GREENWICH

SPECTROSCOPIC AND PHOTOGRAPHIC RESULTS.

1886.

SPECTROSCOPIC AND PHOTOGRAPHIC OBSERVATIONS

MADE AT THE

ROYAL OBSERVATORY, GREENWICH,

1886.

(EXTRACTED FROM THE GREENWICH OBSERVATIONS, 1886.)

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GREENWICH SPECTROSCOPIC AND PHOTOGRAPHIC RESULTS, 1886.

INTRODUCTION.

§ 13. *Spectroscopic Observations in the Year* 1886.

The spectroscope used for these observations was mounted on the South-east equatoreal, the object-glass of which (made by Merz and Son of Munich) has a clear aperture of 12·8 inches, with a focal length of about $17^{ft.}$ $10^{in.}$

This section contains :—Observations of Solar Prominences ; Observations of the Spectrum of a Sun Spot; Measures of Displacement of Lines in the Spectra of Stars, Moon and Planets ; Experimental Observations of the Displacement of Lines in the Spectra of Stars made with the Reversion Apparatus of the Oxford Reversion Spectroscope ; Collected Results for Motions in the line of Sight and for the Rotation of Jupiter ; and Observations of the Spectra of 51 Schjellerup, Nova Orionis, and Comets *e* 1885 and *f* 1886.

For the observations of solar prominences, the Greenwich Civil Times, commencing at Greenwich mean midnight and reckoning from 0 to 24 hours, are given ; and the position-angle from the Sun's axis of the two extremities of each prominence, together with its height in seconds of arc. The Sun's image was always placed centrally with respect to the position-circle, a radial excentricity being given to the spectroscope, so that the slit swept round the Sun's limb.

The position-angles have been first corrected for index-error of the position-circle, which is determined at the time of observation.

The method employed for this purpose has been to set the position-circle to 90° *plus* the approximate index-error, so that the slit points approximately E. and W., and to move the telescope by the slow motions until either the north or the south limb of the Sun just comes into the middle of the field. The position-circle is then read, and the spectroscope rotated through 180°, the telescope remaining rigidly clamped, and as the diurnal motion brings the Sun up to the slit again, the limb previously observed is again brought to the centre of the field by means of the rotation of the spectroscope. The position-circle is read a second time, and the mean of the two readings, corrected for the inclination of the Sun's path, is taken as the zero of the position-circle.

The corrected position-angles have then been converted into Heliographic N. P. D. by applying as a correction the position-angle of the Sun's north pole, taken 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 heights of the bright lines seen in the prominences or chromosphere were read off on a pearl scale, divided to 0·005 inch (corresponding to 2″·4), and carried by the micrometer of the spectroscope. Other particulars are given in the note at the head of this section.

The measures of displacement of lines in the spectra of stars were made with a micrometer in the viewing telescope of the "Half-prism" Spectroscope. The eye-piece used gives a magnifying power of 14. Estimations of the displacement, in terms of the apparent breadth of the bright comparison-line, were also made; the breadth corresponding to any given width of slit being determined by a careful observation under similar conditions. 1$^{rev.}$ of the screw for opening the slit corresponds to 0·01 inch, or 10″. It has not been thought necessary to give in detail all these particulars of the reductions. The values used in each case may be inferred from the observed motion, which is the algebraic sum of the concluded motion and of the Earth's motion. A displacement of one tenth-metre corresponds at D to a motion of 31·7 miles per second, at *b* to a motion of 36·1 miles, and at F to a motion of 38·4 miles. For comparison with the spectrum of hydrogen or other chemical element, an image of the vacuum tube or electrodes is formed on the slit, by means of a transparent plate of glass placed at an angle of 45° with the axis of the collimator, in connexion with a collimating lens, so that the cone of rays from the comparison-light fills the whole of the object-glass of the collimator.

Whenever the star-line was sufficiently distinct to allow of its being seen at the same time as the bright comparison-line, a direct comparison of the two was made; in other cases the bright line was compared with the pointer of the micrometer which had just previously been placed on the star-line, giving an indirect comparison.

The reading of the position-circle is given, as it is conceivable that the results might be affected by the position of the spectroscope. The slit lies north and south when the reading is 5°.

The observations of displacement made with the reversion apparatus of the Oxford Reversion Spectroscope were confined to estimations, no actual micrometric measures being made, for reasons given in the account of the observations. The breadth of the

bright comparison-line was carefully measured (with the same width of slit) with the micrometer and viewing telescope of the "Half-prism" Spectroscope, and the equivalent displacement in wave-length and motion in miles per second were found in the usual manner. The reversing apparatus in this spectroscope consists of two totally reflecting reversion prisms placed between the train of dispersing prisms and the viewing telescope. The refracting edges of the trains of prisms being supposed for convenience of description to be vertical, the lower half of the pencil falls on the lower reversion prism and is reversed end for end by reflexion, the edge of the prism being perpendicular to the length of the spectrum, and the upper half falls on the upper reversion prism placed with its edge parallel to the length of the spectrum, so that the upper half of the spectrum, after reflexion, is reversed top for bottom. Thus, after passing through this reversing apparatus, the red is on the right in one half of the spectrum and on the left in the other. By turning the upper prism round an axis parallel to its edge, the spectra may be superposed or separated to any required distance in a direction perpendicular to their length. By turning the lower prism about an axis parallel to its edge or by turning the train of dispersing prisms, any given line in the reversed half may be brought into coincidence with the corresponding line in the other half. For these adjustments suitable screws are provided.

In practice the two spectra were adjusted so as to be just in contact, and the broad F lines in the two spectra brought into coincidence by either of the methods mentioned. The light from a hydrogen vacuum tube was then flashed in, and the amount of displacement of the two images of the bright Hβ line was estimated in terms of the breadth of either.

With regard to the observations of the spectra of 51 Schjellerup, Nova Orionis, and the Comets, it is sufficient to remark that curves have been laid down in the usual manner, connecting micrometer readings and wave-lengths for both the "Half-prism" and Single-prism Spectroscopes, and that the value of a revolution of the micrometer in tenthmetres of wave-length has been inferred from these for the point of the spectrum measured. The tabular wave-lengths of comparison-lines have been taken from Ångström's *Spectre Normal du Soleil.*

§ 14. *Measures of Positions and Areas of Spots and Faculæ upon the Sun's Disk on Photographs taken at the Royal Observatory, Greenwich, at Dehra Dûn in India, and at the Royal Alfred Observatory, Mauritius, in the year* 1886; *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 with the Dallmeyer Photoheliograph returned from the Transit of Venus expedition to New Zealand, which, as now adapted, gives a solar image of 8 inches diameter on the photographic plate.

Bromo-iodized gelatine dry plates with alkaline development have been regularly used throughout the year.

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 J. B. N. Hennessey, F.R.S., Deputy Superintendent, 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 has been used in connexion with iron development.

The Mauritius photographs were taken under the superintendence of Dr. C. Meldrum, 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 both wet and dry processes have been used, bromo-iodized collodion having been used with iron development, and bromo-iodized gelatine dry plates with alkaline development.

Photographs of the Sun were taken at Greenwich on 199 days and Indian photographs on 128 days with Mauritius photographs on 36 days have been received from the Solar Physics Committee to complete the total of 363 days for which there are either Greenwich, Indian, or Mauritius photographs of the Sun available for measurement in 1886.

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 1886:—

E. W. Maunder	M	S. Phillips	SP
H. P. Hollis	H	A. E. Pilkington	EP
J. Hawton	JH		

The *third* column gives the No. of the group, and the letter for the spot. The groups are numbered in the 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 eye-piece, 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 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-wires which serve to determine the zero of position-angles on the photograph.

The zero of the Dallmeyer Photoheliograph, employed at Greenwich, has been determined throughout 1886 by the measurement of a plate which had been exposed to the Sun's rays twice, with an interval of about 115 seconds between the two exposures, the instrument being firmly clamped. Two images of the Sun, overlapping each other by a little more than the 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 through the centre of the plate, it was easy to measure with the position-micrometer the inclination of the wires of the photoheliograph to the Sun's path, and a small correction for the inclination of the Sun's path was then applied. The following table gives the correction for zero of position of the photoheliograph for the mean of the two wires as thus determined :—

Date, Greenwich Civil Time.		Correction for Zero.
	h	° ′
1885, December	10. 12	+ 0. 17
1886, January	12. 11	+ 0. 53
February	6. 10	+ 0. 14
	24. 11	− 0. 4
March	17. 10	− 0. 7
April	6. 11	− 0. 8
	30. 11	+ 0. 44
June	4. 10	+ 0. 3
	28. 10	+ 0. 11
July	26. 10	+ 0. 6
September	7. 12	+ 0. 51
October	1. 11	+ 0. 42
	13. 12	+ 0. 30
November	4. 11	+ 0. 6
December	30. 11	− 0. 43
1887, January	17. 11	− 1. 0

It was found on October 4 that the tube to which the wire-frame is attached had become loose, and readily permitted a small motion of the wire-frame. The tube and wire-frame were firmly fixed in their places on October 5, before any photographs were taken.

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 readings of the position-circle in 1886 have been as follows :—

From 1886, January 1 - - -	355°·6
October 1 - - -	355°·7
November 16 - - -	356°·4

The correction for zero of position of the photoheliograph adopted for any date has been the mean of the determinations of that zero made next before and next after that date. 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 the photoheliograph 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 $\delta R = + c \,.\, \tan^2 z \times R \times \frac{1}{2} \left\{ \frac{1 + \cos 2 (\theta_0 - v)}{2} + \frac{1 + \cos 2 (\theta_0 + 90^\circ - v)}{2} \right\} = + \frac{1}{2} c R \,.\, \tan^2 z$, where R is the Sun's mean radius and θ_0 , $\theta_0 + 90^\circ$ 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.

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

* 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.

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.

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° 15′, 74°, and 23° 27′·5 respectively.

The Heliographic Longitude of the Spot is found from l, the Heliographic Longitude from Node, by subtracting the Reduction to 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 the epoch 1854·0. The period of rotation assumed is 25·38 days.

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 nearly 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.

§ 15. *Ledgers of Areas and Positions of Spot-groups upon the Sun's Disk deduced from the measurement of the Solar photographs for each day in the year* 1886.

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.

§ 16. *Total Projected Areas of Umbræ, Whole Spots, and Faculæ, for each day (uncorrected for foreshortening), Mean Areas of Umbræ, Whole Spots, and Faculæ, and Mean Heliographic Latitude of Spots, for each Synodic Rotation of the Sun, and for the Year* 1886.

This section requires no further explanation.

W. H. M. CHRISTIE

1888, *April* 25.

ROYAL OBSERVATORY, GREENWICH.

SPECTROSCOPIC OBSERVATIONS

MADE AT THE

ROYAL OBSERVATORY, GREENWICH,

1886.

POSITION-ANGLES and HEIGHTS of SOLAR PROMINENCES, observed with the SPECTROSCOPE, and OBSERVATIONS of BRIGHT LINES in their SPECTRA, made at the ROYAL OBSERVATORY, GREENWICH, in the Year 1886.

Civil Time commencing at Greenwich Mean Midnight and counting from 0 to 24 hours is used throughout.

Note.—The position-angles reckoned from the north pole of the Sun's axis in the direction N., E., S., W., N., are given for the two extremities of the prominence.

The extreme height in seconds of arc is given for each prominence. Where the estimated brightness of any of the bright lines is given, the *average* brightness of the line has been estimated in terms of the brightness of the corresponding part of the solar spectrum. The lines are usually fainter at the extremity than at the base. Where the estimated breadth is given, the *average* breadth of the line has been estimated in terms of the breadth of the corresponding dark line in the solar spectrum, except in the case of the bright line D_3, the breadth of which is estimated in terms of the dark line C. The bright lines are usually narrower at the extremity than at the base. On each occasion the entire limb of the Sun was examined first on the C line only, and the heights and position-angles of the prominences were determined. If possible a second examination of the entire limb was then made in which the entire spectrum from B to F was examined at each prominence. The first time given for any prominence is the time when it was first seen; the second time, the time of the second examination.

The "Half-prism" Spectroscope with a train of two "half-prisms" was used throughout. For viewing the prominences and chromosphere the spectroscope is reversed end for end, the slit and eyepiece being interchanged, so that the pencil is incident on the oblique face and emerges at the perpendicular face of each "half-prism." Thus the breadth of the spectrum-lines, considered as monochromatic images of the slit, is diminished, and greater purity of spectrum is obtained. In order to view a prominence in its just proportions, the breadth can be afterwards magnified by means of a small "half-prism" (direct-vision) placed between the eyepiece and the eye.

A displacement of 1 tenth-metre corresponds to a motion in the line of sight of 28·4 miles per second for the C line, of 36·1 miles for the *b* lines, and of 38·4 miles for the F line.

Observer M.

Greenwich Civil Time, 1886.	Position-Angle from Sun's Axis.	Height in Seconds of Arc.				Brightness.				Breadth.				REMARKS.
		C	D_3	1474 K	F	C	D_3	1474 K	F	C	D_3	1474 K	F	
d h m	° ′	″	″	″	″									
Apr. 27. 11. 26	40. 25	43	43	...	...	$\frac{2}{5}$	$\frac{1}{5}$	...	...	$\frac{2}{3}$	$\frac{1}{3}$	...	...	Straight jet.
11. 58	44. 32	43												
11. 24	46. 7	41	38	...	...	$\frac{1}{2}$	$\frac{1}{4}$	...	...	$\frac{3}{4}$	$\frac{1}{3}$	...	...	
11. 56	49. 37	41												
11. 22	55. 12	48	41	...	...	$\frac{1}{4}$	$\frac{1}{5}$	...	...	$\frac{3}{4}$	$\frac{1}{3}$	...	...	Fine bright jet bending over towards the north.
11. 42	62. 17	53												
11. 20	71. 7	34	19	...	...	$\frac{1}{2}$	$\frac{1}{5}$	...	...	$\frac{3}{4}$	$\frac{1}{3}$	...	...	Double jet.
11. 39	74. 7	31												
11. 10	86. 57	24	19	...	...	$\frac{2}{3}$	$\frac{1}{5}$	...	...	$\frac{2}{3}$	$\frac{1}{3}$	...	...	
11. 37	89. 37	24												The entire limb of the sun was examined twice with the slit radial. The limb was too unsteady for any observations of 1474 K and F to be made.
Apr. 30. 12. 20	108. 52	14	19	...	14	$\frac{1}{2}$	$\frac{1}{2}$	...	$\frac{1}{10}$	$\frac{1}{2}$	$\frac{1}{2}$	...	$\frac{3}{4}$	
12. 30	109. 32	17												
12. 15	114. 32	31	34	4	24	1	$\frac{1}{2}$	...	$\frac{1}{5}$	$\frac{2}{3}$	$\frac{1}{3}$	...	$\frac{3}{4}$	Straight jet. 12^h 28^m. This prominence has changed in shape since it was first seen. It is still a straight jet, but has spread out at the top like a palm-tree.
12. 28	118. 22	31												
12. 16	120. 7	29	29	...	24	$\frac{1}{2}$	$\frac{1}{4}$	...	$\frac{1}{10}$	$\frac{2}{3}$	$\frac{1}{3}$	...	$\frac{3}{4}$	Straight jet.
12. 23	121. 32	29												The limb of the sun was unsteady, making observation difficult. On all the three foregoing prominences neither the D nor *b* lines could be seen distinctly reversed, probably on account of the white haze in which the sun was involved, and the unsteadiness of the limb; yet these dark lines of the sky spectrum grew faint close to the sun's limb. 1474 K was seen distinctly reversed on the second prominence; on the two others it was not actually reversed, but the dark line of the sky spectrum all but disappeared close to the limb.

Greenwich Civil Time. 1886.	Position-Angle from Sun's Axis.	Height in Seconds of Arc.				Brightness.				Breadth.				REMARKS.
		C	D_3	1474 K	F	C	D_3	1474 K	F	C	D_3	1474 K	F	
	d h m	° ′	″	″	″									
Apr. 30. 12. 18	298. 12	31	19	...	...	¼	¼	...	...	½	⅓	...	...	Bright straight jet. Not seen on F, D_1, D_2, *b*, or 1474 K lines with radial slit, but seen on F and 1474 K with the slit tangential.
12. 33	300. 2	17												The entire limb of the sun was examined twice with the slit radial and tangential from B to F. With the tangential slit, C, D_3, 1474 K and F could be seen on all the prominences, but neither D_1, D_2 nor the *b* lines could be detected on any of them. The chromosphere averaged 8″·5 in height.
May 1. 11. 25	73. 56	17	17	4	14	1	1	...	½	¾	⅔	...	1	Fine straight jet, not seen in a previous search.
12. 13	75. 31	14												
11. 9	82. 1	22	14	5	14	2	2	½	2	1¼	1	1	1	Long, low, and brilliant prominence. The C and F lines were displaced towards the blue by about ⅓ tenth-metre, indicating a motion of approach of about 11 miles per second. The *b* lines appeared to be reversed to a height of about 5″.
12. 15	91. 1	14												
11. 14	100. 36	50	48	...	48	½	⅓	...	⅕	⅔	⅓	...	1	Fine straight jet.
11. 45	109. 26	48												
11. 16	114. 41	29	29	...	...	⅓	⅓	...	...	½	¼	...	...	Not seen on the F line.
11. 53	117. 51	29												
11. 18	118. 51	50	29	...	...	⅕	⅕	...	...	⅓	⅓	...	...	Not seen on the F line.
11. 56	122. 46	29												
11. 56	124. 21	22	22	...	...	⅓	¼	...	...	⅓	⅓	...	...	Small straight jet, not seen in first search. Not seen on the F line.
12. 2	125. 41	22												
11. 19	124. 36	26	41	...	..	½	½	...	...	½	½	...	...	Not seen on the F line.
11. 59	126. 21	41												
11. 21	268. 46	29	34	...	31	2	1	...	1	1½	1	...	1½	Fine jet; brilliant; probably a metallic eruption. 12ʰ. 5ᵐ. A slight displacement was detected on the upper part of the prominence on the C and F lines. On both lines it was towards the red, and the amount was roughly ¼ tenth-metre on F, and ⅓ tenth-metre on C, indicating a motion of recession of about 9½ miles per second. The prominence had changed its shape since the first search, a second jet having sprung up, forming with the first jet a complete arch. The above observations of the C and F lines were taken on the first jet. The extreme point of the arch on the second jet was 41″ in height.
12. 5	277. 26	31												The entire limb of the sun was examined twice with the slit radial.
May 3. 11. 3	123. 24	31	29	...	29	¼	⅕	...	1/10	⅓	¼	...	1	Straight jet.
11. 17	125. 12	29												
11. 5	126. 2	29	34	2	34	1	⅔	1/10	¼	⅔	⅔	1	1	Straight jet.
11. 19	127. 52	34												The entire limb of the sun was examined twice with the slit radial. The chromosphere averaged 8″·5 in height. The sun was in white haze, and its limb was boiling.
May 6. 12. 5	48. 18	19	17	2	14	¼	¼	1/10	1/10	¼	⅓	1	1	A small straight jet. This prominence was the only one which could be examined on any other line but C.
12. 17	49. 37	17												

Greenwich Civil Time, 1886.	Position-Angle from Sun's Axis.	Height in Seconds of Arc.				Brightness.				Breadth.				REMARKS.
		C	D_3	1474 K	F	C	D_3	1474 K	F	C	D_3	1474 K	F	
d h m	° ′	″	″	″	″									
May 6. 12. 7	64. 36 66. 57	12	...	...	...	...	...	...	...	...	...	...	...	Chromosphere a little higher than usual, and feathery.
12. 8	88. 17 89. 42	19	...	...	...	...	...	...	...	...	...	...	...	Straight jet.
12. 10	128. 17 132. 2	79	...	...	...	...	...	...	...	...	...	...	...	Fine prominence. Partly detached.
														The entire limb of the sun was examined once with slit radial, on the C line only. The sun was in much haze.
May 7. 11. 50	48. 10	19	24	...	...	$\frac{1}{5}$	$\frac{1}{3}$	...	...	$\frac{1}{2}$	$\frac{1}{5}$	...	...	Straight jet. Lines 1474 K and F not seen.
12. 19	49. 50	17												
11. 51	60. 40	22	26	?	19	$\frac{1}{5}$	$\frac{1}{4}$	?	$\frac{1}{10}$	$\frac{1}{2}$	$\frac{1}{3}$	?	1	Straight jet.
12. 21	61. 50	19												
11. 52	63. 0	31	31	...	...	$\frac{1}{5}$	$\frac{1}{4}$	...	...	$\frac{1}{3}$	$\frac{1}{3}$	...	...	Straight jet.
12. 26	64. 50	24												
11. 56	254. 20	17	14	5	12	$1\frac{1}{4}$	3	...	1	$1\frac{1}{4}$	1	...	2	Bright prominence. This jet, when first seen, was suspected to be a metallic eruption, from the vividness and breadth of the bright C line. The D_3 line was seen distinctly bright for 7″ on the limb of the sun. The sun was in much white haze, and only a brilliant prominence could have shown through it. The solar spectrum did not seem more than three times as bright as the sky spectrum. It was remarkable that, whereas the D_3 line is usually fainter and narrower than the C line, in this instance it was brighter and about as broad. Both C and F could be traced about 2″ bright on the sun, the narrow pointed dark line appearing to bisect the bright line. At 12h. 33m. both D lines were distinctly reversed 5″ in height. 654 K was seen brightly reversed. Height 12″, brightness $\frac{1}{2}$; breadth half of the dark C line.
12. 5	257. 10	12												
11. 57	259. 10 263. 10	17	...	...	...	...	...	...	...	...	...	...	...	Straight jet.
12. 0	295. 10 296. 40	14	...	...	...	...	...	...	...	...	...	...	...	Faint jet; could not be observed on any other line but C.
														The entire limb of the sun was examined twice with the slit radial.
Nov. 4. 12. 48	53. 48 56. 2	24	...	...	...	...	...	...	...	...	...	...	...	Straight jet. Not seen in second search.
12. 52	80. 27	34	...	...	...	...	...	...	...	...	...	...	...	Partly detached. The sun was in much haze at the second examination. Seen only on the C line.
13. 19	83. 7													
12. 54	86. 45	36	34	2	24	$\frac{4}{5}$	$\frac{1}{2}$	...	$\frac{1}{5}$	$\frac{1}{2}$	$\frac{1}{2}$	...	1	Bright prominence. Partly detached. The D_1, D_2, b_1, b_2, lines were reversed $2\frac{1}{2}$″ in height.
13. 20	88. 0	34												
12. 55	98. 38	55	...	...	...	...	...	...	...	...	...	...	...	Sun in haze at second examination. Seen only on C line.
13. 24	104. 40													
12. 57	123. 50 125. 58	29	...	...	...	...	...	...	...	...	...	...	...	Bright straight jet. The sky clouded over before a second examination could be made.
12. 58	126. 44 128. 2	19	...	...	...	...	...	...	...	...	...	...	...	Bending over towards the North.
13. 0	245. 30 249. 0	19	...	...	...	...	...	...	...	...	...	...	...	Faint jet.
														The entire limb of the Sun was examined once with the slit radial on the C line and part of the limb a second time on the entire spectrum from B to F.

Greenwich Civil Time, 1886.	Position-Angle from Sun's Axis.	Height in Seconds of Arc.				Brightness.				Breadth.				REMARKS.
		C	D_3	1474 K	F	C	D_3	1474 K	F	C	D_3	1474 K	F	
d h m														
Dec. 1. 11. 1	233. 30 236. 7	24 26	26	...	17	$\frac{1}{3}$	$\frac{1}{4}$	...	$\frac{1}{10}$	$\frac{1}{2}$	$\frac{1}{3}$	...	1	Straight jet.
11. 3	246. 7 248. 7	24 24	26	...	24	$\frac{1}{2}$	$\frac{1}{4}$	...	$\frac{1}{10}$	$\frac{2}{3}$	$\frac{1}{2}$	...	1	Straight jet.
11. 16	312. 27 314. 0	34 34	...	...	...	$\frac{1}{10}$	...	...	...	$\frac{1}{2}$	...	...	...	Faint prominence. Seen on no other line but C. Not seen in first search.
														The entire limb of the Sun was examined twice with the slit radial.

OBSERVATION of the SPECTRUM of a Sun Spot made at the ROYAL OBSERVATORY, GREENWICH, in the Year 1886.

SPOT-GROUP, No. 1880.

1886, May 6.

A fine group of spots was seen near the centre of the sun, and these, as examined on the C and F lines, showed a remarkable uprush of bright hydrogen. The F line in particular was reversed in places scattered over the entire area of the group, but it was especially brilliant over the principal spot of the group. Over the nucleus of this spot the F line was greatly broadened, being quite three times its usual breadth, and being seen both as a dark and as a bright line. The dark portion appeared to be displaced about $\frac{1}{3}$ tenth-metre towards the red, corresponding to a motion of recession, or a downward motion, of about 13 miles per second. The bright portion appeared to be displaced by about the same amount towards the blue, corresponding to a similar motion of approach, or an upward motion. The bright part of the line was in the shape of a crescent, of which the convex side was turned away from the mean place of the F line, and towards the violet. In some parts of the spot the F line had a peculiar appearance, the bright line being narrower than the dark line, and lying diagonally across it, inclined to it at a small angle. The C line was reversed over a more extensive area even than F, but did not show displacement or twisting so well.

Amongst the dark lines observed to be broadened over the spot were the following :—

D_1, D_2, Sodium, more than double their usual breadth.

b_1, b_2, b_4, Magnesium
λ 4890, 4891, Iron
λ 4918, 4920, do.
λ 6492, Calcium
λ 6462, do.
λ 6438, do.
λ 6161, do.
λ 6121, do.
λ 6101, do.
} Double their usual breadth.

D_3 and 1474 K were not noticeably affected in any way.

The above observations were made by Mr. Maunder with the half-prism Spectroscope mounted on the South-East Equatoreal. The Spectroscope was used in the reversed position, with a train of two half-prisms, giving under these conditions a dispersion of about 6° from A to H, the spectrum being very pure. A power of about 28 was used on the viewing telescope.

The number of the spot-group is taken from the Photographic Results.

1886, May 7.

The same group of spots was again examined with the Spectroscope arranged as on May 6, but no indication of reversal of any of the lines was detected, nor were any lines noticeably broadened. Observer : Mr. Maunder.

MEASURES of DISPLACEMENT of LINES in the SPECTRA of STARS, MOON, AND PLANETS as compared with those of TERRESTRIAL ELEMENTS, and CONCLUDED MOTIONS in the LINE of SIGHT, from OBSERVATIONS at the ROYAL OBSERVATORY, GREENWICH, in the Year 1886.

The day specified in the first column is the Civil Day, and the hours and minutes are those of Greenwich Civil Time, commencing at Greenwich Mean Midnight and counting from 0 to 24 hours.

Note.—The motion corresponding to the displacement actually observed may be inferred from the Concluded Motion by adding the Earth's Motion algebraically.

The "Half-prism" Spectroscope was used throughout. Each "Half-prism" is compound, and is composed of a flint "half-prism" (*i.e.*, the half of an isosceles prism, cut by a plane perpendicular to the base,) and a crown prism, cemented on the emergent face so as to form the half of a direct-vision prism. With one such half-prism a dispersion of about 18½° from A to H, equivalent to that produced by four flint prisms of 60°, is obtained; and with a train of two a dispersion of about 80°, equivalent to that produced by sixteen flint prisms of 60°. One half-prism has been always employed. The dispersions have been inferred from measurements of the distance between b_1 and b_4 as compared with the wavelength measure.

1rev. of the micrometer corresponds with one "half-prism" to 10·4 tenth-metres or 375 miles per second for the *b* lines, and to 7·91 tenth-metres or 304 miles per second for the F line.

1rev. of the screw for opening the slit corresponds to 0·01 inch, or about 10″.

The slit lies north and south when the reading of the Position Circle is 6°.

The velocity of light has been taken as 186,660 miles per second, and the distance of the Sun as 92,250,000 miles.

The estimations of displacements have been made by *indirect* comparison with the comparison-line, except where the contrary is expressly stated. The displacement is estimated in terms of the breadth of the comparison-line.

The sign + denotes a displacement towards the red or a motion of recession, − a displacement towards the blue or a motion of approach.

Date, 1886, Greenwich Civil Time.	Observer.	Object.	Line.	Width of Slit.	Displacement.		Earth's Motion in Miles per Second.	Concluded Motion of Stars in Miles per Second.		REMARKS.
					Measured.	Estimated.		Measured.	Estimated.	
d h m				r						
Jan. 16. 17. 41	M	Venus	F	0·150	−0·044	− 1/5		− 13·4	− 11·6	Calculated motion —6·7 miles per second.
17. 44	M	,,	F	0·150	−0·027	− 1/10		− 8·2	− 5·8	
17. 47	M	,,	F	0·150	−0·008	− 1/20		− 2·4	− 2·9	
17. 50	M	,,	F	0·150	−0·058	− 1/3		− 17·6	− 19·4	
17. 54	M	,,	F	0·150	−0·027	− 1/4		− 8·2	− 14·5	
17. 57	M	,,	F	0·150	−0·020	− 1/4		− 6·1	− 14·5	
18. 1	M	,,	F	0·150	−0·008	− 1/10		− 2·4	− 5·8	
18. 4	M	,,	F	0·150	−0·029	− 1/20		− 8·8	− 2·9	
18. 8	M	,,	F	0·150	0·000	0		0·0	0·0	
18. 11	M	,,	F	0·150	−0·002	0		− 0·6	0·0	
										Position Circle, 169°.
Jan. 18. 22. 28	N	Moon	F	0·150	−0·015			− 4·6		The coincidence of the two spectra appeared perfect.
22. 31	N	,,	F	0·150	+0·037			+ 11·3		
22. 35	N	,,	F	0·150	+0·027			+ 8·2		
22. 38	N	,,	F	0·150	−0·017			− 5·1		
23. 3	N	Procyon	F	0·150	+0·012	0	+ 1·5	+ 2·1	− 1·5	Spectrum bright and fairly steady.
23. 8	N	,,	F	0·150	+0·015	0	+ 1·5	+ 3·1	− 1·5	Star-line fairly distinct.
23. 18	N	,,	F	0·150	−0·009	0	+ 1·5	− 4·2	− 1·5	
										Position Circle, 186°.
Jan. 19. 22. 4	M	Sirius	F	0·150	−0·020	− 1/10	+ 4·4	− 10·5	− 10·2	Spectrum very tremulous. Star seen through cloud.
22. 24	M	,,	F	0·150	−0·041	− 1/5	+ 4·4	− 16·8	− 16·0	Position Circle, 186°.
Jan. 27. 18. 8	M	Venus	F	0·201	−0·074	− 1/3		− 22·5	− 16·0	Spectrum bright but tremulous. The later observations were made under more satisfactory conditions than the earlier; the line in the spectrum of Venus being very distinctly seen during the last seven observations.
18. 10	M	,,	F	0·201	−0·158	− 1/2		− 48·0	− 24·0	
18. 11	M	,,	F	0·201	−0·026	− 1/10		− 7·9	− 4·8	
18. 13	M	,,	F	0·201	−0·003	0		− 0·9	0·0	
18. 15	M	,,	F	0·201	−0·017	0		− 5·1	0·0	
18. 17	M	,,	F	0·201	−0·022	− 1/10		− 6·7	− 4·8	
18. 18	M	,,	F	0·201	−0·034	− 1/5		− 10·3	− 9·6	Calculated motion, —5·4 miles per second.

