GREENWICH

PHOTO-HELIOGRAPHIC RESULTS.

1903

RESULTS OF MEASURES

MADE AT THE

ROYAL OBSERVATORY, GREENWICH,

UNDER THE DIRECTION OF

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ASTRONOMER ROYAL,

OF

PHOTOGRAPHS OF THE SUN

TAKEN AT

GREENWICH, IN INDIA, AND IN MAURITIUS,

IN THE YEAR

1903.

(EXTRACTED FROM THE GREENWICH OBSERVATIONS, 1903.)

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GREENWICH PHOTO-HELIOGRAPHIC RESULTS, 1903.

INTRODUCTION.

§ 1. *Measures of Positions and Areas of Sun Spots and Faculæ on Photographs taken at the Royal Observatory, Greenwich, at Dehra Dûn in India, and at the Royal Alfred Observatory, Mauritius, in the year* 1903; *with the deduced Heliographic Longitudes and Latitudes.*

The photographs from which these measures were made were taken either at Greenwich; at Dehra Dûn, North-West Provinces, India; or at the Royal Alfred Observatory, Mauritius.

The photographs of the Greenwich series were taken either h the Thompson or with the Dallmeyer Photoheliograph. The Thompson Photoheliograph, which was in regular use for the greater part of the year, is a photographic refractor of 9 inches aperture, presented to the Royal Observatory by Sir Henry Thompson, which has been fitted with an enlarging doublet by Ross, and with a camera and shutter for rapid exposure so as to take photographs of the Sun on a scale of about 7·5 inches to the solar diameter. The Dallmeyer, which was used instead of the Thompson on 1903 September 12, and from 1903 September 14 to 1903 December 16 inclusive, while the dome of the Thompson Refractor was undergoing repair, is an instrument used in the Transit of Venus expedition to New Zealand, which, as now adapted, gives a solar image of 8 inches diameter on the photographic plate.

The photographs have been taken throughout the year on gelatine dry plates, "Lantern" plates supplied by R. W. Thomas and Co. being used, with hydroquinone development.

The Indian photographs, which have been forwarded by the Solar Physics Committee to fill the gaps in the Greenwich series, were taken under the

superintendence of the Deputy Surveyor-General, Trigonometrical Survey of India, with a Dallmeyer Photoheliograph giving an image of the Sun nearly 8 inches in diameter. In the process adopted at Dehra Dûn, bromo-iodized collodion wet plates, in connexion with iron development, have been used, as well as "Lantern" dry plates.

The Mauritius photographs were taken under the superintendence of Mr. T. F. Claxton, Director of the Royal Alfred Observatory, Mauritius, with a Dallmeyer Photoheliograph, giving an image of the Sun about 8 inches in diameter. At the Mauritius Observatory bromo-iodized gelatine dry plates have been used with alkaline development.

Photographs of the Sun were taken at Greenwich on 226 days, and Indian photographs on 109 days with Mauritius photographs on 16 days have been received from the Solar Physics Committee to complete the total of 351 days for which there are either Greenwich, Indian, or Mauritius photographs of the Sun available for measurement in 1903.

The *first* column on each page contains the Greenwich civil time at which each photograph was taken, expressed by the day of the year and decimals of a day, reckoning from Greenwich mean midnight January 1d. 0h., and also by the day of the month (civil reckoning), which latter is placed opposite the total area of Spots and Faculæ for the day. The photographs taken in India are distinguished by the letter I., and those taken in Mauritius by the letter M.

The *second* column contains the initials of the two persons measuring the photograph; the initial on the left being that of the person who measured the photograph on the left of the centre of the measuring instrument, and that on the right being that of the person who measured on the right of the centre.

The following are the signatures of those persons who measured the photographs for the year 1903:—

E. W. Maunder	M	A. H. Smith	AS
R. Fowler	RF	C. F. Lait	CL

The *third* column gives the No. of the group, and the letter for the spot. The groups are numbered in order of their appearance.

The *next two* columns give the distance from the centre of the Sun in terms of the Sun's radius, and the position-angle from the Sun's axis, reckoned from the

Sun's north pole in the direction *n*, *f*, *s*, *p*, both results being corrected for the effects of astronomical refraction.

The measures of the photographs were made with a large position-micrometer specially 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 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 a 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.

The following is the process of measurement of a photograph:—By means of the screws attached to the circular plates carrying the pillars which hold the photograph, the image of the Sun is centred as accurately as possible by rotation. The position-circle is then set to the readings 0°, 90°, 180°, and 270° in succession, and the scale readings taken for the two limbs. The scale being so adjusted that its zero coincides with the centre of rotation of the position-circle, the mean of the eight readings for the limb gives the mean radius of the Sun directly.

At the principal focus of the photoheliograph are two cross-spider-lines which serve to determine the zero of position-angles on the photograph.

The zero of position-angles for the Thompson and Dallmeyer Photoheliographs employed at Greenwich has been determined by the measurement of a plate which

has been exposed to the Sun's rays 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 plate, and the exposures having been so given that the line joining the cusps passed approximately through the centre of the plate, the inclination of the wires of the photoheliograph to this line was measured with the position-micrometer, and a small correction for the inclination of the Sun's path was then applied. The following tables give the correction for zero of position for the mean of the two wires as thus determined :—

Thompson Photoheliograph, to 1903 September 13.

Date, Greenwich Civil Time.			Correction for Zero.
		d h	° ′
1902	December	30. 11	+ 0. 22
1903	January	14. 10	+ 0. 22
	February	2. 11	+ 0. 22
		19. 12	+ 0. 27
	March	6. 10	+ 0. 36
		30. 13	+ 0. 33
	April	18. 11	+ 0. 22
	May	21. 11	+ 0. 18
	June	4. 10	+ 0. 32
		22. 11	+ 0. 27
	July	8. 10	+ 0. 32
		30. 10	+ 0. 36
	August	13. 10	+ 0. 44
	September	1. 10	+ 0. 31½

A correction of $+0^{\circ}\cdot4$ for zero of position has been applied to all photographs taken with the Thompson Photoheliograph up to 1903 September 13.

The horizontal wire of the Dallmeyer Photoheliograph was found broken on 1903 September 12 and a new wire was inserted on 1903 September 15. Both wires were replaced on 1903 October 2. Corrections of $+2^{\circ}\cdot6$ for mean zero of position of both wires, and of $+2^{\circ}\cdot4$ for zero of position of the vertical wire alone, were found from the comparison of photographs taken on 1903 August 22 and August 31 with photographs taken on the same days with the Thompson Photoheliograph, and these corrections were applied to the photographs taken with the Dallmeyer Photoheliograph from 1903 September 12 to September 30.

Dallmeyer Photoheliograph, 1903 September 12 to December 16.

Date, Greenwich Civil Time.		Correction for Zero.
	d h	° ′
1903 October	12. 12	+ 1.43
	26. 12	+ 1.40
	31. 11	+ 1.39
	31. 11	+ 1.49
December	2. 13	+ 1.38

A correction of $+1^{\circ}\cdot7$ for zero of position has been applied to all photographs taken with the Dallmeyer photoheliograph from 1903 October 2 to 1903 December 16.

Thompson Photoheliograph, from 1903 December 17.

Date, Greenwich Civil Time.		Correction for Zero.
	d h	° ′
1903 December	30. 11	+ 0.10
1904 January	26. 12	+ 0.19
February	10. 11	+ 0.14
March	16. 11	+ 0.23

A correction of $+0^{\circ}\cdot3$ for zero of position has been applied to all photographs taken with the Thompson Photoheliograph from 1903 December 17 to December 31.

The Thompson Photoheliograph was mounted on the tube of the 26-inch Thompson Photographic refractor throughout the year. The Thompson Photoheliograph is not fitted with a position-circle, and the position-angle of the wires, which are approximately parallel and perpendicular to the circle of declination, cannot be altered.

The Dallmeyer Photoheliograph was mounted on the equatorial stand belonging to it, which was erected on the terrace roof of the South Wing of the New Physical Observatory.

In the use at Greenwich of the Dallmeyer Photoheliograph the position-circle has usually been set to some convenient reading near that for zero, so that the wires are respectively very nearly parallel and perpendicular to the circle of declination, and a correction for zero of position of the photoheliograph for the mean of the two wires has been applied to the zero of the position-circle of the micrometer. The position-circle was set to the reading $354^{\circ}\cdot0$ throughout 1903.

The zero of the position-circle of the micrometer has been determined from the readings of the position-circle for the four extremities of the two wires. The resulting combined correction is applied to all position-circle readings for spots and faculæ, so as to give true position-angles.

In the use of the photoheliographs at Dehra Dûn and in Mauritius the position-circle has always been set to the zero as determined by allowing the diurnal motion to carry a spot or the Sun's limb along the horizontal wire, and the accuracy of the adjustment has been tested at short intervals. No correction for zero of position of the wires has therefore been applied for the reduction of the photographs taken in India or in Mauritius.

The uncorrected distance from the Sun's centre for spots and faculæ is read off directly to 1-250th of an inch by means of a scale and vernier, the zero of the scale of the new micrometer being adjusted to coincide with the centre of the instrument.

Two sets of measures of the Sun's limb and of spots and faculæ on each photograph have been taken, and the mean of the two sets adopted.

No correction has been applied to the photographs on account of distortion.

The correction for the effect of refraction has been thus found, the Sun's image being assumed to be sensibly an ellipse. The refraction being sensibly $c \tan z$ where $c = \sin 57''\cdot5 = \frac{1}{3600}$ nearly, and z is the apparent zenith-distance, we shall have—

$$\frac{\text{Vertical Diameter}}{\text{Horizontal Diameter}} = \frac{1 - c \sec^2 z}{1 - c} = 1 - c \tan^2 z\,;$$

and thus the effect of refraction will be to diminish any vertical ordinate y by the quantity $c \tan^2 z$. Resolving this along and perpendicular to the radius vector r, and putting v for the position-angle of the vertex, we have for δr and $\delta \theta$, the corrections to radius vector and position-angle for the effect of refraction—

$$\delta r = + c \,.\, \tan^2 z \times r \,.\, \cos^2 (\theta - v) = + c \,.\, \tan^2 z \times r \times \frac{1 + \cos 2\,(\theta - v)}{2},$$

$$\delta \theta = - c \,.\, \tan^2 z \,.\, \sin (\theta - v) \,.\, \cos (\theta - v) = - c \,.\, \tan^2 z \, \frac{\sin 2\,(\theta - v)}{2}.$$

The quantity δr thus found is the correction, on the supposition that a horizontal diameter of the Sun is taken as the scale. But, as the mean of two diameters at right angles has been used, the scale itself requires the correction $\delta \mathrm{R} = + c \,.\, \tan^2 z \times \mathrm{R} \times \frac{1}{2} \left\{ \frac{1 + \cos 2\,(\theta_0 - v)}{2} + \frac{1 + \cos 2\,(\theta_0 + 90^\circ - v)}{2} \right\} = + \frac{1}{2} c \,\mathrm{R} \,.\, \tan^2 z,$

where R is the Sun's mean radius and θ_0, $\theta_0 + 90°$ the position-angles of the two diameters measured. Thus the final correction to r becomes—

$$\delta r = + c \,.\, \tan^2 z \times r \times \frac{\cos 2\,(\theta - v)}{2}.$$

The quantities $c \tan^2 z$, $-\frac{\sin 2\,(\theta - v)}{2}$, and $\frac{\cos 2\,(\theta - v)}{2}$ have been tabulated for use as follows, $c \tan^2 z$ being expressed in circular measure and in arc for application to distances and position-angles respectively :—

$c \tan^2 z$.

z.	In Circular Measure.	In Arc.	z.	In Circular Measure.	In Arc.	z.	In Circular Measure.	In Arc.
°		′	°		′	°		′
80	·0089	31	70	·0021	7	60	·0008	3
79	·0073	25	69	·0019	6½	58	·0007	2
78	·0061	21	68	·0017	6	56	·0006	2
77	·0052	18	67	·0015	5½	54	·0005	2
76	·0045	15	66	·0014	5	52	·0005	2
75	·0039	13	65	·0013	4½	50	·0004	1
74	·0034	11½	64	·0012	4	45	·0003	1
73	·0030	10	63	·0011	4	40	·0002	1
72	·0026	9	62	·0010	3	30	·0001	0
71	·0023	8	61	·0009	3			

Factors for Refraction.

$\theta - v$	$\theta - v$	$-\frac{\text{Sin } 2\,(\theta - v)}{2}$	$\frac{\text{Cos } 2\,(\theta - v)}{2}$	$\theta - v$	$\theta - v$	$-\frac{\text{Sin } 2\,(\theta - v)}{2}$	$\frac{\text{Cos } 2\,(\theta - v)}{2}$
°	°			°	°		
0	180	·00	+ ·50	90	180	·00	− ·50
5	185	− ·09	+ ·49	95	275	+ ·09	− ·49
10	190	− ·17	+ ·47	100	280	+ ·17	− ·47
15	195	− ·25	+ ·43	105	285	+ ·25	− ·43
20	200	− ·32	+ ·38	110	290	+ ·32	− ·38
25	205	− ·38	+ ·32	115	295	+ ·38	− ·32
30	210	− ·43	+ ·25	120	300	+ ·43	− ·25
35	215	− ·47	+ ·17	125	305	+ ·47	− ·17
40	220	− ·49	+ ·09	130	310	+ ·49	− ·09
45	225	− ·50	·00	135	315	+ ·50	·00
50	230	− ·49	− ·09	140	320	+ ·49	+ ·09
55	235	− ·47	− ·17	145	325	+ ·47	+ ·17
60	240	− ·43	− ·25	150	330	+ ·43	+ ·25
65	245	− ·38	− ·32	155	335	+ ·38	+ ·32
70	250	− ·32	− ·38	160	340	+ ·32	+ ·38
75	255	− ·25	− ·43	165	345	+ ·25	+ ·43
80	260	− ·17	− ·47	170	350	+ ·17	+ ·47
85	265	− ·09	− ·49	175	355	+ ·09	+ ·49
90	270	·00	− ·50	180	360	·00	+ ·50

The position-angle of the vertex v is readily taken from a globe.

The distance from centre in terms of the Sun's radius given in the *fourth* column is then readily found by dividing the measured distance r_0, as corrected for refraction, by the measured mean radius of the Sun, R; and the position-angle from the Sun's axis given in the *fifth* column is obtained by applying to the position-angle (from the N. point) corrected for refraction the position-angle of the Sun's axis derived from the *Auxiliary Tables for determining the Angle of Position of the Sun's Axis, and the Latitude and Longitude of the Earth referred to the Sun's Equator*, by Warren De La Rue, F.R.S.

The *sixth* and *seventh* columns give the heliographic longitude and latitude of the spot, which are thus computed.* Let r be the measured distance of a spot from the centre of the Sun's apparent disk, R the measured radius of the Sun on the photograph, (R) the tabular semidiameter of the Sun in arc, and ρ, ρ' the angular distances of a spot from the centre of the apparent disk as viewed from the Sun's centre and from the Earth respectively. Then we have—

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

$$\text{whence } \rho = \sin^{-1}\frac{r}{R} - \rho'.$$

Log. sin ρ and log. cos ρ, as computed from this formula, are given in *Tables for the Reduction of Solar Observations No.* 2, by Warren De La Rue, F.R.S. Then, if D, λ are the heliographic latitudes of the Earth and the spot respectively, referred to the Sun's equator, and L, l the heliographic longitudes reckoned from the ascending node of the Sun's equator on the ecliptic, and χ the position-angle from the Sun's axis, we have by the ordinary equations of spherical trigonometry—

$$\sin\lambda = \cos\rho \sin D + \sin\rho \cos D \cos\chi$$
$$\sin(L - l) = \sin\chi \sin\rho \sec\lambda.$$

The quantities L and D are derived from Warren De La Rue's *Auxiliary Tables* before referred to, in the computation of which the following formulæ have been used—

$$\tan L = \cos I \tan(\odot - N)$$
$$\sin D = \sin I \sin(\odot - N)$$

where I is the inclination of the Sun's equator to the ecliptic, N the longitude of the ascending node, and $\odot$ the longitude of the Sun.

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* "Researches on Solar Physics: Heliographical Positions and Areas of Sun Spots observed with the Kew Photoheliograph during the years 1862 and 1863," by W. De La Rue, B. Stewart, and B. Loewy. *Phil. Trans.*, 1869.

The position-angle χ is given by the formula—

$$\chi = P + G + H$$

where P is the position-angle from the north point of the Sun, and G and H two auxiliary angles given by the formulæ—

$$\tan G = \tan \omega \cos \odot$$
$$\tan H = \tan I \cos (\odot - N)$$

where ω is the obliquity of the ecliptic.

It will be seen that G is the inclination of two planes through the line joining the centres of the Earth and Sun passing through the poles of the Earth and of the ecliptic respectively, and that H is the inclination of two planes through the same line and the poles of the Sun and of the ecliptic. The values assumed for I, N, ω in the computation of the tables are $7^\circ.15'$, $74^\circ.24'$, and $23^\circ.27'\cdot5$ respectively.

The heliographic longitude of the spot is found from l, the heliographic longitude from node, by subtracting the reduction to the prime meridian, which is the longitude of the node at the epoch of the photograph, referred to the assumed prime meridian, the latter being the meridian which passed through the ascending node at mean noon, 1854 Jan. 1. The period of rotation assumed is 25·38 days.

The heliographic longitude and latitude of the centre of the Sun's disk at the time of the exposure of each photograph are also given (in brackets) in the *sixth* and *seventh* columns respectively. The longitude of the centre of the disk is found by subtracting the reduction to the prime meridian from L, the longitude of the centre from the node. The latitude of the centre is of course the same as D, the heliographic latitude of the Earth.

The measures of areas given in the *last three* columns were made with a glass diaphragm ruled into squares, with sides of one-hundredth of an inch, and placed as nearly as possible in contact with the photographic film. The integral number of squares and parts of a square contained in the area of a spot or facula was estimated by the observer, two independent sets of measures being made by two observers. The mean of the two sets of measures has been taken for each photograph. The factor for converting the areas, as measured in ten-thousandths of a square inch, into millionths of the Sun's visible hemisphere, allowing for the effect of foreshortening, has been inferred by means of a table of double entry, giving the equivalent of one square for different values of the Sun's radius, and for different distances of the spot or facula from the Sun's centre as measured by means of the position-micrometer.

The individual spots in a group have in some cases not been measured separately, but combined into a cluster of two or three small spots close together, the position of the centre of gravity and the aggregate area of the cluster being given. The actual number of individual spots is usually stated in the notes.

§ 2. *Ledgers of Areas and Heliographic Positions of Groups of Sun Spots deduced from the measurement of the Solar photographs for each day in the year* 1903.

In these ledgers the daily results for each group are collected together from the measures of the individual spots and given in a condensed form. The first column gives, for each day on which the group was observed, the Greenwich civil time at which each photograph was taken, expressed by the day of the month (civil reckoning) and the decimals of a day reckoning from Greenwich mean midnight. The second and third columns give the sums, for each day, of the projected areas of all the umbræ and whole spots comprised in the group, the projected area being the area as it is measured upon the photograph, uncorrected for foreshortening, and expressed in millionths of the Sun's apparent disk. The fourth and fifth columns give the sums for each day of the areas of all the umbræ and whole spots comprised in the group, corrected for foreshortening, and expressed in millionths of the Sun's visible hemisphere. The sixth and seventh columns give the mean longitude and latitude of the group, found by multiplying the longitude and latitude of each separately measured component of the group by its area, and dividing the sum of the products by the sum of the areas. The last column gives the mean longitude of the group from the central meridian, and is found by subtracting the longitude of the centre of the disk from the mean longitude of the group. At the foot of these daily results for each group are given the mean areas of umbræ and whole spots and the mean longitude and latitude for the period of observation.

§ 3. *Total Projected 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* 1903.

This section requires no further explanation.

W. H. M. CHRISTIE.

Royal Observatory, Greenwich.
1905, *March* 1.

ROYAL OBSERVATORY, GREENWICH.

MEASURES OF POSITIONS AND AREAS

OF

SUN SPOTS AND FACULÆ

ON

PHOTOGRAPHS

TAKEN WITH THE

PHOTOHELIOGRAPHS

AT GREENWICH, IN INDIA, AND IN MAURITIUS,

WITH THE DEDUCED

HELIOGRAPHIC LONGITUDES AND LATITUDES.

1903.

MEASURES of POSITIONS and AREAS of SUN SPOTS and FACULÆ on PHOTOGRAPHS taken at the ROYAL OBSERVATORY, GREENWICH, at DEHRA DÛN in INDIA, and at the ROYAL ALFRED OBSERVATORY, MAURITIUS, in the Year 1903.

NOTE.—The Greenwich Civil Time at which the Photograph was taken is expressed by the Day of the Year and decimals of a day, reckoning from Midnight, January 1d 0h. For convenience of reference, the Month and Day of the Month (Civil Reckoning) are added.

The letter I. signifies that the photograph was taken in India; the letter M. that the photograph was taken in Mauritius; the time given is Greenwich Civil Time.

The position-angles are reckoned from the North Pole of the Sun's Axis in the direction N., E., S., W., N.

The Groups of Spots are numbered in the order of their appearance. When there is no number in the third column, it is to be understood that there is a Facula unaccompanied by a Spot. 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. The longitude and latitude of the centre of the disk are given in brackets.

The Areas of Spots and Faculæ are expressed in millionths of the Sun's visible Hemisphere.

Greenwich Civil Time.	Measurers.	No. of Group, and Letter for Spot.	Distance from Centre in terms of Sun's Radius.	Position Angle from Sun's Axis.	Heliographic Longitude.	Heliographic Latitude.	Spots: Area of UMBRA for each Spot (and for Day).	Spots: Area of WHOLE for each Spot (and for Day).	Faculæ: Area for each Group (and for Day).
1903.				°	°	°			
0·514	RF, M		0·952	69·8	271·4	+18·1			70
Jan. 1		Centre			(341·2)	(−3·2)	(0)	(0)	(70)
1·162	RF, M		0·903	68·1	271·1	+18·1			111
I.									
Jan. 2		Centre			(332·7)	(−3·3)	(0)	(0)	(111)
2·548	RF, M	4998	0·710	60·7	274·0	+17·7	1	8	
		4998	0·724	61·3	272·7	+17·8	0	8	
Jan. 3		Centre			(314·4)	(−3·4)	(1)	(16)	(0)
3·465	RF, M	4999*a*	0·690	307·0	338·6	+21·7	4	18	
		4999	0·671	311·9	335·3	+23·7	0	3	
		4999*b*	0·654	311·8	334·2	+22·8	8	35	
			0·922	62·3	239·5	+23·8			127
Jan. 4		Centre			(302·4)	(−3·5)	(12)	(56)	(127)
4·159	RF, M	4999*a*	0·790	301·3	339·6	+21·7	9	21	
I.		4999	0·772	304·3	337·0	+23·2	1	5	79*c*
		4999*b*	0·744	306·1	333·9	+23·2	16	100	
Jan. 5		Centre			(293·2)	(−3·6)	(26)	(126)	(79)
5·178	RF, M	4999*a*	0·905	296·3	340·4	+21·8	1	11	
I.		4999*b*	0·859	300·2	333·5	+23·4	21	118	218*c*
Jan. 6		Centre			(279·7)	(−3·7)	(22)	(129)	(218)
6·420	RF, M		0·879	252·9	324·6	−16·8			66
		4999	0·956	296·2	332·8	+23·7	4	72	150*p*
		5000*a*	0·427	46·8	244·9	+13·3	2	9	
		5000*b*	0·462	51·2	241·9	+13·3	0	3	
			0·949	69·7	194·4	+17·9			238
Jan. 7		Centre			(263·5)	(−3·8)	(6)	(84)	(454)
1903.				°	°	°			
7·260	RF, M	5000*a*	0·321	22·8	245·1	+13·3	0	4	
		5000*b*	0·334	30·8	242·3	+12·8	0	5	
I.			0·908	64·7	190·9	+20·9			299
			0·960	69·5	181·2	+18·4			207
Jan. 8		Centre			(252·4)	(−3·9)	(0)	(9)	(506)
8·469	RF, M		0·738	59·9	209·3	+36·0			487
			0·873	64·7	179·7	+19·7			133
			0·907	112·7	171·9	−22·3			50
Jan. 9		Centre			(236·4)	(−4·0)	(0)	(0)	(670)
9·452	RF, M		0·753	52·6	182·7	+24·0			39
			0·799	115·1	172·2	−22·4			30
			0·850	59·9	170·8	+22·7			449
Jan. 10		Centre			(223·5)	(−4·2)	(0)	(0)	(518)
10·185	RF, M		0·935	108·0	144·6	−18·4			62
Jan. 11		Centre			(213·9)	(−4·3)	(0)	(0)	(62)
11·457	RF, M		0·771	310·0	238·2	+26·4			195
			0·835	111·1	141·3	−20·0			574
Jan. 12		Centre			(197·1)	(−4·4)	(0)	(0)	(769)
12·505	RF, M		0·872	301·6	237·8	+24·5			53
Jan. 13		Centre			(183·3)	(−4·5)	(0)	(0)	(53)
13·429	RF, M		0·888	109·2	108·7	−19·1			39
Jan. 14		Centre			(171·1)	(−4·6)	(0)	(0)	(39)
Jan. 15		No	Spots	or	Faculæ				

Group 4998, January 3. A pair of very small spots.

Group 4999, January 4–7. Two small spots, *a* and *b*, of which *b* is the larger. *a* moves forward in longitude and *b* increases in size on the succeeding days. Some very small spots are seen between them on January 4–5.

Group 5000, January 7–8. Two small spots, *a* and *b*, on January 7. The following spot has broken up to form a compact cluster by January 8.

Measures of Positions and Areas of Sun Spots and Faculæ on Photographs—*continued.*

Greenwich Civil Time.	Measurers.	No. of Group, and Letter for Spot.	Distance from Centre in terms of Sun's Radius.	Position Angle from Sun's Axis.	Heliographic Longitude.	Heliographic Latitude.	Spots. Area of UMBRA for each Spot (and for Day).	Spots. Area of WHOLE for each Spot (and for Day).	Faculæ. Area for each Group (and for Day).
1903.				°	°	°			
15·450	RF, M		0·799	294·8	194·4	+16·4			338
Jan. 16		Centre			(145·5)	(−4·8)	(0)	(0)	(338)
16·185	RF, M		0·798	295·2	183·6	+16·6			44
I.			0·770	299·8	179·7	+19·0			81
Jan. 17		Centre			(134·9)	(−4·9)	(0)	(0)	(125)
17·268	RF, M	5001	0·977	103·2	42·2	−14·0	0	12	
I.		5001	0·981	103·2	41·1	−13·9	0	14	
Jan. 18		Centre			(120·6)	(−5·0)	(0)	(26)	(0)
18·169	RF, M		0·956	292·0	178·5	+19·3			90
			0·923	297·7	171·3	+23·1			115
		5001	0·912	103·3	42·9	−14·0	6	18	
I.		5001	0·925	103·8	40·8	−14·7	1	15	364*c*
		5001	0·942	104·8	38·1	−15·6	3	19	
			0·975	22·7	58·0	+61·0			61
			0·977	55·5	36·9	+32·2			39
Jan. 19		Centre			(108·8)	(−5·1)	(10)	(52)	(669)
19·182	RF, M		0·960	297·8	164·6	+24·9			68
		5001	0·791	103·6	43·2	−13·9	0	5	
		5001	0·804	104·1	42·0	−14·4	5	18	
I.		5001	0·842	105·4	38·2	−15·7	4	14	200*c*
		5001	0·846	104·9	37·7	−15·3	0	3	
Jan. 20		Centre			(95·4)	(−5·1)	(9)	(40)	(268)
20·280	RF, M	5001	0·628	106·0	42·6	−14·1	1	8	
I.		5001	0·690	107·8	38·0	−16·0	0	8	254*c*
			0·950	72·3	11·6	+15·0			30
Jan. 21		Centre			(80·9)	(−5·2)	(1)	(16)	(284)
21·263	RF, M	5001	0·436	111·0	43·3	−13·8	1	4	
I.		5001	0·494	110·5	39·5	−14·7	0	5	
		5001	0·524	112·4	37·9	−16·1	5	10	
Jan. 22		Centre			(68·0)	(−5·3)	(6)	(19)	(0)
22·423	RF, M	5001	0·220	131·7	43·0	−13·7	0	18	
		5001	0·259	129·3	40·8	−14·7	0	8	
		5001	0·268	124·9	39·7	−14·1	0	13	
		5001	0·305	121·9	37·3	−14·5	0	23	
		5001	0·317	125·2	37·2	−15·7	9	32	
Jan. 23		Centre			(52·7)	(−5·4)	(9)	(94)	(0)
1903.				°	°	°			
23·223	AS, M	5001	0·207	153·9	36·8	−16·2	3	10	
		5001	0·184	150·2	36·8	−14·6	0	7	
M.			0·940	63·5	336·7	+22·6			402
			0·910	107·6	336·5	−18·3			177
Jan. 24		Centre			(42·2)	(−5·5)	(3)	(17)	(579)
Jan. 25		No	Photo	graph					
25·373	RF, M	5002	0·730	47·0	337·9	+25·2	0	2	
		5002	0·727	48·1	337·5	+24·4	0	5	
I.		5002	0·735	49·6	336·3	+23·9	0	1	104*c*
		5002	0·747	48·1	336·0	+25·4	0	6	
Jan. 26		Centre			(13·9)	(−5·7)	(0)	(14)	(104)
Jan. 27		No	Spots	or	Faculæ				
27·431	RF, M		0·799	255·6	39·8	−15·0			357
		5003	0·235	155·3	340·9	−18·0	1	12	
		5003	0·249	147·5	338·8	−17·8	1	9	
		5002	0·504	14·5	338·9	+23·3	2	13	
		5002	0·501	18·6	336·9	+22·5	0	4	
Jan. 28		Centre			(346·8)	(−5·8)	(4)	(38)	(357)
28·465	RF, M		0·911	255·7	39·2	−15·4			218
		5003	0·262	216·5	342·6	−18·0	1	8	
		5003	0·252	212·6	341·4	−18·1	1	29	
		5003	0·258	206·0	340·0	−19·2	0	8	
		5003	0·222	202·4	338·3	−17·7	0	5	
		5003	0·230	199·6	337·8	−18·4	1	22	
Jan. 29		Centre			(333·2)	(−5·9)	(3)	(72)	(218)
29·529	RF, M	5003	0·437	240·0	342·5	−18·1	2	41	
		5003	0·408	234·3	339·6	−19·3	5	23	
		5003	0·393	236·7	339·2	−18·1	0	8	
Jan. 30		Centre			(319·1)	(−6·0)	(7)	(72)	(0)
30·425	RF, M	5003	0·604	248·7	343·4	−17·5	0	16	
		5003	0·567	243·6	339·9	−19·7	0	6	
		5003	0·551	246·1	339·3	−18·0	2	17	
		5003	0·545	244·9	338·6	−18·5	2	9	
		5003	0·539	246·6	338·5	−17·5	0	1	
Jan. 31		Centre			(307·4)	(−6·0)	(4)	(49)	(0)

Group 5001, January 18–24. A number of small spots in a short straight stream. The group undergoes a great but short-lived expansion on January 23.
Group 5002, January 26–28. A few very small faint spots. The group is not seen on January 27.
Group 5003, January 28–February 4. A few small spots in a short stream. *a*, the last spot of the group, becomes the largest, and is seen alone on February 2 and 4.

Measures of Positions and Areas of Sun Spots and Faculæ on Photographs—*continued.*

Greenwich Civil Time.	Measurers.	No. of Group, and Letter for Spot.	Distance from Centre in terms of Sun's Radius.	Position Angle from Sun's Axis.	Heliographic Longitude.	Heliographic Latitude.	Spots. Area of UMBRA for each Spot (and for Day).	Spots. Area of WHOLE for each Spot (and for Day).	Faculæ. Area for each Group (and for Day).
1903.				°	°	°			
31·478	RF, M		0·808	308·7	337·9	−26·0			169
			0·901	344·7	317·7	+54·7			36
		5003	0·763	251·8	342·9	−17·8	1	20	} 223*c*
		5003*a*	0·734	251·0	340·2	−18·0	6	32	
Feb. 1		Centre			(293·5)	(−6·8)	(7)	(52)	(428)
32·445	RF, M	5003*a*	0·846	252·1	338·5	−18·4	13	68	272*c*
Feb. 2		Centre			(280·7)	(−6·1)	(13)	(68)	(272)
33·372	RF, M	5003	0·961	253·9	343·5	−17·2	0	11	} 481*c*
		5003*a*	0·940	252·8	339·3	−18·3	16	41	
I.			0·951	299·9	334·9	+25·9			462
			0·958	68·1	198·8	+18·9			294
Feb. 3		Centre			(268·6)	(−6·2)	(16)	(52)	(1237)
34·191	RF, M		0·975	297·0	330·3	+24·5			127
I.		5003*a*	0·984	252·3	338·7	−18·5	11	44	302*c*
			0·905	65·7	197·3	+18·9			137
Feb. 4		Centre			(257·8)	(−6·3)	(11)	(44)	(566)
35·161	RF, M		0·846	59·2	193·7	+21·7			59
I.			0·931	68·9	179·9	+17·0			75
			0·973	98·9	167·8	−10·1			73
Feb. 5		Centre			(245·0)	(−6·4)	(0)	(0)	(207)
36·492	RF, M		0·894	62·6	169·5	+21·0			66
		5004*a*	0·930	106·3	158·4	−17·5	5	35	219*f*
Feb. 6		Centre			(227·5)	(−6·4)	(5)	(35)	(285)
37·191	RF, M	5004*a*	0·864	105·9	158·2	−17·0	6	25	267*f*
I.			0·962	109·1	143·1	−20·1			280
Feb. 7		Centre			(218·3)	(−6·5)	(6)	(25)	(547)
38·209	RF, M		0·866	233·1	147·3	−35·0			38
		5004*a*	0·726	107·6	158·6	−17·2	0	5	82*nf*
I.			0·784	107·7	153·3	−17·9			198
			0·856	107·2	145·7	−18·1			119
			0·907	111·8	139·3	−22·5			202
Feb. 8		Centre			(204·8)	(−6·5)	(0)	(5)	(639)
39·595	RF, M	5004	0·565	111·6	153·4	−17·5	0	7	
		5004	0·577	109·6	152·3	−16·6	0	6	
		5005*a*	0·974	64·7	114·2	+22·7	12	111	251*c*
Feb. 9		Centre			(186·7)	(−6·6)	(12)	(124)	(251)
1903.					°	°			
40·509	RF, M	5004*b*	0·369	117·6	154·8	−16·2	6	27	
		5004	0·401	119·8	153·3	−17·7	0	3	
		5004	0·414	115·5	151·8	−16·4	1	12	
		5004	0·430	116·5	150·9	−17·2	0	3	
		5005*a*	0·923	61·2	113·1	+23·3	34	166	649*c*
		5006*a*	0·984	64·6	99·1	+23·5	28	128	532*p*
Feb. 10		Centre			(174·6)	(−6·7)	(69)	(339)	(1181)
41·506	RF, M	5004*b*	0·185	155·5	156·9	−16·3	8	43	
		5004	0·194	148·3	155·4	−16·2	1	9	
		5004	0·253	137·6	151·2	−17·4	0	8	
		5005*a*	0·831	55·7	113·2	+23·5	26	170	463*c*
		5006*a*	0·921	61·4	100·2	+23·0	20	110	505*p*
			0·866	10·0	147·5	+51·8			147
Feb. 11		Centre			(161·5)	(−6·7)	(55)	(340)	(1115)
42·532	RF, M		0·823	300·6	196·9	+20·3			95
		5004*b*	0·225	221·0	156·8	−16·5	0	16	
		5005*a*	0·728	47·7	112·1	+23·8	24	156	} 539*c*
		5006*a*	0·835	56·5	99·0	+23·0	20	101	
Feb. 12		Centre			(148·0)	(−6·8)	(44)	(273)	(634)
43·582	RF, M		0·896	300·9	191·0	+23·8			166
		5005*a*	0·611	33·6	112·3	+24·2	24	132	
		5006*a*	0·710	47·1	99·7	+23·2	21	93	
Feb. 13		Centre			(134·0)	(−6·8)	(45)	(225)	(166)
44·154	RF, M	5005	0·522	24·7	113·1	+21·6	0	2	
I.		5005*a*	0·567	23·5	112·3	+24·6	15	105	
		5006*a*	0·652	40·3	99·3	+23·7	5	31	
Feb. 14		Centre			(126·6)	(−6·8)	(20)	(138)	(0)
45·183	RF, M		0·928	296·6	176·0	+21·5			126
			0·720	253·2	159·0	−16·9			58
		5005*a*	0·523	1·5	112·2	+24·5	24	106	
		5006*a*	0·558	25·0	98·3	+23·6	0	5	
I.			0·857	147·2	66·0	−50·8			25
			0·930	63·0	50·0	+21·9			35
			0·905	104·9	47·5	−16·5			125
			0·948	109·1	40·6	−20·3			97
Feb. 15		Centre			(113·1)	(−6·9)	(24)	(111)	(466)

Group 5004, February 6–12. A small spot, *a*, on February 6 and the two succeeding days. *a* has disappeared on February 9, and a number of small spots in an irregular stream have formed a little to the rear of its place. *b*, the leader of the stream on February 10, moves rapidly forward and remains alone on February 12.

Group 5005, February 9–19. A large regular spot, *a*, with small companions on February 14 and 16.

Group 5006, February 10–21. A large regular spot, *a*, following Group 5005. *a* diminishes in size and the group has disappeared by February 16. The group has formed afresh by February 17, as a small regular spot, *b*, closely followed by a faint cluster; *b* is seen alone on February 18. By February 19 a small spot, *c*, has formed preceding *b*, and another very small spot, *d*, following it.

Measures of Positions and Areas of Sun Spots and Faculæ on Photographs—*continued.*

Greenwich Civil Time.	Measurers.	No. of Group, and Letter for Spot.	Distance from Centre in terms of Sun's Radius.	Position Angle from Sun's Axis.	Heliographic Longitude.	Heliographic Latitude.	Spots. Area of UMBRA for each Spot (and for Day).	Spots. Area of WHOLE for each Spot (and for Day).	Faculæ. Area for each Group (and for Day).
1903.				°	°	°			
46·479	RF, M		0·826	251·6	150·8	−19·0			1170
		5005*a*	0·571	334·1	111·8	+24·2	15	72	
		5005	0·557	335·9	110·3	+23·8	0	5	
		5005	0·537	335·0	110·0	+22·4	0	3	
			0·830	109·8	39·9	−20·2			714
Feb. 16		Centre			(96·0)	(−6·9)	(15)	(80)	(1884)
47·481	RF, M		0·873	251·2	144·1	−19·8			932
		5005*a*	0·669	319·2	111·4	+24·2	16	59	171*c*
		5006*b*	0·585	333·2	99·7	+24·7	2	13	
		5006	0·569	334·9	98·2	+24·2	1	13	
			0·577	159·0	67·5	−39·3			78
			0·737	110·2	35·9	−19·6			85
Feb. 17		Centre			(82·9)	(−7·0)	(19)	(85)	(1266)
48·426	RF, M		0·913	247·2	136·9	−23·7			158
		5005*a*	0·775	309·5	111·2	+24·3	10	39	} 212*c*
		5006*b*	0·682	318·1	100·2	+24·4	3	9	
Feb. 18		Centre			(70·3)	(−7·0)	(13)	(48)	(370)
49·434	RF, M	5005*a*	0·875	302·5	110·8	+24·0	2	14	} 465*c*
		5006*c*	0·808	303·9	103·3	+22·0	2	18	
		5006*b*	0·796	307·8	100·5	+24·2	0	6	
		5006*d*	0·787	306·3	100·4	+22·7	0	7	
		5007*a*	0·406	122·1	35·9	−18·9	4	16	
		5007	0·463	122·4	32·5	−20·7	0	8	
			0·941	109·3	345·9	−20·5			272
Feb. 19		Centre			(57·1)	(−7·0)	(8)	(69)	(737)
50·459	RF, M		0·882	308·3	95·6	+28·9			108
		5006*c*	0·916	298·1	104·1	+22·2	0	5	} 1040*c*
		5006*d*	0·899	299·8	101·1	+22·8	3	57	
		5007*a*	0·222	155·4	37·9	−18·7	12	57	
		5007	0·283	149·3	34·6	−21·1	0	4	
		5007	0·259	139·0	33·3	−18·3	0	8	
		5007	0·299	145·3	33·0	−21·2	1	5	
		5007	0·276	141·2	33·0	−19·4	2	16	
			0·856	108·8	344·3	−19·7			450
			0·955	57·7	337·6	+28·0			134
Feb. 20		Centre			(43·5)	(−7·1)	(18)	(152)	(1732)
1903.				°	°	°			
51·187	RF, M		0·953	247·0	107·4	+24·0			42
			0·947	305·3	97·0	−30·1			149
		5006*d*	0·952	296·7	100·9	+22·7	0	2	} 859*c*
I.		5006	0·944	297·5	99·2	+23·0	0	3	
		5007*a*	0·218	199·6	38·3	−18·9	8	44	
		5007	0·195	175·5	33·0	−18·3	0	1	
		5007	0·217	175·6	32·9	−19·6	3	14	
			0·930	60·7	331·6	+23·9			145
Feb. 21		Centre			(33·9)	(−7·1)	(11)	(64)	(1195)
52·204	RF, M		0·989	296·3	97·6	+24·6			191
		5007	0·374	235·2	39·5	−19·0	0	4	
I.		5007*a*	0·368	236·5	39·4	−18·4	9	28	
		5007	0·364	234·3	38·7	−19·0	0	4	
			0·867	58·7	327·5	+22·6			315
Feb. 22		Centre			(20·6)	(−7·1)	(9)	(36)	(506)
53·627	RF, M		0·923	302·0	62·1	+25·9			44
		5007*a*	0·623	249·1	39·5	−18·5	15	28	
		5008*a*	0·981	68·1	286·6	+19·8	17	129	129*c*
			0·875	115·1	300·7	−25·4			85
Feb. 23		Centre			(1·8)	(−7·1)	(32)	(157)	(258)
54·163	RF, M	5007*a*	0·715	251·2	40·0	−18·4	6	20	23*c*
		5009	0·804	114·3	301·7	−23·7	7	14	94*f*
I.		5008*a*	0·955	67·1	286·2	+19·3	25	158	} 457*c*
		5008	0·982	68·3	279·1	+19·7	0	3	
Feb. 24		Centre			(354·7)	(−7·1)	(38)	(195)	(574)
55·444	RF, M	5007*a*	0·878	253·0	39·8	−18·3	4	19	323*s*
		5009*a*	0·605	118·4	302·9	−22·6	12	60	
		5009	0·631	120·0	301·2	−24·2	1	11	
		5009*b*	0·658	117·5	298·6	−23·3	24	101	
		5008*a*	0·848	61·6	285·8	+19·4	28	135	443*f*
Feb. 25		Centre			(337·9)	(−7·2)	(69)	(326)	(766)
56·468	RF, M		0·927	250·9	33·3	−20·4			438
			0·813	306·8	9·8	+24·2			108
		5009*a*	0·421	128·4	303·7	−21·9	18	75	
		5009	0·486	127·1	299·5	−23·6	1	7	
		5009*b*	0·481	125·1	299·3	−22·5	15	55	
		5009	0·501	125·4	298·1	−23·3	0	9	
		5008*a*	0·729	54·6	285·5	+19·4	23	115	487*f*
Feb. 26		Centre			(324·4)	(−7·2)	(57)	(261)	(1033)

Group 5007, February 19–25. A number of small spots in an irregular stream. *a*, the leader spot, is the most stable.
Group 5008, February 23–March 5. A large regular spot, *a*, with a small companion on February 24 and March 2.
Group 5009, February 24–March 2. A small spot on February 24. On the succeeding days it is a short stream of which *a* and *b* are the two largest and most stable members.

