595. Dec. 22–24. A small group of stream type.

ROYAL OBSERVATORY, GREENWICH.

GENERAL CATALOGUE

OF

GROUPS OF SUN SPOTS.

FOR THE YEAR

1924.

GREENWICH PHOTO-HELIOGRAPHIC RESULTS, 1924.

GENERAL CATALOGUE of GROUPS of SUN SPOTS for the YEAR 1924.

Groups of Sun Spots, lasting for two or more days, are numbered in the *first* column in continuation of the Group-numbers given in 1923 and the previous years. Groups seen only once are not included in this Catalogue.

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

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

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

The *eleventh* 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 $\xi = 14^\circ\cdot37 - 2^\circ\cdot60 \sin^2\phi$ 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°	4·5	25°	7·5
10°	3	30°	12·5
15°	0·5	35°	18

GENERAL CATALOGUE of SUN SPOTS.

No. of Group.	Duration in Days.	First Seen.		Last Seen.		Mean Area Corrected for Foreshortening.		Mean Position of Group.		Reference to Ledger.	NOTES.
		Date.	Longitude from Central Meridian.	Date.	Longitude from Central Meridian.	Umbræ.	Whole Spots.	Longitude.	Latitude.		
		1924.	°	1924.	°			°	°		
9521	2	Jan. 5	+36·0	Jan. 6	+45·4	1	4	249·5	+28·4		
2	2	Feb. 15	+ 7·0	Feb. 16	+19·3	2	4	42·4	+22·6		
3	9	25	−28·3	Mar. 4	+74·9	59	320	233·6	+27·2	II.	
4	2	Mar. 22	+41·1	23	+51·7	3	12	320·0	−29·6		
5	3	22	−21·0	24	+ 3·3	2	9	258·2	+18·9		
6	2/5	Apr. 10	+ 2·6	Apr. 14	+58·2	1	6	33·5	+29·6		
7	7	16	−52·1	22	+23·2	19	80	256·5	+21·8	II.	Revival of Group 9525.
8	9	18	−38·4	26	+61·0	34	245	243·3	−28·6	II.	
9	9	19	−19·8	27	+77·6	31	188	250·8	−27·5	I. 957 (1)	
9530	8	May 7	−29·6	May 14	+59·5	12	68	2·1	+31·7	II.	
1	11	11	−49·7	21	+82·6	52	326	290·2	−21·0	II.	
2	10/13	12	−78·4	24	+74·6	5	23	246·3	−30·2	I. 957 (2)	
3	3	14	−70·0	16	−44·8	2	8	231·0	−26·8		Revival of Group 9528.
4	11	17	−84·4	27	+44·4	8	38	175·7	−22·0	II.	
5	8/11	18	−65·5	28	+52·3	8	30	175·8	+37·4	II.	
6	3	27	− 6·3	29	+23·1	4	29	124·2	+18·7		
7	14	29	−84·6	June 11	+80·7	116	856	10·4	+31·2	I. 958 (1)	
8	2/3	31	−72·6	2	−42·8	1	5	3·7	−29·4		
9	2	June 1	+10·1	2	+22·5	1	4	71·1	+ 2·9		
9540	2/5	7	−53·0	11	+ 1·4	0	2	289·8	−21·6		Revival of Group 9531.
1	9	10	−36·2	18	+75·8	20	106	269·7	+22·4	II.	
2	7	13	−18·5	19	+63·0	11	51	246·9	−24·9	II.	
3	10	19	−47·5	28	+70·0	13	75	138·6	+36·8	II.	
4	6/7	20	+ 3·4	26	+76·5	2	16	171·8	+26·8		
5	13	27	−80·8	July 9	+75·2	34	209	353·6	+32·4	I. 958 (2)	
6	11	July 1	−57·4	11	+80·3	17	84	331·4	+19·4	II.	
7	5	1	−57·8	5	− 8·2	14	54	327·0	+25·9		
8	4	5	−53·6	8	−14·6	1	14	280·2	−22·0		
9	14	6	−82·2	19	+85·7	50	317	235·7	+21·8	I. 959 (1)	
9550	6	7	−58·1	12	+ 0·3	2	13	243·7	−27·0	II.	Revival of Group 9542.
1	2	9	−25·7	10	−14·4	1	6	254·3	−24·6		
2	9	9	−29·5	17	+82·3	58	306	254·4	+ 5·3	I. 960 (1)	
3	5	20	−67·0	24	−11·9	2	6	69·4	+19·9		
4	3	21	+42·6	23	+71·8	11	43	165·4	+27·2		Revival of Group 9544.
5	9	21	−28·5	29	+71·9	11	49	90·6	+27·5	II.	
6	13	25	−75·5	Aug. 6	+85·7	28	136	355·4	+34·6	II.	Revival near position of Group 9545.
7	6	30	−81·6	4	−22·8	3	16	278·0	+38·8	II.	
8	13	Aug. 1	−74·1	13	+84·6	49	236	261·6	+ 5·9	I. 960 (2)	
9	4	3	−67·5	6	−24·5	6	19	243·4	+28·1		
9560	9	3	−77·8	11	+27·3	10	43	230·4	+24·1	I. 959 (2)	
1	4	7	+18·6	10	+58·2	3	15	274·2	−18·8		
2	3	12	+40·8	14	+65·4	15	59	230·3	−25·4		Revival of Group 9550.
3	13	15	−80·1	27	+82·3	36	220	72·6	+15·8	II.	
4	10	28	−31·2	Sept. 6	+81·9	160	958	307·4	+21·5	II.	
5	13	28	−76·3	9	+85·2	33	184	264·4	+ 4·6	I. 960 (3)	
6	6	Sept. 5	+ 4·1	10	+69·0	6	25	238·6	−27·1	II.	
7	10	10	−53·5	19	+69·8	31	182	115·6	+22·6	II.	
8	10	18	−65·7	27	+49·1	22	113	355·5	−24·9	II.	
9	5/6	20	−21·2	25	+42·4	1	8	15·8	+24·7		

GENERAL CATALOGUE of SUN SPOTS—*continued.*

No. of Group.	Duration in Days.	First Seen.		Last Seen.		Mean Area Corrected for Foreshortening.		Mean Position of Group.		Reference to Ledger.	NOTES.
		Date.	Longitude from Central Meridian.	Date.	Longitude from Central Meridian.	Umbræ.	Whole Spots.	Longitude.	Latitude.		
		1924.	°	1924.	°			°	°		
9570	11	Sept. 24	−77·6	Oct. 4	+51·4	17	99	264·3	+ 6·6	I. 960 (4)	
1	4/6	25	+ 6·4	Sept. 30	+77·3	3	15	336·9	+19·9		
2	3	28	+ 0·2	30	+20·0	3	12	286·9	+21·5		
3	13	28	−76·4	Oct. 10	+78·0	32	197	211·2	+23·0	I. 961 (1)	
4	8	Oct. 1	−74·3	8	+18·0	11	62	174·4	+26·0	II.	
5	13	3	−76·1	15	+77·2	46	295	138·5	−27·9	II.	
6	14	13	−82·8	26	+84·0	80	495	5·3	+23·0	II.	Revival of Group 9569.
7	3	23	+52·2	25	+80·6	7	29	13·4	+23·9		
8	9	25	−28·4	Nov. 2	+80·7	23	108	267·3	+21·2	II.	
9	6	25	−85·2	Oct. 30	−19·8	8	63	208·6	+21·2	I. 961 (2)	
9580	2	31	−68·7	Nov. 1	−57·8	1	20	143·4	−26·4		Revival near Group 9575.
1	5/6	Nov. 11	−57·1	16	+ 7·2	7	27	10·6	+21·5	II.	Revival of Group 9577.
2	3/10	14	−49·0	23	+73·6	0	3	343·5	+24·1		
3	6	15	−13·6	20	+50·6	10	69	3·1	+27·2	II.	
4	14	15	−80·2	28	+82·0	103	723	296·2	+18·2	I. 962 (1)	
5	14	18	−79·4	Dec. 1	+83·6	76	529	253·1	+24·2	II.	
6	2	22	−57·8	Nov. 23	−44·5	2	5	227·4	−22·9		
7	3	Dec. 3	+17·7	Dec. 5	+46·7	4	25	156·9	+18·6		
8	10	7	−72·7	16	+48·1	15	78	15·1	+20·9	II.	
9	7	9	−59·6	15	+14·3	11	60	359·3	+27·8	II.	Revival of Group 9583.
9590	12	12	−77·1	23	+62·4	30	158	297·6	+21·2	I. 962 (2)	
1	6/8	15	−55·7	22	+32·9	2	11	284·7	+18·7	II.	
2	8	17	−28·2	24	+63·8	6	22	287·7	+13·9	II.	
3	4/11	18	−54·1	28	+74·0	0	3	244·4	+24·1	II.	Revival of Group 9585.
4	7	21	+ 9·4	27	+81·6	61	349	271·4	−24·6	II.	
5	3	22	+10·3	24	+38·6	7	31	260·6	+19·7		

GENERAL CATALOGUE of SUN SPOTS—*continued.*

REVIVAL GROUPS of SUN SPOTS, 1924.

Groups of spots, noted in the preceding Catalogue as "Revivals," have been tabulated in series in the following table. The respective groups of each series are in the same heliographic position, and are 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.

Reference No. of Series.	Group No.	No. of Rotation.	Duration.	First Seen.		Last Seen.		Mean Area.	Mean Position.		Reference to Ledger.
				Date.	Longitude from C.M.	Date.	Longitude from C.M.		Longitude.	Latitude.	
1	9525	943	3	Mar. 22	−21	Mar. 24	+ 3	9	258	+19	
	9527	944	7	Apr. 16	−52	Apr. 22	+23	80	257	+22	II.
2	9528	944	9	Apr. 18	−38	Apr. 26	+61	245	243	−29	II.
	9533	945	3	May 14	−70	May 16	−45	8	231	−27	
3	9531	945	11	May 11	−50	May 21	+83	326	290	−21	II.
	9540	946	2/5	June 7	−53	June 11	+ 1	2	290	−22	
	9548	947	4	July 5	−54	July 8	−15	14	280	−22	
4	9542	946	7	June 13	−19	June 19	+63	51	247	−25	II.
	9550	947	6	July 7	−58	July 12	0	13	244	−27	II.
	9562	948	3	Aug. 12	+41	Aug. 14	+65	59	230	−25	
5	9544	946	6/7	June 20	+ 3	June 26	+77	16	172	+27	
	9554	947	3	July 21	+43	July 23	+72	43	165	+27	
6	9569	950	5/6	Sept. 20	−21	Sept. 25	+42	8	16	+25	
	9576	951	14	Oct. 13	−83	Oct. 26	+84	495	5	+23	II.
7	9577	951	3	Oct. 23	+52	Oct. 25	+81	29	13	+24	
	9581	952	5/6	Nov. 11	−57	Nov. 16	+ 7	27	11	+22	II.
8	9583	952	6	Nov. 15	−14	Nov. 20	+51	69	3	+27	II.
	9589	953	7	Dec. 9	−60	Dec. 15	+14	60	359	+28	II.
9	9585	952	14	Nov. 18	−79	Dec. 1	+84	529	253	+24	II.
	9593	953	4/11	Dec. 18	−54	Dec. 28	+74	3	244	+24	II.

ROYAL OBSERVATORY, GREENWICH.

LEDGERS

OF

GROUPS OF SUN SPOTS

FOR THE YEAR

1924.

LEDGER I.—RECURRENT GROUPS.

Ledger I.—Recurrent Groups of Sun Spots for the Year 1924.

The Greenwich Civil Time at which the photograph was taken is expressed in the *first* column by the Day of the Year (civil reckoning) 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, Kodaikánal, Dehra Dûn, by the letters C, K, and D 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 disc.

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 $25{\cdot}38$ 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 near the East or the West limb of the Sun on any particular day, and in consequence is only visible in part, the measures for that day are marked with an asterisk and are not included in taking the mean area, longitude, and latitude of the group.

LEDGER I.—RECURRENT GROUP of SUN SPOTS for the YEAR 1924.

Date. G.M.T. (Civil) Place.	Projected Area. Umbræ.	Projected Area. Whole Spots.	Corrected Area. Umbræ.	Corrected Area. Whole Spots.	Longitude and Proper Motion.	Latitude.	Long. from C.M.
RECURRENT SERIES No. 957. Latitude −28°·8.							
Group 9529 in Rotation 944.							
,, 9532 ,, ,, 945.							
Group 9529.—April 19–27. A short stream immediately preceding Group 9528. A small regular spot leading the stream is the only stable component until the appearance of a similar spot at the rear on April 24.							
d					°	°	°	°
109·459 G	18	36	10	21	251·0	0·0	−27·8	−19·8
110·460 G	17	71	9	38	251·2	+0·6	−27·5	− 6·4
111·365 C	38	243	21	131	250·1	−0·1	−27·1	+ 4·5
112·449 G	57	386	32	220	250·4	+0·6	−26·8	+19·1
113·510 C	52	228	34	147	250·6	+1·3	−27·1	+33·3
114·353 C	70	447	53	334	250·4	+1·4	−27·4	+44·2
115·479 G	53	323	54	331	250·5	+2·0	−27·8	+59·2
116·328 C	22	171	36	282	252·3	+4·1	−28·3	+72·2
117·339 G	8	59	(18	133	244·3	..	−28·2)	*+77·6
Means ..	..	..	31	188	250·8	..	−27·5	..
Group 9532.—May 12–24. Intermittent. A small regular spot diminishing to a dot on May 18. Nothing is then visible until May 22, when a few small spots make their appearance in the faculæ marking the disturbed region.								
132·382 G	2	13	5	33	249·4	+7·9	−29·9	−78·4
133·627 G	15	54	18	64	248·5	+7·5	−29·7	−62·9
134·352 G	10	52	9	48	248·1	+7·4	−29·8	−53·7
135·491 C	9	37	7	27	247·0	+6·8	−29·7	−39·7
136·348 C	7	15	4	10	246·5	+6·6	−29·8	−28·9
137·354 G	6	13	4	8	246·1	+6·7	−29·7	−16·0
138·475 G	1	8	1	4	245·4	+6·4	−29·8	− 1·9
139·351 G	0	0	0	0	..	..	..	..
140·606 G	0	0	0	0	..	..	..	..
141·353 G	0	0	0	0	..	..	..	..
142·360 G	0	3	0	3	244·6	+7·2	−31·9	+48·7
143·364 G	13	50	16	59	244·2	+7·2	−30·2	+61·6
144·411 G	3	18	6	38	243·3	+6·8	−31·0	+74·6
Means ..	..	..	5	23	246·3	..	−30·2	..
No. 958. Latitude +31°·8.								
Group 9537 in Rotation 945.								
,, 9545 ,, ,, 946.								
Group 9537.—May 29–June 11. A very large stream, 14° of longitude in length, of which the leader, *a*, is the predominating spot. The other components are mostly unstable aggregations of indefinite markings, showing a tendency on some days to condense to definite spots. The rearmost cluster is represented by *b*.								
149·364 G	10	60	(74	442	18·6	..	+30·9)	*−84·6
150·378 G	61	373	127	969	13·6	0·0	+31·7	−76·2
151·450 C	84	724	108	934	13·1	+0·1	+31·4	−62·5
152·446 C	117	955	106	868	13·2	+0·7	+31·5	−49·2

Date. G.M.T. (Civil) 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. 958, Group 9537—*continued.*							
d					°	°	°	°
153·593 G	169	1206	123	878	11·6	−0·3	+31·5	−35·6
154·422 G	243	1361	160	892	10·9	−0·5	+31·6	−25·4
155·391 C	206	1685	123	1013	10·9	0·0	+31·4	−12·5
156·412 G	220	1827	130	1076	9·6	−0·8	+31·3	− 0·3
157·370 G	225	1837	135	1101	8·9	−1·0	+31·2	+11·7
158·439 C	227	1520	148	984	8·1	−1·2	+31·3	+25·0
159·303 G	154	1001	111	728	8·9	+0·2	+30·7	+37·2
160·375 G	102	682	94	630	8·9	+0·6	+30·6	+51·4
161·364 G	57	375	77	506	9·1	+1·4	+30·7	+64·7
162·585 G	20	159	70	544	8·9	+1·8	+30·9	+80·7
Means ..	..	..	116	856	10·4	..	+31·2	..
Spot *a*.							
150·378 G	50	275	91	519	18·3	0·0	+30·7	−71·5
151·450 C	55	446	60	486	18·1	+0·4	+30·3	−57·5
152·446 C	68	520	56	426	18·0	+0·8	+30·5	−44·4
153·593 G	84	604	56	405	17·2	+0·6	+30·4	−30·0
154·422 G	130	753	81	467	16·1	0·0	+30·6	−20·2
155·391 C	135	909	78	527	16·0	+0·4	+30·2	− 7·4
156·412 G	129	981	75	569	14·4	−0·7	+30·2	+ 4·5
157·370 G	124	924	74	554	13·7	−0·9	+29·9	+16·5
158·439 C	122	809	81	534	12·4	−1·6	+30·3	+29·3
159·303 G	80	647	60	485	11·8	−1·6	+30·0	+40·1
160·375 G	68	490	65	470	10·9	−2·1	+30·2	+53·4
161·364 G	49	322	68	444	10·0	−2·4	+30·3	+65·6
162·585 G	18	134	65	484	9·4	−2·4	+30·8	+81·2
Cluster *b*.							
153·593 G	33	207	27	172	3·3	0·0	+32·3	−43·9
154·422 G	36	242	26	174	2·3	−0·6	+32·5	−34·0
155·391 C	28	242	18	155	1·9	−0·4	+32·6	−21·5
156·412 G	36	245	22	147	0·0	−1·8	+32·5	− 9·9
157·370 G	23	191	14	113	359·3	−2·0	+32·2	+ 2·1
158·439 C	32	182	20	111	358·3	−2·4	+32·0	+15·2
159·303 G	21	73	14	47	357·6	−2·7	+31·7	+25·9
160·375 G	6	40	4	30	356·7	−3·0	+31·5	+39·2
Group 9545.—June 27–July 9. A pair of nearly regular spots, *a* and *a'*, about 2½° apart in longitude, with occasional very small companions. The following spot shows instability from July 1–3, but it regains its normal appearance before finally disappearing as a tiny spot after July 7. The two spots which most probably represent *a* of Group 9537 partake of a common retrograde motion in longitude. The position on July 9 is that of an ephemeral companion.							
178·367 G	16	130	50	413	358·5	−4·9	+31·5	−80·8
179·304 G	40	248	64	392	357·3	−5·6	+32·0	−69·6
180·422 G	60	316	60	316	356·3	−6·0	+32·3	−55·8

LEDGER I.—RECURRENT GROUPS of SUN SPOTS for the YEAR 1924—*continued.*

Date. G.M.T. (Civil) 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. 958, Group 9545—*continued.*							
d					°	°	°
181·421 G	49	346	39	271	355·5	−6·2	+32·5	−43·4
182·368 G	54	334	37	226	354·4	−6·9	+32·8	−31·9
183·478 G	45	344	28	208	353·6	−7·1	+32·7	−18·1
184·435 G	61	330	35	191	353·2	−7·0	+32·8	− 5·8
185·497 C	49	297	29	172	351·9	−7·7	+32·6	+ 7·0
186·368 G	57	248	34	149	351·3	−7·9	+32·7	+17·9
187·402 G	31	176	20	119	352·1	−6·5	+32·9	+32·4
188·570 G	8	47	7	39	350·6	−7·4	+32·3	+46·3
189·308 G	1	13	1	13	349·1	−8·5	+32·2	+54·6
190·350 G	0	10	(0	20	355·9	..	+34·4)*	+75·2
Means ..	..	..	34	209	353·6	..	+32·4	..
Spot *a*.							
179·304 G	16	103	24	151	358·5	−4·4	+31·1	−68·4
180·422 G	28	133	27	126	357·8	−4·5	+31·5	−54·3
181·421 G	22	123	17	93	356·8	−4·9	+31·8	−42·1
182·368 G	24	133	16	88	356·0	−5·3	+31·9	−30·3
183·478 G	23	125	14	74	355·3	−5·4	+31·9	−16·4
184·435 G	35	147	20	84	354·5	−5·7	+31·9	− 4·5
185·497 C	24	147	14	85	353·4	−6·2	+31·8	+ 8·5
186·368 G	28	115	17	69	352·8	−6·4	+31·6	+19·4
187·402 G	15	75	10	50	351·9	−6·7	+31·7	+32·2
188·570 G	8	36	7	30	351·2	−6·8	+32·0	+46·9
189·308 G	1	6	1	6	350·2	−7·4	+32·3	+55·7
Spot a^1.							
179·304 G	24	145	40	241	356·0	−6·9	+32·7	−70·9
180·422 G	32	183	33	190	355·0	−7·3	+32·9	−57·1
181·421 G	26	201	21	161	354·2	−7·5	+33·0	−44·7
182·368 G	30	192	21	132	353·0	−8·3	+33·4	−33·3
183·478 G	19	193	12	118	352·2	−8·5	+33·2	−19·5
184·435 G	16	133	9	77	351·9	−8·3	+33·0	− 7·1
185·497 C	19	123	11	71	350·8	−8·8	+33·0	+ 5·9
186·368 G	24	106	14	64	350·5	−8·7	+33·0	+17·1
187·402 G	11	60	7	40	349·6	−9·0	+33·1	+29·9
188·570 G	0	11	0	9	349·2	−8·8	+33·1	+44·9

No. **959.** Latitude +22°·9.

Group 9549 in Rotation 947.
,, 9560 ,, ,, 948

Group 9549.—July 6–19. A stream of normal type in which the leader, *a*, shows signs of being somewhat unstable, and the follower, *b*, although small, is unusually persistent.

187·402 G	10	62	(34	213	237·5	..	+21·8)*	−82·2
188·570 G	61	385	83	527	236·4	0·0	+22·1	−67·9
189·308 G	83	484	82	476	236·4	+0·2	+21·8	−58·1
190·350 G	118	583	87	426	236·4	+0·4	+21·8	−44·3

Date. G.M.T. (Civil) 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. 959, Group 9549—*continued.*							
d					°	°	°	°
191·307 G	92	639	57	392	236·0	+0·2	+21·4	−32·0
192·349 G	101	622	58	345	236·1	+0·5	+21·7	−18·1
193·306 G	81	459	43	240	235·9	+0·5	+21·4	− 5·7
194·367 C	70	371	38	197	236·2	+1·0	+21·5	+ 8·7
195·306 G	75	437	41	243	235·4	+0·4	+21·8	+20·3
196·307 G	52	369	32	231	235·9	+1·1	+21·8	+34·0
197·517 G	65	399	51	314	235·3	+0·7	+21·5	+49·4
198·305 G	43	296	44	297	235·1	+0·7	+21·9	+59·7
199·405 G	21	122	38	220	235·5	+1·3	+22·0	+74·6
200·374 G	0	39	0	207	233·8	−0·2	+22·4	+85·7
Means ..	..	..	50	317	235·7	..	+21·8	..
Spot *a*.							
188·570 G	45	275	56	344	238·4	0·0	+22·0	−65·9
189·308 G	59	343	55	319	238·2	0·0	+21·7	−56·3
190·350 G	82	447	58	317	238·2	+0·2	+21·7	−42·5
191·307 G	60	470	36	282	237·9	+0·1	+21·4	−30·1
192·349 G	76	457	42	251	237·7	+0·1	+21·4	−16·5
193·306 G	54	366	28	190	237·1	−0·3	+21·1	− 4·5
194·367 C	54	294	29	156	237·4	+0·2	+21·2	+ 9·9
195·306 G	54	323	30	181	236·9	−0·1	+21·4	+21·8
196·307 G	43	293	27	185	236·5	−0·3	+21·6	+34·6
197·517 G	50	264	40	211	236·1	−0·5	+21·5	+50·2
198·305 G	38	190	39	194	235·6	−0·8	+21·9	+60·2
199·405 G	21	122	38	220	235·5	−0·7	+22·0	+74·6
Spot *b*.							
188·570 G	16	110	27	183	231·8	0·0	+22·5	−72·5
189·308 G	22	126	25	142	231·4	−0·2	+22·7	−63·1
190·350 G	27	112	22	91	230·6	−0·8	+22·4	−50·1
191·307 G	18	108	12	71	230·1	−1·1	+22·2	−37·9
192·349 G	24	92	14	53	229·6	−1·4	+22·5	−24·6
193·306 G	18	65	10	35	229·1	−1·7	+22·4	−12·5
194·367 C	11	28	6	15	229·2	−1·4	+22·4	+ 1·7
195·306 G	9	39	5	21	228·6	−1·8	+22·6	+13·5

Group 9560.—August 3–11. A small regular spot, *a* of Group 9549, decreasing to a tiny marking before extinction.

215·362 G	10	42	21	89	232·0	−0·9	+24·4	−77·8
216·387 G	11	68	13	80	231·2	−1·5	+24·7	−65·1
217·352 G	20	80	17	67	230·9	−1·6	+24·5	−52·6
218·482 G	21	93	14	61	230·4	−1·9	+24·1	−38·1
219·616 G	20	80	11	46	230·3	−1·8	+24·4	−23·3
220·366 G	15	39	8	21	229·7	−2·2	+24·3	−13·9
221·377 G	10	35	5	18	229·4	−2·3	+24·1	− 0·9
222·417 G	2	8	1	4	228·7	−2·8	+24·1	+12·2
223·391 G	0	5	0	3	230·9	−0·4	+22·0	+27·3
Means ..	..	..	10	43	230·4	..	+24·1	..

LEDGER I.—RECURRENT GROUPS of SUN SPOTS for the YEAR 1924—*continued.*

No **960.** Latitude +5°·6.

Group 9552 in Rotation 947.
" 9558 " " 948.
" 9565 " " 949.
" 9570 " " 950.

Group 9552.—July 9–17. A large stream of normal type in low latitude, developing rapidly from a few spots seen on July 9 in a position lightly marked by faculæ at the east limb on July 6 and 7. The leader, *a*, when completely developed, is a well-defined regular spot; the follower, *b*, as usual, is composite and is very short-lived. The appearance of so large a group in equatorial latitudes within a year of the minimum is abnormal.

Date. G.M.T. (Civil) 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					°	°	°
190·350 G	31	78	18	44	251·2	0·0	+ 5·3	−29·5
191·307 G	32	180	16	94	251·1	−0·3	+ 4·7	−16·9
192·349 G	109	558	54	278	253·6	+2·1	+ 5·5	− 0·6
193·306 G	190	962	98	496	254·1	+2·4	+ 5·5	+12·5
194·367 C	163	889	91	497	254·6	+2·7	+ 5·3	+27·1
195·306 G	117	695	76	452	254·8	+2·8	+ 5·2	+39·7
196·307 G	71	463	59	388	255·4	+3·2	+ 5·2	+53·5
197·517 G	33	178	48	269	256·9	+4·5	+ 5·3	+71·0
198·305 G	16	66	58	238	257·7	+5·2	+ 5·5	+82·3
Means ..	..	..	58	306	254·4	..	+ 5·3	..
Spot *a*.								
193·306 G	109	531	57	276	256·1	0·0	+ 5·2	+14·5
194·367 C	96	552	55	315	257·0	+0·7	+ 5·2	+29·5
195·306 G	81	466	54	312	257·0	+0·6	+ 5·0	+41·9
196·307 G	56	359	48	309	256·6	0·0	+ 5·3	+54·7
197·517 G	26	160	40	248	257·4	+0·6	+ 5·3	+71·5
198·305 G	16	66	58	238	257·7	+0·8	+ 5·5	+82·3
Spot *b*.								
193·306 G	81	431	41	220	251·0	0·0	+ 5·6	+ 9·4
194·367 C	67	337	36	182	250·8	−0·4	+ 5·6	+23·3
195·306 G	36	229	22	140	250·6	−0·7	+ 5·5	+35·5
196·307 G	15	104	11	79	250·7	−0·8	+ 5·1	+48·8
197·517 G	7	18	8	21	251·4	−0·3	+ 4·7	+65·5

Group 9558.—August 1–13. A stable regular spot, evidently *a*, of Group 9552, with a few tiny companions on August 7, 8, and 11.