Date, 1886. Greenwich Civil Time.	Observer.	Object.	Line.	Width of Slit.	Displacement. Measured.	Displacement. Estimated.	Earth's Motion in Miles per Second.	Concluded Motion of Stars in Miles per Second. Measured.	Concluded Motion of Stars in Miles per Second. Estimated.	REMARKS.
d h m				r	r					
Jan. 27. 18. 20	M	Venus	F	0·201	− 0·063	− $\frac{1}{5}$		− 19·1	− 9·6	
18. 21	M	,,	F	0·201	− 0·054	− $\frac{1}{7}$		− 16·4	− 6·9	
18. 23	M	,,	F	0·201	+ 0·002	0		+ 0·6	0·0	
18. 59	M	α Pegasi	F	0·154	− 0·051	− $\frac{1}{10}$	+ 12·4	− 27·9	− 19·0	Spectrum very faint and tremulous.
19. 2	M	,,	F	0·154	+ 0·001	0	+ 12·4	− 12·1	− 12·4	Measures made with great difficulty.
19. 6	M	,,	F	0·154	− 0·084	− $\frac{1}{3}$	+ 12·4	− 37·9	− 34·3	
19. 9	M	,,	F	0·154	− 0·155	− $\frac{2}{5}$	+ 12·4	− 59·5	− 38·7	
19. 14	M	α Andromedæ	F	0·154	− 0·073	− $\frac{1}{4}$	+ 15·4	− 37·6	− 31·8	Spectrum fairly steady.
19. 18	M	,,	F	0·154	− 0·001	0	+ 15·4	− 15·1	− 15·4	
19. 41	M	β Persei	F	0·154	− 0·139	− $\frac{1}{2}$	+ 16·8	− 59·0	− 49·6	Spectrum fairly bright and steady. Definition fair.
19. 46	M	,,	F	0·154	− 0·081	− $\frac{2}{5}$	+ 16·8	− 41·4	− 43·1	
19. 49	M	α Persei	F	0·154	− 0·140	− $\frac{2}{5}$	+ 15·1	− 57·6	− 41·4	Spectrum fairly bright and steady. Definition fair.
19. 56	M	,,	F	0·154	− 0·030	− $\frac{1}{5}$	+ 15·1	− 24·2	− 28·2	
20. 10	M	Aldebaran	F	0·154	+ 0·064	+ $\frac{1}{4}$	+ 16·3	+ 3·1	+ 0·1	
20. 15	M	,,	F	0·154	+ 0·194	+ $\frac{1}{2}$	+ 16·3	+ 42·6	+ 16·5	
20. 35	M	Rigel	F	0·154	+ 0·103	+ $\frac{1}{2}$	+ 12·9	+ 18·4	+ 9·0	Spectrum bright but tremulous. Star-line seen fairly well.
20. 40	M	,,	F	0·154	+ 0·183	+ $\frac{3}{5}$	+ 12·9	+ 42·7	+ 26·5	
20. 42	M	γ Orionis	F	0·154	+ 0·113	+ $\frac{1}{3}$	+ 13·6	+ 20·7	+ 8·3	Spectrum bright but tremulous. Star-line seen very well.
20. 45	M	,,	F	0·154	+ 0·009	0	+ 13·6	− 10·9	− 13·6	
20. 49	M	β Tauri	F	0·154	− 0·088	− $\frac{2}{5}$	+ 13·8	− 40·5	− 40·1	Spectrum bright and steady. Star-line seen fairly well.
20. 55	M	,,	F	0·154	− 0·071	− $\frac{1}{3}$	+ 13·8	− 35·4	− 35·7	
21. 1	M	δ Orionis	F	0·154	+ 0·109	+ $\frac{2}{5}$	+ 12·7	+ 20·4	+ 13·6	Spectrum somewhat faint and tremulous, but star-line seen fairly well.
21. 4	M	,,	F	0·154	+ 0·026	+ $\frac{1}{10}$	+ 12·7	− 4·8	− 6·1	
21. 8	M	ε Orionis	F	0·154	+ 0·081	+ $\frac{3}{10}$	+ 12·4	+ 12·2	+ 7·3	Spectrum somewhat faint and tremulous, but star-line seen fairly well.
21. 13	M	,,	F	0·154	+ 0·098	+ $\frac{3}{10}$	+ 12·4	+ 17·4	+ 7·3	
21. 17	M	ζ Orionis	F	0·154	+ 0·072	+ $\frac{2}{5}$	+ 12·1	+ 9·8	+ 14·2	Spectrum somewhat faint and tremulous, but star-line seen fairly well.
21. 21	M	,,	F	0·154	+ 0·094	+ $\frac{2}{5}$	+ 12·1	+ 16·5	+ 14·2	
21. 24	M	κ Orionis	F	0·154	− 0·078	− $\frac{1}{4}$	+ 10·9	− 34·6	− 27·3	Spectrum faint and tremulous, but star-line seen fairly well.
21. 27	M	,,	F	0·154	+ 0·009	0	+ 10·9	− 8·2	− 10·9	
21. 32	M	γ Geminorum	F	0·154	− 0·335	− 1	+ 9·5	− 111·3	− 75·1	Spectrum bright and steady. The star-line is broad, diffused and difficult to bisect. It was seen fairly well on this occasion, and the difficulty of bisection was due simply to its nebulous character.
21. 35	M	,,	F	0·154	− 0·217	− $\frac{4}{5}$	+ 9·5	− 75·4	− 62·0	
21. 37	M	,,	F	0·154	− 0·032	− $\frac{1}{4}$	+ 9·5	− 19·2	− 25·9	
21. 40	M	,,	F	0·154	+ 0·006	0	+ 9·5	− 7·7	− 9·5	
21. 42	M	,,	F	0·154	− 0·075	− $\frac{2}{5}$	+ 9·5	− 32·3	− 35·8	
21. 45	M	,,	F	0·154	− 0·110	− $\frac{2}{5}$	+ 9·5	− 42·9	− 35·8	
21. 48	M	Sirius	F	0·154	− 0·172	− $\frac{2}{3}$	+ 6·3	− 58·6	− 50·0	Direct comparison showed a displacement of about half the breadth of the comparison-line towards the blue, equivalent to a motion of approach of 39·1 miles per second.
21. 50	M	,,	F	0·154	− 0·106	− $\frac{3}{5}$	+ 6·3	− 38·5	− 45·7	
21. 52	M	,,	F	0·154	− 0·059	− $\frac{3}{10}$	+ 6·3	− 24·2	− 26·0	
21. 54	M	,,	F	0·154	− 0·103	− $\frac{1}{2}$	+ 6·3	− 37·6	− 39·1	
21. 56	M	,,	F	0·154	− 0·021	− $\frac{1}{10}$	+ 6·3	− 12·7	− 12·9	
21. 58	M	,,	F	0·154	− 0·059	− $\frac{1}{5}$	+ 6·3	− 24·2	− 19·4	
22. 9	M	Capella	F	0·154	− 0·012	− $\frac{1}{10}$	+ 12·9	− 16·5	− 19·5	Spectrum bright and steady. The star-line, which is rather faint, was seen with unusual distinctness.
22. 11	M	,,	F	0·154	+ 0·057	+ $\frac{3}{10}$	+ 12·9	+ 4·4	+ 6·8	
22. 13	M	,,	F	0·154	+ 0·058	+ $\frac{1}{4}$	+ 12·9	+ 4·7	+ 3·5	
22. 15	M	,,	F	0·154	+ 0·014	+ $\frac{1}{10}$	+ 12·9	− 8·6	− 6·3	
22. 21	M	β Aurigæ	F	0·154	− 0·065	− $\frac{2}{5}$	+ 11·3	− 31·0	− 37·6	Spectrum faint and tremulous. Star-line ill-defined.
22. 25	M	,,	F	0·154	− 0·094	− $\frac{1}{2}$	+ 11·3	− 39·9	− 44·1	
22. 31	M	Castor.....	F	0·154	− 0·126	+ $\frac{2}{3}$	+ 6·2	+ 32·1	+ 37·5	Spectrum tremulous. Star-line very ill-defined.
22. 35	M	,,	F	0·154	− 0·106	+ $\frac{1}{2}$	+ 6·2	+ 26·0	+ 26·6	
22. 39	M	Pollux	F	0·154	− 0·110	− $\frac{2}{3}$	+ 5·3	− 38·7	− 49·0	Spectrum bright and steady. Definition good. Star-line seen well. Displacement evidently large and towards the blue.
22. 45	M	,,	F	0·154	− 0·152	− $\frac{3}{4}$	+ 5·3	− 51·5	− 54·5	
22. 49	M	Procyon.....	F	0·154	− 0·068	− $\frac{2}{5}$	+ 4·4	− 25·1	− 30·7	Spectrum bright and steady. Definition good. But the star-line from its peculiar character was difficult to observe. The displacement was evidently very small.
22. 51	M	,,	F	0·154	− 0·010	− $\frac{1}{10}$	+ 4·4	− 7·4	− 11·0	
22. 53	M	,,	F	0·154	− 0·016	− $\frac{1}{10}$	+ 4·4	− 9·3	− 11·0	
22. 55	M	,,	F	0·154	+ 0·016	+ $\frac{1}{10}$	+ 4·4	+ 0·5	+ 2·2	
22. 57	M	,,	F	0·154	− 0·092	− $\frac{1}{3}$	+ 4·4	− 32·4	− 26·3	
22. 59	M	,,	F	0·154	− 0·016	0	+ 4·4	− 9·3	− 4·4	
										Position Circle, 186°.
Jan. 28. 12. 29	M	Sky.....	F	0·154	− 0·002			− 0·6		The sky spectrum was seen very well. The coincidence of the two spectra appeared perfect.
12. 34	M	,,	F	0·154	+ 0·021			+ 6·4		
12. 38	M	,,	F	0·154	+ 0·010			+ 3·0		
12. 41	M	,,	F	0·154	− 0·003			− 0·9		
12. 45	M	,,	F	0·154	− 0·007			− 2·1		
										Position Circle, 186°.

Date, 1886. Greenwich Civil Time.	Observer.	Object.	Line.	Width of Slit.	Displacement.		Earth's Motion in Miles per Second.	Concluded Motion of Stars in Miles per Second.		REMARKS.
					Measured.	Estimated.		Measured.	Estimated.	
d h m				r	r					
Jan. 28. 21. 59	N	Procyon.....	F	0·154	+0·002	0	+ 4·7	− 4·1	− 4·7	Position Circle, 186°.
Feb. 1. 18. 49	M	α Pegasi.....	F	0·104	−0·017	− 1/10	+ 11·2	− 16·3	− 15·8	Star low. Spectrum faint and very tremulous. Definition bad. Measures rough.
18. 55	M	,,	F	0·104	−0·145	− 1/2	+ 11·2	− 55·2	− 34·4	
19. 3	M	γ Pegasi	F	0·104	+0·025	− 2/5	+ 15·0	− 7·4	+ 3·6	Spectrum faint and tremulous. Definition bad. Star-line seen with great difficulty.
19. 8	M	,,	F	0·104	+0·031	0	+ 15·0	− 5·6	− 15·0	
19. 13	M	α Andromedæ.	F	0·104	−0·228	− 2/3	+ 14·7	− 83·9	− 45·7	Wind high. Spectrum fairly bright but tremulous. Definition poor.
19. 18	M	,,	F	0·104	−0·171	− 3/5	+ 14·7	− 66·7	− 42·6	
19. 23	M	β Arietis	F	0·104	−0·188	− 1/2	+ 18·4	− 75·5	− 41·6	Wind very high. Spectrum tremulous. Definition bad.
19. 28	M	,,	F	0·104	−0·253	− 2/3	+ 18·4	− 95·2	− 49·4	
19. 43	M	β Persei	F	0·104	−0·037	− 1/3	+ 17·1	− 28·4	− 32·6	Spectrum fairly bright and steady. Definition fair.
19. 48	M	,,	F	0·104	−0·038	− 1/4	+ 17·1	− 28·7	− 28·7	
19. 55	M	α Persei	F	0·104	−0·005	− 1/10	+ 15·6	− 17·1	− 20·2	Spectrum fairly bright but tremulous. Definition poor.
20. 1	M	,,	F	0·104	−0·032	− 1/3	+ 15·6	− 25·3	− 31·1	
20. 13	M	Rigel	F	0·104	+0·071	+ 2/5	+ 13·7	+ 7·9	+ 4·9	Wind very high. Spectrum bright but tremulous. Star-line seen with great difficulty.
20. 21	M	,,	F	0·104	+0·055	+ 1/5	+ 13·7	+ 3·0	− 4·4	
20. 25	M	γ Orionis	F	0·104	+0·138	+ 3/4	+ 14·6	+ 28·2	+ 21·2	Wind very high. Spectrum fairly bright but tremulous. Definition bad. Star-line seen with great difficulty. Measures rough.
20. 30	M	,,	F	0·104	−0·056	− 1/3	+ 14·6	− 30·7	− 29·2	
20. 33	M	β Tauri	F	0·104	−0·029	− 1/5	+ 14·8	− 23·6	− 24·1	Wind very high. Spectrum bright but tremulous. Definition bad.
20. 39	M	,,	F	0·104	−0·041	− 1/4	+ 14·8	− 27·2	− 26·4	
20. 42	M	γ Geminorum .	F	0·104	−0·168	− 2/3	+ 10·9	− 61·9	− 41·9	Wind very high. Spectrum bright but tremulous. Definition bad.
20. 48	M	,,	F	0·104	−0·048	− 1/3	+ 10·9	− 25·5	− 26·4	Position Circle, 6°.
Feb. 2. 12. 0	M	Sky.....	F	0·104	+0·024			+ 7·3		The coincidence of the two spectra appeared perfect.
12. 4	M	,,	F	0·104	+0·005			+ 1·5		
12. 7	M	,,	F	0·104	+0·026			+ 7·9		
12. 11	M	,,	F	0·104	−0·012			− 3·6		
12. 15	M	,,	F	0·104	+0·010			+ 3·0		Position Circle, 6°.
March 3. 19. 55	M	Rigel	F	0·190	+0·078	+ 1/4	+ 16·0	+ 7·7	+ 5·3	Spectrum fairly bright and steady but definition poor. Star-line seen with great difficulty.
19. 59	M	,,	F	0·190	+0·155	+ 1/3	+ 16·0	+ 31·1	+ 12·3	
20. 10	M	γ Orionis	F	0·190	+0·040	+ 1/10	+ 17·8	− 5·7	− 9·3	Spectrum faint but fairly steady. Definition poor. Star-line seen with great difficulty.
20. 13	M	,,	F	0·190	+0·119	+ 1/3	+ 17·8	+ 18·3	+ 10·5	
20. 20	M	β Tauri	F	0·190	−0·090	− 1/3	+ 18·4	− 45·7	− 46·7	Spectrum fairly bright and steady but definition poor.
20. 24	M	,,	F	0·190	+0·060	+ 1/10	+ 18·4	− 0·2	− 9·9	
20. 26	M	,,	F	0·190	−0·086	− 1/4	+ 18·4	− 44·5	− 39·7	
20. 29	M	,,	F	0·190	−0·056	− 3/10	+ 18·4	− 35·4	− 43·9	
20. 40	M	Aldebaran.....	F	0·190	+0·198	+ 1/2	+ 18·5	+ 41·6	+ 24·0	Spectrum bright and fairly steady, but definition poor. Star-line faint.
20. 43	M	,,	F	0·190	+0·087	+ 1/4	+ 18·5	+ 7·9	+ 2·8	
20. 52	M	Capella	F	0·190	−0·102	− 1/3	+ 17·1	− 48·1	− 45·4	Spectrum bright. Definition fair. The displacement was distinctly towards the blue. Star line seen fairly well.
20. 56	M	,,	F	0·190	−0·144	− 1/2	+ 17·1	− 60·8	− 59·6	
21. 0	M	β Aurigæ	F	0·190	−0·170	− 1/2	+ 16·8	− 68·4	− 59·3	Spectrum fairly bright and steady. Definition fair.
21. 4	M	,,	F	0·190	−0·106	− 2/5	+ 16·8	− 49·0	− 50·8	
21. 37	M	Sirius	F	0·190	+0·035	+ 1/10	+ 12·6	− 2·0	− 4·1	Star in light cloud. Spectrum faint and tremulous. Definition bad.
21. 41	M	,,	F	0·190	−0·057	− 1/5	+ 12·6	− 29·9	− 29·6	
21. 43	M	,,	F	0·190	−0·230	− 1/2	+ 12·6	− 82·4	− 55·1	
21. 45	M	,,	F	0·190	−0·064	− 1/3	+ 12·6	− 32·0	− 40·9	
21. 46	M	,,	F	0·190	−0·060	− 3/10	+ 12·6	− 30·8	− 38·1	
21. 47	M	,,	F	0·190	−0·138	− 2/5	+ 12·6	− 54·5	− 46·6	
21. 56	M	Procyon.....	F	0·190	−0·149	− 1/2	+ 13·6	− 58·9	− 56·1	
21. 58	M	,,	F	0·190	−0·034	− 1/4	+ 13·6	− 23·9	− 34·9	
22. 0	M	,,	F	0·190	−0·073	− 3/10	+ 13·6	− 35·8	− 39·1	
22. 2	M	,,	F	0·190	−0·076	− 1/4	+ 13·6	− 36·7	− 34·9	Position Circle, 6°.

Date, 1886. Greenwich Civil Time.	Observer.	Object.	Line.	Width of Slit.	Displacement. Measured.	Displacement. Estimated.	Earth's Motion in Miles per Second.	Concluded Motion of Stars in Miles per Second. Measured.	Concluded Motion of Stars in Miles per Second. Estimated.	REMARKS.
d h m				r	r					
Mar. 4. 12. 0	M	Sky.....	F	0·190	+0·007			+ 2·1		No want of coincidence between the two spectra could be detected.
12. 5	M	,,	F	0·190	+0·030			+ 9·1		
12. 10	M	,,	F	0·190	+0·001			+ 0·3		
12. 15	M	,,	F	0·190	+0·007			+ 2·1		
12. 20	M	,,	F	0·190	−0·011			− 3·3		Position Circle, 6°.
Mar. 17. 20. 0	M	Aldebaran.....	b_1	0·153	+0·080	+ $\frac{1}{3}$	+ 17·4	+ 12·6	+ 24·9	Spectrum faint and tremulous. Definition poor. Star-lines seen with difficulty.
20. 10	M	,,	b_1	0·153	+0·085	+ $\frac{1}{3}$	+ 17·4	+ 14·5	+ 24·9	
20. 15	M	Capella	b_1	0·153	+0·205	+ $\frac{4}{7}$	+ 16·9	+ 60·1	+ 55·6	Spectrum bright but tremulous. Definition poor. Star-lines seen with difficulty.
20. 25	M	,,	b_1	0·153	+0·110	+ $\frac{3}{7}$	+ 16·9	+ 24·4	+ 37·5	
20. 38	M	α Orionis	b_4	0·153	+0·182	+ $\frac{1}{2}$	+ 17·8	+ 50·5	+ 45·7	Spectrum fairly steady; b_1 could not be distinctly seen, but b_4 was very distinct.
20. 42	M	,,	b_4	0·153	+0·094	+ $\frac{2}{5}$	+ 17·8	+ 17·5	+ 33·0	
21. 35	M	Pollux	b_1	0·153	−0·028	− $\frac{1}{10}$	+ 16·8	− 27·3	− 29·5	Spectrum faint but fairly steady. Star-line faint but seen fairly well now and then.
21. 38	M	,,	b_1	0·153	−0·039	− $\frac{1}{4}$	+ 16·8	− 31·5	− 48·5	
21. 44	M	Moon	b_1	0·153	−0·011			− 4·1		The coincidence of the two spectra appeared perfect.
21. 46	M	,,	b_1	0·153	−0·008			− 3·0		
21. 47	M	,,	b_1	0·153	−0·016			− 6·0		
21. 49	M	,,	b_1	0·153	+0·025			+ 9·4		
21. 50	M	,,	b_1	0·153	+0·008			+ 3·0		
22. 3	M	Mars	b_1	0·153	+0·058	+ $\frac{1}{4}$		+ 21·8	+ 31·7	Spectrum faint. The line in the spectrum of the planet was faint, but fairly well defined. Calculated motion + 2·0 miles per second.
22. 7	M	,,	b_1	0·153	−0·014	− $\frac{1}{20}$		− 5·3	− 6·4	
22. 10	M	,,	b_1	0·153	+0·054	+ $\frac{1}{4}$		+ 20·3	+ 31·7	
22. 13	M	,,	b_1	0·153	+0·017	+ $\frac{1}{20}$		+ 6·4	+ 6·4	Position Circle, 6°.
Mar. 23. 21. 8	N	Capella	b_1	0·190	−0·013	0	+ 16·6	− 21·5	− 16·6	Spectrum tremulous. Star-line very faint.
21. 15	N	,,	b_1	0·190	−0·009	0	+ 16·6	− 20·0	− 16·6	
22. 27	N	Pollux	b_1	0·190	−0·006	0	+ 17·4	− 19·6	− 17·4	Star-line seen fairly well at intervals. Mist rendered measurement difficult.
22. 33	N	,,	b_1	0·190	−0·031	− $\frac{1}{8}$	+ 17·4	− 29·0	− 30·2	
22. 55	N	Mars	b_1	0·190	−0·066	− $\frac{1}{4}$		− 24·8	− 25·6	The line in the spectrum of the planet was faint. Calculated motion + 3·3 miles per second.
23. 0	N	,,	b_1	0·190	−0·018	− $\frac{1}{10}$		− 6·8	− 10·3	
23. 5	N	,,	b_1	0·190	+0·010	0		+ 3·8	0·0	
23. 10	N	,,	b_1	0·190	+0·010	0		+ 3·8	0·0	Position Circle, 186°.
Mar. 24. 12. 10	N	Sky.....	b_1	0·190	−0·009			− 3·4		The coincidence of the two spectra appeared perfect.
12. 14	N	,,	b_1	0·190	−0·010			− 3·8		
12. 17	N	,,	b_1	0·190	−0·001			− 0·4		Position Circle, 186°.
April 6. 21. 30	N	Capella	F	0·218	+0·052	+ $\frac{1}{4}$	+ 15·1	+ 0·7	− 0·4	Spectrum tremulous.
21. 40	N	,,	F	0·218	+0·057	+ $\frac{1}{4}$	+ 15·1	+ 2·2	− 0·4	
22. 15	N	Procyon.....	F	0·218	−0·036	− $\frac{1}{5}$	+ 17·5	− 28·4	− 29·3	
22. 25	N	,,	F	0·218	+0·010	+ $\frac{1}{20}$	+ 17·5	− 14·5	− 14·5	
22. 40	N	Castor.....	F	0·218	+0·010	+ $\frac{1}{20}$	+ 18·0	− 15·0	− 15·0	Star-line diffused and ill-defined.
22. 50	N	,,	F	0·218	−0·031	− $\frac{1}{6}$	+ 18·0	− 27·4	− 27·8	
23. 0	N	,,	F	0·218	+0·041	+ $\frac{1}{6}$	+ 18·0	− 5·6	− 8·2	
23. 5	N	,,	F	0·218	+0·021	+ $\frac{1}{10}$	+ 18·0	− 11·6	− 12·1	
23. 17	N	Pollux.....	F	0·218	−0·042	− $\frac{1}{5}$	+ 18·1	− 30·8	− 29·9	Spectrum tremulous. Star-line faint.
23. 25	N	,,	F	0·218	−0·040	− $\frac{1}{5}$	+ 18·1	− 30·2	− 29·9	
23. 40	N	Mars	F	0·218	+0·005	0		+ 1·5	0·0	Calculated motion + 5·6 miles per second.
23. 45	N	,,	F	0·218	+0·010	+ $\frac{1}{20}$		+ 3·0	+ 3·0	Position Circle, 6°.
Apr. 22. 22. 45	N	Mars	F	0·137	+0·006	0		+ 1·8	0·0	Spectrum tremulous. The line in the spectrum of the planet faint and indistinct. Measure rough. Calculated motion + 7·3 miles per second. Position Circle, 6°.

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					Measured.	Estimated.		Measured.	Estimated.	
d h m				r	r					
Apr. 30. 21. 30	N	Regulus.....	F	0·175	+0·001	0	+ 17·2	− 16·9	− 17·2	
21. 38	N	,,	F	0·175	−0·001	0	+ 17·2	− 17·5	− 17·2	
22. 5	N	Mars.....	F	0·175	+0·017	+ $\frac{1}{20}$		+ 5·1	+ 4·0	Calculated motion + 7·8 miles per second.
22. 13	N	,,	F	0·175	+0·017	+ $\frac{1}{20}$		+ 5·1	+ 4·0	
22. 40	N	β Leonis.....	F	0·175	−0·067	− $\frac{1}{4}$	+ 13·6	− 34·0	− 33·6	
22. 45	N	,,	F	0·175	−0·044	− $\frac{1}{6}$	+ 13·6	− 27·0	− 26·9	
23. 20	N	Spica	F	0·175	−0·020	− $\frac{1}{20}$	+ 5·7	− 11·8	− 9·7	
23. 25	N	,,	F	0·175	−0·051	− $\frac{1}{5}$	+ 5·7	− 21·2	− 21·7	
23. 45	N	Arcturus	F	0·175	−0·041	− $\frac{1}{6}$	+ 4·8	− 17·2	− 18·1	
23. 50	N	,,	F	0·175	−0·066	− $\frac{1}{4}$	+ 4·8	− 24·8	− 24·8	
										Position Circle, 6°.
May 1. 21. 0	M	Procyon.....	F	0·065	+0·012	+ $\frac{1}{10}$	+ 16·6	− 13·0	− 9·5	Spectrum faint and very tremulous. Bisection difficult and uncertain.
21. 10	M	,,	F	0·065	−0·284	− $\frac{4}{5}$	+ 16·6	−102·8	− 73·0	
21. 25	M	Pollux.....	F	0·065	−0·078	− $\frac{2}{5}$	+ 16·9	− 40·6	− 45·1	Spectrum and star-line faint. Measures made with great difficulty.
21. 35	M	,,	F	0·065	−0·112	− $\frac{2}{5}$	+ 16·9	− 50·9	− 45·1	
21. 50	M	Castor.....	F	0·065	+0·116	+ $\frac{1}{3}$	+ 16·4	+ 18·9	+ 7·1	Spectrum faint but definition good.
22. 0	M	,,	F	0·065	+0·154	+ $\frac{1}{2}$	+ 16·4	+ 30·4	+ 18·9	
22. 35	M	β Ursæ Majoris	F	0·065	+0·112	+ $\frac{1}{3}$	+ 12·7	+ 21·3	+ 10·8	Spectrum faint. Measures made with great difficulty.
22. 45	M	,,	F	0·065	+0·009	0	+ 12·7	− 10·0	− 12·7	
23. 5	M	α Ursæ Majoris	F	0·140	−0·112	− $\frac{1}{3}$	+ 11·7	− 45·7	− 41·0	Spectrum fairly bright, but star-line very faint and difficult to see.
23. 15	M	,,	F	0·140	−0·204	− $\frac{3}{5}$	+ 11·7	− 73·7	− 64·4	
23. 30	M	γ Ursæ Majoris	F	0·140	−0·015	− $\frac{1}{20}$	+ 11·7	− 16·3	− 16·1	Star-line very ill-defined.
23. 40	M	,,	F	0·140	+0·100	+ $\frac{1}{3}$	+ 11·7	+ 18·7	+ 17·6	
23. 50	M	ε Ursæ Majoris	F	0·140	+0·046	+ $\frac{1}{5}$	+ 9·5	+ 4·5	+ 8·0	Star-line very ill-defined.
23. 55	M	,,	F	0·140	−0·017	− $\frac{1}{20}$	+ 9·5	− 14·6	− 13·9	
2. 0. 15	M	ζ Ursæ Majoris	F	0·140	+0·075	+ $\frac{1}{4}$	+ 8·4	+ 14·4	+ 13·6	Spectrum bright and definition fair, but star-line broad and diffused.
0. 25	M	,,	F	0·140	+0·023	+ $\frac{1}{10}$	+ 8·4	− 1·4	+ 0·4	
										Position Circle, 6°.
May 3. 10. 10	M	Sky.....	F	0·140	−0·030			− 9·1		The coincidence of the two spectra appeared perfect.
10. 15	M	,,	F	0·140	−0·021			− 6·4		
10. 20	M	,,	F	0·140	+0·036			+ 10·9		
10. 25	M	,,	F	0·140	+0·001			+ 0·3		
10. 30	M	,,	F	0·140	+0·005			+ 1·5		
										Position Circle, 6°.
May 3. 23. 40	M	Regulus.....	F	0·135	+0·100	+ $\frac{1}{2}$	+ 17·5	+ 12·9	+ 19·4	Spectrum bright but tremulous. Star-line diffused but seen fairly well.
23. 50	M	,,	F	0·135	+0·027	+ $\frac{1}{10}$	+ 17·5	− 9·3	− 10·1	
4. 0. 0	M	Mars	F	0·135	−0·021	− $\frac{1}{10}$		− 6·4	− 7·4	Spectrum bright and steady, definition fair. Calculated motion + 8·0 miles per second.
0. 5	M	,,	F	0·135	−0·056	− $\frac{1}{5}$		− 17·0	− 14·7	
0. 10	M	,,	F	0·135	+0·009	0		+ 2·7	0·0	
0. 15	M	,,	F	0·135	−0·027	− $\frac{1}{10}$		− 8·2	− 7·4	
0. 30	M	β Leonis	F	0·135	+0·025	+ $\frac{1}{10}$	+ 14·2	− 6·6	− 6·8	Spectrum fairly bright and steady. Star-line very diffused but seen fairly well.
0. 40	M	,,	F	0·135	−0·003	0	+ 14·2	− 15·1	− 14·2	
1. 0	M	γ Virginis	F	0·135	−0·130	− $\frac{1}{2}$	+ 10·3	− 49·8	− 47·2	Spectrum fairly bright and steady. Star-line broad and diffused but seen fairly well.
1. 10	M	,,	F	0·135	−0·089	− $\frac{1}{3}$	+ 10·3	− 37·3	− 34·9	
1. 20	M	α Virginis	F	0·135	−0·196	− $\frac{2}{3}$	+ 6·6	− 66·1	− 55·8	Spectrum bright but very tremulous. A large displacement towards the blue was manifest.
1. 30	M	,,	F	0·135	−0·161	− $\frac{3}{5}$	+ 6·6	− 55·5	− 50·9	
1. 45	M	Arcturus	F	0·135	−0·221	− $\frac{4}{5}$	+ 5·5	− 72·6	− 64·6	Spectrum bright. Definition good.
1. 55	M	,,	F	0·135	−0·212	− $\frac{4}{5}$	+ 5·5	− 69·9	− 64·6	
2. 5	M	α Coronæ Bor.	F	0·135	−0·065	− $\frac{1}{4}$	+ 0·7	− 20·4	− 19·2	Star-line very difficult to bisect.
2. 15	M	,,	F	0·135	−0·141	− $\frac{1}{2}$	+ 0·7	− 43·5	− 37·6	
2. 20	M	,,	F	0·135	+0·010	0	+ 0·7	+ 2·3	− 0·7	
2. 25	M	,,	F	0·135	−0·145	− $\frac{1}{2}$	+ 0·7	− 44·7	− 37·6	
										Position Circle, 6°.