Measures of Positions and Areas of Sun Spots and Faculæ on Photographs—*continued.*

Greenwich Civil Time.	Measurers.	No. of Group, and Letter for Spot.	Distance from Centre in terms of Sun's Radius.	Position Angle from Sun's Axis.	Heliographic Longitude.	Heliographic Latitude.	Spots. Area of UMBRA for each Spot (and for Day).	Spots. Area of WHOLE for each Spot (and for Day).	Faculæ. Area for each Group (and for Day).
1903.				°	°	°			
57·215	RF, M		0·894	303·7	10·0	+25·7			131
			0·969	249·5	31·8	−21·6			279
I.		5009*a*	0·308	147·1	304·2	−22·0	6	36	
		5009*b*	0·362	139·3	299·8	−22·8	14	45	
		5009	0·379	140·6	299·4	−23·9	0	2	
		5009	0·389	141·4	299·2	−24·6	0	2	
		5008*a*	0·637	47·4	284·9	+19·2	13	109	
Feb. 27		Centre			(314·6)	(−7·2)	(33)	(194)	(410)
58·146	RF, M		0·961	299·3	10·3	+25·5			61
I.		5009*a*	0·264	190·7	305·3	−22·2	3	17	
		5009*b*	0·277	173·4	300·3	−23·1	3	19	
		5008*a*	0·524	33·0	284·8	+19·1	14	102	
			0·969	105·4	225·3	−16·7			228
Feb. 28		Centre			(302·3)	(−7·2	(20)	(138)	(289)
59·517	RF, M		0·843	306·4	332·8	+25·3			107
			0·850	248·4	342·6	−22·1			174
		5009*a*	0·432	231·7	305·7	−22·2	4	15	
		5009*b*	0·378	222·2	300·3	−23·2	2	13	
		5009	0·377	216·8	298·6	−24·5	0	6	
		5008*a*	0·434	359·1	284·7	+18·4	20	110	
			0·839	104·8	226·8	−16·3			124
Mar. 1		Centre			(284·3)	(−7·2)	(26)	(144)	(405)
60·266	RF, M		0·921	249·4	342·2	−21·7			22
			0·895	304·8	329·7	+26·8			213
		5010	0·785	245·1	325·3	−23·9	0	5	68*c*
I.		5009	0·563	240·4	306·2	−22·3	0	3	
		5009	0·560	239·7	305·8	−22·5	0	7	
		5009*b*	0·500	235·1	300·8	−23·1	0	4	
		5008*a*	0·464	338·5	284·7	+18·4	17	94	
		5008	0·477	348·6	280·2	+20·6	0	4	
Mar. 2		Centre			(274·4)	(−7·2)	(17)	(117)	(303)
61·584	RF, M	5010	0·935	247·4	327·3	−23·7	0	3	} 346*c*
		5010	0·911	246·4	323·2	−24·4	0	4	
		5008*a*	0·607	313·2	284·6	+18·1	13	62	
			0·893	57·8	201·0	+24·5			230
Mar. 3		Centre			(257·0)	(−7·2)	(13)	(69)	(576)
62·493	AS, M		0·980	248·0	326·0	−23·0			174
M.			0·839	247·0	302·0	−23·2			146
		5008*a*	0·734	304·1	284·9	+18·8	8	33	
Mar. 4		Centre			(245·1)	(−7·2)	(8)	(33)	(320)
1903.				°	°	°			
63·183	RF, M		0·905	247·9	301·4	−23·0			240
I		5008*a*	0·820	298·4	285·3	+18·3	3	13	75*c*
			0·950	105·5	163·2	−16·9			86
Mar. 5		Centre			(236·0)	(−7·2)	(3)	(13)	(401)
64·426	RF, M		0·919	296·5	281·1	+20·9			462
			0·877	106·4	157·7	−17·8			134
Mar. 6		Centre			(219·6)	(−7·2)	(0)	(0)	(596)
65·202	AS, M		0·961	295·3	278·6	+21·9			229
M.									
Mar. 7		Centre			(209·3)	(−7·2)	(0)	(0)	(229)
66·482	RF, M		0·845	112·7	134·9	−23·0			342
			0·975	65·7	119·8	+21·7			107
Mar. 8		Centre			(192·6)	(−7·2)	(0)	(0)	(449)
67·452	RF, M	5011	0·468	311·0	200·7	+11·1	0	3	
		5011	0·443	315·0	198·3	+11·4	0	2	
		5011	0·375	310·9	196·2	+ 7·3	0	4	
			0·939	62·7	115·3	+22·5			214
Mar. 9		Centre			(179·7)	(−7·2)	(0)	(9)	(214)
Mar. 10		No	Photo	graph					
69·449			0·912	291·7	215·2	+16·4			58
			0·868	55·7	101·3	+24·9			472
Mar. 11		Centre			(153·4)	(−7·2)	(0)	(0)	(530)
70·344	RF, M		0·916	303·3	83·0	+26·6			43
		5012	0·717	113·3	96·8	−21·6	0	6	
		5012	0·723	112·6	96·2	−21·2	0	1	
			0·820	53·2	95·7	+24·5			215
Mar. 12		Centre			(141·7)	(−7·2)	(0)	(7)	(258)
71·456	RF, M		0·910	285·1	190·1	+10·3			35
		5012	0·522	120·4	98·2	−21·6	1	7	
		5012	0·522	119·1	97·9	−21·0	4	16	
		5012	0·561	118·1	95·0	−21·4	4	20	
Mar. 13		Centre			(127·0)	(−7·2)	(9)	(43)	(35)

Group 5010, March 2–3. A very small spot on March 2. A pair of small spots on March 3.
Group 5011, March 9. A few very small faint spots.
Group 5012, March 12–14. A few very small spots in a short straight stream.

Measures of Positions and Areas of Sun Spots and Faculæ on Photographs—*continued.*

Greenwich Civil Time.	Measurers.	No. of Group, and Letter for Spot.	Distance from Centre in terms of Sun's Radius.	Position Angle from Sun's Axis.	Heliographic Longitude.	Heliographic Latitude.	Spots. Area of UMBRA for each Spot (and for Day).	Spots. Area of WHOLE for each Spot (and for Day).	Faculæ. Area for each Group (and for Day).
1903.				°	°	°			
72·194	RF, M	5012	0·394	129·9	98·3	−21·4	3	6	
I.		5012	0·440	126·9	95·0	−22·0	0	8	
			0·943	111·3	45·6	−22·4			128
Mar. 14		Centre			(117·2)	(−7·2)	(3)	(14)	(128)
73·225	RF, M		0·928	183·3	115·3	−74·8			84
I.			0·922	111·5	35·7	−22·5			152
Mar. 15		Centre			(103·6)	(−7·1)	(0)	(0)	(236)
74·431	RF, M		0·721	114·8	42·7	−22·7			83
Mar. 16		Centre			(87·7)	(−7·1)	(0)	(0)	(83)
Mar. 17		No	Spots	or	Faculæ				
76·618	RF, M		0·954	247·5	132·8	−23·6			222
			0·803	318·4	97·5	+31·3			502
			0·849	138·0	7·5	−43·6			120
Mar. 18		Centre			(59·0)	(−7·1)	(0)	(0)	(844)
Mar. 19		No	Photo	graph					
Mar. 20		No	Photo	graph					
79·434	RF, M		0·965	252·3	97·9	−18·9			100
			0·946	303·7	85·4	+28·7			57
			0·831	296·6	72·8	+17·5			182
		5013*a*	0·983	66·4	306·4	+21·5	33	253	106*f*
			0·884	116·4	319·8	−26·5			74
Mar. 21		Centre			(2[illegible]·8)	(−7·0)	(33)	(253)	(519)
80·487	RF, M		0·927	255·5	76·6	−16·0			47
			0·939	292·3	73·7	+18·1			56
			0·929	300·0	69·9	+24·5			49
		5013*a*	0·919	62·9	306·5	+21·5	46	262	
		5013	0·931	65·7	303·8	+19·7	1	13	
		5014	0·988	68·5	290·2	+19·9	0	139	1009*c*
			0·930	113·6	298·7	−24·5			178
Mar. 22		Centre			(7·9)	(−6·9)	(47)	(414)	(1339)
1903.				°	°	°			
81·348	RF, M	5013*a*	0·837	58·8	306·5	+21·3	52	258	
		5014	0·945	65·4	290·1	+20·5	0	81	794*c*
		5014	0·943	66·8	290·1	+19·2	0	66	
Mar. 23		Centre			(356·5)	(−6·9)	(52)	(405)	(794)
82·457	RF, M	5013*a*	0·702	50·1	306·9	+21·1	49	248	
		5013	0·724	51·6	304·6	+21·4	0	7	
		5013	0·742	53·8	302·3	+20·7	0	4	
		5013	0·761	55·7	300·1	+20·3	0	3	
		5014	0·801	62·0	294·3	+17·5	0	6	
		5014	0·838	55·4	293·8	+22·6	0	3	
		5014	0·843	60·0	290·9	+20·6	6	12	
		5014	0·839	62·2	290·6	+18·7	6	25	
		5014	0·849	60·7	290·0	+20·3	5	28	
			0·791	57·7	297·8	+20·1			964
			0·929	60·7	279·7	+24·0			211
Mar. 24		Centre			(342·0)	(−6·9)	(66)	(336)	(1175)
83·444	RF, M	5013*a*	0·584	37·5	306·6	+21·2	50	235	
		5013	0·564	43·2	305·0	+18·0	0	2	415*c*
		5013	0·597	40·1	304·7	+20·9	0	5	
		5014	0·734	53·5	290·0	+20·6	1	12	
		5014	0·724	55·5	289·9	+18·9	0	10	442*c*
		5014	0·735	54·4	289·6	+20·0	0	9	
			0·855	55·7	278·2	+24·5			203
Mar. 25		Centre			(328·9)	(−6·8)	(51)	(273)	(1060)
84·446	RF, M	5013*a*	0·489	17·5	306·7	+21·0	41	214	
		5013	0·490	21·4	304·8	+20·4	0	9	
		5013	0·521	23·2	303·0	+21·9	0	5	
		5015*a*	0·996	106·6	229·1	−17·1	0	260	
Mar. 26		Centre			(315·7)	(−6·8)	(41)	(488)	(0)
85·603	RF, M	5013	0·518	347·6	307·4	+23·6	0	7	
		5013*a*	0·477	347·7	306·6	+21·0	39	225	
		5013	0·514	351·2	305·3	+23·7	0	7	
		5013	0·476	352·5	304·2	+21·4	0	2	
		5013	0·516	353·3	304·2	+24·0	0	5	
		5014	0·455	16·9	292·4	+19·1	0	3	
		5014	0·495	19·8	290·1	+21·1	0	2	
		5015*a*	0·943	105·0	229·0	−16·3	41	345	
		5015	0·960	106·6	225·6	−17·8	0	11	576*c*
		5015	0·961	105·4	225·4	−16·6	4	32	
Mar. 27		Centre			(300·4)	(−6·7)	(84)	(639)	(576)

Group 5013, March 21–April 2. A large well-defined spot, *a*, with a few very small companions from time to time.
Group 5014, March 22–27. An irregular cluster following Group 5013. It rapidly diminishes in size. It is not seen on March 26, but a very small spot is seen on March 27 near its place.
Group 5015, March 26–April 5. A large composite spot, *a*, usually with several small companions. The group has broken up into an irregular stream by April 1, and rapidly diminishes in size.

Measures of Positions and Areas of Sun Spots and Faculæ on Photographs—*continued.*

Greenwich Civil Time.	Measurers.	No. of Group, and Letter for Spot.	Distance from Centre in terms of Sun's Radius.	Position Angle from Sun's Axis.	Heliographic Longitude.	Heliographic Latitude.	Spots. Area of UMBRA for each Spot (and for Day).	Spots. Area of WHOLE for each Spot (and for Day).	Faculæ. Area for each Group (and for Day).
1903.				°	°	°			
86·157	RF, M		0·932	273·6	1·3	+ 0·9			110
I.		5013*a*	0·513	335·4	306·3	+21·2	35	202	
		5015*a*	0·906	105·0	227·5	−16·4	33	459	267*s*
Mar. 28		Centre			(293·1)	(−6·7)	(68)	(661)	(377)
87·493	RF, M	5013*a*	0·661	313·2	306·5	+21·2	39	215	
		5016*a*	0·516	344·8	283·9	+23·2	15	35	
		5016	0·522	348·3	282·1	+24·1	1	14	
		5016	0·505	349·2	281·4	+23·1	0	13	
		5016	0·497	352·4	279·6	+22·8	9	27	
		5016	0·522	353·4	279·3	+24·5	8	20	
		5015	0·697	106·4	231·5	−16·2	4	21	
		5015*a*	0·749	106·6	227·1	−16·8	28	361	
Mar. 29		Centre			(275·5)	(−6·6)	(104)	(706)	(0)
88·468	RF, M	5013*a*	0·781	304·2	306·3	+21·3	37	204	278*c*
		5016*a*	0·604	324·6	284·9	+23·3	25	101	
		5016	0·587	327·8	282·5	+23·5	0	22	
		5016	0·571	330·1	280·6	+23·3	0	8	
		5016	0·560	331·5	279·4	+23·1	5	34	
		5016*b*	0·571	334·7	278·1	+24·6	11	45	
		5015	0·527	109·3	231·6	−15·7	0	32	
		5015	0·548	112·8	230·7	−17·8	0	5	
		5015	0·554	106·8	229·5	−14·7	1	17	
		5015*a*	0·594	110·1	227·0	−17·2	38	273	
Mar. 30		Centre			(262·6)	(−6·6	(117)	(741)	(278)
89·432	RF, M	5013*a*	0·884	298·4	306·3	+21·4	35	187	598*nf*
		5016*a*	0·720	312·2	285·4	+23·6	17	65	
		5016	0·690	313·7	282·6	+23·0	0	10	
		5016	0·663	317·1	279·2	+23·3	0	14	
		5016	0·662	318·6	278·4	+24·0	3	17	
		5016	0·674	320·8	278·0	+25·7	0	8	
		5016*b*	0·661	320·3	277·5	+24·8	7	31	
		5015	0·337	118·3	232·1	−15·4	10	52	
		5015	0·376	121·7	230·4	−17·5	0	5	
		5015	0·377	115·7	229·3	−15·5	0	16	
		5015	0·399	114·9	227·9	−15·7	3	14	
		5015	0·422	117·9	227·0	−17·4	9	124	
		5015	0·416	114·6	226·8	−15·9	4	22	
		5015	0·455	116·7	224·7	−17·7	0	5	
Mar. 31		Centre			(249·9)	(−6·5)	(88)	(570)	(598)
1903.				°	°	°			
90·221	RF, M	5013*a*	0·951	295·1	307·0	+21·4	44	217	733*f*
		5016*a*	0·815	305·6	285·7	+23·8	12	62	
		5016	0·763	308·3	280·0	+23·3	0	17	
		5016	0·765	312·9	278·1	+26·3	0	4	252*c*
		5016*b*	0·753	311·9	277·6	+25·0	13	58	
		5015	0·198	146·6	233·0	−16·0	0	1	
		5015	0·198	142·1	232·3	−15·4	13	38	
		5015	0·192	134·6	231·4	−14·1	0	3	
		5015	0·251	140·7	229·9	−17·6	0	10	
I.		5015	0·224	132·8	229·7	−15·1	0	3	
		5015	0·244	133·6	229·0	−16·0	2	11	
		5015	0·264	131·2	227·6	−16·3	1	7	
		5015	0·288	132·5	226·7	−17·5	16	52	
		5015	0·274	128·5	226·7	−16·2	5	30	
		5015	0·319	135·5	225·8	−19·4	1	16	
		5015	0·339	129·8	223·6	−18·8	0	4	
			0·913	57·6	180·6	+26·0			45
			0·935	51·6	179·5	+32·4			55
			0·951	109·9	166·5	−20·9			116
			0·975	122·2	160·8	−32·8			48
Apr. 1		Centre			(239·5)	(−6·5)	(107)	(533)	(1249)
91·278	RF, M		0·940	253·2	296·4	−18·0			95
		5013*a*	0·996	292·4	307·1	+21·5	82	204	
		5016*a*	0·917	299·9	285·9	+24·1	8	40	
		5016	0·886	300·0	281·6	+22·8	0	10	104*c*
		5016	0·863	301·8	278·3	+23·2	0	4	
		5016*b*	0·862	305·1	276·8	+25·7	3	23	
		5015	0·191	219·3	232·7	−14·8	8	18	
		5015	0·179	221·0	232·4	−14·1	0	4	
I.		5015	0·196	203·5	230·2	−16·7	0	11	
		5015	0·174	198·4	228·8	−15·9	1	2	
		5015	0·167	188·9	227·0	−15·9	1	7	
		5015	0·194	186·5	226·8	−17·5	12	34	
		5015	0·242	178·6	225·1	−20·3	0	3	
		5017*a*	0·990	109·0	142·0	−19·7	121	506	223*c*
			0·877	110·3	164·0	−20·9			18
			0·926	112·5	157·2	−23·2			17
Apr. 2		Centre			(225·5)	(−6·4)	(236)	(866)	(457)
92·501	RF, M	5016*b*	0·957	298·6	277·2	+25·0	0	20	563*c*
		5015	0·413	248·2	232·7	−14·7	5	10	
		5015	0·397	249·6	231·8	−13·8	0	3	
		5015	0·342	235·2	226·4	−17·4	0	11	
		5017*a*	0·918	108·9	142·2	−19·9	76	411	
		5017	0·943	108·9	138·0	−20·0	3	56	1059*c*
Apr. 3		Centre			(209·4)	(−6·4)	(84)	(511)	(1622)

Group 5016, March 29–April 3. A fine stream appearing suddenly following Group 5013. *a*, the leader spot, is the largest, and *b*, the last spot, the next in size. *b* remains alone on April 3.

Group 5017, April 2–14. A very large spot, *a*, usually with a number of small companions.

Measures of Positions and Areas of Sun Spots and Faculæ on Photographs—*continued.*

Greenwich Civil Time.	Measurers.	No. of Group, and Letter for Spot.	Distance from Centre in terms of Sun's Radius.	Position Angle from Sun's Axis.	Heliographic Longitude.	Heliographic Latitude.	Spots. Area of UMBRA for each Spot (and for Day).	Spots. Area of WHOLE for each Spot (and for Day).	Faculæ. Area for each Group (and for Day).
1903.				°	°	°			
93·236	RF, M		0·990	298·1	277·1	+26·6			303
		5015	0·479	244·9	226·6	−17·1	0	8	
		5015	0·558	252·8	233·0	−14·7	0	10	
		5017*a*	0·851	109·5	141·4	−19·9	81	364	
		5017	0·859	107·4	140·3	−18·2	1	15	
I.		5017	0·867	111·8	139·7	−22·0	0	7	825
		5017	0·868	109·9	139·4	−20·4	0	55	
		5017	0·872	108·9	138·9	−19·5	3	48	
		5017	0·885	109·2	137·2	−19·9	1	45	
			0·974	65·3	126·9	+22·3			74
Apr. 4		Centre			(199·7)	(−6·3)	(86)	(552)	(1202)
94·429	RF, M	5015	0·750	255·8	232·4	−14·7	1	15	
		5017*a*	0·687	112·4	141·6	−19·8	77	403	
		5017	0·714	114·0	139·6	−21·4	0	13	1515*c*
		5017	0·726	110·8	138·1	−19·3	0	18	
			0·905	61·9	124·5	+22·2			98
Apr. 5		Centre			(183·9)	(−6·2)	(78)	(449)	(1613)
95·543	RF, M		0·968	293·9	240·8	+21·2			41
			0·855	253·2	228·2	−17·5			1147
		5017	0·525	124·7	141·5	−22·8	0	4	
		5017*a*	0·509	119·2	141·2	−19·8	69	355	
		5017	0·538	117·3	138·9	−19·6	0	21	
		5017	0·560	121·8	138·4	−22·5	0	5	
		5017	0·549	114·8	137·7	−18·6	0	17	
		5017	0·585	117·1	135·6	−20·6	0	13	
		5017	0·609	115·3	133·6	−20·1	0	11	
Apr. 6		Centre			(169·3)	(−6·2)	(69)	(426)	(1188)
96·429	RF, M		0·930	252·5	226·6	−18·5			399
		5017*a*	0·359	132·7	141·4	−19·9	73	448	
		5017	0·410	133·0	138·8	−21·9	0	10	
		5018	0·668	45·2	126·8	+22·8	4	12	
Apr. 7		Centre			(157·6)	(−6·1)	(77)	(470)	(399)
97·547	RF, M		0·981	251·0	223·0	−19·8			113
		5017	0·233	184·5	144·0	−19·5	1	2	
		5017*a*	0·242	171·0	140·6	−19·9	65	356	
		5017	0·213	163·7	139·3	−17·8	0	8	
		5017	0·274	165·3	138·6	−21·4	0	20	
		5017	0·254	161·7	138·1	−20·0	0	5	
		5019	0·933	66·9	78·0	+18·9	0	24	619*sf*
			0·804	47·4	100·8	+28·4			39
			1·829	56·2	94·4	+23·4			52
Apr. 8		Centre			(142·9)	(−6·1)	(66)	(415)	(823)
1903.				°	°	°			
98·220	RF, M	5017*a*	0·265	202·3	140·1	−20·4	46	353	
M.		5017	0·285	194·5	138·4	−21·9	0	14	
		5019	0·875	64·5	77·6	+18·9	0	18	299*f*
Apr. 9		Centre			(134·0)	(−6·0)	(46)	(385)	(299)
99·496	RF, M	5017	0·430	243·2	140·7	−16·6	0	4	
		5017*a*	0·446	236·3	140·3	−19·7	61	363	
		5017	0·413	240·0	139·1	−17·4	0	8	
		5017	0·416	236·8	138·7	−18·7	0	5	
		5017	0·414	235·1	138·2	−19·2	0	3	
		5017	0·402	237·1	137·9	−18·1	3	12	
		5017	0·394	239·0	137·8	−17·2	0	4	
		5019	0·721	56·0	78·1	+19·2	6	15	518*f*
Apr. 10		Centre			(117·2)	(−5·9)	(70)	(414)	(518)
Apr. 11		No	Photo	graph					
101·418	RF, M	5017	0·781	252·2	142·3	−17·5	0	10	
		5017	0·754	252·3	139·8	−17·1	0	59	
		5017*a*	0·757	248·3	139·6	−20·1	50	338	905*c*
		5017	0·746	250·2	138·9	−18·6	0	5	
		5017	0·739	251·1	138·4	−17·8	0	5	
		5017	0·723	248·3	136·6	−19·6	0	7	
		5019	0·491	31·7	75·5	+19·0	0	9	
Apr. 12		Centre			(91·3)	(−5·8)	(50)	(433)	(905)
102·471	RF, M		0·829	304·8	24·9	−31·7			68
		5017	0·885	253·5	140·3	−17·3	6	38	1566*f*
		5017*a*	0·882	250·5	139·7	−19·8	28	303	
		5019	0·423	5·0	75·5	+19·1	0	20	
Apr. 13		Centre			(77·8)	(−5·7)	(34)	(361)	(1634)
103·411	RF, M		0·895	299·1	123·2	+22·8			99
		5017*a*	0·959	250·8	139·7	−20·0	27	248	1431*f*
			0·957	113·1	351·8	−28·5			33
Apr. 14		Centre			(65·4)	(−5·6)	(27)	(248)	(1563)
104·592	RF, M		0·973	244·8	129·9	−25·8			195
			0·923	236·8	118·4	−32·6			33
Apr. 15		Centre			(52·2)	(−5·5)	(0)	(0)	(228)
105·445	RF, M		0·901	296·9	98·0	+21·4			83
			0·891	107·9	335·4	−18·4			175
Apr. 16					(38·5)	(−5·4)	(0)	(0)	(258)

Group 5018, April 7. A small spot.
Group 5019, April 8–13. A small spot.

Measures of Positions and Areas of Sun Spots and Faculæ on Photographs—*continued.*

Greenwich Civil Time.	Measurers.	No. of Group, and Letter for Spot.	Distance from Centre in terms of Sun's Radius.	Position Angle from Sun's Axis.	Heliographic Longitude.	Heliographic Latitude.	Spots. Area of UMBRA for each Spot (and for Day).	Spots. Area of WHOLE for each Spot (and for Day).	Faculæ. Area for each Group (and for Day).
1903.				°	°	°			
106·282	RF, M		0·813	297·5	76·9	+18·6			121
Apr. 17					(27·5)	(−5·4)	(0)	(0)	(121)
107·448	RM, F		0·903	293·1	72·9	+18·2			190
			0·941	63·5	306·4	+22·7			430
			0·946	108·0	300·6	−18·7			219
			0·973	111·9	294·6	−22·5			88
Apr. 18		Centre			(12·1)	(−5·3)	(0)	(0)	(927)
108·525	RF, M		0·964	291·4	69·3	+19·0			135
		5020*a*	0·840	56·0	308·0	+24·7	1	14	219*c*
		5020*b*	0·847	60·4	305·7	+21·6	3	16	
		5021	0·800	108·7	305·2	−18·1	2	9	369*c*
		5021	0·843	108·0	300·7	−18·0	2	16	
			0·950	66·1	289·8	+20·8			233
Apr. 19		Centre			(357·9)	(−5·2)	(8)	(55)	(956)
109·429	RF, M	5020*b*	0·741	54·6	305·6	+21·5	1	11	279*f*
			0·899	62·5	286·8	+22·0			426
Apr. 20		Centre			(345·9)	(−5·1)	(1)	(11)	(705)
110·213	RF, M		0·929	242·6	43·5	−27·3			30
		5020*b*	0·648	47·1	305·0	+21·8	3	9	
I.			0·819	58·0	287·1	+22·4			194
			0·943	59·3	270·5	+26·8			313
Apr. 21		Centre			(335·6)	(−5·0)	(3)	(9)	(537)
111·420	RF, M	5020*b*	0·503	27·9	305·1	+21·5	0	3	
		5021	0·330	135·3	305·6	−18·3	0	3	
		5021	0·322	132·5	305·4	−17·3	0	5	
		5021	0·342	130·1	303·9	−17·4	0	2	
		5021	0·361	128·8	302·6	−17·7	0	2	
		5022	0·959	105·3	245·7	−16·1	0	12	201*c*
		5023*a*	0·991	104·2	236·7	−14·7	0	115	
			0·858	54·3	268·4	+27·0			309
			0·968	67·1	247·5	+20·7			427
Apr. 22		Centre			(319·7)	(−4·9)	(0)	(142)	(937)
112·471	RF, M	5022	0·858	105·9	246·8	−16·1	0	7	
		5023*a*	0·933	103·9	236·6	−14·7	26	150	990*c*
			0·907	65·6	244·7	+19·7			1557
Apr. 23		Centre			(305·8)	(−4·8)	(26)	(157)	(2547)
1903.				°	°	°			
113·225	RF, M		0·950	250·5	7·9	−20·0			99
		5022	0·755	106·0	247·3	−15·1	0	4	
		5022	0·761	107·4	246·9	−16·2	0	2	
		5023*a*	0·862	104·4	236·3	−14·8	32	184	
		5023	0·892	103·8	232·6	−14·4	0	5	861*sf*
		5023	0·898	104·6	231·9	−15·1	4	14	
I.		5024	0·908	68·5	233·8	+17·2	3	7	
		5024	0·943	67·5	228·6	+19·3	2	9	
		5024	0·962	67·4	224·9	+20·2	8	18	509*np*
		5024	0·963	68·2	224·4	+19·5	2	14	
			0·856	62·5	241·8	+20·5			720
Apr. 24		Centre			(295·8)	(−4·7)	(51)	(257)	(2189)
114·426	RF, M	5025	0·796	302·0	326·4	+21·7	0	7	62*c*
		5023*a*	0·689	105·8	237·0	−14·1	24	144	364*f*
		5024	0·807	63·1	230·8	+18·4	0	6	
		5024	0·823	62·1	229·6	+19·7	0	1	
		5024	0·859	64·3	225·1	+19·2	0	5	455*c*
		5024	0·866	62·6	224·8	+20·9	0	4	
		5024	0·872	60·7	224·7	+22·6	0	3	
Apr. 25		Centre			(280·0)	(−4·6)	(24)	(170)	(881)
115·209	RF, M	5023*a*	0·559	108·8	236·5	−14·3	22	128	
		5023	0·574	106·6	235·2	−13·3	0	1	
		5024	0·698	57·8	231·2	+18·2	3	9	
		5024	0·726	58·3	228·9	+18·9	4	18	
I.		5024	0·761	58·7	225·9	+20·0	7	40	
		5024	0·780	57·4	224·5	+22·2	5	36	
		5026	0·993	72·7	188·3	+16·5	0	21	254*p*
Apr. 26		Centre			(269·5)	(−4·6)	(41)	(253)	(254)
116·623	RF, M		0·822	251·8	305·6	−17·5			111
			0·839	302·0	301·6	+23·5			52
			0·775	251·1	300·9	−17·5			22
			0·794	306·4	295·5	+24·9			281
			0·684	243·4	291·7	−21·2			73
		5027*a*	0·890	299·2	308·5	+23·3	6	15	
		5027*b*	0·877	295·0	308·1	+19·3	9	25	67*c*
		5027	0·876	297·3	307·3	+21·2	0	5	
		5022	0·215	169·9	248·7	−16·7	0	3	
		5023*a*	0·289	124·9	236·8	−13·8	10	53	
		5023	0·302	124·8	236·1	−14·3	0	2	
		5023	0·304	122·4	235·7	−13·7	0	7	
		5024	0·493	39·6	231·7	+18·0	15	48	
		5024	0·533	41·8	228·9	+19·2	0	15	
		5024	0·548	43·8	227·3	+19·1	2	25	
		5024	0·574	42·2	226·6	+21·0	16	42	

Group 5020, April 19–22. A pair of small spots, *a* and *b*, on April 19. Only *b* remains by April 20.
Group 5021, April 19–22. A stream of very small spots. The group is not seen on the two succeeding days, but is faintly seen on April 22.
Group 5022, April 22–27. A small spot on April 22 and 23. Two very small spots on April 24. The group is not seen on April 25 and 26, but a very small spot is seen on April 27.
Group 5023, April 22–May 1. A large regular spot, *a*, with occasionally a few very small companions.
Group 5024, April 24–May 5. A few very small spots in a long scattered stream on April 24. The group rapidly increases in size, and has become a fine compact stream by April 30, after which it diminishes in size. *a*, the last spot of the group on April 28, is the largest.
Group 5025, April 25. A very small spot.
Group 5026, April 26–May 3. A short, compact, irregular stream. The group lengthens out and becomes straighter on succeeding days. The following spots tend to die out and only one spot remains by May 4.
Group 5027, April 27–28. Two small clusters appearing suddenly close to the west limb. The more northern cluster, *a*, has disappeared before April 28.

Measures of Positions and Areas of Sun Spots and Faculæ on Photographs—*continued.*

Greenwich Civil Time.	Measurers.	No. of Group, and Letter for Spot.	Distance from Centre in terms of Sun's Radius.	Position Angle from Sun's Axis.	Heliographic Longitude.	Heliographic Latitude.	Spots. Area of UMBRA for each Spot (and for Day).	Spots. Area of WHOLE for each Spot (and for Day).	Faculæ. Area for each Group (and for Day).
1903.				°	°	°			
116·623	RF, M	5024	0·591	42·3	225·6	+21·8	8	32	
		5024	0·590	43·9	225·0	+21·1	1	23	
		5026	0·887	69·0	191·5	+16·2	20	157	} 598*c*
		5026	0·909	68·7	188·6	+17·2	11	83	
Apr. 27		Centre			(250·9)	(−4·5)	(98)	(535)	(1204)
117·613	RF, M		0·914	252·1	303·8	−18·1			210
			0·918	304·3	297·7	+29·0			133
			0·838	247·7	293·7	−21·0			77
			0·853	296·8	291·8	+20·1			129
		5027*b*	0·961	292·2	308·7	+19·9	0	16	311*n*
		5023*a*	0·165	174·8	236·9	−13·8	11	46	
		5023	0·169	169·8	236·0	−13·9	0	2	
		5024	0·379	12·5	233·0	+17·2	9	37	
		5024	0·406	17·3	230·5	+18·4	0	17	
		5024	0·426	20·5	228·8	+19·1	0	14	
		5024	0·436	24·1	227·0	+19·0	0	3	
		5024*a*	0·484	24·5	225·4	+21·7	35	174	
		5026	0·769	64·5	191·7	+16·3	36	248	} 475*c*
		5026	0·801	64·1	188·9	+17·6	11	76	
			0·895	63·8	178·7	+21·0			47
Apr. 28		Centre			(237·8)	(−4·4)	(102)	(633)	(1382)
118·483	RF, M		0·974	258·5	303·5	−12·1			185
			0·926	237·5	292·5	−31·6			44
			0·916	248·6	292·3	−21·3			70
			0·936	294·7	291·9	+21·2			67
			0·937	299·0	291·0	+25·2			23
			0·793	310·3	269·2	+27·7			226
		5023*a*	0·247	227·6	237·1	−13·8	15	40	
		5023	0·217	226·5	235·6	−12·8	0	6	
		5023	0·225	207·7	232·5	−15·7	0	11	
		5024	0·447	333·1	238·6	+19·2	0	8	
		5024	0·438	341·2	234·9	+20·2	6	25	
		5024	0·381	343·0	232·9	+17·0	4	15	
		5024	0·413	352·6	229·5	+19·8	10	78	
		5024	0·425	0·1	226·3	+20·8	7	80	
		5024*a*	0·445	3·0	224·9	+22·0	26	113	
		5028	0·393	127·1	207·2	−17·7	0	3	
		5028	0·403	128·5	206·9	−18·6	0	1	
		5028	0·424	124·8	204·9	−18·0	0	8	
		5026	0·619	56·6	193·9	+16·3	25	120	
		5026	0·664	58·6	190·2	+16·8	12	62	
		5026	0·679	57·2	189·5	+18·1	0	1	
		5026	0·681	58·5	189·0	+17·4	12	60	
Apr. 29		Centre			(226·3)	(−4·3)	(117)	(631)	(615)
1903.				°	°	°			
119·466	RF, M		0·884	304·0	268·7	+27·2			138
			0·897	315·8	265·2	+37·4			27
			0·824	310·0	259·5	+29·0			157
		5023*a*	0·418	247·6	236·7	−13·0	8	41	
		5023	0·378	237·1	232·6	−15·8	0	12	
		5024	0·564	313·7	238·8	+19·0	9	32	
		5024	0·538	315·7	236·7	+18·7	0	4	
		5024	0·537	320·0	234·9	+20·3	6	18	
		5024	0·487	315·1	234·3	+16·2	5	10	
		5024	0·484	326·3	229·9	+19·7	12	185	
		5024*a*	0·467	336·1	225·1	+21·1	57	283	
		5029	0·405	229·0	232·2	−19·3	13	55	
		5026	0·468	42·7	194·2	+16·1	16	97	
		5026	0·489	46·0	192·0	+15·9	2	7	
		5026	0·525	47·6	189·6	+16·9	11	106	
		5030	0·969	109·5	137·4	−19·9	4	17	433*sp*
			0·955	83·0	141·4	+ 5·4			91
Apr. 30		Centre			(213·4)	(−4·2)	(143)	(867)	(846)
120·196	RF, M		0·923	302·8	265·1	+28·1			108
		5023	0·549	253·6	236·2	−12·4	1	8	
		5023	0·572	253·1	237·7	−13·0	5	15	
		5024	0·684	304·4	240·3	+19·4	6	19	
		5024	0·637	309·8	235·1	+20·5	0	9	
		5024	0·602	304·1	234·8	+16·2	4	76	
		5024	0·588	312·3	231·1	+19·6	10	67	
		5024*a*	0·545	321·7	224·9	+21·4	46	304	
		5024	0·531	326·7	222·0	+22·4	0	1	
I.		5029*a*	0·529	237·7	232·0	−20·0	6	20	
		5026	0·378	20·8	195·7	+16·6	4	19	
		5026	0·385	25·4	193·9	+16·2	7	47	
		5026	0·366	29·0	193·2	+14·6	0	2	
		5026	0·401	29·5	191·9	+16·3	0	2	
		5026	0·427	33·8	189·4	+16·7	6	43	
		5026	0·428	38·3	187·8	+15·6	0	9	
		5030	0·923	110·1	136·6	−20·1	4	16	153*f*
			0·897	117·6	141·3	−26·5			50
			0·970	117·8	127·6	−28·0			121
May 1		Centre			(203·7)	(−4·1)	(99)	(657)	(432)
121·508	RF, M	5024	0·789	294·0	234·8	+16·0	5	29	
		5024	0·777	299·4	232·1	+19·6	0	9	
		5024	0·762	297·9	231·3	+18·1	0	22	
		5024	0·761	300·5	230·4	+19·8	6	47	
		5024	0·722	306·8	225·0	+22·5	0	3	1058*p*
		5024*a*	0·703	305·7	224·0	+21·0	13	232	
		5029*a*	0·734	246·8	232·0	−19·6	0	11	427*sf*
		5026	0·382	332·7	196·9	+15·8	1	8	

Group 5028, April 29. A few very small spots.
Group 5029, April 30–May 3. A short stream appearing suddenly near Group 5023. It is a small regular spot on the succeeding days.
Group 5030, April 30–May 1. A small spot.

Measures of Positions and Areas of Sun Spots and Faculæ on Photographs—*continued.*

Greenwich Civil Time.	Measurers.	No. of Group, and Letter for Spot.	Distance from Centre in terms of Sun's Radius.	Position Angle from Sun's Axis.	Heliographic Longitude.	Heliographic Latitude.	Spots. Area of UMBRA for each Spot (and for Day).	Spots. Area of WHOLE for each Spot (and for Day).	Faculæ. Area for each Group (and for Day).
1903.				°	°	°			
121·508	RF, M	5026	0·372	341·7	193·4	+16·6	1	14	
		5026	0·354	350·4	189·9	+16·4	1	20	
		5031*a*	0·964	103·7	111·5	−14·3	0	18	579*sf*
			0·869	116·9	127·7	−25·2			1123
			0·988	106·8	104·7	−17·2			149
May 2		Centre			(186·4)	(−4·0)	(27)	(413)	(3336)
122·221	RF, M		0·947	254·8	248·2	−15·6			103
			0·874	258·8	237·8	−11·7			206
			0·950	193·3	218·0	−70·6			46
		5024	0·884	290·5	236·2	+16·0	10	37	
		5024	0·858	293·3	232·5	+17·7	0	16	
		5024	0·852	296·2	231·1	+19·8	8	90	
		5024	0·834	297·6	228·7	+20·3	1	12	
I.		5024*a*	0·798	300·7	224·2	+21·4	15	165	1672*c*
		5029*a*	0·833	249·4	232·4	−19·3	1	4	350*c*
		5026	0·475	314·6	197·4	+15·8	0	2	
		5026	0·449	322·0	193·6	+16·9	3	10	
		5031*a*	0·910	104·0	111·5	−14·3	1	19	455*f*
			0·799	115·8	125·8	−22·8			69
			0·831	123·6	124·2	−29·8			160
May 3		Centre			(176·9)	(−3·9)	(39)	(355)	(3061)
123·515	RF, M		0·976	258·2	237·5	−12·3			128
			0·946	252·5	230·8	−17·7			235
			0·906	245·9	223·9	−23·4			104
		5024	0·978	287·2	235·8	+15·9	0	20	
		5024	0·974	288·5	234·7	+17·1	0	31	
		5024	0·971	290·5	233·6	+18·9	0	38	
		5024	0·970	288·4	233·6	+16·8	0	43	1125*c*
		5024	0·963	291·8	231·5	+19·8	0	50	
		5024	0·944	293·0	227·5	+20·3	0	14	
		5024	0·925	293·8	224·1	+20·3	5	30	
		5031*a*	0·743	105·6	112·5	−14·0	0	12	
		5031*b*	0·773	106·8	109·9	−15·3	0	6	630*f*
May 4		Centr			(159·8)	(−3·7)	(5)	(244)	(2222)
124·173	RF, M		0·982	252·7	230·6	−17·7			107
			0·958	245·8	224·2	−24·2			142
		5024	0·992	290·6	231·8	+19·9	17	60	
		5024	0·969	293·2	223·9	+21·4	2	15	1214*c*
I.		5031*a*	0·642	107·8	112·2	−14·1	0	3	
		5031*b*	0·677	109·8	109·8	−15·9	0	8	
			0·972	68·9	77·1	+19·5			84
May 5		Centre			(151·1)	(−3·6)	(19)	(86)	(1547)
1903.				°	°	°			
May 6		No	Photo	graph					
126·522	RF, M		0·962	289·1	192·0	+17·4			378
			0·939	253·8	189·8	−16·4			111
		5032	0·755	113·5	72·8	−19·8	0	6	
May 7		Centre			(120·0)	(−3·4)	(0)	(6)	(489)
127·438	RF, M		0·786	239·6	154·3	−21·1			31
			0·694	245·4	149·7	−19·3			110
May 8		Centre			(107·9)	(−3·3)	(0)	(0)	(141)
May 9		No	Spots	or	Faculæ				
129·489	RF, M		0·843	247·6	136·9	−20·4			108
			0·943	104·4	10·4	−14·6			156
May 10		Centre			(80·9)	(−3·1)	(0)	(0)	(264)
130·223	RF, M		0·916	249·1	136·8	−20·3			209
			0·860	240·8	127·9	−26·4			192
I.			0·692	251·5	113·8	−14·9			109
			0·991	71·0	350·5	+18·4			160
May 11		Centre			(71·2)	(−3·0)	(0)	(0)	(670)
131·452	RF, M		0·840	252·0	111·1	−16·7			184
		5033	0·921	69·5	350·2	+17·6	0	8	138*sf*
May 12		Centre			(54·8)	(−2·9)	(0)	(8)	(322)
132·171	RF, M		0·977	246·9	123·0	−23·2			62
			0·970	239·6	120·4	−30·1			89
			0·900	252·5	108·9	−16·9			179
I.			0·867	246·2	103·9	−22·0			81
		5033	0·853	67·3	349·9	+17·6	0	10	137*f*
May 13		Centre			(45·3)	(−2·8)	(0)	(10)	(548)
133·211	AS, RF		0·951	251·3	103·2	−18·6			195
M.		5033	0·742	65·3	347·2	+16·1	6	17	213*c*
			0·973	102·3	315·0	−12·6			154
May 14		Centre			(31·6)	(−2·7)	(6)	(17)	(562)

Group 5031, May 2–5. A small spot, *a*, followed on May 4 and 5 by another, *b*.
Group 5032, May 7. A very small faint spot.
Group 5033, May 12–15. A small spot.

Measures of Positions and Areas of Sun Spots and Faculæ on Photographs—*continued.*

Greenwich Civil Time.	Measurers.	No. of Group, and Letter for Spot.	Distance from Centre in terms of Sun's Radius.	Position Angle from Sun's Axis.	Heliographic Longitude.	Heliographic Latitude.	Spots. Area of UMBRA for each Spot (and for Day).	Spots. Area of WHOLE for each Spot (and for Day).	Faculæ. Area for each Group (and for Day).
1903.				°	°	°			
134·214	RF, M		0·924	296·6	82·3	+23·3			41
		5033	0·581	56·2	348·3	+16·6	4	7	
			0·923	103·9	311·3	−13·8			212
I.			0·958	67·8	307·5	+20·4			209
			0·993	119·4	294·5	−29·6			174
May 15		Centre			(18·4)	(−2·6)	(4)	(7)	(636)
135·206	RF, M		0·968	292·5	78·4	+21·1			59
			0·953	280·3	76·7	+ 9·1			33
		5034	0·968	120·3	290·8	−29·9	0	4	
		5034	0·971	119·6	289·9	−29·3	1	12	805c
		5034	0·981	121·2	287·2	−31·0	2	14	
I.		5034	0·986	120·6	285·4	−30·5	7	20	
			0·888	105·7	303·1	−15·0			176
			0·933	62·5	300·0	+24·5			148
			0·950	111·2	293·9	−20·9			68
			0·974	68·3	290·5	+20·4			85
May 16		Centre			(5·2)	(−2·4)	(10)	(50)	(1374)
136·185	AS, RF		0·953	250·3	64·2	−19·5			73
		5034	0·921	121·5	287·7	−29·8	0	4	
		5034	0·928	123·3	286·9	−31·6	0	9	
M.		5034	0·937	123·6	285·4	−32·1	0	15	596c
		5034	0·937	122·4	285·2	−31·0	0	10	
			0·911	54·7	292·8	+30·5			87
			0·909	65·4	290·1	+21·1			133
May 17		Centre			(352·3)	(−2·3)	(0)	(38)	(889)
137·303	RF, M	5034	0·855	127·1	283·9	−32·3	0	8	443c
I.									
May 18		Centre			(337·5)	(−2·2)	(0)	(8)	(443)
138·243	RF, M	5034	0·684	133·3	290·2	−29·6	3	6	
		5034	0·703	134·5	289·3	−31·1	0	2	258f
		5034	0·716	133·7	287·9	−31·3	2	5	
			0·896	58·7	266·3	+26·6			105
I.			0·979	64·8	249·1	+24·1			216
			0·980	102·0	246·6	−12·1			127
			0·982	107·6	245·9	−17·7			47
			0·989	72·9	244·8	+16·5			303
May 19		Centre			(325·0)	(−2·1)	(5)	(13)	(1056)
1903.				°	°	°			
139·545	RF, M	5034	0·520	151·4	291·3	−29·0	0	11	
		5035	0·942	69·9	239·5	+18·1	5	28	
		5035	0·952	70·0	237·6	+18·3	10	33	1041c
		5035	0·963	68·7	235·5	+19·8	2	57	
			0·886	61·2	249·7	+24·2			159
			0·906	104·9	243·4	−14·3			175
May 20		Centre			(307·8)	(−2·0)	(17)	(129)	(1375)
140·434	RF, M		0·793	293·7	345·4	+17·4			59
		5034	0·500	162·6	286·2	−30·3	4	26	
		5034	0·534	157·0	282·1	−31·1	8	38	
		5036	0·807	67·1	245·2	+17·1	0	4	
		5035a	0·862	67·8	239·2	+18·0	9	68	1470c
		5035	0·902	66·6	234·5	+20·1	0	21	
			0·824	107·6	241·7	−15·5			168
May 21		Centre			(296·1)	(−1·9)	(21)	(157)	(1697)
141·421	RF, M		0·905	290·0	345·7	+17·2			160
		5034	0·475	186·6	286·6	−29·8	0	9	
		5034	0·495	176·9	281·2	−31·2	3	20	
		5035a	0·731	63·2	239·8	+18·0	9	62	1064c
		5035	0·796	62·6	234·3	+20·3	0	8	
			0·902	117·2	220·8	−25·1			193
May 22		Centre			(283·0)	(−1·7)	(12)	(99)	(1417)
142·455	RF, M	5035a	0·565	54·6	240·5	+17·7	6	25	
			0·777	59·3	223·3	+22·2			567
			0·961	70·0	197·1	+18·7			171
May 23		Centre			(269·3)	(−1·6)	(6)	(25)	(738)
143·577	RF, M	5035a	0·399	33·8	241·0	+17·8	0	16	
		5035	0·479	41·4	234·9	+19·6	0	11	
			0·889	70·4	193·7	+16·6			207
May 24		Centre			(254·4)	(−1·5)	(0)	(27)	(207)
144·420	RF, M		0·749	229·0	284·2	−30·4			432
		5036	0·329	348·7	247·3	+17·4	3	27	
		5035a	0·334	6·2	241·2	+18·0	0	3	
		5037	0·403	147·0	229·9	− 2·1	0	12	
			0·755	66·4	197·4	+16·6			208
May 25		Centre			(243·4)	(−1·4)	(3)	(42)	(640)

Group 5034, May 16–22. A few small spots irregularly scattered. Only one of these remains by May 18. But a fresh outburst in the region of the preceding part of the group has taken place by May 19. This outburst has disappeared by May 21, and a third outburst has taken place in the region of the following part of the group.
Group 5035, May 20–26. Three spots on May 20. The two first of these have coalesced to form a spot, *a*, of double nucleus by May 21. The third spot has broken up by May 21 and disappeared by May 23. A small spot is seen again in its place on May 24.
Group 5036, May 21–30. A small spot on May 21, not seen again until May 25. It has broken up by May 26, and has disappeared by May 28. It is seen again on May 30 as a small spot.
Group 5037, May 25. A small faint spot.