213·383 C	30	174	53	308	261·9	+2·5	+ 5·5	−74·1
214·427 G	43	249	43	251	261·5	+1·9	+ 5·7	−60·7
215·362 G	66	337	49	253	261·2	+1·5	+ 5·8	−48·6
216·387 G	76	371	46	226	261·3	+1·4	+ 5·8	−35·0
217·352 G	111	490	60	265	261·5	+1·4	+ 5·8	−22·0
218·482 G	115	460	57	230	261·3	+1·1	+ 5·8	− 7·2

No. **960**, Group 9558—*continued.*

d					°	°	°	°
219·615 G	90	514	45	257	261·4	+1·0	+ 6·0	+ 7·8
220·366 G	106	420	55	218	261·3	+0·7	+ 6·0	+17·7
221·377 G	87	392	50	227	261·6	+0·9	+ 6·1	+31·3
222·417 G	60	288	43	204	262·0	+1·1	+ 6·1	+45·5
223·391 G	43	235	41	223	262·2	+1·1	+ 6·1	+58·6
224·373 G	30	167	46	257	262·2	+1·0	+ 6·1	+71·5
225·370 G	9	32	43	153	262·1	+0·7	+ 6·0	+84·6
Means ..	..	..	49	236	261·6	..	+ 5·9	..

Group 9565.—August 28–September 9. A stable regular spot, *a*, of Group 9552.

240·331 C	28	103	57	211	263·5	−0·4	+ 4·8	−76·3
241·462 G	50	191	52	197	263·6	−0·4	+ 4·8	−61·2
242·475 G	50	253	37	185	264·1	−0·1	+ 4·6	−47·3
243·565 G	57	312	34	184	264·4	0·0	+ 4·6	−32·7
244·575 G	61	339	32	180	264·4	−0·2	+ 4·5	−19·3
245·328 C	58	353	30	180	264·2	−0·5	+ 4·6	− 9·6
246·622 G	64	351	32	176	264·3	−0·6	+ 4·7	+ 7·6
247·343 C	59	332	31	173	264·6	−0·4	+ 4·7	+17·4
248·441 G	42	272	25	160	264·3	−0·9	+ 4·7	+31·7
249·428 G	44	244	31	173	264·7	−0·7	+ 4·7	+45·1
250·233 D	30	177	27	158	265·1	−0·4	+ 4·7	+56·1
251·382 G	19	113	29	171	264·8	−0·9	+ 4·5	+71·0
252·437 G	2	47	11	250	265·1	−0·8	+ 4·4	+85·2
Means ..	..	..	33	184	264·4	..	+ 4·6	..

Group 9570.—September 24–October 4. A small regular spot, *a*, of Group 9552, diminishing appreciably after September 29. After September 26, small unstable spots appear in close proximity following it, and one, which is rather more persistent, is seen some distance *np* it from September 28 to October 1. The region is represented but sparsely by faculæ at the west limb.

267·393 G	9	83	20	183	264·8	−3·5	+ 6·0	−77·6
268·366 C	25	120	29	137	265·1	−3·4	+ 6·4	−64·5
269·348 C	25	175	20	140	264·7	−3·9	+ 6·3	−51·9
270·420 G	23	146	14	92	265·0	−3·8	+ 6·1	−37·5
271·430 G	53	279	30	153	265·3	−3·7	+ 6·4	−23·9
272·420 G	47	295	24	150	264·7	−4·5	+ 6·1	−11·4
273·425 G	27	104	14	52	264·8	−4·5	+ 6·4	+ 2·0
274·362 C	17	120	9	61	264·7	−4·8	+ 6·6	+14·2
275·334 C	24	101	13	56	262·8	−6·8	+ 7·2	+25·1
276·452 G	18	71	12	46	262·5	−7·3	+ 7·4	+39·6
277·327 C	2	28	2	22	262·8	−7·2	+ 7·2	+51·4
Means ..	..	..	17	99	264·3	..	+ 6·6	..

LEDGER I.—RECURRENT GROUPS of SUN SPOTS for the YEAR 1924—*continued.*

Date. G.M.T. (Civil) 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. 961. Latitude +22°·1.							
Group 9573 in Rotation 950.							
,, 9579 ,, ,, 951.							
Group 9573.—September 28–October 10. A stable regular spot slowly diminishing, with two distant followers on October 2 and 3.							
d					°	°	°
271·430 G	24	135	46	257	212·8	0·0	+22·3	−76·4
272·420 G	26	208	29	229	212·7	+0·1	+22·4	−63·4
273·425 G	35	240	28	192	212·2	−0·2	+22·7	−50·6
274·362 C	59	334	38	217	212·1	−0·2	+22·7	−38·4
275·334 C	88	424	51	244	211·0	−1·1	+22·8	−26·7
276·452 G	67	377	36	200	211·3	−0·6	+22·7	−11·6
277·327 C	74	374	38	194	211·6	−0·1	+23·0	+ 0·2
278·510 C	59	350	32	189	211·2	−0·3	+23·2	+15·5
279·413 G	59	320	34	186	210·7	−0·7	+23·2	+26·9
280·429 G	49	262	33	176	210·3	−0·9	+23·4	+39·9
281·627 G	27	208	24	187	210·3	−0·7	+23·4	+55·7
282·432 G	17	132	21	160	210·1	−0·7	+23·4	+66·1
283·405 G	5	58	11	126	209·2	−1·5	+23·7	+78·0
Means ..	..	..	32	197	211·2	..	+23·0	..
Group 9579.—October 25–30. A small regular spot disappearing rather suddenly.							
298·322 C	0	28	0	134	209·2	+1·2	+21·7	−85·2
299·357 C	10	48	16	75	209·0	+1·2	+21·4	−71·8
300·393 G	12	64	12	62	208·7	+1·1	+21·0	−58·4
301·516 G	12	84	9	60	208·6	+1·1	+20·9	−43·7
302·323 C	12	44	7	27	208·3	+1·0	+21·1	−33·4
303·368 C	7	35	4	19	208·1	+1·0	+20·8	−19·8
Means ..	..	..	8	63	208·6	..	+21·2	..
No. 962. Latitude +19°·7.							
Group 9584 in Rotation 952.							
,, 9590 ,, ,, 953.							
Group 9584.—November 15–28. A large active stream of spots. At first a simple grouping of a large regular spot, *a*, and a smaller double spot, 7° following in longitude. Small unstable followers then appear after November 17 in increasing numbers, which give the stream a complex appearance, especially on November 23, when it has nearly doubled its original length. On November 26 a large spot has developed near the place of the original follower and another, of a more composite character, at the rear of the stream; meanwhile the original leader, *a*, has decreased considerably.							
319·316 C	24	179	62	555	297·4	0·0	+17·7	−80·2
320·608 C	48	496	53	565	297·5	+0·2	+17·8	−63·1
321·424 G	141	618	121	525	297·0	−0·2	+17·8	−52·8

Date. G.M.T. (Civil) 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. 962, Group 9584—*continued.*							
d					°	°	°	°
322·321 C	132	757	90	511	297·7	+0·6	+17·8	−40·3
323·343 C	157	771	90	444	298·0	+1·0	+17·8	−26·5
324·327 C	145	922	76	492	297·8	+0·9	+17·8	−13·8
325·406 C	204	1365	107	711	296·7	−0·1	+18·1	− 0·6
326·308 C	226	1434	119	762	296·8	+0·1	+18·4	+11·3
327·365 C	250	1498	143	866	295·6	−1·0	+18·6	+24·1
328·496 C	120	950	81	636	295·2	−1·2	+18·3	+38·6
329·308 C	161	1018	127	798	293·5	−2·9	+18·3	+47·6
330·327 C	134	1076	141	1142	292·8	−3·4	+19·0	+60·3
331·527 G	62	550	132	1387	294·9	−1·2	+18·7	+78·2
332·508 G	2	83	(7	300	285·7	..	+20·0)*	+82·0
Means ..	..	..	103	723	296·2	..	+18·2	..
Spot *a*.							
319·316 C	24	153	62	396	298·4	0·0	+17·6	−79·2
320·608 C	39	316	41	332	299·6	+1·3	+17·9	−61·0
321·424 G	97	439	79	356	299·3	+1·1	+17·8	−50·5
322·321 C	105	629	69	415	299·2	+1·1	+17·9	−38·8
323·343 C	130	654	74	373	299·0	+1·0	+17·8	−25·5
324·327 C	114	633	60	335	299·3	+1·4	+17·7	−12·3
325·406 C	92	830	48	432	298·9	+1·1	+17·4	+ 1·6
326·308 C	108	731	57	387	299·1	+1·4	+17·3	+13·6
327·365 C	87	574	51	339	299·2	+1·6	+17·2	+27·7
328·496 C	64	388	45	272	299·3	+1·9	+16·8	+42·7
329·308 C	54	291	47	253	299·5	+2·1	+17·0	+53·6
330·327 C	23	165	31	221	299·9	+2·7	+16·8	+67·4
Group 9590.—December 12–23. Two regular spots, *a* and *b*, about 9° apart in longitude. There are occasional small companions, chiefly near the follower on December 19 and 20.							
346·353 C	11	53	(24	135	304·2	..	+21·3)*	−77·1
347·313 C	41	172	70	259	300·6	+6·1	+20·8	−68·1
348·468 G	45	255	42	239	299·3	+5·0	+20·8	−54·1
349·341 C	55	320	42	243	298·9	+4·7	+20·8	−43·0
350·335 C	50	306	31	193	297·8	+3·7	+21·3	−31·0
351·315 C	51	256	30	147	297·6	+3·6	+20·8	−18·3
352·510 G	52	295	29	160	297·8	+3·9	+21·1	− 2·4
353·616 C	43	302	24	168	296·9	+3·1	+21·6	+11·3
354·430 G	57	303	33	176	295·9	+2·2	+21·1	+21·0
355·380 C	24	135	16	88	295·4	+1·8	+21·6	+33·0
356·328 C	13	74	11	58	294·8	+1·3	+21·2	+44·9
357·402 C	2	10	3	12	298·1	+4·7	+22·4	+62·4
Means ..	..	..	30	158	297·6	..	+21·2	..

LEDGER I.—RECURRENT GROUPS of SUN SPOTS for the YEAR 1924—*continued.*

Date. G.M.T. (Civil) Place.	Projected Area.		Corrected Area.		Longitude and Proper Motion.	Latitude.	Long. from C.M.
	Umbræ.	Whole Spots.	Umbræ.	Whole Spots.			
	Spot *a*.						
d					°	°	°
346·353 C	11	44	24	95	305·9	+11·3	+21·4	−75·4
347·313 C	14	101	17	123	305·3	+10·8	+21·4	−63·4
348·468 G	24	110	20	90	304·7	+10·4	+21·6	−48·7
349·341 C	20	132	14	91	303·9	+ 9·7	+22·1	−38·0
350·335 C	19	112	11	67	303·4	+ 9·3	+22·1	−25·4
351·315 C	19	101	11	57	303·0	+ 9·0	+21·9	−12·9
352·510 G	14	87	8	48	303·7	+ 9·8	+22·0	+ 3·5
353·616 C	16	83	9	48	303·5	+ 9·7	+22·8	+17·9
354·430 G	15	53	9	33	303·2	+ 9·5	+22·7	+28·3
355·380 C	5	18	4	13	302·9	+ 9·3	+23·0	+40·5
356·328 C	4	12	4	11	302·7	+ 9·2	+23·0	+52·8
357·402 C	2	6	3	8	301·9	+ 8·5	+23·1	+66·2
	Spot *b*.						
d					°	°	°	°
347·313 C	27	60	53	118	294·8	+0·3	+19·8	−73·9
348·468 G	21	145	22	149	294·8	+0·5	+19·8	−58·6
349·341 C	33	157	26	126	294·3	+0·1	+20·1	−47·6
350·335 C	31	194	20	126	294·2	+0·1	+20·5	−34·6
351·315 C	32	155	19	90	294·3	+0·3	+20·4	−21·6
352·510 G	38	208	21	112	294·9	+1·0	+20·4	− 5·3
353·616 C	27	219	15	120	294·3	+0·5	+21·1	+ 8·7
354·430 G	42	250	24	143	294·0	+0·3	+20·7	+19·1
355·380 C	16	107	10	68	293·8	+0·2	+21·0	+31·4
356·328 C	9	62	7	47	293·2	−0·3	+20·8	+43·3
357·402 C	0	4	0	4	293·2	−0·2	+21·1	+57·5

ROYAL OBSERVATORY, GREENWICH.

LEDGERS

OF

GROUPS OF SUN SPOTS

FOR THE YEAR

1924.

LEDGER II.—NON-RECURRENT GROUPS.

Ledger II.—Non-Recurrent Groups of Sun Spots for the Year 1924.

The Greenwich Civil Time at which the photograph was taken is expressed in the *first* column by the Day of the Year (civil reckoning) 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, Kodaikánal, Dehra Dûn, by the letters C, K, and D 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 disc.

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 $14°{\cdot}18$, due to the Sun's rotation, constant at all latitudes; this corresponds to Carrington's assumed rotation period of $25{\cdot}38$ 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, $\xi = 14°{\cdot}37 - 2°{\cdot}60 \sin^2\phi$.

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 near the East or the West limb of the Sun on any particular day, and in consequence is only visible in part, the measures for that day are marked with an asterisk and are not included in taking the mean area, longitude and latitude of the group.

LEDGER II.—NON-RECURRENT GROUPS of SUN SPOTS for the YEAR 1924—*continued.*

Date. G.M.T. (Civil) 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 9523. February 25–March 4. An active stream of normal type; rapid in growth and dissolution. The leader, *a*, which is a regular spot, alone survives to the west limb.							
d					°	°	°
55·430 C	43	230	30	160	235·0	0·0	+27·2	−28·3
56·411 G	120	677	76	428	235·3	+0·6	+27·2	−15·1
57·321 C	127	782	78	480	235·1	+0·8	+27·7	− 3·3
58·416 G	149	777	92	479	233·3	−0·6	+27·6	+ 9·3
59·484 G	92	548	62	365	233·0	−0·6	+27·5	+23·1
60·399 G	72	435	54	329	233·2	0·0	+27·2	+35·3
61·429 G	63	283	60	273	232·4	−0·5	+27·2	+48·1
62·459 G	26	146	37	210	232·4	−0·1	+26·7	+61·7
63·410 G	15	56	42	158	233·1	+0·9	+26·1	+74·9
Means ..	..	..	59	320	233·6	..	+27·2	..
Spot *a*.							
55·430 C	17	112	12	76	237·3	0·0	+26·9	−26·0
56·411 G	73	377	45	234	237·7	+0·7	+27·1	−12·7
57·321 C	67	467	41	285	237·6	+1·0	+27·4	− 0·8
58·416 G	65	340	40	211	237·3	+1·1	+27·1	+13·3
59·484 G	42	261	29	177	237·0	+1·1	+26·6	+27·1
60·399 G	44	272	34	212	236·2	+0·7	+26·5	+38·3
61·429 G	43	210	43	210	235·5	+0·3	+26·5	+51·2
62·459 G	23	129	34	191	234·5	−0·3	+26·2	+63·8
63·410 G	15	56	42	158	233·1	−1·4	+26·1	+74·9
Group 9527. April 16–22. Revival of Group 9525. A stream of unstable components. The axis of the group is considerably inclined to the solar equator.							
106·405 G	3	12	3	11	259·1	0·0	+21·1	−52·1
107·353 G	22	66	17	49	258·0	−0·9	+20·9	−40·6
108·363 G	71	286	45	183	256·5	−2·3	+21·1	−28·8
109·459 G	69	297	39	173	256·1	−2·5	+21·6	−14·7
110·460 G	34	153	19	86	255·8	−2·6	+22·1	− 1·8
111·365 C	20	83	11	48	255·2	−3·1	+22·8	+ 9·6
112·449 G	3	27	2	17	254·5	−3·6	+23·0	+23·2
Means ..	..	..	19	80	256·5	..	+21·8	..
Group 9528. April 18–26. A short compact stream appearing near its maximum development almost as a single compound spot. This group closely follows Group 9529, with which it might have been associated as the following component of a large complex stream. A clear separation, however, is usually seen between the two groups, and their respective developments appear, moreover, to be largely independent.							
108·363 G	39	183	26	125	246·9	0·0	−28·9	−38·4
109·459 G	69	386	42	230	246·5	0·0	−29·3	−24·3
110·460 G	71	682	40	382	244·9	−1·1	−28·8	−12·7

Date. G.M.T. (Civil) 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 9527—*continued*.							
d					°	°	°	°
111·365 C	106	751	58	413	243·4	−2·3	−28·6	− 2·2
112·449 G	82	654	45	366	242·4	−2·8	−28·5	+11·1
113·510 C	76	498	46	299	241·9	−2·9	−28·0	+24·6
114·353 C	34	273	22	180	241·5	−3·0	−28·0	+35·3
115·479 G	19	189	16	157	241·0	−3·0	−28·3	+49·7
116·328 C	7	52	8	56	241·1	−2·6	−29·0	+61·0
Means ..	..	..	34	245	243·3	..	−28·6	..
Group 9530. May 7–14. A short stream showing a brief conformity to the normal type and then rapidly dissipating.							
127·360 G	19	89	13	63	4·7	0·0	+31·9	−29·6
128·450 G	34	281	21	179	3·8	−0·3	+32·1	−16·1
129·355 G	33	203	20	124	2·6	−1·0	+31·5	− 5·3
130·457 G	39	168	24	103	1·1	−2·0	+31·7	+ 7·8
131·398 G	23	69	15	44	0·3	−2·3	+31·5	+19·4
132·382 G	4	24	4	18	0·9	−1·1	+31·3	+33·1
133·627 G	2	8	2	8	1·7	+0·3	+31·8	+50·3
134·352 G	0	6	0	7	1·3	+0·3	+31·6	+59·5
Means ..	..	..	12	68	2·0	..	+31·7	..
Group 9531. May 11–21. Two spots 5° apart in longitude. The leader, *a*, survives after changes of structure between May 14 and 17. The follower, however, is more unstable and is succeeded by a cluster represented latterly by an indefinitely formed spot.							
131·398 G	16	50	13	40	291·2	0·0	−21·4	−49·7
132·382 G	86	312	57	207	290·3	−0·8	−21·5	−37·5
133·627 G	89	558	50	313	290·8	−0·1	−20·7	−20·6
134·352 G	101	610	54	327	290·7	−0·1	−20·8	−11·1
135·491 C	157	935	83	495	290·7	+0·1	−20·7	+ 4·0
136·348 C	170	1186	92	646	289·6	−0·9	−20·8	+14·2
137·354 G	166	911	99	542	289·4	−0·9	−20·8	+27·3
138·475 G	85	529	61	376	288·7	−1·5	−21·4	+41·4
139·351 G	41	335	36	296	288·9	−1·2	−21·4	+53·2
140·606 G	18	112	28	187	290·3	+0·4	−20·7	+71·2
141·353 G	1	42	4	160	291·8	+2·0	−20·2	+82·6
Means ..	..	..	52	326	290·2	..	−21·0	..
Spot *a*.							
131·398 G	7	16	5	12	293·5	0·0	−21·4	−47·4
132·382 G	28	99	18	62	293·6	+0·2	−21·2	−34·2
133·627 G	40	253	22	139	294·0	+0·8	−20·4	−17·4

LEDGER II.—NON-RECURRENT GROUPS of SUN SPOTS for the YEAR 1924—*continued.*

Date. G.M.T. (Civil) 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 9531—Spot *a*—*continued.*							
d.					°	°	°
134·352 G	40	295	21	156	294·0	+0·9	−20·6	− 7·8
135·491 C	82	472	43	250	293·2	+0·3	−20·5	+ 6·5
136·348 C	99	558	54	307	292·8	0·0	−20·7	+17·4
137·354 G	85	439	52	268	292·6	0·0	−21·0	+30·5
138·475 G	43	270	32	200	292·1	−0·4	−21·0	+44·8
139·351 G	17	144	16	135	291·8	−0·6	−20·9	+56·1
140·606 G	11	102	19	175	291·9	−0·3	−20·8	+72·8
141·353 G	1	42	4	160	291·8	−0·3	−20·2	+82·6
Group 9534.							
May 17–27. A small regular spot gradually dying out. A small follower is seen on May 23 and 24.							
137·354 G	0	7	0	34	177·7	0·0	−23·0	−84·4
138·475 G	10	30	16	47	176·4	−1·1	−22·7	−70·9
139·351 G	12	83	12	85	176·9	−0·4	−22·6	−58·8
140·606 G	18	91	13	66	176·5	−0·6	−22·2	−42·6
141·353 G	17	93	11	59	176·6	−0·4	−22·2	−32·6
142·360 G	17	85	10	48	176·2	−0·6	−21·8	−19·7
143·364 G	11	52	6	28	175·4	−1·2	−21·6	− 7·2
144·411 G	11	46	6	25	174·7	−1·8	−21·4	+ 6·0
145·461 G	10	18	6	10	174·5	−1·8	−21·6	+19·7
146·352 G	6	10	4	6	174·1	−2·0	−21·6	+31·1
147·382 C	2	8	1	6	173·8	−2·1	−21·5	+44·4
Means ..	..	..	8	38	175·7	..	−22·0	..
Group 9535.							
May 18–28. Intermittent. A small but persistent spot in high northern latitude, followed by faculæ in which small spots appear on May 21. The group has disappeared by May 25, but three ephemeral spots are seen on May 28.							
138·475 G	4	15	7	24	181·8	0·0	+37·4	−65·5
139·351 G	7	16	8	18	181·0	−0·1	+37·2	−54·7
140·606 G	6	18	5	15	180·7	+0·5	+37·1	−38·4
141·353 G	21	78	17	63	173·8	−5·8	+37·6	−35·4
142·360 G	28	131	19	92	173·0	−5·8	+37·0	−22·9
143·364 G	27	102	18	67	173·5	−4·5	+37·5	− 9·1
144·411 G	11	37	7	24	173·6	−3·6	+37·1	+ 4·9
145·461 G	0	0	0	0	..	..	..	..
146·352 G	0	0	0	0	..	..	..	..
147·382 C	0	0	0	0	..	..	..	..
148·359 G	8	28	8	29	168·8	−5·3	+37·9	+52·3
Means ..	..	..	8	30	175·8	..	+37·4	..

Date. G.M.T. (Civil) 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 9541.							
June 10–18. Two or three small spots on June 10–13, becoming a short-lived stream of normal type.							
d.					°	°	°	°
161·364 G	2	6	1	4	268·2	0·0	+22·2	−36·2
162·585 G	6	27	3	15	268·6	+0·6	+22·2	−19·6
163·360 G	7	44	4	24	268·1	+0·3	+22·0	− 9·9
164·375 C	26	117	14	64	268·3	+0·7	+22·0	+ 3·8
165·467 G	41	263	24	148	267·9	+0·5	+22·3	+17·8
166·387 G	61	351	39	223	270·0	+2·7	+22·7	+32·1
167·345 G	48	259	36	199	271·0	+3·9	+22·5	+45·8
168·570 G	33	153	40	185	273·0	+6·1	+22·9	+64·0
169·506 G	8	42	17	89	272·4	+5·7	+23·1	+75·8
Means ..	..	..	20	106	269·7	..	+22·4	..
Group 9542.							
June 13–19. At first a few small spots in a stream which later, near the west limb, shows a tendency to normal type.							
164·375 C	15	43	9	26	246·0	0·0	−25·1	−18·5
165·467 G	17	60	10	34	246·2	+0·5	−24·7	− 3·9
166·387 G	15	73	8	41	246·9	+1·4	−24·7	+ 9·0
167·345 G	11	36	7	22	247·2	+2·0	−24·9	+22·0
168·570 G	20	100	14	71	247·1	+2·2	−25·0	+38·1
169·506 G	22	102	19	91	247·0	+2·4	−25·1	+50·4
170·397 G	9	56	12	72	247·8	+3·4	−25·1	+63·0
Means ..	..	..	11	51	246·9	..	−24·9	..
Group 9543.							
June 19–28. A group of "stream" type, in high northern latitude, consisting of a small regular spot, *a*, followed by a tiny cluster which has disappeared by June 24.							
170·397 G	15	49	13	44	137·3	0·0	+36·7	−47·5
171·583 G	25	138	17	99	137·8	+1·4	+37·1	−31·3
172·360 G	18	155	11	102	138·0	+2·2	+37·4	−20·8
173·395 G	28	140	17	86	140·7	+5·6	+36·9	− 4·4
174·359 G	20	136	12	83	139·7	+5·3	+36·8	+ 7·3
175·395 G	23	143	15	93	139·9	+6·3	+36·7	+21·2
176·301 G	18	120	13	86	139·4	+6·5	+36·7	+32·7
177·304 G	16	100	14	85	138·7	+6·5	+36·5	+45·3
178·367 G	15	60	17	68	138·1	+6·7	+36·7	+58·8
179·304 G	1	3	2	5	136·9	+6·2	+36·5	+70·0
Means ..	..	..	13	75	138·6	..	+36·8	..
Spot *a*.							
170·397 G	14	35	12	31	138·6	0·0	+36·7	−46·2
171·583 G	19	91	13	64	139·8	+2·1	+37·1	−29·3
172·360 G	16	112	10	73	140·3	+3·2	+37·4	−18·5
173·395 G	27	137	16	84	140·8	+4·4	+36·9	− 4·3

LEDGER II.—NON-RECURRENT GROUPS of SUN SPOTS for the YEAR 1924—*continued.*

Date. G.M.T. (Civil) 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 9543—Spot *a—continued.*				
d					°	°	°	°
174·359 G	20	126	12	77	140·4	+4·7	+36·7	+ 8·0
175·395 G	23	143	15	93	139·9	+5·0	+36·7	+21·2
176·301 G	18	120	13	86	139·4	+5·2	+36·7	+32·7
177·304 G	16	100	14	85	138·7	+5·2	+36·5	+45·3
178·367 G	15	60	17	68	138·1	+5·4	+36·7	+58·8
179·304 G	1	3	2	5	136·9	+4·9	+36·5	+70·0
			Group 9546.				
July 1–11. A few unstable spots in a stream, from which a small regular spot emerges as the leader on July 6.								
182·368 G	2	17	2	16	328·9	0·0	+17·5	−57·4
183·478 G	8	45	6	32	328·3	−0·5	+18·7	−43·4
184·435 G	15	61	9	36	331·0	+2·3	+18·8	−28·0
185·497 C	29	87	16	47	330·1	+1·5	+19·0	−14·8
186·368 G	46	254	25	132	328·7	+0·2	+18·9	− 4·7
187·402 G	46	228	24	122	330·8	+2·4	+19·8	+11·1
188·570 G	40	202	24	120	332·8	+4·5	+19·8	+28·5
189·308 G	35	182	23	121	333·2	+5·0	+19·9	+38·7
190·350 G	21	117	17	99	333·7	+5·6	+20·0	+53·0
191·307 G	11	79	14	97	333·8	+5·8	+20·4	+65·8
192·349 G	7	36	19	99	334·5	+6·6	+20·5	+80·3
Means ..	..	..	17	84	331·4	..	+19·4	..
			Group 9550.				
July 7–12. Revival of Group 9542. One or two very small spots in conspicuous faculæ.								
188·570 G	1	15	1	17	246·2	0·0	−26·0	−58·1
189·308 G	1	8	1	7	246·2	+0·3	−26·1	−48·3
190·350 G	5	17	4	13	243·2	−2·4	−27·2	−37·5
191·307 G	6	34	4	22	242·7	−2·6	−27·5	−25·3
192·349 G	7	24	4	14	242·1	−2·8	−27·6	−12·1
193·306 G	0	8	0	5	241·9	−2·7	−27·9	+ 0·3
Means ..	..	..	2	13	243·7	..	−27·0	..
			Group 9555.				
July 21–29. A stream of generally insignificant spots.								
202·453 G	7	30	4	18	92·1	0·0	+27·5	−28·5
203·357 G	31	93	18	53	90·6	−1·2	+27·4	−18·0
204·370 G	17	62	9	33	91·9	+0·5	+27·6	− 3·3
205·364 G	37	152	20	85	93·8	+2·8	+28·3	+11·8
206·397 G	12	44	7	26	91·2	+0·5	+28·6	+22·8
207·392 G	10	29	7	19	89·8	−0·5	+28·4	+34·6
208·315 G	5	17	4	14	90·9	+0·9	+28·0	+47·9
209·188 K	13	73	12	68	87·1	−2·6	+26·5	+55·7
210·369 G	13	83	20	128	87·7	−1·5	+25·5	+71·9
Means ..	..	..	11	49	90·6	..	+27·5	..