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d h m				r	r					
May 6. 22. 39	N	Regulus.....	F	0·145	+0·052	+ 1/4	+ 17·6	− 1·8	+ 2·1	Measures made with difficulty.
22. 44	N	,,	F	0·145	−0·030	− 1/7	+ 17·6	− 26·7	− 28·9	
23. 50	N	Arcturus	F	0·145	−0·060	− 1/4	+ 6·2	− 24·4	− 25·9	
23. 59	N	,,	F	0·145	−0·055	− 1/5	+ 6·2	− 22·9	− 21·9	
										Position Circle, 6°.
May 13. 21. 30	M	Arcturus	F	0·153	−0·086	− 1/3	+ 7·8	− 33·9	− 41·0	Spectrum bright and fairly steady, but definition poor.
21. 45	M	,,	F	0·153	−0·093	− 3/10	+ 7·8	− 36·1	− 37·7	
22. 10	M	α Canum Ven..	F	0·153	−0·072	− 1/4	+ 11·9	− 33·8	− 36·8	Spectrum bright and fairly steady, but definition poor.
22. 30	M	,,	F	0·153	−0·084	− 1/4	+ 11·9	− 37·4	− 36·8	
22. 50	M	Moon	F	0·153	−0·027			− 8·2		The coincidence of the two spectra appeared perfect. The observations were interrupted by passing cloud.
22. 55	M	,,	F	0·153	+0·022			+ 6·7		
23. 0	M	,,	F	0·153	+0·001			+ 0·3		
23. 5	M	,,	F	0·153	+0·017			+ 5·1		
23. 10	M	,,	F	0·153	−0·010			− 3·0		
23. 30	M	β Libræ.....	F	0·153	−0·120	− 1/3	+ 1·7	− 38·1	− 34·9	Spectrum bright but tremulous. The observations were interrupted by passing cloud.
23. 50	M	,,	F	0·153	−0·032	− 1/10	+ 1·7	− 11·4	− 11·6	
14. 0. 5	M	α Coronæ Bor.	F	0·153	+0·061	+ 1/4	+ 2·8	+ 15·7	+ 22·1	Spectrum bright and fairly steady. Definition fair.
0. 15	M	,,	F	0·153	+0·042	+ 1/6	+ 2·8	+ 9·9	+ 17·1	
0. 25	M	β Serpentis ...	F	0·153	−0·027	− 1/10	+ 1·3	− 9·5	− 11·2	Spectrum steady and fairly bright. Star-line very well seen. Measures considered good.
0. 30	M	,,	F	0·153	−0·058	− 1/5	+ 1·3	− 18·9	− 21·2	
0. 45	M	γ Herculis.....	F	0·153	−0·125	− 2/5	− 1·1	− 36·9	− 38·8	Spectrum faint. The observations were interrupted by cloud.
										Position Circle, 6°.
May 15. 21. 20	M	Regulus.....	F	0·103	+0·024	+ 1/10	+ 17·9	− 10·6	− 9·6	Spectrum faint and tremulous. Star-line faint and very ill defined.
21. 30	M	,,	F	0·103	+0·060	+ 1/4	+ 17·9	+ 0·3	+ 2·9	
21. 45	M	δ Leonis.....	F	0·103	−0·115	− 2/5	+ 16·8	− 51·7	− 50·1	Spectrum fairly bright but tremulous. Definition fair. Displacement evidently large and towards the blue. Star-line dark, very broad and diffused at the edges.
22. 0	M	,,	F	0·103	−0·064	− 2/5	+ 16·8	− 36·2	− 50·1	
22. 15	M	β Leonis	F	0·103	−0·013	− 1/20	+ 15·9	− 19·9	− 20·0	Spectrum fairly bright but tremulous. Definition fair. Displacement very small.
22. 25	M	,,	F	0·103	+0·021	+ 1/10	+ 15·9	− 9·5	− 7·6	
23. 35	M	Moon.....	F	0·103	−0·003			− 0·9		The coincidence of the two spectra appeared perfect.
23. 40	M	,,	F	0·103	0·000			0·0		
23. 45	M	,,	F	0·103	−0·001			− 0·3		
23. 50	M	,,	F	0·103	−0·009			− 2·7		
23. 55	M	,,	F	0·103	−0·006			− 1·8		
										Position Circle, 6°.
May 18. 22. 35	N	Regulus.....	F	0·180	+0·045	+ 1/6	+ 17·9	− 4·2	− 4·2	Star-line diffused and faint.
22. 40	N	,,	F	0·180	+0·053	+ 1/5	+ 17·9	− 1·8	− 1·5	
22. 58	N	Spica.....	F	0·180	+0·004	0	+ 10·5	− 9·3	− 10·5	Definition poor. Measures rough.
23. 3	N	,,	F	0·180	+0·017	+ 1/10	+ 10·5	− 5·4	− 2·3	
23. 25	N	Arcturus	F	0·180	−0·114	− 2/5	+ 8·9	− 43·5	− 41·7	
23. 30	N	,,	F	0·180	−0·058	− 1/5	+ 8·9	− 26·5	− 25·3	
23. 50	N	Moon.....	F	0·180	−0·006			− 1·8		The coincidence of the two spectra appeared fairly exact.
23. 53	N	,,	F	0·180	−0·021			− 6·4		
23. 56	N	,,	F	0·180	+0·005			+ 1·5		
23. 59	N	,,	F	0·180	+0·003			+ 0·9		
										Position Circle, 6°.
May 20. 22. 15	N	Arcturus	F	0·230	−0·069	− 1/5	+ 9·3	− 30·3	− 30·9	Star-line very indistinct.
22. 25	N	,,	F	0·230	−0·044	− 1/7	+ 9·3	− 22·7	− 24·7	
22. 45	N	α Coronæ Bor.	F	0·230	−0·040	− 1/10	+ 4·2	− 16·3	− 15·0	Star-line very broad and dark.
22. 50	N	,,	F	0·230	−0·039	− 1/10	+ 4·2	− 16·0	− 15·0	
23. 25	N	Moon.....	F	0·230	−0·028			− 8·5		The coincidence of the two spectra appeared perfect.
23. 28	N	,,	F	0·230	−0·023			− 7·0		

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d h m				r	r					
May 20. 23. 30	N	Moon.....	F	0·230	−0·009			− 2·7		
23. 33	N	,,	F	0·230	−0·001			− 0·3		Position Circle, 6°.
June 7. 22. 5	M	Arcturus	b_1	0·165	−0·099	− $\frac{3}{10}$	+ 12·5	− 49·7	− 50·0	Spectrum faint but fairly steady. Star-lines faint and seen with difficulty.
22. 20	M	,,	b_1	0·165	−0·096	− $\frac{1}{4}$	+ 12·5	− 48·5	− 43·8	Position Circle, 6°.
June 8. 10. 20	M	Sky	b_1	0·165	+0·030			+ 11·3		The coincidence of the two spectra appeared perfect.
10. 21	M	,,	b_1	0·165	+0·030			+ 11·3		
10. 23	M	,,	b_1	0·165	−0·013			− 4·9		
10. 24	M	,,	b_1	0·165	+0·019			+ 7·1		
10. 25	M	,,	b_1	0·165	−0·011			− 4·1		Position Circle, 6°.
June 15. 23. 0	N	Arcturus	b_1	0·150	−0·138	− $\frac{1}{2}$	+ 13·5	− 65·3	− 62·3	
23. 5	N	,,	b_1	0·150	−0·095	− $\frac{1}{3}$	+ 13·5	− 49·2	− 46·0	
23. 40	N	Moon.....	b_1	0·150	−0·014			− 5·3		The coincidence of the two spectra appeared perfect.
23. 42	N	,,	b_1	0·150	−0·014			− 5·3		
23. 43	N	,,	b_1	0·150	−0·023			− 8·6		
23. 45	N	,,	b_1	0·150	−0·006			− 2·2		
16. 0. 15	N	γ Ursæ Majoris	b_1	0·150	+0·006	0	+ 10·9	− 8·7	− 10·9	Spectrum faint. Star-line fairly well seen at times.
0. 20	N	,,	b_1	0·150	+0·037	+ $\frac{1}{6}$	+ 10·9	+ 3·0	+ 5·4	
0. 38	N	α Ursæ Majoris	b_1	0·150	−0·121	− $\frac{1}{2}$	+ 8·7	− 54·1	− 57·5	
0. 50	N	,,	b_1	0·150	−0·138	− $\frac{1}{2}$	+ 8·7	− 60·5	− 57·5	Position Circle, 6°.
June 28. 23. 0	M	Arcturus	b_1	0·124	−0·049	− $\frac{1}{5}$	+ 14·7	− 33·1	− 36·0	Spectrum very tremulous. Definition poor.
23. 15	M	,,	b_1	0·124	−0·074	− $\frac{1}{4}$	+ 14·7	− 42·5	− 41·3	
23. 30	M	ϵ^2 Boötis	b_1	0·124	−0·036	− $\frac{1}{10}$	+ 12·7	− 26·2	− 23·3	Spectrum fairly steady, but definition bad. Star-lines seen with great difficulty.
23. 45	M	,,	b_1	0·124	+0·024	+ $\frac{1}{7}$	+ 12·7	− 3·7	+ 2·5	
29. 0. 0	M	α Serpentis ...	b_1	0·124	+0·033	+ $\frac{1}{7}$	+ 11·7	+ 0·7	+ 3·5	The spectrum of this star is of the second type, and not of the third, as given by Secchi. Spectrum faint. Definition poor. Star-lines seen with great difficulty.
0. 20	M	,,	b_1	0·124	+0·008	+ $\frac{1}{20}$	+ 11·7	− 8·7	− 6·4	
0. 40	M	γ Draconis ...	b_1	0·124	+0·072	+ $\frac{2}{5}$	+ 0·9	+ 26·1	+ 41·6	Spectrum very tremulous. Definition bad. Star-lines seen with great difficulty.
0. 50	M	,,	b_1	0·124	+0·044	+ $\frac{1}{4}$	+ 0·9	+ 15·6	+ 25·7	
1. 5	M	γ Cygni	b_1	0·124	+0·009	+ $\frac{1}{10}$	− 6·9	+ 10·3	+ 17·5	Spectrum very tremulous. Definition very bad.
1. 20	M	,,	b_1	0·124	+0·007	0	− 6·9	+ 9·5	+ 6·9	
1. 35	M	α Cygni	b_1	0·124	−0·046	− $\frac{1}{5}$	− 7·4	− 9·9	− 13·9	Spectrum very tremulous. Definition bad. Star-lines seen with great difficulty.
1. 50	M	,,	b_1	0·124	+0·009	+ $\frac{1}{20}$	− 7·4	+ 10·8	+ 12·7	Position Circle, 6°.
June 29. 12. 0	M	Sky	b_1	0·124	−0·013			− 4·9		The coincidence of the two spectra appeared perfect.
12. 2	M	,,	b_1	0·124	+0·010			− 3·8		
12. 4	M	,,	b_1	0·124	+0·024			+ 9·0		
12. 6	M	,,	b_1	0·124	+0·005			+ 1·9		
12. 8	M	,,	b_1	0·124	−0·018			− 6·8		Position Circle, 6°.
July 5. 22. 30	M	Arcturus	F	0·150	−0·132	− $\frac{1}{2}$	+ 15·1	− 55·2	− 54·8	Spectrum very tremulous, but star-line fairly well seen at times.
22. 50	M	,,	F	0·150	−0·011	− $\frac{1}{10}$	+ 15·1	− 18·4	− 23·0	
23. 15	M	α Coronæ Bor.	F	0·150	+0·124	+ $\frac{1}{20}$	+ 11·4	+ 26·3	+ 28·3	Spectrum fairly steady. Definition fair.
23. 30	M	,,	F	0·150	+0·111	+ $\frac{2}{5}$	+ 11·4	+ 22·3	+ 20·3	
23. 45	M	α Ophiuchi ...	F	0·150	−0·023	− $\frac{1}{10}$	+ 5·7	− 12·7	− 13·6	Spectrum steady. Definition fair.
23. 58	M	,,	F	0·150	−0·069	− $\frac{1}{4}$	+ 5·7	− 26·7	− 25·5	
6. 0. 15	M	α Lyræ	F	0·150	−0·081	− $\frac{3}{10}$	0·0	− 24·6	− 23·8	Spectrum bright and steady. Definition fair.

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July 6. 0. 30	M	α Lyræ	F	0·150	−0·004	0	0·0	− 1·2	0·0	Position of star very awkward for observing; measures rough in consequence.
0. 45	M	α Aquilæ	F	0·150	−0·079	− ¼	− 4·3	− 19·7	− 15·5	Spectrum tremulous, but definition fair.
1. 0	M	,,	F	0·150	−0·105	− ⅔	− 4·3	− 27·6	− 27·4	Star-line faint.
1. 20	M	α Cygni	F	0·150	−0·061	− ¼	− 6·8	− 11·7	− 13·0	Spectrum bright and steady. Definition fair. Position of star very awkward for observing; measures rough in consequence.
1. 40	M	,,	F	0·150	−0·129	− ½	− 6·8	− 32·4	− 32·9	Position Circle, 6°.
July 6. 13. 15	M	Sky	F	0·150	+0·007			+ 2·1		The coincidence of the two spectra appeared perfect.
13. 17	M	,,	F	0·150	−0·006			− 1·8		
13. 20	M	,,	F	0·150	+0·031			+ 9·4		
13. 22	M	,,	F	0·150	+0·005			+ 1·5		
13. 25	M	,,	F	0·150	−0·008			− 2·4		Position Circle, 6°.
Aug. 10. 22. 30	N	α Lyræ	F	0·114	−0·080	− ⅓	+ 4·8	− 29·1	− 31·3	Spectrum very bright and steady. Star-line distinct.
22. 35	N	,,	F	0·114	−0·084	− ⅓	+ 4·8	− 30·3	− 31·3	
23. 0	N	Moon.....	F	0·114	−0·012			− 3·6		The coincidence of the two spectra appeared perfect.
23. 2	N	,,	F	0·114	−0·011			− 3·3		
23. 5	N	,,	F	0·114	−0·007			− 2·1		
23. 8	N	,,	F	0·114	−0·007			− 2·1		
23. 10	N	,,	F	0·114	+0·005			+ 1·5		
23. 53	N	α Aquilæ	F	0·114	−0·052	− ⅓	+ 4·9	− 20·7	− 20·8	Star-line broad and diffused.
23. 58	N	,,	F	0·114	−0·121	− ½	+ 4·9	− 41·6	− 44·7	
11. 1. 25	N	α Pegasi	F	0·114	−0·028	− $\frac{1}{10}$	− 9·3	+ 0·8	+ 1·4	Spectrum faint.
1. 30	N	,,	F	0·114	−0·011	0	− 9·3	+ 6·0	+ 9·3	Position Circle, 6°.
Oct. 13. 19. 40	M	α Lyræ	F	0·105	−0·210	− ¾	+ 8·7	− 72·5	− 56·5	Clouds constantly passing. Observations much interrupted, but star-line seen fairly well at time of bisection.
19. 55	M	,,	F	0·105	−0·133	− ½	+ 8·7	− 49·1	− 40·6	Position Circle 6°.
Oct. 18. 21. 20	M	α Aquilæ	F	0·105	−0·167	− ⅗	+ 16·1	− 66·8	− 54·4	Spectrum very faint and tremulous.
21. 40	M	,,	F	0·105	−0·172	− ⅗	+ 16·1	− 68·4	− 54·4	
22. 0	M	α Cygni	F	0·105	−0·221	− ⅘	+ 7·3	− 74·4	− 58·3	Spectrum faint but steady. Star-line fairly well seen.
22. 10	M	,,	F	0·105	−0·095	− ⅖	+ 7·3	− 36·1	− 32·8	Position Circle, 6°.
Oct. 22. 19. 25	M	α Lyræ	F	0·103	−0·212	− ⅘	+ 8·5	− 72·9	− 53·2	Spectrum bright and fairly steady.
19. 40	M	,,	F	0·103	−0·118	− ½	+ 8·5	− 44·3	− 36·5	
20. 5	M	α Aquilæ	F	0·103	−0·088	− ⅖	+ 16·2	− 42·9	− 38·5	Spectrum bright and fairly steady. Position Circle, 6°.
Nov. 5. 22. 35	M	α Andromedæ	F	0·148	+0·035	+ ⅕	+ 8·6	(+ 2·0)	(+ 9·1)	
22. 55	M	,,	F	0·148	+0·009	+ $\frac{1}{20}$	+ 8·6	(− 5·9)	(− 4·1)	
23. 10	M	Moon.....	F	0·148	+0·034			(+ 10·3)		The lines in the spectrum of the Moon seemed to be displaced towards the red.
23. 15	M	,,	F	0·148	+0·046			(+ 14·0)		
23. 20	M	,,	F	0·148	+0·013			(+ 4·0)		
23. 22	M	,,	F	0·148	+0·012			(+ 3·6)		
23. 25	M	,,	F	0·148	−0·014			(− 4·3)		
23. 45	M	Rigel.....	F	0·148	+0·169	+ ⅗	− 8·4	(+ 59·7)	(+ 61·6)	
6. 0. 5	M	,,	F	0·148	+0·161	+ ⅗	− 8·4	(+ 57·3)	(+ 61·6)	
0. 30	M	Sirius	F	0·148	+0·054	+ ⅕	− 12·3	(+ 28·7)	(+ 30·0)	

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d h m				r	r					
Nov. 6. 0. 40	M	Sirius.....	F	0·148	+0·050	+ $\frac{1}{5}$	− 12·3	(+ 27·5)	(+ 30·0)	*Note.*—On examining the spectroscope on the following morning, it was found to be out of adjustment. The observations have therefore not been used.
0. 50	M	,,	F	0·148	+0·073	+ $\frac{1}{4}$	− 12·3	(+ 34·5)	(+ 34·5)	
1. 0	M	,,	F	0·148	+0·069	+ $\frac{1}{4}$	− 12·3	(+ 33·3)	(+ 34·5)	
										Position Circle, 6°.
Nov. 17. 23. 15	M	Aldebaran ...	F	0·119	+0·132	+ $\frac{2}{3}$	− 4·1	+ 44·2	+ 41·2	Spectrum steady, but star-line rather faint.
23. 25	M	,,	F	0·119	+0·132	+ $\frac{2}{3}$	− 4·1	+ 44·2	+ 41·2	
23. 40	M	,,	F	0·119	+0·154	+ $\frac{3}{4}$	− 4·1	+ 50·9	+ 45·8	
23. 50	M	,,	F	0·119	+0·111	+ $\frac{1}{2}$	− 4·1	+ 37·8	+ 31·9	
18. 0. 5	M	Rigel.....	F	0·119	+0·019	+ $\frac{1}{10}$	− 5·4	+ 11·2	+ 11·0	Spectrum tremulous, but star-line distinct and well defined.
0. 15	M	,,	F	0·119	+0·010	+ $\frac{1}{20}$	− 5·4	+ 8·4	+ 8·2	
0. 25	M	γ Orionis	F	0·119	+0·118	+ $\frac{3}{5}$	− 7·2	+ 43·0	+ 40·6	Spectrum fairly bright and steady. The star-line appeared to be broader and more diffused than usual.
0. 30	M	,,	F	0·119	−0·068	− $\frac{1}{3}$	− 7·2	− 13·5	− 11·3	
0. 35	M	,,	F	0·119	+0·009	− $\frac{1}{20}$	− 7·2	+ 9·9	+ 10·0	
0. 40	M	,,	F	0·119	−0·002	0	− 7·2	+ 6·6	+ 7·2	
0. 50	M	β Tauri.....	F	0·119	−0·073	− $\frac{1}{3}$	− 8·0	− 14·2	− 18·5	Spectrum steady. Star-line well seen.
1. 0	M	,,	F	0·119	−0·032	− $\frac{1}{10}$	− 8·0	− 1·7	+ 2·4	
1. 10	M	Sirius	F	0·119	−0·032	− $\frac{1}{5}$	− 10·6	+ 0·9	− 0·5	Spectrum very bright but tremulous.
1. 15	M	,,	F	0·119	+0·002	0	− 10·6	+ 11·2	+ 10·6	Star-line well seen. Direct comparison showed that the two spectra were almost in exact coincidence, the displacement, if any, being towards the red.
1. 20	M	,,	F	0·119	+0·016	+ $\frac{1}{10}$	− 10·6	+ 15·5	+ 16·2	
1. 25	M	,,	F	0·119	+0·010	+ $\frac{1}{20}$	− 10·6	+ 13·6	+ 13·4	
1. 30	M	,,	F	0·119	−0·008	0	− 10·6	+ 8·2	+ 10·6	
1. 35	M	,,	F	0·119	−0·032	− $\frac{1}{5}$	− 10·6	+ 0·9	− 0·5	
1. 40	M	Procyon	F	0·119	−0·032	− $\frac{1}{6}$	− 15·4	+ 5·7	+ 6·1	Spectrum steady. Star-line well seen. Direct comparison showed that the two spectra were almost in exact coincidence, but with a very slight displacement towards the blue.
1. 45	M	,,	F	0·119	−0·062	− $\frac{1}{2}$	− 15·4	− 3·4	− 3·1	
1. 50	M	,,	F	0·119	+0·034	+ $\frac{1}{5}$	− 15·4	+ 25·7	+ 26·5	
1. 55	M	,,	F	0·119	−0·018	− $\frac{1}{10}$	− 15·4	+ 9·9	+ 9·8	
2. 5	M	Castor	F	0·119	+0·011	+ $\frac{1}{20}$	− 14·7	+ 18·0	+ 17·5	Spectrum steady and fairly bright. Star-line diffused, but seen well.
2. 10	M	,,	F	0·119	+0·075	+ $\frac{2}{5}$	− 14·7	+ 37·5	+ 36·9	
2. 20	M	Pollux	F	0·119	−0·086	− $\frac{1}{2}$	− 15·5	− 10·6	− 12·3	Spectrum steady. Star-line very faint, but seen fairly well at times.
2. 30	M	,,	F	0·119	−0·118	− $\frac{1}{2}$	− 15·5	− 20·3	− 12·3	
2. 40	M	Moon.....	F	0·119	−0·003			− 0·9		The coincidence of the two spectra appeared perfect. Moon spectrum very well defined.
2. 45	M	,,	F	0·119	0·000			0·0		
2. 50	M	,,	F	0·119	−0·001			− 0·3		
2. 55	M	,,	F	0·119	−0·001			− 0·3		
3. 0	M	,,	F	0·119	+0·010			+ 3·0		
										Position Circle, 6°.
Nov. 29. 19. 30	M	β Persei	F	0·173	+0·095	+ $\frac{2}{5}$	+ 3·9	+ 24·9	+ 15·3	Spectrum bright and steady. Star-line very broad and diffused, but seen well. The displacement was evidently very small.
19. 36	M	,,	F	0·173	+0·094	+ $\frac{2}{5}$	+ 3·9	+ 24·7	+ 15·3	
19. 39	M	,,	F	0·173	−0·039	− $\frac{1}{10}$	+ 3·9	− 15·7	− 8·7	
19. 44	M	,,	F	0·173	−0·017	− $\frac{1}{10}$	+ 3·9	− 9·0	− 8·7	
19. 48	M	,,	F	0·173	−0·015	− $\frac{1}{20}$	+ 3·9	− 8·5	− 6·3	
19. 53	M	,,	F	0·173	−0·043	− $\frac{1}{5}$	+ 3·9	+ 9·2	+ 5·7	
20. 30	M	α Persei	F	0·173	−0·031	− $\frac{1}{10}$	+ 2·0	− 11·4	− 6·8	Spectrum steady, but star-line very difficult to observe. Same type as Procyon.
20. 50	M	,,	F	0·173	+0·089	+ $\frac{1}{2}$	+ 2·0	+ 25·0	+ 22·0	
21. 20	M	Aldebaran.....	F	0·173	+0·042	+ $\frac{1}{4}$	− 0·2	+ 12·9	+ 12·2	Spectrum tremulous. Definition poor. Observations made with much difficulty.
21. 40	M	,,	F	0·173	+0·081	+ $\frac{1}{2}$	− 0·2	+ 24·8	+ 24·2	
22. 0	M	Capella	F	0·173	+0·096	+ $\frac{3}{5}$	− 3·8	+ 32·9	+ 32·6	Definition poor. Star-line seen with much difficulty. Observations rough.
22. 15	M	,,	F	0·173	+0·073	+ $\frac{1}{2}$	− 3·8	+ 26·0	+ 27·8	
										Position Circle, 6°.
Nov. 30. 11. 30	M	Sky	F	0·173	+0·015			− 4·6		No want of coincidence between the two spectra was detected.
11. 34	M	,,	F	0·173	−0·029			− 8·8		
11. 37	M	,,	F	0·173	−0·006			− 1·8		
11. 41	M	,,	F	0·173	+0·028			+ 8·5		
11. 45	M	,,	F	0·173	−0·011			− 3·3		
										Position Circle, 6°.

Date, 1886. Greenwich Civil Time.	Observer.	Object.	Line.	Width of Slit.	Displacement. Measured.	Displacement. Estimated.	Earth's Motion in Miles per Second.	Concluded Motion of Stars in Miles per Second. Measured.	Concluded Motion of Stars in Miles per Second. Estimated.	REMARKS.
d h m				r	r					
Dec. 4. 20. 40	M	β Arietis	F	0·206	+0·130	+ ½	+ 12·1	+ 27·4	+ 28·3	Spectrum rather faint but steady. Definition good.
20. 50	M	,,	F	0·206	+0·059	+ ¼	+ 12·1	+ 5·8	+ 8·1	
21. 5	M	,,	F	0·206	+0·042	+ 1/10	+ 12·1	+ 0·6	− 4·0	
21. 15	M	,,	F	0·206	+0·092	+ ⅓	+ 12·1	+ 15·9	+ 14·8	
21. 25	M	Moon.....	F	0·206	+0·017			+ 5·1		Spectrum bright and steady. Definition fair. The coincidence of the two spectra appeared perfect.
21. 29	M	,,	F	0·206	−0·041			− 12·4		
21. 32	M	,,	F	0·206	+0·027			+ 8·2		
21. 36	M	,,	F	0·206	+0·024			+ 7·3		
21. 40	M	,,	F	0·206	−0·012			− 3·6		
22. 5	M	β Persei	F	0·206	−0·358	− 1¼	+ 5·4	−114·1	−106·4	Spectrum rather faint but steady. Star-line not seen very well, but unmistakeably greatly displaced towards the blue.
22. 15	M	,,	F	0·206	−0·362	− 1¼	+ 5·4	−115·3	−106·4	
22. 25	M	,,	F	0·206	−0·395	− 1½	+ 5·4	−125·4	−126·6	
22. 35	M	,,	F	0·206	−0·286	− 1	+ 5·4	− 92·3	− 86·2	
22. 50	M	α Persei	F	0·206	+0·001	0	+ 3·5	− 3·2	− 3·5	Spectrum steady. Definition good. Displacement evidently very small.
23. 0	M	,,	F	0·206	−0·046	− 1/10	+ 3·5	− 17·5	− 11·6	
23. 15	M	Aldebaran.....	F	0·206	+0·116	+ ½	+ 1·5	+ 33·8	+ 38·9	Spectrum bright and steady, but star-line not seen well.
23. 25	M	,,	F	0·206	+0·167	+ ⅗	+ 1·5	+ 49·2	+ 47·0	Position Circle, 6°.
Dec. 14. 19. 55	M	β Persei	F	0·200	+0·146	+ ½	+ 8·3	+ 36·0	+ 29·5	Spectrum fairly bright and steady. Definition fair.
19. 57	M	,,	F	0·200	+0·005	0	+ 8·3	− 6·8	− 8·3	
20. 0	M	,,	F	0·200	+0·112	+ ½	+ 8·3	+ 25·7	+ 29·5	
20. 4	M	,,	F	0·200	−0·029	− 1/20	+ 8·3	− 17·1	− 12·1	
20. 17	L	,,	F	0·200	+0·005	+ 1/10	+ 8·3	− 6·8	− 0·7	
20. 19	L	,,	F	0·200	+0·008	+ ½	+ 8·3	− 5·9	+ 29·5	
20. 24	L	,,	F	0·200	+0·030	+ ½	+ 8·3	+ 0·8	+ 29·5	
20. 26	L	,,	F	0·200	−0·030	0	+ 8·3	− 17·4	− 8·3	
20. 28	L	,,	F	0·200	+0·067	+ ¼	+ 8·3	+ 12·1	+ 10·6	
20. 33	M	,,	F	0·200	+0·103	+ ½	+ 8·3	+ 23·0	+ 29·5	Position Circle, 6°.