Measures of Positions and Areas of Sun Spots and Faculæ on Photographs—*continued.*

Greenwich Civil Time.	Measurers.	No. of Group, and Letter for Spot.	Distance from Centre in terms of Sun's Radius.	Position Angle from Sun's Axis.	Heliographic Longitude.	Heliographic Latitude.	Spots. Area of UMBRA for each Spot (and for Day).	Spots. Area of WHOLE for each Spot (and for Day).	Faculæ. Area for each Group (and for Day).
1903.				°	°	°			
145·600	RF, M		0·914	303·5	288·7	+29·6			144
			0·773	234·8	272·8	−27·3			605
		5038	0·744	292·3	273·1	+15·4	17	69	
		5039	0·686	295·1	267·8	+15·9	0	13	
		5036	0·457	313·6	247·9	+17·1	0	6	
		5035*a*	0·383	330·6	239·1	+18·1	0	5	
May 26		Centre			(227·7)	(−1·3)	(17)	(93)	(749)
146·478	RF, M		0·917	235·8	278·7	−31·5			432
		5038	0·855	289·1	272·9	+15·6	12	58	332*f*
		5039	0·805	291·4	267·3	+16·4	0	6	
		5036	0·598	301·0	248·4	+17·0	0	5	
		5036	0·591	302·4	247·5	+17·4	0	6	
		5036	0·586	303·1	247·0	+17·7	0	5	
		5035	0·481	316·8	236·4	+19·4	0	14	
		5035	0·470	319·8	234·8	+19·9	0	5	
May 27		Centre			(216·1)	(−1·1)	(12)	(99)	(764)
147·590	RF, M		0·750	299·5	245·6	+20·9			619
			0·968	237·4	274·6	−31·7			138
		5038	0·958	286·6	273·6	+15·6	0	30	141*f*
			0·905	113·0	138·4	−21·1			128
May 28		Centre			(201·4)	(−1·0)	(0)	(30)	(1026)
148·286	AS, M		0·984	286·6	271·0	+16·2			124
I.			0·862	296·1	248·3	+21·7			357
			0·751	299·7	236·3	+21·2			128
May 29		Centre			(192·1)	(−0·9)	(0)	(0)	(609)
149·092	AS, M		0·909	255·9	246·7	−13·1			138
I.		5036	0·930	289·1	248·3	+17·4	0	14	845*nf*
May 30		Centre			(181·5)	(−0·8)	(0)	(14)	(983)
150·516	RF, M		0·886	242·6	222·2	−24·4			87
			0·882	297·4	221·1	+23·5			683
			0·808	126·1	114·7	−28·8			132
May 31		Centre			(162·7)	(−0·7)	(0)	(0)	(902)
151·433	RF, M		0·910	296·8	213·1	+24·0			431
June 1		Centre			(150·5)	(−0·5)	(0)	(0)	(431)
1903.				°	°	°			
152·611	RF, M		0·918	293·2	199·3	+21·0			39
			0·804	305·1	182·4	+27·2			44
			0·861	63·8	78·8	+22·0			59
June 2		Centre			(134·9)	(−0·4)	(0)	(0)	(142)
153·207	RF, M		0·927	289·5	193·5	+17·9			215
I.			0·952	145·4	66·8	−51·6			84
June 3		Centre			(127·1)	(−0·3)	(0)	(0)	(299)
June 4		No	Spots	or	Faculæ				
155·507	RF, M	5040	0·503	41·3	75·7	+22·0	1	12	
		5040	0·519	45·2	73·4	+21·3	0	13	
			0·914	113·7	32·7	−21·6			254
June 5		Centre			(96·6)	(−0·1)	(1)	(25)	(254)
June 6		No	Spots	or	Faculæ				
157·110	RF, M		0·881	240·8	133·5	−25·3			72
I.			0·979	105·4	357·9	−15·0			354
			0·920	108·4	9·9	−16·8			60
June 7		Centre			(75·4)	(+0·3)	(0)	(0)	(486)
158·440	RF, M	5041	0·816	249·7	110·5	−16·2	0	9	
		5041	0·781	252·9	107·6	−13·0	0	13	
		5041	0·717	257·4	102·8	− 9·3	0	10	
		5042	0·574	345·6	67·7	+34·1	0	8	
		5042	0·568	347·7	66·2	+34·0	0	4	
		5043	0·881	108·0	357·6	−15·6	0	7	319*c*
June 8		Centre			(57·8)	(+0·4)	(0)	(51)	(319)
159·514	RF, M		0·923	252·2	109·6	−16·2			174
June 9		Centre			(43·6)	(+0·5)	(0)	(0)	(174)
160·124	RF, M		0·943	249·8	104·4	−18·8			115
			0·949	237·9	103·6	−30·1			43
			0·942	232·7	100·9	−34·6			34
I.		5044	0·353	167·7	30·9	−19·6	0	5	
		5044	0·375	161·7	28·3	−20·3	2	8	
			0·978	113·2	319·0	−22·5			55
June 10		Centre			(35·5)	(+0·5)	(2)	(13)	(247)

Group 5038, May 26–28. A spot crossed by a bright bridge. It diminishes on the succeeding days.
Group 5039, May 26–27. A small spot following Group 5038. It has broken up by the next day.
Group 5040, June 5. Two small spots.
Group 5041, June 8. Three very small spots arranged in a long row almost at right angles to the solar equator.
Group 5042, June 8. Two very small spots.
Group 5043, June 8. A very small spot.
Group 5044, June 10–16. A few very small spots in a straight stream. The group is not seen on June 13, but has reappeared by June 15.

Measures of Positions and Areas of Sun Spots and Faculæ on Photographs—*continued.*

Greenwich Civil Time.	Measurers.	No. of Group, and Letter for Spot.	Distance from Centre in terms of Sun's Radius.	Position Angle from Sun's Axis.	Heliographic Longitude.	Heliographic Latitude.	Spots. Area of UMBRA for each Spot (and for Day).	Spots. Area of WHOLE for each Spot (and for Day).	Faculæ. Area for each Group (and for Day).
1903.				°	°	°			
161·196	RF, M	5044	0·372	192·7	26·3	−20·5	4	11	
I.		5044	0·359	183·7	22·7	−20·3	2	6	
			0·934	115·0	314·6	−23·0			79
June 11		Centre			(21·3)	(+0·7)	(6)	(17)	(79)
162·112	RF, M		0·969	243·1	82·5	−25·7			50
			0·909	245·0	71·8	−22·2			92
			0·906	296·0	71·8	+23·7			120
		5044	0·462	218·2	26·9	−20·5	2	6	
I.		5044	0·444	217·7	25·9	−19·8	0	2	
		5044	0·424	212·3	23·1	−20·1	0	4	
			0·902	117·3	308·1	−24·0			76
June 12		Centre			(9·2)	(+0·8)	(2)	(12)	(338)
163·254	RF, M	5046	0·395	230·2	12·2	−13·8	3	10	
		5046	0·386	228·7	11·4	−13·9	0	2	
		5046	0·363	224·2	9·2	−14·1	0	6	
		5045	0·963	122·9	283·4	−31·2	0	8	
		5045	0·965	122·1	282·7	−30·5	0	6	533*c*
I.		5045	0·972	123·4	281·2	−32·0	0	19	
			0·890	65·1	293·5	+22·4			42
			0·975	113·2	278·5	+22·4			73
			0·983	65·8	275·3	+24·0			202
June 13		Centre			(354·1)	(+0·9)	(3)	(51)	(850)
164·188	AS, CL		0·770	241·0	27·9	−21·2			216
		5046	0·557	243·1	12·4	−13·7	3	10	
		5046	0·517	240·5	9·3	−13·8	0	10	
M.		5045	0·905	125·3	282·5	−31·0	3	15	450*c*
			0·943	65·4	272·8	+23·5			240
June 14		Centre			(341·8)	(+1·0)	(6)	(35)	(906)
165·258	RF, M	5044	0·875	245·6	25·7	−20·6	0	9	149*c*
		5045	0·818	129·8	280·8	−30·7	0	7	432*f*
			0·886	61·5	268·1	+25·6			104
			0·973	72·9	251·4	+16·9			387
June 15		Centre			(327·6)	(+1·2)	(0)	(16)	(1072)
166·516	RF, M		0·873	252·6	10·0	−14·4			131
		5044	0·986	251·1	30·1	−18·4	0	6	
		5044	0·981	248·3	28·2	−21·0	0	171	283*c*
		5045	0·706	137·8	277·7	−30·3	0	3	259*f*
		5047	0·933	69·0	243·1	+20·0	0	11	
		5047	0·948	69·7	240·4	+19·6	9	21	1259*p*
		5048	0·985	69·1	231·3	+20·8	0	85	
			0·814	130·9	265·1	−31·2			87
			0·846	112·5	255·8	−18·1			95
June 16		Centre			(310·9)	(+1·3)	(9)	(297)	(2114)
1903.				°	°	°			
167·435	RF, M		0·882	250·0	358·5	−16·8			97
		5047	0·840	66·9	243·7	+20·0	0	6	
		5047	0·855	67·5	241·9	+19·8	5	21	1252*c*
		5048	0·929	65·9	232·1	+22·8	0	26	
June 17		Centre			(292·8	(+1·4)	(5)	(53)	(1349)
168·426	RF, M	5047	0·708	62·2	243·9	+20.0	6	19	
		5047	0·726	60·8	242·8	+20·4	0	5	
		5047	0·721	63·4	242·6	+21·8	2	12	592*c*
		5047	0·743	63·8	240·6	+19·9	0	4	
		5048	0·828	65·4	232·1	+20·2	0	3	
		5049	0·933	70·2	217·4	+21·1	0	8	1253*c*
			0·876	115·3	227·8	+19·0			193
June 18		Centre			(285·7)	−21·1 (+1·5)	(8)	(51)	(2038)
June 19		No	Photo	graph					
170·189	RF, M	5050	0·439	190·0	267·1	−21.0	20	35	
		5050	0·435	188·5	266·3	−23·8	1	3	
		5050	0·456	186·1	265·4	−23·7	1	2	
		5050	0·471	184·4	264·6	−25·2	4	31	
		5047*a*	0·433	42·6	242·7	−26·2	14	47	
		5047*b*	0·458	45·6	242·0	+18·6	11	48	
		5047	0·513	49·9	237·6	+20·2	4	22	
I.		5051*a*	0·659	57·9	225·5	+20·8	9	57	
		5051	0·681	60·2	223·2	+21·8	1	5	
		5051*b*	0·702	58·9	221·9	+21·1	10	41	
		5049	0·770	65·2	214·4	+22·5	0	4	90*c*
			0·848	115·5	207·8	+20·0			39
			0·955	73·6	190·0	−20·4			190
			0·966	110·6	189·2	+16·2			74
June 20		Centre			(262·3)	−19·3 (+1·7)	(75)	(295)	(393)
June 21		No	Photo	graph					
172·420	RF, M		0·818	231·0	279·6	−29·6			282
		5050	0·681	231·4	268·1	−23·4	3	18	
		5050	0·683	227·7	266·7	−25·6	0	5	
		5050	0·675	224·5	264·8	−27·0	4	20	
		5047*c*	0·349	330·1	243·4	+19·5	23	121	
		5047	0·336	345·0	238·1	+20·9	0	14	
		5048	0·350	6·7	230·3	+22·3	0	2	
		5051*a*	0·346	15·9	227·0	+21·4	22	152	
		5051	0·335	28·9	223·0	+19·0	0	2	
		5051*b*	0·413	28·8	220·4	+23·1	11	83	
June 22		Centre			(232·8)	(+2·0)	(63)	(417)	(282)

Group 5045, June 13–16. A few very small faint spots in an irregular cluster.
Group 5046, June 13–14. A few very small spots in a straight stream.
Group 5047, June 16–27. A few small spots in an irregular cluster. The leading portion of the group increases, and a pair of spots, *a* and *b*, are seen here on June 20. *a* and *b* have coalesced to form a large spot *c* with double nucleus by June 23.
Group 5048, June 16–24. A faint spot following Group 5047 on June 16 and rapidly diminishing on the succeeding days. It is not seen on June 20, but has reappeared by June 22.
Group 5049, June 18–20. A very small spot following Group 5048.
Group 5050, June 20–23. A few small spots in a straight stream, inclined at a considerable angle to the equator.
Group 5051, June 20–28. A stream of spots forming between Groups 5048 and 5049. *a* and *b*, the first and last spots, are the largest. *b* has disappeared by June 25, and *a* remains alone on June 26.

Measures of Positions and Areas of Sun Spots and Faculæ on Photographs—*continued.*

Greenwich Civil Time.	Measurers.	No. of Group, and Letter for Spot.	Distance from Centre in terms of Sun's Radius.	Position Angle from Sun's Axis.	Heliographic: Longitude.	Heliographic: Latitude.	Spots: Area of UMBRA for each Spot (and for Day).	Spots: Area of WHOLE for each Spot (and for Day).	Faculæ: Area for each Group (and for Day).
1903.				°	°	°			
173·462	RF, M		0·793	302·1	267·3	+26·2			227
			0·571	301·7	249·8	+19·2			141
		5050	0·816	239·4	268·7	−23·2	1	8	} 641*p*
		5050	0·794	233·8	264·5	−26·4	0	8	
		5047*c*	0·499	307·7	243·7	+19·7	24	140	
		5047	0·472	309·0	241·8	+19·2	0	4	
		5047	0·450	319·7	237·2	+22·0	0	9	
		5048	0·389	329·0	231·4	+21·5	0	30	
		5051*a*	0·347	339·8	226·3	+21·0	31	137	
		5051	0·333	352·5	221·7	+21·3	0	10	
		5051*b*	0·362	357·3	220·1	+23·2	10	52	
June 23		Centre			(219·0)	(+2·1)	(66)	(398)	(1009)
174·248	CL, RF		0·962	238·0	278·6	−29·9			251
			0·878	235·1	263·8	−28·9			224
M.		5047*c*	0·623	299·4	243·6	+19·6	18	130	
		5048	0·497	310·6	232·3	+20·8	0	18	
		5051*a*	0·436	319·4	226·3	+21·4	15	122	
		5051	0·395	334·0	219·4	+22·8	2	7	
June 24		Centre			(208·6)	(+2·2)	(35)	(277)	(475)
175·444	RF, M		0·966	242·4	264·6	−25·9			276
		5047*c*	0·797	293·6	243·5	+20·0	12	109	871*c*
		5051*a*	0·606	303·2	225·5	+21·2	20	111	
		5051	0·584	307·5	222·7	+22·8	0	3	
June 25		Centre			(192·7)	(+2·3)	(32)	(223)	(1147)
176·359	RF, M	5047*c*	0·899	291·1	243·7	+20·0	25	115	1756*c*
		5051*a*	0·735	297·0	225·1	+21·1	20	96	
			0·894	99·4	118·2	− 7·3			88
June 26		Centre			(180·7)	(+2·4)	(45)	(211)	(1844)
177·455	RF, M	5047*c*	0·976	289·9	241·7	+18·8	13	60	1457*c*
		5051	0·870	293·9	225·0	+22·0	15	100	
			0·915	121·5	104·9	−27·3			50
			0·898	60·8	104·5	+27·2			98
			0·904	112·8	104·4	−19·2			59
June 27		Centre			(166·1)	(+2·6)	(28)	(160)	(1664)
178·509	RF, M	5051*a*	0·957	292·4	224·8	+22·2	16	59	804*nf*
			0·956	98·6	80·0	− 7·4			85
June 28		Centre			(152·2)	(+2·7)	(16)	(59)	(889)
179·437	RF, M		0·972	293·4	216·1	+23·4			581
			0·911	62·3	76·1	+26·2			139
June 29		Centre			(139·9)	(+2·8)	(0)	(0)	(720)
180·477	RF, M	5052	0·434	200·0	135·2	−21·1	0	6	
		5052	0·434	196·9	133·9	−21·5	0	19	
		5052	0·437	192·3	131·9	−22·3	1	11	
		5053*a*	0·999	109·0	39·3	−18·9	0	269	
June 30		Centre			(126·1)	(+2·9)	(1)	(305)	(0)
181·641	RF, M		0·931	259·9	178·4	− 8·3			177
		5052	0·569	225·1	136·3	−20·9	3	18	
		5052	0·535	218·3	131·7	−22·0	0	2	
		5053*a*	0·951	110·9	41·2	−18·8	50	301	710*f*
July 1		Centre			(110·8)	(+3·0)	(53)	(321)	(887)
182·413	RF, M	5052	0·681	234·2	136·6	−20·9	2	20	} 106*c*
		5052	0·634	227·9	131·0	−22·4	4	22	
		5053*a*	0·890	112·9	40·8	−18·7	58	291	1187*f*
July 2		Centre			(100·5)	(+3·1)	(64)	(333)	(1293)
183·413	RF, M		0·904	274·6	151·8	+ 5·5			90
			0·885	245·0	145·8	−20·3			98
			0·869	310·6	141·9	+36·2			93
		5052	0·804	240·7	135·8	−21·1	1	9	189*f*
		5053*a*	0·782	117·5	40·2	−18·9	50	264	} 2127*f*
		5053	0·789	115·3	38·9	−17·6	0	31	
			0·939	104·3	18·8	−12·3			108
			0·851	132·2	38·9	−32·6			195
July 3		Centre			(87·2)	(+3·2)	(51)	(304)	(2900)
184·457	RF, M		0·894	243·1	132·7	−22·2			308
		5053	0·602	125·7	42·7	−17·7	0	2	} 1034*c*
		5053	0·617	126·6	42·1	−18·7	0	3	
		5053*a*	0·644	125·3	39·9	−19·0	58	294	
			0·805	121·3	25·6	−22·5			1431
			0·961	120·7	364·0	−28·2			288
July 4		Centre			(73·5)	(+3·3)	(58)	(299)	(3061)
185·237	RF, M		0·934	245·4	134·6	−22·6			412
		5052	0·965	245·8	134·8	−22·2	0	6	
		5053*a*	0·540	134·9	39·3	−19·2	58	275	
I.			0·753	123·0	20·5	−21·7			239
			0·922	122·5	1·5	−28·1			335
July 5		Centre			(63·1)	(+3·4)	(58)	(281)	(986)

Group 5052, June 30–July 5. A few small spots in a straight stream. The group is not seen on July 4.
Group 5053, June 30–July 11. A large regular spot, *a*, frequently with some small companions. A number of spots have formed round *a* by July 7, and by July 9 a fine straight stream has formed to the south of it, and *a* is seen as the centre of a wide area of disturbance.

Measures of Positions and Areas of Sun Spots and Faculæ on Photographs—*continued.*

Greenwich Civil Time.	Measurers.	No. of Group, and Letter for Spot.	Distance from Centre in terms of Sun's Radius.	Position Angle from Sun's Axis.	Heliographic Longitude.	Heliographic Latitude.	Spots. Area of UMBRA for each Spot (and for Day).	Spots. Area of WHOLE for each Spot (and for Day).	Faculæ. Area for each Group (and for Day).
1903.				°	°	°			
186·432	RF, M	5053	0·371	167·6	42·5	−17·7	0	5	
		5053*a*	0·408	161·1	39·3	−19·2	57	280	
			0·808	129·5	2·3	−28·4			357
July 6		Centre			(47·3)	(+3·5)	(57)	(285)	(357)
187·420	RF, M	5053	0·378	202·0	42·8	−16·9	4	14	
		5053	0·366	197·0	40·7	−16·9	5	20	
		5053*a*	0·397	191·6	39·1	−19·2	46	221	
		5054*a*	0·613	129·1	4·1	−19·5	15	33	
		5054	0·619	126·9	2·9	−18·7	0	6	
		5054	0·629	125·7	1·9	−18·4	0	4	
		5054	0·649	125·7	0·5	−19·2	10	34	
		5054	0·646	123·8	0·1	−18·0	0	3	
			0·723	136·8	0·1	−28·7			215
July 7		Centre			(34·3)	(+3·6)	(80)	(335)	(215)
188·433	RF, M	5053	0·508	226·3	43·3	−17·1	0	28	
		5053	0·549	216·2	41·3	−22·7	13	61	
		5053	0·461	223·3	39·9	−16·0	3	12	
		5053*a*	0·485	217·6	39·0	−19·0	39	214	
		5053	0·541	210·9	38·4	−24·0	7	42	
		5053	0·492	210·0	36·1	−21·5	0	3	
		5054*a*	0·466	147·4	5·4	−19·5	22	97	
		5054	0·503	138·8	0·4	−18·7	18	119	
July 8		Centre			(20·8)	(+3·7)	(102)	(576)	(0)
189·442	RF, M	5053	0·665	238·9	43·9	−17·0	0	6	
		5053	0·688	230·8	42·6	−22·6	23	132	
		5053	0·608	238·5	39·9	−15·3	0	2	
		5053	0·646	230·0	39·3	−20·6	2	6	
		5053*a*	0·625	232·4	39·0	−19·1	38	211	
		5053	0·652	225·6	38·0	−23·9	13	95	
		5054*a*	0·397	176·6	6·1	−19·5	16	81	
		5054	0·400	161·3	359·8	−18·4	3	32	
		5055	0·454	55·7	344·3	+18·3	26	79	
		5055	0·486	58·9	341·7	+17·9	6	31	
		5055	0·508	59·5	340·2	+18·3	6	27	
July 9		Centre			(7·5)	(+3·8)	(133)	(702)	(0)
190·408	RF, M	5053	0·824	240·4	44·7	−21·4	19	117	
		5053	0·778	243·9	41·4	−17·2	7	23	
		5053	0·795	236·3	40·5	−23·3	1	6	
		5053	0·778	238·6	39·8	−21·1	0	5	760*c*
		5053	0·750	243·6	38·9	−16·6	0	7	
		5053*a*	0·761	240·3	38·9	−19·2	44	213	
		5053	0·766	234·2	37·2	−23·7	12	68	
1903.				°	°	°			
190·408	RF, M	5053	0·738	234·8	35·1	−22·1	1	4	
		5054*a*	0·438	206·5	6·5	−19·0	18	96	
		5054	0·432	201·3	4·2	−19·7	4	20	
		5054	0·396	201·0	3·1	−17·7	0	2	
		5054	0·398	195·1	0·8	−18·5	5	45	
		5054	0·377	190·8	358·8	−17·7	1	4	
		5055	0·286	30·9	345·7	+18·1	9	76	
		5055	0·351	43·6	339·9	+18·5	20	61	
July 10		Centre			(354·6)	(+4·0)	(141)	(747)	(760)
191·431	RF, M	5053	0·928	244·6	44·9	−21·1	18	109	
		5053*a*	0·883	245·4	39·2	−19·4	38	225	1757*c*
		5053	0·881	240·5	37·6	−23·5	10	48	
		5054*a*	0·560	227·0	6·6	−18·7	18	87	
		5054	0·545	225·9	5·4	−18·5	0	41	
		5054	0·507	222·3	2·1	−18·1	6	13	
		5054	0·493	219·9	0·5	−18·3	0	3	
		5055	0·256	336·2	347·3	+17·6	14	34	
		5055	0·254	340·6	346·2	+17·9	2	14	
		5055	0·235	344·1	344·9	+17·1	3	8	
		5055	0·254	351·6	343·3	+18·6	1	18	
		5055	0·231	357·9	341·6	+17·4	9	48	
		5055	0·256	3·3	340·2	+18·9	10	49	
		5056*a*	0·939	124·0	277·4	−29·9	9	24	432*f*
July 11		Centre			(341·1)	(+4·1)	(138)	(721)	(2189)
July 12		No photograph							
193·463	RF, M		0·819	228·6	359·2	−29·8			168
			0·949	246·1	22·5	−21·1			796
		5054*a*	0·831	243·9	6·2	−18·8	17	73	745*f*
		5055	0·579	293·9	347·8	+17·1	4	27	
		5055	0·563	294·3	346·6	+17·0	23	101	
		5055	0·511	298·5	342·3	+17·9	0	6	
		5055	0·486	301·0	340·2	+18·4	4	26	
		5055	0·497	302·6	340·5	+19·3	0	7	
		5056*a*	0·770	136·3	276·4	−30·4	7	17	931*f*
			0·918	71·2	247·8	+18·9			1389
			0·968	106·6	240·8	−14·9			142
July 13		Centre			(314·3)	(+4·3)	(55)	(257)	(4171)
194·463	RF, M		0·900	234·2	357·8	−29·4			151
		5054*a*	0·928	247·4	5·8	−19·1	11	58	371*f*
		5055*a*	0·734	289·1	347·3	+16·9	28	151	342*c*
		5055	0·654	293·8	340·0	+18·6	5	19	
		5056*a*	0·673	147·1	276·0	−30·4	5	8	
			0·761	138·7	266·1	−31·3			618
			0·863	68·5	242·0	+20·7			833
			0·918	113·5	237·9	−19·5			91
July 14		Centre			(301·0)	(+4·3)	(49)	(236)	(2406)

Group 5054, July 7–14. A stream of spots following Group 5053. The leader, *a*, is the largest and most stable. *a* remains alone on July 13.
Group 5055, July 9–16. Several spots in a straight stream. The leader, *a*, has become a large regular spot by July 14, and remains alone by July 15.
Group 5056, July 11–18. A small spot, *a*, on July 11. A second, *b*, has formed behind it by July 15. Neither spot is seen on July 16, probably on account of a defect on the Photograph, as both are seen on July 17. *b* has disappeared by July 18.

Measures of Positions and Areas of Sun Spots and Faculæ on Photographs—*continued.*

Greenwich Civil Time.	Measurers.	No. of Group, and Letter for Spot.	Distance from Centre in terms of Sun's Radius.	Position Angle from Sun's Axis.	Heliographic Longitude.	Heliographic Latitude.	Spots. Area of UMBRA for each Spot (and for Day).	Spots. Area of WHOLE for each Spot (and for Day).	Faculæ. Area for each Group (and for Day).
1903.				°	°	°			
195·422	RF, M		0·959	248·0	358·9	−19·7			294
		5055*a*	0·863	286·9	347·7	+16·8	31	173	588*nf*
		5057*b*	0·430	171·7	284·5	−20·7	2	25	
		5057*a*	0·430	166·2	282·1	−20·3	1	13	
		5057	0·472	165·5	281·0	−22·7	0	7	
		5056*a*	0·602	161·9	275·8	−30·5	0	11	
		5056*b*	0·606	157·6	272·9	−29·8	0	10	
			0·839	116·1	235·6	−19·0			239
			0·821	64·1	234·7	+23·7			654
July 15		Centre			(288·3)	(+4·4)	(34)	(239)	(1775)
196·172	RF, M	5055*a*	0·939	286·5	348·4	+17·0	30	134	623*f*
		5058*a*	0·749	76·1	230·2	+13·4	0	22	} 71*c*
I.		5058	0·777	76·5	227·7	+13·3	0	9	
			0·948	64·9	207·1	+25·2			266
					(278·4)	(+4·5)	(30)	(165)	(960)
July 16		Centre							
197·434	RF, M		0·981	288·6	341·4	+19·2			340
		5057*a*	0·569	219·4	284·5	−21·8	0	4	
		5057*b*	0·549	213·9	281·0	−22·7	1	11	
		5056*a*	0·606	200·3	275·7	−30·1	3	6	
		5056*b*	0·576	194·8	271·4	−29·2	0	8	
		5058*a*	0·509	71·1	232·1	+13·5	3	18	
		5058	0·550	72·1	229·3	+13·6	0	3	
		5058	0·567	73·1	228·0	+13·3	1	12	
			0·813	61·7	209·4	+25·5			445
July 17		Centre			(261·7)	(+4·6)	(8)	(62)	(785)
198·531	RF, M	5057*a*	0·701	231·3	284·0	−22·1	0	2	} 102*sp*
		5057*b*	0·683	229·0	281·8	−22·7	0	13	
		5056*a*	0·697	216·6	276·5	−29·8	0	2	
		5059	0·619	222·7	275·0	−22·8	0	12	
		5059	0·610	219·2	272·8	−23·8	0	5	
		5059	0·597	218·8	271·9	−23·3	0	3	
		5060	0·365	47·4	231·6	+18·7	0	3	
		5058*a*	0·286	55·9	233·9	+13·8	5	23	
		5058	0·351	60·4	229·7	+14·4	0	2	
		5058	0·353	63·2	229·2	+13·6	2	5	
July 18		Centre			(248·0)	(+4·7)	(7)	(70)	(102)
July 19		No photograph							
July 20		No photograph							

Greenwich Civil Time.	Measurers.	No. of Group, and Letter for Spot.	Distance from Centre in terms of Sun's Radius.	Position Angle from Sun's Axis.	Heliographic Longitude.	Heliographic Latitude.	Spots. Area of UMBRA for each Spot (and for Day).	Spots. Area of WHOLE for each Spot (and for Day).	Faculæ. Area for each Group (and for Day).
1903.				°	°	°			
201·414	RF, M		0·893	231·5	263·4	−30·9			801
			0·758	291·9	257·2	+19·8			396
		5057	0·980	247·1	284·3	−21·2	0	30	} 709*c*
		5059	0·964	245·5	279·9	−22·0	0	31	
		5059	0·935	244·0	274·0	−22·2	0	12	
		5058*a*	0·464	290·1	235·5	+13·6	4	17	
July 21		Centre			(209·0)	(+5·0)	(4)	(90)	(1906)
202·627	RF, M		0·928	231·2	252·3	−33·0			610
			0·857	289·6	251·5	+19·4			617
		5058*a*	0·687	284·5	235·9	+13·7	3	10	
July 22		Centre			(192·9)	(+5·1)	(3)	(10)	(1227)
203·634	RF, M		0·903	290·0	244·1	+20·3			868
			0·929	229·6	238·5	−34·4			291
			0·895	241·8	237·9	−22·3			73
		5058*a*	0·839	283·3	236·7	+14·0	4	13	} 190*c*
		5058	0·823	283·4	235·0	+14·0	0	2	
July 23		Centre			(179·6)	(+5·2)	(4)	(15)	(1422)
204·528	RF, M		0·975	286·8	245·8	+17·5			174
			0·892	292·0	230·6	+21·9			384
		5058*a*	0·934	282·9	237·2	+13·9	0	13	173*c*
		5061*a*	0·340	8·1	164·8	+24·8	12	39	
		5061	0·335	12·0	163·4	+24·2	0	2	
		5061	0·362	14·0	162·2	+25·7	8	24	
		5061	0·371	18·0	160·5	+25·7	0	8	
July 24		Centre			(167·8)	(+5·2)	(20)	(86)	(731)
205·479	RF, M		0·928	288·1	223·8	+18·8			530
			0·807	297·9	207·3	+25·5			367
		5061*a*	0·382	332·5	166·5	+24·9	38	143	
		5061	0·347	336·5	164·0	+23·7	4	44	
		5061	0·355	344·3	161·4	+25·2	0	27	
		5061	0·329	346·6	160·1	+23·8	10	23	
		5061	0·344	348·9	159·5	+25·0	3	10	
		5061	0·357	349·4	159·5	+25·7	11	27	
July 25		Centre			(155·3)	(+5·3)	(66)	(274)	(897)
206·613			0·949	253·3	209·5	−14·0			61
			0·895	297·0	203·0	+26·5			464
		5062	0·735	236·0	169·4	−32·8	0	7	
		5061*a*	0·548	308·9	168·1	+24·9	21	109	
		5061	0·511	310·4	165·3	+24·2	7	23	
		5061	0·488	312·7	163·3	+24·2	3	14	
		5061	0·476	315·3	161·7	+24·7	0	3	
		5061	0·458	318·5	159·7	+25·1	19	81	
July 26		Centre			(140·2)	(+5·4)	(50)	(237)	(525)

Group 5057, July 15–21. A few small spots in a straight stream north of Group 5056. *a* and *b*, the first and last, are the most stable. This group, like Group 5056, is not seen on July 16.
Group 5058, July 16–24. A few small spots in a straight stream. *a*, the leader, moves forward rapidly in longitude. It remains alone on July 21 and 22.
Group 5059, July 18–21. A few small faint spots, preceding Group 5057.
Group 5060, July 18. A very small spot, north of Group 5058.
Group 5061, July 24–30. A few small spots in a straight stream on July 24. The group increases in size, and the leader, *a*, has become a large regular spot by July 25.
Group 5062, July 26. Three very small spots in a compact cluster.
Group 5062*, July 27. Two small dark spots.

Measures of Positions and Areas of Sun Spots and Faculæ on Photographs—*continued.*

Greenwich Civil Time.	Measurers.	No. of Group, and Letter for Spot.	Distance from Centre in terms of Sun's Radius.	Position Angle from Sun's Axis.	Heliographic Longitude.	Heliographic Latitude.	Spots. Area of UMBRA for each Spot (and for Day).	Spots. Area of WHOLE for each Spot (and for Day).	Faculæ. Area for each Group (and for Day).
1903.				°	°	°			
207·247	CL, RF		0·936	297·9	201·1	+28·0			305
			0·846	240·6	183·9	−21·2	4	9	} 194*c*
			0·818	239·2	180·5	−21·2	8	21	
M.		5061*a*	0·654	302·5	169·1	+25·0	10	94	
		5061	0·623	303·5	166·5	+24·6	0	9	
		5061	0·591	304·7	163·9	+24·3	6	19	
		5061	0·544	310·6	158·9	+25·6	11	47	
July 27		Centre			(131·8)	(+5·5)	(39)	(199)	(499)
July 28		No photograph							
29·497	RF, M	5061*a*	0·925	293·6	169·9	+23·9	17	139	
		5061	0·911	293·6	167·7	+23·8	0	21	
		5061	0·911	294·4	167·6	+24·5	0	24	} 579*c*
		5061	0·900	295·2	166·0	+25·1	0	14	
		5063	0·832	297·2	157·0	+25·6	0	16	586*c*
		5064	0·591	130·5	74·1	−17·6	0	3	
		5065	0·868	112·0	45·5	−15·9	0	4	
		5065	0·884	111·5	43·5	−16·0	0	3	} 1507*c*
		5066	0·921	112·0	38·5	−17·8	0	5	
July 29		Centre			(102·1)	(+5·6)	(17)	(229)	(2672)
210·425	RF, M	5061*a*	0·977	294·1	168·8	+24·8	17	250	
		5061	0·952	292·3	162·6	+23·0	0	10	} 966*c*
		5063	0·915	296·5	155·6	+26·4	3	24	
		5065	0·771	117·2	44·3	−16·6	0	9	1758*f*
July 30		Centre			(89·8)	(+5·7)	(20)	(293)	(2724)
211·149	RF, M		0·849	237·1	131·2	−23·8			128
		5063	0·961	296·4	155·0	+27·0	0	12	622*sp*
I.		5065	0·672	125·9	45·3	−18·4	0	6	
		5065	0·683	124·6	44·1	−18·1	0	3	873*f*
July 31		Centre			(80·2)	(+5·8)	(0)	(21)	(1623)
212·500	RF, M	5065	0·496	145·1	45·1	−18·3	0	8	
		5065	0·507	138·6	42·0	−16·8	0	15	
			0·785	126·3	19·0	−23·4			291
			0·903	114·8	2·3	−19·3			280
			0·968	69·5	351·0	+17·1			208
Aug. 1		Centre			(62·4)	(+5·9)	(0)	(23)	(779)
1903.				°	°	°			
213·463	RF, M	5065	0·404	164·0	43·0	−16·9	0	5	
		5067	0·743	76·7	1·8	+13·8	4	14	} 116*c*
		5067	0·781	76·1	358·3	+14·5	0	13	
			0·739	134·1	13·6	−26·1			94
			0·776	124·0	8·0	−15·4			220
			0·804	116·1	0·9	−16·9			126
			0·899	70·5	345·5	+20·1			370
Aug. 2		Centre			(49·7)	(+5·9)	(4)	(32)	(926)
214·446		5067	0·563	75·3	2·7	+13·3	1	6	
	RF, M	5067	0·631	74·4	357·9	+14·4	0	9	
			0·819	67·7	342·2	+21·6			184
Aug. 3		Centre			(36·6)	(+6·0)	(1)	(15)	(184)
215·622	RF, M	5067	0·358	67·0	1·4	+13·7	2	16	
			0·980	114·5	306·4	−22·5			529
Aug. 4		Centre			(21·1)	(+6·1)	(2)	(16)	(529)
216·619	RF, M		0·764	239·4	51·6	−18·5			206
			0·916	181·2	9·9	−60·0			463
		5065	0·688	234·6	44·0	−18·6	0	7	
		5065	0·667	235·8	43·0	−17·0	0	2	
		5067	0·212	45·6	358·9	+14·6	0	5	
Aug. 5		Centre			(7·9)	(+6·1)	(0)	(14)	(669)
217·420	RF, M		0·791	240·1	43·6	−19·0			843
		5068	0·845	121·9	306·4	−22·7	5	43	522*c*
		5069	0·991	112·8	278·4	−21·5	0	44	} 242*c*
		5069	0·997	113·7	275·2	−22·9	0	57	
			0·969	116·6	286·2	−23·8			192
Aug. 6		Centre			(357·3)	(+6·2)	(5)	(144)	(1799)
218·430	RF, M		0·898	245·0	47·8	−25·2			989
			0·747	229·4	22·4	−24·2			531
		5068*a*	0·713	129·7	307·9	−22·0	9	65	231*p*
		5069	0·937	116·0	279·2	−21·7	10	65	709*c*
			0·893	119·8	286·9	−23·0			306
Aug. 7		Centre			(344·0)	(+6·3)	(19)	(130)	(2766)

Group 5063, July 29–31. A small spot following Group 5061.
Group 5064, July 29. A very small faint spot.
Group 5065, July 29–August 5. A few very small faint spots. The group is not seen on August 3 and 4.
Group 5066, July 29. A very small faint spot.
Group 5067, August 2–5. A few very small faint spots in a straight stream.
Group 5068, August 6–15. A number of small faint spots in an irregular cluster on August 6. A spot, *a*, on August 7, followed by a distant companion on August 8. Both these spots have broken up by August 10, and the group forms an irregular stream on August 10 and 11. It slowly diminishes in size on the succeeding days, and is seen as a small straight stream.
Group 5069, August 6–13. A few small spots in a short irregular stream, following Group 5068.

Measures of Positions and Areas of Sun Spots and Faculæ on Photographs—*continued.*

Greenwich Civil Time.	Measurers.	No. of Group, and Letter for Spot.	Distance from Centre in terms of Sun's Radius.	Position Angle from Sun's Axis.	Heliographic Longitude.	Heliographic Latitude.	Spots. Area of UMBRA for each Spot (and for Day).	Spots. Area of WHOLE for each Spot (and for Day).	Faculæ. Area for each Group (and for Day).
1903.				°	°	°			
219·449	RF, M		0·962	247·7	41·0	−19·4			195
			0·842	238·9	21·3	−21·8			530
		5068*a*	0·585	144·0	308·8	−22·4	19	67	
		5068	0·607	137·7	304·7	−21·0	3	11	
		5070	0·777	129·5	289·3	−24·9	0	10	131*nf*
		5069	0·870	120·4	276·4	−22·5	11	78	556*c*
Aug. 8		Centre			(330·5)	(+6·3)	(33)	(166)	(1412)
220·512	RF, M		0·933	246·2	21·2	−19·5			199
			0·898	240·1	14·3	−23·3			177
		5068*a*	0·499	166·1	309·1	−22·5	13	68	
		5068	0·491	157·7	305·1	−20·7	3	15	
		5070	0·621	145·5	293·8	−24·8	0	2	
		5070	0·627	141·7	291·5	−23·6	6	25	
		5070	0·628	139·5	290·4	−22·7	0	4	
		5070	0·665	139·5	288·2	−24·7	9	63	
		5069	0·734	128·8	278·4	−22·4	4	23	
		5069	0·751	127·4	276·5	−22·2	0	10	273*c*
		5069	0·777	128·0	274·6	−23·8	6	56	
		5069	0·779	124·8	273·1	−21·8	0	3	
			0·915	129·4	260·1	−32·1			222
			0·898	69·8	252·3	+20·9			556
Aug. 9		Centre			(316·5)	(+6·4)	(41)	(269)	(1427)
221·418	RF, M		0·881	240·4	0·2	−22·3			563
		5068	0·511	190·2	310·2	−23·7	0	3	
		5068	0·491	188·5	309·0	−22·6	12	39	
		5068	0·479	183·8	306·5	−22·0	0	2	
		5068	0·454	180·6	304·8	−20·5	5	15	
		5068	0·469	179·9	304·4	−21·4	0	19	
		5070	0·529	159·3	292·8	−23·3	1	11	
		5070	0·524	157·7	292·1	−22·7	0	1	
		5070	0·538	158·1	291·9	−23·6	3	16	
		5070	0·555	155·8	290·1	−24·1	10	31	
		5070	0·562	153·3	288·5	−23·9	0	4	
		5070	0·580	152·5	287·4	−24·7	14	107	
		5069	0·632	138·0	277·4	−22·2	5	62	
		5069	0·649	136·5	275·7	−22·4	0	4	
		5069	0·683	136·5	274·4	−24·2	0	37	
		5071	0·969	114·4	232·9	−21·7	0	31	217*f*
			0·927	7·2	281·7	+72·6			67
			0·859	135·8	258·6	−33·7			466
			0·900	129·0	250·0	−30·9			212
			0·913	119·4	244·5	−23·5			73
			0·876	72·7	243·0	+18·3			1141
			0·963	57·8	229·2	+32·7			242
Aug. 10		Centre			(304·5)	(+6·4)	(50)	(382)	(2981)
1903.				°	°	°			
222·178	RF, M		0·945	246·5	1·3	−19·7			119
		5068	0·544	210·9	311·9	−21·5	0	3	
		5068	0·541	206·6	309·7	−22·6	20	42	
		5068	0·534	203·7	307·9	−22·8	5	15	
		5068	0·507	201·1	305·8	−21·7	10	31	
		5068	0·487	200·2	304·8	−20·7	3	8	
		5068	0·503	197·0	303·6	−22·2	4	16	
		5070	0·509	174·1	291·2	−23·8	10	63	
	I.	5070	0·535	167·1	287·0	−24·9	13	133	
		5070	0·539	162·5	284·3	−24·4	0	6	
		5069	0·544	150·8	277·9	−22·0	8	40	
		5069	0·598	147·8	274·1	−24·2	1	15	
		5072	0·840	70·1	237·4	+20·2	0	10	
		5072	0·904	68·3	229·4	+22·4	3	21	423*c*
		5071	0·917	117·3	233·3	−21·8	3	22	424*f*
			0·778	142·3	260·2	−32·6			179
			0·840	133·5	249·5	−30·7			135
			0·927	55·4	227·1	+34·4			80
Aug. 11		Centre			(294·5)	(+6·5)	(80)	(425)	(1360)
223·456	AS, M	5068	0·690	226·5	310·3	−22·8	7	28	
		5068	0·673	225·9	308·9	−22·4	0	21	
		5068	0·662	224·4	307·5	−22·5	0	10	
		5068	0·636	223·9	305·7	−21·5	2	22	
		5068	0·648	221·7	305·4	−23·2	0	5	
		5068	0·618	223·6	304·5	−20·8	0	6	
		5068	0·622	219·9	303·0	−22·5	0	5	
		5070	0·547	205·4	292·2	−23·2	5	29	
		5070	0·538	203·2	290·8	−23·2	0	9	
		5070	0·539	197·5	287·7	−24·4	4	19	
		5070	0·539	194·2	285·9	−24·9	9	51	
		5069	0·482	180·8	277·9	−22·2	2	10	
		5069	0·481	172·4	276·2	−21·9	0	5	
		5072	0·690	66·3	235·1	+20·9	7	25	
		5072	0·724	65·3	232·4	+22·2	0	5	
		5072	0·732	67·0	231·5	+21·1	0	4	566*c*
		5072	0·761	65·6	229·0	+22·7	14	68	
		5071	0·786	124·3	233·3	−21·7	6	20	397*f*
		5073	0·971	110·2	204·6	−17·8	10	54	134*sf*
Aug. 12		Centre			(277·5)	(+6·5)	(66)	(396)	(1097)
224·416	AS, M	5068	0·804	234·9	310·2	−22·9	10	21	
		5068	0·785	235·0	308·6	−22·0	3	28	665*c*
		5068	0·754	231·6	304·5	−22·8	0	27	
		5070	0·645	221·6	292·4	−22·9	2	20	
		5070	0·636	219·9	291·1	−23·2	0	26	
		5070	0·626	218·2	289·7	−23·4	0	8	
		5070	0·613	214·8	287·2	−24·0	2	6	

Group 5070, August 8–16. A few small spots in a straight stream between Groups 5068 and 5069.
Group 5071, August 10–13. A small spot.
Group 5072, August 11–21. A number of small spots in a straight stream.
Group 5073, August 12–16. A single spot on August 12, which has broken up into a cluster of very small spots by August 15.