Date. G.M.T. (Civil) 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 9556.				
July 25–August 6. A stream pertaining to the normal type in which the following component is never conspicuous. This group, which is an entirely new formation, precedes a well-defined area of faculæ which represents the place of Group 9545. Spot *a* is the leader.							
d					°	°	°	°
206·397 G	0	3	0	6	352·9	0·0	+34·7	−75·5
207·392 G	14	49	15	54	354·0	+1·7	+34·7	−61·2
208·315 G	57	222	46	183	355·8	+4·2	+34·8	−47·2
209·188 K	44	230	31	159	357·0	+5·9	+34·8	−34·4
210·369 G	57	253	34	153	357·1	+6·8	+34·7	−18·7
211·411 G	52	281	30	162	356·2	+6·5	+34·9	− 5·9
212·363 G	43	296	25	171	356·0	+7·0	+35·0	+ 6·5
213·383 C	40	317	25	192	355·8	+7·4	+34·8	+19·8
214·427 G	58	266	40	180	355·6	+7·9	+34·3	+33·4
215·362 G	39	191	31	153	355·9	+8·8	+34·4	+46·1
216·387 G	35	128	37	134	355·6	+9·2	+34·6	+59·3
217·352 G	17	70	26	109	354·7	+8·9	+34·3	+71·2
218·482 G	5	27	20	110	354·2	+9·1	+34·5	+85·7
Means ..	..	..	28	136	355·4	..	+34·6	..
			Spot *a*.				
207·392 G	9	26	9	27	356·1	0·0	+34·4	−59·1
208·315 G	36	137	28	108	357·9	+2·4	+34·8	−45·1
209·188 K	32	196	22	133	358·6	+3·7	+35·0	−32·8
210·369 G	37	193	22	116	359·1	+4·9	+34·8	−16·7
211·411 G	45	222	26	127	358·9	+5·4	+34·9	− 3·2
212·363 G	33	228	19	132	358·5	+5·6	+34·8	+ 9·0
213·383 C	37	257	23	157	357·7	+5·5	+34·6	+21·7
214·427 G	37	175	26	121	357·3	+5·7	+34·7	+35·1
215·362 G	28	155	23	126	356·5	+5·6	+34·6	+46·7
216·387 G	28	110	30	117	356·1	+5·8	+34·7	+59·8
217·352 G	15	59	24	94	355·4	+5·8	+34·6	+71·9
218·482 G	5	27	20	110	354·2	+5·3	+34·5	+85·7
			Group 9557				
July 30–August 4. A short stream of small components of which one at the rear alone remains on August 4.							
211·411 G	0	6	0	18	280·5	0·0	+39·7	−81·6
212·363 G	3	17	4	25	279·5	−0·2	+37·4	−70·0
213·383 C	3	23	3	24	279·0	+0·1	+37·8	−57·0
214·427 G	10	22	8	18	278·1	+0·1	+38·6	−44·1
215·362 G	4	12	3	8	277·2	0·0	+38·8	−32·6
216·387 G	2	3	1	2	273·5	−2·9	+40·2	−22·8
Means ..	..	..	3	16	278·0	..	+38·8	..

LEDGER II.—NON-RECURRENT GROUPS of SUN SPOTS for the YEAR 1924—*continued.*

Group 9563.

August 15–27. A stream of normal type in which the first stages of its development have taken place when it comes into view at the east limb. The leader, *a*, preserves its regular form until it reaches the west limb, when it apparently divides into two parts. This division is preceded by the appearance of a bright " bridge " seen first on August 22. The follower, *b*, 12° behind the leader, has diminished to a dot on August 21; it has disappeared on August 22, but reappears temporarily on August 23 and 24.

Date. G.M.T. (Civil) 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					°	°	°
227·367 G	18	112	35	279	71·0	0·0	+16·4
228·380 G	41	274	51	359	69·3	−1·7	+16·8
229·609 G	75	441	60	357	69·5	−1·5	+16·9
230·575 G	77	462	49	301	69·4	−1·6	+17·2
231·394 G	107	515	61	298	70·0	−1·0	+17·2
232·448 G	75	392	40	203	71·8	+0·8	+16·4
233·379 G	64	346	33	176	74·7	+3·7	+15·7
234·363 G	57	281	30	149	75·1	+4·1	+15·3
235·416 G	54	291	31	169	74·6	+3·6	+14·9
236·229 D	43	269	28	176	74·6	+3·6	+15·0
237·376 C	30	187	26	165	74·7	+3·7	+14·8
238·358 C	8	107	10	140	74·4	+3·4	+14·5
239·387 G	5	26	16	82	74·5	+3·5	+14·4
Means ..	..	..	36	220	72·6	..	+15·8

Date. G.M.T. (Civil) 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					°	°	°
240·331 C	23	101	14	60	308·6	0·0	+20·8
241·462 G	208	1154	113	624	308·7	+0·3	+22·1
242·475 G	441	1903	216	990	308·3	0·0	+22·0
243·564 G	416	2192	220	1159	308·1	0·0	+22·0
244·575 G	395	2176	222	1220	307·2	−0·7	+21·7
245·328 C	349	2070	214	1281	307·0	−0·8	+21·6
246·622 G	223	1617	177	1275	306·9	−0·7	+21·2
247·343 C	128	1207	124	1180	306·6	−0·9	+21·4
248·441 G	88	534	142	837	305·4	−1·9	+20·9
249·428 G	20	136	(52	381	301·5	..	+21·0)*
Means ..	..	..	160	958	307·4	..	+21·5

Spot *a*.

227·367 G	18	101	35	198	74·6	0·0	+15·9
228·380 G	29	165	31	177	74·8	+0·2	+15·6
229·609 G	48	249	35	179	75·2	+0·6	+15·3
230·575 G	53	263	32	158	75·0	+0·4	+15·6
231·394 G	66	307	36	169	75·1	+0·5	+15·9
232·448 G	62	293	32	149	75·0	+0·4	+15·6
233·379 G	63	338	32	172	75·0	+0·4	+15·6
234·363 G	57	281	30	149	75·1	+0·5	+15·3
235·416 G	54	284	31	165	74·9	+0·3	+14·8
236·229 D	37	252	24	166	75·2	+0·6	+14·7
237·376 C	30	187	26	165	74·7	+0·1	+14·8
238·358 C	8	107	10	140	74·4	−0·2	+14·5
239·387 G	5	26	16	82	74·5	−0·1	+14·4

Spot *a*.

240·331 C	10	49	6	29	310·4	0·0	+21·2
241·462 G	90	474	48	251	312·2	+2·0	+21·8
242·475 G	175	751	91	391	313·1	+3·0	+22·1
243·564 G	179	940	97	508	314·0	+4·1	+22·0
244·575 G	168	781	99	461	313·7	+4·0	+21·7
245·328 C	150	998	99	659	313·0	+3·4	+21·6
246·622 G	103	707	92	629	312·8	+3·4	+21·4
247·343 C	47	468	55	552	312·9	+3·6	+21·8
248·441 G	23	123	57	303	312·9	+3·8	+21·4

Spot *b*.

228·380 G	11	99	19	168	63·7	0·0	+18·1
229·609 G	27	184	25	171	63·5	−0·2	+18·5
230·575 G	24	199	17	143	63·3	−0·4	+18·9
231·394 G	41	208	25	129	63·3	−0·4	+18·9
232·448 G	12	93	7	51	62·9	−0·8	+18·6
233·379 G	1	8	1	4	63·2	−0·5	+20·2

Spot *b*.

240·331 C	13	52	8	31	307·2	0·0	+20·4
241·462 G	102	565	56	311	305·7	−1·3	+22·0
242·475 G	213	965	111	502	304·4	−2·5	+22·1
243·564 G	225	1167	117	606	303·1	−3·6	+22·0
244·575 G	202	1184	109	639	302·1	−4·4	+21·7
245·328 C	199	1072	115	622	300·7	−5·7	+21·7
246·622 G	120	910	85	646	301·2	−5·0	+21·1
247·343 C	81	739	69	628	301·1	−5·0	+21·1
248·441 G	65	411	85	534	301·1	−4·8	+20·6
249·428 G	20	136	52	381	301·5	−4·3	+21·0

Group 9564.

August 28–September 6. A very large group of the " stream " type developing with extreme rapidity from two small spots or close clusters of spots photographed on August 28. Both the leading spot, *a*, and the following spot, *b*, are very large and somewhat composite in character; the leader becomes increasingly unstable and has broken up into several components by September 4. A cluster of small spots is prominent on August 30, and although this practically disappears, a chain of spots is formed later in its place from disintegrated portions of *a* and *b*.

Date. G.M.T. (Civil) 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					°	°	°
240·331 C	23	101	14	60	308·6	0·0	+20·8
241·462 G	208	1154	113	624	308·7	+0·3	+22·1
242·475 G	441	1903	216	990	308·3	0·0	+22·0
243·564 G	416	2192	220	1159	308·1	0·0	+22·0
244·575 G	395	2176	222	1220	307·2	−0·7	+21·7
245·328 C	349	2070	214	1281	307·0	−0·8	+21·6
246·622 G	223	1617	177	1275	306·9	−0·7	+21·2
247·343 C	128	1207	124	1180	306·6	−0·9	+21·4
248·441 G	88	534	142	837	305·4	−1·9	+20·9
249·428 G	20	136	(52	381	301·5	..	+21·0)*
Means ..	..	..	160	958	307·4	..	+21·5

Spot *a*.

240·331 C	10	49	6	29	310·4	0·0	+21·2
241·462 G	90	474	48	251	312·2	+2·0	+21·8
242·475 G	175	751	91	391	313·1	+3·0	+22·1
243·564 G	179	940	97	508	314·0	+4·1	+22·0
244·575 G	168	781	99	461	313·7	+4·0	+21·7
245·328 C	150	998	99	659	313·0	+3·4	+21·6
246·622 G	103	707	92	629	312·8	+3·4	+21·4
247·343 C	47	468	55	552	312·9	+3·6	+21·8
248·441 G	23	123	57	303	312·9	+3·8	+21·4

Spot *b*.

240·331 C	13	52	8	31	307·2	0·0	+20·4
241·462 G	102	565	56	311	305·7	−1·3	+22·0
242·475 G	213	965	111	502	304·4	−2·5	+22·1
243·564 G	225	1167	117	606	303·1	−3·6	+22·0
244·575 G	202	1184	109	639	302·1	−4·4	+21·7
245·328 C	199	1072	115	622	300·7	−5·7	+21·7
246·622 G	120	910	85	646	301·2	−5·0	+21·1
247·343 C	81	739	69	628	301·1	−5·0	+21·1
248·441 G	65	411	85	534	301·1	−4·8	+20·6
249·428 G	20	136	52	381	301·5	−4·3	+21·0

LEDGER II.—NON-RECURRENT GROUPS of SUN SPOTS for the YEAR 1924—*continued.*

Date. G.M.T. (Civil) 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 9566.							
September 5–10. A small stream of unimportant spots of which only the leader is seen on September 9.							
d					°	°	°
248·441 G	2	4	1	2	236·7	0·0	−28·0	+ 4·1
249·428 G	6	21	4	14	239·1	+2·7	−27·2	+19·5
250·233 D	18	71	13	50	238·8	+2·7	−27·3	+29·8
251·382 G	10	47	9	41	237·4	+1·7	−27·5	+43·6
252·437 G	4	15	6	21	242·6	+7·3	−26·1	+62·7
253·361 G	0	11	0	21	236·7	+1·7	−26·7	+69·0
Means ..	..	..	6	25	238·6	..	−27·1	..
Group 9567.							
September 10–19. A group of the stream type developing from two spot centres seen on September 10 in a position lightly marked by faculæ on the previous day. A quasi-regular spot has appeared as the leader by September 12, after which the following members decrease. The axis of the group is considerably inclined to the Sun's equator.							
253·361 G	20	95	17	81	114·2	0·0	+22·7	−53·5
254·412 G	59	412	39	277	113·0	−1·0	+23·8	−40·8
255·326 C	103	561	61	328	114·1	+0·3	+23·3	−27·6
256·422 G	113	617	60	331	114·0	+0·4	+23·0	−13·3
257·378 G	81	432	42	225	113·7	+0·3	+22·4	− 0·9
258·507 G	62	442	33	238	114·8	+1·6	+22·4	+15·1
259·377 G	23	168	13	97	116·3	+3·3	+22·1	+28·0
260·340 C	31	180	21	124	117·6	+4·8	+21·8	+42·1
261·329 C	17	96	16	88	119·2	+6·5	+22·0	+56·7
262·321 C	4	22	6	31	119·2	+6·7	+22·1	+69·8
Means ..	..	..	31	182	115·6	..	+22·6	..
Group 9568.							
September 18–27. Two small spots appearing from a small compact mass of faculæ at the Sun's south-east limb. These fail to develop, but small variable spots or clusters of spots continue to mark their place at the two extremities of the disturbance, which lengthens out considerably as shown by a comparison of the faculæ on September 18 and 27.							
261·329 C	2	4	3	6	356·8	0·0	−23·3	−65·7
262·321 C	27	107	27	107	357·1	+0·6	−24·1	−52·3
263·336 C	24	153	18	118	357·2	+0·9	−24·1	−38·8
264·380 G	56	205	37	136	356·2	+0·2	−24·9	−26·0
265·414 G	84	416	51	252	356·1	+0·4	−25·3	−12·5
266·648 G	52	396	31	233	355·4	0·0	−25·2	+ 3·1
267·393 G	43	237	26	145	354·8	−0·4	−25·0	+12·4
268·366 C	30	132	19	87	354·7	−0·2	−25·1	+25·1
269·348 C	14	58	11	44	354·9	+0·3	−24·9	+38·3
270·420 G	0	6	0	6	351·6	−2·7	−27·1	+49·1
Means ..	..	..	22	113	355·5	..	−24·9	..

Date. G.M.T. (Civil) 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 9574.							
October 1–8. A regular spot diminishing to a very small marking before disappearing after October 8. There is a small distant follower on October 5 and a few close ones on October 7 and 8. The group evidently represents the last phases of a stream which completed its earlier development on the invisible hemisphere.							
d					°	°	°	°
274·362 C	11	74	19	127	176·2	0·0	+25·5	−74·3
275·334 C	14	103	15	110	175·5	−0·4	+25·7	−62·2
276·452 G	21	111	16	85	174·9	−0·7	+25·8	−48·0
277·327 C	26	112	17	73	174·8	−0·5	+25·9	−36·6
278·510 C	21	86	12	49	174·2	−0·7	+26·4	−21·5
279·413 G	10	33	5	18	174·2	−0·4	+26·0	− 9·6
280·429 G	8	44	4	23	172·9	−1·4	+26·4	+ 2·5
281·627 G	5	20	3	11	172·6	−1·4	+25·9	+18·0
Means ..	..	..	11	62	174·4	..	+26·0	..
Group 9575.							
October 3–15. A stream of roughly normal type but of remarkable length, the greatest distance between the leading and following spots being 17°. The group is a few days old when first seen at the Sun's east limb. The leader, *a*, appears throughout as a small contracting regular spot. The last definite trace of the follower, *b*, is visible on October 11, although one or two of the small spots which have hitherto preceded it, continue until October 14.							
276·452 G	9	80	(28	252	146·8	..	−27·3)	*−76·1
277·327 C	35	223	55	487	140·3	0·0	−28·5	−71·1
278·510 C	51	419	63	513	137·8	−2·1	−28·5	−57·9
279·413 G	95	527	86	502	136·5	−3·0	−28·7	−47·3
280·429 G	89	582	67	439	136·1	−3·0	−28·7	−34·3
281·627 G	112	669	73	434	135·9	−2·8	−27·9	−18·7
282·432 G	81	424	50	261	136·0	−2·4	−28·2	− 8·0
283·405 G	58	295	36	180	137·8	−0·2	−27·7	+ 6·6
284·347 C	41	340	27	221	136·5	−1·1	−28·1	+17·8
285·369 C	46	282	34	206	138·0	+0·7	−28·2	+32·7
286·447 G	19	119	18	117	142·3	+5·4	−27·1	+51·3
287·467 G	17	66	25	100	142·1	+5·6	−26·9	+64·5
288·368 C	4	24	13	79	142·9	+6·8	−26·6	+77·2
Means ..	..	..	46	295	138·5	..	−27·9	..
Spot *a*.							
277·327 C	20	108	30	164	146·9	0·0	−27·3	−64·5
278·510 C	19	167	18	159	146·0	−0·5	−26·9	−49·7
279·413 G	59	246	46	192	145·1	−1·0	−26·8	−38·7
280·429 G	41	277	27	186	144·4	−1·3	−26·5	−26·0
281·627 G	45	253	27	152	144·4	−0·9	−26·1	−10·2
282·432 G	34	183	20	108	144·0	−1·0	−26·5	0·0
283·405 G	36	184	22	112	143·6	−1·0	−26·5	+12·4
284·347 C	22	172	15	114	143·5	−0·7	−26·4	+24·8
285·369 C	28	160	22	123	143·6	−0·3	−26·3	+38·3
286·447 G	15	107	15	108	143·6	+0·1	−26·8	+52·6
287·467 G	14	59	22	93	143·3	+0·2	−26·6	+65·7
288·368 C	4	24	13	79	142·9	+0·2	−26·6	+77·2

LEDGER II.—NON-RECURRENT GROUPS of SUN SPOTS for the YEAR 1924—*continued.*

Date. G.M.T. (Civil) 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 9575—*continued.*							
Spot *b*.							
d					°	°	°
277·327 C	0	42	0	184	133·2	0·0	−31·0	−78·2
278·510 C	22	173	35	272	131·7	−1·1	−30·2	−64·0
279·413 G	32	269	36	299	130·1	−2·3	−30·6	−53·7
280·429 G	39	210	33	176	129·4	−2·6	−30·2	−41·0
281·627 G	46	181	32	127	127·9	−3·7	−29·9	−26·7
282·432 G	24	107	16	70	127·4	−3·9	−29·9	−16·6
283·405 G	19	80	12	50	126·5	−4·4	−30·2	− 4·7
284·347 C	17	76	11	48	125·5	−5·0	−30·2	+ 6·8
Group 9576.							
October 13–26. Revival near Group 9569 of the previous rotation. A very large regular spot, *a*, showing minor changes both of umbra and penumbra. A following spot seen at the east limb divides into two by October 16 and so disappears, but a number of very small markings are evidence of continued activity in the faculæ following *a*.								
286·447 G	12	105	(39	344	8·2	..	+22·7)*	−82·8
287·467 G	44	300	73	505	5·6	0·0	+23·8	−72·0
288·368 C	112	563	117	572	5·9	+0·5	+23·7	−59·8
289·339 C	125	747	95	562	6·4	+1·2	+22·7	−46·5
290·339 C	131	896	82	559	6·4	+1·4	+22·6	−33·3
291·405 G	152	1005	84	553	6·2	+1·4	+22·7	−19·4
292·383 C	143	988	76	523	6·1	+1·5	+22·7	− 6·6
293·352 C	166	1051	88	556	5·3	+0·9	+22·8	+ 5·3
294·319 C	154	784	85	431	4·9	+0·7	+22·9	+17·7
295·620 G	99	736	62	463	4·7	+0·8	+22·7	+34·7
296·438 G	103	617	75	450	4·5	+0·8	+22·8	+45·2
297·509 C	98	439	98	438	4·5	+1·0	+23·1	+59·4
298·322 C	44	285	62	402	3·9	+0·6	+23·0	+69·5
299·357 C	11	109	42	416	4·8	+1·7	+23·0	+84·0
Means ..	..	..	80	495	5·3	..	+23·0	..
Spot *a*.								
286·447 G	12	105	39	344	8·2	0·0	+22·7	−82·8
287·467 G	33	218	48	316	7·1	−0·9	+22·9	−70·5
288·368 C	83	465	80	446	7·5	−0·3	+22·7	−58·2
289·339 C	110	687	81	508	6·9	−0·7	+22·4	−46·0
290·339 C	123	861	76	534	6·7	−0·7	+22·4	−33·0
291·405 G	152	988	84	543	6·4	−0·8	+22·7	−19·2
292·383 C	142	946	75	501	6·1	−0·9	+22·7	− 6·6
293·352 C	166	991	88	525	5·5	−1·3	+23·0	+ 5·5
294·319 C	154	761	85	419	5·0	−1·6	+22·9	+17·8
295·620 G	99	716	62	451	4·9	−1·4	+22·8	+34·9
296·438 G	103	617	75	450	4·5	−1·6	+22·8	+45·2
297·509 C	97	423	97	423	4·5	−1·4	+23·1	+59·4
298·322 C	44	285	62	402	3·9	−1·8	+23·0	+69·5
299·357 C	11	109	42	416	4·8	−0·7	+23·0	+84·0

Date. G.M.T. (Civil) 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 9578.							
October 25–November 2. A group of the stream type arising from two close pairs of tiny spots seen on October 25. The rapid separation in longitude of the two spot centres is very marked.							
d					°	°	°	°
298·322 C	11	49	7	29	266·0	0·0	+21·5	−28·4
299·357 C	75	310	41	168	266·4	+0·6	+21·3	−14·4
300·393 G	95	383	50	201	266·3	+0·6	+21·6	− 0·8
301·516 G	67	310	36	168	267·3	+1·8	+21·4	+15·0
302·323 C	45	200	26	116	267·6	+2·2	+21·5	+25·9
303·368 C	24	153	16	104	267·8	+2·6	+21·2	+39·9
304·549 C	20	80	19	74	269·1	+4·0	+20·5	+56·8
305·411 C	8	50	10	63	266·8	+1·9	+20·8	+65·9
306·415 C	2	17	6	48	268·4	+3·6	+20·6	+80·7
Means ..	..	..	23	108	267·3	..	+21·2	..
Group 9581.							
November 11–16. Revival of Group 9577. A small stream not seen on November 13. Only the rear spot remains on November 16.							
315·403 G	8	25	8	24	12·1	0·0	+21·4	−57·1
316·255 D	11	41	8	30	12·7	+0·7	+21·8	−45·3
317·447 C	0	0	0	0	..	..	..	..
318·310 C	28	112	16	63	10 1	−1·5	+21·1	−20·8
319·316 C	20	54	11	29	10·3	−1·2	+21·3	− 7·3
320·608 C	2	31	1	16	7·8	−3·5	+22·0	+ 7·2
Means ..	..	..	7	27	10·6	..	+21·5	..
Group 9583.							
November 15–20. A small group of stream type composed generally of two small clusters of spots at the front and rear respectively.							
319·316 C	11	58	6	33	4·0	0·0	+26·9	−13·6
320·608 C	13	160	7	88	4·2	+0·7	+27·0	+ 3·6
321·424 G	46	255	26	144	3·2	−0·1	+27·3	+13·4
322·321 C	19	126	11	77	3·5	+0·6	+27·5	+25·5
323·343 C	10	84	7	58	1·5	−1·1	+27·8	+37·0
324·327 C	2	17	2	15	2·2	0·0	+26·7	+50·6
Means ..	..	..	10	69	3·1	..	+27·2	..
Group 9585.							
November 18–December 1. A large and somewhat irregularly-shaped spot in the following portion of an extensive area of faculæ. It is preceded by a small companion suggestive of a larger spot when on the invisible hemisphere. Other small companions appear from time to time, in general preceding the chief spot. The retrograde motion in longitude is very marked.							
322·321 C	22	175	63	504	258·6	0·0	+23·8	−79·4
323·343 C	63	551	87	778	257·5	−0·9	+23·7	−67·0
324·327 C	120	807	114	770	255·7	−2·4	+24·6	−55·9

LEDGER II.—NON-RECURRENT GROUPS of SUN SPOTS for the YEAR 1924—*continued*.

Date. G.M.T. (Civil) 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 9585—*continued*.							
d					°	°	°
325·406 C	171	1027	124	752	254·9	−2·9	+24·7	−42·4
326·308 C	147	1138	93	724	254·6	−3·0	+24·8	−30·9
327·365 C	154	1240	87	705	254·0	−3·4	+24·8	−17·5
328·496 C	148	1126	81	618	253·5	−3·6	+24·8	− 3·1
329·308 C	94	862	52	474	252·5	−4·4	+24·4	+ 6·6
330·327 C	110	554	64	321	251·8	−4·8	+24·4	+19·3
331·527 G	113	569	75	376	251·3	−5·0	+23·8	+34·6
332·508 G	71	492	56	389	250·7	−5·4	+23·7	+47·0
333·322 C	56	416	56	416	250·4	−5·5	+23·9	+57·4
334·369 C	29	206	47	337	249·8	−5·8	+23·7	+70·6
335·446 G	13	51	62	244	248·6	−6·8	+23·5	+83·6
Means ..	..	..	76	529	253·1	..	+24·2	..

Group 9588.

December 7–16. Revival near the place of Group 9581. A small regular spot, with double umbra, which has divided into two components on December 8–9. The leading component remains on December 15 as a small but perfectly defined umbral spot. There is a tiny distant follower on December 12.

341·373 C	14	111	25	200	14·2	0·0	+21·0	−72·7
342·349 C	22	141	24	151	14·1	0·0	+20·8	−60·0
343·437 G	27	138	21	105	14·6	+0·7	+20·8	−45·1
344·321 C	22	143	14	92	14·7	+0·9	+20·9	−33·4
345·329 C	30	170	17	97	15·0	+1·4	+20·8	−19·8
346·353 C	25	97	14	52	14·8	+1·3	+21·0	− 6·5
347·313 C	18	65	10	35	15·2	+1·8	+21·1	+ 6·5
348·468 G	22	43	13	25	15·4	+2·2	+20·8	+22·0
349·341 C	12	24	8	16	16·3	+3·2	+21·1	+34·4
350·335 C	4	12	3	10	16·9	+4·0	+21·0	+48·1
Means ..	..	..	15	78	15·1	..	+20·9	..

Group 9589.

December 9–15. A small stream *n.f.* Group 9588.

343·437 G	6	22	7	25	0·1	0·0	+27·6	−59·6
344·321 C	23	98	19	82	0·6	+0·8	+27·5	−47·5
345·329 C	25	191	17	130	0·7	+1·3	+27·2	−34·1
346·353 C	27	109	17	67	358·8	−0·2	+27·9	−22·5
347·313 C	22	114	13	65	0·0	+1·4	+27·3	− 8·7
348·468 G	3	70	2	40	358·4	+0·2	+28·3	+ 5·0
349·341 C	1	21	1	12	356·2	−1·7	+29·1	+14·3
Means ..	..	..	11	60	359·3	..	+27·8	..

Group 9591.

December 15–22. Intermittent. One or two very small spots on December 15 and 16; on December 19, a double spot, which breaks up into a faint cluster by December 21.

349·341 C	1	3	1	3	286·2	0·0	+18·9	−55·7
350·335 C	1	4	1	3	286·3	+0·2	+18·5	−42·5
351·315 C	0	0	0	0	..	..	..	..