ROTATION of JUPITER deduced from the Relative Displacement of Lines in the Spectrum at the Preceding and Following Limbs respectively.

Date, 1886. Greenwich Civil Time.	Observer.	*p* Limb.	*f* Limb.	Line.	Width of Slit.	Displacement Measured. *p* — *f*	Concluded Motion in Miles per Second. *p* — *f*	Position Circle.	REMARKS.
d. h. m.		r.	r.		r.				
May 15. 22. 40	M	1·010	0·933	F	0·103	+ 0·077	+ 23·4	32°	Cylindrical lens before slit. Slit tangential to limb. The limb of the planet was brought up as carefully as possible to the outer edge of the slit, which was about 1″·0 in width. The mean point observed was therefore about 0″·5 from the limb. Spectrum faint, and measures very difficult though the definition was fair.
22. 50	M	1·052	0·898	F	0·103	+ 0·154	+ 46·8	32	
23. 0	M	1·076	0·994	F	0·103	+ 0·082	+ 24·9	32	
23. 15	M	1·024	0·962	F	0·103	+ 0·062	+ 18·8	32	
23. 25	M	1·099	0·942	F	0·103	+ 0·157	+ 47·7	32	
						Mean...	+ 32·3		

Calculated Relative Motion of the limbs (*p*—*f*) + 32 miles per second.

EXPERIMENTAL OBSERVATIONS of DISPLACEMENT of LINES in the SPECTRA of STARS, as compared with those of TERRESTRIAL ELEMENTS, made with the REVERSION APPARATUS of the OXFORD REVERSION SPECTROSCOPE, at the ROYAL OBSERVATORY, GREENWICH, in the Year 1886.

The following observations were made with the reversion apparatus and viewing telescope of the Reversion Spectroscope belonging to the University Observatory, Oxford, which had been lent by the Rev. Prof. Pritchard for the purpose of experiment. The slit, collimator, and prisms of the Greenwich Half-prism Spectroscope were used, the Oxford Reversion Spectroscope not being well adapted in its complete state for use with the S. E. Equatoreal, but the viewing telescope of the Half-prism Spectroscope was taken off, and the reversion prisms and viewing telescope of the Oxford Spectroscope substituted for it. As the aperture of the telescope of the Oxford instrument was very much smaller than that of the Half-prism Spectroscope, a considerable portion of the light was lost in this rough combination. It was not found possible to attach the two instruments very rigidly to each other without making serious alterations in one or the other. The observations were therefore made under great disadvantages, and direct micrometric measures were found to be out of the question. The following estimations were however made successfully. One half-prism was used throughout.

Date, 1886. Greenwich Civil Time.	Observer.	Object.	Line.	Width of Slit.	Estimated Displacement.	Earth's Motion in Miles per Second.	Concluded Motion of Star in Miles per Second.	REMARKS.
Feb. 26. h m 20. 5	M	Sirius.....	F	0·135	− ¼	+ 11·9	− 24·1	Spectrum very tremulous, and definition poor. Neither the micrometer screw moving the prisms of the Half-prism spectroscope, nor that moving the prisms of the reversion apparatus moved with sufficient steadiness for any trustworthy measures to be obtained by their means. It was only possible therefore to make estimations. These were made by bringing the two images of the dark F line in the star spectrum into coincidence, and then immediately flashing in the bright hydrogen line, and estimating the distance between the centres of the two images of the bright hydrogen line in terms of its breadth. In the first nine observations the micrometer screw moving the prisms of the Half-prism spectroscope was turned in order to bring the lines into coincidence; in the last four, the micrometer screw of the reversion apparatus; the latter proved much the more sensitive and satisfactory; indeed when the finger was lifted from the first-mentioned micrometer the spectra would often shift while actually under observation. Notwithstanding the comparative faintness of the spectrum, its tremulousness and poor definition, it was found fairly easy to bring the two spectra into coincidence, but it was not so easy as had been anticipated.
20. 10	M	,,	F	0·135	− 1¼	+ 11·9	− 76·9	
20. 15	M	,,	F	0·135	− ¾	+ 11·9	− 44·4	
20. 20	M	,,	F	0·135	− 1	+ 11·9	− 60·7	
20. 25	M	,,	F	0·135	− ¼	+ 11·9	− 24·1	
22. 30	M	,,	F	0·135	− 1¼	+ 11·9	− 72·8	
20. 35	M	,,	F	0·135	− 1¼	+ 11·9	− 72·8	
20. 40	M	,,	F	0·135	− 1¼	+ 11·9	− 72·8	
20. 45	M	,,	F	0·135	− 1½	+ 11·9	− 85·1	
20. 50	M	,,	F	0·135	− 1	+ 11·9	− 60·7	
20. 55	M	,,	F	0·135	− ¼	+ 11·9	− 24·1	
21. 0	M	,,	F	0·135	− 1	+ 11·9	− 60·7	
21. 5	M	,,	F	0·135	− ¼	+ 11·9	− 24·1	
						Mean	− 57·2	
21. 15	M	Procyon.....	F	0·135	0	+ 12·5	− 12·5	Spectrum faint. Definition poor. The observations of this star were however much more satisfactory than those of Sirius, and repeated observations showed that the displacement was practically nil. The precision with which the two images of the line could be brought into coincidence was evidently much greater than that with which the star line can be bisected by the pointer in the ordinary observations with the Half-prism spectroscope.
21. 20	M	,,	F	0·135	− 1/10	+ 12·5	− 17·4	
21. 25	M	,,	F	0·135	− 1/100	+ 12·5	− 13·0	
21. 30	M	,,	F	0·135	− 1/100	+ 12·5	− 13·0	
21. 35	M	,,	F	0·135	0	+ 12·5	− 12·5	
						Mean	− 13·7	
21. 45	M	Castor	F	0·135	+ 1/100	+ 14·1	− 13·6	The spectrum was exceedingly faint, but the observations were made with comparative ease, the extreme faintness of the spectrum being the only drawback.
21. 50	M	,,	F	0·135	+ 1/100	+ 14·1	− 13·6	
21. 55	M	,,	F	0·135	+ 1/10	+ 14·1	− 9·2	
22. 0	M	,,	F	0·135	+ ⅓	+ 14·1	+ 2·1	
22. 5	M	,,	F	0·135	+ ⅓	+ 14·1	+ 2·1	
						Mean	− 6·4	

The adjustment of this rough combination of the two spectroscopes was defective in one particular, which may have affected the measures systematically. Although the lines in the two spectra were truly parallel to each other, the two spectra themselves were not parallel; the inverted,—not the reversed,—spectrum, which was the lower in the field of view, sloping downwards towards the right hand, that is towards its own red end.

Position Circle, 6°.

COLLECTED RESULTS for MOTIONS of STARS in the line of Sight, from SPECTROSCOPIC OBSERVATIONS made at the ROYAL OBSERVATORY, GREENWICH, in the Year 1886.

(F for the Star or Moon is compared with Hβ of Hydrogen; and b_1, b_2, b_4, with Mg_1, Mg_2, Mg_3, of Magnesium.)

(+ denotes Recession; − Approach.)

Date, 1886.	Observer.	Number of Measures.	Number of Prisms.	Position Circle.	Width of Slit.	Line.	Earth's Motion in Miles per Second.	Concluded Motion of Star in Miles per Second.	
								Measured.	Estimated.
α ANDROMEDÆ. F line broad and nebulous. Estimated total breadth 18 tenth-metres; central and more condensed portion 8 tenth-metres.									
January 27	M	2	1	186	0·154	F	+ 15·4	− 26·4	− 23·6
February 1	M	2	1	6	0·104	F	+ 14·7	− 75·3	− 44·2
November 5	M	2	1	6	0·148	F	+ 8·6	(− 2·0)	(+ 2·5)
γ PEGASI. F line broad and diffused at the edges.									
February 1	M	2	1	6	0·104	F	+ 15·0	− 6·5	− 5·7
β ARIETIS. F line broad, estimated breadth 18 tenth-metres, but dark and less diffused at the edges than in many stars of the type.									
February 1	M	2	1	6	0·104	F	+ 18·4	− 85·4	− 45·5
December 4	M	4	1	6	0·206	F	+ 12·1	+ 12·4	+ 11·8
β PERSEI. F line broad, estimated breadth 21 tenth-metres. The character of the line appears to change; it is generally nebulous without any central condensation, but has occasionally been observed as dark and sharply defined.									
January 27	M	2	1	186	0·154	F	+ 16·8	− 50·2	− 46·4
February 1	M	2	1	6	0·104	F	+ 17·1	− 28·6	− 30·7
November 29	M	6	1	6	0·173	F	+ 3·9	+ 4·3	+ 2·1
December 4	M	4	1	6	0·206	F	+ 5·4	−111·8	−106·4
14	M	5	1	6	0·200	F	+ 8·3	+ 12·2	+ 13·6
14	L	5	1	6	0·200	F	+ 8·3	− 3·4	+ 12·1

Date, 1886.	Observer.	Number of Measures.	Number of Prisms.	Position Circle.	Width of Slit.	Line.	Earth's Motion in Miles per Second.	Concluded Motion of Star in Miles per Second. Measured.	Concluded Motion of Star in Miles per Second. Estimated.
α PERSEI. The F line in this spectrum resembles that of Procyon, viz., a narrow but rather faint line on a broad nebulous band. The latter is nearly 24 tenth-metres in breadth.									
January 27	M	2	1	186	0·154	F	+ 15·1	− 40·9	− 34·8
February 1	M	2	1	6	0·104	F	+ 15·6	− 21·2	− 25·7
November 29	M	2	1	6	0·173	F	+ 2·0	+ 6·8	+ 7·6
December 4	M	2	1	6	0·206	F	+ 3·5	− 10·4	− 7·6
α TAURI (*Aldebaran*). F line narrow, sharp, and fairly dark; *b* lines narrow, sharp, and distinct.									
January 27	M	2	1	186	0·154	F	+ 16·3	+ 22·9	+ 8·3
March 3	M	2	1	6	0·190	F	+ 18·5	+ 24·8	+ 13·4
17	M	2	1	6	0·153	b_1	+ 17·4	+ 13·6	+ 24·9
November 17	M	4	1	6	0·119	F	− 4·1	+ 44·3	+ 40·0
29	M	2	1	6	0·173	F	− 0·2	+ 18·9	+ 18·2
December 4	M	2	1	6	0·206	F	+ 1·5	+ 41·5	+ 43·0
α AURIGÆ (*Capella*). F line narrow and sharp, but not very dark; *b* lines narrow, sharp, and fairly dark.									
January 27	M	4	1	186	0·154	F	+ 12·9	− 4·0	− 3·9
March 3	M	2	1	6	0·190	F	+ 17·1	− 54·5	− 52·5
17	M	2	1	6	0·153	b_1	+ 16·9	+ 42·3	+ 46·6
23	N	2	1	186	0·190	b_1	+ 16·6	− 20·8	− 16·6
April 6	N	2	1	6	0·218	F	+ 15·1	+ 1·5	− 0·4
November 29	M	2	1	6	0·173	F	− 3·8	+ 29·5	+ 30·2
β ORIONIS (*Rigel*). F line narrow, sharp, and fairly dark; estimated breadth 0·9 tenth-metre.									
January 27	M	2	1	186	0·154	F	+ 12·9	+ 30·6	+ 17·8
February 1	M	2	1	6	0·104	F	+ 13·7	+ 5·5	+ 0·3
March 3	M	2	1	6	0·190	F	+ 16·0	+ 19·4	+ 8·8
November 5	M	2	1	6	0·148	F	− 8·4	(+ 58·5)	(+ 61·6)
18	M	2	1	6	0·119	F	− 5·4	+ 9·8	+ 9·6

Date, 1886.	Observer.	Number of Measures.	Number of Prisms.	Position Circle.	Width of Slit.	Line.	Earth's Motion in Miles per Second.	Concluded Motion of Star in Miles per Second.	
								Measured.	Estimated.
γ ORIONIS. F line narrow, but a little diffused at the edges. Estimated total breadth 4 tenth-metres, central condensation 1·3 tenth-metres.									
January 27	M	2	1	186	0·154	F	+ 13·6	+ 4·9	− 2·7
February 1	M	2	1	6	0·104	F	+ 14·6	− 1·3	− 4·0
March 3	M	2	1	6	0·190	F	+ 17·8	+ 6·3	+ 0·6
November 18	M	4	1	6	0·119	F	− 7·2	+ 11·5	+ 11·6
β TAURI. F line broad, diffused, and fairly dark. Breadth 16 tenth-metres, central condensation 4·0 tenth-metres.									
January 27	M	2	1	186	0·154	F	+ 13·8	− 38·0	− 37·9
February 1	M	2	1	6	0·104	F	+ 14·8	− 25·4	− 25·3
March 3	M	4	1	6	0·190	F	+ 18·4	− 31·5	− 35·1
November 18	M	2	1	6	0·119	F	− 8·0	− 8·0	− 8·1
δ ORIONIS. F line faint and ill-defined, but not very broad.									
January 27	M	2	1	186	0·154	F	+ 12·7	+ 7·8	+ 3·8
ε ORIONIS. F line faint and ill-defined, but not very broad.									
January 27	M	2	1	186	0·154	F	+ 12·4	+ 14·8	+ 7·3
ζ ORIONIS. F line faint and ill-defined, but not very broad.									
January 27	M	2	1	186	0·154	F	+ 12·1	+ 13·2	+ 14·2

Date, 1886.	Observer.	Number of Measures.	Number of Prisms.	Position Circle.	Width of Slit.	Line.	Earth's Motion in Miles per Second.	Concluded Motion of Star in Miles per Second. Measured.	Concluded Motion of Star in Miles per Second. Estimated.
κ ORIONIS. F line dark and distinct.									
January 27	M	2	1	186	0·154	F	+ 10·9	− 21·4	− 19·1
α ORIONIS. Third type spectrum. The *b* lines stand out on the background of a shaded band from which it is often difficult to separate them.									
March 17	M	2	1	6	0·153	b_4	+ 17·8	+ 34·0	+ 39·4
β AURIGÆ. F line broad and nebulous.									
January 27	M	2	1	186	0·154	F	+ 11·3	− 35·5	− 40·9
March 3	M	2	1	6	0·190	F	+ 16·8	− 58·7	− 55·1
γ GEMINORUM. F line dark but very broad, and very diffused at the edges.									
January 27	M	6	1	186	0·154	F	+ 9·5	− 48·1	− 40·7
February	M	2	1	6	0·104	F	+ 10·9	− 43·7	− 34·2
α CANIS MAJORIS (*Sirius*). F line dark, but very broad and diffused at the edges. Estimated breadth 21 tenth-metres, central condensation 6 tenth-metres.									
January 19	M	2	1	186	0·150	F	+ 4·4	− 13·7	− 13·1
27	M	6	1	186	0·154	F	+ 6·3	− 32·6	− 32·2
* February 26	M	13	1	6	0·135	F	+ 11·9	...	− 57·2
March 3	M	6	1	6	0·190	F	+ 12·6	− 38·6	− 35·7
November 6	M	4	1	6	0·148	F	− 12·3	(+ 31·0)	(+ 32·3)
18	M	6	1	6	0·119	F	− 10·6	+ 8·4	+ 8·3

* Observations made with the reversion apparatus of the Oxford Reversion Spectroscope.

Date, 1886.	Observer.	Number of Measures.	Number of Prisms.	Position Circle.	Width of Slit.	Line.	Earth's Motion in Miles per Second.	Concluded Motion of Star in Miles per Second.	
								Measured.	Estimated.
α GEMINORUM (*Castor*).									
The two components of this double star have been observed together as one star.									
F line very broad and nebulous. Estimated breadth 21 tenth-metres; no central condensation.									
January 27	M	2	1	186	0·154	F	+ 6·2	+ 29·1	+ 32·1
*February 26	M	5	1	6	0·135	F	+ 14·1	...	− 6·4
April 6	N	4	1	6	0·218	F	+ 18·0	− 14·9	− 15·8
May 1	M	2	1	6	0·065	F	+ 16·4	+ 24·7	+ 13·0
November 18	M	2	1	6	0·119	F	− 14·7	+ 27·8	+ 27·2
* Observations made with the reversion apparatus of the Oxford Reversion Spectroscope.									
α CANIS MINORIS (*Procyon*).									
F line narrow but rather faint and surrounded by a broad nebulous haze. Estimated breadth of haze 16 tenth-metres.									
January 18	N	3	1	186	0·150	F	+ 1·5	+ 0·3	− 1·5
27	M	6	1	186	0·154	F	+ 4·4	− 13·8	− 13·5
28	N	1	1	186	0·154	F	+ 4·7	− 4·1	− 4·7
*February 26	M	5	1	6	0·135	F	+ 12·5	...	− 13·7
March 3	M	4	1	6	0·190	F	+ 13·6	− 38·8	− 41·3
April 6	N	2	1	6	0·218	F	+ 17·5	− 21·5	− 21·9
May 1	M	2	1	6	0·065	F	+ 16·6	− 57·9	− 41·3
November 18	M	4	1	6	0·119	F	− 15·4	+ 9·5	+ 9·8
* Observations made with the reversion apparatus of the Oxford Reversion Spectroscope.									
β GEMINORUM (*Pollux*).									
F line narrow but faint. *b* lines narrow and sharp but faint.									
January 27	M	2	1	186	0·154	F	+ 5·3	− 45·1	− 51·8
March 17	M	2	1	6	0·153	b_1	+ 16·8	− 29·4	− 39·0
23	N	2	1	186	0·190	b_1	+ 17·4	− 24·3	− 23·8
April 6	N	2	1	6	0·218	F	+ 18·1	− 30·5	− 29·9
May 1	M	2	1	6	0·065	F	+ 16·9	− 45·8	− 45·1
November 18	M	2	1	6	0·119	F	− 15·5	− 15·5	− 12·3

Date, 1886.		Observer.	Number of Measures.	Number of Prisms.	Position Circle.	Width of Slit.	Line.	Earth's Motion in Miles per Second.	Concluded Motion of Star in Miles per Second. Measured.	Concluded Motion of Star in Miles per Second. Estimated.
α LEONIS (*Regulus*). F line faint, very ill-defined, and nebulous. A specially difficult object for measurement.										
April	30	N	2	1	6	0·175	F	+ 17·2	− 17·2	− 17·2
May	3	M	2	1	6	0·135	F	+ 17·5	+ 1·8	+ 4·7
	6	N	2	1	6	0·145	F	+ 17·6	− 14·3	− 13·4
	15	M	2	1	6	0·103	F	+ 17·9	− 5·2	− 3·4
	18	N	2	1	6	0·180	F	+ 17·9	− 3·0	− 2·9
β URSÆ MAJORIS. F line dark, broad, and nebulous.										
May	1	M	2	1	6	0·065	F	+ 12·7	+ 5·7	− 2·0
α URSÆ MAJORIS. F line exceedingly faint. *b* lines fairly well defined.										
May	1	M	2	1	6	0·140	F	+ 11·7	− 59·7	− 52·7
June	16	N	2	1	6	0·150	b_1	+ 8·7	− 57·3	− 57·5
δ LEONIS. F line very broad and dark, and somewhat ill-defined at the edges. Estimated breadth 29 tenth-metres; central condensation, 8 tenth-metres.										
May	15	M	2	1	6	0·103	F	+ 16·8	− 44·0	− 50·1
β LEONIS. F line very broad and diffused at the edges. Estimated breadth 26 tenth-metres; central condensation, 5 tenth-metres.										
April	30	N	2	1	6	0·175	F	+ 13·6	− 30·5	− 30·3
May	4	M	2	1	6	0·135	F	+ 14·2	− 10·9	− 10·5
	15	M	2	1	6	0·103	F	+ 15·9	− 14·7	− 13·8

Date, 1886.		Observer.	Number of Measures.	Number of Prisms.	Position Circle.	Width of Slit.	Line.	Earth's Motion in Miles per Second.	Concluded Motion of Star in Miles per Second.	
									Measured.	Estimated.
γ URSÆ MAJORIS. F line very broad and nebulous.										
May	1	M	2	1	6	0·140	F	+ 11·7	+ 1·2	+ 0·8
June	16	N	2	1	6	0·150	b_1	+ 10·9	− 2·9	− 2·8
γ VIRGINIS. The two components of this double star have been observed together as one star. F line faint, broad, and diffused at the edges.										
May	4	M	2	1	6	0·135	F	+ 10·4	− 43·6	− 41·1
ε URSÆ MAJORIS. F line very broad and nebulous.										
May	1	M	2	1	6	0·140	F	+ 9·5	− 5·1	− 3·0
α CANUM VENATICORUM. F line very dark, broad, and well defined.										
May	13	M	2	1	6	0·153	F	+ 11·9	− 35·6	− 36·8
α VIRGINIS (*Spica*). F line faint and ill-defined.										
April	30	N	2	1	6	0·175	F	+ 5·7	− 16·5	− 15·7
May	4	M	2	1	6	0·135	F	+ 6·6	− 60·8	− 53·4
	18	M	2	1	6	0·180	F	+ 10·5	− 7·4	− 6·4
ζ URSÆ MAJORIS. F line dark, broad, and nebulous.										
May	2	M	2	1	6	0·140	F	+ 8·4	+ 6·5	+ 7·0

Date, 1886.		Observer.	Number of Measures.	Number of Prisms.	Position Circle.	Width of Slit.	Line.	Earth's Motion in Miles per Second.	Concluded Motion of Star in Miles per Second. Measured.	Concluded Motion of Star in Miles per Second. Estimated.
α BOOTIS (*Arcturus*). F line narrow and sharp. *b* lines dark, narrow, and sharp.										
April	30	N	2	1	6	0·175	F	+ 4·8	− 21·0	− 21·5
May	4	M	2	1	6	0·135	F	+ 5·5	− 71·3	− 64·6
	6	N	2	1	6	0·145	F	+ 6·2	− 23·7	− 23·9
	13	M	2	1	6	0·153	F	+ 7·8	− 35·0	− 39·4
	18	N	2	1	6	0·180	F	+ 8·9	− 35·0	− 33·5
	20	N	2	1	6	0·230	F	+ 9·3	− 26·5	− 27·8
June	7	M	2	1	6	0·165	b_1	+ 12·5	− 49·1	− 46·9
	15	N	2	1	6	0·150	b_1	+ 13·5	− 57·3	− 54·2
	28	M	2	1	6	0·124	b_1	+ 14·7	− 37·8	− 38·7
July	5	M	2	1	6	0·150	F	+ 15·1	− 36·8	− 38·9
ϵ^2 BOOTIS. F line faint and narrow.										
June	28	M	2	1	6	0·124	F	+ 12·7	− 15·0	− 10·4
β LIBRÆ. F line faint and narrow.										
May	13	M	2	1	6	0·153	F	+ 1·7	− 24·8	− 23·3
α CORONÆ BOREALIS. F line dark, very broad, and diffused at the edges. Estimated breadth 31 tenth-metres; central portion of the line 8 tenth-metres. There is no very marked condensation at the centre of the line.										
May	4	M	4	1	6	0·135	F	+ 0·7	− 26·6	− 23·8
	14	M	2	1	6	0·153	F	+ 2·8	+ 12·8	+ 19·6
	20	N	2	1	6	0·230	F	+ 4·2	− 16·2	− 15·0
July	5	M	2	1	6	0·150	F	+ 11·4	+ 24·3	+ 24·3
α SERPENTIS. *b* lines very faint and difficult to see.										
June	29	M	2	1	6	0·124	b_1	+ 11·7	− 4·0	− 1·5

Date, 1886.		Observer.	Number of Measures.	Number of Prisms.	Position Circle.	Width of Slit.	Line.	Earth's Motion in Miles per Second.	Concluded Motion of Star in Miles per Second.	
									Measured.	Estimated.
β SERPENTIS.										
May	14	M	2	1	6	0·153	F	+ 1·3	− 14·2	− 16·2
γ HERCULIS. F line broad and diffused at the edges.										
May	14	M	1	1	6	0·153	F	− 1·1	− 36·9	− 38·8
α OPHIUCHI. F line dark, very broad, and diffused at the edges. Estimated breadth, 34 tenth-metres; central portion, 10 tenth-metres. No very marked central condensation.										
July	5	M	2	1	6	0·150	F	+ 5·7	− 19·7	− 19·6
γ DRACONIS. *b* lines sharp and distinct.										
June	29	M	2	1	6	0·124	b_1	+ 0·9	+ 20·9	+ 33·7
α LYRÆ (*Vega*). F line dark, broad, and diffused at the edges. Estimated breadth 16 tenth-metres, central condensation 4 tenth-metres.										
July	6	M	2	1	6	0·150	F	+ 0·0	− 12·9	− 11·9
August	10	N	2	1	6	0·114	F	+ 4·8	− 29·7	− 31·3
October	13	M	2	1	6	0·105	F	+ 8·7	− 60·8	− 48·6
	22	M	2	1	6	0·103	F	+ 8·5	− 58·6	− 44·8
α AQUILÆ (*Altair*). F line dark, very broad, and diffused at the edges. Estimations of breadth very discordant.										
July	6	M	2	1	6	0·150	F	− 4·3	− 23·7	− 21·5
August	10	N	2	1	6	0·114	F	+ 4·9	− 31·2	− 32·8
October	18	M	2	1	6	0·105	F	+ 16·1	− 67·6	− 54·4
	22	M	1	1	6	0·103	F	+ 16·2	− 42·9	− 38·5

Date, 1886.		Observer.	Number of Measures.	Number of Prisms.	Position Circle.	Width of Slit.	Line.	Earth's Motion in Miles per Second.	Concluded Motion of Star in Miles per Second.	
									Measured.	Estimated.
γ CYGNI. F and *b* lines narrow, but somewhat faint.										
June	29	M	2	1	6	0·124	b_1	− 6·9	+ 9·9	+ 12·2
α CYGNI. F line narrow and fairly dark; *b* lines narrow but faint.										
June	29	M	2	1	6	0·124	b_1	− 7·4	+ 0·5	− 0·6
July	6	M	2	1	6	0·150	F	− 6·8	− 22·1	− 23·0
October	18	M	2	1	6	0·105	F	+ 7·3	− 55·3	− 45·6
α PEGASI. F line broad and diffused at the edges.										
January	27	M	4	1	186	0·154	F	+ 12·4	− 34·4	− 26·1
February	1	M	2	1	6	0·104	F	+ 11·2	− 35·8	− 25·1
August	11	N	2	1	6	0·114	F	− 9·3	+ 3·4	+ 5·4
MARS.										
March	17	M	4	1	6	0·153	b_1	...	+ 10·8	+ 15·9
	23	N	4	1	186	0·190	b_1	...	− 6·9	− 9·0
April	6	M	2	1	6	0·218	F	...	+ 2·3	+ 1·5
	22	N	1	1	6	0·137	F	...	+ 1·8	0·0
	30	N	2	1	6	0·175	F	...	+ 5·1	+ 4·0
May	4	M	4	1	6	0·135	F	...	− 7·2	− 7·4
VENUS.										
January	16	M	10	1	169	0·150	F	...	− 6·8	− 7·7
	27	M	10	1	186	0·201	F	...	− 13·6	− 7·6

Date, 1886.		Observer.	Number of Measures.	Number of Prisms.	Position Circle.	Width of Slit.	Line.	Earth's Motion in Miles per Second.	Concluded Motion of Star in Miles per Second.	
									Measured.	Estimated.
MOON.										
January	18	N	4	1	186	0·150	F	...	+ 2·5	...
March	17	M	5	1	6	0·153	b_1	...	− 0·1	...
May	13	M	5	1	6	0·153	F	...	+ 0·2	...
	15	M	5	1	6	0·103	F	...	− 1·1	...
	18	N	4	1	6	0·180	F	...	− 1·5	...
	20	N	4	1	6	0·230	F	...	− 4·6	...
June	15	N	4	1	6	0·150	b_1	...	− 5·4	...
August	10	N	5	1	6	0·114	F	...	− 1·9	...
November	5	M	5	1	6	0·148	F	...	(+ 5·5)	...
	18	M	5	1	6	0·119	F	...	+ 0·3	...
December	4	M	5	1	6	0·206	F	...	+ 0·9	...
SKY.										
January	28	M	5	1	186	0·154	F	...	+ 1·2	...
February	2	M	5	1	6	0·104	F	...	+ 3·2	...
March	4	M	5	1	6	0·190	F	...	− 2·1	...
	24	N	3	1	186	0·190	F	...	− 2·5	...
May	3	M	5	1	6	0·140	F	...	− 0·6	..
June	8	M	5	1	6	0·165	b_1	...	+ 4·1	...
	29	M	5	1	6	0·124	b_1	...	− 0·9	...
July	6	M	5	1	6	0·150	F	...	+ 1·8	...
November	30	M	5	1	6	0·173	F	...	− 2·0	...
ROTATION OF JUPITER. Displacement between the *p* and *f* limbs.										
May	15	M	5	1	32	0·103	F	...	+ 32·3	...

OBSERVATIONS OF THE SPECTRA of 51 SCHJELLERUP, NOVA ORIONIS, and of COMETS 1885 and 1886, made at the ROYAL OBSERVATORY, GREENWICH, in the Year 1886.

51 SCHJELLERUP.

1886, January 6.

Single-prism Spectroscope.

Observer, M.

The Spectrum was very faint, and not seen at all well. It consisted mainly of a bright strip lying between *b* and D, and interrupted by one dark band in the yellow. This bright strip was bounded towards the blue by a broad dark shaded band in the green near *b*, the light beyond being so feeble that the sharp edge of the band might be almost said to terminate the spectrum in that direction. Towards the red, the bright strip was bounded by another dark band near D, which might in like manner be almost said to terminate the spectrum in that direction, only a very feeble light being traceable beyond it.