Measures of Positions and Areas of Sun Spots and Faculæ on Photographs—*continued.*

Greenwich Civil Time.	Measurers.	No. of Group, and Letter for Spot.	Distance from Centre in terms of Sun's Radius.	Position Angle from Sun's Axis.	Heliographic Longitude.	Heliographic Latitude.	Spots. Area of UMBRA for each Spot (and for Day).	Spots. Area of WHOLE for each Spot (and for Day).	Faculæ. Area for each Group (and for Day).
1903.				°	°	°			
224·416	AS, M	5070	0·608	212·0	285·5	−24·8	0	7	
		5069	0·516	207·3	279·4	−20·8	0	8	
		5069	0·525	203·5	277·8	−22·2	0	5	
		5072	0·515	60·3	236·4	+20·6	12	38	
		5072	0·566	61·1	232·8	+21·5	9	31	681c
		5072	0·601	61·5	230·2	+22·1	8	35	
		5072	0·619	61·4	228·9	+22·5	12	54	
		5071	0·663	133·1	233·6	−21·2	5	18	
		5073	0·892	113·1	205·8	−17·2	16	50	410f
			0·906	57·8	200·5	+31·9			235
Aug. 13		Centre			(264·8)	(+6·6)	(79)	(382)	(1991)
225·604	AS, RF		0·931	244·4	312·9	−20·9			98
		5068	0·919	241·2	310·1	−23·2	0	15	1099c
		5070	0·773	233·0	291·0	−22·8	4	36	
		5070	0·759	230·5	288·7	−23·7	0	7	399c
		5072	0·300	37·6	237·9	+20·3	9	18	
		5072	0·329	38·9	236·3	+21·3	1	2	
		5072	0·349	45·3	233·8	+20·6	11	19	
		5072	0·419	48·7	229·3	+22·3	14	47	
		5074	0·500	63·6	221·0	+18·7	5	17	
		5074	0·517	65·3	219·6	+18·3	0	1	
		5074	0·531	64·8	218·7	+18·9	0	4	
		5074	0·541	65·9	217·9	+18·5	4	13	
		5073	0·763	121·5	205·9	−18·6	0	19	249f
		5073	0·801	121·0	202·4	−19·8	0	6	
			0·824	53·3	196·7	+33·7			185
			0·949	53·3	177·5	+36·8			139
			0·947	70·2	176·8	+20·9			96
			0·984	66·9	167·9	+23·8			158
Aug. 14		Centre			(249·1)	(+6·7)	(48)	(204)	(2423)
226·415	AS, RF		0·715	225·2	272·2	−24·7			249
		5068	0·971	243·7	309·8	−23·5	0	7	573sf
		5070	0·871	238·5	292·1	−23·2	6	19	894f
		5072	0·230	1·5	238·0	+20·0	6	13	
		5072	0·254	15·9	234·1	+20·8	10	40	
		5072	0·269	16·4	233·7	+21·5	0	13	
		5072	0·301	25·8	230·3	+22·3	6	77	
		5074	0·341	52·5	221·9	+18·4	6	22	
		5074	0·398	59·1	217·4	+18·0	5	26	
		5073	0·670	127·5	204·4	−18·5	2	24	114c
			0·835	51·5	185·2	+35·5			353
			0·964	65·0	162·4	+25·9			534
Aug. 15		Centre			(238·4)	(+6·7)	(41)	(241)	(2717)
227·470	AS, RF	5070	0·954	243·7	292·2	−22·6	0	15	938sf
		5072	0·320	316·6	238·0	+20·0	5	11	
		5072	0·298	323·9	235·3	+20·4	25	55	
		5072	0·295	328·2	234·0	+21·1	0	2	
		5072	0·279	345·2	228·9	+22·3	15	72	
		5072	0·266	350·1	227·3	+21·9	0	3	
		5074	0·201	13·8	221·6	+17·9	3	10	
		5074	0·223	20·2	219·9	+18·7	0	1	
		5074	0·264	17·6	219·6	+21·2	0	1	
		5074	0·235	32·7	216·9	+18·0	3	14	
		5073	0·557	143·9	204·1	−20·4	0	2	
		5073	0·580	141·1	201·7	−20·6	3	16	
			0·901	63·4	160·2	+26·8			1158
Aug. 16		Centre			(224·5)	(+6·7)	(54)	(202)	(2096)
228·438	AS, M		0·934	241·8	275·0	−23·2			392
			0·836	223·2	254·3	−32·6			347
		5072	0·495	299·2	238·9	+20·0	3	10	
		5072	0·475	301·2	237·2	+20·3	3	17	
		5072	0·459	302·6	235·9	+20·5	12	33	
		5072	0·458	300·0	236·4	+19·3	0	3	
		5072	0·466	304·4	235·9	+21·4	0	10	
		5072	0·414	316·0	229·8	+23·7	0	7	
		5072	0·387	315·5	228·6	+22·5	10	68	
		5074	0·265	318·2	222·3	+18·0	0	1	
		5074	0·218	335·1	217·1	+18·1	0	4	
			0·821	61·2	157·7	+27·4			693
			0·954	97·1	140·0	−4·7			170
Aug. 17		Centre			(211·6)	(+6·8)	(28)	(153)	(1602)
229·657	AS, M		0·929	230·6	254·0	−32·8			242
		5072	0·674	293·1	236·8	+20·5	6	27	
		5072	0·684	292·2	237·7	+20·1	1	6	
		5072	0·589	298·4	229·3	+21·9	2	9	
Aug. 18		Centre			(195·5)	(+6·8)	(9)	(42)	(242)
230·485	AS, M		0·963	307·2	259·9	+37·6			50
			0·962	230·8	249·7	−34·8			130
		5075	0·886	285·3	247·6	+16·8	4	10	
		5075	0·857	284·9	244·0	+16·3	0	3	970c
		5072	0·793	288·7	237·0	+19·0	0	4	
		5072	0·797	290·8	237·2	+20·7	6	21	
			0·984	64·4	102·8	+26·4			381
Aug. 19		Centre			(184·6)	(+6·9)	(10)	(38)	(1531)

Group 5074, August 14–17. A few small spots in a straight stream, *sf* Group 5072.
Group 5075, August 19. A few small spots preceding Group 5072.

Measures of Positions and Areas of Sun Spots and Faculæ on Photographs—*continued.*

Greenwich Civil Time.	Measurers.	No. of Group, and Letter for Spot.	Distance from Centre in terms of Sun's Radius.	Position Angle from Sun's Axis.	Heliographic Spots. Longitude.	Heliographic Spots. Latitude.	Spots. Area of UMBRA for each Spot (and for Day).	Spots. Area of WHOLE for each Spot (and for Day).	Faculæ. Area for each Group (and for Day).
1903.				°	°	°			
231·542	AS, M		0·965	284·6	246·5	+15·9			104
			0·883	237·3	225·2	−24·6			147
			0·751	290·1	218·9	+19·6			137
		5072	0·911	289·3	236·9	+20·4	0	11	732*sf*
		5076	0·864	112·4	114·8	−15·4	0	3	103*nf*
			0·939	63·9	90·4	+31·3			473
Aug. 20		Centre			(170·6)	(+6·9)	(0)	(14)	(1696)
232·439	AS, M		0·950	239·9	224·4	−25·7			190
			0·784	237·1	203·2	−20·3			158
		5072	0·975	289·2	237·5	+20·2	0	11	845*nf*
		5077	0·838	63·8	102·5	+25·6	0	12	412*c*
			0·913	61·4	92·9	+28·8			352
Aug. 21		Centre			(158·8)	(+6·9)	(0)	(23)	(1957)
233·433	AS, RF		0·956	225·4	206·7	−39·0			94
			0·902	243·2	204·8	−20·5			316
			0·855	294·9	204·2	+24·9			630
		5076	0·588	127·0	116·8	−14·6	4	17	
		5076	0·605	127·9	116·1	−15·7	0	4	
			0·766	60·8	97·4	+26·7			642
Aug. 22		Centre			(145·7)	(+7·0)	(4)	(21)	(1682)
234·503	AS, RF		0·947	291·8	204·0	+22·9			219
			0·948	245·5	198·6	−20·6			132
		5076	0·432	147·5	117·8	−14·5	1	13	
Aug. 23		Centre			(131·6)	(+7·0)	(1)	(13)	(351)
235·507	AS, M		0·938	301·1	188·5	+31·6			469
			0·766	297·3	166·8	+25·3			272
		5078	0·833	237·0	167·1	−22·4	0	6	
		5078	0·810	236·7	164·8	−21·6	0	4	33*c*
		5078	0·800	235·4	163·4	−22·2	0	2	
		5076	0·379	173·3	115·6	−15·0	0	2	
		5077	0·341	26·6	108·6	+24·6	0	3	
		5077	0·350	31·8	106·6	+24·1	0	1	
		5077	0·362	36·7	104·6	+23·7	0	4	
		5077	0·393	38·5	102·7	+24·6	0	13	
		5079	0·434	73·1	93·0	+13·6	0	7	
			0·930	114·8	54·4	−20·0			335
Aug. 24		Centre			(118·2)	(+7·0)	(0)	(42)	(1109)
Aug. 25		No photograph							
237·180	RF, M		0·958	244·7	164·8	−21·7			83
			0·860	298·1	154·9	+27·7			304
		5076	0·532	228·4	120·3	−14·1	3	8	
			0·732	123·6	56·4	−18·4			269
I.			0·964	118·0	27·0	−24·6			112
			0·960	110·7	26·1	−17·5			114
			0·963	76·3	20·7	+15·1			57
Aug. 26		Centre			(96·2)	(+7·1)	(3)	(8)	(939)
238·391	AS, RF		0·922	297·5	147·8	+28·1			488
		5080*a*	0·629	143·2	55·9	−23·7	0	14	
		5080	0·636	143·3	55·6	−24·1	0	2	
		5080*b*	0·652	139·1	52·5	−23·2	5	16	
			0·899	120·2	22·6	−23·2			605
			0·912	71·9	13·5	+19·4			380
Aug. 27		Centre			(80·1)	(+7·1)	(5)	(32)	(1473)
239·481	AS, RF		0·825	246·8	117·2	−14·6			433
			0·964	298·4	141·8	+29·2			314
		5080*a*	0·543	162·9	55·8	−24·1	0	3	
		5080*b*	0·549	157·5	52·6	−23·3	3	9	
			0·798	125·4	21·2	−22·4			463
Aug. 28		Centre			(65·8)	(+7·2)	(3)	(12)	(1210)
240·441	AS, M		0·932	250·8	118·6	−15·0			143
			0·754	298·7	100·4	+26·2			261
		5080	0·528	184·7	55·8	−24·4	0	3	
		5080	0·514	182·9	54·7	−23·5	0	2	
		5080	0·503	180·3	53·3	−22·8	2	5	
		5080	0·513	179·4	52·8	−23·5	3	11	
		5080	0·526	177·7	51·8	−24·3	4	13	
Aug. 29		Centre			(53·1)	(+7·2)	(9)	(34)	(404)
241·175	RF, M		0·978	253·1	118·7	−14·8			157
			0·848	296·4	100·9	+26·1			286
I.			0·750	303·7	89·1	+29·7			397
		5080	0·543	197·0	53·4	−24·1	9	23	
Aug. 30		Centre			(43·4)	(+7·2)	(9)	(23)	(840)
242·421	AS, M		0·909	297·7	92·5	+28·1			1014
Aug. 31		Centre			(26·9)	(+7·2)	(0)	(0)	(1014)

Group 5076, August 20–26. A very small faint spot on August 20. The group is not seen on August 21, but one or two small spots are seen in the same neighbourhood from August 22 to August 26.

Group 5077, August 21–24. A small faint spot on August 21. The group is not seen on the next two days, but on August 24 a number of small faint spots are seen in the same neighbourhood.

Group 5078, August 24. Three very small faint spots.

Group 5079, August 24. A cluster of very small faint spots.

Group 5080, August 27–30. A pair of small spots, *a* and *b*. *a* has a small companion on August 27. The group consists chiefly, on August 29, of a short stream considerably inclined to the equator, preceded by a few very small faint spots, and on August 30 of a close cluster of very small spots.

Measures of Positions and Areas of Sun Spots and Faculæ on Photographs—*continued.*

Greenwich Civil Time.	Measurers.	No. of Group, and Letter for Spot.	Distance from Centre in terms of Sun's Radius.	Position Angle from Sun's Axis.	Heliographic Longitude.	Heliographic Latitude.	Spots. Area of UMBRA for each Spot (and for Day).	Spots. Area of WHOLE for each Spot (and for Day).	Faculæ. Area for each Group (and for Day).
1903.				°	°	°			
243·419	AS, M		0·950	299·0	86·7	+29·8			283
			0·781	233·8	56·4	−22·2			285
		5081	0·532	179·5	13·4	−24·9	0	2	
Sept. 1		Centre			(13·7)	(+7·2)	(0)	(2)	(568)
244·435	AS, M		0·931	116·9	297·1	−21·8			375
			0·879	239·7	55·2	−22·3			360
Sept. 2		Centre			(360·3)	(+7·2)	(0)	(0)	(735)
245·428	AS, M		0·925	242·4	49·3	−22·2			283
			0·858	124·4	296·3	−24·5			290
Sept. 3		Centre			(347·2)	(+7·2)	(0)	(0)	(573)
246·428	RF, M		0·871	235·1	26·2	−25·5			277
			0·784	131·3	293·3	−25·7			145
			0·917	119·7	273·8	−23·6			370
			0·942	72·1	262·5	+19·3			228
Sept. 4		Centre			(334·0)	(+7·2)	(0)	(0)	(1020)
247·335	AS, M		0·918	240·1	22·3	−23·8			235
			0·859	231·4	11·2	−27·8			175
M.			0·810	122·4	275·1	−20·8			526
			0·949	124·1	258·0	−29·2			278
			0·953	68·8	248·3	+22·4			325
Sept. 5		Centre			(322·0)	(+7·2)	(0)	(0)	(1539)
248·206	CL, M		0·935	239·5	13·2	−25·1			132
			0·898	127·7	256·2	−29·2			256
M.			0·916	69·2	243·4	+21·9			557
Sept. 6		Centre			(310·5)	(+7·3)	(0)	(0)	(945)
29·402	AS, RF		0·857	106·6	238·4	−10·2			102
			0·886	66·1	232·0	+24·5			208
Sept. 7		Centre			(294·7)	(+7·3)	(0)	(0)	(310)
Sept. 8		No	photograph.						
1903.				°	°	°			
251·410	AS, RF		0·711	220·4	299·1	−26·6			224
		5082	0·326	55·4	251·9	+17·6	0	4	
		5082	0·341	56·2	251·0	+17·8	0	5	
		5082	0·352	57·3	250·2	+17·8	0	2	
		5083*a*	0·984	109·8	191·8	−17·9	26	104	164*f*
			0·765	70·2	218·5	+19·7			285
			0·891	123·1	212·8	−25·2			98
Sept. 9			0·879	79·1	206·1	+13·0			84
		Centre			(268·2)	(+7·2)	(26)	(115)	(855)
252·441	AS, RF	5082	0·230	26·8	248·3	+19·0	2	5	
		5083*a*	0·917	113·4	192·5	−18·1	15	83	501*f*
			0·936	59·8	184·6	+30·7			63
Sept. 10		Centre			(254·6)	(+7·2)	(17)	(88)	(564)
253·242		5082	0·222	327·7	251·1	+17·9	0	4	
M.		5083*a*	0·841	117·1	192·2	−18·1	14	110	726*f*
Sept. 11		Centre			(244·0)	(+7·2)	(14)	(114)	(726)
254·464	AS, M	5083*a*	0·684	125·6	192·3	−17·6	15	108	239*p*
		5084	0·769	120·2	183·8	−17·7	0	3	188*c*
			0·915	63·2	161·2	+27·4			132
Sept. 12		Centre			(227·9)	(+7·2)	(15)	(111)	(559)
255·483	AS, RF	5083*a*	0·543	138·1	192·2	−17·1	25	106	
			0·873	116·7	159·0	−19·0			149
			0·927	60·0	146·0	+30·5			326
Sept. 13		Centre			(214·4)	(+7·2)	(25)	(106)	(475)
256·683	AS, M		0·876	230·3	249·3	−29·6			380
		5085*a*	0·243	305·6	210·4	+15·2	0	4	
		5085	0·237	310·8	209·3	+16·0	0	6	
		5085	0·205	314·9	207·2	+15·4	1	5	
		5083*a*	0·425	164·2	191·7	−16·9	17	60	
			0·854	62·6	140·4	+27·1			373
Sept. 14		Centre			(198·6)	(+7·2)	(18)	(75)	(753)
257·484	AS, M		0·916	287·6	255·2	+19·0			229
			0·950	233·6	251·2	−31·3			275
			0·891	222·5	236·3	−36·4			146
		5086*a*	0·730	227·8	224·0	−23·5	7	14	
		5086	0·695	226·0	220·7	−22·8	1	4	
		5085*a*	0·407	291·1	211·1	+15·1	4	13	
		5083*a*	0·416	188·2	191·5	−17·1	14	60	
			0·835	110·6	134·9	−12·8			307
Sept. 15		Centre			(188·0)	(+7·2)	(26)	(91)	(957)

Group 5081, September 1. A very small faint spot.
Group 5082, September 9–11. A few very small faint spots on September 9. Only one very small spot, *nf* the place of the group on September 9 is seen on September 10.
Group 5083, September 9–17. A regular spot, *a*, which diminishes in size after September 13. Some small companions are seen on September 16 and 17.
Group 5084, September 12. A very small faint spot.
Group 5085, September 14–15. A few very small spots in a short irregular stream. Only the leader spot, *a*, remains by September 15.
Group 5086, September 15–16. A few very small spots in a short stream. The leader spot, *a*, alone remains by September 16.

Measures of Positions and Areas of Sun Spots and Faculæ on Photographs—*continued.*

Greenwich Civil Time.	Measurers	No. of Group, and Letter for Spot.	Distance from Centre in terms of Sun's Radius.	Position Angle from Sun's Axis.	Heliographic Longitude.	Heliographic Latitude.	Spots. Area of UMBRA for each Spot (and for Day).	Spots. Area of WHOLE for each Spot (and for Day).	Faculæ. Area for each Group (and for Day).
1903.				°	°	°			
258·436	AS, RF		0·904	292·4	240·6	+23·3			578
		5086*a*	0·840	235·9	224·6	−23·5	2	13	278*c*
		5087	0·677	290·9	217·3	+19·4	0	2	
		5087*a*	0·566	290·7	216·5	+19·1	10	15	
		5087	0·638	291·7	214·2	+19·3	1	10	
		5087	0·641	293·5	214·1	+20·4	0	1	
		5087	0·632	293·5	213·4	+20·3	4	5	
		5083	0·497	215·6	192·9	−16·9	0	2	
		5083	0·491	214·0	192·0	−17·1	1	5	
		5083*a*	0·484	211·4	190·7	−17·4	8	24	
			0·955	65·4	101·3	+25·6			279
Sept. 16		Centre			(175·4)	(+7·2)	(26)	(77)	(1135)
259·430	AS, M		0·960	292·9	237·5	+24·0			200
			0·909	240·5	221·4	−23·0			98
		5087*a*	0·814	288·2	216·9	+19·0	11	22	} 333*c*
		5087	0·782	289·5	213·6	+19·7	0	6	
		5083	0·635	230·2	193·0	−17·8	0	2	
		5083*a*	0·609	227·7	190·4	−17·8	0	6	
		5083	0·603	228·7	190·5	−17·1	0	2	
			0·891	64·6	99·2	+25·8			437
			0·942	56·0	91·4	+34·4			106
Sept. 17		Centre			(162·3)	(+7·2)	(11)	(38)	(1174)
260·441	AS, RFA		0·943	243·6	214·4	−21·9			305
			0·880	232·4	201·2	−28·3			245
			0·815	245·5	199·1	−15·3			33
			0·763	241·8	193·3	−16·1			125
		5087*a*	0·924	287·3	217·4	+18·7	2	12	708*c*
			0·838	61·1	93·0	+28·0			851
			0·959	109·6	78·8	−16·5			114
Sept. 18		Centre			(149·0)	(+7·1)	(2)	(12)	(2381)
261·462	RF, M		0·963	286·0	211·1	+17·3			317
			0·853	243·5	188·8	−18·2			624
			0·739	51·3	92·3	+32·8			194
			0·792	63·1	84·2	+25·5			200
			0·892	114·4	77·0	−18·0			168
			0·877	52·9	76·2	+35·7			179
			0·889	103·1	74·7	−8·2			133
			0·984	114·2	59·9	−22·2			223
Sept. 19		Centre			(135·5)	(+7·1)	(0)	(0)	(2038)
262·490	AS, RF		0·931	246·0	185·9	−19·2			415
			0·897	295·4	185·9	+25·9			52
			0·935	114·9	57·4	−20·3			249
Sept. 20		Centre			(121·9)	(+7·1)	(0)	(0)	(716)
1903.				°	°	°			
263·427	AS, RF		0·972	249·2	182·4	−18·2			146
			0·879	119·4	54·3	−21·6			371
Sept. 21		Centre			(109·6)	(+7·1)	(0)	(0)	(517)
264·343	CL, RF		0·914	4·9	82·7	+72·2			96
M.									
Sept. 22		Centre			(97·5)	(+7·0)	(0)	(0)	(96).
265·187	RF, M		0·945	294·0	158·3	+24·9			167
			0·803	299·1	138·4	+27·4			212
		5088	0·092	332·7	88·9	+11·7	0	1	
		5088	0·112	345·1	88·1	+13·2	0	9	
I.			0·921	19·1	39·9	+65·5			37
			0·829	126·1	39·2	−24·5			154
			0·940	117·7	21·9	−23·0			269
Sept. 23		Centre			(86·4)	(+7·0)	(0)	(10)	(839)
266·337	RF, M		0·906	295·0	135·4	+25·5			194
		5088	0·331	287·3	89·0	+12·3	7	50	
I			0·876	143·6	27·8	−39·7			57
			0·881	125·1	16·8	−26·4			156
Sept. 24		Centre			(70·2)	(+7·0)	(7)	(50)	(407)
267·639	AS, RF		0·632	300·4	90·5	+24·2			304
		5088*a*	0·621	280·8	92·4	+12·1	17	128	198*c*
		5088	0·568	279·9	88·6	+11·3	0	17	
		5088*b*	0·562	282·7	88·1	+12·8	4	23	
Sept. 25		Centre			(54·0)	(+6·9)	(21)	(168)	(502)
268·493	AS, M		0·841	298·1	99·0	+27·2			281
		5088*a*	0·763	280·0	92·7	+12·1	41	239	
		5088*b*	0·714	279·9	88·5	+11·9	15	77	
Sept. 26					(42·7)	(+6·9)	(56)	(316)	(281)
269·655	AS, RF		0·911	296·3	93·2	+26·7			142
		5088*a*	0·909	279·8	93·3	+11·7	41	306	} 167*c*
		5088*b*	0·874	280·0	88·8	+12·0	5	90	
		5089*a*	0·656	227·5	58·3	−20·4	0	3	
Sept. 27		Centre			(27·4)	(+6·8)	(46)	(399)	(309)

Group 5087, September 16–18. A few small spots in a short irregular stream. *a*, the darkest spot on September 16, alone remains by September 18.
Group 5088, September 23–29. A few very small spots forming at the centre of the disc on September 23. The group has developed into a short straight stream by September 24. On the succeeding days the group consists chiefly of two large spots, *a* and *b*, of which *a*, the leader, an irregular spot, is the larger.
Group 5089, September 27–30. A very small spot, *a*, on September 27. Other small spots have appeared following it by September 28, making with it a short irregular stream.

Measures of Positions and Areas of Sun Spots and Faculæ on Photographs—*continued.*

Greenwich Civil Time.	Measurers.	No. of Group, and Letter for Spot.	Distance from Centre in terms of Sun's Radius.	Position Angle from Sun's Axis.	Heliographic Longitude.	Heliographic Latitude.	Spots. Area of UMBRA for each Spot (and for Day).	Spots. Area of WHOLE for each Spot (and for Day).	Faculæ. Area for each Group (and for Day).
1903.				°	°	°			
270·255	RF, M		0·938	296·4	89·7	+27·1			298
	AS, M		0·977	232·0	88·7	−34·8			142
			0·928	240·3	81·2	−24·3			108
		5088*a*	0·954	280·4	92·5	+12·0	49	258	691*c*
I.		5088*b*	0·927	280·5	87·8	+12·3	13	94	
		5089*a*	0·738	233·8	58·6	−20·6	0	3	
		5089	0·730	234·6	58·3	−19·8	1	3	259*c*
		5089	0·704	231·8	55·2	−20·3	2	7	
Sept. 28		Centre			(19·2)	(+6·8)	(65)	(365)	(1498)
271·218	RF, M		0·952	294·0	80·1	+24·9			75
			0·916	303·2	72·7	+33·0			52
		5088*a*	0·996	281·4	92·7	+11·9	47	246	454*c*
		5088*b*	0·984	281·5	87·7	+12·6	15	88	
I.		5089	0·854	240·8	59·5	−20·6	11	29	402*c*
		5089	0·820	239·8	55·7	−20·0	1	10	
			0·912	113·1	305·3	−17·8			96
Sept. 29		Centre			(6·9)	(+6·8)	(74)	(373)	(1079)
272·432	AS, RF		0·920	279·3	58·2	+11·1			161
			0·869	235·1	42·9	−25·8			142
		5089	0·965	243·7	60·7	−23·2	2	11	
		5089	0·963	242·8	60·0	−23·9	1	6	377*c*
		5089	0·951	243·6	57·8	−22·5	0	5	
			0·917	116·4	289·3	−20·9			210
Sept. 30		Centre			(350·7)	(+6·7)	(3)	(22)	(890)
272·375	RF, M		0·982	246·8	53·6	−21·2			443
		5090	0·793	238·4	24·0	−19·9	3	7	
			0·902	120·6	280·4	−23·8			50
I.			0·967	109·6	266·2	−17·0			81
			0·952	69·6	265·2	+21·4			117
Oct. 1		Centre			(338·3)	(+6·7)	(3)	(7)	(691)
274·519	RF, M		0·873	240·7	17·9	−21·5			114
		5091*a*	0·983	77·8	242·8	+13·2	32	157	267*c*
			0·913	111·7	261·0	−16·8			91
			0·895	70·2	259·3	+20·7			254
Oct. 2		Centre			(323·2)	(+6·6)	(32)	(157)	(726)
1903.				°	°	°			
275·480	AS, RF		0·951	244·8	18·0	−21·5			126
			0·913	236·0	8·7	−27·3			117
		5091*a*	0·918	78·9	243·3	+12·8	47	274	
		5091	0·938	79·0	240·1	+12·6	7	33	
		5091	0·940	80·0	239·8	+11·7	0	3	
		5091	0·943	77·9	239·2	+13·6	0	9	595*c*
		5091	0·956	78·0	236·7	+13·4	0	41	
		5091	0·959	76·5	236·1	+14·8	0	7	
		5091	0·959	75·4	236·0	+15·9	0	83	
			0·945	123·6	246·7	−28·8			146
			0·875	70·7	249·2	+20·1			198
			0·925	63·2	242·4	+27·3			225
Oct. 3		Centre			(310·5)	(+6·6)	(54)	(450)	(1407)
276·526	AS, RF	5091*a*	0·796	78·9	243·[illegible]	+12·8	53	254	
		5091	0·822	79·2	241·1	+12·6	0	7	
		5091	0·838	78·9	239·5	+12·8	7	39	
		5091	0·852	77·7	237·9	+13·9	0	12	437*c*
		5091	0·866	77·7	236·3	+13·9	2	30	
		5091	0·873	75·9	235·5	+15·5	6	103	
		5091	0·882	74·4	234·4	+16·8	0	11	
		5092*a*	0·995	111·6	215·6	−20·6	0	97	100*sp*
			0·786	69·0	245·4	+20·4			107
			0·897	129·3	242·9	−30·9			200
			0·890	63·5	234·0	+26·5			164
Oct. 4		Centre			(296·7)	(+6·5)	(68)	(553)	(1008)
277·643	AS, M	5091*a*	0·617	77·0	243·9	+13·1	50	270	
		5091	0·671	77·7	239·8	+13·1	3	42	
		5091	0·733	75·0	234·8	+15·4	13	103	
		5092*a*	0·950	114·6	214·5	−20·9	16	90	
		5093	0·975	114·2	208·8	−21·8	112	519	
		5093	0·983	111·6	205·8	−19·8	0	221	
		5093	0·995	112·6	201·0	−21·6	0	107	792*c*
		5093	0·998	110·3	198·2	−19·7	0	343	
		5093	0·999	108·7	197·1	−18·2	0	113	
			0·791	61·3	231·3	+26·5			81
			0·838	50·7	228·8	+36·0			130
			0·922	64·7	214·4	+25·8			164
			0·920	76·3	214·3	+15·1			131
Oct. 5		Centre			(281·9)	(+6·5)	(194)	(1808)	(1298)
278·125	RF, M	5091*a*	0·518	75·3	244·8	+13·1	54	293	
		5091	0·567	76·4	241·3	+13·0	3	47	
		5091	0·597	76·2	239·2	+13·4	0	30	
I.		5091	0·620	73·4	237·7	+15·3	0	15	
		5091	0·651	73·9	235·3	+15·4	10	62	

Group 5090, October 1. A very small spot.
Group 5091, October 2–14. A large regular spot, *a*, followed by a stream of much smaller and fainter spots. The latter have all disappeared by October 12, leaving *a* alone.
Group 5092, October 4–13. A regular spot, *a*, with occasionally a small companion. The group precedes the great Group 5093.
Group 5093, October 5–18. Much the largest group of the year. It consists principally of one immense irregular spot of composite structure, subdivided by bright bridges in a very irregular manner. The great spot has divided into two composite spots, *a* and *b*, by October 12. Of these, *a* steadily diminishes and *b* increases in area.

Measures of Positions and Areas of Sun Spots and Faculæ on Photographs—*continued.*

Greenwich Civil Time.	Measurers.	No. of Group, and Letter for Spot.	Distance from Centre in terms of Sun's Radius.	Position Angle from Sun's Axis.	Heliographic Longitude.	Heliographic Latitude.	Spots. Area of UMBRA for each Spot (and for Day).	Spots. Area of WHOLE for each Spot (and for Day).	Faculæ. Area for each Group (and for Day).
1903.				°	°	°			
278·125	RF, M	5092*a*	0·912	116·8	215·0	−21·2	16	94	
I.		5093	0·944	116·4	209·8	−22·2	69	459	1718*c*
		5093	0·962	113·7	205·5	−20·7	12	324	
		5093	0·981	112·2	200·2	−20·3	19	227	
			0·893	66·4	212·2	+24·0			362
Oct. 6		Centre			(275·6)	(+6·5)	(183)	(1551)	(2080)
279·207	RF, M	5091*a*	0·280	63·7	246·4	+13·3	50	241	
		5091	0·337	68·1	242·6	+13·3	2	17	
		5091	0·352	63·9	242·3	+14·9	0	2	
		5091	0·363	70·6	240·8	+12·9	1	6	
I.		5091	0·408	66·1	238·6	+15·4	0	4	
		5091	0·443	67·8	236·2	+15·4	6	67	
		5092*a*	0·792	123·4	216·2	−21·4	23	125	2392*c*
		5093	0·880	118·7	205·4	−21·5	161	1494	
Oct. 7		Centre			(261·3)	(+6·4)	(243)	(1956)	(2392)
280·191	RF, M	5094	0·738	232·7	287·3	−21·7	2	11	
		5094	0·728	230·4	285·6	−22·6	0	2	160*c*
		5094	0·728	228·1	284·6	−24·0	8	22	
		5091*a*	0·133	24·7	245·0	+13·3	47	253	
		5091	0·165	37·9	242·3	+13·7	2	6	
		5091	0·159	44·0	241·8	+12·8	1	7	
		5091	0·177	55·9	239·7	+11·9	0	3	
I.		5091	0·226	49·1	238·2	+14·7	0	7	
		5091	0·246	54·9	236·4	+14·3	1	6	
		5091	0·284	52·4	234·8	+16·0	0	6	
		5092*a*	0·687	130·9	214·5	−21·5	15	135	
		5092	0·690	127·8	213·0	−19·8	0	2	1408*c*
		5093	0·782	123·8	204·3	−21·2	202	2006	
Oct. 8		Centre			(248·3)	(+6·3)	(278)	(2466)	(1568)
281·433	RF, M	5094	0·897	241·9	290·1	−21·8	3	8	
		5094	0·882	242·4	288·4	−20·8	0	5	
		5094	0·881	241·7	288·1	−21·3	0	8	
		5094	0·874	242·7	287·6	−20·2	5	39	350*c*
		5094	0·859	240·3	285·0	−21·5	7	31	
		5904	0·862	237·4	284·4	−24·0	2	9	
		5904	0·863	236·9	284·3	−24·4	4	16	
		5091*a*	0·258	298·2	245·3	+13·0	46	233	
		5091	0·257	303·8	244·6	+14·2	0	2	
		5091	0·242	306·3	243·4	+14·3	0	2	
		5091	0·214	303·5	242·4	+12·8	0	1	
		5091	0·225	312·1	241·8	+14·7	0	2	
		5091	0·193	312·6	240·3	+13·6	0	2	
		5091	0·195	318·2	239·6	+14·5	0	3	
		5091	0·186	321·5	238·7	+14·5	0	1	
1903.				°	°	°			
281·433	RF, M	5091	0·206	343·0	235·5	+17·5	0	2	
		5092*a*	0·546	148·5	214·1	−21·7	21	93	
		5092	0·552	144·5	211·9	−20·8	0	1	
		5093	0·576	133·8	206·1	−17·9	0	2	
		5093	0·614	137·3	205·5	−21·2	128	1313	
		5093	0·668	138·7	203·0	−24·6	0	4	
		5093	0·664	137·3	202·5	−23·8	0	11	
		5093	0·660	135·2	201·8	−22·5	0	11	
		5093	0·645	129·2	200·2	−18·7	21	195	
		5093	0·665	131·3	199·7	−20·8	20	147	
		5093	0·703	132·5	197·7	−23·2	1	5	
		5093	0·682	127·6	197·1	−19·5	15	81	
		5093	0·720	133·5	197·0	−24·6	1	3	
		5093	0·697	129·9	197·0	−21·4	28	213	
Oct. 9		Centre			(231·9)	(+6·2)	(302)	(2443)	(350)
282·452	AS, RF	5094	0·969	246·5	290·2	−20·9	0	112	
		5094	0·946	244·5	285·0	−21·7	0	48	376*c*
		5094	0·943	241·6	283·6	−24·2	0	60	
		5091*a*	0·459	286·2	245·2	+12·9	43	228	
		5091	0·432	286·9	243·4	+12·8	0	8	
		5091	0·428	296·4	241·9	+16·6	0	4	
		5091	0·367	297·5	238·1	+15·6	0	30	
		5092*a*	0·473	172·5	214·6	−21·7	21	94	
		5093	0·501	156·3	206·0	−21·1	121	1331	
		5093	0·525	146·5	200·5	−20·0	21	124	
		5093	0·508	143·0	199·7	−18·0	22	157	
		5093	0·561	143·8	197·7	−21·0	41	403	
Oct. 10		Centre			(218·4)	(+6·2)	(269)	(2599)	(376)
283·225	AS, RF		0·865	244·3	263·3	−18·6			221
			0·763	294·0	256·8	+22·2			223
		5094	0·980	243·4	282·4	−24·5	0	78	359*c*
		5091*a*	0·601	283·2	244·9	+12·8	34	198	
		5091	0·506	291·9	237·3	+16·2	0	35	
		5092*a*	0·484	191·1	214·0	−22·2	13	48	
I.		5092	0·470	187·8	212·1	−21·5	0	4	
		5093*a*	0·462	175·5	206·0	−21·2	148	1368	
		5093	0·525	170·8	202·9	−25·0	2	12	
		5093	0·468	164·6	200·6	−20·7	9	84	
		5093	0·439	161·4	199·8	−18·4	23	193	
		5093	0·493	158·2	196·9	−21·1	50	466	
		5093	0·541	154·8	193·7	−23·3	0	6	
			0·964	65·2	132·6	+25·5			213
Oct. 11		Centre			(208·2)	(+6·1)	(279)	(2492)	(1016)

Group 5094, October 8–11. A few small spots in a straight stream inclined at a considerable angle to the equator.

Measures of Positions and Areas of Sun Spots and Faculæ on Photographs—*continued.*

Greenwich Civil Time.	Measurers.	No. of Group, and Letter for Spot.	Distance from Centre in terms of Sun's Radius.	Position Angle from Sun's Axis.	Heliographic Longitude.	Heliographic Latitude.	Spots. Area of UMBRA for each Spot (and for Day).	Spots. Area of WHOLE for each Spot (and for Day).	Faculæ. Area for each Group (and for Day).
1903.				°	°	°			
284·478	RF, M		0·954	249·2	261·0	−17·7			133
		5091*a*	0·803	281·6	245·4	+12·9	37	205	814*p*
		5092*a*	0·587	217·8	214·5	−22·0	3	31	
		5093*a*	0·518	207·4	206·6	−21·5	192	1233	
		5093	0·460	202·3	202·4	−19·2	0	7	
		5093	0·496	201·3	202·9	−21·5	0	30	
		5093*b*	0·469	193·1	198·3	−21·1	107	724	
		5093	0·446	184·2	193·8	−20·3	0	6	
			0·936	2·8	181·8	+74·8			31
			0·885	59·3	130·7	+29·8			108
Oct. 12		Centre			(191·8)	(+6·0)	(339)	(2236)	(1086)
285·408	AS, RF		0·838	296·4	235·2	+25·2			106
		5091*a*	0·906	281·7	244·8	+13·1	29	185	145*f*
		5091	0·867	284·4	239·7	+15·4	0	7	323*f*
		5092	0·706	230·8	215·3	−21·7	0	2	
		5092	0·692	228·4	213·3	−22·4	0	8	
		5093*a*	0·624	223·7	206·9	−21·5	142	1203	
		5093*b*	0·547	214·3	198·6	−21·2	70	768	
		5093	0·499	207·0	193·3	−20·6	0	8	
			0·977	60·7	100·5	+29·8			116
Oct. 13		Centre			(179·4)	(+5·9)	(241)	(2181)	(690)
286·145	RF, M		0·906	295·0	234·5	+25·1			319
			0·824	239·9	219·1	−20·6			15
		5091*a*	0·961	282·2	244·4	+13·4	24	159	615*nf*
		5093*a*	0·714	231·4	206·5	−21·7	131	1023	
I.		5093*b*	0·629	225·2	198·2	−21·1	107	874	
		5095*a*	0·973	76·9	92·3	+14·1	46	183	289*p*
			0·942	64·7	98·9	+25·8			16
Oct. 14		Centre			(169·7)	(+5·9)	(308)	(2239)	(1254)
287·413	RF, M	5093	0·865	240·4	207·0	−21·9	150	910	
		5093	0·827	242·0	203·5	−19·2	4	81	1283*c*
		5093	0·815	237·7	200·8	−21·9	0	40	
		5093	0·781	236·3	197·1	−21·5	72	872	
		5095*a*	0·870	77·0	92·3	+14·1	32	176	427*f*
Oct. 15		Centre			(153·0)	(+5·8)	(258)	(2079)	(1710)
288·405	AS, M		0·904	280·6	205·0	+12·0			132
			0·904	204·8	176·5	−50·5			141
		5093*a*	0·945	244·3	206·5	−22·0	110	857	1019*c*
		5093*b*	0·884	241·8	196·7	−21·6	79	1091	
		5095*a*	0·741	78·5	92·3	+14·3	28	158	261*c*
Oct. 16		Centre			(140·0)	(+5·7)	(217)	(2106)	(1553)
1903.				°	°	°			
289·505	AS, M		0·938	291·4	195·5	+22·0			102
		5093*a*	0·991	246·7	204·5	−22·1	44	442	1050*c*
		5093*b*	0·965	245·9	196·4	−21·5	68	1069	
		5096*a*	0·831	241·0	176·0	−20·2	6	20	67*c*
		5096*b*	0·818	239·3	174·1	−21·1	0	14	
		5095*a*	0·562	72·4	92·0	+14·4	32	183	
			0·930	117·7	62·0	−23·2			176
Oct. 17		Centre			(125·4)	(+5·6)	(150)	(1728)	(1395)
290·216	AS, RF	5093*b*	0·990	247·0	194·8	−21·8	101	990	535*sf*
		5096*a*	0·905	244·2	176·3	−20·4	3	18	194*c*
		5096*b*	0·884	242·1	172·9	−21·4	0	7	
I.		5095*a*	0·430	66·8	92·0	+14·9	25	166	
			0·887	122·0	60·2	−25·0			240
Oct. 18		Centre			(116·1)	(+5·6)	(129)	(1181)	(969)
291·290	AS, M		0·969	246·8	174·2	−20·9			234
I.		5095*a*	0·234	45·9	91·9	+14·7	32	169	
			0·823	124·7	54·2	−24·2			344
Oct. 19		Centre			(101·9)	(+5·5)	(32)	(169)	(578)
292·160	RF, M	5095*a*	0·166	350·3	92·2	+14·8	27	162	
I.									
Oct. 20		Centre			(90·5)	(+5·4)	(27)	(162)	(0)
293·654	AS, M		0·901	288·2	135·2	+18·7			179
		5095*a*	0·394	295·8	92·2	+14·8	31	209	
		5097	0·398	196·3	77·5	−17·1	0	10	
		5097	0·387	191·0	75·2	−17·0	0	10	
Oct. 21		Centre			(70·8)	(+5·3)	(31)	(229)	(179)
294·472	AS, RF		0·963	287·6	135·1	+18·4			188
		5095*a*	0·554	289·3	92·6	+15·0	32	195	
Oct. 22		Centre			(60·0)	(+5·2)	(32)	(195)	(188)
295·403	AS, RF	5095*a*	0·705	285·5	92·1	+14·5	21	176	
			0·975	111·0	333·3	−19·2			155
Oct. 23		Centre			(47·7)	(+5·1)	(21)	(176)	(155)
296·140	AS, RF		0·827	299·5	91·7	+27·0			182
		5095*a*	0·810	284·3	92·0	+14·5	38	196	53*nf*
			0·886	67·6	336·0	+22·2			88
I.			0·933	112·9	332·7	−19·2			127
			0·932	75·4	328·9	+15·4			98
Oct. 24		Centre			(38·0)	(+5·0)	(38)	(196)	(548)

Group 5095, October 14–26. A fine regular spot, *a*. A small companion is seen near it on October 25.
Group 5096, October 17–18. A pair of small spots, *a* and *b*, following Group 5093.
Group 5097, October 21. A pair of small faint spots.