Date. G.M.T. (Civil) 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 9591—*continued*.							
d					°	°	°
352·510 G	0	0	0	0	..	..	..	..
353·616 C	7	83	4	44	284·4	−1·5	+19·1	− 1·2
354·430 G	18	46	10	25	284·1	−1·7	+18·3	+ 9·2
355·380 C	2	18	1	10	284·3	−1·4	+18·3	+21·9
356·328 C	0	4	0	3	282·8	−2·9	+19·2	+32·9
Means ..	..	..	2	11	284·7	..	+18·7	..

Group 9592.

December 17–24. A few small unstable spots in the extreme southern portion of a large faculous area, immediately following Group 9590, in which Groups 9591 and *953a* are also contained.

351·315 C	4	14	2	8	287·7	0·0	+14·4	−28·2
352·510 G	14	56	7	30	287·0	−0·7	+13·8	−13·2
353·616 C	1	20	1	11	287·6	−0·2	+14·3	+ 2·0
354·430 G	1	10	1	5	286·9	−0·9	+14·0	+12·0
355·380 C	10	30	5	18	289·3	+1·4	+13·7	+26·9
356·328 C	9	39	6	26	289·4	+1·5	+13·6	+39·5
357·402 C	23	70	19	59	287·4	−0·5	+13·7	+51·7
358·421 G	3	18	4	21	286·1	−1·9	+13·6	+63·8
Means ..	..	..	6	22	287·7	..	+13·9	..

Group 9593.

December 18–28. Intermittent. Revival of Group 9585. A single small spot in a disturbed area on each of the days—December 18, 19, 24 and 28.

352·510 G	1	6	1	6	246·1	0·0	+23·7	−54·1
353·616 C	1	12	1	9	245·7	−0·1	+24·0	−39·9
354·430 G	0	0	0	0	..	..	..	..
355·380 C	0	0	0	0	..	..	..	..
356·328 C	0	0	0	0	..	..	..	..
357·402 C	0	0	0	0	..	..	..	..
358·421 G	0	9	0	5	242·7	−1·9	+22·9	+20·4
359·437 G	0	0	0	0	..	..	..	..
360·515 G	0	0	0	0	..	..	..	..
361·331 C	0	0	0	0	..	..	..	..
362·454 G	0	4	0	9	243·2	−0·5	+25·9	+74·0
Means ..	..	..	0	3	244·4	..	+24·1	..

Group 9594.

December 21–27. A stream of normal type developing with great rapidity and breaking up prematurely.

355·380 C	51	283	27	155	271·8	0·0	−24·1	+ 9·4
356·328 C	128	737	74	432	271·9	+0·3	−24·4	+22·0
357·402 C	135	679	89	453	271·3	0·0	−24·7	+35·6
358·421 G	97	516	79	423	270·4	−0·6	−24·8	+48·1
359·437 G	51	307	60	356	271·3	+0·6	−24·7	+62·4
360·515 G	15	109	38	274	271·8	+1·3	−25·0	+77·1
361·331 C	1	11	(3	36	265·6	..	−21·8)	*+81·6
Means ..	..	..	61	349	271·4	..	−24·6	..

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

1924.

GREENWICH PHOTO-HELIOGRAPHIC RESULTS, 1924.

TOTAL AREAS of SUN SPOTS and FACULÆ for EACH DAY in the YEAR 1924.

The Greenwich Civil Time at which the photograph was taken is expressed by the month, day of month (civil reckoning), 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, Kodaikánal and Dehra Dûn, by the letters C, K and D 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 disc.

The Area Corrected for Foreshortening is expressed in millionths of the Sun's visible hemisphere.

Greenwich Civil Time.	Place.	Projected Area.			Area Corrected for Foreshortening.			Greenwich Civil Time.	Place.	Projected Area.			Area Corrected for Foreshortening.		
		Umbræ.	Whole Spots.	Faculæ.	Umbræ.	Whole Spots.	Faculæ.			Umbræ.	Whole Spots.	Faculæ.	Umbræ.	Whole Spots.	Faculæ.
1924 d								1924 d							
January 1·352	C	0	0	460	0	0	542	February 8·339	C	0	0	48	0	0	57
2·167	D	0	0	442	0	0	615	9·371	C	0	0	0	0	0	0
3·474	G	0	0	0	0	0	0	10·426	C	0	0	0	0	0	0
4·518	C	0	0	111	0	0	174	11·345	C	0	0	0	0	0	0
5·425	C	0	4	53	0	3	95	12·364	C	0	7	48	0	7	48
6·357	C	2	6	95	2	5	81	13·374	C	0	0	93	0	0	87
7·319	C	0	0	79	0	0	91	14·313	C	0	0	0	0	0	0
8·487	C	0	0	95	0	0	199	15·407	G	3	10	0	2	6	0
9·309	C	0	0	100	0	0	144	16·333	C	2	24	75	2	26	92
10·459	C	0	0	195	0	0	189	17·561	G	0	0	0	0	0	0
11·355	C	0	0	195	0	0	201	18·118	K	0	0	0	0	0	0
12·338	C	0	0	61	0	0	114	19·328	C	0	0	0	0	0	0
13·359	C	0	0	58	0	0	116	20·371	C	0	0	75	0	0	78
14·361	C	0	0	58	0	0	100	21·356	C	0	0	43	0	0	58
15·332	C	0	0	164	0	0	184	22·410	C	0	0	0	0	0	0
16·449	G	0	0	272	0	0	328	23·504	G	0	0	32	0	0	56
17·319	C	0	0	353	0	0	332	24·431	C	0	0	110	0	0	108
18·398	C	0	0	194	0	0	232	25·430	C	43	230	123	30	160	119
19·535	C	0	0	221	0	0	251	26·411	G	123	687	113	78	433	165
20·432	G	0	0	0	0	0	0	27·321	C	127	782	0	78	480	0
21·391	C	0	0	28	0	0	46	28·416	G	149	777	0	92	479	0
22·343	C	0	0	21	0	0	36	29·484	G	92	548	0	62	365	0
23·403	C	4	24	312	2	12	370								
24·320	C	0	0	437	0	0	495	March 1·399	G	74	446	184	55	335	138
25·340	C	0	0	249	0	0	268	2·429	G	63	283	270	60	273	251
26·324	C	2	20	265	1	16	267	3·459	G	26	146	286	37	210	346
27·361	C	0	0	0	0	0	0	4·410	G	15	56	189	42	158	403
28·443	C	2	8	228	4	16	279	5·398	G	0	0	49	0	0	113
29·466	C	0	0	165	0	0	213	6·609	G	0	0	59	0	0	67
30·328	C	0	0	143	0	0	172	7·599	G	0	0	156	0	0	159
31·407	C	0	0	79	0	0	60	8·498	G	0	0	151	0	0	143
								9·376	G	0	0	119	0	0	105
								10·398	G	0	0	0	0	0	0
February 1·457	G	0	0	139	0	0	106	11·401	G	0	0	0	0	0	0
2·494	G	0	0	144	0	0	141	12·402	G	0	0	38	0	0	51
3·485	G	2	19	198	2	17	236	13·398	G	0	0	0	0	0	0
4·442	C	0	0	58	0	0	71	14·398	G	0	0	0	0	0	0
5·346	C	0	0	37	0	0	80	15·608	G	0	0	76	0	0	65
6·323	C	0	0	0	0	0	0	16·471	G	0	0	76	0	0	87
7·327	C	0	0	52	0	0	65	17·403	G	0	0	0	0	0	0

TOTAL AREAS of SUN SPOTS and FACULÆ for EACH DAY in the YEAR 1924—*continued.*

Greenwich Civil Time.		Place.	Projected Area.			Area Corrected for Foreshortening.		
			Umbræ.	Whole Spots.	Faculæ.	Umbræ.	Whole Spots.	Faculæ.
1924	d							
March	18·401	G	0	0	0	0	0	0
	19·408	G	0	0	0	0	0	0
	20·402	G	0	0	115	0	0	252
	21·326	C	4	10	228	2	5	334
	22·564	C	12	47	510	8	31	532
	23·370	C	6	22	453	4	15	426
	24·330	C	0	7	233	0	4	219
	25·513	C	0	0	236	0	0	220
	26·110	K	0	0	0	0	0	0
	27·330	G	0	0	21	0	0	30
	28·325	C	0	0	108	0	0	126
	29·354	C	0	0	221	0	0	222
	30·401	G	0	0	300	0	0	277
	31·371	C	0	0	246	0	0	284
April	1·609	G	0	0	109	0	0	147
	2·486	G	0	0	83	0	0	140
	3·536	G	0	0	111	0	0	197
	4·337	C	0	0	20	0	0	29
	5·426	G	0	0	0	0	0	0
	6·607	G	0	12	0	0	7	0
	7·409	G	0	0	0	0	0	0
	8·342	C	0	0	0	0	0	0
	9·610	G	0	0	0	0	0	0
	10·329	C	0	5	0	0	3	0
	11·346	C	0	0	0	0	0	0
	12·547	G	0	0	0	0	0	0
	13·407	G	0	0	0	0	0	0
	14·611	G	4	21	72	5	26	90
	15·353	C	0	0	112	0	0	149
	16·405	G	3	12	77	3	11	75
	17·353	G	22	66	221	17	49	219
	18·363	G	110	469	116	71	308	126
	19·459	G	156	719	105	91	424	87
	20·460	G	122	906	100	68	506	141
	21·365	C	164	1077	105	90	592	122
	22·449	G	142	1067	83	79	603	74
	23·510	C	128	726	199	80	446	145
	24·353	C	104	720	254	75	514	226
	25·479	G	72	512	477	70	488	561
	26·328	C	29	223	448	44	338	725
	27·339	G	8	59	411	18	133	704
	28·354	G	3	12	56	2	8	214
	29·363	G	0	0	106	0	0	105
	30·372	C	0	0	156	0	0	208
May	1·418	C	0	0	128	0	0	229
	2·450	G	0	0	128	0	0	188
	3·462	G	0	0	72	0	0	86
	4·413	G	1	2	161	1	2	187
	5·351	G	0	0	241	0	0	207
	6·347	C	1	7	72	1	4	63
	7·360	G	19	89	0	13	63	0
	8·450	G	34	281	0	21	179	0

Greenwich Civil Time.		Place.	Projected Area.			Area Corrected for Foreshortening.		
			Umbræ.	Whole Spots.	Faculæ.	Umbræ.	Whole Spots.	Faculæ.
1924	d							
May	9·355	G	33	203	0	20	124	0
	10·457	G	39	168	112	24	103	144
	11·398	G	39	119	45	28	84	142
	12·382	G	92	349	677	66	258	894
	13·627	G	106	620	1063	70	385	1276
	14·352	G	112	676	798	65	394	876
	15·491	C	168	978	1349	92	528	1438
	16·348	C	180	1208	700	98	661	628
	17·354	G	172	931	265	103	584	221
	18·475	G	100	582	321	85	451	407
	19·351	G	60	434	744	56	399	847
	20·606	G	42	221	794	46	268	904
	21·353	G	39	213	455	32	282	548
	22·360	G	47	223	562	30	145	534
	23·364	G	51	204	416	40	154	488
	24·411	G	25	101	411	19	87	645
	25·461	G	10	18	237	6	10	342
	26·352	G	6	10	269	4	6	258
	27·382	C	21	95	517	11	53	411
	28·359	G	16	87	243	11	61	246
	29·364	G	10	74	367	74	450	485
	30·378	G	61	373	265	127	969	562
	31·450	C	86	734	579	111	946	693
June	1·446	C	119	962	714	107	872	710
	2·593	G	171	1223	135	124	889	181
	3·422	G	243	1361	0	160	892	0
	4·391	C	206	1685	135	123	1013	100
	5·412	G	220	1827	175	130	1076	372
	6·370	G	225	1837	542	135	1101	798
	7·439	C	228	1526	568	149	989	589
	8·303	G	154	1001	802	111	728	641
	9·375	G	102	682	475	94	630	458
	10·364	G	59	381	596	78	510	707
	11·585	G	26	191	698	73	562	1048
	12·360	G	8	49	499	5	29	769
	13·375	C	31	160	327	23	90	267
	14·467	G	58	323	176	34	182	128
	15·387	G	76	424	443	47	264	372
	16·345	G	59	295	516	43	221	556
	17·570	G	53	253	539	54	256	691
	18·506	G	30	144	579	36	180	687
	19·397	G	24	105	430	25	116	600
	20·583	G	31	154	307	20	108	422
	21·360	G	27	186	85	16	120	114
	22·395	G	32	146	80	19	90	145
	23·359	G	20	138	266	12	85	244
	24·395	G	24	157	142	16	106	129
	25·301	G	23	138	182	19	109	233
	26·304	G	16	119	340	14	128	475
	27·367	G	31	191	357	67	481	519
	28·304	G	41	251	503	66	397	748
	29·422	G	60	316	856	60	316	1144
	30·421	G	49	346	591	39	271	619

TOTAL AREAS of SUN SPOTS and FACULÆ for EACH DAY in the YEAR 1924—*continued.*

Greenwich Civil Time.		Place.	Projected Area.			Area Corrected for Foreshortening.		
			Umbræ.	Whole Spots.	Faculæ.	Umbræ.	Whole Spots.	Faculæ.
1924	d							
July	1·368	G	73	440	767	57	331	664
	2·478	G	77	493	37	52	319	108
	3·435	G	102	482	80	60	284	126
	4·497	C	102	429	349	59	245	448
	5·368	G	113	544	618	64	306	807
	6·402	G	94	490	1096	83	471	1612
	7·570	G	110	675	1924	115	719	1990
	8·308	G	121	736	2140	108	645	2051
	9·350	G	177	819	2326	127	611	2193
	10·307	G	141	939	998	91	609	1136
	11·349	G	226	1245	500	136	739	781
	12·306	G	271	1429	289	141	741	521
	13·367	C	233	1260	723	129	694	856
	14·306	G	192	1132	675	117	695	595
	15·307	G	123	832	1111	91	619	1047
	16·517	G	98	577	1305	99	583	1539
	17·305	G	59	362	1464	102	535	1859
	18·405	G	21	122	548	38	220	845
	19·374	G	0	43	299	0	209	408
	20·347	G	1	6	176	1	8	234
	21·453	G	15	57	306	10	39	238
	22·357	G	44	139	436	31	96	378
	23·370	G	33	125	303	31	121	346
	24·364	G	38	162	266	21	90	383
	25·397	G	12	47	102	7	32	241
	26·392	G	24	78	671	22	73	903
	27·315	G	62	239	971	50	197	1040
	28·188	K	57	303	921	43	227	887
	29·369	G	70	336	1232	54	281	1320
	30·411	G	52	287	421	30	180	635
	31·363	G	46	313	256	29	196	343
August	1·383	C	73	514	596	81	524	812
	2·427	G	111	537	947	91	449	1207
	3·362	G	126	606	1725	113	530	1711
	4·387	G	134	608	2128	106	475	1973
	5·352	G	154	654	2033	107	451	1827
	6·482	G	142	592	1880	92	408	1679
	7·615	G	111	602	404	57	308	473
	8·366	G	125	472	731	66	247	756
	9·377	G	107	468	1203	63	277	1011
	10·417	G	62	308	1085	44	221	997
	11·391	G	43	240	1398	41	226	1310
	12·373	G	37	183	688	52	270	811
	13·370	G	26	96	750	60	218	970
	14·399	G	15	65	800	23	100	1115
	15·367	G	18	112	775	35	279	1215
	16·380	G	41	274	768	51	359	895
	17·609	G	75	441	224	60	357	179
	18·575	G	77	462	26	49	301	125
	19·394	G	107	515	222	61	298	276
	20·448	G	75	392	280	40	203	311
	21·379	G	64	346	78	33	176	104
	22·363	G	57	281	179	30	149	270
	23·416	G	54	291	301	31	169	365
1924	d							
August	24·229	D	43	269	655	28	176	612
	25·376	C	30	187	1058	26	165	1028
	26·358	C	8	107	624	10	140	750
	27·387	G	5	26	227	16	82	376
	28·331	C	51	204	378	71	271	851
	29·462	G	258	1345	306	165	821	321
	30·475	G	464	2159	525	253	1177	536
	31·564	G	473	2504	278	254	1343	371
September	1·575	G	459	2524	446	256	1405	490
	2·328	C	407	2423	1124	244	1461	1184
	3·622	G	287	1968	1513	209	1451	1364
	4·343	C	287	1539	999	155	1353	1073
	5·441	G	132	810	720	168	999	1034
	6·428	G	70	401	663	87	568	820
	7·233	D	48	248	940	40	208	774
	8·382	G	29	160	719	38	212	745
	9·437	G	6	62	1135	17	271	1348
	10·361	G	20	106	623	17	102	913
	11·412	G	59	412	570	39	277	795
	12·326	C	103	561	939	61	328	1108
	13·422	G	113	617	380	60	331	353
	14·378	G	81	432	0	42	225	0
	15·507	G	62	442	132	33	238	156
	16·377	G	23	168	317	13	97	423
	17·340	C	31	180	320	21	124	386
	18·329	C	19	100	511	19	94	462
	19·321	C	31	129	578	33	138	706
	20·336	C	30	178	685	21	132	1169
	21·380	G	56	215	737	37	141	1014
	22·414	G	84	435	1935	51	262	1991
	23·648	G	52	396	1273	31	233	1108
	24·393	G	58	338	940	50	339	880
	25·366	C	58	282	154	50	241	194
	26·348	C	39	233	812	31	184	732
	27·420	G	24	160	1129	16	111	1418
	28·430	G	84	464	822	81	440	1221
	29·420	G	86	561	1336	64	435	1621
	30·425	G	70	388	1243	48	283	1236
October	1·362	C	87	528	1185	66	405	1283
	2·334	C	135	650	1374	88	431	1619
	3·452	G	115	639	595	92	583	728
	4·327	C	138	744	1101	113	780	1481
	5·510	C	131	855	943	107	751	1103
	6·413	G	164	883	1429	125	709	1640
	7·429	G	146	888	1120	104	638	1024
	8·627	G	144	897	843	100	632	757
	9·432	G	98	556	487	71	421	589
	10·405	G	63	353	246	47	306	378
	11·347	C	41	340	371	27	221	312
	12·369	C	46	282	567	34	206	484
	13·447	G	31	224	1223	57	461	1438
	14·467	G	61	366	1747	98	605	2144

TOTAL AREAS of SUN SPOTS and FACULÆ for EACH DAY in the YEAR 1924—*continued*.

Greenwich Civil Time.	Place.	Projected Area.			Area Corrected for Foreshortening.			Greenwich Civil Time.	Place.	Projected Area.			Area Corrected for Foreshortening.		
		Umbræ.	Whole Spots.	Faculæ.	Umbræ.	Whole Spots.	Faculæ.			Umbræ.	Whole Spots.	Faculæ.	Umbræ.	Whole Spots.	Faculæ
1924 d								1924 d							
October 15·368	C	116	587	971	130	651	1226	November 23·365	C	406	2756	1120	233	1595	1117
16·339	C	125	747	1207	95	562	1478	24·496	C	268	2090	254	162	1262	302
17·339	C	131	896	652	82	559	900	25·308	C	255	1880	0	179	1272	0
18·405	G	152	1005	846	84	553	1043	26·327	C	244	1630	668	205	1463	668
19·383	C	143	988	360	76	523	392	27·527	G	175	1119	1032	207	1763	1383
20·352	C	166	1051	824	88	556	936	28·508	G	73	575	884	63	689	941
21·319	C	157	797	1139	88	444	1218	29·322	C	56	416	1038	56	416	1290
22·620	G	99	736	152	62	463	126	30·369	C	29	206	1098	47	337	1437
23·438	G	108	658	174	79	488	262								
24·509	C	110	470	1275	114	480	1290								
25·322	C	55	367	1265	69	579	1579								
26·357	C	96	467	864	99	659	1479	December 1·446	G	13	51	1049	62	244	1422
27·393	G	107	447	238	62	263	235	2·404	C	0	0	328	0	0	507
28·516	G	79	394	745	45	228	656	3·493	C	16	95	503	9	53	484
29·323	C	57	244	614	33	143	759	4·405	C	6	25	535	4	16	449
30·368	C	31	188	575	20	123	755	5·480	G	0	9	69	0	7	83
31·549	C	21	96	829	21	102	898	6·500	G	0	0	117	0	0	112
								7·373	C	14	111	456	25	200	732
								8·349	C	23	149	541	25	156	614
								9·437	G	33	160	512	28	130	501
November 1·411	C	8	61	897	10	75	1157	10·321	C	47	249	544	35	180	538
2·415	C	5	31	811	8	58	1201	11·329	C	55	361	564	34	227	570
3·413	G	0	0	701	0	0	806	12·353	C	63	259	606	55	254	1071
4·472	G	0	0	988	0	0	904	13·313	C	81	351	633	93	359	934
5·359	C	1	7	696	1	4	721	14·468	G	70	368	1140	57	304	1335
6·398	G	0	0	446	0	0	420	15·341	C	69	368	1441	52	274	1721
7·330	C	2	21	139	1	11	228	16·335	C	55	322	1240	35	206	1405
8·396	C	0	0	257	0	0	200	17·315	C	55	270	1557	32	155	1635
9·406	G	0	0	304	0	0	368	18·510	G	67	357	1096	37	196	1315
10·331	C	0	0	829	0	0	898	19·616	C	52	417	1107	30	232	1170
11·403	G	8	25	780	8	24	978	20·430	G	77	363	1078	45	208	1104
12·255	D	13	49	1361	9	35	1373	21·380	C	87	466	47	49	271	83
13·447	C	0	0	1091	0	0	1251	22·328	C	156	886	1255	95	537	1025
14·310	C	29	119	319	17	69	508	23·402	C	188	874	1118	128	592	1128
15·316	C	55	291	480	79	617	687	24·421	G	100	558	1549	83	460	1650
16·608	C	63	687	498	61	669	581	25·437	G	51	307	1160	60	356	1588
17·424	G	193	896	637	151	684	733	26·515	G	15	109	1283	38	274	1797
18·321	C	173	1058	952	164	1092	1306	27·331	C	1	11	928	3	36	1555
19·343	C	230	1406	964	184	1280	1447	28·454	G	0	4	1320	0	9	1575
20·327	C	267	1746	1343	192	1277	1282	29·430	G	0	7	897	0	6	853
21·406	C	375	2392	1284	231	1463	1416	30·360	C	0	0	432	0	0	590
22·308	C	375	2576	708	214	1490	910	31·335	C	2	24	132	2	18	152

MEAN AREAS of SUN SPOTS and FACULÆ for each ROTATION of the SUN, from 1923 December 25 to 1925 January 9.

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 disc, 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 for the years 1873–1923 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 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 Greenwich Civil Time, reckoning from midnight.

No. of Rotation.	Date of Commencement of each Rotation.		No. of Days on which Photographs were taken.	Mean of Daily Areas.					
				Projected.			Corrected for Foreshortening.		
				Umbræ.	Whole Spots.	Faculæ.	Umbræ.	Whole Spots.	Faculæ.
		d							
940	1923 December	25·41	28	1	6	179	1	6	218
941	1924 January	21·75	27	1	4	103	½	4	116
942	February	18·09	27	26	146	77	20	107	90
943	March	16·42	28	1	4	110	½	2	126
944	April	12·71	27	43	266	145	28	178	183
945	May	9·95	27	90	573	457	68	445	532
946	June	6·16	27	61	387	433	51	323	514
947	July	3·36	28	93	496	804	66	367	908
948	,,	30·57	27	73	368	808	55	284	856
949	August	26·80	27	137	754	656	90	523	769
950	September	23·06	27	94	565	925	73	454	1053
951	October	20·35	28	45	257	689	35	218	803
952	November	16·65	27	129	836	683	98	663	824
953	December	13·97	27	40	216	810	28	157	946

MEAN AREAS of SUN SPOTS and FACULÆ for the YEAR 1924.

The Mean Projected Areas are expressed in millionths of the Sun's apparent disc.

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.
1924	366	62	361	498	46	276	575

MEAN HELIOGRAPHIC LATITUDE of SUN SPOTS for each ROTATION of the SUN, from 1923 December 25 to 1925 January 9.

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 for 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.		
			d			°		°	°	°
940	1923	December	25·41	28	6	28·03	0	—	+ 28·03	28·03
941	1924	January	21·75	27	2	26·60	2	20·09	+ 1·85	23·15
942		February	18·09	27	107	27·30	0·4	15·5	+ 27·14	27·26
943		March	16·42	28	1	20·19	1	26·03	− 0·43	22·80
944		April	12·71	27	36	25·78	142	28·17	− 17·28	27·69
945		May	9·95	27	285	31·48	161	21·70	+ 12·29	27·95
946		June	6·16	27	309	30·60	14	24·92	+ 28·28	30·36
947		July	3·36	28	362	19·20	5	24·86	+ 18·56	19·28
948		,,	30·57	27	275	15·32	9	23·80	+ 14·11	15·58
949		August	26·80	27	494	18·67	29	25·24	+ 16·28	19·03
950		September	23·06	27	295	20·84	159	27·83	+ 3·75	23·29
951		October	20·35	28	216	21·66	2	25·86	+ 21·27	21·69
952		November	16·65	27	663	21·35	1	23·05	+ 21·33	21·36
953		December	13·97	27	74	20·77	83	24·24	− 3·08	22·61

MEAN HELIOGRAPHIC LATITUDE of SUN SPOTS for the YEAR 1924.

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.		
			°		°	°	°
1924	366	232	22·19	45	25·54	+14·49	22·73

ROYAL OBSERVATORY, GREENWICH.

DETERMINATION OF THE SOLAR ROTATION FROM LONG-LIVED SPOTS

AND

CHARACTERISTIC MOVEMENTS OF SUNSPOTS

DERIVED FROM THE GREENWICH SUNSPOT MEASURES FOR THE FOUR SOLAR CYCLES, 1878–1923.

DETERMINATION OF THE SOLAR ROTATION FROM LONG-LIVED SPOTS.

The measurement of Sun Spots at Greenwich has been carried on for four complete cycles. The present seems a fitting opportunity for a rediscussion of these measures for determination of the Solar Rotation. For this purpose the most valuable material is given by the spots which have been seen in two or more consecutive rotations of the sun. Instead of using spot-groups, *i.e.*, the mean of a number of allied spots, long-lived single spots have been chosen. Such spots are usually leaders of groups of spots and of regular form which makes them very suitable for measurement.

The measures of these spots have been extracted, with the help of the *Catalogue of Recurrent Groups of Spots*,* from the *Daily Results* since 1878, and collected in the form in which they have been published in the *Ledgers* since 1916. The method of reduction is very simple ; the mean position of the spot for the days when visible at its first appearance (excluding days when the spot is more than 75° from the central meridian) is compared with the corresponding mean position after its re-appearance. If the change of longitude be $x°$ in the interval of y days, then the angular movement of the spot is $x°/y$ per mean solar day relative to a meridian on the Sun having a sidereal rotation of period 25·38 days or a daily movement of 14°·18, this being the datum adopted in the *Nautical Almanac* for the computation of the longitude of the central meridian as seen from the Earth. Thus the sidereal angular motion of the spot per mean solar day is $14°·18 + x°/y$.

In the following table, the first four columns give the numbers of the groups containing the spot during its two successive appearances on the Sun's disc, together with a letter by which it can be easily identified amongst the measures of the components of the group. *l* indicates that it is the leading spot of the group ; *f*, the follower ; *p*, the principal component ; *g*, the sole component of the group. Where a distinctive letter, such as *a, b, or c,* has been given in the *Daily Results* or the *Ledgers*, it is also given in columns *two* and *four*. The *sixth* and *seventh* columns give the mean longitude respectively in the first and second rotations derived from the measures collected from the *Daily Results* from 1878–1915 or appearing in the *Ledgers* from 1916 to 1923. The mean date, given in the *eighth* and *ninth* columns, is expressed in days and decimal of a day, reckoning from midnight at the commencement of the year. Columns *ten* and *eleven* give the differences of longitude and interval in days.