The star spectrum was compared with the spectrum from a Bunsen flame, and the bright band in the green of the Bunsen flame was seen to be closely coincident with the dark band in the green in the star spectrum. The coincidence of the bright band in the yellow of the flame spectrum with the dark band in the yellow of the star spectrum could not be directly observed so satisfactorily. A measure however appeared to show that it was very close. The third band in the spectrum of the flame, that in the blue, was not compared with the star spectrum, that region of the star spectrum being too faint for examination.

The following measures of the positions of the sharp edges of the bands in the green and yellow of the spectrum of the star, as compared with the corresponding bands of the spectrum of the Bunsen flame, were obtained :—

Objects Compared.	Band Observed.	Micrometer Readings.	Displacement.		Inferred Wave-length of Star Band.	Mean Inferred Wave-length.
			In Revolutions.	In Wave-length.		
		r	r	tenth-metres.	tenth-metres.	tenth-metres.
Star	Green band	0·389	+ 0·107	− 4·3	5159·7	5162·2
Bunsen flame	do.	0·282				
Star	Green band	0·983	− 0·016	+ 0·6	5164·6	
Bunsen flame	do.	0·999				
Star	Yellow band	0·695	+ 0·024	− 1·3	5631·7	5631·7
Bunsen flame	do.	0·671				

Thalén's wave-lengths for the less refrangible edges of the bands in the spectrum of the Bunsen flame have been assumed as follows :—

Band.	Wave-length.
	tenth-metres.
Green band	5164·0
Yellow band	5633·0

NOVA ORIONIS.

1886, January 6.

Single-prism Spectroscope.

Observer, M.

No details additional to those seen on 1885, December 29, were made out; indeed the spectrum was not seen so well now as on the former occasion.

1886, January 11.

Single-prism Spectroscope.

Observer, M.

The star was now much fainter and paler than on December 29 and January 6. The red and blue ends were too faint for any details whatsoever to be made out in them, and the beauty of the spectrum as it had been seen on December 29 was quite lost, the vivid alternations of light and darkness being now not nearly so conspicuous and well defined.

Only three dark bands were clearly seen, and these could not be satisfactorily measured. These were bands V., VI., and VII. of the numeration employed in the observations of β Pegasi made on 1876, October 18; wave-lengths as then determined, λ 5450, λ 5164, λ 4953. In Dunér's nomenclature, these are bands 6, 7, and 8. Immediately beyond band VI. towards the blue, the spectrum was, relatively, very bright, and might well have been supposed to indicate the presence of bright lines, but this district is always very bright in stars of this type. The dark bands seemed narrower, and not so dark as on December 29, and the bright intervals or zones far less bright than on that occasion, the zone just alluded to being the only one retaining any large proportion of its former brilliancy. It is clear therefore that the diminution of the light of the star was not accompanied by an increase in the breadth and darkness of the dark bands, but by a diminution in brightness of the general continuous spectrum.

COMET *c* 1885 (BARNARD).

1886, March 31.

Half-prism Spectroscope. One "half-prism" reversed.

Observer, M.

The comet was very faint and great difficulty was experienced in bringing it on to the slit of the spectroscope. The spectrum consisted of the usual three bright bands, sharp towards the less refrangible edge, and shading off towards the more refrangible. Of these the one in the blue could only just be discerned; the one in the green was as usual very much brighter at its sharp edge than was the one in the yellow, but it was not traceable so far towards the blue, for whilst the yellow band was traceable almost up to the green band, the latter could only be traced to about λ 4965.

The green band appeared to be about 72″ in height, the yellow band about 43″ or 45″ or perhaps even 48″ or 50″; but the yellow band was nearly as high at its faintest point as at its brightest. It did not fade away rapidly towards the blue as the green band did, but continued with very little diminution of brightness for a long distance from its bright edge. There was, however, a broad distinct dark gap between the last trace of the yellow band and the bright sharp edge of the green band.

There was no trace of a continuous spectrum seen, although the comet showed a distinct stellar nucleus. It was not found possible to get any satisfactory measures, but it was quite clear that the green band coincided very nearly if not exactly with the green band of the spectrum of the Bunsen flame, and not with the green band of the spectrum from a vacuum tube filled with carbonic dioxide. Indeed, if there was any want of coincidence with the spectrum of the Bunsen flame, the comet band lay towards the blue of the band of the Bunsen flame, and not towards the red.

The height of the blue band of the comet spectrum was about 29″. The yellow band was traced from about λ 5633 to λ 5226.

1886, May 4.

Half-prism Spectroscope; one "half-prism" direct.

Observer, M.

The comet was not observed until the dawn was very far advanced; and the spectrum could only be seen from the actual nucleus, as the light from the sky was so strong as quite to overpower the light from the coma and tail of the comet. The blue and green bands were seen, the latter being particularly well defined.

The following measures were obtained of the Green Band:—

Date, 1885. Greenwich Civil Time.	Object.	Micrometer Readings.	Displacement. In Revolutions.	Displacement. In Wave-lengths.	Inferred Wave-length of Comet-band.
h m		r	r	tenth-metres.	tenth-metres.
May 4. 3. 35	Comet	0·507	+ 0·128	+ 1·3	5165·3
	Bunsen-flame	0·379			
3. 45	Comet	0·568	− 0·058	− 0·6	5163·4
	Bunsen-flame	0·626			
				Mean.....	5164·4

The comet was lost in daylight immediately after the second measure.

Thalén's wave-length for the less refrangible edge of the green band in the spectrum of the Bunsen-flame has been assumed, viz.:

tenth-metres
5164·0

COMET *f* 1886 (BARNARD-HARTWIG).

1886, December 14.

Half-prism Spectroscope; one "half-prism" direct.

Observer, M.

Great difficulty was experienced in bringing the comet on to the slit of the spectroscope. Finally, however, a good view of the spectrum was obtained. The three ordinary bands were seen very easily, but none of them were sharply defined. A faint continuous spectrum,—whether from general sky illumination, or from the comet itself, was not determined,—spread over the field, and much interfered with observation. The following measures were obtained of the sharp less refrangible edge of the green band in the spectrum of the comet as compared with Mg_3 of the magnesium spectrum. The comet was lost in the murkiness of the lower atmosphere before any measures could be secured of the other bands.

Objects compared.	Micrometer Readings.	Displacement. In Revolutions.	Displacement. In Wave-lengths.	Inferred Wave-length of Comet-band.
	r	r	tenth-metres.	tenth-metres.
Comet	0·291			
Mg_3	202	+ 0·089	+ 0·93	5167·81
Comet	0·328			
Mg_3	202	+ 0·126	+ 1·31	5168·19
Comet	1·092			
Mg_3	972	+ 0·120	+ 1·25	5168·13
Comet	0·250			
Mg_3	508	− 0·258	− 2·68	5164·20
			Mean.....	5167·08

Ångström's wave-length for b_4, 5166·88 tenth-metres has been assumed as the wave-length of the Mg_3 line of Magnesium.

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ROYAL OBSERVATORY, GREENWICH.

MEASURES OF POSITIONS AND AREAS

OF

SPOTS AND FACULÆ

UPON THE SUN'S DISK

ON

PHOTOGRAPHS

TAKEN WITH THE

PHOTOHELIOGRAPHS

AT GREENWICH, IN INDIA, AND IN MAURITIUS,

WITH THE DEDUCED

HELIOGRAPHIC LONGITUDES AND LATITUDES.

1886.

MEASURES of POSITIONS and AREAS of SPOTS and FACULÆ upon the SUN'S DISK on PHOTOGRAPHS taken at the ROYAL OBSERVATORY, GREENWICH, at DEHRA DUN in INDIA, and at the ROYAL ALFRED OBSERVATORY, MAURITIUS, in the Year 1886.

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 Greenwich 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.

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).
1886.				°	°	°			
0d.210	SP, H		0·983	294·2	280·3	+23·0			131
			0·975	286·5	279·0	+15·3			236
M.		1819	0·709	284·0	247·3	+ 7·5	10	65	
		1819	0·648	284·3	242·5	+ 6·6	0	25	122c
		1819	0·635	285·8	241·4	+ 7·3	0	4	
		1819	0·620	286·8	240·1	+ 7·7	0	4	
		1820	0·891	75·2	142·1	+11·6	0	4	
		1820a	0·893	78·4	141·5	+ 8·8	10	164	333c
Jan. 1							(20)	(266)	(822)
1·424	H, SP		0·836	265·1	244·2	− 6·0			43
			0·838	251·5	243·6	−17·4			209
M.		1819	0·879	280·6	247·9	+ 7·7	13	62	234c
		1819	0·825	280·8	242·0	+ 6·9	0	8	
		1820a	0·741	74·6	141·4	+ 9·0	8	64	85c
		1821a	0·987	102·6	106·4	−13·0	12	403	325c
Jan. 2							(33)	(537)	(896)
3·240	SP, H		0·985	278·5	243·1	+ 7·7			625
			0·968	252·4	239·6	−18·0			169
M.			0·946	294·6	231·6	+21·8			49
		1820a	0·437	59·3	141·6	+ 9·5	7	32	
		1822	0·783	96·9	112·4	− 7·7	1	11	
		1822	0·798	95·0	111·0	− 6·2	0	7	39c
		1822	0·804	96·1	110·4	− 7·1	0	4	
		1821a	0·854	103·3	105·5	−13·3	78	472	
		1821	0·871	102·3	103·5	−12·6	0	32	
		1821	0·879	103·7	102·6	−13·8	0	12	586c
		1821b	0·890	102·8	101·1	−13·1	11	95	
		1821	0·922	105·2	96·8	−15·4	0	6	
			0·864	110·1	104·9	−19·2			102
			0·948	74·0	94·3	+13·9			604
Jan. 4							(97)	(671)	(2174)
1886.				°	°	°			
4d.492	H, JH	1820a	0·248	22·5	141·6	+ 9·5	4	17	
		1821	0·643	105·2	107·8	−12·7	0	13	
		1821	0·660	111·1	107·3	−16·6	0	17	
		1821	0·669	102·2	105·5	−11·0	8	48	
		1821a	0·675	107·1	105·5	−14·3	54	404	132c
		1821	0·699	104·0	103·3	−12·5	0	8	
		1821	0·704	105·8	103·1	−13·8	0	12	
		1821b	0·738	104·4	100·1	−13·2	14	63	
			0·833	71·6	93·1	+13·0			306
Jan. 5							(80)	(582)	(438)
5·216	EP, H		0·983	252·6	217·4	−17·8			114
			0·937	260·5	207·1	−10·3			111
M.			0·942	284·9	206·2	+12·7			50
		1820a	0·243	344·9	141·2	+ 9·6	5	10	
		1821	0·521	107·0	107·0	−12·1	1	24	
		1821	0·547	114·7	106·4	−16·5	2	14	
		1821	0·540	103·8	105·4	−10·7	3	22	
		1821a	0·552	110·1	105·3	−14·2	60	346	
		1821	0·559	105·1	104·2	−11·6	0	3	
		1821	0·584	114·8	103·9	−17·4	0	2	
		1821	0·591	108·6	102·4	−14·1	0	3	
		1821b	0·633	105·9	99·0	−13·1	8	77	
			0·815	66·6	86·3	+16·4			216
			0·933	61·7	73·1	+24·6			93
			0·913	86·1	72·0	+ 2·0			68
			0·951	64·9	69·0	+22·4			131
Jan. 6							(79)	(501)	(783)
6·148	H, EP		0·971	251·9	201·9	−18·6			148
		1820a	0·362	309·4	141·7	+ 9·4	1	7	
I.		1823	0·055	211·6	127·0	− 6·7	3	8	
		1823	0·028	177·0	125·2	− 5·6	0	5	
		1823	0·049	133·9	123·3	− 6·0	3	16	
		1821	0·340	115·1	107·0	−12·1	0	2	

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

Group 1819, 1885 Dec. 25–1886 Jan. 2. Three small spots on Dec. 25; two small spots on Dec. 26. The group has expanded by Dec. 27 into a short straight stream composed of many small spots. The stream tends to form two compact clusters of spots, and by Jan. 2, the following cluster has disappeared and the preceding cluster has become a regular spot with one small companion.

Group 1820, 1885 Dec. 31–1886 Jan. 7. A regular spot, *a*, which diminishes in size from day to day. A small companion is seen near it on Jan. 1.

Group 1821, Jan. 2–15. A large regular spot, *a*, with two nuclei. The northern portion of the spot, containing the smaller nucleus has become detached from the principal portion of the spot by Jan. 5, and has broken up into a number of small spots. *a* is followed on Jan. 4 and the succeeding days by a fairly large spot, *b*, and a number of small spots. Small spots are also seen preceding *a* on Jan. 5, 6, and 7. *b* has divided into two portions, *c* and *d*, by Jan. 7. *c* has disappeared by Jan. 10.

Group 1822, Jan. 4. Three small spots.

Group 1823, Jan. 7–10. Three small spots on Jan. 7 and 8. Only one is seen on Jan. 9, but two on Jan. 10.

Measures of Positions and Areas of Spots and Faculæ upon the Sun's Disk—*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).
1886.				°	°	°			
6d·148	H, EP	1821	0·350	111·0	105·9	−11·0	6	32	
		1821*a*	0·375	119·3	105·7	−14·3	76	340	
I.		1821	0·357	107·5	105·2	− 9·9	0	2	
		1821	0·419	127·5	104·9	−18·4	2	15	
		1821	0·441	128·5	103·9	−19·7	0	2	
		1821	0·420	120·2	103·2	−15·9	2	4	
		1821	0·431	115·4	101·7	−14·3	2	18	
		1821*c*	0·455	110·4	99·5	−12·7	11	63	
		1821*d*	0·470	113·3	99·0	−14·3	11	76	
		1821	0·473	110·4	98·3	−13·1	0	2	
		1824*a*	0·539	59·9	96·9	+12·1	0	4	
		1824*b*	0·578	60·3	94·4	+13·2	0	3	
			0·846	54·0	75·1	+27·3			90
			0·877	70·9	66·6	+14·6			153
			0·938	89·5	55·8	− 0·9			62
			0·948	99·0	53·7	− 9·9			156
			0·964	72·0	52·9	+16·2			228
Jan. 7							(117)	(599)	(837)
7·216	H, EP	1823	0·303	261·8	128·7	− 6·4	3	9	
		1823	0·255	261·8	125·8	− 6·0	0	15	
M.		1823	0·223	263·1	124·0	− 5·6	0	4	
		1821*a*	0·198	154·3	106·1	−14·3	48	343	
		1821	0·271	160·7	105·8	−18·9	0	12	
		1821	0·150	146·3	105·4	−11·3	0	24	
		1821	0·224	139·8	102·7	−13·9	0	7	
		1821*c*	0·254	128·0	99·4	−13·0	4	17	
		1821*d*	0·271	132·0	99·3	−14·4	5	75	
		1821	0·302	131·0	97·6	−15·4	0	12	
		1824*b*	0·410	43·4	94·4	+13·4	0	10	
		1825	0·836	98·9	54·5	− 9·7	0	4	76*c*
		1826*a*	0·957	92·8	38·1	− 3·9	9	97	715*c*
		1826*b*	0·986	93·3	30·8	− 4·0	16	227	
		1826*c*	0·992	94·3	28·4	− 4·8	0	82	
			0·854	86·6	52·9	+ 0·8			39
			0·856	69·7	55·2	+15·0			287
Jan. 8							(85)	(938)	(1117)
8·196	EP, M	1823	0·480	265·0	126·9	− 6·1	0	7	
		1821	0·189	227·9	106·5	−11·4	0	8	
M.		1821*a*	0·220	218·3	106·3	−14·0	57	336	
		1821	0·158	238·2	106·1	− 8·9	0	6	
		1821	0·166	198·8	101·4	−13·2	0	2	
		1821	0·183	178·7	98·0	−14·7	0	25	
1886.				°	°	°			
8d·196	EP, M	1821*c*	0·146	187·0	99·3	−12·5	0	2	
		1821*d*	0·174	185·1	99·2	−14·1	4	66	
M.		1824*c*	0·278	0·3	98·2	+11·9	0	3	
		1826*a*	0·866	92·3	38·3	− 4·2	20	111	884*c*
		1826*b*	0·925	92·2	30·7	− 3·6	44	239	
		1826*c*	0·942	93·4	27·9	− 4·7	6	103	
			0·903	61·8	38·6	+23·2			123
Jan. 9							(131)	(908)	(1007)
9·155	SP, EP		0·833	281·4	140·8	+ 7·0			158
		1823	0·666	265·2	127·4	− 6·4	0	2	
I.		1823	0·627	264·7	124·5	− 6·7	0	2	
		1821	0·365	249·1	106·0	−11·5	0	3	
		1821*a*	0·378	243·0	105·9	−13·9	71	284	
		1821	0·352	243·5	104·5	−13·1	0	2	
		1821	0·379	233·7	104·2	−17·0	0	3	
		1821*d*	0·279	232·1	98·7	−14·0	8	140	
		1821	0·270	220·7	96·2	−16·0	0	21	
		1824*c*	0·342	323·6	97·6	+11·7	0	4	
		1826*a*	0·740	91·6	38·0	− 4·2	36	158	75*c*
		1826*b*	0·823	91·3	30·2	− 3·5	50	230	485*c*
		1826*c*	0·854	92·2	27·1	− 4·2	9	49	
		1826	0·858	93·9	26·6	− 5·6	0	11	
			0·923	95·3	17·9	− 6·6			690
Jan. 10							(174)	(909)	(1408)
10·210	EP, SP		0·959	283·3	143·7	+11·4			129
			0·834	264·3	128·2	− 7·2			156
I.			0·838	208·8	111·0	−50·5			42
		1827*a*	0·697	258·5	115·6	−11·1	2	61	100*c*
		1827	0·655	256·9	112·2	−11·9	0	13	
		1827	0·649	259·3	112·0	−10·3	0	6	
		1821*a*	0·583	251·9	106·4	−14·0	73	315	
		1821	0·567	244·6	104·1	−17·8	0	9	
		1821	0·486	251·5	99·8	−12·7	0	2	
		1821*d*	0·482	248·2	99·1	−14·2	2	73	
		1821	0·458	243·3	96·8	−15·8	0	11	
		1826*a*	0·554	91·2	38·1	− 4·4	24	145	
		1826*b*	0·658	90·4	30·6	− 3·6	44	254	225*c*
		1826	0·673	93·4	29·4	− 5·6	0	12	
		1826	0·696	93·4	27·6	− 5·5	0	4	
		1826*c*	0·698	91·5	27·5	− 4·2	4	55	

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

Jan. 11. Photograph faint. Faculæ ill-defined.
Group 1824, Jan. 7–10. Two very small spots, *a* and *b*, on Jan. 7. The preceding spot, *a*, has disappeared by Jan. 8, and the following, *b*, by Jan. 9, but another very small spot, *c*, has appeared in the neighbourhood.
Group 1825, Jan. 8. A small spot.
Group 1826, Jan 8–17. Three regular spots, *a*, *b*, and *c*. *a* has broken up into a number of small spots by Jan. 13, and *c* has disappeared by Jan. 14. A few small spots are seen near the principal spots on Jan. 11, and the succeeding days.
Group 1827, Jan. 11–13. A spot, *a*, followed on Jan. 11 by two small spots. Of the latter one has disappeared by Jan. 12, and the other by Jan. 13. Another small spot is seen near *a* on Jan. 12.

Measures of Positions and Areas of Spots and Faculæ upon the Sun's Disk—*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).
1886.				°	°	°			
10d.210	EP,SP	1826	0·710	95·1	26·5	− 6·7	0	10	
			0·844	92·6	14·1	− 4·6			441
I.			0·948	103·9	359·9	−14·6			54
Jan. 11							(149)	(970)	(1147)
11·231	H, EP		0·930	266·2	126·7	− 5·2			140
			0·766	250·7	107·5	−17·7			107
M.			0·716	260·3	103·9	−10·1			62
		1827*a*	0·847	260·4	116·2	−10·5	17	106	
		1827	0·832	262·1	114·7	− 9·1	0	6	111 *c*
		1827	0·808	261·0	112·2	−10·0	2	26	
		1821*a*	0·744	255·9	106·0	−13·5	62	317	
		1821*d*	0·660	254·4	99·0	−13·6	1	31	
		1821	0·641	251·9	97·2	−15·0	1	5	
		1826*a*	0·340	89·6	38·5	− 4·2	20	117	
		1826*b*	0·456	88·0	31·3	− 3·1	33	224	
		1826	0·476	91·1	29·9	− 4·5	1	16	
		1826*c*	0·504	90·6	28·1	− 4·2	4	38	
		1828	0·488	103·3	29·5	−10·4	3	28	
		1828	0·523	102·8	27·2	−10·5	0	7	
		1828	0·530	99·2	26·5	− 8·7	7	37	
		1828	0·572	101·3	23·7	−10·1	7	35	
			0·888	106·8	355·8	−16·9			71
Jan. 12							(158)	(993)	(491)
12·266	SP, H		0·815	290·9	96·2	+14·0			337
		1827*a*	0·952	259·1	117·2	−11·8	17	122	
I.		1821*a*	0·879	256·2	106·3	−14·4	64	345	688 *c*
		1821	0·803	254·2	97·8	−15·4	0	16	
		1826*a*	0·116	87·7	38·1	− 4·3	5	86	
		1826	0·148	104·4	36·4	− 6·7	0	26	
		1826*b*	0·237	84·9	31·1	− 3·3	40	257	
		1826*c*	0·288	89·9	28·0	− 4·4	1	13	
		1828*a*	0·254	117·3	31·5	−11·2	33	165	
		1828	0·283	118·4	30·0	−12·2	0	4	
		1828	0·279	112·1	29·5	−10·4	0	12	
		1828	0·312	115·0	28·0	−12·0	0	8	
		1828	0·319	104·3	26·6	− 8·9	21	88	
		1828	0·337	112·1	26·2	−11·7	1	13	
		1828	0·343	108·3	25·4	−10·5	0	1	
		1828	0·349	101·1	24·5	− 8·2	0	6	
		1828	0·377	106·7	23·3	−10·5	0	53	

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).
1886.				°	°	°			
12d.266	SP, H	1829	0·967	78·0	330·9	+10·3	0	33	
		1829	0·967	79·1	330·7	+ 9·3	0	9	241 *c*
I.		1829	0·974	79·8	329·0	+ 8·8	0	48	
			0·959	102·5	330·8	−13·3			221
Jan. 13							(182)	(1305)	(1487)
13·524	H, JH		0·938	286·0	95·7	+13·2			200
		1821*a*	0·973	256·6	105·2	−14·1	18	170	338 *c*
		1826	0·196	274·7	39·3	− 3·7	0	53	
		1826*b*	0·063	294·7	31·4	− 3·2	18	155	
		1828*a*	0·131	217·9	32·8	−10·6	77	411	
		1828	0·142	198·5	30·7	−12·4	0	9	
		1828	0·125	186·7	29·0	−11·8	0	31	
		1828*b*	0·081	154·2	26·1	− 8·9	0	174	
		1829	0·835	76·6	333·1	+ 8·5	4	99	
		1829	0·873	77·2	328·8	+ 8·8	6	125	125 *c*
Jan. 14							(123)	(1227)	(663)
14·257	SP,EP		0·977	256·7	96·9	−14·0			333
			0·954	287·9	88·8	+15·5			244
M.		1821*a*	0·997	256·1	105·1	−14·3	0	100	
		1826	0·385	272·7	41·2	− 3·4	0	10	
		1826	0·361	273·1	39·7	− 3·4	0	11	
		1826	0·348	265·3	38·9	− 6·2	0	6	
		1826	0·343	271·7	38·6	− 4·0	0	18	
		1826	0·297	263·7	35·8	− 6·5	0	6	
		1826	0·253	273·9	33·2	− 3·7	3	28	
		1826	0·232	283·4	31·6	− 1·6	0	2	
		1826*b*	0·224	276·8	31·4	− 3·2	25	134	
		1826	0·222	287·8	30·8	− 0·9	0	5	
		1826	0·184	284·5	28·8	− 2·1	0	2	
		1828*a*	0·272	247·8	33·4	−10·6	68	476	
		1828	0·217	241·8	29·8	−10·6	0	29	
		1828	0·212	235·0	28·8	−11·7	6	16	
		1828	0·192	236·1	27·9	−10·9	0	5	
		1828*b*	0·140	242·3	25·8	− 8·5	12	159	
		1828	0·153	233·6	25·7	−10·0	3	28	
		1828	0·152	220·1	24·3	−11·4	0	4	
		1828	0·129	222·7	23·7	−10·2	0	3	
		1828	0·111	225·0	23·1	− 9·3	0	2	
		1829*a*	0·714	73·4	335·0	+ 8·3	11	57	
		1829*b*	0·732	72·2	333·8	+ 9·5	14	74	

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

Jan. 12. The image of the Sun on this photograph is decidedly elliptical. The positions of some of the spots appear to be affected to a small extent by distortion of the photographic film.

Jan. 14. Photograph faint. Faculæ ill-defined.

Group 1828, Jan. 12–21. Several small spots on Jan. 12, arranged in four clusters. The group increases in size very rapidly. On Jan. 13, it consists of a large regular spot, *a*, followed by a scattered stream composed of many spots, mostly small. *a* has very greatly increased in size by Jan. 14, and most of the small spots following it have coalesced to form a large spot, *b*. *b* has broken up by Jan. 16, but the small spots have coalesced again in a different manner, to form one large spot, *c*, by Jan. 17. *c* has broken up by Jan. 19.

Group 1829, Jan. 13–22. Three spots on Jan. 13; five spots arranged in two clusters on Jan. 14. The two spots, *a* and *b*, which form the preceding cluster, have separated a little by Jan. 15 and are measured separately. The following cluster has broken up into a number of small spots. The group extends in longitude on the succeeding days but diminishes in area. *b* has broken up into a number of small spots by Jan. 19. Only *a* is seen on Jan. 22.

Measures of Positions and Areas of Spots and Faculæ upon the Sun's Disk—*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).
1886.				°	°	°			
14d.257	SP,EP	1829	0·769	74·8	330·2	+ 8·4	3	8	
		1829	0·785	73·9	328·9	+ 9·5	4	50	382c
M.			0·892	94·8	315·4	− 6·5			124
Jan. 15							(149)	(1233)	(1083)
15·451	H,JH		0·921	287·7	67·4	+14·2			124
			0·823	258·7	58·2	−12·1			107
		1826	0·596	269·7	39·3	− 4·2	3	35	
		1826	0·515	270·9	33·7	− 3·7	5	23	
		1826b	0·483	271·5	31·6	− 3·6	20	123	
		1828a	0·511	257·9	33·2	−10·3	70	506	
		1828	0·453	254·7	29·1	−11·3	5	68	
		1828	0·435	259·7	28·4	− 8·9	0	4	
		1828	0·409	256·1	26·5	−10·2	20	89	
		1828	0·375	259·5	24·6	− 8·5	5	74	
		1829a	0·497	63·0	336·3	+ 8·6	8	31	
		1829	0·505	66·4	335·1	+ 7·3	0	23	
		1829b	0·522	63·7	334·6	+ 9·1	10	58	
		1829	0·536	67·5	333·0	+ 7·6	0	21	
		1829	0·565	67·4	331·1	+ 8·4	6	18	
		1829	0·582	65·6	330·4	+ 9·8	0	10	
		1829	0·599	67·4	328·9	+ 9·2	0	34	
		1830	0·967	90·9	287·7	− 2·1	0	21	194c
		1830	0·977	92·3	285·2	− 3·3	0	22	
			0·949	68·6	294·3	+18·5			237
			0·951	96·3	290·6	− 7·5			148
Jan. 16							(152)	(1160)	(810)
16·541	H,JH		0·908	290·1	50·5	+15·9			92
		1826	0·718	269·9	34·1	− 3·6	0	11	
		1826b	0·691	270·2	31·9	− 3·5	3	84	
		1828a	0·703	260·5	32·9	−10·2	64	482	
		1828c	0·630	260·8	27·3	− 9·7	13	466	
		1828	0·588	263·8	24·3	− 7·7	0	8	
		1829a	0·309	37·8	337·3	+ 9·2	4	14	
		1829	0·304	44·0	336·1	+ 7·7	2	11	
		1829b	0·327	44·0	335·1	+ 8·7	7	43	
		1829	0·362	51·2	331·8	+ 8·3	2	8	
		1829	0·390	49·5	330·9	+ 9·9	0	4	
		1829	0·402	53·0	329·4	+ 9·2	0	31	
		1830	0·871	89·7	287·9	− 2·2	0	5	364n
		1831	0·933	94·2	279·3	− 5·8	0	14	146c

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).
1886.				°	°	°			
16d.541	H,JH		0·878	63·0	291·7	+20·8			141
			0·849	96·9	290·1	− 8·5			175
			0·947	69·9	279·9	+17·2			152
			0·982	87·8	269·6	+ 1·2			101
Jan. 17							(95)	(1181)	(1171)
18·508	H,JH		0·937	270·0	31·9	− 1·8			80
		1828a	0·931	261·1	31·4	−10·2	24	461	262c
		1828	0·902	262·7	27·1	− 8·8	0	49	
		1828	0·884	261·8	24·8	− 9·6	10	140	
		1829a	0·368	312·6	338·4	+ 9·5	0	8	
		1829	0·355	313·5	337·6	+ 9·2	0	7	
		1829	0·321	312·1	336·3	+ 7·4	0	4	
		1829	0·327	320·0	334·8	+ 9·5	0	5	
Jan. 19							(34)	(674)	(342)
19·514	H,SP		0·929	269·4	17·7	− 2·5			123
		1828a	0·990	260·7	31·7	− 9·8	27	448	531nf
		1828	0·965	261·4	24·7	− 9·7	12	82	
		1829a	0·548	297·2	339·0	+10·0	2	9	
		1829	0·529	295·9	338·2	+ 8·8	0	3	
		1829	0·538	300·1	337·7	+11·0	0	3	
		1829	0·501	298·7	335·8	+ 9·2	0	5	
		1829	0·486	302·9	333·9	+10·6	0	2	
Jan. 20							(41)	(552)	(654)
20·142	H,EP	1828	0·997	259·9	27·2	−10·5	0	161	952c
		1829a	0·660	291·3	339·4	+ 9·7	4	13	
I.		1829	0·647	293·0	338·1	+10·4	0	4	
		1829	0·635	291·1	337·7	+ 8·9	0	20	
		1829	0·619	292·8	336·2	+ 9·5	0	5	
			0·827	75·7	247·0	+ 8·7			313
			0·902	110·3	236·6	−20·6			122
Jan. 21							(4)	(203)	~~(397)~~ (387)
21·213	SP,H		0·983	262·2	6·8	− 8·7			395
M.		1829a	0·815	285·9	339·4	+ 9·6	2	7	144c
Jan. 22							(2)	(7)	(539)
22·239	EP,H		0·899	283·2	335·6	+ 9·3			341
			0·852	251·3	331·6	−18·8			79
M.		1832	0·162	255·1	282·4	− 8·0	0	6	
		1832	0·147	248·3	281·2	− 8·6	0	5	
Jan. 23							(0)	(11)	(420)

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

Jan. 16. Photograph faint. Faculæ ill-defined.
Group 1830, Jan. 16–17. Two small spots on Jan. 16. The following spot has disappeared by Jan. 17.
Group 1831, Jan. 17. A small spot.