Measures of Positions and Areas of Sun Spots and Faculæ on Photographs—*continued.*

Greenwich Civil Time.	Measurers.	No. of Group, and Letter for Spot.	Distance from Centre in terms of Sun's Radius.	Position Angle from Sun's Axis.	Heliographic Longitude.	Heliographic Latitude.	Spots. Area of UMBRA for each Spot (and for Day).	Spots. Area of WHOLE for each Spot (and for Day).	Faculæ. Area for each Group (and for Day).
1903.				°	°	°			
297·245	AS, M		0·982	243·7	98·7	−24·6			73
			0·927	301·0	90·4	+30·5			293
		5095*a*	0·928	283·7	91·9	+14·6	36	171	} 383*nf*
I.		5095	0·912	284·4	89·4	+15·2	0	4	
		5098	0·994	109·3	302·0	−18·5	19	119	234*c*
Oct. 25		Centre			(23·4)	(+5·0)	(55)	(294)	(983)
298·510	AS, RF		0·940	295·4	76·6	+25·5			153
			0·864	239·6	60·6	−23·1			227
		5095*a*	0·993	284·1	90·8	+14·6	20	159	174*f*
		5098	0·950	112·0	298·1	−19·1	41	600	883*c*
Oct. 26		Centre			(6·7)	(+4·9)	(61)	(759)	(1437)
299·192	AS, RF		0·926	241·8	60·6	−23·8			336
I.		5098	0·905	114·1	296·7	−19·4	76	679	930*f*
Oct. 27		Centre			(357·7)	(+4·8)	(76)	(679)	(1266)
300·614	AS, M		0·942	246·0	45·6	−20·7			107
		5098	0·742	122·2	297·2	−19·8	64	807	1058*c*
Oct. 28		Centre			(338·9)	(+4·7)	(64)	(807)	(1165)
301·398	RF, M	5098	0·637	128·9	296·9	−19·6	95	735	920*f*
		5099	0·983	75·8	248·5	+14·8	5	32	91*c*
			0·937	65·5	259·2	+24·5			241
Oct. 29		Centre			(328·5)	(+4·6)	(100)	(767)	(1252)
302·448	AS, RF	5098	0·501	145·1	297·0	−19·9	108	667	
		5099*a*	0·913	75·5	248·7	+15·0	7	21	
		5100*a*	0·995	72·0	235·4	+17·7	108	369	} 533*n*
		5100*b*	0·980	72·9	229·7	+18·3	29	254	
			0·852	64·1	257·7	+24·3			162
Oct. 30		Centre			(314·7)	(+4·5)	(252)	(1311)	(695)
303·427	RF, M		0·852	244·1	355·9	−19·3			45
			0·885	231·7	353·5	−30·7			21
		5098	0·385	182·4	302·8	−18·1	4	15	
		5098	0·373	180·4	302·0	−17·4	0	2	
		5098	0·387	177·0	300·6	−18·3	17	56	
		5098	0·369	175·8	300·2	−17·1	0	12	
		5098	0·379	174·3	299·5	−17·7	0	16	
		5098	0·425	167·4	296·2	−20·1	94	556	
		5098	0·474	165·8	295·1	−23·0	0	3	
		5098	0·504	166·2	294·2	−24·9	0	5	
		5098	0·523	164·8	293·1	−25·8	0	1	
1903.				°	°	°			
303·427	RF, M	5098	0·449	159·4	292·1	−20·4	0	1	
		5098	0·543	163·2	291·7	−26·8	0	3	
		5098	0·565	163·0	291·0	−28·3	0	1	
		5099*a*	0·804	74·2	248·7	+15·3	10	38	]
		5100*a*	0·906	73·3	236·9	+17·0	51	324	
		5100	0·947	72·8	230·3	+17·7	0	11	} 419*c*
		5100	0·948	71·4	230·2	+19·0	2	31	
		5100*b*	0·958	72·6	228·2	+17·9	41	294	]
			0·892	116·0	242·9	−20·8			48
			0·930	56·9	234·9	+32·3			78
			0·958	108·5	230·8	−16·3			38
Oct. 31		Centre			(301·8)	(+4·4)	(219)	(1369)	(649)
304·166	RF, M	5098	0·428	205·0	303·0	−18·5	4	24	
		5098	0·406	199·0	300·1	−18·2	13	108	
		5098	0·443	195·6	299·4	−20·9	1	13	
		5098	0·446	191·8	297·7	−21·5	2	8	
		5098	0·416	189·6	296·3	−19·8	70	431	
		5098	0·443	181·7	292·9	−21·9	3	19	
		5099*a*	0·699	72·4	248·6	+15·3	5	21	]
I.		5100*a*	0·825	72·2	237·1	+17·1	60	277	
		5100	0·885	72·1	230·1	+17·8	0	6	} 562*c*
		5100	0·889	70·9	229·7	+18·9	4	20	
		5100*b*	0·903	72·4	227·7	+17·7	53	268	]
			0·909	59·7	228·3	+29·2			142
			0·957	112·0	221·9	−19·6			350
			0·969	71·6	216·0	+18·9			134
Nov. 1		Centre			(292·1)	(+4·3)	(215)	(1195)	(~~1148~~)
305·402	AS, M	5098	0·587	230·3	304·1	−18·3	4	16	
		5098	0·567	224·0	300·5	−20·2	0	4	
		5098	0·542	227·0	300·3	−17·8	22	143	
		5098	0·564	221·2	299·2	−21·2	0	7	
		5098	0·519	222·6	297·4	−18·4	42	159	
		5098	0·524	217·8	295·8	−20·4	0	16	
		5098	0·528	215·0	294·7	−21·6	8	41	
		5098	0·528	212·9	293·8	−22·2	0	20	
		5098	0·551	209·0	292·8	−24·7	0	11	
		5101	0·295	20·7	269·5	+20·1	0	5	
		5101	0·322	24·7	267·5	+21·1	0	8	
		5099*a*	0·487	65·6	248·5	+15·3	6	11	
		5100*a*	0·654	68·5	236·4	+17·1	87	455	
		5100	0·694	70·7	232·9	+16·3	6	30	
		5100	0·695	69·2	233·1	+17·4	0	6	
		5100	0·712	66·5	232·1	+19·5	0	9	
		5100*b*	0·764	70·6	227·0	+17·4	44	302	
		5102*a*	0·982	113·3	199·6	−21·9	26	175	
			0·873	153·2	240·2	−47·6			178
Nov. 2		Centre			(275·8)	(+4·2)	(215)	(1418)	(~~670~~)

Group 5098, October 25–November 6. A very large composite group undergoing a continual change of shape. The group has broken up into a long irregular stream by October 31; the following portion of the group being inclined at a considerable angle to the equator and to the preceding portion of the group. This following portion has entirely disappeared by November 4.

Group 5099, October 29–November 5. A small regular spot, *a*, with a very small companion on November 3.

Group 5100, October 30–November 12. A fine stream consisting chiefly of two large regular spots, *a* and *b*.

Group 5101, November 2. Two very small spots.

Group 5102, November 2–12. A large spot, *a*, which diminishes in size from day to day. *a* has disappeared by November 8, and a number of small spots scattered over a wide area constitute the group.

Measures of Positions and Areas of Sun Spots and Faculæ on Photographs—*continued.*

Greenwich Civil Time.	Measurers.	No. of Group, and Letter for Spot.	Distance from Centre in terms of Sun's Radius.	Position Angle from Sun's Axis.	Heliographic Longitude.	Heliographic Latitude.	Spots. Area of UMBRA for each Spot (and for Day).	Spots. Area of WHOLE for each Spot (and for Day).	Faculæ. Area for each Group (and for Day).
1903.				°	°	°			
306·228	AS, RF	5098	0·710	239·1	304·6	−18·2	5	15	
		5098	0·678	234·5	300·7	−19·8	1	8	
		5098	0·660	236·4	300·1	−18·0	21	104	
		5098	0·632	234·8	297·6	−17·8	24	99	
		5098	0·630	227·9	294·9	−21·4	2	10	
		5099*a*	0·338	53·7	248·6	+15·4	3	7	
		5099	0·374	53·3	246·7	+16·8	0	3	
		5100*a*	0·521	63·5	235·8	+17·0	128	599	
		5100	0·577	61·1	232·6	+19·7	0	11	
		5100	0·577	65·2	231·7	+17·5	1	7	
		5100	0·595	65·3	230·5	+17·8	0	3	
		5100	0·607	63·6	229·9	+19·0	7	34	
		5100*b*	0·637	67·3	227·0	+17·4	57	288	
		5102*a*	0·931	115·5	200·2	−21·9	32	147	596*c*
		5103*a*	0·975	115·1	191·1	−23·3	43	251	610*c*
			0·851	117·8	211·4	−20·9			287
Nov. 3		Centre			(264·9)	(+4·1)	(324)	(1586)	(1493)
307·515	AS, RF	5098	0·872	246·9	305·1	−17·8	6	16	
		5098	0·818	245·2	298·9	−17·5	38	167	
		5098	0·808	246·9	298·3	−15·9	6	13	597*s*
		5098	0·793	246·2	296·7	−16·0	0	11	
		5098	0·788	214·5	295·8	−17·1	1	6	
		5099*a*	0·197	356·9	248·5	+15·3	3	5	
		5100*a*	0·291	39·7	236·8	+16·8	85	562	
		5100	0·333	47·0	233·2	+17·0	9	73	
		5100	0·401	47·9	229·6	+19·3	7	28	
		5100*b*	0·412	55·3	227·2	+17·3	36	270	
		5102	0·793	122·0	201·6	−22·0	0	1	
		5102*a*	0·809	121·1	199·7	−22·0	22	104	401*c*
		5102	0·833	121·3	197·4	−23·[illegible]	2	10	
		5103	0·857	114·4	192·8	−18·4	0	2	
		5103*a*	0·885	118·3	190·5	−22·7	29	215	745*c*
		5103	0·894	115·7	188·6	−20·8	0	8	
		5104	0·986	115·0	170·5	−23·8	35	343	
		5104	0·989	113·0	169·0	−22·0	0	48	374*f*
		5104	0·996	114·8	165·7	−24·2	24	170	
Nov. 4		Centre			(247·9)	(+4·0)	(303)	(2052)	(2117)
308·452	RF, M	5098	0·952	250·0	305·2	−17·7	0	5	
		5098	0·914	248·8	298·6	−17·5	19	156	1376*sf*
		5098	0·893	248·4	295·6	−17·2	0	8	
		5099*a*	0·294	313·3	248·2	+15·4	0	2	
		5100	0·217	343·6	239·1	+15·9	0	2	
		5100	0·181	351·6	237·1	+14·4	0	6	
		5100*a*	0·228	355·7	236·5	+17·0	104	556	
1903.				°	°	°			
308·452	RF, M	5100	0·173	2·7	235·0	+13·8	1	2	
		5100	0·259	2·5	234·8	+18·9	0	11	
		5100	0·200	4·6	234·6	+15·4	0	2	
		5100	0·217	8·4	233·6	+16·2	0	2	
		5100	0·234	8·2	233·5	+17·2	0	24	
		5100	0·233	13·7	232·2	+16·9	5	40	
		5100	0·301	16·4	230·3	+20·6	0	14	
		5100	0·280	22·7	229·0	+18·8	0	10	
		5100	0·298	21·2	228·9	+20·0	0	3	
		5100*b*	0·272	31·1	227·1	+17·2	56	263	
		5100	0·285	35·6	221·8	+13·3	0	6	
		5105	0·525	157·3	222·6	−25·0	0	2	
		5105	0·550	156·8	221·6	−26·4	0	8	
		5102	0·691	130·4	200·7	−23·3	0	5	
		5102	0·680	126·8	200·0	−20·8	0	10	
		5102*a*	0·693	127·9	199·5	−22·0	23	92	
		5102	0·712	129·9	198·9	−24·0	0	4	
		5102	0·731	130·0	197·5	−24·9	0	8	2640*c*
		5102	0·726	127·9	197·1	−23·3	0	13	
		5103	0·788	125·4	190·8	−24·3	0	2	
		5103*a*	0·784	123·3	190·4	−22·7	34	171	
		5103	0·786	121·4	189·5	−21·5	5	40	
		5103	0·784	120·2	189·3	−20·5	3	24	
		5103	0·798	118·9	187·6	−20·1	2	21	
		5104	0·954	116·8	166·8	−24·1	105	752	706*c*
Nov. 5		Centre			(235·5)	(+3·9)	(357)	(2264)	(4722)
309·531	AS, RF	5098	0·981	251·7	298·2	−17·1	20	137	1014*sf*
		5100*a*	0·339	312·2	236·5	+16·8	102	519	
		5100	0·340	320·5	234·6	+18·9	0	9	
		5100	0·305	316·3	234·0	+16·4	3	43	
		5100	0·296	322·0	232·3	+17·2	4	24	
		5100	0·314	335·6	229·3	+20·3	1	9	
		5100*b*	0·255	337·8	227·2	+17·4	48	268	
		5102	0·574	144·4	200·0	−24·2	0	2	
		5102	0·537	139·7	199·7	−20·6	0	15	
		5102*a*	0·559	141·1	199·2	−22·2	19	63	
		5102	0·583	142·5	198·6	−24·0	0	2	
		5102	0·556	137·4	197·8	−20·6	0	1	
		5106	0·459	115·2	196·7	−7·8	3	14	
		5106	0·489	111·3	194·2	−6·8	0	8	
		5103*a*	0·651	132·5	190·2	−22·8	29	176	241*f*
		5103	0·659	129·1	188·2	−21·3	5	54	
		5104*	0·863	118·7	166·7	−22·3	0	29	
		5104	0·881	120·2	165·0	−24·2	96	782	410*c*
		5104	0·928	120·0	158·3	−25·9	0	27	
Nov. 6		Centre			(221·4)	(+3·8)	(330)	(2182)	(1665)

Group 5103, November 3–13. A very large spot, *a*, with several small companions, following Group 5102. The small spots increase in size and scatter, whilst *a* diminishes in size and has disappeared by November 9. The group then, like Group 5102, consists of a great number of small spots scattered over a wide area.

Group 5104, November 4–17. A very fine stream following Group 5103. The stream is so compact that it is frequently measured as consisting chiefly of one very large composite spot. By November 13 two very large spots, *a* and *b*, have formed at the front and rear of the group respectively.

Group 5104*, November 6–16. One or two small spots forming very close to Group 5104, but north and preceding it. The group expands rapidly into a fine straight stream of which the leader, *a*, is the best defined and moves forward the most rapidly in longitude.

Group 5105, November 5. A pair of very small faint spots.

Group 5106, November 6–7. A few very small faint spots in a short stream.

Measures of Positions and Areas of Sun Spots and Faculæ on Photographs—*continued.*

Greenwich Civil Time.	Measurers.	No. of Group, and Letter for Spot.	Distance from Centre in terms of Sun's Radius.	Position Angle from Sun's Axis.	Heliographic Longitude.	Heliographic Latitude.	Spots. Area of UMBRA for each Spot (and for Day).	Spots. Area of WHOLE for each Spot (and for Day).	Faculæ. Area for each Group (and for Day).
1903.				°	°	°			
310·466	RF, M		0·962	242·6	279·5	−25·1			360
			0·894	289·4	271·9	+18·9			80
		5100*a*	0·499	298·0	236·4	+16·7	92	615	
		5100	0·503	303·7	235·3	+19·3	2	10	
		5100	0·454	302·5	232·7	+17·4	2	7	
		5100*b*	0·382	308·7	227·2	+17·2	49	266	
		5102	0·443	160·0	199·8	−21·0	0	19	
		5102*a*	0·469	159·5	198·9	−22·4	3	27	
		5102	0·521	160·7	198·1	−25·8	0	3	
		5102	0·496	157·9	197·4	−23·7	0	5	
		5102	0·508	157·2	196·7	−24·3	0	24	
		5106	0·290	133·1	196·8	− 7·9	0	7	
		5103*a*	0·540	144·4	189·3	−22·5	43	179	
		5104*	0·735	123·6	168·2	−21·2	0	16	} 367*c*
		5104	0·786	124·9	164·3	−24·2	88	925	
Nov. 7		Centre			(209·1)	(+3·6)	(279)	(2103)	(807)
311·225	AS, RF		0·979	243·6	274·1	−24·9			234
			0·869	291·6	258·3	+20·4			486
		5100*a*	0·628	292·3	236·2	+16·6	106	507	
		5100	0·614	296·0	234·4	+18·4	0	10	
		5100	0·593	292·4	233·6	+15·9	0	21	
		5100	0·566	300·9	229·9	+19·8	1	18	
		5100*b*	0·511	298·6	226·9	+17·2	41	238	
		5102	0·414	182·0	199·9	−20·8	2	17	
		5102	0·480	179·0	198·5	−25·0	0	46	
		5102	0·439	178·6	198·3	−22·4	2	10	
		5102	0·453	175·1	196·6	−23·3	0	2	
I.		5102	0·475	174·1	196·0	−24·6	0	35	
		5102	0·470	170·9	194·4	−24·0	2	4	
		5103	0·468	162·9	190·4	−23·0	9	35	
		5103	0·509	163·9	190·0	−25·7	0	7	
		5103	0·422	159·6	190·0	−19·8	5	24	
		5103	0·485	162·0	189·6	−24·0	0	12	
		5103*a*	0·468	160·1	189·1	−22·6	9	23	
		5103	0·431	155·9	188·3	−19·7	11	117	
		5103	0·480	157·1	187·4	−22·7	0	15	
		5104*	0·640	131·2	167·9	−21·9	1	35	
		5104	0·709	130·5	162·8	−24·5	86	879	
Nov. 8		Centre			(199·0)	(+3·5)	(275)	(2055)	(720)
312·526	AS, RF		0·936	291·1	250·9	+20·9			279
		5100*a*	0·824	287·7	236·6	+16·5	105	481	
		5100	0·800	289·1	234·1	+17·3	0	15	
		5100*b*	0·729	290·6	227·3	+17·2	24	195	904*c*
		5100	0·698	294·0	224·1	+19·0	1	6	
		5102	0·521	205·9	196·3	−24·5	2	24	
		5103	0·503	199·8	192·7	−24·8	0	7	

Greenwich Civil Time.	Measurers.	No. of Group, and Letter for Spot.	Distance from Centre in terms of Sun's Radius.	Position Angle from Sun's Axis.	Heliographic Longitude.	Heliographic Latitude.	Spots. Area of UMBRA for each Spot (and for Day).	Spots. Area of WHOLE for each Spot (and for Day).	Faculæ. Area for each Group (and for Day).
1903.				°	°	°			
312·526		5103	0·436	196·9	189·7	−21·2	11	105	
		5104*	0·457	157·1	170·9	−21·4	4	45	
		5104*	0·467	150·5	167·7	−20·6	0	9	
		5104*	0·484	149·8	166·8	−21·4	11	72	
		5104	0·525	153·7	167·1	−24·7	73	357	
		5104	0·567	144·4	160·8	−24·2	51	514	
		5104	0·612	144·3	158·4	−26·6	1	11	
			0·850	99·9	124·7	− 6·6			108
			0·968	71·7	106·2	+18·6			70
			0·994	116·2	100·9	−25·5			545
Nov. 9		Centre			(181·9)	(+3·4)	(283)	(1841)	(1906)
313·265	AS, RF		0·751	237·1	214·6	−21·6			212
		5100*a*	0·905	286·9	236·6	+16·7	131	517	} 755*c*
		5100*b*	0·827	288·4	227·0	+17·1	34	199	
		5102	0·599	224·9	199·1	−22·1	0	9	
		5102	0·608	221·2	198·0	−24·2	0	16	
		5102	0·601	217·5	195·9	−25·4	0	16	
		5103	0·519	221·2	193·3	−19·8	0	2	
		5103	0·568	214·8	192·9	−24·7	0	3	
		5103	0·486	219·9	191·2	−18·7	2	4	
		5103	0·501	212·4	188·8	−21·8	15	73	
I.		5104*	0·421	177·4	170·9	−21·5	5	42	
		5104*	0·431	167·7	166·5	−21·5	10	96	
		5104*	0·457	165·8	165·1	−22·9	0	3	
		5104	0·479	169·6	166·7	−24·7	64	346	
		5104	0·507	166·3	164·4	−26·1	0	9	
		5104	0·481	164·9	164·2	−24·3	0	4	
		5104	0·496	162·3	162·6	−24·9	11	97	
		5104	0·505	156·0	159·1	−24·2	47	319	
		5107	0·982	115·8	96·0	−24·5	0	8	587*p*
Nov. 10		Centre			(172·1)	(+3·3)	(319)	(1763)	(1554)
314·194	AS, RF	5100*a*	0·972	286·2	236·4	+16·5	130	510	} 631*n*
		5100*b*	0·922	286·9	226·7	+16·8	37	181	
		5102	0·727	232·1	198·6	−24·0	0	7	524*p*
		5103	0·636	228·3	190·5	−22·2	0	14	
		5103	0·658	223·8	190·0	−25·5	0	7	
		5103	0·609	231·3	190·0	−19·6	0	22	
I.		5103	0·636	225·4	189·3	−23·7	0	23	
		5103	0·621	227·1	189·1	−22·2	4	16	
		5104*	0·463	205·3	172·0	−21·5	10	55	
		5104*	0·448	197·5	168·1	−22·0	1	14	
		5104*	0·428	193·7	166·0	−21·2	5	51	
		5104*	0·449	191·0	165·1	−22·8	0	10	
		5104	0·484	192·8	166·6	−24·9	64	409	
		5104	0·511	189·1	165·0	−27·0	4	31	
		5104	0·471	180·9	160·3	−24·8	41	331	

Group 5107, November 10–11. A very small spot, seen only close to the limb in a great mass of faculæ.

Measures of Positions and Areas of Sun Spots and Faculæ on Photographs—*continued.*

Greenwich Civil Time.	Measurers.	No. of Group, and Letter for Spot.	Distance from Centre in terms of Sun's Radius.	Position Angle from Sun's Axis.	Heliographic Longitude.	Heliographic Latitude.	Spots. Area of UMBRA for each Spot (and for Day).	Spots. Area of WHOLE for each Spot (and for Day).	Faculæ. Area for each Group (and for Day).
1903.				°	°	°			
314·194	AS, RF	5107	0·930	118·1	95·6	−24·6	0	5	791*c*
			0·955	72·4	87·1	+17·8			476
Nov. 11		Centre			(159·8)	(+3·2)	(296)	(1686)	(2422)
315·146	AS, M		0·926	306·0	212·3	+34·3			141
			0·880	239·9	204·0	−24·5			878
			0·858	226·4	195·8	−34·1			152
			0·759	220·2	182·9	−32·8			107
		5100*b*	0·980	286·2	226·1	+16·5	42	205	302*nf*
		5102	0·840	240·9	199·7	−22·2	0	4	
		5102	0·835	238·9	198·5	−23·6	2	6	
		5103	0·774	240·5	193·1	−20·3	0	3	
I.		5103	0·771	233·1	190·2	−25·2	3	5	
		5103	0·736	238·3	189·2	−20·4	8	38	243*c*
		5103	0·779	228·5	189·0	−28·7	0	2	
		5103	0·753	233·4	188·8	−24·3	9	21	
		5104*a**	0·580	225·1	173·4	−21·3	13	61	
		5104*	0·515	217·0	166·8	−21·3	4	60	
		5104	0·577	208·3	165·3	−27·5	5	15	
		5104	0·535	207·3	163·1	−25·3	134	813	
			0·824	125·1	98·9	−26·2			494
			0·888	71·8	85·4	+17·5			142
			0·906	56·7	85·2	+31·3			136
Nov. 12		Centre			(147·4)	(+3·1)	(220)	(1233)	(2595)
316·195	RF, M		0·911	256·3	197·7	−11·1			167
			0·896	240·8	192·5	−24·4			2049
		5103	0·863	244·7	189·4	−19·9	0	10	
		5104*a**	0·729	236·8	174·2	−21·2	14	53	
		5104*	0.694	234·1	170·5	−21·5	2	10	
		5104*	0·655	231·0	166·6	−21·7	7	92	
		5104*a*	0·673	225·9	165·7	−25·3	75	489	
I.		5104	0·687	222·7	165·1	−27·7	0	10	
		5104	0·644	222·2	162·1	−25·8	1	32	
		5104*b*	0·608	220·4	159·1	−24·8	45	204	
		5104	0·605	215·6	156·6	−26·6	0	12	
		5104	0·581	217·6	156·4	−24·5	5	20	
		5108	0·953	113·3	64·0	−21·1	0	10	267*f*
			0·770	130·0	92·1	−27·3			164
			0·951	67·8	62·0	+22·0			55
Nov. 13		Centre			(133·5)	(+3·0)	(149)	(942)	(2702)
317·561	AS, RF		0·969	245·8	188·4	−22·5			1323
		5104*a**	0·902	244·3	176·2	−21·6	16	200	
		5104*	0·846	241·4	168·6	−22·0	29	181	
		5104*a*	0·833	237·0	165·8	−25·1	70	412	549*c*
		5104*b*	0·777	234·3	159·4	−24·8	0	176	
1903.				°	°	°			
317·561	AS, RF	5109	0·556	143·1	94·2	−23·6	0	8	
		5109*	0·529	134·2	92·0	−18·9	0	8	
		5110	0·799	64·8	64·6	+21·7	0	15	127*c*
			0·865	120·8	60·9	−24·5			246
Nov. 14		Centre			(115·5)	(+2·9)	(115)	(1000)	(2245)
318·154	AS, RF	5104*a**	0·954	245·8	177·3	−22·0	35	175	
		5104*	0·926	246·5	172·4	−20·4	6	13	
		5104*	0·907	244·1	169·1	−22·0	23	267	
I.		5104*a*	0·890	239·9	165·7	−25·0	83	366	1100*c**
		5104	0·868	239·7	162·8	−24·3	3	5	
		5104*b*	0·842	237·8	159·3	−24·9	16	112	
Nov. 15		Centre			(107·7)	(+2·8)	(166)	(938)	(1100)
319·228	AS, RF	5104*	0·978	247·3	169·2	−21·5	43	357	
		5104	0·966	243·4	165·5	−24·9	80	332	1523*sf*
		5104	0·937	242·3	159·2	−24·7	8	130	
I.		5104†	0·867	247·0	150·5	−18·4	2	6	34*c*
		5111*a*	0·975	108·4	18·0	−17·3	17	48	146*sf*
Nov. 16		Centre			(93·5)	(+2·6)	(150)	(873)	(1703)
320·298	AS, RF		0·950	249·8	149·1	−18·3			61
			0·902	244·2	140·4	−21·9			43
I.		5104	0·991	244·4	159·7	−25·0	12	132	475*sf*
		5111*a*	0·892	110·2	18·8	−16·7	7	39	201*sf*
Nov. 17		Centre			(79·5)	(+2·5)	(19)	(171)	(780)
321·542	AS, RF		0·740	233·1	103·4	−24·5			131
		5111*a*	0·732	115·3	19·5	−16·5	6	30	238*f*
Nov. 18		Centre			(63·0)	(+2·4)	(6)	(30)	(369)
322·498	AS, RF		0·816	235·2	98·5	−26·2			349
		5111*a*	0·570	123·1	20·7	−16·1	13	42	
			0·980	111·2	333·7	−20·3			258
Nov. 19		Centre			(50·4)	(+2·3)	(13)	(42)	(607)
323·237	AS, M		0·882	240·1	98·0	−24·9			373
I.		5111*a*	0·458	134·0	20·7	−16·5	8	23	
		5112	0·929	112·3	334·9	−19·8	0	9	180*c*
Nov. 20		Centre			(40·7)	(+2·1)	(8)	(32)	(553)
Nov. 21		No	Photo	graph					

Group 5104†, November 16. A close pair of very small spots measured together, *nf*, Group 5104.
Group 5108, November 13. A very small spot seen only close to the limb in a great mass of faculæ.
Group 5109, November 14. A small faint spot.
Group 5109*, November 14. A small faint spot forming a very wide pair with Group 5109.
Group 5110, November 14. A small spot seen only near the limb in a mass of faculæ.
Group 5111, November 16–24. A small regular spot, *a*, with a very small companion on November 23 and 24.
Group 5112, November 20. A very small spot seen only close to the limb in a mass of faculæ.

Measures of Positions and Areas of Sun Spots and Faculæ on Photographs—*continued.*

Greenwich Civil Time.	Measurers.	No. of Group, and Letter for Spot.	Distance from Centre in terms of Sun's Radius.	Position Angle from Sun's Axis.	Heliographic Longitude.	Heliographic Latitude.	Spots. Area of UMBRA for each Spot (and for Day).	Spots. Area of WHOLE for each Spot (and for Day).	Faculæ. Area for each Group (and for Day).
1903.				°	°	°			
325·144	RF, M		0·963	242·0	86·8	−26·2			298
			0·948	287·7	86·5	+17·4			133
		5111*a*	0·327	220·7	22·5	−15·9	5	10	
		5113	0·404	179·0	15·2	−21·9	0	5	
I.		5113	0·418	175·4	13·5	−22·7	0	3	
		5113	0·432	172·2	12·0	−23·3	0	3	
			0·961	111·4	303·6	−20·0			329
			0·992	118·0	294·9	−27·5			119
Nov. 22		Centre			(15·6)	(+1·9)	(5)	(21)	(879)
326·237	RF, M		0·904	242·3	62·1	−23·9			94
		5111*a*	0·469	230·7	23·2	−15·6	4	8	
I.		5111	0·457	228·5	22·0	−15·9	0	2	
			0·950	117·3	292·5	−25·2			316
Nov. 23		Centre			(1·2)	(+1·8)	(1)	(10)	(410)
327·596	AS, RF	5111*a*	0·704	246·5	25·0	−15·0	4	14	
		5111	0·657	242·3	20·4	−16·5	0	5	
		5114	0·413	157·3	333·4	−20·8	0	19	
		5115	0·962	110·3	270·8	−19·0	18	96	741*p*
Nov. 24		Centre			(343·2)	(+1·6)	(22)	(134)	(741)
328·496	AS, RF		0·786	247·1	20·2	−16·8			159
		5113	0·788	234·8	16·9	−25·9	0	6	
		5113	0·771	235·0	15·4	−25·1	3	18	
		5113	0·742	239·8	14·5	−20·8	0	10	
		5113	0·728	237·2	12·4	−22·0	0	7	
		5115*a*	0·887	111·9	271·2	−18·6	15	121	328*f*
			0·867	121·5	276·1	−26·1			266
Nov. 25		Centre			(331·3)	(+1·5)	(18)	(162)	(753)
329·187	RF, M		0·883	250·6	22·2	−16·3			193
		5113	0·858	239·4	16·6	−25·0	0	8	
		5113	0·833	243·6	15·0	−20·8	0	6	214*c*
		5113	0·812	241·2	12·2	−22·1	0	8	
		5115*a*	0·807	114·6	271·6	−18·7	18	97	
I.		5115	0·806	112·4	271·2	−16·9	0	3	246*f*
		5115	0·845	115·1	267·8	−20·2	0	2	
			0·932	67·8	254·7	+21·2			308
			0·971	118·9	248·8	−27·6			81
Nov. 26		Centre			(322·2)	(+1·4)	(18)	(124)	(1042)
1903.				°	°	°			
330·240	RF, M		0·954	251·9	19·5	−16·8			124
		5113	0·933	246·9	14·9	−20·9	0	15	
		5113	0·922	245·1	12·7	−22·2	0	4	382*c*
I.		5115*a*	0·661	120·6	271·6	−18·6	14	76	
		5116*a*	0·963	71·9	234·6	+17·8	30	196	335*n*
		5116*b*	0·989	74·1	227·2	+15·9	25	134	84*p*
Nov. 27		Centre			(308·4)	(+1·3)	(69)	(425)	(925)
331·201	RF, M		0·976	246·6	11·3	−22·5			418
		5115	0·498	129·1	271·9	−17·2	0	7	
		5115*a*	0·515	131·4	271·7	−18·9	13	71	
		5115	0·569	130·2	268·2	−20·5	1	5	
I.		5116*c*	0·874	70·4	236·2	+17·5	7	39	
		5116*a*	0·892	70·6	233·8	+17·8	24	114	504*c*
		5116*b*	0·933	73·3	227·5	+16·0	21	150	
			0·970	110·7	221·4	−19·7			121
Nov. 28		Centre			(295·7)	(+1·1)	(66)	(386)	(1043)
332·159	RF, M		0·823	244·3	335·2	−20·3			168
		5115	0·356	153·0	273·4	−17·5	0	7	
		5115*a*	0·387	151·4	271·9	−18·8	10	61	
		5116*c*	0·759	67·4	236·0	+17·6	4	25	
I.		5116*a*	0·781	68·3	233·8	+17·4	30	127	510*n*
		5116*b*	0·834	71·7	228·0	+15·7	19	141	
			0·960	114·6	211·6	−23·2			490
Nov. 29		Centre			(283·1)	(+1·0)	(63)	(361)	(1168)
333·162	RF, M		0·926	248·4	335·7	−19·5			249
		5115	0·316	191·0	273·5	−17·1	2	8	
		5115*a*	0·339	185·8	272·0	−18·7	14	50	
		5115	0·343	179·9	269·8	−18·9	0	4	
		5115	0·371	177·6	269·0	−20·8	0	3	
		5115	0·395	174·0	267·4	−22·2	0	2	
I.		5116*c*	0·606	61·1	236·2	+17·8	1	13	
		5116	0·640	60·7	233·9	+18·9	0	1	
		5116*a*	0·633	63·1	233·8	+17·3	18	85	
		5116*b*	0·700	67·8	227·7	+16·0	27	142	
			0·957	116·6	199·4	−25·0			1238
Nov. 30		Centre			(269·9)	(+0·9)	(62)	(308)	(1487)
334·149	RF, M	5115	0·419	222·3	273·9	−17·2	0	1	
		5115	0·456	209·6	270·9	−22·5	0	7	
		5115*a*	0·417	216·1	271·8	−18·9	3	32	
I.		5116*c*	0·447	48·8	236·2	+17·8	0	7	
		5116	0·468	45·5	236·1	+19·8	0	4	
		5116	0·494	47·7	234·0	+20·1	0	1	

Group 5113, November 22–27. A few very small spots scattered over a wide area, *sf*, Group 5111. The group is not seen on November 23 and 24, but has revived by November 25 after the disappearance of Group 5111. The different components of the groups are exceedingly unstable.
Group 5114, November 24. A small faint spot.
Group 5115, November 25–December 2. A large spot, *a*, diminishing in size from day to day and usually seen with some small companions.
Group 5116, November 27–December 8. Two large regular spots, *a* and *b*. A third but much smaller spot is seen preceding *a* on November 28 and the succeeding days. Very small companions are occasionally seen near *a* and *b*.

Measures of Positions and Areas of Sun Spots and Faculæ on Photographs—*continued.*

Greenwich Civil Time.	Measurers.	No. of Group, and Letter for Spot.	Distance from Centre in terms of Sun's Radius.	Position Angle from Sun's Axis.	Heliographic Longitude.	Heliographic Latitude.	Spots. Area of UMBRA for each Spot (and for Day).	Spots. Area of WHOLE for each Spot (and for Day).	Faculæ. Area for each Group (and for Day).
1903.				°	°	°			
334·149	RF, M	5116*a*	0·472	53·2	233·6	+17·1	18	76	
I.		5116*b*	0·541	61·0	227·5	+15·9	23	127	
		5117*a*	0·979	110·7	179·8	−20·1	13	77	2291*sp*
Dec. 1		Centre			(256·8)	(+0·8)	(57)	(332)	(2291)
335·537	AS, RF		0·860	241·1	293·9	−24·2			538
		5115*a*	0·622	238·6	272·4	−18·4	0	10	
		5116*a*	0·295	16·3	233·6	+17·0	13	63	
		5116	0·315	15·2	233·5	+18·3	0	6	
		5116*b*	0·329	34·6	227·3	+16·3	25	139	
		5118	0·393	143·5	224·3	−17·8	1	24	
		5117*a*	0·881	113·1	179·2	−19·9	10	65	469*c*
		5119*a*	0·988	106·6	158·2	−16·3	19	148	323*f*
		5120*a*	0·990	117·0	158·1	−26·6	13	115	198*f*
			0·860	124·1	184·6	−28·4			1104
			0·949	112·5	168·7	−21·1			416
Dec. 2		Centre			(238·5)	(+0·6)	(81)	(570)	(3048)
336·207	AS, RF		0·903	240·9	290·5	−25·7			383
		5116*a*	0·288	347·2	233·4	+16·8	12	61	
		5116*b*	0·278	8·7	227·1	+16·4	29	136	
		5118	0·318	164·9	224·6	−17·4	4	15	
		5118	0·347	159·6	222·3	−18·4	2	8	
		5121	0·579	141·8	206·1	−26·5	0	3	
		5122	0·737	122·7	187·4	−23·0	0	7	
		5117*a*	0·809	115·3	178·7	−19·9	11	52	
		5117	0·816	117·3	178·5	−21·6	0	2	282*s*
		5117	0·818	115·6	177·9	−20·4	4	7	
		5117	0·849	116·4	174·8	−21·9	0	2	
I.		5117	0·879	115·2	170·9	−21·7	0	6	290*f*
		5119*a*	0·959	107·1	157·2	−16·2	11	102	
		5119	0·961	111·7	157·1	−20·7	0	6	
		5119	0·967	107·7	155·4	−17·0	0	8	
		5119	0·974	109·2	153·7	−18·6	0	8	938*c*
		5119	0·978	112·8	153·0	−22·2	3	15	
		5119	0·983	111·1	151·3	−20·6	0	22	
		5119	0·989	110·5	149·0	−20·2	0	14	
		5120*a*	0·970	118·3	156·0	−27·2	13	147	276*c*
			0·894	129·2	173·0	−34·1			224
Dec. 3		Centre			(229·6)	(+0·5)	(89)	(621)	(2393)
337·530	AS, M		0·887	246·1	272·3	−20·9			784
		5123	0·836	293·4	266·6	+19·6	0	13	151*c*
		5123	0·806	296·6	262·8	+21·4	0	9	
		5116*a*	0·447	308·4	233·6	+16·5	10	59	
		5116*b*	0·376	317·6	227·6	+16·4	21	137	
1903.				°	°	°			
337·530	AS, M	5118	0·416	217·2	227·7	−18·9	0	10	
		5118	0·383	218·2	226·6	−17·1	2	16	
		5118	0·361	217·9	225·6	−16·1	0	3	
		5118	0·356	211·7	223·5	−17·2	0	2	
		5118	0·367	206·8	222·3	−18·7	2	8	
		5118	0·355	207·2	222·1	−17·9	0	3	
		5121	0·450	163·9	204·4	−25·2	0	10	
		5121	0·473	161·5	202·7	−26·2	0	7	
		5117*a*	0·620	124·0	179·3	−19·9	9	45	170*c*
		5117	0·634	123·9	178·3	−20·3	4	12	
		5117	0·725	122·1	170·9	−22·3	0	6	296*f*
		5119*a*	0·836	109·5	157·5	−15·9	13	84	755*c*
		5119	0·856	110·1	155·4	−16·8	0	14	
		5119	0·884	114·6	152·8	−21·4	30	416	
		5119	0·909	113·5	149·2	−21·1	16	122	
		5120*a*	0·873	122·1	156·1	−27·4	22	132	391*c*
			0·775	135·3	171·9	−33·0			225
Dec. 4		Centre			(212·3)	(+0·4)	(129)	(1108)	(2772)
338·177	RF, M		0·938	247·8	271·7	−20·7			961
		5123	0·909	291·1	267·4	+19·2	0	7	281*nf*
		5116*a*	0·554	300·3	233·5	+16·3	8	37	
		5116*b*	0·477	305·5	227·4	+16·2	24	127	
		5118	0·482	232·3	227·1	−16·9	1	7	
		5118	0·440	222·8	222·0	−18·6	0	9	
		5117*a*	0·531	131·4	178·7	−20·3	8	48	
I.		5119*a*	0·758	112·1	156·8	−16·4	21	77	
		5119*b*	0·795	117·8	154·8	−21·6	32	188	
		5119	0·784	112·6	154·6	−17·4	0	12	1241*c*
		5119	0·840	114·6	149·4	−20·3	0	24	
		5119*c*	0·851	116·3	148·5	−22·0	18	160	
		5120*a*	0·811	125·0	155·4	−27·5	20	120	
Dec. 5		Centre			(203·7)	(+0·2)	(132)	(816)	(2483)
339·201	AS, M		0·970	246·1	264·9	−23·2			194
		5123	0·974	289·6	266·1	+19·0	0	7	162*nf*
		5116*a*	0·715	293·4	233·3	+16·5	11	46	
		5116	0·703	295·1	232·0	+17·4	1	2	
		5116*b*	0·647	295·0	227·7	+15·9	20	108	
		5118	0·645	243·3	227·1	−16·8	7	14	
		5118	0·619	241·9	224·9	−16·8	0	5	
I.		5124	0·277	316·2	201·5	+11·6	1	4	
		5117*a*	0·402	151·8	178·6	−20·6	15	32	
		5117	0·450	146·5	174·8	−21·9	0	8	
		5117	0·496	139·2	169·9	−21·9	0	15	
		5119*a*	0·605	118·2	156·7	−16·5	18	63	
		5119*b*	0·647	124·3	155·5	−21·2	39	220	
		5119	0·642	119·8	154·5	−18·5	6	29	

Group 5117, Dec. 1–12. A regular spot, *a*, slowly diminishing in size from day to day. A portion has broken off from *a* by Dec. 3, and several small spots have appeared following it. These small spots are very unstable, and *a* is seen alone on Dec. 5 and after Dec. 6. *a* has disappeared by Dec. 11, but a very small spot marks the place of the group on Dec. 12. Group 5118, Dec. 2–8. A few small spots in an irregular stream. Group 5119, Dec. 2–14. A very wide area of disturbance. The group forms, for the most part, two streams at right angles to each other; the first stream lying north and south, the second stream east and west. On Dec. 5 the group shows three principal spots: a regular spot, *a*, to the north; almost due south of it a large double spot, *b*, at the right angle of the group; and due east of *b*, a second large double spot, *c*. Spot *c* has divided into two parts, *d* and *e*, by Dec. 7, and a number of small faint spots have begun to form between *a* and *b* on the same date. *d* and *e* have both broken up by Dec. 9, and the following portion of the group consists of a number of small faint widely scattered spots. A number of small spots have formed near *a* by Dec. 10, and *b* has begun to break up by Dec. 11, and is measured in two portions on Dec. 12. Group 5120, Dec. 2–11. A large double spot, *a*, due south of Group 5119*b*. The two components of *a* are usually measured together; they are taken separately on Dec. 7. The spot is quite broken up by Dec. 10. Group 5121, Dec. 3–4. A few small faint unstable spots. Group 5122, Dec. 3. A few very small faint spots. Group 5123, Dec. 4–6. One or two very small faint spots, seen only near the limb in a mass of faculæ. Group 5124, Dec. 6. A very small spot.

Measures of Positions and Areas of Sun Spots and Faculæ on Photographs—*continued.*

Greenwich Civil Time.	Measurers.	No. of Group, and Letter for Spot.	Distance from Centre in terms of Sun's Radius.	Position Angle from Sun's Axis.	Heliographic Longitude.	Heliographic Latitude.	Spots. Area of UMBRA for each Spot (and for Day).	Spots. Area of WHOLE for each Spot (and for Day).	Faculæ. Area for each Group (and for Day).
1903.				°	°	°			
339·201	AS, M	5119	0·694	123·2	151·6	−22·2	1	9	
		5119	0·679	118·3	151·2	−18·7	1	12	
I.		5119*c*	0·729	121·0	148·1	−21·9	24	125	
		5120	0·698	132·3	154·7	−27·9	25	106	
Dec. 6		Centre			(190·3)	(+0·1)	(169)	(805)	(356)
340·190	AS, RF	5116*a*	0·844	289·7	233·1	+16·5	3	20	545*p*
		5115*b*	0·790	290·2	227·5	+15·8	15	105	
		5118	0·794	249·2	227·8	−16·3	5	20	790*s*
		5118	0·760	248·7	224·6	−16·0	0	13	
		5121*	0·617	220·6	204·2	−27·9	7	14	
		5121*	0·622	217·7	203·1	−29·4	0	10	
		5117*a*	0·353	184·8	179·1	−20·5	9	15	
		5125	0·385	138·6	162·0	−16·8	2	16	
		5119*a*	0·445	130·1	156·6	−16·6	13	61	
		5119*b*	0·494	136·6	156·1	−21·0	23	159	
I.		5119	0·497	131·8	154·3	−19·3	2	27	
		5119	0·468	126·2	154·3	−16·0	0	2	
		5119*d*	0·567	130·0	149·6	−21·3	7	55	
		5119	0·580	131·7	149·4	−22·6	0	2	
		5119*e*	0·593	128·8	147·6	−21·7	22	83	
		5119	0·621	129·5	146·0	−23·2	0	5	
		5120*a*	0·577	143·2	154·5	−27·4	16	56	
		5120*a*	0·595	143·8	153·8	−28·6	8	29	
		5126*a*	0·982	75·6	98·8	+14·1	33	182	116*sf*
Dec. 7		Centre			(177·3)	(0·0)	(165)	(874)	(1451)
341·199	RF, M		0·861	245·9	221·0	−20·7			105
		5118	0·910	252·2	228·2	−16·2	1	15	336*c*
		5118	0·884	251·9	224·7	−16·0	3	20	
		5116*a*	0·940	287·3	232·9	+16·2	2	15	389*n*
		5116*b*	0·905	287·4	227·5	+15·6	20	93	
		5121*	0·740	230·2	204·1	−28·3	8	24	48*c*
		5117*a*	0·432	215·4	179·5	−20·8	9	16	
		5127	0·390	191·7	168·9	−22·5	0	10	
		5119*a*	0·315	156·7	156·5	−16·9	15	62	
I.		5119*b*	0·383	160·9	156·3	−21·3	23	154	
		5119	0·366	154·3	154·4	−19·3	3	47	
		5119*d*	0·434	148·6	150·0	−21·9	6	32	
		5119*e*	0·443	144·1	147·9	−21·1	12	51	
		5119	0·439	141·4	147·1	−20·2	0	3	
		5119	0·484	143·2	145·7	−22·9	4	41	
		5120*a*	0·499	161·8	153·8	−28·4	23	77	
		5128	0·511	123·0	137·6	−16·3	3	6	
		5128	0·565	122·3	134·0	−17·7	0	1	
1903.				°	°	°			
341·199	RF, M	5126*a*	0·915	74·7	98·8	+13·9	31	176	571*c*
		5129*a*	0·973	69·1	88·6	+20·3	35	234	
I.			0·837	70·1	109·1	+16·4			21
			0·951	118·7	94·5	−27·2			268
Dec. 8		Centre			(164·0)	(−0·2)	(198)	(1077)	(1738)
342·593	AS, RF	5121*	0·878	237·1	202·5	−28·6	19	138	333*c*
		5117*a*	0·628	236·2	179·3	−20·6	0	30	
		5125	0·356	224·1	160·4	−15·1	0	14	
		5119*a*	0·343	213·0	156·8	−16·9	15	61	
		5119*b*	0·397	205·1	156·0	−21·3	10	130	
		5119	0·362	203·6	154·4	−19·6	0	56	
		5119	0·352	186·2	147·9	−20·7	3	39	
		5119	0·387	185·4	147·9	−22·9	0	14	
		5119	0·357	181·1	146·0	−21·1	0	12	
		5119	0·394	180·5	145·8	−23·4	0	10	
		5120*a*	0·481	194·2	153·2	−28·0	4	68	
		5126*a*	0·747	71·5	99·0	+13·5	29	227	182*f*
		5129*a*	0·867	66·5	88·0	+20·0	27	302	644*f*
Dec. 9		Centre			(145·6)	(−0·3)	(107)	(1101)	(1159)
343·273	AS, RF	5121*	0·950	240·2	205·7	−28·2	13	101	1137*f*
		5121*	0·932	239·1	202·2	−28·8	3	23	
		5121*	0·928	237·5	201·2	−30·1	24	85	
		5117*a*	0·729	241·0	179·5	−20·9	1	7	158*n*
		5119	0·466	229·5	158·4	−17·9	0	5	
		5119	0·445	233·2	158·2	−15·7	0	5	
		5119*a*	0·443	228·9	157·0	−17·2	8	48	
		5119*b*	0·473	220·2	155·7	−21·5	11	119	
		5119	0·404	229·1	155·0	−15·6	0	5	
		5119	0·447	220·5	154·5	−20·1	2	19	
		5119	0·447	217·0	153·3	−21·2	1	14	
		5119	0·406	217·8	151·8	−19·0	0	5	
I.		5119	0·420	214·0	151·1	−20·7	0	4	
		5119	0·395	208·1	148·0	−20·7	2	8	
		5119	0·409	201·3	145·8	−22·7	0	6	
		5119	0·378	203·0	145·6	−20·6	0	8	
		5119	0·413	199·5	145·2	−23·2	1	20	
		5120	0·551	209·5	154·6	−29·0	0	8	
		5120	0·534	209·2	153·7	−28·1	1	7	
		5120	0·535	206·5	152·4	−28·9	7	23	
		5126	0·622	65·9	100·9	+14·4	0	2	
		5126	0·624	67·8	100·3	+13·3	0	9	
		5126*a*	0·646	67·8	98·7	+13·8	25	178	
		5130	0·657	56·5	100·8	+20·9	4	11	
		5130	0·668	56·6	100·0	+21·2	0	3	

Group 5125, December 7–11. A few very small unstable spots forming in front of Group 5119. The group is not seen on December 8 or December 10.
Group 5126, December 7–19. A large regular spot, *a*, with one or two very small companions on December 10. *a* is crossed by a bright bridge on December 9, making it a double spot, the two components of which have completely separated to form the spots *b* and *c* by December 13. *b* alone remains by December 16.
Group 5121*, December 7–11. A few small spots in a short stream, apparently a recrudescence of Group 5121.
Group 5127, December 8. A very small faint spot preceding Group 5119.
Group 5128, December 8. A few very small faint spots following Group 5119.
Group 5129, December 8–20. A large regular spot, *a*, with one or two small companions on December 10 and December 13 and the succeeding days.
Group 5130, December 10. A small spot and a very faint companion forming due north of Group 5126.