* Appendix to Greenwich Photo-Heliographic Results, 1907 and in subsequent volumes up to 1915.

DETERMINATION OF SOLAR ROTATION FROM LONG-LIVED SPOTS FROM 1878–1923.

Group Number and Spot.				Mean Latitude.	Mean Longitude.		Mean Date.		x.	y.	x/y.	Diurnal Motion.
1st Rotation.		2nd Rotation.			1st Rotation.	2nd Rotation.	1st Rotation.	2nd Rotation.				
				°	°	°			°		°	°
					Year 1878—1879. No suitable spots.							
					Year 1880.							
321	g	327	p	+25·3	89·04	84·32	127·9	152·4	− 4·72	24·5	−·19	13·99
342	l	351	g	+11·1	325·25	327·30	219·3	245·9	+ 2·05	26·6	+·08	14·26
343	g	354	p	+24·7	235·12	230·41	225·9	252·4	− 4·71	26·5	−·18	14·00
348	l	359	p	+22·4	190·98	190·03	232·8	256·0	− 0·95	23·2	−·04	14·14
397	l	403	g	+20·6	256·09	250·00	333·3	360·8	− 6·09	27·5	−·22	13·96
					Year 1881.							
408	l	419	g	+16·5	354·02	354·02	18·3	41·8	0·00	23·5	·00	14·18
410D	l	424	g	−19·0	239·16	240·14	26·2	50·8	+ 0·98	24·6	+·04	14·22
433	l	451	g	+21·3	342·14	335·62	71·9	97·4	− 6·52	25·5	−·25	13·93
436	l	453	g	−15·1	270·58	271·14	76·4	102·8	+ 0·56	26·4	+·02	14·20
453	g	471	p	−14·2	271·14	270·36	102·8	126·4	− 0·78	23·6	−·03	14·15
461	l	474	g	+ 6·8	152·93	167·15	112·3	133·8	+14·22	21·5	+·66	14·84
526	g	549	p	+27·8	307·22	293·17	208·8	237·4	−14·05	28·6	−·49	13·69
552	p	574	g	+14·6	266·20	263·47	240·3	265·9	− 2·73	25·6	−·11	14·07
553	l	575	g	+20·6	263·77	257·26	241·3	267·9	− 6·51	26·6	−·24	13·94
561	l	577	g	−25·0	180·02	173·08	245·8	271·0	− 6·94	25·2	−·27	13·91
566	l	582	g	+12·5	102·90	102·48	253·4	275·4	− 0·42	22·0	−·02	14·16
586	p	598	g	+14·2	39·18	41·45	283·8	310·8	+ 2·27	27·0	+·08	14·26
589	g	603	p	+16·4	289·10	286·81	291·9	319·9	− 2·29	28·0	−·08	14·10
594	p	605	p	+21·8	248·23	251·20	297·3	318·9	+ 2·97	21·6	+·14	14·32
603	p	625	g	+16·6	286·81	282·00	319·9	345·9	− 4·81	26·0	−·18	14·00
606	l	628	g	+16·9	237·00	238·34	323·7	350·4	+ 1·34	26·7	+·05	14·23
					Year 1882.							
642	l	658	p	+16·2	12·03	18·78	6·3	29·7	+ 6·75	23·4	+·29	14·47
653	g	677	l	−17·9	97·75	104·52	23·3	47·0	+ 6·77	23·7	+·28	14·46
664	l	687	f	−13·8	291·40	293·27	39·9	63·3	+ 1·87	23·4	+·08	14·26
672	l	699	l	−18·5	137·69	135·20	47·9	72·4	− 2·49	24·5	−·10	14·08
691	g	718	g	+ 0·3	221·78	224·63	68·8	95·9	+ 2·85	27·1	+·11	14·29
693	l	713	g	+24·4	270·20	267·14	68·4	90·9	− 3·06	22·5	−·13	14·05
702	l	732	g	−22·2	75·72	72·40	79·9	105·5	− 3·32	25·6	−·13	14·05
705	p	735	g	−10·4	3·01	6·77	85·3	112·4	+ 3·76	27·1	+·14	14·32
722	g	749	p	+20·8	160·78	155·36	100·9	126·9	− 5·42	26·0	−·21	13·97
744	g	767	g	+22·1	176·78	168·32	126·9	154·4	− 8·46	27·5	−·31	13·87
785	l	806	p	+10·0	198·72	199·34	181·4	203·4	+ 0·62	22·0	+·03	14·21
797	l	812	g	+14·8	293·25	296·74	199·9	225·9	+ 3·49	26·0	+·13	14·31
808	l	821	g	−11·5	127·55	128·69	214·9	239·4	+ 1·14	24·5	+·04	14·22
838	l	856	g	+11·8	201·67	203·19	260·7	288·3	+ 1·52	27·6	+·05	14·23
846	g	868	g	−22·0	50·18	43·26	271·9	299·9	− 6·92	28·0	−·25	13·93
868	g	890	g	−22·6	43·26	36·12	299·9	328·4	− 7·14	28·5	−·25	13·93
870	l	895	g	+15·9	334·31	330·78	305·9	331·4	− 3·53	25·5	−·14	14·04
885	g	908	l	+18·9	120·97	119·33	321·8	344·8	− 1·64	23·0	−·07	14·11

DETERMINATION OF SOLAR ROTATION FROM LONG-LIVED SPOTS FROM 1878–1923.

Group Number and Spot.				Mean Latitude.	Mean Longitude.		Mean Date.		x.	y.	x/y.	Diurnal Motion.
1st Rotation.		2nd Rotation.			1st Rotation.	2nd Rotation.	1st Rotation.	2nd Rotation.				
				°	°	°			°		°	°
						Year 1883						
927	g	946	g	−18·6	213·87	211·04	4·7	29·8	− 2·83	25·1	−·11	14·07
987	l	1011	l	+13·1	135·56	142·41	92·4	116·4	+ 6·85	24·0	+·28	14·46
999	l	1027	g	−22·1	307·61	300·90	106·8	134·8	− 6·71	28·0	−·24	13·94
1000	p	1026	g	−15·7	303·70	303·15	106·8	130·9	− 0·55	24·1	−·02	14·16
1071	p	1094	p	−10·3	176·04	178·02	196·6	224·9	+ 1·98	28·3	+·07	14·25
1109	g	1126	g	−18·8	253·95	249·48	246·9	274·4	− 4·47	27·5	−·16	14·02
1114	g	1133	g	−22·1	132·79	128·78	255·9	283·4	− 4·01	27·5	−·15	14·03
1133	g	1169	g	−22·8	128·78	118·66	283·4	311·4	−10·12	28·0	−·36	13·82
1144	g	1173	l	− 9·5	35·18	36·80	290·9	317·9	+ 1·62	27·0	+·06	14·24
1173	l	1198	p	− 9·6	36·80	34·65	317·9	345·4	− 2·15	27·5	−·08	14·10
1177	p	1206	p	−15·0	332·45	331·16	322·9	347·4	− 1·29	24·5	−·05	14·13
1216	l	1255	g	− 8·4	206·04	208·21	358·3	386·8	+ 2·17	28·5	+·07	14·25
1217	p	1256	g	+ 1·5	199·58	203·36	358·3	386·8	+ 3·78	28·5	+·13	14·31
						Year 1884.						
1267	p.*a*	1303	l.*a*	−25·4	27·66	19·61	35·8	63·9	− 8·05	28·1	−·28	13·90
1284	p	1320	g	− 9·5	207·39	208·31	48·9	76·4	+ 0·92	27·5	+·03	14·21
1288	l	1323	g	+13·4	178·68	188·52	51·3	78·4	+ 9·84	27·1	+·36	14·54
1324	p.*a*	1358	p.*a*	+ 7·8	180·37	182·59	78·9	104·8	+ 2·22	25·9	+·09	14·27
1330	l.*a*	1360	g	− 8·9	122·49	129·32	82·9	108·9	+ 6·83	26·0	+·26	14·44
1371	l.*a*	1393	g	− 9·5	26·95	28·88	116·9	144·3	+ 1·93	27·4	+·07	14·25
1381	p.*a*	1409	l.*a*	− 7·1	153·17	152·32	134·8	162·3	− 0·85	27·5	−·03	14·15
1388	p.*a*	1410	g	− 2·3	74·87	79·73	140·8	164·8	+ 4·86	24·0	+·20	14·38
1393	g	1414	g	− 8·8	28·88	31·55	144·3	170·9	+ 2·67	26·6	+·10	14·28
1409	l.*a*	1425	g	− 6·9	152·32	151·25	162·3	188·9	− 1·07	26·6	−·04	14·14
1438	l.*a*	1455	p.*a*	− 3·1	317·05	323·44	206·9	230·9	+ 6·39	24·0	+·26	14·44
1480	l.*a*	1501	l.*a*	+14·2	21·04	19·15	256·9	281·4	− 1·89	24·5	−·08	14·10
1480	f.*b*	1501	f.*b*	+14·2	10·88	10·50	257·4	277·4	− 0·38	20·0	−·02	14·16
1495	g	1518	g	−13·9	133·93	132·64	272·4	297·9	− 1·29	25·5	−·05	14·13
1532	l.*a*	1548	g	− 7·1	302·74	307·10	317·3	339·3	+ 4·36	22·0	+·20	14·38
1546	l.*a*	1563	p.*a*	+ 2·4	353·19	355·88	339·8	364·7	+ 2·69	24·9	+·11	14·29
						Year 1885.						
1632	l.*a*	1647	p.*a*	−16·3	243·54	243·08	93·4	116·9	− 0·46	23·5	−·02	14·16
1706	p.*a*	1720	p.*b*	+ 9·7	244·31	245·72	169·8	198·5	+ 1·41	28·7	+·05	14·23
1718	p.*a*	1737	p.*a*	− 9·6	292·79	297·54	195·0	221·9	+ 4·75	26·9	+·18	14·36
1728	p.*a*	1748	g	−12·7	175·00	173·17	203·5	230·9	− 1·83	27·4	−·06	14·12
1738	l.*a*	1759	p.*a*	−11·9	289·34	293·34	222·4	249·4	+ 4·00	27·0	+·15	14·33
1756	l	1767	g	− 3·2	24·34	28·47	245·4	269·4	+ 4·13	24·0	+·17	14·35
1773	l.*a*	1788	p.*a*	−15·5	263·10	260·51	278·8	306·2	− 2·59	27·4	−·09	14·09
						Year 1886.						
1828	l.*a*	1835	p.*a*	− 9·9	32·53	35·31	15·4	40·3	+ 2·78	24·9	+·11	14·29
1835	p.*a*	1852	p.*a*	− 9·0	35·31	35·70	40·3	67·4	+ 0·39	27·1	+·01	14·19
1853	l.*a*	1864	p.*a*	− 5·3	23·47	26·75	68·4	96·4	+ 3·28	28·0	+·12	14·30
1856	l.*a*	1869	g	+ 4·7	199·85	201·68	82·4	109·9	+ 1·83	27·5	+·06	14·24
1860	l.*a*	1874	p.*a*	−17·5	119·37	117·65	90·4	115·9	− 1·72	25·5	−·07	14·11

DETERMINATION OF SOLAR ROTATION FROM LONG-LIVED SPOTS FROM 1878–1923.

Group Number and Spot.				Mean Latitude.	Mean Longitude.		Mean Date.		x.	y.	x/y.	Diurnal Motion.
1st Rotation.		2nd Rotation.			1st Rotation.	2nd Rotation.	1st Rotation.	2nd Rotation.				
				°	°	°			°		°	°
						Year 1886.—*contd.*						
1864	p.*a*	1876	g	− 6·0	26·75	32·30	96·4	122·4	+ 5·55	26·0	+·21	14·39
1878	l.*a*	1884	g	−10·9	72·88	74·25	122·4	146·4	+ 1·37	24·0	+·05	14·23
1884	g	1897	g	−11·1	74·25	74·06	146·4	173·4	− 0·19	27·0	−·01	14·17
1891	l.*a*	1901	p.*a*	−14·9	304·61	301·99	157·9	183·4	− 2·62	25·5	−·10	14·08
1901	p.*a*	1910	p.*a*	−14·2	301·99	300·50	183·4	211·4	− 1·49	28·0	−·05	14·13
1906	l.*a*	1915	p.*a*	− 9·0	76·06	78·90	201·8	226·9	+ 2·84	25·1	+·11	14·29
						Year 1887.						
1987	p.*a*	1992	p.*a*	− 7·8	94·93	97·18	161·9	188·4	+ 2·25	26·5	+·08	14·26
1991	p.*a*	1996	p.*a*	−12·4	179·29	182·34	182·4	206·4	+ 3·05	24·0	+·13	14·31
1992	p.*a*	1998	g	− 7·4	97·18	97·53	188·4	215·4	+ 1·35	27·0	+·01	14·19
						Year 1888.						
						No suitable spots.						
						Year 1889.						
2085	l.*a*	2086	g	+ 5·8	312·67	315·14	73·4	95·4	+ 2·47	22·0	+·11	14·29
2090	l.*a*	2092	p.*a*	− 6·8	31·13	36·29	172·4	198·9	+ 5·16	26·5	+·19	14·37
2092	p.*a*	2099	g	− 8·1	36·29	36·91	198·9	225·9	+ 0·62	27·0	+·02	14·20
2097	l.*a*	2100	g	−19·8	164·72	160·38	218·9	243·9	− 4·34	25·0	−·17	14·01
						Year 1890.						
2159	l.*a*	2165	l.*a*	+20·4	311·40	310·10	331·9	353·9	− 1·30	22·0	−·06	14·12
						Year 1891.						
2183	l.*a*	2193	g	+19·6	280·31	284·54	51·4	77·9	+ 4·23	26·5	+·16	14·34
2204	l.*a*	2220	g	−19·5	137·30	135·48	115·9	143·4	− 1·82	27·5	−·06	14·12
2247	l.*a*	2266	p.*a*	−21·9	37·39	29·62	178·9	202·9	− 7·77	24·0	−·32	13·86
2294	l.*a*	2311	p.*a*	+26·2	178·03	170·43	248·9	276·9	− 7·60	28·0	−·27	13·91
2299	p.*a*	2318	p.*a*	+14·4	51·69	53·66	258·9	285·9	+ 1·97	27·0	+·07	14·25
2349	l.*a*	2364	g	−19·7	265·44	267·67	324·4	351·9	+ 2·23	27·5	+·08	14·26
						Year 1892.						
2376	l.*a*	2411	p.*a*	+21·6	39·88	45·56	3·4	28·4	+ 5·68	25·0	+·22	14·40
2405	p.*a*	2431	p.*a*	+19·0	148·77	144·39	22·9	50·9	− 4·38	28·0	−·15	14·03
2448	p.*a*	2481	p.*a*	+10·5	105·95	106·73	80·9	107·9	+ 0·78	27·0	+·03	14·21
2481	p.*a*	2512	p.*a*	+10·8	106·73	107·83	107·9	132·4	+ 1·10	24·5	+·04	14·22
2492	p.*a*	2528	g	−17·6	313·77	313·11	119·9	144·9	− 0·66	25·0	−·03	14·15
2507	p.*a*	2545	p.*a*	+18·6	166·89	163·13	130·9	155·9	− 3·76	25·0	−·15	14·03
2530	l.*a*	2562	l.*a*	+11·1	2·46	359·94	144·9	167·9	− 2·52	23·0	−·11	14·07
2550	p.*a*	2581	l.*a*	+10·4	85·27	89·60	163·4	191·4	+ 4·33	28·0	+·15	14·33
2560	f.*a*	2583	p.*a*	−31·3	46·98	32·96	168·4	194·9	−14·02	26·5	−·53	13·65
2580	l.*a*	2612	g	−22·4	98·51	91·18	189·9	217·9	− 7·33	28·0	−·26	13·92

DETERMINATION OF SOLAR ROTATION FROM LONG-LIVED SPOTS FROM 1878–1923.

Group Number and Spot.				Mean Latitude.	Mean Longitude.		Mean Date.		x.	y.	x/y.	Diurnal Motion.
1st Rotation.		2nd Rotation.			1st Rotation.	2nd Rotation.	1st Rotation.	2nd Rotation.				
				°	°	°			°		°	°
					Year 1892. *contd.*—							
2581	l.a	2611	p.d	+11·4	89·60	93·18	191·4	218·4	+ 3·58	27·0	+·13	14·31
2583	p.a	2615	p.a	−30·8	32·96	16·58	194·9	222·9	−16·38	28·0	−·58	13·60
2586	l.a	2623	g	− 8·2	302·04	303·22	201·9	228·9	+ 1·18	27·0	+·04	14·22
2598	l.a	2636	p.a	+12·7	176·14	173·73	211·4	238·9	− 2·41	27·5	−·09	14·09
2611	p.d	2643	p.a	+10·6	93·18	93·14	218·4	244·9	− 0·04	26·5	·00	14·18
2612	g	2644	p.a	−22·4	91·18	81·88	217·9	245·9	− 9·30	28·0	−·33	13·85
2643	p.a	2675	p.a	+10·4	93·14	91·53	244·9	272·4	− 1·61	27·5	−·06	14·12
2726	l.a	2760	p.a	+ 7·5	290·76	291·45	310·4	338·9	+ 0·69	28·5	+·02	14·20
2730	l.a	2759	g	+19·8	296·36	292·94	313·4	337·9	− 3·42	24·5	−·14	14·04
2749	p.a	2787	l.a	−15·6	6·69	7·41	333·4	360·9	+ 0·72	27·5	+·02	14·20
2773	l.a	2794	g	−11·6	264·32	271·59	342·4	365·9	+ 7·27	23·5	+·31	14·49
					Year 1893.							
2853	l.a	2889	p.a	+14·8	303·98	304·26	53·9	80·4	+ 0·28	26·5	+·01	14·19
2881	l.a	2914	l.a	− 7·9	42·64	50·08	73·9	100·4	+ 7·44	26·5	+·28	14·46
2893	p.a	2930	p.a	+24·1	274·96	268·53	83·9	109·9	− 6·43	26·0	−·25	13·93
2906	p.a	2939	p.a	−14·3	182·29	190·02	90·9	116·9	+ 7·73	26·0	+·30	14·48
2919	l.a	2956	l.a	−27·7	57·71	50·43	101·4	128·4	− 7·28	27·0	−·27	13·91
2923	l.a	2964	p.a	−13·7	331·87	331·04	106·9	132·9	− 0·83	26·0	−·03	14·15
2951	p.a	2992	l.a	−20·1	93·77	91·05	124·9	151·9	− 2·72	27·0	−·10	14·08
2993	l.a	3034	l.a	−20·0	79·68	77·36	152·9	177·4	− 2·32	24·5	−·09	14·09
3005	p.a	3047	g	−12·2	321·73	322·38	161·9	188·9	+ 0·65	27·0	+·02	14·20
3015	l.c	3054	l.a	−20·2	288·43	284·03	168·9	191·9	− 4·40	23·0	−·19	13·99
3020	f.c	3071	p.a	+17·3	220·32	217·30	172·4	196·9	− 3·02	24·5	−·12	14·06
3054	l.a	3110	g	−21·4	284·03	278·00	191·9	215·9	− 6·03	24·0	−·25	13·93
3059	l.a	3098	p.a	+10·9	318·30	322·53	190·9	216·4	+ 4·23	25·5	+·17	14·35
3067	l.a	3112	p.a	+16·9	251·63	245·24	194·4	220·9	− 6·39	26·5	−·24	13·94
3078	p.a	3185	l.a	−20·2	108·63	103·07	204·9	232·4	− 5·56	27·5	−·20	13·98
3106	l.a	3156	p.a	−19·1	296·39	292·08	218·9	245·9	− 4·31	27·0	−·16	14·02
3107	l.a	3155	p.a	+14·0	301·51	301·85	219·9	244·9	+ 0·34	25·0	+·01	14·19
3154	l.a	3202	p.a	−11·1	307·04	305·59	244·9	271·9	− 1·45	27·0	−·05	14·13
3155	p.a	3203	p.a	+13·5	301·85	300·65	244·9	272·4	− 1·20	27·5	−·04	14·14
3173	l.a	3216	g	− 8·1	170·54	176·17	254·9	281·9	+ 5·63	27·0	+·21	14·39
3203	p.a	3250	p.a	+13·4	300·65	298·28	272·4	299·9	− 2·37	27·5	−·08	14·10
3206	l.c	3246	l.a	+ 9·1	326·12	335·01	273·4	294·9	+ 8·89	21·5	+·41	14·59
3227	p.a	3266	g	+23·0	85·73	80·60	288·9	311·9	− 5·13	23·0	−·22	13·96
3287	l.a	3304	g	+19·0	334·58	334·94	325·9	350·9	+ 0·36	25·0	+·01	14·19
3305	g	3352	g	− 1·4	330·12	335·93	351·9	378·9	+ 5·81	27·0	+·21	14·39
3318	l.a	3367	p.a	− 3·0	225·00	234·05	358·9	387·4	+ 9·05	28·5	+·32	14·50
3323	l.a	3370	g	−10·2	197·08	201·61	361·9	386·4	+ 4·53	24·5	+·18	14·36
3325	p.a	3372	l.a	− 7·2	168·72	173·82	364·4	391·9	+ 5·10	27·5	+·18	14·36
					Year 1894.							
3356	l.a	3396	l.a	+11·5	309·73	309·60	15·9	42·9	− 0·13	27·0	·00	14·18
3360	l.a	3401	g	−14·8	268·03	267·56	18·9	46·9	− 0·47	28·0	−·02	14·16
3371	l.a	3402	p.a	+16·2	264·52	265·40	22·4	46·9	+ 0·88	24·5	+·03	14·21
3402	p.a	3443	g	+16·9	265·40	263·98	46·9	73·4	− 1·42	26·5	−·05	14·13
3414	l.a	3442	p.a	− 4·4	262·03	270·63	50·9	73·9	+ 8·60	23·0	+·37	14·55
3413	p.a	3449	p.a	−25·8	152·24	143·30	54·9	79·9	− 8·94	25·0	−·36	13·82
3460	l.a	3492	p.a	+10·9	54·75	54·94	90·4	116·9	+ 0·19	26·5	+·01	14·19

DETERMINATION OF SOLAR ROTATION FROM LONG-LIVED SPOTS FROM 1878–1923.

Group Number and Spot.				Mean Latitude.	Mean Longitude.		Mean Date.		x.	y.	x/y.	Diurnal Motion.
1st Rotation.		2nd Rotation.			1st Rotation.	2nd Rotation.	1st Rotation.	2nd Rotation.				
				°	°	°			°		°	°
						Year 1894.—*contd.*						
3465	p.*a*	3495	g	+15·1	21·81	19·68	91·9	118·4	− 2·13	26·5	−·08	14·10
3533	p.*a*	3581	p.*a*	+12·8	357·05	359·54	148·9	175·9	+ 2·49	27·0	+·09	14·27
3537	p.*a*	3585	p.*a*	+15·7	314·54	315·87	151·9	178·9	+ 1·33	27·0	+·05	14·23
3546	l.*a*	3583	p.*a*	− 1·0	343·60	348·34	152·9	175·9	+ 4·74	23·0	+·20	14·38
3575	l.*a*	3624	l.*a*+*b*	−13·3	77·21	76·71	169·9	196·9	− 0·50	27·0	−·02	14·16
3581	p.*a*	3637	l.*a*	+13·1	359·54	359·57	175·9	202·9	+ 0·03	27·0	·00	14·18
3599	l.*a*	3652	l.*a*	+11·9	188·78	192·48	188·9	213·9	+ 3·70	25·0	+·15	14·33
3604	f.*c*	3654	p.*a*	−19·3	167·43	162·40	189·9	214·9	− 5·03	25·0	−·20	13·98
3640	l.*a*	3674	p.*a*	− 7·2	329·83	336·38	205·9	230·9	+ 6·55	25·0	+·26	14·44
3642	p.*a*	3679	g	+18·2	300·98	297·94	206·9	232·9	− 3·04	26·0	−·11	14·07
3702	g	3734	p.*a*	+17·1	42·00	41·02	253·9	281·9	− 0·98	28·0	−·04	14·14
3732	p.*a*	3776	g	+12·7	56·43	54·43	280·9	306·9	− 2·00	26·0	−·08	14·10
3817	l.*a*	3836	p.*a*	−14·0	34·18	31·75	338·4	362·9	− 2·43	24·5	−·10	14·08
						Year 1895.						
3847	p.*a*	3883	p.*a*	−18·3	307·52	301·00	5·4	31·9	− 6·52	26·5	−·24	13·94
3884	l.*a*	3916	p.*a*	+13·8	304·95	308·79	32·9	59·9	+ 3·84	27·0	+·14	14·32
3916	p.*a*	3955	g	+12·8	308·79	307·40	59·9	84·4	− 1·39	24·5	−·06	14·12
3933	p.*a*	3964	g	+13·0	183·63	184·01	69·9	95·9	+ 0·38	26·0	+·01	14·19
3968	p.*a*	4005	l.*a*	−13·6	134·53	141·38	100·9	127·9	+ 6·85	27·0	+·25	14·43
3989	l.*a*	4024	p.*a*	+23·0	303·57	299·61	114·9	142·9	− 3·96	28·0	−·14	14·04
3996	l.*a*	4025	g	−12·8	297·60	298·44	118·4	141·9	+ 0·84	23·5	+·03	14·21
4028	l.*a*	4061	p.*a*	−23·9	275·42	273·39	144·9	170·9	− 2·03	26·0	−·08	14·10
4049	p.*a*	4077	p.*a*	−18·2	82·06	76·85	158·9	186·4	− 5·21	27·5	−·19	13·99
4084	l.*a*	4112	p.*a*	− 6·4	1·61	3·12	192·9	219·4	+ 1·51	26·5	+·05	14·23
4107	l.*a*	4133	p.*a*	− 8·7	79·28	79·33	214·9	240·9	+ 0·05	26·0	00	14·18
4110	l.*a*	4139	p.*a*	+10·8	27·53	27·70	219·4	244·9	+ 0·17	25·5	+·01	14·19
4139	p.*a*	4180	p.*a*	+11·2	27·70	26·12	244·9	272·4	− 1·58	27·5	−·06	14·12
4208	l.*a*	4229	p.*a*	+19·0	360·15	359·95	302·4	327·4	− 0·20	25·0	−·01	14·17
4210	l.*a*	4230	p.*a*	+ 9·5	328·06	331·31	305·9	328·9	+ 3·25	23·0	+·14	14·32
4211	l.*a*	4231	p.*b*	+11·6	292·96	297·06	306·9	333·4	+ 4·10	26·5	+·15	14·33
4234	l.*a*	4256	l.*a*	−13·4	304·78	305·52	336·9	360·9	+ 0·74	24·0	+·03	14·21
4255	l.*a*	4277	p.*a*	−10·5	322·18	323·69	358·9	386·4	+ 1·51	27·5	+·05	14·23
4256	l.*a*	4278	p.*a*	−13·8	305·52	303·97	360·9	387·9	− 1·55	27·0	−·06	14·12
						Year 1896.						
4305	l.*a*	4320	p.*a*	−15·9	156·02	160·07	64·4	85·4	+ 4·05	21·0	+·19	14·37
4369	l.*a*	4386	p.*a*	−15·1	219·87	216·72	165·4	191·4	− 3·15	26·0	−·12	14·06
4395	p.*a*	4407	p.*a*	−20·4	124·04	120·63	199·9	228·4	− 3·41	28·5	−·12	14·06
4416	l.*a*	4435	l.*a*	−11·2	297·02	301·78	243·4	267·9	+ 4·76	24·5	+·19	14·37
4435	l.*a*	4446	p.*a*	−11·1	301·78	304·05	267·9	292·9	+ 2·27	25·0	+·09	14·27
4456	p.*a*	4473	p.*a*	−16·0	76·38	77·74	312·9	336·4	+ 1·36	23·5	+·06	14·24
						Year 1897.						
4505	l.*a*	4526	g	+ 6·4	204·06	212·09	22·4	45·9	+ 8·03	23·5	+·34	14·52
4517	l.*a*	4532	p.*a*	− 1·1	27·01	35·26	34·9	58·9	+ 8·25	24·0	+·34	14·52
4518	l.*a*	4535	p.*a*	− 6·2	347·98	347·81	34·9	62·9	− 0·17	28·0	−·01	14·17
4523	l.*a*	4531	l.*a*	+13·2	40·90	45·84	34·9	58·4	+ 4·94	23·5	+·21	14·39

DETERMINATION OF SOLAR ROTATION FROM LONG-LIVED SPOTS FROM 1878–1923.