Jan. 19 and 20. Photographs very faint. Spots and Faculæ ill-defined.
Group 1832, Jan. 23. Two very small spots.

Measures of Positions and Areas of Spots and Faculæ upon the Sun's Disk—*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).
1886.				°	°	°			
23d·545	H, JH		0·979	280·1	333·1	+ 8·7			232
			0·966	253·0	332·1	−17·9			93
Jan. 24							(0)	(0)	(325)
24·154	H, EP		0·910	262·2	314·0	− 9·5			140
			0·824	287·1	301·3	+10·6			80
I.			0·787	303·0	293·1	+21·3			151
Jan. 25							(0)	(0)	(371)
25·423	H, JH		0·887	264·5	294·1	− 7·5			90
			0·916	296·4	293·0	+21·4			170
			0·851	269·2	289·7	− 3·7			52
Jan. 26							(0)	(0)	(312)
26·475	H, JH		0·973	295·1	290·2	+22·7			235
			0·950	268·0	289·5	− 3·7			54
			0·913	288·7	280·7	+14·4			126
			0·827	274·8	273·0	+ 0·7			156
			0·950	75·1	148·0	+12·2			140
Jan. 27							(0)	(0)	(711)
27·449	H, JH		0·860	294·9	259·5	+17·8			43
			0·881	72·1	145·6	+12·7			124
			0·927	95·4	136·5	− 7·3			146
Jan. 28							(0)	(0)	(313)
28·164	EP, H		0·935	291·3	261·1	+17·4			152
			0·907	273·5	260·0	+ 0·7			78
I.			0·870	252·3	256·0	−18·3			60
			0·858	282·1	252·9	+ 7·1			207
			0·967	101·6	119·5	−12·7			277
Jan. 29							(0)	(0)	(774)
29·263	SP, H		0·912	280·6	245·4	+ 7·1			200
I.		1833*a*	0·961	103·6	106·3	−14·7	0	196	296 *c*
			0·973	75·5	106·4	+12·6			59
Jan. 30							(0)	(196)	(555)
30·231	SP, H	1833	0·874	105·9	106·9	−16·9	0	6	394 *c*
M.		1833*a*	0·880	103·4	106·1	−14·7	21	161	
			0·937	72·3	101·3	+14·2			297
Jan. 31							(21)	(167)	(691)
1886.				°	°	°			
31d·480	H, SP	1833*a*	0·716	104·9	106·1	−15·0	23	182	
			0·763	114·2	103·1	−22·4			103
			0·772	99·8	101·0	−11·5			67
			0·886	67·9	93·1	+16·3			243
Feb. 1							(23)	(182)	(413)
32·289	H, SP		0·896	253·7	205·2	−17·4			125
		1833	0·518	109·7	110·8	−15·5	4	31	
I.		1833	0·548	110·4	108·9	−16·3	1	5	
		1833	0·578	114·8	107·5	−19·3	0	12	
		1833	0·568	109·9	107·4	−16·3	8	19	
		1833*a*	0·578	107·2	106·4	−15·0	28	166	
		1833	0·601	113·0	105·5	−18·7	0	13	
			0·810	63·4	92·0	+17·2			109
			0·968	100·3	64·9	−11·6			163
Feb. 2							(41)	(246)	(397)
33·280	SP, EP	1833	0·297	121·0	112·8	−14·9	5	20	
		1833	0·323	120·2	111·2	−15·4	0	16	
I.		1833	0·353	120·0	109·5	−16·2	0	10	
		1833	0·383	117·0	107·3	−15·9	9	20	
		1833*a*	0·392	112·7	106·2	−14·6	30	142	
		1833	0·419	120·8	105·8	−18·2	0	5	
		1833	0·420	113·6	104·6	−15·4	0	6	
			0·881	65·1	70·8	+18·4			162
			0·911	101·6	61·8	−13·2			270
Feb. 3							(44)	(219)	(432)
34·567	H, SP	1834	0·075	261·9	115·4	− 7·0	0	13	
		1833	0·158	202·9	114·7	−14·7	0	5	
		1833	0·175	193·5	113·5	−16·2	4	34	
		1833	0·161	187·1	112·3	−15·6	0	2	
		1833	0·177	178·6	110·8	−16·6	0	5	
		1833	0·189	175·1	110·1	−17·2	2	29	
		1833	0·181	160·6	107·5	−16·2	3	12	
		1833*a*	0·167	150·8	106·3	−14·7	15	126	
		1835*a*	0·967	98·7	35·3	−10·0	45	441	342 *c*
			0·898	98·4	46·8	−10·3			222
			0·902	91·6	46·6	− 4·3			316
Feb. 4							(69)	(667)	(880)
35·148	H, EP	1833	0·338	228·0	118·8	−19·2	0	5	
		1833	0·247	236·2	115·6	−14·1	0	3	
I.		1833	0·248	229·6	114·7	−15·5	7	53	

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

Jan. 24. Photograph faint. Jan. 25. Limb ill-defined. Jan. 26 and 28. Photographs faint. Faculæ ill-defined.

Jan. 30 and Feb. 2. Photographs faint. Limb ill-defined. Feb. 3. Photograph very faint. Spots and Faculæ ill-defined.

Group 1833, Jan. 30–Feb. 11. A large regular spot, *a*. Two very small spots, close together and measured as one, accompany it on Jan. 31. A number of small spots are seen near *a* on Feb. 2 and the succeeding days, forming a fairly straight stream to the south of *a*, and for the most part preceding it. The group slowly decreases in size from day to day, until on Feb. 10 only *a*, now quite a small spot, remains.

Group 1834, Feb. 4. A small spot.

Group 1835, Feb. 4–16. A very large regular spot, *a*, which slowly decreases in size after Feb. 8. On Feb. 8 and the succeeding days until Feb. 14 a number of small spots are seen close to *a*. *a* has divided into two portions by Feb. 14, but these are measured as one as they are very close to each other.

Measures of Positions and Areas of Spots and Faculæ upon the Sun's Disk—*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).
1886.				°	°	°			
35d·148	H,EP	1833	0·219	211·5	110·2	−17·1	0	23	
		1833	0·212	205·9	108·9	−17·4	0	3	
I.		1833	0·184	201·5	107·4	−16·2	0	4	
		1833*a*	0·154	199·1	106·4	−14·7	16	118	
		1835*a*	0·932	97·6	34·2	− 9·4	75	476	
			0·859	98·4	43·8	−10·5			
			0·894	85·1	40·6	+ 1·5			130
Feb. 5							(98)	(685)	(1213)
36·479	H,JH	1833	0·507	253·5	115·8	−14·0	1	20	
		1833	0·444	244·0	110·5	−17·2	0	4	
		1833*a*	0·375	246·4	106·6	−14·7	11	68	
		1833	0·358	245·7	105·5	−14·6	4	17	
		1835*a*	0·777	97·3	34·6	− 9·8	52	449	203*c*
			0·893	96·3	22·3	− 8·5			618
Feb. 6							(68)	(558)	(821)
37·239	SP,H	1833	0·616	250·6	113·1	−17·0	0	8	
		1833	0·586	256·5	111·5	−13·1	0	7	
I.		1833	0·585	248·6	110·5	−17·7	0	4	
		1833*a*	0·521	252·0	106·5	−14·9	9	83	
		1836	0·402	55·3	56·4	+ 7·0	6	41	
		1835*a*	0·658	96·9	34·5	− 9·5	120	498	219 *c*
			0·783	109·4	24·5	−19·2			94
Feb. 7			0·821	95·5	20·4	− 8·2			580
							(135)	(641)	(893)
38·459	H,SP		0·931	283·9	126·4	+10·4			147
			0·786	296·3	106·8	+15·9			282
		1837*a*	0·839	266·3	117·1	− 6·7	0	7	18 *c*
		1837*b*	0·812	266·9	114·4	− 6·4	0	3	27 *c*
		1833	0·822	258·3	115·5	−13·4	3	13	
		1833	0·800	255·5	113·2	−15·6	2	11	342 *c*
		1833	0·772	253·3	110·4	−17·1	4	14	
		1833*a*	0·726	256·3	106·4	−14·4	7	40	
		1836	0·237	4·6	58·8	+ 7·0	9	46	
		1835	0·376	98·7	37·9	− 9·4	1	3	
		1835	0·402	91·3	36·1	− 6·6	0	3	
		1835*a*	0·422	98·4	35·0	− 9·5	70	447	
		1838*a*	0·400	85·0	36·5	− 4·1	6	16	
		1838*b*	0·444	85·6	33·7	− 4·0	2	15	
			0·976	79·2	344·1	+ 8·9			248
Feb. 8							(104)	(618)	(1064)
86.				°	°	°			
39d·449	H,M		0·889	289·8	106·3	+14·3			155
		1837*a*	0·941	265·2	117·3	− 6·7	8	66	
		1837*b*	0·921	266·3	114·1	− 6·0	3	33	200*c*
		1833	0·942	258·4	117·9	−13·1	6	44	298*c*
		1833*a*	0·858	257·4	106·3	−14·2	4	24	342*c*
		1836	0·320	316·3	59·6	+ 6·9	6	16	
		1835	0·146	109·1	38·8	− 9·3	0	11	
		1835	0·159	102·4	37·8	− 8·5	0	4	
		1835	0·159	92·5	37·6	− 7·0	2	7	
		1835*a*	0·207	105·2	35·2	− 9·6	67	414	
		1835	0·245	98·2	32·7	− 8·4	0	2	
		1835	0·265	100·3	31·6	− 9·1	0	3	
		1838*a*	0·168	77·2	37·4	− 4·4	0	7	
		1838*b*	0·241	80·3	33·1	− 4·2	0	6	
			0·919	77·4	341·9	+ 8·8			248
Feb. 9							(96)	(637)	(1243)
40·150	SP,H		0·946	286·7	106·1	+13·4			138
			0·863	294·2	92·9	+17·0			131
I.		1837	0·984	263·3	117·9	− 7·8	0	25	
		1837	0·974	263·4	115·1	− 8·0	0	11	
		1837*b*	0·967	265·0	113·6	− 6·6	0	14	265 *c*
		1833*a*	0·926	256·6	106·2	−15·0	0	13	451 *c*
		1836	0·448	299·6	60·7	+ 6·6	2	11	
		1835	0·051	216·2	39·7	− 9·1	0	5	
		1835	0·022	253·5	38·9	− 7·1	0	5	
		1835	0·022	204·1	38·2	− 7·9	0	17	
		1835*a*	0·061	145·6	35·7	− 9·6	83	409	
		1835	0·090	107·4	32·7	− 8·2	0	10	
		1838	0·056	331·6	39·2	− 3·9	0	11	
		1838	0·038	345·8	38·2	− 4·7	0	7	
		1838	0·042	29·7	36·5	− 4·7	0	6	
		1838	0·081	64·7	33·5	− 4·7	0	6	
			0·848	67·3	343·7	+15·2			103
			0·868	77·1	339·3	+ 7·7			278
			0·935	108·2	327·6	−19·4			194
Feb. 10							(85)	(550)	(1560)
41·151	H,EP		0·912	294·3	85·8	+18·9			150
			0·758	303·0	66·7	+19·5			62
I.		1833*a*	0·981	256·1	104·5	−14·9	0	18	296 *c*
		1839	0·682	263·8	67·7	− 9·2	3	10	
		1836	0·629	289·8	60·9	+ 6·9	0	6	
		1835	0·266	262·9	39·9	− 8·4	0	4	

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

Group 1836, Feb. 7–11. A single spot.

Group 1837, Feb. 8–10. Two very small spots, *a* and *b*, on Feb. 8. Both have increased in size by Feb. 9. The group consists of three spots on Feb. 10, of which one appears to be identical with *b*, but the other two appear to be fresh outbursts.

Group 1838, Feb. 8–10. Two small spots, *a* and *b*, on Feb. 8 and 9. They tend to separate from each other on Feb. 9. By Feb. 10 they have broken up into a number of very small faint spots, hardly distinguishable from the general mottling of the Sun's surface.

Group 1839, Feb. 11. A small spot.

Measures of Positions and Areas of Spots and Faculæ upon the Sun's Disk—*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).
1886.				°	°	°			
41d·151	H,EP	1835*a*	0·198	255·1	35·6	− 9·5	77	403	
		1835	0·163	260·8	33·8	− 8·1	0	57	
I.		1835	0·131	256·4	31·9	− 8·4	0	22	
		1840	0·036	69·4	22·6	− 6·0	0	4	
		1841	0·910	98·6	318·5	−10·6	0	3	172*c*
		1841	0·919	99·6	317·2	−11·4	0	9	
Feb. 11							(80)	(536)	(680)
42·180	SP,EP		0·963	272·9	84·8	+ 0·9			53
		1835*a*	0·422	261·9	35·9	− 9·6	83	390	
I.		1835	0·379	264·2	33·3	− 8·5	6	64	
		1840	0·272	269·6	26·7	− 6·7	0	6	
		1840	0·268	271·5	26·5	− 6·2	0	1	
		1840	0·257	277·0	25·7	− 4·8	0	4	
		1840	0·248	270·4	25·3	− 6·5	0	3	
		1840	0·226	270·2	24·0	− 6·6	0	6	
		1840	0·216	276·3	23·3	− 5·4	0	5	
		1841	0·792	96·5	318·2	− 9·3	0	23	
		1841	0·802	99·6	317·2	−11·7	0	4	
		1841	0·816	99·9	315·9	−12·0	0	2	102*c*
			0·972	94·1	294·2	− 5·6			194
Feb. 12							(89)	(508)	(349)
43·170	H,SP		0·944	262·6	69·1	− 9·3			165
			0·863	281·1	56·0	+ 6·0			140
I.			0·825	269·0	53·4	− 4·7			210
		1835*a*	0·619	263·4	36·2	− 9·4	87	425	
		1835	0·574	265·2	33·0	− 8·4	0	13	
		1840	0·490	272·4	27·1	− 4·8	10	70	
		1840	0·472	268·1	26·1	− 6·9	1	6	
		1840	0·448	269·7	24·5	− 6·2	3	15	
		1840	0·448	273·4	24·3	− 4·6	0	1	
		1840	0·439	267·5	23·9	− 7·2	0	3	
		1840	0·425	271·3	23·0	− 5·6	0	8	
		1841	0·623	97·0	319·1	− 9·7	0	3	
			0·918	63·4	296·4	+21·1			200
			0·900	94·1	293·3	− 6·7			135
Feb. 13							(101)	(544)	(850)
44·186	EP,H		0·909	263·7	50·2	− 8·6			618
		1835*a*	0·774	263·3	35·4	− 9·5	52	333	69*c*
M.		1840	0·679	271·2	27·1	− 4·3	5	26	

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).
1886.				°	°	°			
44d·186	EP,H	1840	0·631	269·7	23·6	− 5·5	1	17	
M.		1840	0·627	265·8	23·4	− 8·0	0	4	
		1840	0·621	268·1	22·9	− 6·6	6	28	
Feb. 14							(64)	(408)	(687)
45·250	H, M		0·961	276·8	43·4	+ 4·6			154
			0·831	258·7	27·0	−13·2			243
I.			0·841	242·9	26·8	−26·4			66
			0·925	262·4	38·6	− 9·6			53
		1835*a*	0·908	263·0	36·1	− 9·3	66	311	626*p*
		1840	0·859	269·2	29·7	− 4·3	0	38	
		1840	0·819	267·6	25·6	− 5·9	0	5	233*c*
		1840	0·790	266·9	22·8	− 6·7	0	12	
Feb. 15							(66)	(366)	(1375)
46·186	EP,M		0·892	277·7	20·3	+ 3·6			21
		1835*a*	0·976	261·9	36·3	− 9·4	53	259	
I.		1840	0·946	267·8	29·4	− 4·4	0	13	
		1840	0·926	265·9	26·3	− 6·5	6	30	1084*c*
		1840	0·910	265·4	24·0	− 7·1	4	47	
			0·923	79·0	252·4	+ 7·4			69
Feb. 16							(63)	(349)	(1174)
47·251	H, M	1840	0·994	267·1	27·9	− 3·7	0	45	
		1840	0·989	264·6	26·1	− 6·4	10	68	54*c*
M.		1840	0·978	262·9	22·7	− 8·4	0	13	
		1842	0·978	104·6	225·1	−15·7	4	45	160*c*
Feb. 17							(4)	(~~51~~) (71)	(214)
48·181	H,SP		0·772	284·9	340·3	+ 6·8			153
I.		1842	0·915	104·7	224·8	−16·3	4	47	214*f*
Feb. 18							(4)	(47)	(367)
49·277	H,EP		0·878	284·7	336·6	+ 9·3			146
		1842	0·794	106·0	224·6	−17·1	7	32	229*f*
I.			0·870	79·5	218·4	+ 5·5			58
			0·934	103·4	207·5	−15·0			33
Feb. 19							(7)	(32)	(466)
50·162	H,SP		0·887	250·0	328·7	−21·0			197
			0·796	261·1	318·8	−11·4			58
I.		1843	0·240	119·4	253·3	−13·7	0	18	
		1843	0·260	121·4	252·5	−14·7	0	3	
		1843	0·264	115·2	251·6	−13·3	1	19	

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

Feb. 15 and 16. Spots and Faculæ ill-defined.

Feb. 19. Limb very faint. Faculæ ill-defined.

Group 1840, Feb. 11–17. A very small spot on Feb. 11. On Feb. 12 the group appears as a straggling stream of very small spots. The preceding spot of the group on Feb. 13 is a regular spot, which has diminished in size by Feb. 14. The rest of the group undergoes continual changes, but remains on the whole an irregular straggling stream of spots.

Group 1841, Feb. 11–13. Two very small faint spots on Feb. 11 and 12. A third is seen close to the first two on Feb. 12. Only one spot remains on Feb. 13.

Group 1842, Feb. 17–23. A small spot.

Group 1843, Feb. 20–25. A number of small spots first seen near the centre of the Sun's disk. When first seen on Feb. 20, most of the spots are arranged in a circle, enclosing a considerable area. By Feb. 21 many of the spots have disappeared, and the group forms a straight stream. The group diminishes in size on succeeding days and no trace of it is seen on Feb. 24. On Feb. 25 a very small spot is seen very near the place of the group.

Measures of Positions and Areas of Spots and Faculæ upon the Sun's Disk—*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).
1886.				°	°	°			
50d.162	H, SP	1843	0·274	118·7	251·4	−14·4	0	15	
		1843	0·301	119·6	250·0	−15·4	6	38	
I.		1843	0·293	114·4	249·8	−13·8	0	7	
		1842	0·665	108·2	224·4	−17·4	3	30	
Feb. 20							(10)	(130)	(255)
51·112	EP, M		0·935	262·2	323·1	− 9·8			80
			0·926	247·5	322·7	−23·5			99
I.			0·922	270·7	320·2	− 2·1			48
		1843	0·123	191·7	254·6	−14·0	5	17	
		1843	0·118	176·7	252·7	−13·8	2	14	
		1843	0·142	170·0	251·6	−15·1	0	2	
		1843	0·152	161·6	250·3	−15·3	5	21	
		1842	0·501	113·2	224·3	−17·6	2	7	
			0·932	99·3	183·7	−11·2			40
Feb. 21							(14)	(61)	(267)
52·525	H, SP		0·920	299·5	295·3	+23·6			127
		1843	0·376	251·3	256·0	−13·6	0	10	
		1843	0·349	248·0	254·0	−14·2	0	11	
		1843	0·300	244·4	250·7	−14·3	0	25	
		1842	0·250	138·7	224·7	−17·8	0	8	
Feb. 22							(0)	(54)	(127)
53·157	H, SP		0·932	270·2	295·0	− 2·5			50
			0·936	285·0	293·4	+11·3			88
I.			0·926	300·8	287·5	+25·0			160
			0·854	291·3	281·3	+14·0			31
		1843	0·506	256·5	256·6	−13·0	0	9	
		1842	0·186	172·1	224·9	−17·8	0	8	
Feb. 23							(0)	(17)	(329)
54·429	M, SP		0·963	98·5	134·4	−10·1			160
Feb. 24							(0)	(0)	(160)
55·200	M, SP	1843	0·834	260·0	256·4	−12·3	0	3	75c
		1844	0·876	95·5	137·8	− 8·3	0	18	285c
I.		1844	0·908	97·6	133·6	− 9·9	0	17	
			0·971	91·2	123·2	− 2·9			303
Feb. 25							(0)	(38)	(663)
56·428	H, EP		0·934	257·5	253·0	−14·2			256
			0·946	279·7	252·7	+ 6·7			144
		1845	0·251	341·6	187·7	+ 6·6	1	8	
1886.				°	°	°			
56d.428	H, EP	1844a	0·691	95·7	139·1	− 9·2	7	46	102c
		1844	0·726	96·4	136·3	− 9·6	0	4	
		1844	0·761	97·0	133·2	−10·0	0	7	
			0·862	91·6	123·4	− 5·1			210
			0·901	102·2	118·1	−14·1			341
			0·968	74·7	110·1	+12·8			78
Feb. 26							(8)	(65)	(1131)
57·472	EP, H	1844a	0·484	96·4	140·3	− 9·4	0	22	
		1844	0·504	95·4	139·0	− 8·9	0	3	
Feb. 27							(0)	(25)	(0)
58·196	EP, H		0·880	252·3	222·1	−19·0			122
		1846	0·279	242·8	174·7	−14·3	0	17	
M.		1844a	0·323	96·9	141·0	− 9·1	4	32	
		1844	0·343	93·7	139·8	− 8·1	0	8	
		1844	0·369	94·3	138·2	− 8·3	0	4	
		1847a	0·961	104·4	84·9	−15·8	15	121	
		1847	0·970	105·9	82·7	−17·1	0	59	
		1847	0·975	104·7	81·5	−15·9	0	11	
		1847b	0·982	106·7	79·3	−17·7	0	92	195c
		1848	0·991	94·3	77·3	− 5·2	0	80	303s
			0·961	67·7	90·0	+19·0			112
Feb. 28							(19)	(424)	(732)
59·207	SP, H		0·960	251·5	221·8	−19·8			182
			0·863	310·8	195·3	+29·6			21
M.		1846	0·498	255·5	176·3	−13·4	4	8	
		1846	0·467	254·0	174·1	−13·8	1	7	
		1846	0·451	252·7	173·0	−14·2	1	3	
		1846	0·454	249·8	172·8	−15·5	4	8	
		1844a	0·093	112·1	141·7	− 9·2	0	5	
		1844	0·105	105·5	140·9	− 8·8	1	6	
		1844	0·162	101·0	137·5	− 8·9	0	2	
		1844	0·182	113·7	137·0	−11·3	0	5	
		1844	0·175	102·5	136·8	− 9·2	1	7	
		1844	0·205	111·3	135·5	−11·4	0	4	
		1844	0·226	110·6	134·3	−11·6	0	2	
		1847a	0·878	104·5	84·7	−16·2	51	454	
		1847	0·914	103·5	79·9	−15·2	6	52	268c
		1847	0·917	104·6	79·4	−16·2	0	73	
		1847b	0·922	106·6	78·7	−18·1	15	297	

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

Feb. 21. Photograph faint. Limb ill-defined.

Feb. 23. Faculæ very faint.

Feb. 25. Photograph faint.

Feb. 27. Photograph very faint. Spots ill-defined.

Group 1844, Feb. 25–March 4. Two small spots on Feb. 25. On Feb. 26 and the succeeding days the group consists of an irregularly shaped spot, *a*, followed by a short stream of very small spots. All but *a* have disappeared by March 2.

Group 1845, Feb. 26. A small spot.

Group 1846, Feb. 28–March 3. A small spot on Feb. 28. A short stream of very small spots on March 1, of which only one member remains by March 2.

Group 1847, Feb. 28–March 11. Two regular spots, *a* and *b*, on Feb. 28, with two smaller spots between them. Both *a* and *b* have increased very greatly in size by March 1 and at the same time have entirely changed in appearance. Two smaller spots lie to the north of *a* and *b*, but between them in longitude. By March 2 the group has undergone another change, *a* has partly broken up, the principal portion, *c*, being a large regular spot. *b* has undergone little change, but between *c* and *b* there is a broad complicated stream of spots forming a wide curve convex to the equator. *b* has divided into two spots, *d* and *e*, by March 4. The group gradually diminishes in size on the succeeding days, the spots intermediate between *c* and *e* dying out. *d* has disappeared by March 7, and by March 8 only *c* and *e* remain. *c* varies somewhat in its shape on the following side as a number of the small spots following it appear to coalesce more or less perfectly with it on March 5 and 6.

Group 1848, Feb. 28–March 7. A regular spot on Feb. 28 and March 1. A bridge divides it into two nearly equal portions on March 2, and the separation between the two parts tends to increase upon the succeeding days. The spot is always measured as one. It diminishes rapidly after March 1.

Measures of Positions and Areas of Spots and Faculæ upon the Sun's Disk—*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).
1886.				°	°	°			
59d·207	SP,H	1848	0·933	93·0	77·6	− 5·4	27	120	550*8f*
M.			0·899	62·9	88·1	+20·6			165
Mar. 1							(111)	(1053)	(1186)
60·454	SP,EP	1846	0·742	257·9	178·5	−13·9	0	12	39*c*
		1844*a*	0·209	259·1	142·3	− 9·4	1	4	
		1849	0·146	43·8	124·5	− 1·3	8	27	
		1849*a*	0·166	57·1	122·3	− 2·1	0	11	
		1847 *c*	0·679	107·4	87·8	−17·2	21	235	
		1847	0·707	105·6	85·3	−16·2	10	126	
		1847	0·709	103·1	85·0	−14·4	0	5	
		1847	0·724	103·2	83·7	−14·6	0	17	
		1847	0·730	106·4	83·4	−16·9	7	45	
		1847	0·741	105·2	82·4	−16·2	0	24	629*c*
		1847	0·763	103·6	80·3	−15·0	4	101	
		1847	0·767	106·5	80·1	−17·3	1	89	
		1847	0·770	104·8	79·7	−16·0	0	11	
		1847 *b*	0·794	108·5	77·7	−19·1	26	271	
		1847	0·793	105·0	77·6	−16·3	2	37	
		1848	0·793	91·9	77·7	− 6·0	17	86	599*c*
			0·937	88·5	61·0	− 1·2			212
			0·948	78·7	60·6	+ 8·2			68
			0·956	98·8	56·6	−10·6			192
Mar. 2							(97)	(1101)	(1739)
61·435	H,EP	1846	0·876	258·7	179·0	−13·4	0	17	195*f*
		1844*a*	0·423	263·2	142·3	− 9·5	0	6	
		1850*a*	0·383	320·8	131·4	+10·2	0	5	
		1850 *b*	0·364	324·8	129·5	+10·2	2	9	
		1849	0·193	306·8	126·1	− 0·7	4	52	
		1849	0·172	311·7	124·5	− 0·7	0	9	
		1849	0·144	311·4	123·4	− 1·9	0	7	
		1849*a*	0·125	314·9	122·3	− 2·3	4	31	
		1847 *c*	0·504	112·4	88·1	−17·5	33	276	
		1847	0·552	109·1	84·4	−16·5	5	139	
		1847	0·588	108·0	81·7	−16·5	3	30	
		1847	0·606	105·4	80·1	−15·1	0	44	
		1847	0·624	108·6	79·1	−17·3	0	84	
		1847	0·639	105·9	77·7	−15·7	7	61	
		1847 *b*	0·655	110·8	77·0	−19·0	9	174	
		1848	0·640	90·6	77·3	− 6·0	14	72	190*c*
		1851*a*	0·975	91·8	39·9	− 3·4	20	127	259*c*

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).
1886.				°	°	°			
61d·435	HE,P	1852*a*	0·988	97·8	35·4	− 8·8	24	194	85*c*
			0·890	84·3	55·0	+ 1·7			228
			0·909	98·5	51·3	−10·7			486
Mar. 3							(125)	(1337)	(1443)
62·473	H,SP		0·955	257·2	177·4	−14·4			99
		1844*a*	0·570	263·8	142·7	− 9·6	0	9	
		1850*a*	0·531	301·1	130·9	+ 9·4	0	11	
		1850*b*	0·506	303·7	128·8	+ 9·6	0	5	
		1849	0·395	286·4	125·8	− 0·4	3	85	
		1849	0·367	285·3	124·2	− 1·3	0	27	
		1849*a*	0·329	282·6	122·3	− 2·8	3	93	
		1847*c*	0·320	124·5	87·6	−17·4	48	269	
		1847	0·333	113·1	85·2	−14·4	0	8	
		1847	0·365	118·3	84·1	−16·8	5	97	
		1847	0·411	116·1	81·0	−17·2	0	36	
		1847	0·430	110·0	79·0	−15·1	0	38	
		1847*d*	0·464	112·4	77·1	−16·8	0	112	
		1847*e*	0·487	117·3	76·4	−19·4	11	143	
		1848	0·449	88·5	76·9	− 5·9	3	44	
		1851*a*	0·900	89·9	39·5	− 3·1	18	108	55*c*
		1852*a*	0·930	96·6	34·7	− 8·8	32	220	79*c*
		1853*a*	0·983	93·7	23·8	− 5·0	32	196	208*c*
			0·968	101·6	27·2	−13·0			121
Mar. 4							(155)	(1501)	(562)
63·217	H,EP	1850*a*	0·681	292·6	133·2	+ 9·6	4	10	
		1850*b*	0·641	294·1	129·9	+ 9·4	0	7	
M.		1849*b*	0·583	278·6	128·8	− 1·2	8	46	
		1849*c*	0·552	280·9	126·4	− 0·1	17	147	
		1849*a*	0·499	276·4	123·3	− 3·1	11	91	
		1847*c*	0·197	150·7	87·9	−17·1	46	282	
		1847	0·174	136·4	86·6	−14·3	0	2	
		1847	0·239	148·2	86·1	−18·9	0	2	
		1847	0·192	131·7	85·2	−14·4	0	1	
		1847	0·225	140·2	85·1	−17·1	4	58	
		1847	0·263	129·4	81·5	−16·6	4	66	
		1847	0·342	132·4	78·2	−20·3	4	30	
		1847*d*	0·313	124·0	78·0	−17·0	8	80	
		1847*e*	0·351	126·4	76·4	−18·9	13	82	
		1848	0·276	85·5	77·7	− 5·8	14	37	
		1851*a*	0·804	88·0	40·4	− 2·7	21	116	171*c*
		1851	0·819	88·6	38·8	− 3·0	0	10	

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

March 4. Photograph very faint. Spots and Faculæ ill-defined.