Measures of Positions and Areas of Sun Spots and Faculæ on Photographs—*continued.*

Greenwich Civil Time.	Measurers.	No. of Group, and Letter for Spot.	Distance from Centre in terms of Sun's Radius.	Position Angle from Sun's Axis.	Heliographic Longitude.	Heliographic Latitude.	Spots. Area of UMBRA for each Spot (and for Day).	Spots. Area of WHOLE for each Spot (and for Day).	Faculæ. Area for each Group (and for Day).
1903.				°	°	°			
343·273	AS, RF	5129*a*	0·795	63·9	87·3	+20·2	36	245	610*f*
		5129	0·807	61·5	86·7	+22·4	0	9	
		5131	0·988	113·3	56·5	−23·0	15	204	208*f*
I.			0·821	126·3	87·4	−29·3			205
			0·961	112·6	64·0	−21·8			156
			0·970	70·2	62·2	+19·0			206
Dec. 10		Centre			(136·6)	(−0·4)	(154)	(1181)	(2680)
344·164	AS, RF	5121*	0·993	241·2	206·9	−28·6	0	34	1270*f*
		5121*	0·979	239·9	201·5	−29·6	26	182	
		5132	0·668	237·0	161·7	−21·7	0	3	
		5125	0·620	245·9	160·5	−15·0	1	6	
		5125	0·610	244·5	159·5	−15·6	1	31	
		5119	0·609	240·5	158·5	−17·8	3	17	
		5119*a*	0·590	240·4	157·2	−17·3	13	51	
		5119*b*	0·600	232·7	155·6	−21·7	10	62	
		5119	0·579	233·2	154·4	−20·6	0	15	
		5119	0·571	235·0	154·4	−19·5	0	12	
		5119	0·567	230·8	152·8	−21·4	0	7	
		5119	0·548	232·6	152·2	−19·8	1	5	
		5119	0·532	231·3	150·9	−19·8	0	14	
I.		5119	0·529	228·3	149·7	−21·0	0	2	
		5119	0·555	220·6	148·2	−25·3	0	4	
		5119	0·506	226·6	147·9	−20·8	4	14	
		5119	0·538	221·5	147·7	−24·1	0	2	
		5119	0·507	221·9	146·2	−22·6	0	3	
		5120	0·619	220·2	151·8	−28·6	3	12	
		5133	0·595	211·5	145·9	−30·8	0	4	
		5119	0·506	219·0	145·1	−23·6	5	33	
		5126*a*	0·496	60·4	98·6	+13·7	20	170	
		5129*a*	0·679	58·9	86·7	+20·1	38	248	413*f*
		5131	0·942	114·5	56·2	−23·2	13	132	674*f*
			0·883	105·9	63·8	−14·2			85
			0·905	67·2	62·2	+20·3			155
Dec. 11		Centre			(124·8)	(−0·5)	(138)	(1063)	(2597)
345·195	AS, M		0·899	241·6	172·4	−25·6			1253
		5117	0·917	249·2	176·3	−19·3	0	5	
		5119*a*	0·749	247·2	157·4	−17·3	9	44	123*c*
		5119*b*	0·751	241·1	156·2	−21·7	2	30	
		5119*b*	0·747	240·0	155·5	−22·4	6	25	135*c*
I.		5119	0·733	239·7	154·2	−22·2	0	14	
		5119	0·668	238·1	148·6	−21·2	0	6	
		5119	0·683	233·9	148·4	−24·2	0	4	
		5119	0·655	238·1	147·7	−20·8	0	2	
1903.				°	°	°			
345·195	AS, M	5119	0·645	232·4	145·1	−23·7	1	19	
		5119	0·629	224·6	141·3	−26·8	0	1	
		5126*a*	0·327	40·6	98·7	+13·6	27	179	
		5129*a*	0·531	48·6	86·3	+19·9	52	270	
I.		5131	0·857	117·0	55·3	−23·2	26	124	273*f*
			0·811	64·6	60·3	+19·9			82
			0·973	64·8	36·5	+24·3			68
Dec. 12		Centre			(111·3)	(−0·7)	(123)	(723)	(1934)
346·191	AS, RF		0·957	247·2	170·0	−22·0			363
			0·937	234·1	163·8	−33·7			182
		5119*a*	0·872	250·8	157·5	−17·1	10	54	203*c*
		5119*b*	0·864	244·5	155·4	−22·2	6	59	
		5119	0·810	240·7	148·6	−23·8	12	43	
		5119	0·797	243·9	148·1	−21·0	2	7	
		5119	0·785	240·4	146·0	−23·3	0	6	621*c*
		5119	0·778	239·3	145·0	−23·9	5	70	
		5126*b*	0·253	357·2	98·9	+13·8	21	144	
I.		5126*c*	0·257	2·6	97·5	+14·1	6	34	
		5129*a*	0·404	29·8	85·9	+19·7	52	279	
		5129	0·447	28·7	84·9	+22·2	0	4	
		5131	0·737	120·8	55·0	−22·7	8	62	
		5131	0·749	122·1	54·4	−24·0	14	56	439*f*
		5131	0·751	120·6	53·8	−23·0	0	5	
			0·910	64·9	35·4	+22·3			105
			0·968	73·1	23·8	+16·1			54
			0·976	109·0	21·4	−18·7			132
Dec. 13		Centre			(98·2)	(−0·8)	(136)	(823)	(2099)
347·412	AS, RF	5119	0·936	245·2	149·8	−23·5	4	72	
		5119	0·919	245·2	146·9	−23·0	0	11	1135*c*
		5119	0·910	244·7	145·5	−23·3	2	115	
		5126*b*	0·393	311·0	99·8	+14·1	25	116	
		5126*a*	0·377	314·0	98·3	+14·3	6	19	
		5126	0·362	312·5	97·9	+13·2	0	3	
		5126	0·353	311·1	97·8	+12·5	0	2	
		5129	0·358	342·3	88·7	+18·9	0	7	
		5129	0·319	344·5	87·2	+16·9	1	14	
		5129*a*	0·356	347·2	86·9	+19·3	59	297	
		5131	0·550	132·4	56·1	−22·5	4	18	
		5131	0·566	133·2	55·5	−23·5	0	7	
		5131	0·576	133·6	55·0	−24·2	5	35	
		5131	0·576	132·0	54·4	−23·4	0	8	
			0·949	114·3	12·0	−23·3			331
Dec. 14		Centre			(82·1)	(−0·9)	(106)	(724)	(1466)

Group 5131, December 10–19. A double spot with the major axis at right angles to the equator. The group has broken up into a stream of small spots by December 14.
Group 5132, December 11. A few very small spots forming south of Group 5125.
Group 5133, December 11. A very small spot following Group 5120.

Measures of Positions and Areas of Sun Spots and Faculæ on Photographs—*continued.*

Greenwich Civil Time.	Measurers.	No. of Group, and Letter for Spot.	Distance from Centre in terms of Sun's Radius.	Position Angle from Sun's Axis.	Heliographic Longitude.	Heliographic Latitude.	Spots. Area of UMBRA for each Spot (and for Day).	Spots. Area of WHOLE for each Spot (and for Day).	Faculæ. Area for each Group (and for Day).
1903.				°	°	°			
348·478	AS, M		0·976	246·9	144·6	−22·7			345
		5126*b*	0·568	297·1	99·4	+14·1	19	133	
		5126*c*	0·549	298·9	97·7	+14·4	2	6	
		5129	0·485	319·6	87·7	+20·7	0	3	
		5129*a*	0·459	319·0	86·6	+19·2	56	328	
		5129	0·436	324·0	83·8	+19·6	0	3	
		5131	0·421	152·1	55·8	−22·7	2	9	
		5131	0·468	154·9	55·4	−25·9	2	8	
		5131	0·451	151·0	54·3	−24·2	3	27	
		5131	0·486	149·0	52·1	−25·5	0	10	
		5134*a*	0·984	67·6	349·7	+21·9	32	156	
			0·947	108·7	357·8	−18·0			51
			0·859	119·2	12·2	−25·3			239
Dec. 15		Centre			(68·1)	(−1·0)	(116)	(683)	(635)
349·486	AS, RF	5126*b*	0·731	290·6	99·5	+14·0	14	126	
		5129*a*	0·611	304·6	86·9	+19·2	64	329	
		5129	0·586	305·1	85·1	+18·6	0	21	
		5129	0·581	307·3	84·0	+19·5	0	5	
		5129	0·584	309·0	83·6	+20·4	0	8	
		5129	0·570	307·6	83·3	+19·2	1	14	
		5131	0·414	182·2	55·8	−25·5	1	10	
		5131	0·367	182·3	55·7	−22·6	1	7	
		5131	0·392	177·6	53·8	−24·2	1	11	
		5135	0·568	58·7	24·6	+16·1	2	13	
		5134*a*	0·928	65·5	349·3	+22·1	39	167	274*f*
			0·784	122·3	7·7	−25·5			300
			0·837	109·7	359·5	−17·1			63
			0·959	77·1	342·2	+12·0			130
Dec. 16		Centre			(54·8)	(−1·2)	(123)	(711)	(767)
350·452	AS, RF		0·843	297·1	95·7	+21·8			180
		5126*b*	0·851	286·9	98·7	+13·6	15	107	187*p*
		5129*a*	0·745	297·0	86·4	+18·8	49	380	
		5129	0·732	294·9	85·8	+16·9	0	8	215*c*
		5129	0·719	296·9	84·2	+18·0	2	5	
		5131	0·456	207·5	55·4	−25·0	0	7	
		5131	0·428	209·6	55·2	−23·1	0	3	
		5135	0·395	41·3	26·3	+15·9	0	4	
		5136	0·729	113·9	357·7	−18·1	2	32	
		5134*a*	0·839	62·5	348·8	+22·0	32	209	399*c*
		5137*a*	0·887	74·9	340·8	+12·7	0	9	128*c*
		5137*b*	0·911	74·4	337·7	+13·6	0	14	
			0·905	64·8	340·2	+22·0			204
Dec. 17		Centre			(42·0)	(−1·3)	(100)	(778)	(1313)
1903.				°	°	°			
351·189	RF, M		0·910	295·6	94·8	+22·5			102
			0·794	301·4	79·7	+23·4			149
			0·860	233·9	79·6	−19·4			146
		5126*b*	0·927	285·7	99·0	+14·0	17	97	137*f*
		5129*a*	0·844	294·1	86·8	+19·3	63	368	
		5129	0·807	293·1	83·3	+17·6	0	3	181*c*
		5131	0·545	221·6	55·8	−25·3	3	11	
		5131	0·501	216·8	51·5	−24·9	0	7	
		5135	0·315	17·3	26·7	+16·0	0	5	
		5136	0·585	119·0	359·9	−17·7	1	6	
	I.	5136	0·598	122·0	359·8	−19·7	0	1	
		5136	0·622	117·2	357·0	−17·6	4	10	
		5134*a*	0·755	58·7	348·4	+22·0	41	189	139*f*
		5134	0·784	59·0	345·7	+22·8	0	2	
		5137*a*	0·801	73·1	342·4	+12·6	1	4	69*c*
		5137*b*	0·839	72·5	337·0	+13·8	1	5	
			0·944	68·5	323·6	+19·7			156
Dec. 18		Centre			(32·3)	(−1·4)	(131)	(708)	(1079)
352·194	AS, M		0·920	239·2	83·2	−28·7			170
		5126*b*	0·988	284·7	99·3	+14·3	13	97	62*nf*
		5129*a*	0·940	291·1	87·1	+19·2	65	336	536*nf*
		5131	0·679	233·6	56·0	−24·9	0	4	
		5131	0·667	232·7	54·8	−25·0	0	3	
		5131	0·640	234·3	53·4	−23·1	0	5	
		5136	0·421	131·0	359·7	−17·4	0	16	
	I.	5136	0·454	127·4	357·0	−17·4	5	18	
		5134	0·607	51·1	348·8	+21·1	0	2	
		5134*a*	0·623	49·8	348·2	+22·4	32	194	
			0·889	66·0	319·3	+20·4			180
Dec. 19		Centre			(19·1)	(−1·5)	(115)	(675)	(948)
253·291	AS, RF		0·964	295·0	76·8	+23·5			315
			0·807	240·3	54·9	−24·6			233
		5129*a*	0·992	289·4	86·2	+19·0	63	276	290*f*
		5138	0·707	243·3	46·7	−19·7	0	6	
		5138	0·678	242·8	44·2	−19·3	0	6	54*c*
		5136	0·282	169·1	1·5	−17·7	0	1	
		5136	0·274	168·4	1·4	−17·1	2	11	
		5136	0·282	164·3	0·1	−17·3	0	11	
		5136	0·296	160·8	358·9	−17·8	0	1	
	I.	5136	0·279	159·2	358·8	−16·7	0	1	
		5136	0·284	153·2	357·1	−16·2	2	3	
		5136	0·296	154·3	357·0	−17·0	10	21	
		5134*b*	0·492	31·1	348·7	+23·3	15	68	
		5134*c*	0·481	34·0	347·9	+21·9	16	74	
		5134	0·497	33·0	347·7	+23·0	0	2	
			0·945	41·1	294·8	−20·4			177
Dec. 20		Centre			(4·7)	(−1·6)	(108)	(481)	(1069)

Group 5134, December 15–25. A large regular spot, *a*, with a very small companion on December 18 and 19. *a* has become a double spot by December 19 and has completely divided into two spots, *b* and *c*, by December 20.
Group 5135, December 16–24. A small spot. The group is not seen on December 19 or 20, but there has been a sudden revival by December 21. The group is seen as a straight stream of spots, of which *a* and *b*, the first and last, are the largest.
Group 5136, December 17–23. A small faint spot on December 17. A few small spots in a short stream on the succeeding days.
Group 5137, December 17–18. A pair of very small spots, *a* and *b*.
Group 5138, December 20–21. A pair of very small spots.

Measures of Positions and Areas of Sun Spots and Faculæ on Photographs—*continued.*

Greenwich Civil Time.	Measurers.	No. of Group, and Letter for Spot.	Distance from Centre in terms of Sun's Radius.	Position Angle from Sun's Axis.	Heliographic Longitude.	Heliographic Latitude.	Spots. Area of UMBRA for each Spot (and for Day).	Spots. Area of WHOLE for each Spot (and for Day).	Faculæ. Area for each Group (and for Day).
1903.				°	°	°			
354·510	AS, RF	5138	0·884	243·0	48·3	−24·5	0	17	
		5135*a*	0·657	296·4	26·1	+15·5	10	59	
		5135	0·621	296·2	23·6	+14·4	0	10	
		5135*b*	0·594	298·5	21·2	+14·9	21	71	
		5136	0·344	220·0	1·9	−16·9	0	8	
		5136	0·317	207·3	357·4	−18·1	0	13	476*c*
		5136	0·290	208·3	356·8	−16·5	1	14	
		5134*b*	0·421	359·5	348·8	+23·0	11	37	
		5134*c*	0·399	1·1	348·1	+21·6	10	64	
			0·902	70·5	286·3	+16·6			98
			0·924	116·4	282·9	−25·0			548
			0·973	68·1	273·8	+20·8			224
Dec. 21		Centre			(348·6)	(−1·8)	(53)	(293)	(1346)
355·175	AS, RF		0·936	243·8	47·7	−25·1			613
		5135*a*	0·773	292·9	27·6	+16·2	17	90	
		5135	0·769	291·0	27·6	+14·7	0	3	
		5135	0·744	292·0	25·3	+14·9	0	4	
		5135	0·733	291·9	24·3	+14·4	0	3	216*c*
		5135	0·728	292·5	23·8	+14·8	5	23	
		5135	0·706	293·1	21·9	+14·6	2	3	
		5135*b*	0·697	293·5	21·1	+14·7	11	61	
		5136	0·454	234·2	2·5	−17·1	0	2	
I.		5136	0·381	228·7	357·2	−16·3	2	8	
		5134*b*	0·447	341·2	348·9	+23·0	9	42	
		5134*c*	0·425	341·6	348·2	+21·8	12	42	
		5134	0·429	343·1	347·6	+22·3	0	1	
			0·869	123·0	283·5	−29·2			180
			0·900	108·7	276·6	−17·7			126
			0·957	68·6	268·9	+19·8			94
			0·957	117·7	268·2	−27·0			210
Dec. 22		Centre			(339·9)	(−1·9)	(58)	(282)	(1439)
356·180	AS, RF		0·898	245·6	28·8	−22·7			234
			0·727	234·9	7·9	−26·1			150
		5135	0·900	290·9	28·4	+17·8	0	2	
		5135*a*	0·895	289·4	28·0	+16·3	17	132	289*c*
I.		5135	0·858	288·6	23·6	+14·8	4	7	
		5135*b*	0·834	288·7	21·0	+14·4	12	52	
		5136	0·655	241·5	4·1	−19·7	0	2	
		5136	0·613	242·8	1·4	−17·9	0	4	
		5134*b*	0·547	320·3	348·8	+23·0	4	29	
		5134*c*	0·525	319·9	347·9	+21·7	6	21	
		5134	0·523	326·3	345·0	+23·8	0	3	
			0·886	67·8	266·9	+18·6			262
			0·897	118·6	265·3	−26·4			418
Dec. 23		Centre			(326·6)	(−2·0)	(43)	(252)	(1353)
1903.				°	°	°			
357·187	AS, RF		0·911	249·8	18·0	−19·2			90
			0·814	241·0	4·6	−24·5			183
		5135*a*	0·974	286·9	28·9	+16·0	22	134	
I.		5135	0·957	286·8	24·9	+15·4	0	4	660*c*
		5135*b*	0·935	286·1	21·1	+14·3	8	30	
		5134*b*	0·679	307·4	348·9	+22·6	4	20	
		5134*c*	0·662	307·1	347·8	+21·8	6	11	
		5139	0·975	71·5	237·6	+17·5	0	13	275*c*
			0·807	62·9	263·6	+20·1			81
			0·809	122·5	263·4	−27·1			154
			0·940	60·3	247·2	+26·9			185
Dec. 24					(313·3)	(−2·1)	(40)	(212)	(1628)
358·161	AS, RF		0·913	243·8	4·7	−24·7			609
		5134*b*	0·801	300·5	348·7	+22·5	0	8	196*c*
		5134*c*	0·793	300·0	348·1	+21·9	0	5	
I.			0·902	57·7	241·2	+21·7			208
			0·928	68·7	234·7	+18·8			382
			0·953	110·5	228·7	−20·2			156
Dec. 25		Centre			(300·5)	(−2·2)	(0)	(13)	(1551)
359·303	CL, RF		0·974	238·0	1·5	−31·7			68
			0·958	247·0	358·3	−22·7			109
			0·953	254·6	357·7	−15·4			168
			0·824	303·3	335·1	+25·3			68
M.		5134	0·913	297·0	347·7	+23·3	0	10	328*c*
			0·820	67·0	233·6	+17·2			384
			0·917	59·2	223·8	+26·8			164
			0·923	113·9	219·5	−22·9			460
Dec. 26		Centre			(285·6)	(−2·4)	(0)	(10)	(1749)
360·434	CL, RF	5134	0·993	292·9	351·9	+22·4	0	84	312*c*
		5134	0·984	294·6	348·0	+23·7	17	84	
			0·955	287·1	341·6	+15·5			44
			0·947	300·1	337·7	+27·4			509
M.			0·819	295·7	321·7	+19·2			254
			0·842	117·4	215·7	−24·2			64
			0·956	116·4	198·5	−25·9			368
Dec. 27		Centre			(270·5)	(−2·5)	(17)	(168)	(1551)
361·135	RF, M		0·979	295·3	337·1	+24·2			148
		5140*a*	0·949	113·9	190·6	−23·4	22	93	479*c*
I.		5140*b*	0·965	111·5	186·9	−21·4	4	76	
			0·875	118·1	204·5	−23·0			964
Dec. 28		Centre			(261·3)	(−2·6)	(26)	(169)	(1591)

Group 5139, December 24. A small spot only seen close to the limb in a mass of faculæ.
Group 5140, 1903, December 28–1904, January 3. A pair of regular spots, *a* and *b*. *b* has a small companion on December 29.

Measures of Positions and Areas of Sun Spots and Faculæ on Photographs—*continued.*

Greenwich Civil Time.	Measurers.	No. of Group, and Letter for Spot.	Distance from Centre in terms of Sun's Radius.	Position Angle from Sun's Axis.	Heliographic Longitude.	Heliographic Latitude.	Spots: Area of UMBRA for each Spot (and for Day).	Spots: Area of WHOLE for each Spot (and for Day).	Faculæ: Area for each Group (and for Day).
1903.				°	°	°			
362·416	AS, RF	5141*a*	0·319	31·1	234·8	+13·1	0	5	
		5140*a*	0·836	116·5	190·0	−23·5	18	69	
		5140*b*	0·855	112·7	187·2	−20·8	11	87	422*f*
		5140	0·862	111·6	186·2	−20·0	0	23	
		5142*a*	0·946	104·1	173·5	−14·3	19	158	
		5142*b*	0·977	102·4	166·7	−12·7	7	42	300*c*
			0·811	128·2	196·0	−32·0			500
Dec. 29		Centre			(244·5)	(−2·8)	(55)	(384)	(1222)
363·440	AS, RF	5141*a*	0·280	348·1	234·4	+12·9	0	12	
		5141*b*	0·309	357·4	231·8	+15·0	2	11	
		5140*a*	0·703	120·9	190·1	−23·3	12	56	
		5140*b*	0·725	115·8	187·0	−20·4	3	42	197*f*
		5142*a*	0·859	105·0	172·3	−14·4	33	168	
		5142	0·877	104·1	170·1	−13·7	0	117	963*c*
1903.				°	°	°			
363·440	AS, RF	5142*b*	0·903	102·5	166·6	−12·6	15	60	
			0·918	113·2	165·4	−22·4			429
Dec. 30		Centre			(231·0)	(−2·9)	(65)	(466)	(1589)
364·233	CL, RF		0·853	253·7	278·5	−15·4			186
			0·856	239·2	276·5	−27·7			296
			0·818	295·2	271·7	+18·5			163
		5140*a*	0·597	128·6	189·9	−24·4	9	78	
		5140*b*	0·610	122·8	187·2	−21·8	2	18	
		5140	0·636	121·9	185·1	−22·0	0	8	
M.		5142*a*	0·760	108·7	172·3	−16·1	32	197	
		5142	0·764	104·9	171·5	−13·3	0	10	
		5142	0·801	108·2	168·4	−16·3	0	28	311*c*
		5142*b*	0·819	105·4	166·2	−14·3	7	56	
			0·835	118·9	166·7	−25·5			201
			0·937	114·3	152·0	−23·7			703
Dec. 31		Centre			(220·6)	(−3·0)	(50)	(395)	(1860)

Group 5141, December 29–30. A small spot, *a*, on December 29; a second, *b*, has formed following it by December 30.
Group 5142, 1903, December 29–1904, January 9. A stream of spots. The leader, *a*, is the largest spot of the group and is a large regular spot. The last spot, *b*, is the next in size.

ROYAL OBSERVATORY, GREENWICH.

LEDGERS

OF

AREAS AND POSITIONS OF GROUPS OF SUN SPOTS

DEDUCED FROM THE MEASUREMENT

OF THE

SOLAR PHOTOGRAPHS

FOR EACH DAY IN THE YEAR

1903.

AREAS and HELIOGRAPHIC POSITIONS of GROUPS of SUN SPOTS DEDUCED FOR EACH DAY from the MEASUREMENTS of the PHOTOGRAPHS taken at the ROYAL OBSERVATORY, GREENWICH, at DEHRA DÛN IN INDIA, and at the ROYAL ALFRED OBSERVATORY, MAURITIUS, in the YEAR 1903.

NOTE.—The Greenwich Civil Time at which the photograph was taken is expressed by the month, day of the month (civil reckoning), and decimal of a day, reckoned from Greenwich Mean Midnight.

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

The Column "Longitude from Central Meridian" gives the Mean heliographic longitude of the group, reckoned from the meridian passing through the centre of the Sun's disk at the moment of observation; longitudes west of the centre being reckoned as positive.

Dates for which no numbers are given indicate days for which no photographic Record is at present available. In these cases the means have been taken of the areas and positions of the spot-groups as measured on the day immediately preceding, and that immediately following the day for which the photograph is lacking. These interpolated values are enclosed in brackets, but are used in taking the final means for each spot-group.

Date. Greenwich Civil Time.	Projected Area of		Area for Group.		Mean Longitude of Group.	Mean Latitude of Group.	Longitude from Central Meridian.
	Umbra.	Whole Spot.	Umbra.	Whole Spot.			
Group 4998. A pair of very small spots.							
1903. d					°	°	°
Jan. 3·548	1	23	1	16	273·4	+17·8	−41·0
Means ...	...	...	1	16	273·4	+17·8	...
Group 4999. Two small spots, *a* and *b*, of which *b* is the larger. *a* moves forward in longitude, and *b* increases in size on the succeeding days. Some very small spots are seen between them on January 4–5.							
Jan. 4·465	18	86	12	56	335·7	+22·5	+33·3
5·159	33	167	26	126	335·0	+23·0	+41·8
6·178	22	130	22	129	334·1	+23·3	+54·4
7·420	2	43	4	72	332·8	+23·7	+69·3
Means ...	...	...	16	96	334·40	+23·13	...
Group 5000. Two small spots, *a* and *b*, on January 7. The following spot has broken up to form a compact cluster by January 8.							
Jan. 7·420	3	22	2	12	244·1	+13·3	−19·4
8·260	2	18	0	9	243·5	+13·0	− 8·9
Means ...	...	...	1	11	243·80	+13·15	...

Date. Greenwich Civil Time.	Projected Area of		Area for Group.		Mean Longitude of Group.	Mean Latitude of Group.	Longitude from Central Meridian.
	Umbra.	Whole Spot.	Umbra.	Whole Spot.			
Group 5001. A number of small spots in a short straight stream. The group undergoes a great but short-lived expansion on January 28.							
1903. d					°	°	°
Jan. 18·268	0	11	0	26	41·6	−13·9	−79·0
19·169	8	39	10	52	40·5	−14·8	−68·3
20·182	11	45	9	40	40·5	−14·9	−54·9
21·280	1	23	1	16	40·3	−15·1	−40·6
22·263	10	33	6	19	39·5	−15·2	−28·5
23·423	17	180	9	94	39·0	−14·7	−13·7
24·223	5	33	3	17	36·8	−15·5	− 5·4
Means ...	...	...	5	38	39·74	−14·87	...
Group 5002. A few very small faint spots. The group is not seen on January 27.							
Jan. 26·373	0	18	0	14	336·8	+24·9	−37·1
27·197	0	0	0	0	...	...	...
28·437	4	30	2	17	338·4	+23·1	− 8·4
Means ...	...	...	1	10	337·6	+24·00	...
Group 5003. A few small spots in a short stream. *a*, the last spot of the group, becomes the largest, and is seen alone on February 2 and 4.							
Jan. 28·431	5	41	2	21	340·0	−17·9	− 6·8
29·465	6	140	3	72	340·1	−18·3	+ 6·9
30·529	13	131	7	72	341·2	−18·5	+22·1
31·425	6	80	4	49	340·6	−18·1	+33·2

AREAS and HELIOGRAPHIC POSITIONS of GROUPS of SUN SPOTS—*continued.*

Group 5003—*continued.*

Date. Greenwich Civil Time.	Projected Area of Umbra.	Projected Area of Whole Spot.	Area for Group. Umbra.	Area for Group. Whole Spot.	Mean Longitude of Group.	Mean Latitude of Group.	Longitude from Central Meridian.
1903. d					°	°	°
Feb. 1·478	10	70	7	52	341·2	−17·9	+47·7
2·445	14	73	13	68	338·5	−18·4	+57·8
3·372	11	35	16	52	340·2	−18·1	+71·6
4·191	4	16	11	44	338·7	−18·5	+80·9
Means ...	...	...	8	54	340·06	−18·21	...

Group 5004.

A small spot, *a*, on February 6, and the two succeeding days. *a* has disappeared on February 9, and a number of small spots in an irregular stream have formed a little to the rear of its place. *b*, the leader of the stream on February 10, moves rapidly forward, and remains alone on February 12.

Feb. 6·492	3	26	5	35	158·4	−17·5	−69·1
7·191	6	25	6	25	158·2	−17·0	−60·1
8·209	0	6	0	5	158·6	−17·2	−46·2
9·595	0	22	0	13	152·9	−17·1	−33·8
10·509	13	81	7	45	153·6	−16·4	−21·0
11·506	18	119	9	60	155·9	−16·4	− 5·6
12·532	1	32	0	16	156·8	−16·5	+ 8·8
Means ...	...	...	4	28	156·34	−16·87	...

Group 5005.

A large regular spot, *a*, with small companions on February 14 and 16.

Feb. 9·595	6	51	12	111	114·2	+22·7	−72·5
10·509	29	130	34	166	113·1	+23·3	−61·5
11·506	30	192	26	170	113·2	+23·5	−48·3
12·532	33	214	24	156	112·1	+23·8	−35·9
13·582	39	210	24	132	112·3	+24·2	−21·7
14·154	25	175	15	107	112·3	+24·5	−14·3
15·183	41	180	24	106	112·2	+24·5	+ 0·9
16·479	25	133	15	80	111·5	+24·1	+15·5
17·481	23	89	16	59	111·4	+24·2	+28·5
18·426	13	49	10	39	111·2	+24·3	+40·9
19·434	2	14	2	14	110·8	+24·0	+53·7
Means ...	...	...	18	104	112·21	+23·92	...

Group 5006.

A large regular spot, *a*, following Group 5005. *a* diminishes in size and the group has disappeared by February 16. The group has formed afresh by February 17, as a small regular spot, *b*, closely followed by a faint cluster. *b* is seen alone on February 18. By February 19, a small spot, *c*, has formed, preceding *b*, and another very small spot, *d*, following it.

Feb. 10·509	10	47	28	128	99·1	+23·5	−75·5
11·506	16	87	20	110	100·2	+23·0	−61·3
12·532	22	114	20	101	99·0	+23·0	−49·0
13·582	30	132	21	93	99·7	+23·2	−34·3
14·154	7	46	5	31	99·3	+23·7	−27·3
15·183	0	8	0	5	98·3	+23·6	−14·8

Group 5006—*continued.*

1903. d					°	°	°
Feb. 16·479	0	0	0	0	...	...	...
17·481	5	43	3	26	99·0	+24·5	+16·1
18·426	5	13	3	9	100·2	+24·4	+29·9
19·434	2	37	2	31	102·1	+22·6	+45·0
20·459	2	54	3	62	101·3	+22·8	+57·8
21·187	0	3	0	5	99·9	+22·3	+66·0
Means ...	..	...	9	50	99·83	+23·31	...

Group 5007.

A number of small spots in an irregular stream. *a*, the leader spot, is the most stable.

Feb. 19·434	7	42	4	24	34·8	−19·5	−22·3
20·459	29	173	15	90	36·2	−19·0	− 7·3
21·187	20	115	11	59	36·9	−19·1	+ 3·0
22·204	16	67	9	36	39·3	−18·5	+18·7
23·627	24	43	15	28	39·5	−18·5	+37·7
24·163	9	28	6	20	40·0	−18·4	+45·3
25·444	4	18	4	19	39·8	−18·3	+61·9
Means ...	...	...	9	39	38·07	−18·76	...

Group 5008.

A large regular spot, *a*, with a small companion on February 24 and March 2.

Feb. 23·627	7	51	17	129	286·6	+19·8	−75·2
24·163	15	96	25	161	286·1	+19·3	−68·6
25·444	30	144	28	135	285·8	+19·4	−52·1
26·468	31	158	23	115	285·5	+19·4	−38·9
27·215	19	168	13	109	284·9	+19·2	−29·7
28·146	24	174	14	102	284·8	+19·1	−17·5
Mar. 1·517	35	197	20	110	284·7	+18·4	+ 0·4
2·266	30	173	17	98	284·5	+18·5	+10·1
3·584	21	100	13	62	284·6	+18·1	+27·6
4·493	11	45	8	33	284·9	+18·8	+39·8
5·183	4	15	3	13	285·3	+18·3	+49·3
Means ...	...	...	16	97	285·25	+18·94	...

Group 5009.

A small spot on February 24. On the succeeding days it is a short stream, of which *a* and *b* are the two largest and most stable members.

Feb. 24·163	8	17	7	14	301·7	−23·7	−53·0
25·444	58	265	37	172	300·3	−23·1	−37·6
26·468	61	259	34	146	301·5	−22·3	−22·9
27·215	37	160	20	85	301·6	−22·5	−13·0
28·146	10	71	6	36	302·7	−22·7	+ 0·4
Mar. 1·517	12	63	6	34	302·4	−23·0	+18·1
2·266	0	25	0	14	305·7	−22·6	+31·3
Means ...	...	...	16	72	302·27	−22·84	...

AREAS and HELIOGRAPHIC POSITIONS of GROUPS of SUN SPOTS—*continued.*

Group 5010.

A very small spot on March 2. A pair of small spots on March 3.

Date. Greenwich Civil Time.	Projected Area of Umbra.	Projected Area of Whole Spot.	Area for Group. Umbra.	Area for Group. Whole Spot.	Mean Longitude of Group.	Mean Latitude of Group.	Longitude from Central Meridian.
1903. d					°	°	°
Mar. 2·266	0	6	0	5	325·3	−23·9	+50·9
3·584	0	6	0	7	325·0	−24·1	+68·0
Means ...	...	...	0	6	325·15	−24·00	...

Group 5011.

A few very small faint spots.

Mar. 9·452	0	16	0	9	198·2	+ 9·5	+18·5
Means ...	...	...	0	9	198·2	+ 9·5	...

Group 5012.

A few very small spots in a short straight stream.

Mar. 12·344	0	10	0	7	96·7	−21·5	−45·0
13·456	17	72	9	43	96·6	−21·3	−30·4
14·194	6	25	3	14	96·4	−21·7	−20·8
Means ...	...	...	4	21	96·57	−21·5	...

Group 5013.

A large well-defined spot, *a*, with a few very small companions from time to time.

Mar. 21·434	12	95	33	253	306·4	+21·5	−75·4
22·487	37	219	47	275	306·3	+21·4	−61·6
23·348	57	283	52	258	306·5	+21·3	−50·0
24·457	71	377	49	262	306·7	+21·1	−35·3
25·444	82	395	50	242	306·5	+21·2	−22·4
26·446	73	400	41	228	306·5	+21·0	− 9·2
27·603	68	427	39	246	306·5	+21·2	+ 6·1
28·157	60	348	35	202	306·3	+21·2	+13·2
29·493	58	317	39	215	306·5	+21·2	+31·0
30·468	47	256	37	204	306·3	+21·3	+43·7
31·432	33	176	35	187	306·3	+21·4	+56·4
Apr. 1·221	28	136	44	217	307·0	+21·4	+67·5
2·278	15	39	82	204	307·1	+21·5	+81·6
Means ...	...	...	45	230	306·53	+21·28	...

Group 5014.

An irregular cluster following Group 5013. It rapidly diminishes in size. It is not seen on March 26, but a very small spot is seen on March 27, near its place.

1903. d					°	°	°
Mar. 22·487	0	44	0	139	290·2	+19·9	−77·7
23·348	0	98	0	147	290·1	+19·9	−66·4
24·457	19	82	17	74	290·9	+22·0	−51·1
25·444	2	4	1	31	289·9	+19·9	−39·0
26·446	0	0	0	0	...	...	...
27·603	0	8	0	5	291·5	+19·9	− 8·9
Means ...	...	...	3	66	290·52	+20·32	...

Group 5015.

A large composite spot, *a*, usually with several small companions. The group has broken up into an irregular stream by April 1, and rapidly diminishes in size.

Mar. 26·446	0	49	0	260	229·1	−17·1	−86·6
27·603	30	260	45	338	228·6	−16·4	−71·8
28·157	28	394	33	459	227·5	−16·4	−65·6
29·493	43	510	32	382	227·3	−16·8	−48·2
30·468	64	530	39	327	227·6	−16·9	−35·0
31·432	47	432	26	238	228·3	−16·6	−21·6
Apr. 1·221	72	341	38	175	228·3	−16·8	−11·2
2·278	43	153	22	79	229·0	−16·5	+ 3·5
3·501	9	44	5	24	229·7	−15·8	+20·3
4·236	0	31	0	18	230·2	−15·8	+30·5
5·429	1	19	1	15	232·4	−14·7	+48·5
Means ...	...	...	22	210	228·91	−16·35	...

Group 5016.

A fine stream appearing suddenly, following Group 5013. *a*, the leader spot, is the largest, and *b*, the last spot, the next in size. *b* remains alone on April 3.

Mar. 29·493	57	187	33	109	280·8	+23·4	+ 5·3
30·468	65	341	41	210	282·1	+23·6	+19·5
31·432	38	209	27	145	281·7	+23·9	+31·8
Apr. 1·221	32	176	25	141	281·5	+24·3	+42·0
2·278	10	68	11	77	282·2	+24·4	+56·7
3·501	0	12	0	20	277·2	+25·0	+67·8
Means ...	...	...	23	117	280·92	+24·10	...

Group 5017.

A very large spot, *a*, usually with a number of small companions.

Apr. 2·278	35	147	121	506	142·0	−19·7	−83·5
3·501	63	367	79	467	141·7	−19·9	−67·7
4·236	91	531	86	534	140·6	−19·9	−59·1
5·429	113	640	77	434	141·4	−19·8	−42·5
6·543	118	728	69	426	140·6	−19·8	−28·7
7·429	136	855	73	458	141·3	−19·9	−16·3

AREAS and HELIOGRAPHIC POSITIONS of GROUPS of SUN SPOTS—*continued.*

Group 5017—*continued.*

Date. Greenwich Civil Time.	Projected Area of Umbra.	Projected Area of Whole Spot.	Area for Group. Umbra.	Area for Group. Whole Spot.	Mean Longitude of Group.	Mean Latitude of Group.	Longitude from Central Meridian.
1903. d					°	°	°
Apr. 8·547	128	755	66	391	140·5	−19·9	− 2·4
9·220	90	714	46	367	140·0	−20·5	+ 6·0
10·496	114	712	64	399	140·1	−19·5	+22·9
11	No photograph.		(57	412	139·9	−19·6	+35·6)
12·418	66	555	50	424	139·6	−19·6	+48·3
13·471	32	322	34	341	139·8	−19·5	+62·0
14·411	15	143	27	248	139·7	−20·0	+74·3
Means ...	...	...	65	416	140·55	−19·82	...

Group 5018.

A small spot.

Apr. 7·429	7	18	4	12	126·8	+22·8	−30·8
Means ...	...	...	4	12	126·80	+22·8	...

Group 5019.

A small spot.

Apr. 8·547	0	18	0	24	78·0	+18·9	−64·9
9·220	0	18	0	18	77·6	+18·9	−56·4
10·496	8	21	6	15	78·1	+19·2	−39·1
11	No photograph.		(3	12	76·8	+19·1	−27·5)
12·418	0	16	0	9	75·5	+19·0	−15·8
13·471	0	38	0	20	75·5	+19·1	− 2·3
Means ..	...	...	2	16	76·92	19·03	...

Group 5020.

A pair of small spots, *a* and *b*, on April 19. Only *b* remains by April 20.

Apr. 19·525	4	33	4	30	306·8	+23·0	−51·1
20·429	2	14	1	11	305·6	+21·5	−40·3
21·213	4	16	3	9	305·0	+21·8	−30·6
22·420	0	5	0	3	305·1	+21·5	−14·6
Means ...	...	...	2	13	305·63	+21·95	...

Group 5021.

A stream of very small spots. The group is not seen on the two succeeding days, but is faintly seen on April 22.

Apr. 19·525	5	29	4	25	302·3	−18·0	−55·6
20·429	0	0	0	0	...	...	...
21·213	0	0	0	0	...	...	...
22·420	0	23	0	12	304·7	−17·6	−15·0
Means	...	...	1	9	303·5	−17·8	...

Group 5022.

A small spot on April 22 and 23. Two very small spots on April 24. The group is not seen on April 25 and 26, but a very small spot is seen on April 27.

1903. d					°	°	°
Apr. 22·420	0	7	0	12	245·7	−16·1	−74·0
23·471	0	7	0	7	246·8	−16·1	−59·0
24·225	0	7	0	6	247·2	−15·5	−48·6
25·426	0	0	0	0	...	...	...
26·209	0	0	0	0	...	...	...
27·623	1	7	0	3	248·7	−16·7	− 2·2
Means ...	...	...	0	5	247·10	−16·10	...

Group 5023.

A large regular spot, *a*, with occasionally a few very small companions.

Apr. 22·420	0	32	0	115	236·7	−14·7	−83·0
23·471	19	109	26	150	236·6	−14·7	−69·2
24·225	36	205	36	203	235·9	−14·8	−59·9
25·426	36	210	24	114	237·0	−14·1	−43·0
26·209	36	214	22	129	236·5	−14·3	−33·0
27·623	19	120	10	62	236·7	−13·8	−14·2
28·613	23	96	11	48	236·9	−13·8	− 0·9
29·483	26	113	15	57	236·1	−14·1	+ 9·8
30·466	14	97	8	53	235·8	−13·6	+22·4
May 1·196	11	39	6	23	237·2	−12·8	+33·5
Means ...	...	...	16	95	236·54	−14·07	...

Group 5024.

A few very small spots in a long scattered stream on April 24. The group rapidly increases in size, and has become a fine compact stream by April 30, after which it diminishes in size. *a*, the last spot of the group on April 28, is the largest.

Apr. 24·225	10	30	15	48	226·7	+19·4	−69·1
25·426	0	20	0	19	226·9	+19·9	−53·1
26·209	24	136	19	103	226·4	+20·4	−43·1
27·623	70	310	42	185	227·7	+20·0	−23·2
28·613	79	437	44	245	227·1	+20·6	−10·7
29·483	97	576	63	319	227·9	+20·7	+ 1·6
30·466	155	926	89	532	228·2	+20·3	+14·8
May 1·196	107	676	66	476	228·2	+20·2	+24·5
2·508	33	471	24	342	226·5	+20·2	+40·1
3·221	37	359	34	320	228·1	+20·1	+51·2
4·515	4	123	5	226	231·8	+18·5	+72·0
5·173	6	23	19	75	230·2	+20·2	+79·1
Means ...	...	...	35	241	227·98	+20·04	...