Group Number and Spot.				Mean Latitude.	Mean Longitude.		Mean Date.		x.	y.	x/y.	Diurnal Motion.
1st Rotation.		2nd Rotation.			1st Rotation.	2nd Rotation.	1st Rotation.	2nd Rotation.				
				°	°	°			°		°	°
						Year 1897—*contd.*						
4526	g	4541	f.*c*	+ 6·1	212·09	216·05	45·9	72·4	+ 3·96	26·5	+·15	14·33
4532	p.*a*	4549	p.*a*	− 1·3	35·26	41·24	58·9	85·4	+ 5·98	26·5	+·22	14·40
4560	l.*c*	4573	p.*a*	+ 2·9	225·92	232·96	100·4	125·9	+ 7·04	25·5	+·27	14·45
4579	p.*a*	4588	p.*a*	− 8·9	270·13	271·36	150·4	177·4	+ 1·23	27·0	+·04	14·22
4588	p.*a*	4599	g	− 9·0	271·36	271·77	177·4	200·4	+ 0·41	23·0	+·02	14·20
4605	l.*a*	4615	p.*a*	− 5·4	69·56	70·91	219·9	246·9	+ 1·35	27·0	+·05	14·23
4615	p.*a*	4634	p.*a*	− 5·9	70·91	73·03	246·9	273·9	+ 2·12	27·0	+·08	14·26
4663	p.*a*	4674	p.*a*	+ 9·8	210·83	209·10	345·9	372·9	− 1·73	27·0	−·06	14·12
						Year 1898.						
4687	g	4704	p.*a*	− 7·5	100·77	104·12	43·9	70·9	+ 3·35	27·0	+·12	14·30
4765	p.*a*	4778	g	+11·1	333·88	341·41	216·9	243·4	+ 7·53	26·5	+·28	14·46
4781	l.*a*	4791	p.*a*	−12·4	240·94	240·75	250·9	278·4	− 0·19	27·5	−·01	14·17
						Year 1899.						
4848	p.*a*	4855	p.*a*	−12·8	61·40	61·18	90·9	117·9	− 0·22	27·0	−·01	14·17
4855	p.*a*	4857	p.*a*	−12·6	61·18	61·14	117·9	144·9	− 0·04	27·0	·00	14·18
						Year 1900.						
4915	l.*a*	4917	p.*a*	−11·3	290·84	292·14	66·3	90·4	+ 1·30	24·1	+·05	14·23
						Year 1901.						
4953	l.*a*	4955	p.*a*	+ 9·3	165·72	168·66	145·4	171·3	+ 2·94	25·9	+·11	14·29
						Year 1902.						
						No suitable spots.						
						Year 1903.						
5088	l.*a*	5095	g	+13·9	92·72	92·15	269·0	291·8	− 0·57	22·8	−·03	14·15
5091	l.*a*	5099	p.*a*	+13·9	244·70	248·54	280·9	305·4	+ 3·84	24·5	+·16	14·34
5100	l.*a*	5116	l.*a*	+16·9	236·52	233·58	308·9	335·7	− 2·94	26·8	−·11	14·07
5100	f.*b*	5116	f.*b*	+16·6	227·12	227·53	309·3	336·2	+ 0·41	26·9	+·02	14·20
5104	l.*a*	5120	g	−26·8	165·68	154·79	317·3	339·3	−10·89	22·0	−·49	13·69
5129	p.*a*	5146	p.*a*	+18·9	86·96	83·94	346·8	374·9	− 3·02	28·1	−·11	14·07
						Year 1904.						
5183	p.*a*	5204	g	+ 8·1	237·11	244·82	79·9	105·5	+ 7·71	25·6	+·30	14·48
5195	g	5210	l.*a*	+13·6	105·42	111·27	89·9	117·9	+ 5·85	28·0	+·21	14·39
5269	l.*a*	5291	g	−18·6	60·31	58·56	203·5	227·5	− 1·75	24·0	−·07	14·11
5317	l.*a*	5329	p.*a*	−23·1	326·88	320·27	267·7	290·4	− 6·61	22·7	−·29	13·89

DETERMINATION OF SOLAR ROTATION FROM LONG-LIVED SPOTS FROM 1878–1923.

Group Number and Spot.				Mean Latitude.	Mean Longitude.		Mean Date.		x.	y.	x/y.	Diurnal Motion.
1st Rotation.		2nd Rotation.			1st Rotation.	2nd Rotation.	1st Rotation.	2nd Rotation.				
				°	°	°			°		°	°
						Year 1904—*contd.*						
5322	l.a	5351	p.a	−16·2	56·63	59·87	286·7	311·3	+ 3·24	24·6	+·13	14·31
5366	p.a	5396	p.a	+28·8	246·30	239·92	329·2	349·4	− 6·38	20·2	−·31	13·87
5390	p.a	5420	p.a	+17·6	268·46	263·30	350·3	376·9	− 5·16	26·6	−·19	13·99
						Year 1905.						
5441	p.a	5471	p.a	−16·2	329·49	330·75	33·9	61·3	+ 1·26	27·4	+·05	14·23
5524	l.a	5542	p.b	+11·1	162·11	167·28	131·4	155·8	+ 5·17	24·4	+·21	14·39
5529	l.a	5550	p.a	−15·2	67·23	69·86	136·8	162·8	+ 2·63	26·0	+·10	14·28
5529	f.c	5553	p.a	−14·9	53·80	52·42	136·8	164·4	− 1·38	27·6	−·05	14·13
5589	l.a	5620	p.a	+12·6	343·62	346·62	197·1	223·9	+ 3·00	26·8	+·11	14·29
5597	l.a	5622	l.a	+14·6	323·72	323·89	202·0	225·9	+ 0·17	23·9	+·01	14·19
5622	l.a	5653	p.a	+13·5	323·89	325·77	225·9	250·9	+ 1·88	25·0	+·07	14·25
5628	l.a	5655	p.a	+ 3·2	273·68	286·28	231·9	254·9	+12·60	23·0	+·55	14·73
5680	l.a	5703	p.a	+13·2	236·25	238·70	286·4	313·8	+ 2·45	27·4	+·09	14·27
5713	p.a	5745	l.a	−17·6	157·37	158·36	319·8	343·3	+ 0·99	23·5	+·04	14·22
5747	l.a	5775	l.a	+ 8·0	99·09	104·78	351·4	378·9	+ 5·69	27·5	+·20	14·38
5766	l.a	5788	g	− 8·1	281·78	286·93	364·8	391·8	+ 5·15	27·0	+·19	14·37
						Year 1906.						
5775	l.a	5798	p.a	+ 8·5	104·78	107·02	13·9	40·4	+ 2·24	26·5	+·08	14·26
5785	l.a	5802	p.a	−10·9	335·38	339·01	24·3	50·3	+ 3·63	26·0	+·14	14·32
5790	l.a	5803	l.a	+14·1	303·51	309·04	27·9	52·9	+ 5·53	25·0	+·22	14·40
5817	l.a	5843	p.a	+19·3	106·95	106·21	70·7	95·4	− 0·74	24·7	−·03	14·15
5871	l.a	5889	p.a	+11·9	133·93	135·40	147·4	175·0	+ 1·47	27·6	+·05	14·23
5886	l.a	5898	p.a	+20·9	7·22	6·62	160·5	184·5	− 0·60	24·0	−·03	14·15
5894	p.a	5928	p.a	+10·4	45·09	48·20	182·5	206·6	+ 3·11	24·1	+·13	14·31
5898	p.a	5931	p.a	+21·5	6·62	1·25	184·5	211·9	− 5·37	27·4	−·19	13·99
5912	p.a	5935	p.a	+18·2	201·55	199·93	197·0	224·0	− 1·62	27·0	−·06	14·12
5931	p.a	5946	p.a	+22·4	1·25	353·78	211·9	240·4	− 7·47	28·5	−·26	13·92
5933	l.a	5944	p.a	−16·2	24·87	23·90	213·2	238·0	− 0·97	24·8	−·04	14·14
6004	l.a	6034	p.a	−11·4	60·75	63·19	316·8	341·9	+ 2·44	25·1	+·10	14·28
						Year 1907.						
6059	l.a	6098	p.a	+ 7·7	109·47	113·15	2·8	29·8	+ 3·68	27·0	+·13	14·31
6075	p.a	6103	l.a	−13·2	329·72	337·20	13·3	40·4	+ 7·48	27·1	+·28	14·46
6088	l.a	6112	g	−16·2	232·38	233·94	21·3	43·4	+ 1·56	22·1	+·07	14·25
6090	p.a	6115	p.a	+ 5·0	174·10	176·73	24·8	49·3	+ 2·63	24·5	+·11	14·29
6099	l.a	6123	p.a	+22·6	83·59	77·25	32·3	59·3	− 6·34	27·0	−·23	13·95
6103	l.a	6136	l.a	−13·5	337·20	339·29	40·4	66·4	+ 2·09	26·0	+·08	14·26
6134	p.a	6156	g	+12·4	356·75	355·69	65·9	92·4	− 1·06	26·5	−·04	14·14
6140	p.a	6161	g	−17·1	309·25	303·50	69·4	96·9	− 5·75	27·5	−·21	13·97
6172	l.a	6189	g	+ 7·4	77·53	82·27	114·4	139·5	+ 4·74	25·1	+·19	14·37
6205	l.a	6215	p.a	−17·8	68·20	63·71	170·0	196·9	− 4·49	26·9	−·17	14·01
6215	p.a	6233	p.a	−19·0	63·71	56·48	196·9	224·9	− 7·23	28·0	−·26	13·92
6236	l.a	6255	p.a	−23·3	337·43	325·10	230·9	259·0	−12·33	28·1	−·44	13·74
6243	l.a	6267	p.a	−16·8	134·33	134·83	248·0	272·9	+ 0·50	24·9	+·02	14·20
6247	p.a	6273	p.a	− 7·1	37·25	36·46	253·5	278·3	− 0·79	24·8	−·03	14·15
6256	p.a	6280	p.a	+ 7·4	308·72	310·71	260·0	287·4	+ 1·99	27·4	+·07	14·25

DETERMINATION OF SOLAR ROTATION FROM LONG-LIVED SPOTS FROM 1878–1923.

Group Number and Spot.				Mean Latitude.	Mean Longitude.		Mean Date.		x.	y.	x/y.	Diurnal Motion.
1st Rotation.		2nd Rotation.			1st Rotation.	2nd Rotation.	1st Rotation.	2nd Rotation.				
				°	°	°			°		°	°
						Year 1907—*contd.*						
6276	p.*a*	6293	p.*a*	−21·1	351·15	352·48	285·9	310·3	+ 1·33	24·4	+·05	14·23
6296	l.*a*	6316	l.*a*	−13·9	338·87	341·35	312·8	339·9	+ 2·48	27·1	+·09	14·27
6300	l.*a*	6318	p.*a*	+12·1	270·15	277·20	318·8	344·4	+ 7·05	25·6	+·27	14·45
6318	p.*a*	6335	g	+13·1	277·20	276·43	344·4	370·4	− 0·77	26·0	−·03	14·15
6323	l.*a*	6344	g	−15·9	220·11	226·35	350·8	376·4	+ 6·24	25·6	+·24	14·42
6324	l.*a*	6349	l.*a*	− 4·5	143·43	147·64	354·8	381·4	+ 4·21	26·6	+·16	14·34
						Year 1908.						
6390	g	6416	g	− 9·0	180·81	184·39	96·4	123·4	+ 3·58	27·0	+·13	14·31
6393	g	6420	p.*a*	−15·1	161·85	162·32	98·9	124·8	+ 0·47	25·9	+·02	14·20
6420	p.*a*	6440	g	−15·0	162·32	158·46	124·8	152·4	− 3·86	27·6	−·14	14·04
6436	l.*a*	6453	g	+10·9	331·52	333·34	139·4	165·9	+ 1·82	26·5	+·07	14·25
6441	p.*a*	6464	p.*a*	− 3·0	144·56	154·06	152·9	179·9	+ 9·50	27·0	+·35	14·53
6465	p.*a*	6489	g	−16·4	130·64	127·16	181·8	208·9	− 3·48	27·1	−·13	14·05
6494	l.*a*	6517	p.*a*	− 6·4	354·04	354·91	221·3	245·9	+ 0·87	24·6	+·03	14·21
6499	l.*a*	6519	p.*a*	− 5·5	274·38	279·67	228·8	251·9	+ 5·29	23·1	+·23	14·41
6517	p.*a*	6535	p.*a*	− 6·5	354·91	357·15	245·9	271·9	+ 2·24	26·0	+·08	14·26
6519	p.*a*	6539	p.*a*	− 5·4	279·67	278·77	251·9	278·9	− 0·90	27·0	−·03	14·15
6520	g	6540	p.*a*	+12·2	268·24	271·61	253·4	280·0	+ 3·37	26·6	+·13	14·31
6540	p.*a*	6558	g	+12·4	271·61	271·71	280·0	306·4	+ 0·10	26·4	·00	14·18
6577	p.*a*	6592	p.*a*	+11·6	168·05	166·50	342·8	369·7	− 1·55	26·9	−·06	14·12
6589	l.*a*	6602	g	− 3·0	322·42	326·70	361·2	384·9	+ 4·28	23·7	+·18	14·36
						Year 1909.						
6592	p.*a*	6609	p.*a*	+10·0	166·50	167·18	3·7	30·9	+ 0·68	27·2	+·02	14·20
6602	g	6618	g	− 3·0	326·70	331·98	18·9	44·9	+ 5·28	26·0	+·20	14·38
6604	p.*a*	6621	p.*a*	+ 8·2	296·89	298·53	21·3	47·9	+ 1·64	26·6	+·06	14·24
6610	p.*a*	6628	p.*a*	−16·8	152·64	150·83	31·7	58·7	− 1·81	27·0	−·07	14·11
6676	l.*a*	6686	p.*a*	− 1·6	341·98	347·21	157·8	180·8	+ 5·23	23·0	+·23	14·41
6695	l.*a*	6711	p.*a*	+ 6·6	40·85	42·53	204·5	230·8	+ 1·68	26·3	+·06	14·24
6722	l.*a*	6733	p.*a*	−12·6	158·62	168·60	251·3	276·8	+ 9·98	25·5	+·39	14·57
6723	l.*a*	6734	p.*a*	− 1·1	163·10	167·08	252·6	276·8	+ 3·98	24·2	+·16	14·34
6733	p.*a*	6754	*a*	−13·3	168·60	167·82	276·8	302·9	− 0·78	26·2	−·03	14·15
6734	p.*a*	6753	g	+ 0·4	167·08	169·73	276·8	303·9	+ 2·65	27·1	+·10	14·28
6746	p.*a*	6765	g.*a*	− 4·9	311·83	310·67	293·3	320·3	− 1·16	27·0	−·04	14·14
6756	l.*a*	6778	g.*a*	− 4·9	94·51	97·79	309·8	333·9	+ 3·28	24·1	+·13	14·31
6771	l.*a*	6786	g.*a*	−13·4	182·65	184·13	329·8	356·8	+ 1·48	27·0	+·05	14·23
6772	p.*a*	6787	g.*a*	−12·7	167·24	172·30	330·9	357·9	+ 5·06	27·0	+·19	14·37
6774	l.*a*	6788	p.*a*	+14·7	171·99	170·32	332·3	357·9	− 1·67	25·6	−·06	14·12
6793	p.*a*	6809	p.*a*	−15·7	84·22	82·08	364·3	391·8	− 2·14	27·5	−·08	14·10
						Year 1910.						
6796	l.*a*	6811	g	+ 5·4	58·98	65·95	1·7	28·3	+ 6·97	26·6	+·26	14·44
6813	l.*a*	6826	*b*	−15·3	187·97	187·22	46·9	72·8	− 0·75	25·9	−·03	14·15
6813	f.*b*	6826	*c*	−11·7	184·11	188·19	46·9	73·9	+ 4·08	27·0	+·15	14·33
6817	l.*a*	6827	p.*a*	− 7·3	107·21	115·23	55·4	77·9	+ 8·02	22·5	+·36	14·54
6823	l.*a*	6828	g.*a*	+15·9	3·39	3·41	62·4	87·4	+ 0·02	25·0	00	14·18
6849	l.*a*	6859	p.*a*	−10·5	51·35	54·75	138·4	162·0	+ 3·40	23·6	+·14	14·32
6874	p.*a*	6880	p.*a*	−15·6	48·39	47·18	220·5	248·0	− 1·21	27·5	−·04	14·14

DETERMINATION OF SOLAR ROTATION FROM LONG-LIVED SPOTS FROM 1878–1923.

Group Number and Spot.				Mean Latitude.	Mean Longitude.		Mean Date.		x.	y.	x/y.	Diurnal Motion.
1st Rotation.		2nd Rotation.			1st Rotation.	2nd Rotation.	1st Rotation.	2nd Rotation.				
				°	°	°			°		°	°
						Year 1911.						
6937	l.*a*	6942	g	− 1·8	195·23	202·86	90·9	116·9	+ 7·63	26·0	+·29	14·47
6944	g.*a*	6950	g.*a*	− 6·2	189·45	193·38	117·9	140·8	+ 3·93	22·9	+·17	14·35
						Years 1912 and 1913. No suitable Spots.						
						Year 1914.						
7060	p.*a*	7068	g.*a*	+18·4	68·01	65·21	230·9	258·5	− 2·80	27·6	−·10	14·08
7102	l.*a*	7122	g	−22·8	115·90	109·44	336·4	363·9	− 6·46	27·5	−·24	13·94
						Year 1915.						
7169	p.*a*	7204	p.*a*	+23·4	239·27	234·49	42·4	69·4	− 4·78	27·0	−·18	14·00
7223	p.*a*	7255	l.*a*	+19·9	299·89	295·52	93·9	121·4	− 4·37	27·5	−·16	14·02
7255	l.*a*	7285	g.*a*	+20·2	295·52	289·00	121·4	149·4	− 6·52	28·0	−·23	13·95
7266	l.*a*	7282	p.*a*	+21·7	317·02	312·35	123·4	147·4	− 4·67	24·0	−·19	13·99
7304	l.*a*	7341	p.*a*	+17·6	6·02	10·32	174·4	197·4	+ 4·30	23·0	+·19	14·37
7315	l.*a*	7343	g.*a*	+19·5	347·58	350·06	174·9	198·9	+ 2·48	24·0	+·10	14·28
7341	p.*a*	7384	g.*a*	+18·0	10·32	9·08	197·4	224·9	− 1·24	27·5	−·05	14·13
7406	l.*a*	7445	g.*a*	+22·2	189·53	184·93	239·4	263·9	− 4·60	24·5	−·19	13·99
7418	g.*a*	7450	g.*a*	−16·3	77·16	81·54	246·9	273·4	+ 4·38	26·5	+·17	14·35
7564	p.*a*	7595	g	+10·3	173·40	175·30	352·4	375·9	+ 1·90	23·5	+·08	14·26
						Year 1916.						
7595	g	7622	g	+10·8	175·30	174·60	10·9	38·4	− 0·70	27·5	−·03	14·15
7618	l.*a*	7646	g	−13·1	239·01	241·79	34·9	59·9	+ 2·78	25·0	+·11	14·29
7683	l.*a*	7701	l.*a*	+20·1	231·20	233·81	93·4	111·9	+ 2·61	18·5	+·14	14·32
7683	f.*b*	7701	f.*b*	+20·6	227·40	224·36	93·4	113·4	− 3·04	20·0	−·15	14·03
7708	g	7733	g	+10·4	107·29	108·73	125·4	152·4	+ 1·44	27·0	+·05	14·23
7733	g	7756*	g	+10·2	108·73	111·40	152·4	175·4	+ 2·67	23·0	+·12	14·30
7737	l.*a*	7751	l.*a*	+12·8	128·40	128·64	155·3	178·4	+ 0·24	23·1	+·01	14·19
7737	f.*b*	7751	f.*b*	+14·0	122·77	124·92	155·3	177·9	+ 2·15	22·6	+·10	14·28
7740	l.*a*	7767	l.*a*	+ 6·8	297·91	302·18	164·9	189·9	+ 4·27	25·0	+·17	14·35
7746	l.*a*	7769	g	+13·4	273·90	277·33	170·4	193·9	+ 3·43	23·5	+·15	14·33
7748	l.*a*	7771	g	+17·1	180·92	180·05	176·4	201·4	− 0·87	25·0	−·03	14·15
7769	g	7789	g	+12·9	277·33	275·26	193·9	221·4	− 2·07	27·5	−·07	14·11
7772	l.*a*	7796	g	+ 8·8	164·01	168·69	204·4	229·4	+ 4·68	25·0	+·19	14·37
7820	l.*a*	7852	g	+24·5	134·38	131·27	259·4	286·9	− 3·11	27·5	−·11	14·07
7831	f.*b*	7845	g	+18·4	148·60	145·38	262·4	285·9	− 3·22	23·5	−·14	14·04
7833	l.*a*	7853	g	+26·2	112·44	113·22	264·4	288·4	+ 0·78	24·0	+·03	14·21
7845	g	7870	f.*b*	+17·5	145·38	147·25	285·9	313·4	+ 1·87	27·5	+·07	14·25
7853	g	7876	l.*a*	+24·8	112·26	107·87	288·4	315·9	− 4·39	27·5	−·16	14·02
7865	f.*b*	7891	l.*a*	−21·2	260·28	259·69	307·9	330·4	− 0·59	22·5	−·03	14·15
7895	l.*a*	7918	g	−21·8	215·97	215·17	339·4	362·4	− 0·80	23·0	−·03	14·15
7899	l.*a*	7920	g	+ 7·8	181·37	187·55	341·4	364·4	+ 6·18	23·0	+·27	14·45

DETERMINATION OF SOLAR ROTATION FROM LONG-LIVED SPOTS FROM 1878–1923.

Group Number and Spot.				Mean Latitude.	Mean Longitude.		Mean Date.		x.	y.	x/y.	Diurnal Motion.
1st Rotation.		2nd Rotation.			1st Rotation.	2nd Rotation.	1st Rotation.	2nd Rotation.				
				°	°	°			°		°	°
						Year 1917.						
7949	l.*a*	7980	g	+19·6	347·40	344·02	16·9	40·4	− 3·38	23·5	−·14	14·04
7977	l.*a*	8008	l.*a*	−14·8	15·27	15·76	39·9	66·4	+ 0·49	26·5	+·02	14·20
7977	f.*b*	8008	f.*b*	−17·9	4·66	3·68	40·4	66·9	− 0·98	26·5	−·04	14·14
8002	l.*a*	8038	g	+24·1	67·93	67·16	62·9	87·9	− 0·77	25·0	−·03	14·15
8009	l.*a*	8037	g	+23·5	95·52	89·70	63·9	84·4	− 5·82	20·5	−·28	13·90
8024	l	8046	g	− 9·8	232·94	236·73	78·9	103·4	+ 3·79	24·5	+·15	14·33
8047	l.*a*	8073	g	+18·4	250·34	247·35	105·4	130·4	− 2·99	25·0	−·12	14·06
8049	l.*a*	8076	g	+ 9·8	219·17	224·88	105·9	132·4	+ 5·71	26·5	+·22	14·40
8076	g	8104	g	+ 9·8	224·88	228·02	132·4	159·4	+ 3·14	27·0	+·12	14·30
8089	l.*a*	8125	g	−24·6	24·78	16·25	147·4	175·4	− 8·53	28·0	−·30	13·88
8104	g	8140	g	+10·8	228·02	230·16	159·4	186·4	+ 2·14	27·0	+·08	14·26
8125	g	8163	g	−23·6	16·25	10·09	175·4	203·4	− 6·16	28·0	−·22	13·96
8189	l.*a*	8221	g	+ 0·3	204·75	212·30	218·9	242·4	+ 7·55	23·5	+·32	14·50
8199	l.*a*	8239	g	−16·8	72·13	68·97	225·4	251·9	− 3·16	26·5	−·12	14·06
8215	l.*a*	8260	g	−17·0	264·96	262·35	238·4	265·4	− 2·61	27·0	−·10	14·08
8256	l.*a*	8289	g	−12·8	284·28	286·83	264·4	290·9	+ 2·55	26·5	+·10	14·28
8257	l.*a*	8290	g	+13·6	270·32	271·99	264·9	292·4	+ 1·67	27·5	+·06	14·24
8289	g	8315	g	−10·9	286·83	287·83	290·9	318·4	+ 1·00	27·5	+·04	14·22
8307	l.*a*	8334	g	+ 6·4	59·48	65·78	311·4	334·4	+ 6·30	23·0	+·27	14·45
8317	l.*a*	8348	g	+ 7·7	303·02	306·43	319·9	344·4	+ 3·41	24·5	+·14	14·32
8328	l.*a*	8370	g	−13·6	111·14	115·44	332·9	358·4	+ 4·30	25·5	+·17	14·35
8337	l.*a*	8366	g	− 6·3	123·23	129·80	333·9	357·4	+ 6·57	23·5	+·28	14·46
8353	l.*a*	8389	g	+ 6·3	262·33	267·64	348·4	373·4	+ 5·31	25·0	+·21	14·39
8354	l.*a*	8387	f.*b*	+ 6·7	298·68	306·35	347·9	371·4	+ 7·67	23·5	+·33	14·51
8366	g	8401	p.*a*	− 6·5	129·80	133·97	357·4	384·4	+ 4·17	27·0	+·15	14·33
8369	l.*a*	8402	l.*a*	+16·3	129·29	127·69	359·4	385·4	− 1·60	26·0	−·06	14·12
8369	f.*b*	8402	f.*b*	+18·5	120·98	117·13	360·4	382·9	− 3·85	22·5	−·17	14·01
8377	l.*a*	8409	g	− 8·1	55·98	59·84	363·4	390·4	+ 3·86	27·0	+·14	14·32
						Year 1918.						
8387	f.*b*	8419	g	+ 7·4	306·35	308·08	6·4	33·9	+ 1·73	27·5	+·06	14·24
8419	g	8444	g	+ 7·3	308·08	307·23	33·9	60·9	− 0·85	27·0	−·03	14·15
8433	l.*a*	8456	g	+ 2·9	130·48	136·68	47·4	71·4	+ 6·20	24·0	+·26	14·44
8462	l.*a*	8483	g	+ 6·9	181·72	185·93	72·9	97·9	+ 4·21	25·0	+·17	14·35
8473	g	8500	g	− 5·0	321·48	326·11	87·4	114·4	+ 4·63	27·0	+·17	14·35
8478	l.*a*	8501	p.*a*	−22·1	292·00	287·49	93·4	115·4	− 4·51	22·0	−·20	13·98
8479	l.*a*	8508	g	+14·6	223·75	226·60	94·9	118·4	+ 2·85	23·5	+·12	14·30
8484	l.*a*	8507	g	+27·3	250·78	242·18	96·9	119·9	− 8·60	23·0	−·37	13·81
8516	l.*a*	8549	g	+17·3	139·42	136·61	128·4	155·9	− 2·81	27·5	−·10	14·08
8549	g	8573	g	+16·9	136·61	131·69	155·9	183·4	− 4·92	27·5	−·18	14·00
8582	l.*a*	8615	g	+10·8	83·86	86·01	187·4	213·9	+ 2·15	26·5	+·08	14·26
8597	l.*a*	8623	g	− 9·7	354·03	360·13	198·4	217·9	+ 6·10	19·5	+·31	14·49
8612	l.*a*	8651	g	+16·6	132·30	132·86	211·9	237·9	+ 0·56	26·0	+·02	14·20
8615	g	8657	g	+10·5	86·01	86·50	213·9	238·9	+ 0·49	25·0	+·02	14·20
8619	l.*a*	8660	g	−20·4	30·06	25·95	217·9	242·9	− 4·11	25·0	−·16	14·02
8631	l.*a*	8669	g	+10·5	272·37	271·71	227·4	252·9	− 0·66	25·5	−·03	14·15
8631	f.*b*	8670	g	+ 9·1	260·00	263·03	224·4	250·9	+ 3·03	26·5	+·11	14·29
8651	g	8680	g	+15·8	132·86	130·43	237·9	264·9	− 2·43	27·0	−·09	14·09
8683	l.*a*	8715	g	+ 7·4	124·52	127·65	266·9	291·9	+ 3·13	25·0	+·12	14·30
8691	l.*a*	8717	g	+10·8	104·93	109·89	271·4	293·9	+ 4·96	22·5	+·22	14·40
8703	l.*a*	8727	g	+ 0·7	298·58	304·63	282·9	306·4	+ 6·05	23·5	+·26	14·44

DETERMINATION OF SOLAR ROTATION FROM LONG-LIVED SPOTS FROM 1878–1923.