Group 1849, March 2–8. Two small spots on March 2. Of these the following spot, *a*, increases in size on the succeeding days, but remains fairly stable in position and appearance. It undergoes a great increase in size between March 7 and 8. The preceding portion of the group has become a short stream of spots by March 3. These spots have coalesced to form two spots by March 4, and have again divided and coalesced in a different manner, principally to form two spots, *b* and *c*, by March 5. *c* has divided into two spots by March 7, but these have combined again by March 8.

Group 1850, March 3–6. Two very small faint spots, *a* and *b*. *b* has disappeared by March 6.

Group 1851, March 3–14. A regular spot, *a*; one or two small spots are seen near it on March 5, 6, and 8.

Group 1852, March 3–15. A large regular spot, *a*. The group has become suddenly larger by March 11, principally by the appearance of a stream of spots immediately to the south of *a*. These later formed spots diminish in number and area on the succeeding days.

Group 1853, March 4–16 A very large regular spot, *a*, followed by a stream of small spots. The small spots undergo very frequent changes in area, appearance, and arrangement; *a* has thrown off a portion by March 9, but increases in size during the succeeding days. The small spots have all disappeared by March 14.

Measures of Positions and Areas of Spots and Faculæ upon the Sun's Disk—*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).
1886.				°	°	°			
63d·217	H, EP	1852 *a*	0·847	95·4	35·4	− 8·4	29	214	83*c*
M.		1853 *a*	0·933	92·2	24·6	− 4·7	62	561	934*c*
		1853	0·966	93·6	18·4	− 5·4	0	140	
			0·964	72·3	22·1	+14·9			85
Mar. 5							(245)	(~~1895~~)	(1273)
64·226	H, EP		0·835	261·9	137·5	−10·7		(1982)	171
			0·732	266·0	127·8	− 7·9			38
M.		1850 *a*	0·840	285·6	135·3	+ 9·0	1	12	
		1849 *b*	0·778	274·7	131·1	− 0·9	35	169	
		1849	0·736	273·7	127·6	− 2·2	0	2	
		1849 *c*	0·730	276·2	126·8	− 0·5	28	309	
		1849 *a*	0·682	272·8	123·4	− 3·4	12	122	
		1847 *c*	0·209	216·0	87·8	−16·9	30	319	
		1847	0·159	213·4	85·7	−14·8	0	9	
		1847	0·189	198·1	84·0	−17·5	0	2	
		1847	0·156	168·4	78·6	−16·0	0	11	
		1847 *d*	0·181	167·5	78·2	−17·4	0	27	
		1847	0·229	168·9	77·8	−20·1	0	3	
		1847 *e*	0·211	160·9	76·3	−18·7	17	118	
		1848	0·050	62·6	78·0	− 5·9	3	11	
		1851 *a*	0·643	84·8	40·8	− 2·2	24	113	
		1851	0·659	85·3	39·6	− 2·4	0	11	
		1851	0·684	87·3	37·5	− 3·5	0	2	
		1852 *a*	0·702	94·2	35·7	− 8·1	35	220	
		1853	0·804	88·3	27·1	− 2·9	0	7	
		1853 *a*	0·832	90·7	24·1	− 4·6	101	585	644*c*
		1853	0·881	91·9	18·6	− 5·1	11	139	
		1853	0·914	90·9	14·4	− 3·7	0	31	
			0·837	104·0	23·3	−15·6			239
Mar. 6							(297)	(2122)	(1092)
65·507	H, SP		0·962	261·6	138·4	−10·0			162
			0·941	283·3	131·7	+ 9·9			105
		1849 *b*	0·933	272·6	132·1	− 0·3	21	180	
		1849 *c*	0·898	274·0	127·0	+ 0·4	45	244	197*c*
		1849 *c*	0·879	272·8	124·8	− 1·0	5	64	
		1849 *a*	0·865	270·9	123·4	− 3·3	28	130	
		1847 *c*	0·418	245·4	86·9	−16·6	23	270	
		1847	0·385	247·3	85·1	−15·3	0	8	
		1847 *e*	0·290	224·0	75·8	−19·0	13	106	
		1848	0·255	274·5	78·3	− 5·8	0	7	
		1851 *a*	0·392	79·8	41·0	− 2·7	16	117	
		1852 *a*	0·466	94·8	35·7	− 8·6	29	192	
		1853	0·602	86·2	26·8	− 3·5	0	5	
1886.				°	°	°			
65d·507	H, SP	1853 *a*	0·643	89·4	23·6	− 5·1	104	573	
		1853	0·693	88·9	19·8	− 4·5	0	86	
		1853	0·695	91·8	19·4	− 6·5	0	9	
		1853	0·728	92·0	16·7	− 6·4	6	73	
		1853	0·768	90·6	13·4	− 5·1	0	17	316*f*
Mar. 7							(290)	(2081)	(~~675~~) 780
66·430	EP, SP		0·921	261·2	119·1	−11·3			108
		1849 *b*	0·989	270·7	132·6	− 0·4	13	150	
		1849 *c*	0·968	271·6	126·5	− 0·3	36	426	
		1849 *a*	0·955	268·6	124·2	− 3·5	36	314	529*c*
		1847 *c*	0·587	251·3	86·7	−16·8	32	311	
		1847 *e*	0·452	240·7	76·0	−19·3	11	85	
		1851 *a*	0·191	66·7	41·3	− 2·8	14	135	
		1851	0·215	74·2	39·5	− 3·7	0	5	
		1851	0·242	74·6	37·9	− 3·3	0	4	
		1852 *a*	0·267	96·4	35·9	− 8·6	27	196	
		1853 *a*	0·468	87·8	23·5	− 5·4	105	655	
		1853	0·513	85·8	20·7	− 4·1	2	40	
		1853	0·513	91·6	20·4	− 7·0	0	22	
		1853	0·532	89·8	19·2	− 6·0	0	9	
		1853	0·554	92·4	17·6	− 7·4	0	4	
		1853	0·570	89·3	16·6	− 5·5	0	15	
		1853	0·572	92·0	16·4	− 7·1	5	54	
			0·961	78·3	339·2	+ 9·1			89
Mar. 8							(281)	(2425) (~~2453~~)	(726)
67·448	H, SP	1847 *c*	0·745	254·1	86·1	−16·6	34	268	
		1847 *e*	0·623	248·3	75·5	−19·0	3	50	
		1851 *a*	0·102	322·6	41·4	− 2·6	10	116	
		1852 *a*	0·040	119·9	35·9	− 8·4	23	186	
		1853 *a*	0·255	82·5	23·3	− 5·1	67	577	
		1853	0·299	79·3	20·9	− 3·7	0	72	
		1853	0·296	89·6	20·6	− 6·8	0	44	
		1853	0·372	90·3	16·0	− 6·8	0	72	
			0·893	75·5	336·9	+ 9·5			154
Mar. 9							(137)	(1385)	(154)
68·419	H, EP		0·914	297·2	85·8	+21·3			80
			0·773	266·9	76·0	− 7·0			234
		1847 *c*	0·870	254·9	86·2	−16·6	11	233	329*c*
		1847 *e*	0·776	250·9	76·0	−19·3	6	43	
		1851 *a*	0·299	284·5	42·0	− 2·7	9	118	
		1852 *a*	0·187	263·6	36·0	− 8·3	26	188	

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

March 9. Faculæ very faint.

Measures of Positions and Areas of Spots and Faculæ upon the Sun's Disk—*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).
1886.				°	°	°			
68d·419	H,EP	1853*a*	0·048	45·6	23·2	− 5·3	88	544	
		1853	0·097	46·9	21·2	− 3·4	0	32	
		1853	0·090	66·0	20·5	− 5·1	0	37	
		1853	0·091	89·3	20·0	− 7·1	0	17	
		1853	0·156	76·2	16·5	− 5·0	0	3	
		1853	0·154	86·7	16·3	− 6·6	0	10	
		1853	0·177	95·8	15·0	− 8·1	0	6	
		1853	0·185	80·4	14·7	− 5·3	0	11	
			0·797	71·1	335·4	+10·3			97
Mar. 10							(140)	(1242)	(740)
69·465	H,SP		0·897	264·6	75·6	− 8·1			308
		1847*c*	0·954	254·5	85·0	−16·9	8	186	455*c*
		1847*e*	0·896	251·2	75·7	−20·0	0	24	
		1851*a*	0·516	276·9	42·1	− 2·7	14	91	
		1852	0·448	261·6	38·0	−10·2	2	27	
		1852	0·424	261·1	36·5	−10·3	0	8	
		1852*a*	0·415	264·9	36·0	− 8·6	15	206	
		1852	0·399	260·1	34·9	−10·6	3	76	
		1853	0·273	274·5	27·2	− 5·8	0	4	
		1853*a*	0·205	278·2	23·1	− 5·4	78	581	
		1853	0·186	289·8	21·4	− 3·5	0	73	
		1853	0·161	262·8	20·6	− 8·3	0	14	
		1853	0·153	280·0	20·1	− 5·6	0	6	
		1853	0·094	285·1	16·6	− 5·7	0	9	
		1853	0·074	295·3	15·2	− 5·4	0	10	
		1853	0·054	315·6	13·6	− 5·0	0	8	
Mar. 11							(120)	(1323)	(763)
70·207	H,EP		0·969	253·9	78·4	−17·4			473
			0·956	263·5	75·0	− 8·3			324
I.			0·852	273·7	59·5	− 0·7			131
		1851*a*	0·658	274·6	42·4	− 2·5	12	93	
		1852	0·601	264·0	38·6	− 9·3	15	47	
		1852*a*	0·564	265·6	36·0	− 8·5	29	171	
		1852	0·547	262·0	34·8	−10·4	4	89	
		1853	0·483	279·2	29·9	− 2·0	0	9	
		1853*a*	0·371	274·1	23·2	− 5·2	97	594	
		1853	0·280	267·7	17·8	− 7·5	0	3	
		1853	0·268	276·4	16·9	− 5·2	0	25	
		1853	0·191	256·2	12·3	− 9·7	2	22	
Mar. 12							(159)	(1053)	(928)
1886.				°	°	°			
71d·569	EP,SP		0·913	264·3	50·1	− 8·2			135
		1851*a*	0·859	271·8	42·7	− 2·2	5	43	159*c*
		1852	0·820	263·5	39·2	− 9·5	3	11	
		1852*a*	0·786	264·8	35·8	− 8·6	28	180	324*c*
		1852	0·768	263·1	34·2	− 9·9	0	83	
		1853*a*	0·635	270·7	23·1	− 5·1	92	585	
		1853	0·632	274·4	22·6	− 2·8	0	31	
		1853	0·608	265·5	21·3	− 8·5	0	10	
		1853	0·586	270·1	19·6	− 5·8	0	3	
			0·881	79·7	283·4	+ 5·5			44
Mar. 13							(128)	(946)	(662)
72·219	EP, H	1851*a*	0·926	270·5	42·8	− 2·3	3	44	658*c*
		1852	0·898	262·8	39·5	− 9·6	7	15	
I.		1852*a*	0·867	264·2	35·6	− 8·6	38	181	108*c*
		1852	0·851	262·5	33·9	−10·1	0	48	
		1853*a*	0·741	269·8	23·0	− 5·0	149	592	284*c*
			0·879	70·6	276·9	+13·3			97
Mar. 14							(197)	(880)	(1147)
73·229	SP,H		0·907	286·5	24·1	+11·7			103
		1852	0·975	261·1	39·7	−10·3	0	12	
M.		1852*a*	0·960	262·9	36·0	− 8·8	21	170	551*c*
		1853*a*	0·880	268·0	23·5	− 5·1	109	632	736*c*
			0·927	77·2	255·7	+ 9·0			151
			0·926	103·0	253·1	−14·7			202
Mar. 15							(130)	(814)	(1743)
74·327	EP, M		0·937	254·5	17·8	−17·0			351
		1853*a*	0·970	267·4	23·4	− 4·3	113	603	667*f*
M.		1854	0·431	261·9	332·8	− 9·9	3	9	
		1854	0·423	259·8	332·3	−10·7	0	1	
		1854	0·415	262·0	331·8	− 9·8	0	1	
		1854	0·372	258·8	329·0	−10·7	0	5	
		1854	0·334	262·4	326·8	− 9·2	0	1	
			0·860	104·1	247·5	−15·7			47
Mar. 16							(116)	(620)	(1065)
75·440	H, EP		0·978	263·8	11·1	− 7·5			421
		1854*a*	0·667	264·4	334·6	− 9·0	9	52	
		1854	0·624	263·8	331·4	− 9·5	0	4	
		1854*b*	0·613	261·8	330·6	−10·6	2	12	
Mar. 17							(11)	(68)	(421)

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

Group 1854, March 16–20. A stream of very small spots on March 16. The members of the group have coalesced by March 17 to form three spots, of which the first and last, *a* and *b*, are the largest. Only *a* and *b* remain by March 18. *a* has broken up into several portions by March 20, but is still measured as one spot.

Measures of Positions and Areas of Spots and Faculæ upon the Sun's Disk—*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).
1886.				°	°	°			
76d.202	H,EP	1854*a*	0·794	264·0	335·4	− 9·0	11	94	71*c*
		1854*b*	0·748	262·3	331·2	−10·4	4	48	60*c*
M.		1855	0·938	101·8	212·0	−13·5	0	5	} 147*c*
		1855	0·950	98·9	210·0	−10·7	0	4	
		1856*a*	0·993	84·1	200·2	+ 5·0	35	268	
			0·979	173·1	229·8	−81·5			46
			0·959	161·8	222·9	−69·7			107
			0·894	105·6	218·5	−17·1			99
Mar. 18							(50)	(419)	(530)
77·465	H,EP	1854*a*	0·935	263·7	335·7	− 8·4	8	45	} 268*c*
		1854*b*	0·907	262·4	331·6	− 9·9	0	15	
		1857*a*	0·729	259·4	313·0	−12·6	0	14	} 82*c*
		1857*b*	0·696	258·3	310·3	−13·2	0	22	
		1855	0·793	100·3	213·2	−12·4	0	9	131*c*
		1856*a*	0·921	81·6	200·1	+ 4·9	39	275	477*f*
Mar. 19							(47)	(380)	(958)
78·159	H	1854*a*	0·979	262·4	335·6	− 8·8	21	131	} 314*c*
		1854*b*	0·964	262·2	332·0	− 9·4	0	40	
I.		1857*a*	0·840	259·8	314·4	−12·4	0	7	} 59*c*
		1857*b*	0·805	258·6	310·8	−13·4	0	5	
		1858	0·264	50·0	245·2	+ 2·9	0	2	
		1858	0·255	52·9	245·1	+ 2·0	2	29	
		1858	0·289	55·8	243·0	+ 2·5	0	6	
		1858	0·297	54·0	242·9	+ 3·3	0	14	
		1855	0·731	99·6	209·2	−11·8	2	11	
		1856*a*	0·855	79·6	199·4	+ 5·1	36	276	} 596*c*
		1856	0·881	80·0	196·4	+ 5·4	4	16	
		1856	0·894	81·1	194·6	+ 4·7	0	15	
		1856	0·916	80·4	191·8	+ 5·9	6	22	
			0·955	102·5	183·1	−14·0			109
Mar. 20							(~~69~~ 71)	(574)	(1078)
79·196	EP,SP	1858	0·171	334·7	247·3	+ 2·0	6	25	
		1858	0·160	342·5	245·8	+ 1·9	7	17	
M.		1858	0·147	353·2	244·1	+ 1·5	0	1	
		1858	0·176	359·4	243·2	+ 3·2	1	12	
		1858	0·159	4·0	242·5	+ 2·2	10	51	
		1855	0·506	103·1	212·9	−12·6	1	10	
		1855	0·551	102·6	209·8	−12·7	0	6	

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).
1886.				°	°	°			
79d.196	EP,SP	1856*a*	0·710	75·5	199·6	+ 5·2	33	254	} 301*c*
		1856	0·735	75·5	197·6	+ 5·8	9	14	
M.		1856	0·795	77·0	192·1	+ 6·0	3	12	
			0·907	104·5	177·3	−16·0			100
Mar. 21							(70)	(402)	(401)
80·205	H,SP		0·986	258·1	311·3	−12·9			136
		1858*a*	0·352	294·2	248·5	+ 1·7	14	67	
M.		1858	0·293	301·4	244·2	+ 2·1	0	6	
		1858	0·291	306·1	243·4	+ 3·1	0	1	
		1858	0·269	304·2	242·6	+ 1·9	1	9	
		1858	0·265	306·4	242·1	+ 2·3	9	15	
		1855	0·337	107·7	210·7	−12·3	0	2	
		1856*a*	0·531	68·8	200·1	+ 5·1	41	236	
		1856*b*	0·563	67·1	198·5	+ 6·7	15	101	
		1856	0·632	71·6	192·9	+ 6·0	1	17	
			0·838	105·8	172·6	−17·0			63
			0·974	72·9	155·6	+14·9			133
Mar. 22							(81)	(454)	(332)
81·141	M,SP	1858*a*	0·538	284·1	248·7	+ 1·7	21	86	
		1858	0·524	279·6	248·4	− 1·0	0	2	
I.		1858	0·462	287·0	243·5	+ 1·6	0	15	
		1858	0·436	290·3	241·5	+ 2·4	0	7	
		1856*a*	0·364	56·2	199·8	+ 5·1	64	215	
		1856*b*	0·395	55·4	198·4	+ 6·5	22	89	
		1856	0·462	63·2	193·0	+ 5·7	2	15	
		1859*a*	0·985	89·0	137·6	− 0·3	0	166	} 192*c*
		1859	0·990	93·6	135·4	− 4·6	0	37	
			0·893	70·0	157·6	+14·4			160
			0·937	98·8	147·2	−10·7			131
Mar. 23							(109)	(632)	(483)
82·466	H,SP		0·885	288·8	259·1	+13·1			120
		1858*a*	0·763	277·3	249·0	+ 1·1	6	42	76*c*
		1856*a*	0·208	1·8	199·6	+ 5·1	39	242	
		1856*b*	0·228	7·1	198·4	+ 6·3	11	83	
		1859*a*	0·890	86·8	137·5	− 0·3	22	171	
		1859	0·898	91·7	136·0	− 4·6	0	32	
		1859	0·915	88·4	134·1	− 1·3	0	81	} 756*c*
		1859*b*	0·929	89·6	131·9	− 2·2	16	221	
			0·898	74·6	138·5	+10·6			118
Mar. 24							(94)	(872)	(1070)

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

March 23. Limb of Sun faint. Faculæ ill-defined.

Group 1855, March 18–22. Two very small faint spots on March 18. Only one spot is seen on March 19, 20, and 22, but on March 21 the group consists of six very small spots arranged in two clusters. The spots seen on March 19 and 20 do not seem to be the same.

Group 1856, March 18–30. A large regular spot, *a*, followed on March 20 and the succeeding days by a short stream of small spots. A second regular spot, *b*, has appeared close to *a* by March 22; *b* has divided into two portions by March 26, but is still measured as one spot. It has entirely broken up by March 28, and only *a* remains by March 29; *a* diminishes in size after March 20, but slightly recovers itself on March 24, diminishing again on succeeding days.

Group 1857, March 19–20. Two small spots, *a* and *b*.

Group 1858, March 20–25. An irregular cluster of very small spots on March 20. The group develops on the succeeding days, and has become a straight stream of spots by March 22, the first spot, *a*, being the largest; only *a* remains by March 24.

Group 1859, March 23–April 4. Two large regular spots, *a* and *b*, with several small spots between them. Only *a* and *b* are seen after March 30.

Measures of Positions and Areas of Spots and Faculæ upon the Sun's Disk—*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).
1886.				°	°	°			
83d·594	H,EP		0·977	285·4	260·5	+ 13·4			120
		1858*a*	0·900	273·5	248·9	+ 0·1	3	30	250*f*
		1856*a*	0·325	307·9	200·0	+ 4·9	27	212	
		1856*b*	0·326	313·6	198·9	+ 6·3	6	82	
		1859*a*	0·740	84·1	138·0	− 0·3	21	172	
		1859	0·752	89·7	136·5	− 4·3	0	10	
		1859	0·769	85·4	135·3	− 0·9	5	19	619*c*
		1859	0·782	86·6	134·1	− 1·6	0	27	
		1859*b*	0·801	86·8	132·3	− 1·6	38	213	
			0·914	105·1	118·5	−16·6			185
Mar. 25							(100)	(765)	(1174)
84·426	H,EP		0·947	273·6	244·9	+ 1·2			159
		1856*a*	0·477	293·5	200·1	+ 4·9	29	204	
		1856*b*	0·477	297·9	199·2	+ 6·8	11	87	
		1856	0·446	296·6	197·7	+ 5·3	0	4	
		1859*a*	0·602	81·8	137·8	− 0·5	17	174	
		1859	0·616	89·1	136·2	− 4·7	0	6	
		1859	0·634	83·9	135·3	− 1·4	0	12	
		1859	0·663	83·2	133·2	− 0·6	0	6	
		1859*b*	0·676	85·2	132·0	− 1·7	24	283	
		1860	0·868	104·0	113·6	−15·4	0	14	
		1860	0·875	104·7	112·7	−16·1	0	5	154*c*
		1860	0·882	106·1	111·9	−17·3	0	3	
			0·903	73·3	112·3	+11·9			81
Mar. 26							(81)	(798)	(394)
85·116	H, H		0·986	272·8	245·0	+ 1·6			156
		1856*a*	0·602	287·7	200·1	+ 5·1	38	205	
I.		1856*b*	0·604	291·0	199·6	+ 7·0	10	57	
		1859*a*	0·466	78·3	138·1	− 0·6	24	169	
		1859	0·507	72·9	136·2	− 2·7	0	11	
		1859	0·504	81·6	135·3	− 1·6	2	5	
		1859*b*	0·547	82·9	132·3	− 1·8	38	235	
		1860	0·729	106·1	118·5	−16·3	0	15	
		1860	0·768	105·5	114·9	−16·2	9	17	
		1860	0·803	105·8	111·5	−16·7	6	47	215*c*
		1860	0·829	106·1	108·9	−17·1	4	16	
			0·944	84·2	95·2	+ 3·2			98
			0·965	87·9	90·7	+ 0·3			47
			0·984	109·2	83·9	−20·0			316
Mar. 27							(131)	(777)	(832)
1886.				°	°	°			
86d·188	H,SP		0·959	275·1	223·7	+ 3·0			26
			0·914	278·2	215·9	+ 4·7			43
M.			0·871	258·5	211·9	−13·3			107
			0·686	281·4	193·1	+ 2·9			65
		1856	0·778	285·1	199·9	+ 7·4	3	37	
		1856*a*	0·772	282·3	199·9	+ 5·2	30	178	158*c*
		1856	0·754	284·2	198·0	+ 6·2	0	6	
		1859*a*	0·244	65·1	138·2	− 0·5	23	165	
		1859	0·279	72·7	135·5	− 1·6	0	2	
		1859*b*	0·326	75·6	132·6	− 1·7	18	181	
		1860	0·548	109·5	118·5	−16·1	3	16	
		1860*a*	0·582	109·5	116·1	−16·6	16	131	
		1860	0·605	108·9	114·4	−16·6	0	4	
		1860*b*	0·634	108·9	112·2	−17·0	31	138	
		1860	0·680	109·0	108·6	−17·7	2	14	
			0·922	61·8	89·3	+22·8			73
			0·894	101·8	87·0	−13·5			176
			0·938	109·4	80·5	−20·4			390
Mar. 28							(126)	(872)	(1038)
87·421	SP,EP	1856*a*	0·915	279·2	199·6	+ 5·6	27	176	559*c*
		1859*a*	0·126	326·4	138·6	− 0·6	32	124	
		1859*b*	0·093	17·0	133·0	− 1·5	15	120	
		1860*a*	0·327	122·1	117·9	−16·3	16	252	
		1860	0·370	118·1	114·8	−16·2	0	8	
		1860*b*	0·420	117·0	111·7	−17·1	11	239	
		1861	0·972	100·5	57·3	−11·8	0	27	232*c*
			0·957	87·4	61·9	+ 0·5			120
Mar. 29							(101)	(946)	(911)
88·232	H, H	1856*a*	0·976	277·2	200·2	+ 5·5	28	172	584*nf*
		1859*a*	0·274	290·7	138·7	− 0·8	20	153	
I.		1859	0·225	291·2	136·0	− 1·7	0	6	
		1859*b*	0·186	296·3	133·5	− 1·7	18	114	
		1860*a*	0·193	153·0	118·7	−16·3	38	285	
		1860	0·243	139·4	114·4	−17·1	6	12	
		1860*b*	0·288	131·9	111·0	−17·4	21	221	
		1861	0·916	99·6	57·0	−11·4	7	30	
		1861	0·966	101·4	48·0	−12·7	5	17	810*c*
		1862	0·923	96·7	56·1	− 8·7	0	18	
Mar. 30							(143)	(1028)	(1394)

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

Group 1860, March 26–April 5. Three small spots on March 26. The group rapidly increases in size on the succeeding days, and two large spots, *a* and *b*, have formed by March 28. These, but especially *a*, increase in size on the succeeding days; *b* has broken up into a great number of small spots, which are still measured as one, on March 31 and April 1, but has closed up again to form one large spot by April 2. A large portion of *b* has become partly separated from it by April 4, and has wholly disappeared by April 5, thus causing an apparent change in the position of the spot.

Group 1861, March 29–April 9. A small spot on March 29. Other spots appear following it on the succeeding days, and the group consists on April 1 and the succeeding days of a number of spots, mostly small, following one another in a fairly straight stream. The group changes its appearance from day to day.

Group 1862, March 30–April 1. Two very small spots on March 30. One small spot on March 31 and April 1.

Measures of Positions and Areas of Spots and Faculæ upon the Sun's Disk—*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).
1886.				°	°	°			
89d·418	H, SP	1859*a*	0·516	279·3	138·9	− 0·8	20	161	
		1859*b*	0·443	279·0	134·2	− 1·9	15	103	
		1860*a*	0·260	227·0	119·8	−16·5	47	289	
		1860	0·232	219·6	117·2	−16·7	0	16	
		1860*b*	0·203	193·4	111·2	−17·8	11	182	
		1861	0·769	99·2	57·9	−11·3	0	41	} 366*f*
		1861	0·817	99·9	53·3	−11·9	0	7	
		1862	0·771	96·3	57·7	− 9·0	0	4	
		1863*a*	0·940	99·0	37·8	−10·7	0	19	} 451*c*
		1864*a*	0·992	93·8	25·5	− 4·6	0	217	
			0·983	106·3	27·7	−17·2			243
Mar. 31							(93)	(1039)	(1060)
90·386	EP,SP	1859*a*	0·691	275·7	138·9	− 0·8	18	161	
		1859*b*	0·631	274·5	134·5	− 2·2	7	64	
		1860*a*	0·440	244·8	120·0	−16·6	54	345	
		1860	0·392	240·2	116·4	−17·2	4	41	
		1860*b*	0·338	232·5	111·9	−18·0	15	180	
		1861	0·617	100·9	57·5	−11·7	4	93	
		1861	0·643	102·4	55·7	−12·9	0	5	
		1861	0·657	100·7	54·5	−11·9	4	12	
		1861	0·683	101·3	52·5	−12·4	0	24	
		1861	0·725	101·4	49·0	−12·7	0	9	
		1862	0·650	96·1	54·9	− 8·8	0	6	
		1863*a*	0·845	99·0	37·6	−11·0	0	14	249*n*
		1864*a*	0·940	92·9	25·4	− 4·9	65	248	377*c*
			0·953	72·4	26·0	+14·6			248
			0·942	104·7	24·4	−16·0			465
Apr. 1							(171)	(1202)	(1339)
91·432	H, EP	1859*a*	0·844	273·4	139·0	− 0·6	17	94	
		1859*b*	0·800	272·3	134·7	− 2·0	15	111	
		1860*a*	0·633	251·6	120·4	−16·6	58	521	
		1860	0·582	248·7	116·3	−17·5	0	80	
		1860*b*	0·518	244·8	111·3	−18·3	20	248	
		1865	0·278	324·1	91·2	+ 6·7	0	5	
		1865	0·278	336·1	88·3	+ 8·3	0	5	
		1861	0·398	104·0	58·7	−11·4	6	47	
		1861	0·464	102·2	54·4	−11·3	0	4	
		1861	0·488	103·3	52·9	−12·0	0	7	
		1861	0·514	102·5	51·1	−11·9	0	8	
		1863*a*	0·693	99·3	37·8	−11·1	0	13	

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).
1886.				°	°	°			
91d·432	H,EP	1863	0·696	102·2	37·7	−13·1	0	8	
		1864*a*	0·830	92·0	25·6	− 5·3	40	256	319*f*
			0·896	110·2	17·9	−20·9			99
Apr. 2							(156)	(1407)	(418)
92·567	SP,EP	1859*a*	0·952	271·2	138·6	− 0·8	10	89	} 405*c*
		1859*b*	0·924	270·0	134·1	− 2·4	12	160	
		1860*a*	0·802	253·9	120·1	−16·7	78	532	
		1860	0·764	252·2	116·2	−17·6	0	46	
		1860*b*	0·698	249·0	110·1	−19·1	21	230	360*c*
		1865	0·487	296·1	92·7	+ 6·7	0	6	
		1865	0·468	298·9	91·0	+ 7·3	0	4	
		1865	0·442	302·3	88·8	+ 7·8	0	6	
		1861	0·162	124·1	58·9	−11·4	4	58	
		1861	0·187	116·2	56·9	−11·0	0	3	
		1861	0·208	123·3	56·5	−12·7	2	5	
		1861	0·221	113·9	54·9	−11·3	0	7	
		1861	0·242	112·8	53·6	−11·6	10	54	
		1861	0·286	113·2	51·2	−12·5	7	58	
		1863	0·472	104·7	38·9	−12·5	0	16	
		1863*a*	0·483	101·3	38·0	−11·0	0	7	
		1863	0·506	98·6	36·3	− 9·8	0	5	
		1864*a*	0·654	90·6	25·8	− 5·2	52	269	
		1864	0·655	96·2	25·7	− 8·8	0	11	
		1864	0·670	94·3	24·5	− 7·6	0	3	
Apr. 3							(196)	(1569)	(765)
93·102	H,EP		0·980	283·6	136·3	+12·0			146
		1859*a*	0·986	270·3	139·8	− 0·8	14	103	
I.		1859*b*	0·967	269·4	134·8	− 2·2	35	238	723*c*
		1860	0·873	258·3	120·9	−13·3	0	8	
		1860*a*	0·872	254·8	120·7	−16·3	109	538	
		1860	0·837	253·3	116·6	−17·4	0	21	280*c*
		1860	0·812	251·8	113·9	−18·4	0	4	
		1860*b*	0·776	250·5	110·2	−19·0	17	184	167*c*
		1865*a*	0·587	291·4	93·0	+ 7·1	5	27	
		1865	0·548	292·1	90·3	+ 6·6	0	2	
		1865	0·540	295·6	89·1	+ 8·1	0	14	
		1861	0·090	175·3	59·3	−11·4	7	60	
		1861	0·131	140·3	54·8	−12·0	8	91	
		1861	0·179	122·6	50·9	−11·6	7	39	
		1863*a*	0·371	105·9	38·4	−11·6	6	34	

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

March 31. Faculæ ill-defined.