AREAS and HELIOGRAPHIC POSITIONS of GROUPS of SUN SPOTS—*continued.*

Date. Greenwich Civil Time.	Projected Area of		Area for Group.		Mean Longitude of Group.	Mean Latitude of Group.	Longitude from Central Meridian.
	Umbra.	Whole Spot.	Umbra.	Whole Spot.			
Group 5025. A very small spot.							
1903. d					°	°	°
Apr. 25·426	0	8	0	7	326·4	+21·7	+46·4
Means ...	...	...	0	7	326·4	+21·7	+46·4
Group 5026. A short compact irregular stream. The group lengthens out and becomes straighter on succeeding days. The following spots tend to die out, and only one spot remains by May 4.							
Apr 26·209	0	5	0	21	188·3	+16·5	−81·2
27·623	28	216	31	240	190·5	+16·5	−60·4
28·613	59	412	47	324	191·0	+16·6	−46·8
29·483	75	371	49	243	191·7	+16·7	−34·6
30·466	51	361	29	210	191·8	+16·5	−21·6
May 1·196	31	223	17	122	192·0	+16·4	−11·7
2·508	6	78	2	40	192·5	+16·3	+ 6·1
3·221	5	22	3	12	194·2	+16·7	+17·3
Means ...	...	...	22	152	191·50	+16·53	...
Group 5027. Two small spots appearing suddenly close to the west limb. The more northern cluster, *a*, has disappeared before April 28.							
Apr 27·623	14	42	15	45	308·1	+20·8	+57·2
28·613	0	9	0	16	308·7	+19·9	+70·9
Means ...	...	...	8	32	308·40	+20·35	...
Group 5028. A few very small spots.							
Apr. 29·483	0	21	0	12	205·6	−18·0	−20·7
Means ...	...	...	0	12	205·6	−18·0	...
Group 5029. A short stream appearing suddenly near Group 5023. It is a small regular spot on the succeeding days.							
1903. d					°	°	°
Apr. 30·466	23	101	13	55	232·2	−19·3	+18·8
May 1·196	10	35	6	20	232·0	−20·0	+28·3
2·508	0	14	0	11	232·0	−19·6	+45·6
3·221	1	4	1	4	232·4	−19·3	+55·5
Means ...	...	...	5	23	232·15	−19·55	...
Group 5030. A small spot.							
Apr. 30·466	2	8	4	17	137·4	−19·9	−76·0
May 1·196	3	12	4	16	136·6	−20·1	−67·1
Means ...	...	...	4	17	137·0	−20·0	...
Group 5031. A small spot, *a*, followed on May 4 and 5 by another, *b*.							
May 2·508	0	9	0	18	111·5	−14·5	−74·9
3·221	1	16	1	19	111·5	−14·3	−65·4
4·515	0	23	0	18	111·6	−14·4	−48·2
5·173	1	16	0	11	110·5	−15·4	−40·6
Means ...	...	...	0	17	111·28	−14·65	...
Group 5032. A very small faint spot.							
May 7·522	0	8	0	6	72·8	−19·8	−47·2
Means ...	...	...	0	6	72·8	−19·8	...
Group 5033. A small spot.							
May 12·452	0	6	0	8	350·2	+17·6	−64·6
13·171	0	11	0	10	349·9	+17·6	−55·4
14·211	8	23	6	17	347·2	+16·1	−44·4
15·214	6	11	4	7	348·3	+16·6	−30·1
Means ...	...	...	3	11	348·90	+16·98	...

AREAS and HELIOGRAPHIC POSITIONS of GROUPS of SUN SPOTS—*continued.*

Group 5034.

A few small spots irregularly scattered. Only one of these remains by May 18. But a fresh outburst in the region of the preceding part of the group has taken place by May 19. This outburst has disappeared by May 21, and a third outburst has taken place in the region of the following part of the group.

Date. Greenwich Civil Time.	Projected Area of Umbra.	Projected Area of Whole Spot.	Area for Group. Umbra.	Area for Group. Whole Spot.	Mean Longitude of Group.	Mean Latitude of Group.	Longitude from Central Meridian.
1903. d					°	°	°
May 16·206	4	20	10	50	287·4	−30·3	−77·8
17·185	0	28	0	38	285·9	−31·4	−66·4
18·303	0	8	0	8	283·9	−32·3	−53·6
19·243	7	19	5	13	289·2	−30·5	−35·8
20·545	0	18	0	11	291·3	−29·0	−16·5
21·434	22	109	12	64	283·8	−30·8	−12·3
22·421	6	50	3	29	282·9	−30·8	− 0·1
Means ...	...	...	4	30	286·34	−30·73	...

Group 5035.

Three spots on May 20. The first two of these have coalesced to form a spot, *a*, of double nucleus by May 21. The third spot has broken up by May 21, and disappeared by May 23. A small spot is seen again in its place on May 24.

May 20·545	11	69	17	118	237·0	+18·9	−70·8
21·434	10	87	9	89	238·1	+18·5	−58·0
22·421	12	96	9	70	239·2	+18·3	−43·8
23·455	10	42	6	25	240·5	+17·7	−28·8
24·577	0	48	0	27	238·5	+18·5	−15·9
25·420	0	5	0	3	241·2	+18·0	− 2·2
26·600	0	10	0	5	239·1	+18·1	+11·4
Means ...	...	...	6	48	239·09	+18·29	...

Group 5036.

A small spot on May 21, not seen again until May 25. It has broken up by May 26, and has disappeared by May 28. It is seen again on May 30 as a small spot.

May 21·434	0	5	0	4	245·2	+17·1	−50·9
22·421	0	0	0	0	...	...	...
23·455	0	0	0	0	...	...	...
24·577	0	0	0	0	...	...	...
25·420	5	51	3	27	247·3	+17·4	+ 3·9
26·600	0	12	0	6	247·9	+17·1	+20·2
27·478	0	25	0	16	247·6	+17·4	+31·5
28·590	0	0	0	0	...	...	...
29·286	0	0	0	0	...	...	...
30·092	0	10	0	14	248·3	+17·4	+66·8
Means ...	...	..	0	7	247·26	+17·28	...

Group 5037.

A small faint spot.

May 25·420	0	22	0	12	229·9	− 2·1	−13·5
Means ...	...	...	0	12	229·9	− 2·1	...

Group 5038.

A spot crossed by a bright bridge. It diminishes on the succeeding days.

1903. d					°	°	°
May 26·600	23	92	17	69	273·1	+15·4	+45·4
27·478	12	60	12	58	272·9	+15·6	+56·8
28·590	0	18	0	30	273·6	+15·6	+72·2
Means ...	...	...	10	52	273·20	+15·53	...

Group 5039.

A small spot following Group 5038. It has broken up by the next day.

May 26·600	0	20	0	13	267·8	+15·9	+40·1
27·478	0	7	0	6	267·3	+16·4	+51·2
Means ...	...	...	0	10	267·55	+16·15	...

Group 5040.

Two small spots.

June 5·507	1	43	1	25	74·5	+21·6	−22·1
Means ...	...	...	1	25	74·5	+21·6	...

Group 5041.

Three very small spots arranged in a long row almost at right angles to the solar equator.

June 8·440	0	7	0	7	357·6	−15·6	−60·2
Means ...	...	...	0	7	357·6	−15·6	...

Group 5042.

Two very small spots.

June 8·440	0	42	0	32	106·9	−12·7	+49·1
Means ...	...	...	0	32	106·9	−12·7	...

Group 5043.

A very small spot.

June 8·440	0	19	0	12	65·9	+34·1	+ 8·1
Means ...	...	...	0	12	65·9	+34·1	...

AREAS and HELIOGRAPHIC POSITIONS of GROUPS of SUN SPOTS—*continued.*

Group 5044.

A few very small spots in a straight stream. The group is not seen on June 13, but has reappeared by June 15.

Date. Greenwich Civil Time.	Projected Area of Umbra.	Projected Area of Whole Spot.	Area for Group. Umbra.	Area for Group. Whole Spot.	Mean Longitude of Group.	Mean Latitude of Group.	Longitude from Central Meridian.
1903. d					°	°	°
June 10·124	3	23	2	13	29·3	−20·0	− 6·2
11·196	11	32	6	17	25·0	−20·4	+ 3·7
12·112	4	23	2	12	25·5	−20·2	+16·3
13·254	0	0	0	0	...	...	...
14·188	0	0	0	0	...	...	...
15·258	0	9	0	9	25·7	−20·6	+58·1
16·516	0	70	0	177	28·3	−20·9	+77·4
Means ...	...	...	1	33	26·76	−20·42	...

Group 5045.

A few very small faint spots in an irregular cluster.

June 13·254	0	16	0	33	282·0	−31·5	−72·1
14·188	2	13	3	15	282·5	−31·0	−59·3
15·258	0	9	0	7	280·8	−30·7	−46·8
16·516	0	5	0	3	277·7	−30·3	−33·2
Means ...	...	...	1	15	280·75	−30·88	...

Group 5046.

A few very small spots in a straight stream.

June 13·254	6	33	3	18	11·1	−13·9	+17·0
14·188	5	34	3	20	10·9	−13·8	+29·1
Means ...	...	...	3	19	11·00	−13·85	...

Group 5047.

A few very small spots in an irregular cluster. The leading portion of the Group increases, and a pair of spots, *a* and *b*, are seen here on June 20. *a* and *b* have coalesced to form a large spot, *c*, with double nucleus, by June 23.

June 16·516	6	21	9	32	241·3	+19·7	−69·6
17·435	5	28	5	27	242·3	+19·8	−56·5
18·426	11	55	8	40	243·0	+20·3	−42·7
19	No photograph.		(19	79	242·3	+20·0	−31·8)
20·189	52	210	29	117	241·5	+19·7	−20·8
21	No photograph.		(26	126	242·2	+19·7	− 5·3)
22·420	43	253	23	135	242·9	+19·6	+10·1
23·462	41	266	24	153	243·3	+19·8	+24·3
24·248	28	205	18	130	243·6	+19·6	+35·0
25·444	15	133	12	109	243·5	+20·0	+50·8
26·359	22	102	25	115	243·7	+20·0	+63·0
27·455	6	27	13	60	241·7	+18·8	+75·6
Means ...	...	...	18	94	242·61	+19·75	...

Group 5048.

A faint spot following Group 5047 on June 16, and rapidly diminishing on the succeeding days. It is not seen on June 20, but has reappeared by June 22.

1903. d					°	°	°
June 16·516	0	30	0	85	231·3	+20·8	−79·6
17·435	0	19	0	26	232·1	+22·8	−66·7
18·426	0	3	0	3	232·1	+21·1	−53·6
19	No photograph.		(0	2	231·7	+21·4	−40·8)
20·189	0	0	0	0	...	...	...
21	No photograph.		(0	1	230·8	+22·0	−15·2)
22·420	0	4	0	2	230·3	+22·3	− 2·5
23·462	0	56	0	30	231·4	+21·5	+12·4
24·248	0	30	0	18	232·3	+20·8	+23·7
Means ...	...	...	0	19	231·50	+21·59	...

Group 5049.

A very small spot following Group 5048.

June 18·426	0	6	0	8	217·4	+19·0	−68·3
19	No photograph.		(0	6	215·9	+19·5	−58·1)
20·189	0	5	0	4	214·4	+20·0	−47·9
Means ...	...	...	0	6	215·90	+19·50	...

Group 5050.

A few small spots in a straight stream, inclined at a considerable angle to the equator.

June 20·189	45	127	26	71	265·9	−24·9	+ 3·6
21	No photograph.		(17	57	266·2	−25·1	+18·6)
22·420	11	62	7	43	266·4	−25·3	+33·6
23·462	1	19	1	16	266·6	−24·8	+47·6
Means ...	...	...	13	47	266·28	−25·03	...

Group 5051.

A stream of spots forming between Groups 5048 and 5049. *a* and *b*, the first and last spots, are the largest. *b* has disappeared by June 25, and *a* remains alone on June 26.

June 20·189	29	153	20	103	224·0	+22·0	−38·3
21	No photograph.		(27	170	224·4	+22·0	−23·2
22·420	61	443	33	237	224·7	+22·0	− 8·1
23·462	77	373	41	199	224·5	+21·6	+ 5·5
24·248	30	230	17	129	225·9	+21·5	+17·3
25·444	31	182	20	114	225·4	+21·2	+32·7
26·359	27	131	20	96	225·1	+21·1	+44·4
27·455	15	99	15	100	225·0	+22·0	+58·9
28·509	10	35	16	59	224·8	+22·2	+72·6
Means ...	...	...	23	134	224·87	+21·73	...

AREAS and HELIOGRAPHIC POSITIONS of GROUPS of SUN SPOTS—*continued.*

Group 5052.

A few small spots in a straight stream. The group is not seen on July 4.

Date. Greenwich Civil Time.	Projected Area of Umbra.	Projected Area of Whole Spot.	Area for Group. Umbra.	Area for Group. Whole Spot.	Mean Longitude of Group.	Mean Latitude of Group.	Longitude from Central Meridian.
1903. d					°	°	°
June 30·477	0	63	1	36	133·5	−21·7	+ 7·4
July 1·641	5	32	3	20	135·8	−21·0	+25·0
2·413	9	63	6	42	133·7	−21·7	+33·2
3·413	1	10	1	9	135·8	−21·1	+48·6
4·457	0	0	0	0	...	...	...
5·237	0	3	0	6	134·8	−22·2	+71·7
Means ...	...	...	2	19	154·72	−21·54	...

Group 5053.

A large regular spot, *a*, frequently with some small companions. A number of spots have formed round *a* by July 7, and by July 9 a fine straight stream has formed to the south of it, and *a* is seen as the centre of a wide area of disturbance.

June 30·477	0	27	0	269	39·3	−18·9	−86·8
July 1·641	31	189	50	301	41·2	−18·8	−69·6
2·413	53	269	58	291	40·8	−18·7	−59·7
3·413	63	370	50	295	40·1	−18·8	−47·1
4·457	90	458	58	299	39·9	−19·0	−33·6
5·237	98	465	58	275	39·3	−19·2	−23·8
6·432	104	523	57	285	39·4	−19·2	− 7·9
7·420	102	472	55	255	39·4	−18·9	+ 5·1
8·433	106	620	62	360	39·7	−20·0	+18·9
9·442	117	689	76	452	39·9	−21·1	+32·4
10·408	107	556	84	443	40·3	−20·4	+45·7
11·431	59	341	66	382	40·6	−20·4	+59·5
Means ...	...	...	56	326	39·99	−19·45	...

Group 5054.

A stream of spots following Group 5053. The leader, *a*, is the largest and most stable. *a* remains alone on July 13.

July 7·420	39	125	25	180	2·2	−19·2	−32·1
8·433	70	378	40	216	2·6	−19·1	−18·2
9·442	34	207	19	113	4·2	−19·2	− 3·3
10·408	50	303	28	167	4·5	−18·9	+ 9·9
11·431	40	238	24	144	5·7	−18·6	+24·6
12	No photograph.		(21	109	6·0	−18·7	+38·3)
13·463	19	82	17	73	6·2	−18·8	+51·9
14·463	8	44	11	58	5·8	−19·1	+64·8
Means ...	...	...	23	133	4·65	−18·95	...

Group 5055.

Several spots in a straight stream. The leader, *a*, has become a large regular spot by July 14, and remains alone by July 15.

1903. d					°	°	°
July 9·442	65	241	38	137	342·9	+18·2	−24·6
10·408	55	259	29	137	343·1	+18·3	−11·5
11·431	76	330	39	171	343·0	+18·0	+ 1·9
12	No photograph.		(35	169	344·2	+17·7	+16·5)
13·463	52	277	31	167	345·4	+17·4	+31·1
14·463	48	235	33	170	346·5	+17·1	+45·5
15·422	31	175	31	173	347·7	+16·8	+59·4
16·172	21	93	30	134	348·4	+17·0	+70·0
Means ...	...	...	33	157	345·15	+17·56	...

Group 5056.

A small spot, *a*, on July 11. A second, *b*, has formed behind it by July 15. Neither spot is seen on July 16, probably on account of a defect on the Photograph, as both are seen on July 17. *b* has disappeared by July 18.

July 11·431	6	17	9	24	277·4	−29·9	−63·7
12	No photograph.		(8	21	276·9	−30·2	−50·8)
13·463	8	22	7	17	276·4	−30·4	−37·9
14·463	7	12	5	8	276·0	−30·4	−25·0
15·422	0	33	0	21	274·4	−30·2	−13·9
16·172	0	0	0	0	...	...	...
17·434	5	23	3	14	273·2	−29·6	+11·5
18·531	0	3	0	2	276·5	−29·8	+28·5
Means ...	...	...	4	13	275·83	−30·07	...

Group 5057.

A few small spots in a straight stream, north of Group 5056. *a* and *b*, the first and last, are the most stable. This group, like Group 5056, is not seen on July 16.

July 15·422	5	79	3	45	283·3	−20·9	− 5·0
16·172	0	0	0	0	...	...	...
17·434	2	25	1	15	281·9	−22·5	+20·2
18·531	0	22	0	15	282·1	−22·6	+34·1
19	No photograph.		(0	20	282·8	−22·1	+47·8)
20	No photograph.		(0	25	283·6	−21·7	+61·6)
21·414	0	12	0	30	284·3	−21·2	+75·3
Means ...	...	...	1	21	283·00	−21·83	...

AREAS and HELIOGRAPHIC POSITIONS of GROUPS of SUN SPOTS—*continued.*

Group 5058.

A few small spots in a straight stream. *a*, the leader, moves forward rapidly in longitude. It remains alone on July 21 aud 22.

Date. Greenwich Civil Time.	Projected Area of Umbra.	Projected Area of Whole Spot.	Area for Group. Umbra.	Area for Group. Whole Spot.	Mean Longitude of Group.	Mean Latitude of Group.	Longitude from Central Meridian.
1903. d					°	°	°
July 16·172	0	41	0	31	229·5	+13·4	−48·9
17·434	7	54	4	33	230·4	+13·4	−31·3
18·531	14	57	7	30	232·8	+13·8	−15·2
19	No photograph.		(6	26	233·7	+13·7	− 1·3)
20	No photograph.		(5	21	234·6	+13·7	+12·6)
21·414	7	30	4	17	235·5	+13·6	+26·5
22·627	5	15	3	10	235·9	+13·7	+43·0
23·634	4	17	4	15	236·5	+14·0	+56·9
24·528	0	10	0	13	237·2	+13·9	+69·4
Means ...	..	...	4	22	234·01	+13·69	...

Group 5059.

A few small faint spots preceding Group 5057.

Date. Greenwich Civil Time.	Projected Area of Umbra.	Projected Area of Whole Spot.	Area for Group. Umbra.	Area for Group. Whole Spot.	Mean Longitude of Group.	Mean Latitude of Group.	Longitude from Central Meridian.
July 18·531	0	31	0	20	274·0	−23·1	+26·0
19	No photograph.		(0	28	275·4	−23·8	+40·4)
20	No photograph		(0	35	276·9	−22·4	+54·9)
21·414	0	25	0	43	278·3	−22·1	+69·3
Means ...	...	...	0	32	276·15	−22·85	...

Group 5060.

A very small spot, north of Group 5058.

Date. Greenwich Civil Time.	Projected Area of Umbra.	Projected Area of Whole Spot.	Area for Group. Umbra.	Area for Group. Whole Spot.	Mean Longitude of Group.	Mean Latitude of Group.	Longitude from Central Meridian.
July 18·531	0	6	0	3	231·6	+18·7	−16·4
Means ...	...	...	0	3	231·6	+18·7	...

Group 5061.

A few small spots in a straight stream on July 24. The group increases in size, and the leader, *a*, has become a large regular spot by July 25.

Date. Greenwich Civil Time.	Projected Area of Umbra.	Projected Area of Whole Spot.	Area for Group. Umbra.	Area for Group. Whole Spot.	Mean Longitude of Group.	Mean Latitude of Group.	Longitude from Central Meridian.
July 24·528	36	134	20	73	163·4	+25·2	− 4·4
25·479	124	511	66	274	164·1	+24·7	+ 8·8
26·613	87	392	50	230	164·5	+24·9	+24·3
27·247	44	267	27	169	165·5	+25·1	+33·7
28	No photograph.		(22	184	167·3	+24·6	+50·4)
29·497	13	154	17	198	169·1	+24·0	+67·0
30·425	7	115	17	260	168·6	+24·7	+78·8
Means ...	...	...	31	198	166·07	+24·74	...

Group 5062.

Three very small spots in a compact cluster.

Date. Greenwich Civil Time.	Projected Area of Umbra.	Projected Area of Whole Spot.	Area for Group. Umbra.	Area for Group. Whole Spot.	Mean Longitude of Group.	Mean Latitude of Group.	Longitude from Central Meridian.
1903. d					°	°	°
July 26·613	0	9	0	7	169·4	−32·8	+29·2
Means ...	...	...	0	7	169·4	−32·8	...

Group 5062*.

Two small dark spots.

Date. Greenwich Civil Time.	Projected Area of Umbra.	Projected Area of Whole Spot.	Area for Group. Umbra.	Area for Group. Whole Spot.	Mean Longitude of Group.	Mean Latitude of Group.	Longitude from Central Meridian.
July 27·247	14	34	12	30	181·5	−21·2	+49·7
Means ...	...	...	12	30	181·5	−21·2	...

Group 5063.

A small spot following Group 5061.

Date. Greenwich Civil Time.	Projected Area of Umbra.	Projected Area of Whole Spot.	Area for Group. Umbra.	Area for Group. Whole Spot.	Mean Longitude of Group.	Mean Latitude of Group.	Longitude from Central Meridian.
July 29·497	0	18	0	16	157·0	+25·6	+54·9
30·425	2	19	3	24	155·6	+26·4	+65·8
31·149	0	7	0	12	155·0	+27·0	+74·8
Means ...	...	...	1	17	155·87	+26·33	...

Group 5064.

A very small faint spot.

Date. Greenwich Civil Time.	Projected Area of Umbra.	Projected Area of Whole Spot.	Area for Group. Umbra.	Area for Group. Whole Spot.	Mean Longitude of Group.	Mean Latitude of Group.	Longitude from Central Meridian.
July 29·497	0	5	0	3	74·1	−17·6	−28·0
Means ...	...	...	0	3	74·1	−17·6	...

Group 5065.

A few very small faint spots. The group is not seen on August 3 and 4.

Date. Greenwich Civil Time.	Projected Area of Umbra.	Projected Area of Whole Spot.	Area for Group. Umbra.	Area for Group. Whole Spot.	Mean Longitude of Group.	Mean Latitude of Group.	Longitude from Central Meridian.
July 29·497	0	6	0	7	44·6	−15·9	−57·5
30·425	0	11	0	9	44·3	−16·6	−45·5
31·149	0	13	0	9	44·9	−18·3	−35·3
Aug. 1·500	0	36	0	23	43·1	−17·3	−19·3
2·463	0	10	0	5	43·0	−16·9	− 6·7
3·446	0	0	0	0	...	...	...
4·622	0	0	0	0	...	...	...
5·619	0	13	0	9	43·8	−18·2	+35·9
Means ...	...	...	0	8	43·95	−17·20	...

AREAS and HELIOGRAPHIC POSITIONS of GROUPS of SUN SPOTS—*continued.*

Group 5066.

A very small faint spot.

Date. Greenwich Civil Time.	Projected Area of Umbra.	Projected Area of Whole Spot.	Area for Group. Umbra.	Area for Group. Whole Spot.	Mean Longitude of Group.	Mean Latitude of Group.	Longitude from Central Meridian.
1903. d					°	°	°
July 29·497	0	4	0	5	38·5	−17·8	−63·6
Means ...	...	...	0	5	38·5	−17·8	...

Group 5067.

A few very small faint spots in a straight stream.

Date. Greenwich Civil Time.	Projected Area of Umbra.	Projected Area of Whole Spot.	Area for Group. Umbra.	Area for Group. Whole Spot.	Mean Longitude of Group.	Mean Latitude of Group.	Longitude from Central Meridian.
Aug. 2·463	6	35	4	27	0·1	+14·1	−49·6
3·446	1	24	1	15	359·8	+14·0	−36·8
4·622	3	29	2	16	1·4	+13·7	−19·7
5·619	0	9	0	5	358·9	+14·6	− 9·0
Means ...	...	...	2	16	0·05	+14·10	...

Group 5068.

A number of small, faint spots in an irregular cluster on August 6. A spot, *a*, on August 7, followed by a distant companion on August 8. Both these spots have broken up by August 10, and the group forms an irregular stream on August 10 and 11. It slowly diminishes in size on the succeeding days, and is seen as a small, straight, stream.

Date. Greenwich Civil Time.	Projected Area of Umbra.	Projected Area of Whole Spot.	Area for Group. Umbra.	Area for Group. Whole Spot.	Mean Longitude of Group.	Mean Latitude of Group.	Longitude from Central Meridian.
Aug. 6·420	5	46	5	43	306·4	−22·7	−50·9
7·430	12	92	9	65	307·9	−22·0	−36·1
8·449	36	127	22	78	308·2	−22·2	−22·3
9·512	29	145	16	83	308·4	−22·2	− 8·1
10·418	30	137	17	78	307·1	−21·9	+ 2·6
11·178	72	197	42	115	307·3	−22·2	+12·8
12·456	13	145	9	97	307·7	−22·3	+30·2
13·416	16	98	13	76	307·6	−22·5	+42·8
14·604	0	12	0	15	310·1	−23·2	+61·0
15·415	0	3	0	7	309·8	−23·5	+71·4
Means ...	...	...	13	66	308·05	−22·47	...

Group 5069.

A few small spots in a short irregular stream, following Group 5068.

Date. Greenwich Civil Time.	Projected Area of Umbra.	Projected Area of Whole Spot.	Area for Group. Umbra.	Area for Group. Whole Spot.	Mean Longitude of Group.	Mean Latitude of Group.	Longitude from Central Meridian.
Aug. 6·420	0	21	0	101	276·6	−23·5	−80·7
7·430	7	46	10	65	279·2	−21·7	−64·8
8·449	11	77	11	78	276·4	−22·5	−54·1
9·512	13	234	10	92	275·7	−23·2	−40·8
10·418	8	156	5	103	276·3	−22·9	−28·2
11·178	15	93	9	55	276·9	−22·6	−17·6
12·456	3	27	2	15	277·3	−22·1	− 0·2
13·416	0	22	0	13	278·8	−21·3	+14·0
Means ...	...	...	6	65	277·15	−22·48	...

Group 5070.

A few small spots in a straight stream between Groups 5068 and 5069.

Date. Greenwich Civil Time.	Projected Area of Umbra.	Projected Area of Whole Spot.	Area for Group. Umbra.	Area for Group. Whole Spot.	Mean Longitude of Group.	Mean Latitude of Group.	Longitude from Central Meridian.
1903. d					°	°	°
Aug. 8·449	0	12	0	10	289·3	−24·9	−41·2
9·512	22	141	15	94	289·3	−24·3	−27·2
10·418	45	278	28	170	288·7	−24·4	−15·8
11·178	40	342	23	202	288·2	−24·5	− 6·3
12·456	29	181	18	108	288·3	−24·2	+10·8
13·416	5	104	4	67	290·4	−23·4	+25·6
14·604	5	55	4	43	290·6	−22·9	+41·5
15·415	6	19	6	19	292·1	−23·2	+53·7
16·470	0	9	0	15	292·2	−22·6	+67·7
Means ...	...	...	11	81	289·90	−23·82	...

Group 5071.

A small spot.

Date. Greenwich Civil Time.	Projected Area of Umbra.	Projected Area of Whole Spot.	Area for Group. Umbra.	Area for Group. Whole Spot.	Mean Longitude of Group.	Mean Latitude of Group.	Longitude from Central Meridian.
Aug. 10·418	0	16	0	31	232·9	−21·7	−71·6
11·178	2	18	3	22	233·3	−21·8	−61·2
12·456	7	25	6	20	233·3	−21·7	−44·2
13·416	7	26	5	18	233·6	−21·2	−31·2
Means ...	...	...	4	23	233·28	−21·60	...

Group 5072.

A number of small spots in a straight stream.

Date. Greenwich Civil Time.	Projected Area of Umbra.	Projected Area of Whole Spot.	Area for Group. Umbra.	Area for Group. Whole Spot.	Mean Longitude of Group.	Mean Latitude of Group.	Longitude from Central Meridian.
Aug. 11·178	3	29	3	31	232·0	+21·7	−62·5
12·456	28	137	21	102	230·8	+22·2	−46·7
13·416	70	256	41	158	231·8	+21·8	−33·0
14·604	63	156	35	86	232·3	+21·5	−16·8
15·415	43	273	22	143	232·4	+21·6	− 6·0
16·470	87	274	45	143	232·1	+21·4	+ 7·6
17·438	49	263	28	148	232·6	+21·5	+21·0
18·657	14	63	9	42	235·3	+20·7	+39·8
19·485	7	30	6	25	237·2	+20·4	+52·6
20·542	0	9	0	11	236·9	+20·4	+66·3
21·439	0	5	0	11	237·5	+20·2	+78·7
Means ...	...	...	19	82	233·72	+21·22	...

Group 5073.

A single spot on August 12, which has broken up into a cluster of very small spots by August 15.

Date. Greenwich Civil Time.	Projected Area of Umbra.	Projected Area of Whole Spot.	Area for Group. Umbra.	Area for Group. Whole Spot.	Mean Longitude of Group.	Mean Latitude of Group.	Longitude from Central Meridian.
Aug. 12·456	5	27	10	54	204·6	−17·8	−72·9
13·416	14	46	16	50	205·8	−17·2	−59·0
14·604	0	31	0	25	205·1	−18·9	−44·0
15·415	3	36	2	24	204·4	−18·5	−34·0
16·470	4	30	3	18	202·0	−20·6	−22·5
Means ...	...	...	6	34	204·38	−18·60	...

AREAS and HELIOGRAPHIC POSITIONS of GROUPS of SUN SPOTS—*continued.*

Group 5074.

A few small spots in a straight stream *sf* Group 5072.

Date. Greenwich Civil Time.	Projected Area of Umbra.	Projected Area of Whole Spot.	Area for Group. Umbra.	Area for Group. Whole Spot.	Mean Longitude of Group.	Mean Latitude of Group.	Longitude from Central Meridian
1903. d					°	°	°
Aug. 14·604	16	60	9	35	219·5	+18·6	−29·6
15·415	21	89	11	48	219·5	+18·2	−18·9
16·470	12	53	6	26	218·9	+18·1	− 5·6
17·438	0	11	0	5	218·1	+18·1	+ 6·5
Means ...	...	...	7	29	219·00	+18·25	...

Group 5075.

A few small spots preceding Group 5072.

Aug. 19·485	4	12	4	13	246·8	+16·7	+62·2
Means ...	...	...	4	13	246·8	+16·7	...

Group 5076.

A very small, faint spot on August 20. The group is not seen on August 21, but one or two small spots are seen in the same neighbourhood from August 22 to August 26.

Aug. 20·542	0	3	0	3	114·8	−15·4	−55·8
21·439	0	0	0	0	...	...	...
22·433	6	33	4	21	116·7	−14·8	−29·0
23·503	2	23	1	13	117·8	−14·5	−13·8
24·507	0	4	0	2	115·6	−15·0	− 2·6
25·	No pho	tograph.	(2	5	118·0	−14·6	+13·4)
26·180	4	13	3	8	120·3	−14·1	+24·1
Means ...	...	...	1	7	117·20	−14·73	...

Group 5077.

A small, faint spot on August 21. The group is not seen on the next two days, but on August 24 a number of small faint spots are seen in the same neighbourhood.

Aug. 21·439	0	13	0	12	102·5	+25·6	−56·3
22·433	0	0	0	0	...	...	...
23·503	0	0	0	0	...	...	...
24·507	0	41	0	21	104·1	+24·4	−14·1
Means ...	...	...	0	8	103·30	+25·00	..

Group 5078.

Three very small faint spots.

Aug. 24·507	0	14	0	12	165·7	−22·1	+47·5
Means ...	...	...	0	12	165·7	−22·1	...

Group 5079.

A cluster of very small faint spots.

1903. d					°	°	°
Aug. 24·507	0	13	0	7	93·0	+13·6	−25·2
Means ...	...	...	0	7	93·0	+13·6	...

Group 5080.

A pair of small spots, *a* and *b*. *a* has a small companion on August 27. The group consists chiefly, on August 29, of a short stream considerably inclined to the equator, preceded by a few very small faint spots, and, on August 30, of a close cluster of very small spots.

Aug. 27·391	8	49	5	32	54·2	−23·5	−25·9
28·481	4	20	3	12	53·4	−23·5	−12·4
29·441	14	57	9	34	52·9	−23·8	− 0·2
30·175	16	31	9	23	53·4	−24·1	+10·0
Means ...	..	...	7	25	53·48	−23·73	...

Group 5081.

A very small faint spot.

Sept. 1·419	0	4	0	2	13·4	−24·9	− 0·3
Means ...	...	...	0	2	13·4	−24·9	...

Group 5082.

A few very small faint spots on September 9. Only one very small spot *nf* the place of the group on September 9 is seen on September 10.

Sept. 9·410	0	22	0	11	251·2	+17·7	−17·0
10·441	4	10	2	5	248·3	+19·0	− 6·3
11·242	0	8	0	4	251·1	+17·9	+ 7·1
Means ...	...	...	1	7	250·20	+18·20	...

Group 5083.

A regular spot, *a*, which diminishes in size after September 13. Some small companions are seen on September 16 and 17.

Sept. 9·410	10	38	26	104	191·8	−17·9	−76·4
10·441	12	67	15	83	192·5	−18·1	−62·1
11·242	15	119	14	110	192·2	−18·1	−51·8
12·464	23	158	15	108	192·3	−17·6	−35·6
13·483	41	179	25	106	192·2	−17·1	−22·2
14·683	31	109	17	60	191·7	−16·9	− 6·9
15·484	25	109	14	60	191·5	−17·1	+ 3·5
16·436	16	54	9	31	191·1	−17·3	+15·7
17·430	0	15	0	10	190·9	−17·7	+28·6
Means ...	...	...	15	75	191·80	−17·53	...

AREAS and HELIOGRAPHIC POSITIONS of GROUPS of SUN SPOTS—*continued.*

Group 5084.

A very small faint spot.

Date. Greenwich Civil Time.	Projected Area of Umbra.	Projected Area of Whole Spot.	Area for Group. Umbra.	Area for Group. Whole Spot.	Mean Longitude of Group.	Mean Latitude of Group.	Longitude from Central Meridian.
1903. h					°	°	°
Sept. 12·464	0	4	0	3	183·8	−17·7	−44·1
Means ...	...	...	0	3	183·8	−17·7	...

Group 5085.

A few very small spots in a short irregular stream. Only the leader spot, *a*, remains by September 15.

Sept. 14·683	2	29	1	15	208·9	+15·6	+10·3
15·484	8	25	4	13	211·1	+15·1	+23·1
Means ...	...	...	3	14	210·0	+15·35	...

Group 5086.

A few very small spots in a short stream. The leader spot, *a*, alone remains by September 16.

Sept. 15·484	10	25	8	18	223·3	−23·3	+35·3
16·436	2	14	2	13	224·6	−23·5	+49·2
Means ...	...	...	5	16	223·95	−23·40	...

Group 5087.

A few small spots in a short irregular stream. *a*, the darkest spot, on September 16, alone remains by September 18.

Sept. 16·436	22	50	15	33	215·3	+18·8	+39·9
17·430	12	33	11	28	216·2	+19·2	+53·9
18·441	2	9	2	12	217·4	+18·7	+68·4
Means ...	...	...	9	24	216·30	+18·90	...

Group 5088.

A few very small spots forming at the centre of the disc on September 23. The group has developed into a short straight stream by September 24. On the succeeding days, the group consists chiefly of two large spots, *a* and *b*, of which, *a*, the leader, an irregular spot, is the larger.

Sept. 23·187	1	21	0	10	88·2	+13·0	+ 1·8
24·337	14	95	7	50	89·0	+12·3	+18·8
25·639	33	266	21	168	91·4	+12·1	+37·4
26·493	73	418	56	316	91·7	+12·1	+49·0
27·655	39	345	46	396	92·3	+11·8	+64·9
28·255	37	210	62	352	91·2	+12·1	+72·0
29·218	14	78	62	334	91·4	+12·1	+84·5
Means ...	...	...	36	232	90·74	+12·21	...

Group 5089.

A very small spot, *a*, on September 27. Other small spots have appeared following it by September 28, making with it a short irregular stream.

1903. d					°	°	°
Sept. 27·655	0	4	0	3	58·3	−20·4	+30·9
28·255	4	17	3	13	56·7	−20·3	+37·5
29·218	12	41	12	39	58·5	−20·4	+51·6
30·432	2	12	3	22	60·0	−23·2	+69·3
Means ...	...	...	5	19	58·38	−21·08	...

Group 5090.

A very small spot

Oct. 1·375	4	9	3	7	24·0	−19·9	+45·7
Means ...	...	...	3	7	24·00	−19·9	...

Group 5091.

A large regular spot, *a*, followed by a stream of much smaller and fainter spots. The latter have all disappeared by October 12, leaving *a* alone.

Oct. 2·519	12	59	32	157	242·8	+13·2	−80·4
3·480	43	327	54	450	240·9	+13·5	−69·6
4·526	80	515	68	456	240·6	+13·6	−56·1
5·643	102	626	66	415	241·2	+13·7	−40·7
6·125	112	745	67	447	242·5	+13·5	−33·1
7·207	113	637	59	337	244·0	+13·7	−17·3
8·191	102	566	51	288	244·3	+13·4	− 4·0
9·433	89	478	46	248	245·0	+13·1	+13·1
10·452	76	482	43	270	244·3	+13·3	+25·9
11·225	55	379	34	233	243·8	+13·3	+35·6
12·478	44	246	37	205	245·4	+12·9	+53·6
13·408	25	164	29	192	244·6	+13·2	+65·2
14·145	14	89	24	159	244·4	+13·4	+74·7
Means ...	...	...	47	297	243·37	+13·37	..

Group 5092.

A regular spot, *a*, with occasionally a small companion. The group precedes the Great Group 5093.

Oct. 4·526	0	20	0	97	215·6	−20·6	−81·1
5·643	10	57	16	90	214·5	−20·9	−67·4
6·125	13	78	16	94	215·0	−21·2	−60·6
7·207	28	153	23	125	216·2	−21·4	−45·1
8·191	23	201	15	137	214·5	−21·5	−33·8
9·433	34	158	21	94	214·1	−21·7	−17·8
10·452	37	167	21	94	214·6	−21·7	− 3·8
11·225	22	92	13	52	213·9	−22·1	+ 5·7
12·478	5	51	3	31	214·5	−22·0	+22·7
13·408	0	14	0	10	213·7	−22·3	+34·3
Means ...	...	...	13	82	214·66	−21·54	...

AREAS and HELIOGRAPHIC POSITIONS of GROUPS of SUN SPOTS—*continued.*

Group 5093.

Much the largest group of the year. It consists principally of one immense irregular spot of composite structure, sub-divided by bright bridges in a very irregular manner. The great spot has divided into two composite spots, *a* and *b*, by October 12. Of these, *a* steadily diminishes, and *b* increases in area.

Date. Greenwich Civil Time.	Projected Area of Umbra.	Projected Area of Whole Spot.	Area for Group. Umbra.	Area for Group. Whole Spot.	Mean Longitude of Group.	Mean Latitude of Group.	Longitude from Central Meridian.
1903. d					°	°	°
Oct. 5·643	51	399	112	1303	203·8	−20·6	−78·1
6·125	61	581	100	1010	206·3	−21·3	−69·3
7·207	154	1428	161	1494	205·4	−21·5	−55·9
8·191	252	2497	202	2006	204·3	−21·2	−44·0
9·433	331	3091	214	1985	203·2	−20·9	−28·7
10·452	352	3465	205	2015	203·5	−20·8	−14·9
11·225	412	3771	232	2129	203·2	−20·9	− 5·0
12·478	519	3469	299	2000	203·5	−21·3	+11·7
13·408	340	3190	212	1979	203·6	−21·4	+24·2
14·145	350	2790	238	1897	202·7	−21·4	+33·0
15·413	245	2148	226	1903	202·2	−21·6	+49·2
16·405	147	1588	189	1948	201·0	−21·8	+61·0
17·505	48	695	112	1511	198·8	−21·7	+73·4
18·216	29	289	101	990	194·8	−21·8	+78·7
Means ...	...	...	186	1726	202·59	−21·30	...

Group 5094.

A few small spots in a straight stream inclined at a considerable angle to the equator.

Oct. 8·191	14	47	10	35	285·5	−23·2	+37·2
9·433	20	114	21	116	286·4	−21·6	+54·5
10·452	0	128	0	220	287·3	−22·0	+68·9
11·225	0	32	0	78	282·4	−24·5	+74·2
Means ...	...	...	8	112	285·40	−22·83	...

Group 5095.

A fine regular spot, *a*. A small companion is seen near it on October 25.

Oct. 14·145	22	86	46	183	92·3	+14·1	−77·4
15·413	32	174	32	176	92·3	+14·1	−60·7
16·405	38	213	28	158	92·3	+14·3	−47·8
17·505	53	302	32	183	92·0	+14·4	−33·4
18·216	46	299	25	166	92·0	+14·9	−24·1
19·290	63	329	32	169	91·9	+14·7	−10·0
20·160	53	318	27	162	92·2	+14·8	+ 1·7
21·654	56	382	31	209	92·2	+14·8	+21·4
22·472	53	325	32	195	92·6	+15·0	+32·6
23·403	30	249	21	176	92·1	+14·5	+44·4
24·140	44	231	38	196	92·0	+14·5	+54·0
25·245	27	131	36	175	91·8	+14·6	+68·4
26·510	5	39	20	159	90·8	+14·6	+84·1
Means ...	...	...	31	177	92·04	+14·56	...

Group 5096.

A pair of small spots, *a* and *b*, following Group 5093.

1903. d					°	°	°
Oct. 17·505	7	38	6	34	175·2	−20·6	+49·8
18·216	3	22	3	25	175·3	−20·7	+59·2
Means ...	...	...	5	30	175·25	−20·65	...

Group 5097.

A pair of small faint spots.

Oct. 21·654	0	36	0	20	76·4	−17·1	+ 5·6
Means ...	...	...	0	20	76·40	−17·1	...

Group 5098.

A very large composite group, undergoing a continual change of shape. The group has broken up into a long irregular stream by October 31; the following portion of the group being inclined at a considerable angle to the equator and to the preceding portion of the group. This following portion has entirely disappeared by November 4.

Oct. 25·245	4	27	19	119	302·0	−18·5	−81·4
26·510	26	380	41	600	298·1	−19·1	−68·6
27·192	65	583	76	679	296·7	−19·4	−61·0
28·614	87	1090	64	807	297·2	−19·8	−41·7
29·398	148	1140	95	735	296·9	−19·6	−31·6
30·448	187	1160	108	667	297·0	−19·9	−17·7
31·427	209	1216	115	671	297·0	−20·0	− 4·8
Nov. 1·166	170	1103	93	603	297·2	−19·6	+ 5·1
2·402	127	703	76	417	298·1	−19·0	+22·3
3·228	79	360	53	236	299·1	−18·1	+34·2
4·515	58	245	51	213	299·1	−17·3	+51·2
5·452	16	138	19	169	298·7	−17·5	+63·2
6·531	8	54	20	137	298·2	−17·1	+76·8
Means ...	...	...	64	466	298·10	−18·84	...

Group 5099.

A small regular spot, *a*, with a very small companion on November 3.

Oct. 29·398	2	12	5	32	248·5	+14·8	−80·0
30·448	6	17	7	21	248·7	+15·0	−66·0
31·427	12	46	10	38	24[illegible]	+ [illegible]	−5[illegible]
Nov. 1·166	7	30	5	21	248·6	+15·3	−43·5
2·402	10	19	6	11	248·5	+15·3	−27·3
3·228	6	20	3	10	248·0	+15·8	−16·9
4·515	5	10	3	5	248·5	+15·3	+ 0·6
5·452	0	4	0	2	248·2	+15·4	+12·7
Means ...	..	...	5	18	248·[illegible]	+15·[illegible]	...

AREAS and HELIOGRAPHIC POSITIONS of GROUPS of SUN SPOTS—*continued.*

Group 5100.

A fine stream, consisting chiefly of two large regular spots, *a* and *b*.

Date. Greenwich Civil Time.	Projected Area of Umbra.	Projected Area of Whole Spot.	Area for Group. Umbra.	Area for Group. Whole Spot.	Mean Longitude of Group.	Mean Latitude of Group.	Longitude from Central Meridian.
1903. d					°	°	°
Oct. 30·448	50	203	137	623	233·1	+17·9	−81·6
31·427	69	475	94	660	232·6	+17·5	−69·2
Nov. 1·166	117	570	117	571	232·4	+17·5	−59·7
2·402	197	1143	137	803	232·6	+17·2	−43·2
3·228	320	1551	193	942	232·8	+17·2	−32·1
4·515	258	1750	137	933	233·5	+17·0	−14·4
5·452	321	1825	166	941	233·3	+17·1	− 2·2
6·531	298	1656	158	872	233·3	+17·0	+11·9
7·466	256	1585	145	898	233·6	+16·9	+24·5
8·225	238	1285	148	794	233·2	+16·9	+34·2
9·526	153	841	130	697	233·8	+16·7	+51·9
10·265	151	667	165	716	233·9	+16·8	+61·8
11·194	91	384	167	691	233·9	+16·6	+74·1
12·146	17	83	42	205	226·1	+16·5	+78·7
Means ...	...	...	138	739	232·72	+17·06	...

Group 5101.

Two very small spots.

Nov. 2·402	0	25	0	13	268·3	+20·8	− 7·5
Means ...	...	...	0	13	268·3	+20·8	...

Group 5102.