Group Number and Spot.				Mean Latitude.	Mean Longitude.		Mean Date.		x.	y.	x/y.	Diurnal Motion.
1st Rotation.		2nd Rotation.			1st Rotation.	2nd Rotation.	1st Rotation.	2nd Rotation.				
				°	°	°			°		°	°
						Year 1918—*contd.*						
8738	1.*a*	8766	g	−10·5	143·56	148·66	322·4	345·9	+ 5·10	23·5	+·22	14·40
8766	g	8791	g	− 9·8	148·66	150·62	345·9	371·9	+ 1·96	26·0	+·08	14·26
8773	1.*a*	8798	g	− 8·2	36·92	42·97	355·4	380·9	+ 6·05	25·5	+·24	14·42
8774	g	8801	g	−21·2	6·83	1·60	356·4	379·9	− 5·23	23·5	−·22	13·96
						Year 1919.						
8815	1.*a*	8834	g	− 5·8	290·84	301·22	27·4	50·9	+10·38	23·5	+·44	14·62
8834	g	8858	g	− 5·9	301·22	303·95	50·9	77·9	+ 2·73	27·0	+·10	14·28
8839	g	8861	g	+13·2	204·35	204·01	58·4	83·4	− 0·34	25·0	−·01	14·17
8850	1.*a*	8871	g	+ 6·5	79·22	84·85	68·9	94·9	+ 5·63	26·0	+·22	14·40
8862	1.*a*	8884	g	−19·4	182·51	181·43	87·4	114·9	− 1·08	27·5	−·04	14·14
8871	g	8889	g	+ 6·3	84·85	87·37	94·9	121·9	+ 2·52	27·0	+·09	14·27
8884	g	8903	g	−19·6	181·43	174·90	114·9	140·4	− 6·53	25·5	−·26	13·92
8889	g	8909	g	+ 8·3	87·37	89·21	121·9	148·9	+ 1·84	27·0	+·07	14·25
8895	1.*a*	8917	g	+ 6·9	6·56	10·54	127·9	154·9	+ 3·98	27·0	+·15	14·33
8902	1.*a*	8932	g	− 7·9	209·91	220·10	140·9	165·4	+10·19	24·5	+·41	14·59
8917	g	8958	g	+ 8·0	10·54	13·42	154·9	179·9	+ 2·88	25·0	+·11	14·29
8922	1.*a*	8952	g	+ 4·6	54·77	61·76	156·4	177·9	+ 6·99	21·5	+·33	14·51
8948	1.*a*	8973	g	−13·3	113·80	114·41	177·9	200·9	+ 0·61	23·0	+·03	14·21
8955	1.*a*	8971	g	+ 7·4	122·06	126·59	177·4	200·4	+ 4·53	23·0	+·20	14·38
8966	1.*a*	8994	g	− 6·3	219·40	226·87	194·9	219·9	+ 7·47	25·0	+·30	14·48
8966	f.*b*	8996	g	− 9·6	210·24	212·67	195·9	220·9	+ 2·43	25·0	+·10	14·28
8973	g	9002	g	−14·1	114·41	114·13	200·9	228·9	− 0·28	28·0	−·01	14·17
8994	g	9021	g	− 6·7	226·87	230·51	219·9	245·9	+ 3·64	26·0	+·14	14·32
9005	1.*a*	9031	g	+ 2·7	96·14	103·02	230·4	256·9	+ 6·88	26·5	+·26	14·44
9007	1.*a*	9030	g	− 2·1	98·05	105·41	230·4	256·4	+ 7·36	26·0	+·28	14·46
9031	g	9047	g	+ 1·9	103·02	106·32	256·9	283·9	+ 3·30	27·0	+·12	14·30
9040	g	9056	g	−11·6	273·41	275·80	271·4	297·9	+ 2·39	26·5	+·09	14·27
9043	1.*a*	9059	g	−15·0	223·15	222·71	275·4	302·4	− 0·44	27·0	−·02	14·16
9047	g	9065	g	+ 3·0	106·32	106·89	283·9	311·4	+ 0·57	27·5	+·02	14·20
9064	1.*a*	9075	g	−15·0	145·37	142·97	308·9	335·4	− 2·40	26·5	−·09	14·09
9065	g	9077	g	+ 3·4	106·89	108·91	311·4	336·4	+ 2·02	25·0	+·08	14·26
						Year 1920.						
9108	1.*a*	9127	g	− 5·9	125·96	132·00	26·4	51·4	+ 6·04	25·0	+·24	14·42
9143	1.*a*	9157	g	− 6·1	144·19	147·99	81·9	106·9	+ 3·80	25·0	+·15	14·33
9144	g	9158	g	− 5·2	117·50	121·54	81·9	106·4	+ 4·04	24·5	+·16	14·34
9157	g	9174	g	− 5·9	147·99	151·16	106·9	131·9	+ 3·17	25·0	+·13	14·31
9189	l	9204	g	+13·9	218·81	222·90	156·4	182·9	+ 4·09	26·5	+·15	14·33
9204	g	9215	g	+13·5	222·90	224·55	182·9	209·4	+ 1·65	26·5	+·06	14·24
9207	1.*a*	9216	g	−14·5	196·75	196·38	184·9	211·9	− 0·37	27·0	−·01	14·17
9213	g	9225	g	+11·6	299·30	303·39	204·4	229·4	+ 4·09	25·0	+·16	14·34
9251	l	9263	g	+17·7	153·66	149·13	299·4	324·9	− 4·53	25·5	−·18	14·00
9258	1.*a*	9270	g	− 9·2	351·41	357·04	309·9	336·4	+ 5·63	26·5	+·21	14·39
						Year 1921.						
9284	1.*a*	9294	g	−15·1	211·54	213·38	12·4	35·9	+ 1·84	23·5	+·08	14·26
9315	1.*a*	9329	g	+ 9·4	282·31	285·22	85·4	112·4	+ 2·91	27·0	+·11	14·29
9334	1.*a*	9345	g	+ 0·9	7·06	15·35	134·9	159·9	+ 8·29	25·0	+·33	14·51

DETERMINATION OF SOLAR ROTATION FROM LONG-LIVED SPOTS FROM 1878–1923.

Group Number and Spot.				Mean Latitude.	Mean Longitude.		Mean Date.		x.	y.	x/y.	Diurnal Motion.
1st Rotation.		2nd Rotation.			1st Rotation.	2nd Rotation.	1st Rotation.	2nd Rotation.				
				°	°	°			°		°	°
						Year 1921 —*contd.*						
9345	g	9360	f.*b*	+ 0·8	15·35	20·01	159·9	186·9	+ 4·66	27·0	+·17	14·35
9384	l.*a*	9393	g	+11·5	113·27	116·90	239·4	284·9	+ 3·63	45·5	+·08	14·26
9396	l.*a*	9399	g	+ 7·7	41·07	43·48	298·4	321·4	+ 2·41	23·0	+·10	14·28
9397	l.*a*	9400	g	+ 3·9	330·43	332·49	300·4	326·4	+ 2·06	26·0	+·08	14·26
9401	l.*a*	9407	g	− 5·6	319·00	324·81	327·9	354·9	+ 5·81	27·0	+·22	14·40
9407	g	9415	g	− 5·7	324·81	329·46	354·9	381·4	+ 4·65	26·5	+·18	14·36
9415	g	9421	g	− 5·2	329·46	335·35	381·4	408·4	+ 5·89	27·0	+·22	14·40
						Year 1922.						
9426	l.*a*′	9439	g	+ 7·8	117·10	122·56	63·4	86·9	+ 5·46	23·5	+·23	14·41
9426	f.*b*	9441	g	+ 8·7	105·90	103·29	61·9	86·9	− 2·61	25·0	−·10	14·08
9451	l.*a*	9452	g	+ 8·0	18·75	22·57	123·9	147·4	+ 3·82	23·5	+·16	14·34
9465	l.*a*	9472	g	−11·8	343·08	344·20	237·9	283·9	+ 1·12	46·0	+·02	14·20
9477	g	9483	g	− 5·6	0·62	3·89	314·4	338·4	+ 3·27	24·0	+·13	14·31
9482	l.*a*	9486	g	− 3·7	50·93	55·50	337·4	363·9	+ 4·57	26·5	+·17	14·35
						Year 1923.						
9511	g	9514	g	−16·9	58·80	57·59	272·4	298·9	− 1·21	26·5	−·05	14·13

The mean diurnal motions are collected in the following table for each of the four cycles with their respective latitudes in 5° zones from the equator to $\pm 30°$. Cycle I includes the years 1878–1888; Cycle II, 1889–1899; Cycle III, 1900–1913; Cycle IV, 1914–1923. The mean latitude is indicated by (ϕ), the sidereal diurnal motion by (ξ), and the number of spots by (n).

		Cycle I.	II.	III.	IV.	Mean.	Observed *Minus* Computed.
0°– 5°	ϕ	2°·5	2°·2	3°·0	2°·6	2°·6	
	ξ	14°·34	14°·46	14°·38	14°·38	14°·38	+°·01
	n	7	7	12	14	40	
5°–10°	ϕ	8°·3	7°·5	7°·4	7°·4	7°·6	
	ξ	14°·28	14°·30	14°·31	14°·36	14°·33	°·00
	n	22	22	20	47	111	
10°–15°	ϕ	12°·8	12°·3	12°·8	12°·4	12°·5	
	ξ	14°·23	14°·23	14°·27	14°·25	14°·25	°·00
	n	23	47	34	32	136	
15°–20°	ϕ	17°·0	17°·9	16°·9	17°·6	17°·4	
	ξ	14°·16	14°·12	14°·15	14°·12	14°·13	−°·01
	n	18	27	24	26	95	
20°–25°	ϕ	22°·2	21°·8	22°·1	22°·4	22°·2	
	ξ	14°·00	14°·02	13°·99	14°·03	14°·01	+°·01
	n	15	14	7	18	54	
25°–30°	ϕ	25°·9	28°·4	27°·8	26°·8	27°·3	
	ξ	13°·87	13°·78	13°·78	14°·01	13°·85	+°·02
	n	4	5	2	2	13	

The value of the sidereal angular daily motion found from the collected data is expressed by

$$\xi = 14°·37 - 2°·60 \sin^2\phi.$$

The discordances from this formula are given in the last column of the preceding table. The mean deviation of a single spot is $\pm 0°·08$, and is the same in all latitudes. The observations have been classified according to the hemisphere in which the spots occur.

For the Northern hemisphere

$$\xi = 14°·36 - 2°·34 \sin^2\phi \text{ from 223 spots.}$$

For the Southern hemisphere

$$\xi = 14°\cdot38 - 2\cdot82 \sin^2\phi \text{ from } 226 \text{ spots.}$$

These results point to no measurable difference between the two hemispheres from the equator to $\pm 30°$. Their degree of accordance may be used as a means of determining the probable error of the formula obtained for the daily sidereal motion—

$$14°\cdot37 \pm °\cdot01 - (2°\cdot60 \pm °\cdot24) \sin^2\phi.$$

A summary of these results, with a comparison with other determinations of the Solar Rotation, is given in *Monthly Notices* of the *R.A.S.* for April, 1925, pp. 548–552.

CHARACTERISTIC MOVEMENTS OF SUN SPOTS.

It has been shown above that the average daily motion of Sun Spots in latitude ϕ is given by the formula $\xi = 14°\cdot37 - 2°\cdot60 \sin^2\phi$. It is known that the motion of spots in longitude is not uniform, and particularly that the "leader" spot immediately after formation tends to move forward in longitude. In order to obtain more definitive information on this characteristic movement, the longitudes of suitable spots used in the previous discussion have been tabulated for each day onwards from the day of their formation.

The longitudes for each day were taken from the annual volumes, where they are given corresponding to an assumed rotation of the sun $\xi = 14°\cdot18$ constant for all latitudes. These were corrected to correspond with a mean rotation $\xi = 14°\cdot37 - 2°\cdot60 \sin^2\phi$, appropriate to the latitude. By taking out the means the displacement in longitude of a spot for each day of its existence was obtained.

There are of necessity gaps of about 14 days' duration when the spots were on the invisible hemisphere, and days for which there were less than seven observations have been omitted from the tables.

A division of the material has been made between (*a*) Recurrent Spots which were seen to disappear at their first return, (*b*) Spots which passed off the disc after their first return but did not come round again, and (*c*) Spots which returned a second time. The length of life in these three classes is approximately 30, 45 and 60 days respectively. The displacements of spots for each day from their mean positions are given for these three groups separately in Tables I, II and III.

TABLE I.

(*a*) 30-Day "Leader" Spots.

Displacement of Spots in longitude (unit = 0°.1,)

Group Numbers.	Lat.	1	2	3	4	5	6	7	8	9	10	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35
	°																									
433, 51 ..	+21·3	− 9	− 1	+15	+10	+20	+20	+31	+37							+ 8	0	+ 3	− 6	−12	−14	−15	−15	−20	−22	−28
552, 74 ..	+14·6	+13	+12	+ 2	+22	+14	+30	+22	..	+22	..							− 9	−10	− 7	−12	−18	−14	−19	−20	−27
566, 82 ..	+12·5	−10	− 4	+ 8	+ 7	+18	+15	+ 8	+ 9	+ 9						−16	−14	−12	−11	−10						
594, 605 ..	+21·8	−20	−28	−27	−34	−31	−34	−43						+35	+32	+33	+38	+38	+35							
693, 712 ..	+24·4	−32	−26	−20	− 7	+ 4							+16	+ 6	+ 7	+11	+10	+11	+10	+11						
785, 806 ..	+10·0	−19	− 4	+ 6	+17	+10	+16	+11	..	+20						−20	−11	−08	−11	− 8						
1438, 55 ..	− 3·1	−30	−23	− 8	− 3							+13	+ 9	+ 8	+ 8	+ 3	+ 3	+ 8	+ 6	+ 6	+ 1	−12				
1532, 48 ..	− 7·1	−19	−15	−11	− 5	0	+ 4	+ 5						+ 2	+ 4	+ 6	+ 7	+ 6	+ 5	+ 3						
1632, 47 ..	−16·3	−17	− 6	+ 1	+ 5	+21						+ 1	− 2	− 2	− 5	− 1	0	0	+ 1	+ 3	+ 4	+ 2	− 4			
1756, 67 ..	− 3·2	..	− 2	+ 5	+ 2	+ 2	− 2						+ 6	+ 3	+ 2	+ 3	+ 5	− 3	0	− 1	− 9	−12	− 9			
1906, 15 ..	− 9·0	−23	− 6	+ 4	+ 8	+10	+11	+ 9	+ 6	− 2	− 1						−10	− 6	− 3	− 2	− 2	− 3	0	+ 4	+ 4	+ 3
2085, 86 ..	+ 5·8	− 2	+13	+14								+ 4	0	− 1	− 1	− 4	− 5	− 7	−14	−18						
2159, 65 ..	+20·4	−38	−22	− 8	+ 7	+10	+ 8	+ 5	+ 8	+ 7	+ 3							+12	+12							
2247, 66 ..	−21·9	−19	−15	+ 6	+17	+26	+28	+30	+23	+22	+25							−24	−27	−19	−22	−19	−22			
2530, 62 ..	+11·1	+27	+32	+31	+27	+20	+19	+17	+12							−17	−28	−19	−27	−21	−23	−25	−26			
2730, 59 ..	+19·8	−18	−12	+ 2	+13	+16	+ 7	+25								− 8	+ 3	− 7	− 3	− 1	− 1	− 2	+ 3	− 9	− 3	
2773, 94 ..	−11·6	−81	−76	−67	−42	−25	− 3	+17	+22	+29							+16	+21	+30	+54	+38	+18	+22	+22		
3067, 112 ..	+16·9	+37	+17	+35	+32	+42	+41	+27	+26	+18	+ 9									−27	−27	−25	−29	−27	−26	−30	−30
3206, 46 ..	+ 9·1	−53	−50	−41	−27	−22						+24	+18	+19	+22	+25	+25	+26	+29							
3287, 304 ..	+19·0	−60	−36	−30	−16	−20	− 5	+ 2	+ 9	+15	+17						+ 8	+ 4	+ 3	+ 8	+14	+10	+14	+17	+21	+26
3414, 42 ..	− 4·4	−44	−52	−33	− 8							+ 7	+10	+10	+12	+13	+12	+12	+11	+16	+17	+14				
3546, 83 ..	− 1·0	−32	−14	− 4	+ 7	+ 8	+19						− 2	+ 2	+ 4	+ 3	− 3	− 4	+ 3	+ 7	+ 3	0				
3640, 74 ..	− 7·2	−45	−36	−28	−21	−14	− 4	+ 1	0	+ 8	+ 2						+ 9	+ 5	+ 8	+10	+ 9	+13	+18	+24	+20	+27
3817, 36 ..	−14·0	+ 2	+ 7	+16	+20	+21	+25	+23	+20	+11							−14	−12	−18	−17	−23	−19	−20	−20		
3996, 4025 ..	−12·8	− 7	− 3	+ 2	+12	+12	+ 5	+ 4						− 3	− 2	− 3	− 3	− 5	− 2	0	− 2	− 3	− 3			
4028, 61 ..	−23·9	−62	−33	−19	−17	−11	−11	−11	−10	−11	−11								+19	+22	+24	+24	+24	+24	+22	+23
4107, 33 ..	− 8·7	−26	+10	+16	+27	+30	+35	+32	+26	+22	+14						− 9	−11	−16	−17	−14	−14	−16	−16	−13	−15
4210, 30 ..	+ 9·5	−15	− 8	+ 4	+ 8	+ 1	− 4	− 6	− 2						− 3	− 3	− 1	+ 3	+ 4	+ 6	+ 6	+ 6				
4305, 20 ..	−15·9	−44	−38	−24	− 9	− 4						+23	+25	+19	+14	+15	+14	+14								
5104, 20 ..	−26·8	+18	+23	+25	+27							−11	− 7	−10	−14	−14	−16	−19								
5317, 29 ..	−23·1	+ 2	+ 9	+12	+28							+ 1	− 2	− 4	− 6	− 9	− 9	− 4	− 8	−11						
5366, 96 ..	+28·8	−18	−12	− 6								+ 8	+ 5	+10	..	+ 2										
5894, 928 ..	+10·4	−13	− 8	0	+ 7	+ 1	− 4	− 4	0	+ 1						+ 9	+ 7	+ 4	+ 5	+ 5	+ 1	− 2	+ 2	− 4		
6088, 112 ..	−16·2	−43	−35	−28	−16	− 6	+ 2	+ 9	+ 7	+13	+16						+27	+14	+ 8	+ 7	+ 7					
6243, 67 ..	−16·8	−21	−14	−10	− 6	− 6	+ 2	0	− 5						+19	+14	+ 7	+ 8	+ 3	+ 4	+ 1	− 1	+ 4	+ 3	− 3	− 4
6247, 73 ..	− 7·1	+ 7	+15	+24	+28	+25	+21	+16	+16	+11	+12								−26	−25	−30	−32	−31	−29	−24	
6276, 93 ..	−21·1	−39	−28	−24	−24	−25	−27	−18	−23							+24	+25	+14	+25	+26	+22	+19	+30	+27		
6323, 44 ..	−15·9	−70	−45	−42	−39	−31	−32	−22	−30					+37	+31	+29	+26	+22	+21	+28	+27	+26	+25	+25	+15	
6817, 27 ..	− 7·3	−38	−32	−29	−31	−25	−21	−17						+28	+28	+26	+21	+17	+14	+11	+13	+14	+19			
6823, 28 ..	+15·9	−12	− 6	+ 3	+ 3	+ 2	+ 1	+ 1							− 1	+ 6	0	+ 2	− 2	+ 1	+ 1	0	0	0	0	
7406, 45 ..	+22·2	−15	− 1	+ 4	+ 8	+11	+ 9	+ 6	+ 1	− 4	− 4						+ 6	+11	+ 7	+ 4	+ 1	0	− 3	− 8	−11	−12
7618, 46 ..	−13·1	−20	− 9	− 5	− 4	− 6	− 7	− 6	− 3							+ 6	+ 7	+ 9	+ 1	+ 4	+ 5	+ 3	+ 6	+ 9	+11	
7748, 71 ..	+17·1	−16	− 7	0	+ 8	+ 6	+ 2	+ 3							+ 7	+ 5	+ 5	+ 4	+ 3	− 1	− 6	− 3	− 5	− 5	− 7	
7949, 80 ..	+19·6	+ 4	+ 7	+ 8	+ 6	+ 5	+ 3							− 3	− 2	− 5	− 4	− 3	− 2	− 4	− 5	− 6				
8002, 38 ..	+24·1	−49	−37	−34	−31	−35	−24	−11	− 6	− 2	− 4							+41	+34	+31	+30	+33	+25	+26	+21	
8009, 37 ..	+23·5	− 2	+ 6	+11	+12							− 4	− 2	− 5	− 5	−11										
8024, 46 ..	− 9·8	−15	− 5	− 2	− 3	− 4	− 6	− 7	− 4						+ 8	+ 9	+ 4	+ 4	+ 7	+ 5	+ 3	+ 4	+ 2	− 1	− 3	
8189, 221 ..	+ 0·3	−33	−25	−19	−13							+ 3	+ 8	+11	+12	+10	+12	+11	+10	+ 5	+ 8	+ 5				
8307, 34 ..	+ 6·4	−43	−29	−18	− 9	+ 4						+13	+ 9	+13	+10	+10	+ 8	+ 9	+ 5	+ 2	+ 8	+ 9				
8353, 89 ..	+ 6·3	−45	−40	−21	− 1	+ 7	+11	+10	+11	+ 9							+13	+ 9	+11	+ 8	+ 5	+ 6	+ 5	+ 3	+ 3	
8462, 83 ..	+ 6·9	−17	− 3	+ 4	+ 2	+ 2	− 2							+ 9	+ 4	+ 2	+ 3	+ 4	+ 1	− 3	0	+ 4	0	− 3	0	
8478, 501 ..	−22·1	− 1	+ 4	+11								+ 2	− 1	− 4	− 2	− 1	− 2	− 2								
8484, 507 ..	+27·3	−11	+ 5	+11	+ 6							+ 5	+ 4	+ 5	+ 4	− 2	0	− 8	− 8	−13	− 5					
8597, 623 ..	− 9·7	−24	−25	−28								+16	+14	+13	+ 9											
8683, 715 ..	+ 7·4	−20	− 3	+ 5	+14	+15	+14	+ 9	+ 2	− 1	− 3						− 2	− 1	− 1	− 2	0	− 2	+ 2	− 4	− 7	− 7
8703, 27 ..	+ 0·7	−29	−13	− 5	− 7	− 3	− 3						+ 8	+ 7	+ 10	+ 4	+ 7	+ 6	+ 5	+ 3	+ 7	+ 4	+ 4			
8773, 98 ..	− 8·2	−53	−21	−14	−15	−15	− 2	− 7	− 2	− 2						+ 14	+ 7	+ 10	+12	+12	+14	+18	+19	+13	+ 4	+ 9
8902, 32 ..	− 7·9	−80	−58	−40	−39	−32	−26	−20	−13	− 6	− 1						+44	+45	+42	+38	+33	+27	+30	+32	+33	
8955, 71 ..	+ 7·4	−18	−10	+ 1	0	−11						+12	+11	+ 9	+ 8	+ 4	+ 2	+ 2	− 2	− 1	− 1	− 4				
9451, 52 ..	+ 8·0	+ 2	− 2	− 3	− 3	− 2	− 6	− 7	− 1	− 1					+ 8	+ 7	+ 4	+ 4	0	+ 3	− 3	+ 1	+ 1			

Days on which Photographs are

TABLE II.

(*b*) 45-Day "Leader" Spots.

on day of formation (day 1) and successive days.