A large spot, *a*, which diminishes in size from day to day. *a* has disappeared by November 8, and a number of small spots scattered over a wide area constitute the group.

Nov. 2·402	10	68	26	175	199·6	−21·9	−76·2
3·228	24	108	32	147	200·2	−21·9	−64·7
4·515	28	135	24	115	199·5	−22·1	−48·4
5·452	34	189	23	132	199·2	−22·3	−36·3
6·531	32	138	19	83	199·3	−22·0	−22·1
7·466	6	137	3	78	198·3	−22·9	−10·8
8·225	12	203	6	114	197·7	−24·0	− 1·3
9·526	4	41	2	24	196·3	−24·5	+14·4
10·265	0	66	0	41	197·4	−24·2	+25·3
11·194	0	10	0	7	198·6	−24·0	+38·8
12·146	2	11	2	10	199·0	−23·0	+51·6
Means ...	...	...	12	84	198·65	−22·98	...

Group 5103.

A very large spot, *a*, with several small companions, following Group 5102. The small spots increase in size, and scatter, whilst *a* diminishes in size, and has disappeared by November 9. The group then, like Group 5102, consists of a great number of small spots scattered over a wide area.

Date. Greenwich Civil Time.	Projected Area of Umbra.	Projected Area of Whole Spot.	Area for Group. Umbra.	Area for Group. Whole Spot.	Mean Longitude of Group.	Mean Latitude of Group.	Longitude from Central Meridian.
1903. d					°	°	°
Nov. 3·228	19	113	43	251	191·1	−23·3	−73·8
4·515	27	211	29	225	190·5	−22·6	−57·4
5·452	54	321	44	258	189·9	−22·1	−45·6
6·531	52	349	34	230	189·7	−22·4	−31·7
7·466	72	299	43	179	189·3	−22·5	−19·8
8·225	60	415	34	233	188·9	−21·1	−10·1
9·526	20	202	11	112	189·9	−21·4	+ 8·0
10·265	29	143	17	82	189·2	−21·7	+17·1
11·194	6	129	4	82	189·7	−22·2	+29·9
12·146	26	92	20	69	189·3	−22·2	+41·9
13·195	0	11	0	10	189·4	−19·9	+55·9
Means ...	...	...	25	157	189·72	−21·95	...

Group 5104.

A very fine stream following Group 5103. The stream is so compact that it is frequently measured as consisting chiefly of one very large composite spot. By November 13, two very large spots, *a* and *b*, have formed at the front and rear of the group respectively.

Nov. 4·515	17	164	59	561	168·9	−23·8	−79·0
5·452	64	458	105	752	166·8	−24·1	−68·7
6·531	92	764	96	809	164·8	−24·3	−56·6
7·466	109	1150	88	925	164·3	−24·2	−44·8
8·225	124	1274	86	879	162·8	−24·5	−36·2
9·526	210	1471	125	882	163·3	−24·4	−18·6
10·265	213	1349	122	775	163·0	−24·5	− 9·1
11·194	193	1356	109	771	163·8	−24·9	+ 4·0
12·146	233	1389	139	828	163·1	−25·3	+15·7
13·195	192	1163	126	767	163·4	−25·1	+29·9
14·561	78	682	70	588	163·9	−25·0	+48·4
15·154	96	463	102	483	164·2	−25·0	+56·5
16·228	47	266	88	462	163·7	−24·8	+70·2
17·298	3	37	12	132	159·7	−25·0	+80·2
Means ...	...	...	95	687	163·98	−24·64	...

Group 5104.*

One or two small spots forming very close to Group 5104, but north and preceding it. The group expands rapidly into a fine straight stream, of which the leader, *a*, is the best defined, and moves forward the most rapidly in longitude.

Nov. 6·531	0	30	0	29	166·7	−22·3	−54·7
7·466	0	22	0	16	168·2	−21·2	−40·9
8·225	2	55	1	35	167·9	−21·9	−31·1
9·526	26	221	15	126	168·3	−21·3	−13·6
10·265	27	257	15	141	167·8	−21·5	− 4·3
11·194	27	232	16	130	168·7	−21·5	+ 8·9

AREAS and HELIOGRAPHIC POSITIONS of GROUPS of SUN SPOTS—*continued.*

Group 5104*—*continued.*

Date. Greenwich Civil Time.	Projected Area of Umbra.	Projected Area of Whole Spot.	Area for Group. Umbra.	Area for Group. Whole Spot.	Mean Longitude of Group.	Mean Latitude of Group.	Longitude from Central Meridian.
1903. d					°	°	°
Nov. 12·146	29	202	17	121	170·1	−21·3	+22·7
13·195	33	227	23	155	169·5	−21·5	+36·0
14·561	45	368	45	381	172·6	−21·8	+57·1
15·154	45	342	64	455	172·4	−22·0	+64·7
16·228	18	152	43	357	169·2	−21·5	+75·7
Means ...	...	...	22	177	169·22	−21·62	...

Group 5105.

A pair of very small faint spots.

Nov. 5·452	0	17	0	10	221·8	−26·1	−13·7
Means ...	...	...	0	10	221·8	−26·1	...

Group 5106.

A few very small faint spots in a short stream.

Nov. 6·531	6	38	3	22	195·8	− 7·4	−25·6
7·466	0	14	0	7	196·8	− 7·9	−12·3
Means ...	...	...	2	15	196·3	− 7·65	...

Group 5107.

A very small spot, seen only close to the limb in a great mass of faculæ.

Nov. 10·265	0	3	0	8	96·0	−24·5	−76·1
11·194	0	4	0	5	95·6	−24·6	−64·2
Means ...	...	...	0	7	95·8	−24·55	...

Group 5108.

A very small spot, seen only close to the limb in a great mass of faculæ.

Nov. 13·195	0	6	0	10	64·0	−21·1	−69·5
Means ...	...	...	0	10	64·0	−21·1	...

Group 5109.

A small faint spot.

Nov. 14·561	0	13	0	8	94·2	−23·6	−21·3
Means ...	...	...	0	8	94·2	−23·6	...

Group 5109.*

A small faint spot forming a very wide pair with Group 5109.

1903. d					°	°	°
Nov. 14·561	0	13	0	8	92·0	−18·9	−23·5
Means ...	...	...	0	8	92·0	−18·9	...

Group 5110.

A small spot, seen only near the limb in a mass of faculæ.

Nov. 14·561	0	18	0	15	64·6	+21·7	−50·9
Means ...	...	...	0	15	64·6	+21·7	...

Group 5111.

A small regular spot, *a*, with a very small companion on November 23 and 24.

Nov. 16·228	8	22	17	48	18·0	−17·3	−75·5
17·298	6	35	7	39	18·8	−16·7	−60·7
18·542	8	41	6	30	19·5	−16·5	−43·5
19·498	21	68	13	42	20·7	−16·1	−29·7
20·237	15	41	8	23	20·7	−16·5	−20·0
21·	No photograph.		(7	17	21·6	−16·2	− 6·6)
22·144	9	19	5	10	22·5	−15·9	+ 6·9
23·237	6	17	4	10	23·0	−15·7	+21·8
24·596	6	27	4	19	23·8	−15·4	+40·6
Means ...	...	...	8	26	20·96	−16·26	...

Group 5112.

A very small spot, seen only close to the limb in a mass of faculæ.

Nov. 20·237	0	6	0	9	334·9	−19·8	−65·8
Means ...	...	...	0	9	334·9	−19·8	...

Group 5104.†

A close pair of very small spots measured together *nf* Group 5104.

Nov. 16·228	2	6	2	6	150·5	−18·4	+57·0
Means ...	...	...	2	6	150·5	−18·4	...

AREAS and HELIOGRAPHIC POSITIONS of GROUPS of SUN SPOTS—*continued.*

Group 5113.

A few very small spots scattered over a wide area of Group 5111. The group is not seen on November 23 and 24, but has revived by November 25, after the disappearance of Group 5111. The different components of the groups are exceedingly unstable.

Date. Greenwich Civil Time.	Projected Area of Umbra.	Projected Area of Whole Spot.	Area for Group. Umbra.	Area for Group. Whole Spot.	Mean Longitude of Group.	Mean Latitude of Group.	Longitude from Central Meridian.
1903. d					°	°	°
Nov. 22·144	0	18	0	11	13·9	−22·5	− 1·7
23·237	0	0	0	0	...	...	...
24·596	0	0	0	0	...	...	...
25·496	4	54	3	41	14·9	−23·6	+43·6
26·187	0	24	0	22	14·6	−22·8	+52·4
27·240	0	14	0	19	14·4	−21·2	+66·0
Means ...	...	...	1	16	14·45	−22·53	...

Group 5114.

A small faint spot.

Nov. 24·596	0	34	0	19	333·4	−20·8	− 9·8
Means ...	...	...	0	19	333·4	−20·8	...

Group 5115.

A large spot, *a*, diminishing in size from day to day, and usually seen with some small companions.

Nov. 24·596	10	53	18	96	270·8	−19·0	−72·4
25·496	14	113	15	121	271·2	−18·6	−60·1
26·187	21	122	18	102	271·5	−18·7	−50·7
27·240	21	114	14	76	271·6	−18·6	−36·8
28·201	24	141	14	83	271·5	−18·9	−24·2
29·159	19	126	10	68	272·1	−18·7	−11·0
30·162	29	128	16	67	271·8	−18·7	+ 1·9
Dec. 1·149	5	72	3	40	271·7	−19·5	+14·9
2·537	1	16	0	10	272·4	−18·4	+33·9
Means ...	...	...	12	74	271·62	−18·79	...

Group 5116.

Two large regular spots, *a* and *b*. A third, but much smaller spot, is seen preceding *a* on November 28, and the succeeding days. Very small companions are occasionally seen near *a* and *b*.

Nov. 27·240	24	148	55	330	231·6	+17·0	−76·8
28·201	44	251	52	303	231·0	+16·9	−64·7
29·159	64	350	53	293	231·2	+16·6	−51·9
30·162	70	362	46	241	230·3	+16·7	−39·6

Group 5116—*continued.*

1903 d					°	°	°
Dec. 1·149	71	369	41	215	230·1	+16·5	−26·7
2·537	73	394	38	208	229·4	+16·6	− 9·1
3·207	79	380	41	197	229·1	+16·5	− 0·5
4·530	58	360	31	196	229·4	+16·4	+17·1
5·177	57	287	32	164	228·8	+16·2	+25·1
6·201	48	232	32	156	229·4	+16·1	+39·1
7·190	21	150	18	125	228·4	+15·9	+51·1
8·199	18	90	22	108	228·3	+15·7	+64·3
Means ...	...	...	38	211	229·75	+16·43	...

Group 5117.

A regular spot, *a*, slowly diminishing in size from day to day. A portion has broken off from *a* by December 3, and several small spots have appeared following it. These small spots are very unstable, and *a* is seen alone on December 5 and after December 6. *a* has disappeared by December 11, but a very small spot marks the place of the group on December 12.

Dec. 1·149	5	32	13	77	179·8	−20·1	−77·0
2·537	10	62	10	65	179·2	−19·9	−59·3
3·207	18	79	15	69	177·8	−20·2	−51·8
4·530	20	99	13	63	178·3	−20·2	−34·0
5·177	13	81	8	48	178·7	−20·3	−25·0
6·201	28	101	15	55	175·7	−21·1	−14·6
7·190	18	29	9	15	179·1	−20·5	+ 1·8
8·199	17	29	9	16	179·5	−20·8	+15·5
9·593	0	47	0	30	179·3	−20·6	+33·7
10·273	2	13	1	7	179·5	−20·9	+42·9
11·164	0	0	0	0	...	...	...
12·195	0	4	0	5	176·3	−19·3	+65·0
Means ...	...	...	8	38	178·47	−20·35	...

Group 5118.

A few small spots in an irregular stream.

Dec. 2·537	2	44	1	24	224·3	−17·8	−14·2
3·207	12	44	6	23	223·8	−17·7	− 5·8
4·530	7	76	4	42	225·5	−17·8	+13·2
5·177	2	28	1	16	224·2	−17·9	+20·5
6·201	11	29	7	19	226·5	−16·5	+36·2
7·190	6	42	5	33	226·5	−16·2	+49·2
8·199	4	31	4	35	226·2	−16·1	+62·2
Means ...	...	...	4	27	225·29	−17·14	...

AREAS and HELIOGRAPHIC POSITIONS of GROUPS of SUN SPOTS—*continued.*

Group 5119.

A very wide area of disturbance. The group forms, for the most part, two streams at right angles to each other; the first stream lying north and south, and the second east and west. On December 5, the group shows three principal spots: a regular spot, *a*, to the north; almost due south of it, a large double spot, *b*, at the right angle of the group; and due east of *b*, a second large double spot, *c*. Spot *c* has divided into two parts, *d* and *e* by December 7, and a number of small faint spots have begun to form between *a* and *b* on the same date. *d* and *e* have both broken up by December 9, and the following portion of the group consists of a number of small faint widely scattered spots. A number of small spots have formed near *a* by December 10, and *b* has begun to break up by December 11, and is measured in two portions on December 12.

Date. Greenwich Civil Time.	Projected Area of Umbra.	Projected Area of Whole Spot.	Area for Group. Umbra.	Area for Group. Whole Spot.	Mean Longitude of Group.	Mean Latitude of Group.	Longitude from Central Meridian.
1903. d					°	°	°
Dec. 2·537	6	47	19	148	158·2	−16·3	−80·3
3·207	7	89	14	175	155·2	−17·9	−74·4
4·530	57	602	59	636	152·8	−20·5	−59·5
5·177	86	540	71	461	152·7	−20·7	−51·0
6·201	133	689	89	458	153·4	−20·5	−36·9
7·190	117	669	67	394	153·2	−20·4	−24·1
8·199	115	716	63	390	153·3	−20·5	−10·7
9·593	53	595	28	322	153·9	−20·2	+ 8·3
10·273	44	474	25	266	154·1	−20·4	+17·5
11·164	61	405	36	241	153·4	−20·5	+28·6
12·195	24	200	18	145	154·0	−20·9	+42·7
13·191	39	267	35	239	151·2	−21·8	+53·0
14·412	5	156	6	198	147·1	−23·4	+65·0
Means ...	...	...	41	313	153·27	−20·31	...

Group 5120.

A large double spot, *a*, due south of Group 5119. *b*, the two components of *a* are usually measured together, they are taken separately on December 7. The spot is quite broken up by December 10.

Date.	Projected Area of Umbra.	Projected Area of Whole Spot.	Area for Group. Umbra.	Area for Group. Whole Spot.	Mean Longitude of Group.	Mean Latitude of Group.	Longitude from Central Meridian.
Dec. 2·537	4	33	13	115	158·1	−26·6	−80·4
3·207	6	73	13	147	156·0	−27·2	−73·6
4·530	22	130	22	132	156·1	−27·4	−56·2
5·177	24	141	20	120	155·4	−27·5	−48·3
6·201	36	152	25	106	154·7	−27·9	−35·6
7·190	38	138	24	85	154·3	−27·8	−23·0
8·199	40	133	23	77	153·8	−28·4	−10·2
9·593	6	119	4	68	153·2	−28·0	+ 7·6
10·273	14	66	8	38	153·1	−28·8	+16·5
11·164	5	18	3	12	151·8	−28·6	+27·0
Means ...	...	...	16	90	154·65	−27·82	...

Group 5121.

A few small faint unstable spots.

Date.	Projected Area of Umbra.	Projected Area of Whole Spot.	Area for Group. Umbra.	Area for Group. Whole Spot.	Mean Longitude of Group.	Mean Latitude of Group.	Longitude from Central Meridian.
Dec. 3·207	0	4	0	3	206·1	−26·5	−23·5
4·530	0	31	0	17	203·7	−25·6	− 8·6
Means ...	...	...	0	10	204·90	−26·05	...

Group 5122.

A few very small faint spots.

Date.	Projected Area of Umbra.	Projected Area of Whole Spot.	Area for Group. Umbra.	Area for Group. Whole Spot.	Mean Longitude of Group.	Mean Latitude of Group.	Longitude from Central Meridian.
1903. d					°	°	°
Dec. 3·207	0	10	0	7	187·4	−23·0	−42·2
Means ...	...	...	0	7	187·4	−23·0	...

Group 5123.

One or two very small faint spots seen only near the limb in a mass of faculæ.

Date.	Projected Area of Umbra.	Projected Area of Whole Spot.	Area for Group. Umbra.	Area for Group. Whole Spot.	Mean Longitude of Group.	Mean Latitude of Group.	Longitude from Central Meridian.
Dec. 4·530	0	25	0	22	265·0	+20·3	+52·7
5·177	0	6	0	7	267·4	+19·2	+63·7
6·201	0	3	0	7	266·1	+19·0	+75·8
Means ...	...	...	0	12	266·17	+19·50	...

Group 5124.

A very small spot.

Date.	Projected Area of Umbra.	Projected Area of Whole Spot.	Area for Group. Umbra.	Area for Group. Whole Spot.	Mean Longitude of Group.	Mean Latitude of Group.	Longitude from Central Meridian.
Dec. 6·201	2	9	1	4	201·5	+11·6	+11·2
Means ...	...	...	1	4	201·5	+11·6	...

Group 5125.

A few very small unstable spots forming in front of Group 5119. The group is not seen on December 8, or December 10.

Date.	Projected Area of Umbra.	Projected Area of Whole Spot.	Area for Group. Umbra.	Area for Group. Whole Spot.	Mean Longitude of Group.	Mean Latitude of Group.	Longitude from Central Meridian.
Dec. 7·190	4	30	2	16	162·0	−16·8	−15·3
8·199	0	0	0	0	...	...	...
9·593	0	25	0	14	160·4	−15·1	+14·8
10·273	0	0	0	0	...	...	...
11·164	4	59	2	37	159·7	−15·5	+34·9
Means ...	...	...	1	13	160·70	−15·80	...

Group 5126.

A large regular spot, *a*, with one or two very small companions on December 10. *a* is crossed by a bright bridge on December 9, making it a double spot, the two components of which have completely separated to form the spots *b* and *c* by December 13. *b* alone remains by December 16.

Date.	Projected Area of Umbra.	Projected Area of Whole Spot.	Area for Group. Umbra.	Area for Group. Whole Spot.	Mean Longitude of Group.	Mean Latitude of Group.	Longitude from Central Meridian.
Dec. 7·190	13	70	33	182	98·8	+14·1	−78·5
8·199	25	143	31	176	98·8	+13·9	−65·2
9·593	39	312	29	227	99·0	+13·5	−46·6
10·273	39	290	25	189	98·8	+13·8	−37·8
11·164	141	294	20	170	98·6	+13·7	−26·2
12·195	52	341	27	179	98·7	+13·6	−12·6
13·191	51	345	27	178	98·6	+13·9	+ 0·4
14·412	56	257	31	140	99·5	+14·1	+17·4

AREAS and HELIOGRAPHIC POSITIONS of GROUPS of SUN SPOTS—*continued.*

Date. Greenwich Civil Time.	Projected Area of Umbra.	Projected Area of Whole Spot.	Area for Group. Umbra.	Area for Group. Whole Spot.	Mean Longitude of Group.	Mean Latitude of Group.	Longitude from Central Meridian.
Group 5126—*continued.*							
1903. d					°	°	°
Dec. 15·478	34	228	21	139	99·3	+14·1	+31·2
16·486	20	172	14	126	99·5	+14·0	+44·7
17·452	16	111	15	107	98·7	+13·6	+56·7
18·189	13	73	17	97	99·0	+14·0	+66·7
19·194	4	31	13	97	99·3	+14·3	+80·2
Means ...	...	...	23	154	98·89	+13·89	...
Group 5121.* A short stream, apparently a recrudescence of Group 5121.							
Dec. 7·190	12	38	7	24	203·7	−28·5	+26·4
8·199	11	32	8	24	204·1	−28·3	+40·1
9·593	19	132	19	138	202·5	−28·6	+56·9
10·273	29	145	40	209	203·5	−29·0	+66·9
11·164	11	84	26	216	202·4	−29·4	+77·6
Means ...	...	...	20	122	203·24	−28·76	...
Group 5127. A very small faint spot preceding Group 5119.							
Dec. 8·199	0	18	0	10	168·9	−22·5	+ 4·9
Means ...	...	...	0	10	168·9	−22·5	...
Group 5128. A few very small faint spots following Group 5119.							
Dec. 8·199	5	13	3	7	137·1	−16·1	−26·9
Means ...	...	...	3	7	137·1	−16·1	...
Group 5129. A large regular spot, *a*, with one or two small companions on December 10 and 13, and the succeeding days.							
Dec. 8·199	17	110	35	234	88·6	+20·3	−75·4
9·593	27	304	27	302	88·0	+20·0	−57·6
10·273	44	309	36	254	87·3	+20·3	−49·3
11·164	55	364	38	248	86·7	+20·1	−38·1
12·195	87	456	52	270	86·3	+19·9	−25·0
13·191	96	519	52	283	85·9	+19·7	−12·3
14·412	112	593	60	318	87·0	+19·2	+ 4·9
15·478	100	595	56	334	86·6	+19·2	+18·5
16·486	103	598	65	377	86·6	+19·2	+31·8
17·452	67	519	51	393	86·4	+18·8	+44·4
18·189	68	400	63	371	86·8	+19·3	+54·5
19·194	45	232	65	336	87·1	+19·2	+68·0
20·291	17	72	63	276	86·2	+19·0	+81·5
Means ...	...	...	51	307	86·88	+19·55	...
Group 5130. A small spot and a very faint companion forming due north of Group 5126.							
1903. d					°	°	°
Dec. 10·273	5	21	4	14	100·6	+21·0	−36·0
Means ...	...	...	4	14	100·6	+21·0	...
Group 5131. A double spot with the major axis at right angles to the equator. The group has broken up into a stream of small spots by December 14.							
Dec. 10·273	5	65	15	204	56·5	−23·0	−80·1
11·164	9	89	13	132	56·2	−23·2	−68·6
12·195	27	128	26	124	55·3	−23·2	−56·0
13·191	29	164	22	123	54·7	−23·3	−43·5
14·412	15	109	9	68	55·3	−23·6	−26·8
15·478	13	95	7	54	54·3	−24·4	−13·8
16·486	6	50	3	28	55·0	−24·3	+ 0·2
17·452	0	18	0	10	55·3	−24·4	+13·3
18·189	5	29	3	18	54·1	−25·1	+21·8
19·194	0	17	0	12	54·6	−24·2	+35·5
Means ...	...	...	10	77	55·13	−23·87	...
Group 5132. A few very small spots forming south of Group 5125.							
Dec. 11·164	0	4	0	3	161·7	−21·7	+36·9
Means ...	...	...	0	3	161·7	−21·7	...
Group 5133. A very small spot following Group 5120.							
Dec. 11·164	0	6	0	4	145·9	−30·8	+21·1
Means ...	...	...	0	4	145·9	−30·8	...
Group 5134. A large regular spot, *a*, with a very small companion on December 18 and 19. *a* has become a double spot by December 19, and has completely divided into two spots, *b* and *c*, by December 20.							
Dec. 15·478	12	57	32	156	349·7	+21·9	−78·4
16·486	29	125	39	167	349·3	+22·1	−65·5
17·452	34	225	32	209	348·8	+22·0	−53·2
18·189	53	249	41	191	348·4	+22·0	−43·9
19·164	50	308	32	196	348·2	+22·4	−30·9
20·291	53	253	31	144	348·3	+22·6	−16·4
21·510	38	183	21	101	348·4	+22·1	− 0·2
22·175	37	153	21	85	348·5	+22·4	+ 8·6
23·180	18	88	10	53	348·2	+22·5	+21·6
24·187	14	46	10	31	348·5	+22·3	+35·2

AREAS and HELIOGRAPHIC POSITIONS of GROUPS of SUN SPOTS—*continued.*

Group 5134—*continued.*

Date. Greenwich Civil Time.	Projected Area of Umbra.	Projected Area of Whole Spot.	Area for Group. Umbra.	Area for Group. Whole Spot.	Mean Longitude of Group.	Mean Latitude of Group.	Longitude from Central Meridian.
1903. d					°	°	°
Dec. 25·161	0	16	0	13	348·5	+22·3	+48·0
26·303	0	8	0	10	347·7	+23·3	+62·1
27·434	6	51	17	168	350·0	+23·1	+79·5
Means ...	...	...	22	117	348·65	+22·38	...

Group 5135.

A small spot. The group is not seen on December 19 or 20, but there has been a sudden revival by December 21. The group is seen as a straight stream of spots of which *a* and *b*, the first and last, are the largest.

Dec. 16·486	3	21	2	13	24·6	+16·1	−30·2
17·452	0	8	0	4	26·3	+15·9	−15·7
18·189	0	10	0	5	26·7	+16·0	− 5·6
19·194	0	0	0	0	...	...	...
20·291	0	0	0	0	...	...	...
21·510	49	218	31	140	23·4	+14·7	+34·8
22·175	46	256	35	187	24·8	+15·4	+44·9
23·180	32	185	33	193	26·0	+15·7	+59·4
24·187	16	85	30	168	27·4	+15·7	+74·1
Means ...	...	...	15	79	25·60	+15·64	...

Group 5136.

A small faint spot on December 17. A few small spots in a short stream on the succeeding days.

Dec. 17·452	2	43	2	32	357·7	−18·1	−44·3
18·189	7	27	5	17	358·2	−17·8	−34·1
19·194	10	61	5	34	358·3	−17·4	−20·8
20·291	27	96	14	49	358·8	−17·1	− 5·9
21·510	1	65	1	35	358·2	−17·2	+ 9·6
22·175	4	18	2	10	358·3	−16·5	+18·4
23·180	0	9	0	6	2·3	−18·5	+35·7
Means ...	...	...	4	26	358·83	−17·51	...

Group 5137.

A pair of very small spots, *a* and *b*.

Dec. 17·452	0	19	0	23	338·9	+13·2	−63·1
18·189	2	11	2	9	339·4	+13·3	−52·9
Means ...	...	...	1	16	339·15	+13·25	...

Group 5138.

A pair of very small spots.

Dec. 20·291	0	18	0	12	45·5	−19·5	+40·8
21·510	0	16	0	17	48·3	−24·5	+59·7
Means ...	...	...	0	15	46·9	−22·0	...

Group 5139.

A small spot, only seen close to the limb in a mass of faculæ.

Date. Greenwich Civil Time.	Projected Area of Umbra.	Projected Area of Whole Spot.	Area for Group. Umbra.	Area for Group. Whole Spot.	Mean Longitude of Group.	Mean Latitude of Group.	Longitude from Central Meridian.
1903. d					°	°	°
Dec. 24·187	0	6	0	13	237·6	+17·5	−75·7
Means ...	...	...	0	13	237·6	+17·5	...

Group 5140.

A pair of regular spots, *a* and *b*. *b* has a small companion on December 29.

Dec. 28·135	16	100	26	169	188·9	−22·5	−72·4
29·416	31	188	29	179	188·2	−21·7	−56·3
30·440	22	136	15	98	188·8	−22·1	−42·2
31·233	17	165	11	104	190·0	−22·7	−30·6
1904.							
Jan. 1·138	28	114	16	64	188·6	−22·3	−20·0
2·510	15	91	8	48	187·0	−21·5	− 3·5
3·139	19	62	10	33	187·3	−21·1	+ 5·0
Means ...	...	...	16	99	188·40	−21·99	...

Group 5141.

A small spot, *a*, on December 29. A second, *b*, has formed following it by December 30.

1903.							
Dec. 29·416	0	9	0	5	234·8	+13·1	− 9·7
30·440	5	44	2	23	233·2	+13·9	+ 2·2
Means ...	...	...	1	14	234·0	+13·5	...

Group 5142.

The leader, *a*, is the largest spot of the group, and is a large regular spot. The last spot, *b*, is the next in size.

Dec. 29·416	15	121	26	200	172·1	−14·0	−72·4
30·440	47	334	48	345	170·6	−13·8	−60·4
31·233	49	365	39	291	170·5	−14·1	−50·1
1904.							
Jan. 1·138	67	453	44	290	170·9	−14·5	−37·7
2·510	86	431	47	232	171·6	−14·5	−18·9
3·139	65	333	34	173	171·5	−14·8	−10·8
4·413	45	335	23	172	171·9	−14·4	+ 6·5
5·478	35	239	18	129	172·0	−14·2	+20·6
6·138	26	207	15	122	172·1	−14·4	+29·3
7·134	24	190	17	130	172·6	−14·6	+43·0
8·157	10	98	9	90	173·0	−14·8	+56·9
9·132	5	54	8	79	173·5	−14·9	+70·3
Means ...	...	...	27	188	171·86	−14·42	...

ROYAL OBSERVATORY, GREENWICH.

TOTAL PROJECTED 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

1903.

TOTAL PROJECTED AREAS of SUN SPOTS and FACULÆ for EACH DAY in the YEAR 1903.

The Projected Area is the Area as it is measured on the photograph, uncorrected for the effect of foreshortening, and expressed in millionths of the Sun's apparent disk.

The Greenwich Civil Time is expressed by the month, day of the month (civil reckoning), and decimal of a day, reckoned from Greenwich Mean Midnight.

Dates for which the decimal of a day is not given, indicate days for which no photographic Record is at present available. The areas given for these days are enclosed in brackets, and are obtained by interpolation from the measures of photographs taken on the days immediately preceding and following.

Greenwich Civil Time.		Projected Area.		
		Umbræ.	Whole Spots.	Faculæ.
1903.	d			
Jan.	1·5	0	0	45
	2·2	0	0	95
	3·5	1	23	0
	4·5	18	86	99
	5·2	33	167	102
	6·2	22	130	206
	7·4	6	65	296
	8·3	2	18	371
	9·5	0	0	825
	10·5	0	0	563
	11·2	0	0	45
	12·5	0	0	885
	13·5	0	0	59
	14·4	0	0	36
	15·5	0	0	0
	16·5	0	0	409
	17·2	0	0	158
	18·3	0	11	0
	19·2	8	39	454
	20·2	11	45	388
	21·3	1	23	406
	22·3	10	33	0
	23·4	17	180	0
	24·2	5	33	425
	25	(0	0	283)
	26·4	0	18	141
	27·2	0	0	0
	28·4	8	71	431
	29·5	6	140	182
	30·5	13	131	0
	31·4	6	80	0
Feb.	1·5	10	70	545
	2·4	14	73	272
	3·4	11	35	749
	4·2	4	16	272
	5·2	0	0	153
	6·5	3	26	210
	7·2	6	25	385
	8·2	0	6	1049
	9·6	6	74	114
	10·5	52	258	752
	11·5	63	397	1094
	12·5	55	360	771
	13·6	68	342	148
	14·2	32	222	0

Greenwich Civil Time.		Projected Area.		
		Umbræ.	Whole Spots.	Faculæ.
1903.	d			
Feb.	15·2	41	187	396
	16·5	25	133	2132
	17·5	28	132	1402
	18·4	17	62	415
	19·4	11	93	722
	20·5	31	227	1522
	21·2	20	118	682
	22·2	16	67	370
	23·6	31	95	168
	24·2	32	140	366
	25·4	92	427	721
	26·5	92	417	1099
	27·2	56	328	258
	28·1	34	245	149
Mar.	1·5	48	260	433
	2·3	30	204	441
	3·6	21	105	469
	4·5	11	45	227
	5·2	4	15	347
	6·4	0	0	497
	7·2	0	0	128
	8·5	0	0	418
	9·5	0	16	150
	10	(0	0	336)
	11·4	0	0	522
	12·3	0	10	283
	13·5	17	72	29
	14·2	6	25	87
	15·2	0	0	182
	16·4	0	0	116
	17·2	0	0	0
	18·6	0	0	865
	19	(0	0	709)
	20	(0	0	552)
	21·4	12	95	396
	22·5	37	263	918
	23·3	57	381	746
	24·5	90	458	1347
	25·4	83	436	1494
	26·4	73	449	0
	27·6	98	695	350
	28·2	88	742	300
	29·5	158	1014	0
	30·5	176	1127	350
	31·4	118	817	722

Greenwich Civil Time.		Projected Area.		
		Umbræ.	Whole Spots.	Faculæ.
1903.	d			
Apr.	1·2	132	654	1206
	2·3	103	407	979
	3·5	73	424	1112
	4·2	91	562	936
	5·4	115	660	2272
	6·5	118	728	1214
	7·4	142	874	293
	8·5	128	772	530
	9·2	90	731	263
	10·5	122	733	658
	11	(98	693	917)
	12·4	66	572	1175
	13·5	32	360	1604
	14·4	15	143	1166
	15·6	0	0	118
	16·4	0	0	233
	17·3	0	0	142
	18·4	0	0	645
	19·5	9	61	852
	20·4	2	14	732
	21·2	4	16	457
	22·4	0	66	631
	23·5	19	116	2030
	24·2	45	242	1913
	25·4	36	238	1053
	26·2	61	354	87
	27·6	131	694	1274
	28·6	161	954	1349
	29·5	198	1081	518
	30·5	246	1493	647
May	1·2	162	986	306
	2·5	40	573	3282
	3·2	44	402	2934
	4·5	4	145	1789
	5·2	6	39	702
	6	(0	0	495)
	7·5	0	8	287
	8·4	0	0	198
	9·2	0	0	0
	10·5	0	0	221
	11·2	0	0	568
	12·5	0	6	295
	13·2	0	11	435
	14·2	8	23	472
	15·2	6	11	361

Greenwich Civil Time.		Projected Area.		
		Umbræ.	Whole Spots.	Faculæ.
1903.	d			
May	16·2	4	20	816
	17·2	0	28	730
	18·3	0	8	463
	19·2	7	19	693
	20·5	11	87	992
	21·4	31	201	1912
	22·4	18	146	1643
	23·5	10	42	816
	24·6	0	48	192
	25·4	5	78	852
	26·6	23	134	886
	27·5	12	126	708
	28·6	0	18	1099
	29·3	0	0	612
	30·1	0	10	908
	31·5	0	0	886
June	1·4	0	0	360
	2·6	0	0	144
	3·2	0	0	216
	4·5	0	0	0
	5·5	1	43	207
	6·6	0	0	0
	7·1	0	0	263
	8·4	0	68	306
	9·5	0	0	135
	10·1	3	23	151
	11·2	11	32	57
	12·1	4	23	271
	13·3	6	49	433
	14·2	7	47	818
	15·3	0	18	841
	16·5	6	126	1805
	17·4	5	47	1308
	18·4	11	64	2308
	19	(32	141	1308)
	20·2	127	495	308
	21	(134	672	317)
	22·4	115	762	325
	23·5	120	713	1210
	24·2	58	465	356
	25·4	46	316	1210
	26·4	48	232	1943
	27·5	20	126	1679
	28·5	10	35	777
	29·4	0	0	394
	30·5	0	90	0

TOTAL PROJECTED AREAS of SUN SPOTS and FACULÆ—*concluded.*

Greenwich Civil Time.		Projected Area. Umbræ.	Whole Spots.	Faculæ.
1903.	d			
July	1·6	37	221	530
	2·4	62	332	1198
	3·4	64	380	3145
	4·5	90	458	3720
	5·2	98	468	805
	6·4	104	523	424
	7·4	141	597	315
	8·4	177	997	0
	9·4	216	1137	0
	10·4	212	1118	968
	11·4	181	926	2178
	12	(110	522	2989)
	13·5	80	381	3799
	14·5	64	290	2692
	15·4	36	288	1859
	16·2	21	134	764
	17·4	15	103	644
	18·5	14	119	128
	19	(12	122	646)
	20	(9	103	1164)
	21·4	7	68	1682
	22·6	5	15	1101
	23·6	4	17	1263
	24·5	36	144	575
	25·5	124	511	835
	26·6	87	401	456
	27·2	58	301	433
	28	(28	237	1464)
	29·5	13	187	2494
	30·4	10	145	2627
	31·1	0	19	1480
Aug.	1·2	0	36	709
	2·5	6	45	1030
	3·4	1	24	211
	4·6	3	29	214
	5·6	0	22	639
	6·4	5	67	1726
	7·4	19	137	2633
	8·4	47	216	1393
	9·5	64	520	1338
	10·4	84	587	2653
	11·2	131	679	1191
	12·5	85	541	1275
	13·4	112	552	2491
	14·6	84	314	2285
	15·4	72	420	2532
	16·5	104	366	1952

Greenwich Civil Time.		Projected Area. Umbræ.	Whole Spots.	Faculæ.
1903.	d			
Aug.	17·4	49	273	1560
	18·7	14	63	181
	19·5	11	43	1283
	20·5	0	12	1564
	21·4	0	18	1686
	22·4	6	33	1818
	23·5	2	23	227
	24·5	0	72	968
	25	(4	10	928)
	26·2	4	13	888
	27·4	8	49	1232
	28·5	4	20	1221
	29·4	14	57	449
	30·2	16	31	899
	31·4	0	0	850
Sept.	1·4	0	4	536
	2·4	0	0	621
	3·4	0	0	515
	4·4	0	0	907
	5·3	0	0	1364
	6·2	0	0	774
	7·4	0	0	300
	8	(0	0	602)
	9·4	10	60	904
	10·4	15	77	549
	11·2	15	127	726
	12·5	23	162	687
	13·5	41	179	393
	14·7	33	138	760
	15·5	43	158	831
	16·4	40	118	927
	17·4	12	48	1047
	18·4	2	9	2265
	19·5	0	0	1871
	20·5	0	0	530
	21·4	0	0	426
	22·3	0	0	79
	23·2	1	21	753
	24·3	14	95	370
	25·6	33	266	769
	26·5	73	418	306
	27·7	39	349	271
	28·3	40	227	1102
	29·2	26	119	739
	30·4	2	12	674

Greenwich Civil Time.		Projected Area. Umbræ.	Whole Spots.	Faculæ.
1903.	d			
Oct.	1·4	4	9	329
	2·5	12	59	495
	3·5	43	327	1054
	4·5	80	535	967
	5·6	163	1072	859
	6·1	186	1404	1386
	7·2	295	2219	2278
	8·2	390	3311	1971
	9·4	474	3840	333
	10·5	466	4242	232
	11·2	489	4274	767
	12·5	569	3766	1133
	13·4	365	3368	631
	14·1	385	2965	1121
	15·4	277	2322	1849
	16·4	185	1801	1463
	17·5	108	1035	842
	18·2	78	609	597
	19·3	63	329	510
	20·2	53	318	0
	21·7	56	418	157
	22·5	53	325	104
	23·4	30	249	70
	24·1	44	231	518
	25·2	31	158	705
	26·5	31	419	953
	27·2	65	583	961
	28·6	87	1090	1332
	29·4	150	1152	1371
	30·4	243	1380	280
	31·4	290	1737	549
Nov.	1·2	294	1703	953
	2·4	344	1958	454
	3·2	448	2152	1026
	4·5	392	2516	1984
	5·5	488	2954	4895
	6·5	487	3030	1453
	7·5	443	3206	718
	8·2	437	3233	583
	9·5	413	2776	1598
	10·3	420	2485	1231
	11·2	316	2115	1960
	12·1	307	1776	2590
	13·2	225	1406	2367
	14·6	122	1094	1662
	15·2	141	805	892

Greenwich Civil Time.		Projected Area. Umbræ.	Whole Spots.	Faculæ.
1903.	d			
Nov.	16·2	75	445	1083
	17·3	9	72	431
	18·5	8	41	463
	19·5	21	68	511
	20·2	15	47	484
	21	(14	34	474)
	22·1	9	37	463
	23·2	6	17	279
	24·6	16	114	752
	25·5	18	167	743
	26·2	21	145	946
	27·2	46	276	597
	28·2	68	393	636
	29·2	83	476	1017
	30·2	98	490	918
Dec.	1·1	81	473	1434
	2·5	95	597	2523
	3·2	123	679	1685
	4·5	164	1322	2970
	5·2	181	1084	2273
	6·2	257	1215	195
	7·2	229	1166	1519
	8·2	252	1314	1293
	9·6	145	1534	1098
	10·3	181	1382	2394
	11·2	285	1324	2535
	12·2	190	1129	1815
	13·2	215	1295	1931
	14·4	187	1114	1044
	15·5	159	975	431
	16·5	161	966	711
	17·5	119	944	1396
	18·2	148	801	1085
	19·2	109	649	746
	20·3	96	439	739
	21·5	88	482	1051
	22·2	88	427	1193
	23·2	50	282	1321
	24·2	30	137	1229
	25·2	0	16	1310
	26·3	0	8	1493
	27·4	6	51	1023
	28·1	16	100	1255
	29·4	47	318	1071
	30·4	73	514	1494
	31·2	66	530	1787

MEAN AREAS of SUN SPOTS and FACULÆ, as measured on PHOTOGRAPHS taken at the ROYAL OBSERVATORY, GREENWICH, at DEHRA DÛN, INDIA, and in MAURITIUS, for each ROTATION of the SUN, from 1902 December 31 to 1903 December 20.

The Mean Areas have been formed by taking the Means of the Areas for each day of observation throughout each Rotation of the Sun, the Projected Areas being the Areas as measured on the photographs and expressed in millionths of the Sun's apparent disk, and the Areas corrected for foreshortening being expressed in millionths of the Sun's visible hemisphere.

The rotations adopted in the following table (which is in continuation of those for the years 1873–1902 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 rotations adopted in the volumes of Greenwich Observations, 1877 to 1883, correspond, on the other hand, to the sidereal rotation of the Sun, the commencement of each being defined by the coincidence of the assumed prime meridian with the ascending node. 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							
659	1902	December	31·09	27	5	31	225	4	25	228
660	1903	January	27·42	27	21	127	553	17	102	612
661		February	23·77	24	18	99	396	14	83	455
662		March	23·08	26	84	535	769	65	419	762
663		April	19·36	27	42	270	882	29	199	1060
664		May	16·60	27	5	42	574	4	33	602
665		June	12·81	25	64	352	1018	42	249	1037
666		July	10·00	23	42	234	1298	29	174	1379
667		August	6·21	27	34	183	1371	21	122	1444
668		September	2·46	26	17	95	769	17	93	846
669		September	29·73	27	183	1467	815	142	1201	982
670		October	27·02	27	224	1425	1180	171	1085	1391
671		November	23·33	27	138	832	1312	104	658	1535

MEAN AREAS of SUN SPOTS and FACULÆ, as measured on PHOTOGRAPHS taken at the ROYAL OBSERVATORY, GREENWICH, at DEHRA DÛN, INDIA, and in MAURITIUS, for the YEAR 1903.

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

The Mean Areas corrected for foreshortening are expressed in millionths of the Sun's visible hemisphere.

Year.	No. of Days on which Photographs were taken.	Mean of Daily Areas.					
		Projected.			Corrected for Foreshortening.		
		Umbræ.	Whole Spots.	Faculæ.	Umbræ.	Whole Spots.	Faculæ.
1903	350	67	434	875	51	340	970

MEAN HELIOGRAPHIC LATITUDE of SUN SPOTS, as measured on PHOTOGRAPHS taken at the ROYAL OBSERVATORY, GREENWICH, at DEHRA DÛN, INDIA, and in MAURITIUS, for each ROTATION of the SUN, from 1902 December 31 to 1903 December 20.

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			°		°	°	°
659	1902 Dec. 31·09	27	16	22·51	9	14·92	+ 8·36	19·64
660	1903 Jan. 27·42	27	70	23·43	32	18·07	+10·37	21·75
661	Feb. 23·77	24	60	19·68	23	22·26	+ 8·10	20·40
662	Mar. 23·08	26	136	21·52	297	18·97	− 6·32	19·76
663	Apr. 19·36	27	152	19·14	47	15·67	+11·03	18·27
664	May 16·60	27	24	18·07	9	25·07	+ 5·69	20·08
665	June 12·81	25	98	20·75	151	19·83	− 3·84	20·19
666	July 10·00	23	105	20·86	69	20·50	+ 4·40	20·72
667	Aug. 6·21	27	38	21·26	83	22·54	− 8·80	22·14
668	Sept. 2·46	26	65	12·38	28	17·98	+ 3·17	14·08
669	Sept. 29·73	27	228	13·93	973	21·24	−14·55	19·85
670	Oct. 27·02	27	375	17·12	710	22·46	− 8·76	20·61
671	Nov. 23·33	27	360	17·80	298	21·94	− 0·20	19·68

MEAN HELIOGRAPHIC LATITUDE of SUN SPOTS, as measured on PHOTOGRAPHS taken at the ROYAL OBSERVATORY, GREENWICH, at DEHRA DÛN, INDIA, and in MAURITIUS, for the YEAR 1903.

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.		
			°		°	°	°
1903	350	132	18·11	208	21·15	−5·85	19·94

NOTE.—In the computations for forming the corresponding Tables given in the volumes for 1884 and 1885, the latitudes of the Spots were only taken to the nearest degree, the next higher whole degree being adopted whenever the fractional part of the latitude amounted to or exceeded ·5. Thus, under 8°, for example, would be included all Spots from 7°·5 to 8°·4, both inclusive; and the corresponding mean latitude should have been taken as 7°·95 instead of 8°. The Mean Heliographic Latitudes, therefore, both for Spots North and South of the Equator, and the Mean Distances from the Equator of all Spots, both for the rotations and for entire years, require a correction of − 0°·05. The Mean Latitude of the entire Spotted Area requires the following correction:—

$$-0^\circ\cdot05 \times \frac{\text{Mean Area N.} - \text{Mean Area S.}}{\text{Mean Area N.} + \text{Mean Area S.}}$$

These corrections have been applied in computing the Mean Heliographic Latitudes and Mean Distance from the Equator given in the above Tables for 1903, and in corresponding Tables for the years 1886 to 1902.