Group Numbers.	Lat.	1	2	3	4	5	6	7	8	9	10	11	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38
	°																														
348, 59 ..	+22·4	−47	−44	−21	−13	+ 2	− 7																								
408, 19 ..	+16·5	−29	−17	+ 6	+17	+ 7								+ 9	+10	+15	+12	+17	+15	+11	+ 6	+23	+ 8	+ 8	+ 8						
410D, 24	−19·0	−63	−41	−28	−20	− 3	+13	+ 2						+10	+13	+ 8	+ 2	− 4	0	− 5	− 2	+ 6	− 3	− 5	− 3						
553, 75 ..	+20·6	+14	+18	+22	+24	+17	..	+16	..	+19						+17	+18	+18	+14	+12	+11	+13	+ 7	+ 7	+ 5	+ 4	+ 6				
606, 28 ..	+16·9	..	−51	−19	−15	− 7	− 5	− 5	− 5	0	− 5	+ 2							−12	−11	−11	−10	− 4	− 8	− 8	−11	−11	−14	− 9	−20		
642, 58 ..	+16·2	−63	−53	−48																	− 9	+ 3	+ 4	+ 6	+ 7	+13	+15	+18	+18	+22	+16
664, 87 ..	−13·8	−25	..	− 6	+10								+ 9	+16	+16	+13	+15	..	..	+14	+19	+20	+20	+17							
808, 21 ..	−11·5	+ 4	+11	+ 8	+ 2									+ 2	+ 1	+ 2	+ 3	+ 1	+ 3	+ 1	+ 2	+ 2	+ 4	− 2							
999, 1027	−22·1	+ 3	+14	+19	..	+13	+15	+13	+ 7	+ 4	0	+ 6			− 6	− 5	− 7	+ 1	− 5	+ 3	0	− 3	− 3	− 6							
1288, 323..	+13·4	−101	..	•−79	..	− 59	−47	−40	−35	−31	−17	−13									− 2	− 6	− 5	− 9	− 4	− 8	−10	−11	−14	−12	
1480, 501..	+14·2	+ 7	+19	+24	..	+24	+22														+38	+33	+33	+31	+39	+38	+37	+40	+40	+48	+46
1546, 63 ..	+ 2·4	+ 2	+10	+16	+12	+12	+11	+10	+19						+ 6	+ 4	− 2	0	− 7	− 7	− 9	− 9	−12	−14	−14	−24	−14				
1738, 59 ..	−11·9	..	−17	−14	−11	−11	− 9	− 5	− 7	− 5	− 9	− 5					+ 1	− 5	− 7	−10	−10	−10	− 8	− 9	−10	−13	− 8	− 9				
1860, 74 ..	−17·5	−32	−13	−05	+ 7	+ 9	+14	+11	+18	+17								+ 5	+ 3	+ 2	− 1	− 3	− 1	0	− 4	− 7	− 6	− 9	−12			
2097, 100..	−19·8	−13	+14	+19	+20	+12	+10	+11	+07								+ 6	+ 1	− 1	− 4	− 7	− 8	−10	−11	−11	− 6	−13	−10				
2183, 93 ..	+19·6	−72	−63	−44	−39	−33	−32	−31	−23	−22									+27	+29	+31	+32	+31	+30	+28	+30	+29	+30	+33	+29		
2726, 60 ..	+ 7·5	+ 7	+10	+21	+22	+17	+22	+24	+19	+ 7	+22	+15								−13	− 4	−16	−11	−12	−12	−14	−14	−21	−20	−21	−21
3015, 54 ..	−20·2	+12	+22	+18	+14								− 2	+ 2	+ 6	+ 8	+ 6	+ 7	+ 8	+ 6	+ 4	− 1	− 1	− 7	− 7						
3059, 98 ..	+10·9	−33	−23	−13	− 3	− 4	− 4	− 2	− 2									+ 5	+ 5	+ 6	+ 7	+14	+11	+13	+ 8	+ 9	+ 1	+ 1			
3106, 56 ..	−19·1	+ 3	+ 7	+11	+22	+23	+24	+ 9	− 3	+16	− 4									0	− 5	− 6	−11	−10	−12	+ 2	−13	−12	− 6	−13	−17
3460, 92 ..	+10·9	−39	−19	+ 7	+20	+22	+33	+33	+20	+18	+16	+15								−15	−14	−16	−11	− 8	− 8	− 7	− 4	− 7	−10	−17	−16
4084, 112..	− 6·4	+14	+19	+17	+15	+14	+17	+17	+14	+16	+11								− 1	− 3	− 5	−10	− 5	− 4	− 6	− 7	−10	−16	−21	−24	−31
4523, 31 ..	+13·2	−46	−28	..	−14	−17							+17	+12	+ 8	+ 4	+ 6	+ 8	+11	+ 6	+ 8	+ 8	+ 9	+ 1							
4560, 73 ..	+ 2·9	−47	−37	−24	−11	0	0	+ 4	0	− 3								− 2	+ 1	+ 1	+ 2	+ 4	+ 8	+11	+14	+17	+20	+22	+24		
4915, 17 ..	−11·3	+ 1	+ 7	+ 8	+ 6	+ 5									− 2	+11	− 3	− 6	− 2	− 7	− 5	− 5	− 4	− 4	− 6						
5088, 95 ..	+13·9	+ 9	+11	+17	+ 8								0	0	− 1	− 4	− 5	− 6	− 3	− 4	0	− 6	− 7	− 8							
5524, 42 ..	+11·1	−26	−28	−17	−11	−11	−14	−18								+ 7	+ 30	+20	+ 9	+12	+16	− 9	+ 8	+ 5	+ 9	+14	+11				
5628, 55 ..	+ 3·2	−88	−73	−59	−46	−36	−31							+31	+25	+21	+22	+24	+24	+27	+30	+35	+33	+36	+34						
5790, 803..	+14·1	−67	−39	−34	−30	−22	−11	− 7	−10								−17	− 7	+ 9	+18	+24	+29	+32	+32	+24	+31	+26	+24			
5817, 43 ..	+19·3	−23	−19	−14	− 7	− 3	+ 6									+13	+ 6	+ 9	+ 4	+ 4	+ 5	+ 4	+ 5	+ 3	+ 3	+ 3					
5933, 44 ..	−16·2	+ 9	+ 8	+ 1	+ 1	+ 2	− 3									+ 5	+ 5	0	− 9	..	− 5	− 6	− 5	− 4	− 5	+18	−12				
6099, 123..	+22·6	+ 1	+ 1	− 2	− 1	− 7	+ 7	+14	+15	+13	+14	+ 5									− 3	− 5	− 8	− 1	− 1	0	− 6	− 5	− 9	− 7	−15
6390, 416..	− 9·0	−18	−15	− 7	−10	0	+ 3	+ 7	+ 7	+10	+12	+ 5									−12	− 2	+ 1	+ 4	+ 2	0	+ 2	+ 4	+ 4	+ 5	+ 6
6676, 86 ..	− 1·6	−22	−12	− 2	− 1	+ 2	0							+10	+ 9	+ 9	+ 5	0	− 1	0	− 1	0	+ 2	+ 6	+ 1						
6746, 65 ..	− 4·9	+20	+30	+29	+31	+33	+31	+30	+28	+29	+32	+26									−40	−38	−33	−34	−33	−27	−26	−24	−21	−20	−20
6774, 88 ..	+14·7	+ 3	+21	+24	+21	+18	+14	+ 6	+ 6	+ 2								−14	−10	− 9	−15	−13	− 7	− 8	− 7	− 6	− 8	−11	−10		
6937, 42 ..	− 1·8	−76	−60	−41	−19	− 5	+12	+26	+27									+19	+19	+14	+11	+10	+ 9	+ 7	+ 7	+ 8	+ 5	+ 7	+12		
7266, 82 ..	+21·7	−17	+ 1	+ 7	+15	+20									+13	+ 8	+ 7	+ 9	+ 7	+ 7	+ 4	− 1	− 7	− 7	−11	−14	−14	−15				
7737, 51 ..	+12·8	−13	+ 8	+34									+ 9	+10	+ 7	+ 3		0	− 3	− 5	− 9	−12	−11	− 9							
7772, 96 ..	+ 8·8	−46	−19	− 1	+ 2	+ 3	− 1	− 1									+ 5	+ 6	+ 5	+ 5	+ 9	+11	+ 9	+ 8	+14	+ 2	−14				
7895, 918..	−21·8	−26	−24	−22									+13	+10	+10	+10	+10	+ 5	+11	+ 6	+ 6	− 1	− 2								
7899, 920..	+ 7·8	−40	−22	− 7									+16	+11	+ 9	+ 8	+ 6	+ 4	+ 3	+ 3	+ 3	+ 3	+ 3								
7977, 8008	−14·8	−33	+ 1	+16	+19	+17	+18	− 1	− 9	− 5	− 7									+ 1	− 9	− 3	− 3	− 2	− 1	0	+ 1	+ 4	+ 7	+ 8	
8047, 73 ..	+18·4	+13	+14	+12	+11	+ 8	0	− 1									+ 4	+ 4	+ 2	− 2	+ 1	− 6	− 7	− 5	− 9	−12	−20				
8256, 89 ..	−12·8	−45	−29	−20	− 8	− 1	+ 2	+ 4	+ 8	+10	+13	+12								+15	+ 6	+ 8	+ 7	+ 2	+ 3	0	+ 1	+ 3	0	+ 3	+ 3
8317, 48 ..	+ 7·7	−21	− 6	− 1	+ 6	+13	+10									+ 4	+ 4	+ 2	− 1	− 1	− 3	− 1	− 3	− 1	− 2	− 7					
8328, 70 ..	−13·6	−21	−17	−15	−18	−18	−16	−19	−17									+ 8	+ 8	+ 6	+10	+12	+14	+17	+17	+20	+20	+17			
8369, 402..	+16·3	+ 4	−11	+ 3	+11	+14	+15	+10									+ 1	+ 5	+ 1	0	+ 1	− 2	− 4	− 8	−10	− 9	−14	−15			
8691, 717..	+10·8	−35	−20	−10									+ 7	+ 6	+ 8	+ 7	+ 5	+ 3	+ 2	− 1	+ 1	+ 2	+17								
8922, 52 ..	+ 4·6	−36	−23	−18									+10	+10	+ 8	+ 5	+ 7	+ 7	+ 3	+ 4	+ 5	+ 3									
9007, 30 ..	− 2·1	−54	−34	−16	− 8	− 6	− 8	−11	− 6	− 3	+ 3	+ 4								+20	+16	+18	+16	+11	+11	+ 8	+ 9	+11	+ 8	+10	
9064, 75 ..	−15·0	+ 1	+13	+16	+15	+19	+21	+17	+18	+16	+13									−10	− 7	−10	−12	−11	−13	−13	−15	−15	−18	−23	
9258, 70 ..	− 9·2	−37	−25	−21	−18	−15	−12	−11	− 6	− 1	+ 1	+ 5								+15	+15	+12	+16	+16	+15	+11	+10	+10	+ 6	+10	+10
9284, 94 ..	−15·1	−28	−10	− 8	− 9	− 5							+26	+14	+ 9	+ 5	+ 1	− 1	− 2	+ 1	+ 2	+ 2	+ 2	+ 3	+ 2	− 2					
9384, 88 ..	+10·5	−22	+ 5										+14	+13	+10	+10	+ 9	+ 9	+ 9	+ 6	+ 7	+ 3									
9396, 99 ..	+ 7·7	+ 2	+ 2	+17									+15	+10	+ 7	+ 5	+ 2	− 2	− 5	−11	−11	−12	−22	−22							
9397, 400..	+ 3·9	+24	+25	+26	+22	+19	+14	+10	+10	+ 5	+ 1	− 8								− 2	− 6	−12	− 9	−12	−14	−15	−17	−17	−17	−16	−21
9426, 39 ..	+ 7·8	−23	−17	−16	−12	− 8	−15							− 5	−14	− 7	+ 3	+ 6	+ 9	+12	+18	+19	+17	+10	+ 7						
9465, 69 ..	−11·8	+10	+ 9	+ 8	+ 4								+11	+16	+13	+10	+ 7	+ 9	+ 5	+ 2	− 3	− 5	− 8	−10							
9511, 14 ..	−16·9	− 7	− 6	− 7	− 4	+11	+13	+ 5	+ 7	+ 4	+ 2	+ 2									+14	+10	+ 5	+ 3	+ 2	+ 1	− 4	− 5	− 8	− 8	−14

not available are indicated by ..

TABLE III.

(c) 60–Day "Leader" Spots.

Displacement of Spots in longitude (unit=0°·1)

Group Numbers.	Latitude	1	2	3	4	5	6	7	8	9	21	22	23	24	25	26	27	28
436, 53, 71	° 14·9	−53	−30	−15	− 7	+ 6	+13	+20	+17	+23							+ 1	+ 4
1828, 35, 52	9·3	+ 7	+19	+23	+20	+16	..	− 2						+ 6	+ 8	+ 6	+10	+11
1878, 84, 97	11·2	+ 1	+18	+25	+27	+18						+18	+12	+10	+ 8	+10	+ 7	+ 9
1891, 1901, 10	14·3	+ 4	+27	+42	+43	+40	+40	+38	+36						+10	+10	+10	+ 1
2560, 83, 2615	31·0	− 6	+ 1	+16	+20	+12	+20	+24	+23	+23						+15	+13	− 4
3371, 3402, 43	16·6	−22	−11	− 4	+ 1	− 6						+ 4	− 1	+ 1	+ 1	+ 1	+ 7	+10
4234, 56, 78	13·7	+ 3	+ 9	+21	+26						+ 4	+14	+11	+13	+14	+15	+10	+12
4416, 35, 46	11·1	−35	−24	−16	−15	−11	−12	−11	−15	−11				+12	+ 8	+ 5	+ 6	+ 8
4505, 26, 41	6·1	−57	−48	−36	−18	−12					+ 7	+ 9	+ 4	+ 3	+ 4	+ 5	+ 8	+12
4517, 32, 49	1·4	−64	−54	−35	−25	..	−20	−14	−14				+ 5	0	+ 3	+ 2	+ 3	+ 4
5597, 5622, 53 ..	13·9	− 1	+ 2	+ 6	+ 6						−14	− 7	− 5	− 6	− 4	− 4	− 4	− 2
5785, 5802, 20*	10·9	−37	−24	−16	+ 1	+ 4	+ 9	+ 5	+ 2	− 9					+17	+15	+11	+10
6393, 6420, 40	15·0	−32	+ 2	+13	+17	+19	+22	+26	+25	+26						+25	+18	+19
6494, 6517, 35	6·4	−21	− 9	−10	+ 2	+ 4	+ 2	+ 5	+ 3	+ 2				+15	+13	+13	+10	+11
6499, 6519, 39	5·4	+ 1	+ 7	+21	+10	+17	+ 4				+29	+33	+31	+28	+28	+26	+24	+23
6589, 6602, 18	3·0	−17	− 3	+ 1	+ 2	− 4					− 4	− 5	− 2	− 4	− 1	− 1	0	0
6722, 33, 54 ..	12·9	−82	−75	−57	−49	−54	−49	−43	−38	−27					+27	+28	+33	+34
6723, 34, 53	1·3	+ 2	+11	+25	+22						+13	+ 9	+12	+13	+12	+12	+12	+11
7304, 41, 84	17·6	−59	−49	−45	−38	−32					+ 9	+10	+10	+ 9	+ 9	+10	+ 8	+ 7
7564, 95, 622	10·5	+ 4	+16	+24	+23	+22					+23	+19	+21	+20	+20	+16	+13	+ 8
7746, 69, 89	12·6	−15	− 5	..	+ 6	+14					+25	+25	+25	+23	+20	+18	+18	+16
7833, 53, 76	25·0	−86	−76	−62	−54	−54					+16	+13	+ 9	+10	+10	+ 5	+ 1	− 4
8089, 8125, 63	23·9	+ 2	+14	+19	+18	+16	+13	+ 8	+10	+12								
8337, 66, 8401	6·5	−42	−36	−18	− 3						+11	+ 5	+ 6	+ 3	+ 4	0	+ 3	+ 3
8612, 51, 80	16·1	−47	−40	−19	− 3	+12	+20	+22	+26	+26						+20	+17	+13
8738, 66, 61	10·0	−32	−17	− 8	−11	−15					+14	+13	+11	+ 6	+10	+ 7	+ 7	+ 6
8815, 34, 58	6·0	−92	−58	−39	−28	−20					+17	+22	+19	+14	+18	+17	+18	+17
8948, 73, 9002	13·8	+ 6	+12	+15	+10	+ 6	+ 2				+14	+15	+12	+11	+ 6	+ 7	+11	+11
8966, 94, 9021	6·4	−82	−51	−29	−18	− 9	− 4	+ 1	− 1					+16	+18	+16	+14	+13
9143, 57, 74	5·8	− 2	+11	+10	+ 7	+ 6	+ 2	+ 4	− 2					+ 8	+ 4	+10	+ 8	+ 4
9334, 45, 60	0·9	−27	−27	−26	−27	−29	−24	−18	−21					+ 8	+14	+14	+14	+12

TABLE III.

(*c*) 60-Day "Leader" Spots.

on day of formation (day 1) and successive days.

29	30	31	32	33	34	35	48	49	50	51	52	53	54	55	56	57	58	59	60	61
+ 4	+ 8	+ 6	+ 2	+ 2	+ 6	+ 6							−12	−10	− 7	−10	− 8			
+15	+12	+14	+16	+ 7	+13					−22	−16	−15	−16	−15	−16	−17	−18	−19	− 22	−25
+ 8	+ 8	+ 7	+ 8					−16	−12	−14	−10	−15	−13	−17	−20	−21	−24	−26		
+ 1	0	− 3	− 9	− 7	− 9	− 9						−26	−31	−29	−25	−23	−20	−22	−21	−23
+ 5	+ 7	+ 4	+ 6	+10	+ 8	+10							+ 1	− 8	−16	−20	−19	−18	−13	−20
+ 6	+ 7	+ 6	+ 4	+13				+ 4	+ 2	− 2	− 8	− 8	− 7	− 8	−11	− 3	+ 2	+ 3		
+ 9	+10	+13	+13				−20	−23	−18	−20	−19	−18	−15	−14	−13	− 9	−13	− 9		
+ 7	+ 9	+11	+ 9	+10	+ 8	+ 5					+ 6	+ 6	+ 1	+ 6	+10	+13				
+12	+13	+15	+10				+ 6	+ 9	+11	+ 9	+10	+ 6	+ 3	0	+ 2	+ 2	+ 5			
+ 3	+ 3	+ 6	+11	+ 7	+13				+ 4	+ 6	+ 8	+ 8	+12	+16	+17	+17	+21	+26	+29	
− 1	− 2	− 4	− 3				0	+ 1	+ 2	+ 5	+ 3	+ 8	+ 5	+ 9						
+ 9	+ 4	0	+ 1	− 1	+ 3	+ 4						− 9	− 5							
+15	+14	+17	+16	+13	+11	+10							−21	−23	−24	−27	−24	−27	−30	−34
+ 8	+ 7	+ 6	+ 6	+ 3	+ 2	− 1					−12	− 8	−12	− 9	− 8	−11	−11	−14		
+21	+15	+16	+20				−27	−32	−33	−30	−31	−34	−32	−34	−29	−26	−26	−24		
+ 3	+ 3						+ 8	0	0	+ 3	− 1	0	+ 4	+ 4						
+33	+31	+32	+31	+34	+33	+36				+15	+ 9	+10	+ 9	+ 8	+ 7	+ 7	+ 6	+ 6	+ 6	
+13	+ 7	+ 5	+ 8				− 8	−16	−17	−13	−13	−12	−12	−15	−17	−13	−19	−24		
+ 7	+15						+19	+19	+19	+15	+11	+ 9	+ 7	+ 2	+ 2	+ 2	0			
+ 4	0	+ 2	+ 3						−13	−15	−14	−16	−19	−21	−25	−28	−30	−36	−35	
+16	+14	+14	+12					− 8	−10	−15	−16	−17	−14	−13	−10	− 8	− 4	− 1		
− 9	−21	−19	−15	−25				+10	+14	+18	+23	+30	+34	+35	+33	+39	+35	+40	+36	
− 5	− 6	−11	− 9	− 6	− 5	− 3										− 6	− 6	− 6	− 6	− 3
+ 2	+ 6	+ 2					+12	+ 8	+15	+ 4	+ 2	+ 3	+ 1	− 1	− 1	+ 2	+ 4			
+15	+12	+ 9	+12	+11	+ 9	+ 4						−13	−10	−11	−16	−11	−11	+14	+10	+12
+ 5	+ 4	+ 5	+11				+ 8	+11	+ 7	+ 2	+ 1	− 2	− 6	− 8	−11	−12				
+16	+22	+20	+21				+ 8	+14	+ 4	+ 4	+ 2	+ 2	0	0	0	0	0	− 4		
0	−10	−15	− 3					+ 5	0	+ 2	− 4	− 7	− 9	−12	−15	−16	−17	−21	−22	
+10	+10	+ 9	+ 7	+ 7	+ 8	+ 8				+23	+19	+16	+16	+11	+11	− 1	−15	+ 8	−18	
+ 5	+ 2	− 2	− 4	− 6	− 5	− 2				+ 4	+ 2	+ 2	+ 1	− 5	−14	−24	−24			
+13	+10	+10	+ 8	+ 8	+12	+ 7				+ 3	+ 9	+ 8	+ 6	+ 5	+ 5	+ 7	+ 9	+ 6	+ 6	+ 7

TABLE IV.

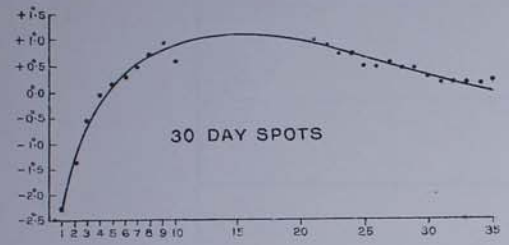
Mean Displacements in Longitude and Areas of "Leader" Spots.

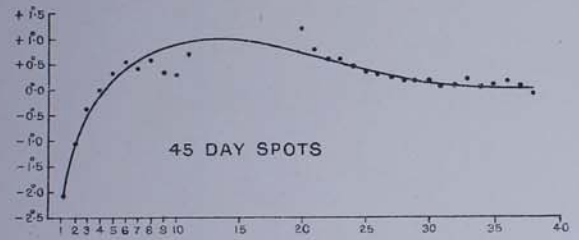
(*a*) 30-day "Leader" Spots.				(*b*) 45-day "Leader" Spots.				(*c*) 60-day "Leader" Spots.			
Day.	Displacement.	Area.	Number of Spots.	Day.	Displacement.	Area.	Number of Spots.	Day.	Displacement.	Area.	Number of Spots.
	°				°				°		
1	−2·30	106	59	1	−2·18	128	58	1	−2·84	119	30
2	−1·36	167	60	2	−1·03	242	58	2	−1·57	230	30
3	−0·60	219	60	3	−0·39	306	58	3	−0·58	308	30
4	−0·04	243	56	4	0·00	340	49	4	−0·11	345	30
5	+0·19	268	49	5	+0·32	373	47	5	−0·01	385	26
6	+0·27	285	43	6	+0·54	409	41	6	+0·23	415	16
7	+0·46	301	38	7	+0·42	436	34	7	+0·43	428	15
8	+0·71	283	29	8	+0·58	450	28	8	+0·51	485	14
9	+0·94	297	23	9	+0·33	458	23	9	+0·79	550	9
10	+0·58	280	14	10	+0·28	452	18				
				11	+0·71	394	14				
				20	+1·22	239	13				
21	+0·95	189	16	21	+0·79	281	20	21	+1·28	356	14
22	+0·86	163	22	22	+0·60	290	23	22	+1·34	367	16
23	+0·71	154	27	23	+0·63	271	28	23	+1·19	349	17
24	+0·72	142	34	24	+0·46	247	34	24	+1·01	351	23
25	+0·48	131	42	25	+0·37	263	39	25	+0·94	342	26
26	+0·47	119	50	26	+0·28	253	42	26	+1·05	337	29
27	+0·51	104	54	27	+0·23	246	51	27	+1·04	328	30
28	+0·42	99	54	28	+0·18	238	58	28	+0·93	316	30
29	+0·41	88	51	29	+0·18	231	58	29	+0·81	303	30
30	+0·27	79	45	30	+0·18	216	58	30	+0·69	296	30
31	+0·19	72	43	31	+0·09	208	54	31	+0·56	296	29
32	+0·19	56	33	32	+0·09	165	46	32	+0·65	278	28
33	+0·19	41	26	33	+0·23	177	40	33	+0·49	276	17
34	+0·13	11	21	34	+0·03	157	36	34	+0·48	259	15
35	+0·22	17	12	35	+0·10	144	30	35	+0·43	267	13
				36	+0·16	131	24				
				37	+0·06	99	20				
				38	−0·10	107	15				
								48	+0·08	175	10
								49	−0·11	158	15
								50	−0·17	144	17
								51	−0·24	134	22
								52	−0·29	130	24
								53	−0·30	118	27
								54	−0·38	112	30
								55	−0·46	111	29
								56	−0·56	89	27
								57	−0·56	81	28
								58	−0·63	85	26
								59	−0·55	57	21
								60	−0·66	43	13
								61	−0·98	11	7

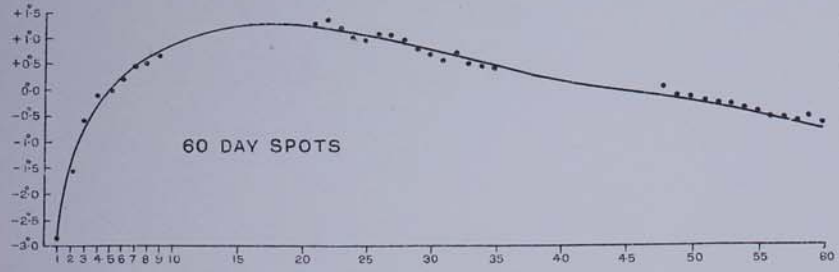
"LEADER" SPOTS (30, 45, AND 60 DAYS AVERAGE DURATION) MEAN DISPLACEMENTS IN LONGITUDE AND AREAS.

MEAN DISPLACEMENTS IN LONGITUDE.

Abscissæ – Days from formation of Spots.
Ordinates – Displacements in longitude.

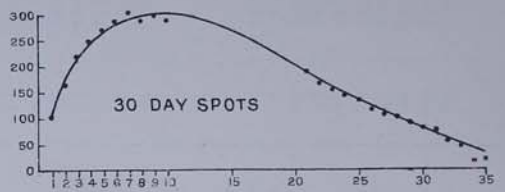


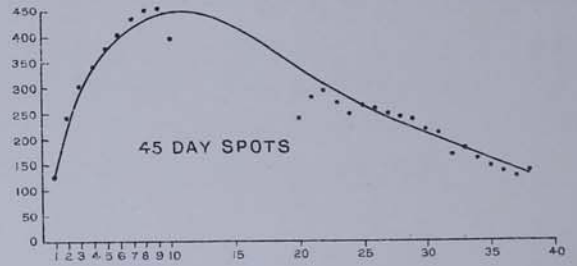




MEAN AREAS.

Abscissæ – Days from formation of Spots.
Ordinates – Areas, corrected for foreshortening in millionths of Sun's visible hemisphere.





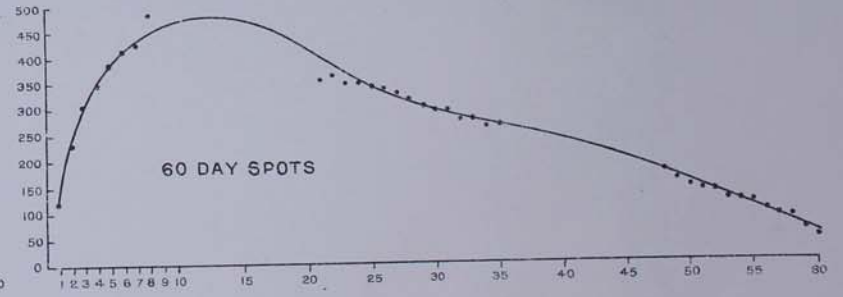


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Table IV gives the mean displacements derived from the preceding tables. The means of those days on which the greatest number of spots were together visible were used as fiducial points from which mean positions for other days were derived. For example : in Table III, Class (*c*), 30 spots were seen on days 1, 2, 3, 4 ; 27, 28, 29, 30 ; 54. The means of these 30 spots were taken, and gave the relative positions as tabulated in Table IV. But on the 8th day only 14 spots were seen. The difference between the mean position of these 14 spots and the same 14 on the 4th day was + 0°·62 ; this was applied to — 0°·11 of 4th day and gave + 0°·51 for the 8th day. Similarly, for the 21st day, 14 spots were seen which occur on the 29th day, the difference of the mean position being + 0°·47. Applying this to the value + 0°·81 already found, + 1°·28 was obtained, as the mean displacement for the 21st day. Actually, values found in this more accurate but slightly complicated manner differ very little from those obtained by taking the simple means of the columns in Tables I, II and III.

The corresponding mean areas, corrected for foreshortening and expressed in millionths of the Sun's visible hemisphere, are also given in the tables for comparison with the displacements in longitude, but it was thought unnecessary to give the separate observations.

The average diurnal movement of the spots in longitude is derived from the curves as follows :—

TABLE V.

Diurnal Movement in Longitude of "Leader Spots."

Day.	(*a*) 30-day Spots.	(*b*) 45-day Spots.	(*c*) 60-day Spots.
	°	°	°
1—3	+ 0·85	+ 0·85	+ 1·10
3—5	+ 0·40	+ 0·30	+ 0·35
5—7	+ 0·20	+ 0·20	+ 0·20
7—9	+ 0·15	+ 0·10	+ 0·15
9—21	0·00	0·00	+ 0·04
21—36	— 0·06	— 0·04	— 0·05
48—61	..	..	— 0·05

Thus in the first two days of its life the leader spot of a group appears to be moving rapidly forward in longitude at the rate of about 1°·0 per day. In the next two days the rate has diminished to about 0°·4 per day, and it continues to diminish until about the 15th day, when the spot is moving with the mean velocity corresponding to its latitude. By about the 20th day it is moving slowly backwards at a rate of about 0°·05 per day. Corresponding changes take place in the size of the spots, which increase rapidly at the start, reach a maximum at about the 10th day, and then slowly decline. It may be noticed that the area is a maximum at nearly the same time both for spots which last 60 days, and for those of half that duration.

A summary of these results is also given in *M.N.R.A.S.*, April, 1925, pp. 553–560.