Group 1863, March 31–April 7. A small spot, *a*, with one or two companions on April 2, 3, and 4. The group has changed its appearance by April 5, when it consists of several small spots in a short stream. Only one very small spot remains by April 6.

Group 1864, March 31–April 12. A large regular spot, *a*, with several small companions from April 3 to April 7.

Group 1865, April 2–7. Two small spots on April 2. The group has increased in size by April 4, and then forms a short regular stream of small spots of which *a*, the preceding spot, is the largest. *a* alone remains on April 6.

Measures of Positions and Areas of Spots and Faculæ upon the Sun's Disk—*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).
1886.				°	°	°			
93d.102	H,EP	1863	0·381	108·9	38·1	−12·8	4	12	
		1864*a*	0·557	90·4	25·8	− 5·4	61	284	
I.		1864	0·557	97·0	25·8	− 9·1	0	2	
		1864	0·586	94·5	23·7	− 7·7	0	2	
			0·751	96·9	10·8	− 9·3			120
			0·915	107·9	353·0	−18·9			81
			0·986	96·6	338·9	− 7·6			77
Apr. 4							(273)	(186) (163)	(1594)
94·446	EP,SP	1860*a*	0·977	254·8	120·6	−16·2	30	431	} 741*c*
		1860*b*	0·909	252·3	107·7	−18·6	0	22	
		1865*a*	0·811	284·3	94·2	+ 7·8	0	14	
		1865	0·766	284·7	90·0	+ 7·1	0	6	95*c*
		1861	0·332	253·3	60·7	−11·3	4	28	
		1861	0·311	252·6	59·4	−11·3	0	6	
		1861	0·314	248·2	59·2	−12·7	0	4	
		1861	0·293	257·8	58·7	− 9·5	0	20	
		1861	0·290	251·4	58·1	−11·3	0	5	
		1861	0·276	246·1	56·8	−12·4	5	49	
		1861	0·231	245·7	54·2	−11·5	2	42	
		1861	0·230	238·0	53·4	−13·1	0	6	
		1861	0·233	232·9	52·9	−14·1	0	3	
		1861	0·193	240·0	51·7	−11·7	2	34	
		1861	0·200	229·9	50·9	−13·5	0	13	
		1863	0·102	150·8	39·0	−11·3	0	2	
		1863	0·112	137·4	37·5	−10·9	0	6	
		1864*a*	0·267	88·2	26·4	− 5·5	58	260	
		1864	0·317	85·1	23·5	− 4·3	0	4	
			0·918	97·5	334·9	− 9·3			89
Apr. 5							(101)	(955)	(925)
95·419	SP,EP		0·984	251·8	109·9	−18·9			522
		1865*a*	0·920	281·4	94·5	+ 8·0	0	18	137*c*
		1861	0·537	258·4	61·4	−11·4	0	8	
		1861	0·512	258·1	59·7	−11·3	0	11	
		1861	0·481	257·2	57·6	−11·5	3	128	
		1861	0·446	257·7	55·3	−10·9	14	70	
		1861	0·441	254·0	54·7	−12·5	0	17	
		1863	0·160	238·5	37·1	−10·7	0	4	
		1864*a*	0·047	77·8	26·5	− 5·5	59	260	
		1864	0·116	69·9	22·9	− 3·9	0	3	
		1864	0·113	83·8	22·7	− 5·4	0	2	
1886.				°	°	°			
95d.419	SP,EP	1864	0·145	69·9	21·3	− 3·2	0	5	
			0·821	99·0	333·7	−10·9			47
			0·883	105·6	326·8	−16·6			38
			0·943	101·3	318·0	−12·7			166
			0·970	87·4	313·5	+ 1·1			119
Apr. 6							(76)	(526)	(1029)
96·286	H, SP		0·899	251·1	82·0	−19·6			249
		1865*a*	0·984	279·4	96·2	+ 8·1	0	8	188*c*
I.		1861	0·663	260·0	59·2	−11·1	9	91	
		1861	0·644	256·7	57·6	−13·1	0	2	
		1861	0·623	257·1	56·0	−12·7	2	26	
		1861	0·619	259·3	55·9	−11·3	22	98	
		1861	0·600	256·4	54·3	−13·0	0	6	
		1861	0·576	258·1	52·7	−11·8	3	47	
		1861	0·575	255·1	52·4	−13·5	4	33	
		1863	0·345	251·7	37·2	−11·9	0	4	
		1864*a*	0·163	272·1	27·1	− 5·6	60	256	
		1864	0·089	271·1	22·8	− 5·9	0	7	
		1866	0·391	344·0	24·1	+16·0	0	4	
		1866	0·372	344·0	23·8	+14·9	0	5	
Apr. 7							(100)	(587)	(437)
97·544	SP,EP		0·963	248·9	76·4	−21·9			278
			0·908	274·9	65·7	+ 1·9			204
		1861	0·862	260·8	61·0	−11·0	0	38	} 443*c*
		1861	0·809	259·0	55·3	−12·4	7	56	
		1861	0·807	260·9	55·1	−10·9	0	15	
		1861	0·775	259·2	52·0	−12·1	0	26	
		1864*a*	0·437	268·8	27·0	− 5·9	58	268	
		1866	0·527	309·9	25·7	+14·3	0	2	
		1866	0·517	311·7	24·5	+14·6	1	9	
Apr. 8							(66)	(414)	(925)
98·417	EP,SP	1861	0·912	259·7	55·8	−11·9	12	60	} 601*c*
		1861	0·894	258·7	53·4	−12·7	0	7	
		1861	0·886	257·2	52·6	−14·1	0	9	
		1861	0·879	259·1	51·5	−12·4	0	25	
		1864*a*	0·617	268·2	27·7	− 5·8	59	267	
Apr. 9							(71)	(368)	(601)

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

Group 1866, April 7–8. Two very small spots on April 7. Three very small spots, two of which are measured together on April 8.

Measures of Positions and Areas of Spots and Faculæ upon the Sun's Disk—*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).
1886.				°	°	°			
99d.479	EP, SP		0·922	263·4	43·1	− 8·4			639
			0·847	252·5	33·5	−17·9			133
			0·864	292·9	31·5	+16·5			86
		1864*a*	0·792	267·5	28·0	− 5·5	60	279	149*c*
		1867	0·685	117·6	294·5	−22·9	0	6	
		1867	0·697	118·3	293·7	−23·7	0	6	
		1867	0·729	120·8	291·6	−26·1	0	7	
Apr. 10							(60)	(298)	(1007)
100·627	EP, SP		0·906	252·1	25·6	−18·7			298
			0·925	290·1	24·8	+16·1			106
			0·866	267·3	20·4	− 5·3			121
		1864*a*	0·924	266·5	28·0	− 5·5	48	253	275*c*
		1867	0·483	130·8	296·9	−23·7	0	3	
		1867	0·534	135·2	295·3	−27·5	0	5	
		1867	0·514	128·4	294·3	−23·8	0	12	
		1867	0·559	130·0	291·9	−26·1	0	6	
Apr. 11							(48)	(279)	(800)
101·437	M, SP	1864*a*	0·979	265·4	28·1	− 5·7	15	176	269*f*
Apr. 12							(15)	(176)	(269)
102·456	EP, SP		0·980	258·2	15·5	−12·7			225
			0·960	266·4	10·2	− 5·1			107
			0·926	248·5	4·5	−22·0			40
Apr. 13							(0)	(0)	(372)
103·095 I.									
Apr. 14							(0)	(0)	(0)
104·557	M, EP		0·892	261·1	332·0	−10·4			38
		1868	0·418	98·5	244·0	− 8·5	0	4	
		1868	0·446	99·0	242·3	− 8·8	0	4	
		1869*a*	0·928	82·7	201·4	+ 4·7	26	141	478*c*
			0·944	72·2	200·4	+14·9			109
Apr. 15							(26)	(149)	(625)
105·389	EP, M		0·943	270·8	328·0	− 1·1			32
			0·922	284·7	322·7	+11·3			38
1886.									
105d.389	EP, M	1870	0·329	332·5	266·4	+11·6	2	3	
		1870	0·313	339·7	263·8	+11·7	2	14	
		1868	0·234	105·0	244·3	− 8·8	0	4	
		1869*a*	0·839	81·4	201·4	+ 4·2	17	134	293*f*
			0·872	69·8	199·9	+14·7			57
Apr. 16							(21)	(155)	(420)
106·102	SP, H		0·907	260·4	313·5	−10·9			105
		1870	0·442	311·7	267·7	+12·1	0	1	
I.		1870	0·415	314·9	265·5	+11·9	0	19	
		1870	0·400	318·9	263·6	+12·4	3	8	
		1869*a*	0·744	79·2	201·2	+ 4·4	27	121	179*c*
			0·929	105·4	179·5	−16·3			68
Apr. 17							(30)	(149)	(352)
107·103 I.	SP, H	1869*a*	0·574	74·7	201·2	+ 4·4	18	136	
Apr. 18							(18)	(136)	(0)
108·391	EP, SP	1869*a*	0·324	60·5	201·4	+ 4·3	10	112	
		1871*a*	0·948	78·8	147·8	+ 8·9	6	52	241*f*
		1872*a*	0·985	90·7	137·9	− 1·6	12	165	358*c*
			0·963	102·3	142·9	−13·2			113
Apr. 19							(28)	(329)	(712)
109·578	SP, EP		0·905	287·2	264·6	−13·3			155
		1869*a*	0·156	1·9	201·9	+ 4·0	12	95	
		1871*a*	0·822	75·2	148·8	+ 9·2	16	77	237*c*
		1871	0·844	77·8	146·1	+ 7·5	0	4	
		1873	0·975	78·4	126·4	+10·1	0	25	143*c*
		1872*a*	0·896	89·1	138·8	− 1·5	24	182	203*c*
		1872	0·916	88·6	136·1	− 0·8	0	65	
		1874*a*	0·991	107·1	118·9	−17·6	67	463	314*c*
			0·898	99·9	138·1	−11·1			69
Apr. 20							(119)	(911)	(1121)
110·159	EP, H		0·952	285·4	264·7	+13·0			108
		1869*a*	0·208	320·4	202·1	+ 4·3	17	113	
		1871*a*	0·741	72·6	148·9	+ 9·3	17	91	17*c*
I.		1872*a*	0·829	88·0	138·8	− 1·1	28	111	136*c*
		1872	0·851	86·9	136·5	+ 0·1	7	21	
		1872	0·852	88·8	136·3	− 1·6	0	5	

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

April 14. Photograph faint. Limb of Sun very faint. No spots or Faculæ visible.

Group 1867, April 10–11. A short stream of very small spots.

Group 1869, April 15–26. A large regular spot, *a*, which gradually diminishes in size from day to day. A small companion is seen at some distance on April 24.

Group 1870, April 16–17. Two small spots on April 16. Three on April 17.

Group 1871, April 19–23. A spot, *a*, with a very small companion on April 20. A change in the shape of the spot, on April 22, causes an apparent shift in the latitude.

Group 1872, April 19–May 1. A large spot, *a*, closely followed by a faint spot of irregular outline on April 20. The latter has become a closely connected chain of very small spots by April 21. These have all disappeared by April 23, but a portion of *a* has become detached, and forms a small regular spot, *b*. Several very small faint spots, some of which are measured with *b*, are seen near on April 26. The group has greatly diminished by April 27, but has undergone an entire transformation by April 28, on which day it consists of a number of irregular penumbral spots, covering a considerable area. These have undergone a great change by April 29, and again by April 30, and the preceding portion of the group has passed out of sight at the limb by May 1.

Group 1873, April 20–24. A small spot on April 20. Two or three small spots on the succeeding days. The identity of the individual members of the group on the different days cannot be satisfactorily established.

Group 1874, April 20–May 3. A large regular spot, *a*. One or two small spots are seen in its neighbourhood on several days. The photograph has been carefully examined, and the change in the umbra on April 21 appears to be real.

April 17 and 18. Limb of Sun faint.

Group 1868, April 15–16. Two very small spots on April 15; one of which has disappeared by April 16.

Measures of Positions and Areas of Spots and Faculæ upon the Sun's Disk—*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).
1886.				°	°	°			
110d·159	EP,H	1873	0·934	76·9	126·7	+10·3	0	11	134c
		1873	0·955	75·0	123·7	+12·7	4	31	
I.		1874a	0·967	107·4	118·7	−18·1	137	480	188c
			0·811	78·1	141·7	+ 6·7			147
			0·840	99·2	137·3	−10·4			107
Apr. 21							(210)	(863)	(837)
111·430	SP,EP	1869a	0·442	289·6	202·3	+ 4·2	10	62	
		1871a	0·509	65·0	150·0	+ 8·2	8	33	
		1872	0·614	83·6	140·3	+ 0·1	0	9	
		1872	0·624	84·0	139·5	− 0·1	0	11	
		1872a	0·628	86·8	139·0	− 1·7	16	103	
		1872	0·650	83·9	137·6	+ 0·3	0	13	
		1873	0·810	71·6	126·1	+11·9	3	10	
		1873	0·829	71·1	124·4	+12·7	0	23	76c
		1873	0·838	73·0	123·1	+11·4	0	27	
		1874a	0·862	108·5	118·4	−18·4	62	486	
		1874	0·920	105·2	110·6	−15·9	0	9	464c
			0·949	114·3	105·9	−24·6			120
Apr. 22							(99)	(786)	(660)
112·451	H,EP	1869a	0·629	282·6	202·1	+ 4·2	13	78	
		1875	0·039	143·2	163·0	− 6·5	0	6	
		1871a	0·323	47·9	150·4	+ 7·9	0	6	
		1872a	0·429	84·4	139·1	− 1·9	9	86	
		1872b	0·445	78·5	138·6	+ 0·8	0	9	
		1873	0·654	65·6	127·0	+11·9	0	3	
		1873	0·652	69·8	126·1	+ 9·3	0	16	
		1873	0·683	69·0	124·0	+10·6	0	6	
		1874a	0·733	111·2	118·3	−18·7	72	465	131c
		1874	0·761	113·8	116·3	−21·0	0	31	
		1874	0·808	106·0	110·8	−15·7	0	7	
		1874	0·834	105·5	108·0	−15·5	0	5	281s
			0·978	101·0	85·9	−11·7			217
Apr. 23							(94)	(718)	(629)
113·499	SP,EP	1869	0·834	276·3	206·2	+ 2·7	0	17	182c
		1869a	0·797	278·8	202·3	+ 4·2	17	49	
		1872a	0·196	76·5	139·4	− 2·0	14	80	
		1872b	0·212	76·0	138·5	− 1·6	4	9	
		1873	0·448	58·4	127·7	+ 9·3	0	2	
		1873	0·458	59·4	126·9	+ 9·2	1	5	
1886.				°	°	°			
113d·499	SP,EP	1873	0·516	60·0	123·4	+10·8	0	7	
		1874a	0·569	116·3	117·9	−18·4	59	393	
		1874	0·620	115·2	114·1	−19·0	0	3	
		1874	0·623	113·2	113·5	−17·9	0	2	
			0·929	114·4	82·4	−24·3			95
			0·936	101·1	80·7	−12·0			403
Apr. 24							(95)	(567)	(680)
114·582	H,EP	1869a	0·916	276·6	201·6	+ 4·2	0	34	181c
		1872a	0·079	308·8	139·5	− 1·7	10	81	
		1872b	0·048	327·1	137·5	− 2·2	0	5	
		1874	0·418	136·5	118·0	−21·9	0	6	
		1874a	0·388	129·5	117·7	−18·5	54	380	
		1874	0·437	132·3	115·8	−21·3	0	39	
			0·825	103·3	80·5	−13·6			110
			0·934	98·2	66·8	− 9·3			340
Apr. 25							(64)	(545)	(631)
115·564	H,SP		0·931	281·0	190·5	+ 8·6			66
		1869a	0·981	275·3	201·3	+ 4·3	0	62	148c
		1872a	0·299	279·2	140·3	− 1·5	7	52	
		1872	0·303	287·7	139·9	+ 1·1	0	3	
		1872	0·286	281·6	139·4	− 1·0	0	5	
		1872b	0·260	278·5	138·0	− 2·1	0	17	
		1874	0·209	172·1	121·5	−13·8	0	14	
		1874	0·218	164·6	119·8	−16·5	0	11	
		1874a	0·259	159·8	117·8	−18·4	51	360	
		1874	0·321	156·5	115·3	−21·4	0	10	
			0·848	99·0	65·2	−10·0			425
Apr. 26							(58)	(534)	(639)
116·388	H,EP	1872a	0·473	275·5	140·2	− 1·2	7	22	
		1872	0·446	275·1	138·5	− 1·6	0	4	
		1874a	0·262	201·0	117·9	−18·4	67	379	
		1874	0·270	219·3	122·4	−16·2	0	5	
		1874	0·300	189·7	115·3	−21·5	0	12	
		1874	0·235	188·9	114·4	−17·7	0	3	
		1876	0·987	96·0	31·3	− 6·6	0	143	96c
			0·731	106·1	65·8	−14·7			156
			0·907	93·2	47·1	− 4·7			200
Apr. 27							(74)	(568)	(452)

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

Group 1875, April 23. A very small faint spot.

Group 1876, April 27–May 9. A large regular spot.

Measures of Positions and Areas of Spots and Faculæ upon the Sun's Disk—*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).
1886.				°	°	°			
117d.524	H,EP	1872	0·698	269·5	141·4	− 3·4	0	35	
		1872	0·676	273·0	139·5	− 1·1	3	158	
		1872	0·665	270·3	138·8	− 3·0	0	27	
		1874*a*	0·415	232·9	117·5	−18·4	74	365	
		1874	0·381	227·3	114·3	−19·0	0	8	
		1877	0·647	89·5	57·0	− 2·9	0	9	
		1877	0·672	90·7	55·0	− 3·6	0	10	
		1876	0·911	95·2	31·5	− 6·5	21	164	143*c*
			0·943	105·0	26·5	−15·6			277
			0·955	92·3	24·5	− 3·5			179
Apr. 28							(98)	(776)	(599)
118·511	H,EP		0·893	263·9	147·4	− 7·3			124
			0·892	282·8	145·8	+ 9·5			180
		1872	0·847	270·1	141·8	− 2·1	9	186	
		1872	0·820	272·2	138·9	− 0·6	8	167	167*c*
		1872	0·815	268·8	138·6	− 3·4	0	17	
		1874*a*	0·579	243·9	117·1	−18·1	61	365	
		1874	0·546	242·2	114·5	−18·3	0	23	
		1878	0·271	116·7	69·9	−11·0	2	38	
		1878	0·341	115·5	65·8	−12·3	4	12	
		1877	0·446	91·1	56·7	− 4·2	0	1	
		1877	0·488	91·1	54·9	− 4·1	0	5	
		1876	0·790	95·2	31·9	− 6·6	23	185	77*c*
			0·890	114·9	22·3	−24·0			195
			0·892	97·6	20·9	− 8·6			338
Apr. 29							(107)	(999)	(1081)
119·389	H,EP		0·952	282·7	143·2	+10·7			111
			0·931	260·5	141·2	−10·3			76
			0·833	251·9	128·3	−17·2			131
		1872	0·947	269·3	143·6	− 2·0	10	220	
		1872	0·937	273·5	141·6	+ 1·9	0	49	388*c*
		1872	0·920	270·9	139·2	− 0·8	10	144	
		1874*a*	0·720	248·6	117·2	−18·1	43	393	114*c*
		1878	0·124	164·9	70·6	−10·9	0	26	
		1878	0·130	153·5	69·1	−10·6	0	11	
		1878	0·150	148·0	67·9	−11·3	0	7	
		1878	0·176	143·9	66·4	−12·1	4	29	
		1877	0·264	87·8	57·2	− 3·3	0	6	
		1877	0·310	90·3	54·5	− 3·9	0	6	
		1876	0·654	95·5	31·7	− 6·6	19	188	74*c*
1886.				°	°	°			
119d.389	H,EP		0·778	99·7	21·6	−10·0			109
			0·784	89·9	21·0	− 2·5			173
			0·838	118·3	17·8	−25·7			69
			0·831	109·1	17·0	−18·1			92
			0·964	99·6	357·7	−10·3			205
Apr. 30							(86)	(1079)	(1542)
120·433	EP,SP		0·948	256·1	130·3	−14·4			231
			0·937	284·5	126·5	+12·1			131
		1872	0·987	269·2	139·3	− 1·5	0	74	
		1872	0·985	270·6	138·5	− 0·1	0	39	705*c*
		1872	0·985	271·7	138·5	+ 1·0	0	35	
		1874	0·856	253·7	117·1	−15·9	0	8	
		1874*a*	0·855	251·1	116·8	−18·1	69	312	317*c*
		1878	0·246	238·3	71·0	−11·2	15	158	
		1878	0·197	235·6	68·2	−10·3	0	5	
		1878	0·203	226·7	67·3	−11·9	3	30	
		1878	0·188	220·9	65·9	−12·0	8	45	
		1876	0·448	97·3	32·2	− 6·8	29	196	
		1879	0·819	101·8	3·9	−11·9	0	13	
		1879	0·891	100·2	355·7	−10·9	0	8	181*c*
			0·880	100·1	357·0	−10·8			214
May 1							(124)	(923)	(1779)
121·406	H,EP	1874*a*	0·944	252·2	116·5	−18·1	40	372	533*c*
		1874	0·927	251·7	113·6	−18·4	0	13	
		1878*a*	0·469	251·8	72·8	−11·9	49	445	
		1878	0·403	251·3	68·6	−10·9	0	7	
		1878*b*	0·364	248·2	65·9	−11·3	26	367	
		1876	0·238	102·2	32·3	− 6·6	26	186	
		1880	0·957	80·7	333·7	+ 7·7	5	95	311*c*
		1880	0·980	80·2	328·3	+ 8·8	26	714	
May 2							(172)	(2199)	(844)
122·418	H,SP		0·782	256·9	83·7	−12·5			83
		1874*a*	0·992	252·3	115·9	−18·0	38	365	407*f*
		1878*a*	0·663	256·5	73·6	−11·7	76	524	
		1878	0·611	256·9	69·7	−10·9	0	5	
		1878	0·613	253·7	69·6	−12·8	0	6	
		1878*b*	0·558	255·2	65·8	−11·3	28	375	
		1876	0·049	179·4	32·6	− 6·5	23	172	

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

May 1. Faculæ ill-defined.

Group 1877, April 28–30. Two small spots.

Group 1878, April 29–May 6. Two small spots on April 29. Other small spots have appeared by April 30, on which day the group consists of an irregular stream of spots. The group develops rapidly on the two succeeding days, and on May 2 consists almost entirely of two very large spots, *a* and *b*. These spots undergo frequent changes of area and shape on the succeeding days.

Group 1879, May 1. Two small faint spots.

Group 1880, May 2–13. A very large, beautiful, and complicated group, consisting of a great number of spots, mostly of irregular outline, following each other in a long stream so closely as almost to form one large spot. It was not found practicable so to divide the group for purposes of measurement, as to measure precisely corresponding portions on different days.

Measures of Positions and Areas of Spots and Faculæ upon the Sun's Disk—*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).
1886				°	°	°			
112d·418	H,SP	1880	0·864	77·8	334·2	+ 8·6	23	121	506c
		1880	0·925	79·4	326·1	+ 8·4	64	821	
May 3							(252)	(2389)	(996)
123·432	EP,H		0·912	255·0	84·8	−15·1			129
		1878a	0·819	258·3	73·9	−11·6	80	505	297c
		1878	0·784	258·1	70·6	−11·6	0	5	
		1878b	0·726	257·4	65·3	−11·6	32	378	
		1876	0·239	256·7	32·7	− 6·7	27	171	
		1880	0·751	75·5	332·1	+ 8·4	22	329	430c
		1880	0·797	75·5	328·0	+ 9·3	0	11	
		1880	0·801	78·2	327·2	+ 7·2	0	14	
		1880	0·835	77·1	324·0	+ 8·7	58	590	
May 4							(219)	(2003)	(856)
124·553	H,SP		0·892	272·9	67·1	+ 1·0			91
		1878a	0·932	259·5	73·1	−11·0	54	437	573c
		1878b	0·877	258·9	65·5	−11·4	19	546	
		1876	0·478	262·7	32·7	− 6·6	26	179	
		1880	0·568	69·0	332·0	+ 8·8	18	302	
		1880	0·618	72·6	327·9	+ 7·8	0	3	
		1880	0·627	69·7	327·8	+ 9·7	0	5	
		1880	0·668	73·0	324·2	+ 8·5	36	738	
May 5							(153)	(2210)	(664)
125·454	SP,EP	1878a	0·981	259·3	71·5	−11·2	73	408	318c
		1878b	0·951	258·6	64·5	−11·9	43	476	
		1876	0·645	264·1	32·4	− 6·4	32	146	
		1880	0·392	57·9	332·9	+ 8·8	67	484	
		1880	0·444	64·1	328·7	+ 8·1	7	27	
		1880	0·465	61·0	328·1	+ 9·9	0	9	
		1880	0·511	66·7	324·2	+ 8·6	89	605	
May 6							(311)	(2155)	(318)
126·462	H,EP	1876	0·805	264·7	32·5	− 6·2	14	151	126c
		1880	0·207	11·5	336·6	+ 8·4	7	67	
		1880	0·265	16·8	334·5	+11·3	0	11	
		1880	0·236	28·4	332·5	+ 8·6	29	407	
		1880	0·277	40·8	328·5	+ 8·8	0	69	
		1880	0·321	52·0	324·3	+ 8·1	43	487	
		1880	0·357	45·2	324·1	+11·3	0	13	
May 7							(93)	(1205)	(126)
1886				°	°	°			
127d·185	SP,EP		0·852	248·5	26·7	−19·9			399
		1876	0·894	264·4	32·8	− 6·5	29	162	183c
I.		1880	0·245	327·2	337·2	+ 8·7	10	52	
		1880	0·218	343·8	333·0	+ 8·9	38	332	
		1880	0·212	19·6	325·4	+ 8·3	52	541	
May 8							(129)	(1087)	(582)
128·524	H,SP		0·907	247·1	15·9	−22·0			195
		1876	0·984	264·5	31·6	− 6·0	0	131	
		1880	0·431	297·5	334·4	+ 8·6	33	435	
		1880	0·359	305·9	328·9	+ 9·1	0	60	
		1880	0·334	303·7	328·0	+ 7·7	0	5	
		1880	0·296	310·4	324·9	+ 8·0	7	278	
May 9							(40)	(909)	(195)
129·460	EP,SP	1880	0·613	289·0	335·3	+ 9·1	41	400	
		1880	0·530	293·6	328·9	+ 9·6	6	80	
		1880	0·474	294·0	325·3	+ 8·4	10	171	
			0·941	94·4	229·3	− 5·2			106
May 10							(57)	(651)	(106)
130·265	SP,H		0·940	259·0	358·8	−11·3			196
		1880	0·755	284·5	336·3	+ 8·9	59	393	361c
I.		1880	0·673	286·7	329·4	+ 8·9	11	40	
		1880	0·626	286·4	326·0	+ 7·8	7	56	
		1880	0·575	287·2	322·3	+ 7·3	0	6	
			0·864	94·5	229·1	− 5·4			189
May 11							(77)	(495)	(746)
131·160	EP,H	1880	0·887	281·4	338·3	+ 8·8	34	231	401c
		1880	0·849	282·7	333·7	+ 9·2	0	6	
I.		1880	0·770	282·0	326·1	+ 7·4	4	21	
		1881a	0·339	181·5	277·5	−22·5	0	11	
		1881b	0·352	177·4	275·9	−23·3	0	7	
			0·917	79·2	211·5	+ 8·7			188
May 12							(38)	(276)	(589)
132·145	SP,H	1880	0·968	279·4	338·5	+ 8·4	5	119	726c
		1880	0·894	279·3	326·3	+ 7·1	0	12	
I.		1882a	0·765	264·6	313·6	− 5·9	0	61	73c
		1882	0·736	265·3	311·1	− 5·3	0	12	

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

May 9 and 10. Spots and Faculæ ill-defined.

May 18. Photograph faint. Faculæ ill-defined.

Group 1882, May 13–14. A close pair of small spots, *a*, measured as one.

May 11, 12, and 20. Photograph faint. Limb of sun very faint.

Group 1881, May 12–13. Two small spots, *a* and *b*. Another spot is seen in the neighbourhood of *a* on May 13, and another, but not the same, on May 14.

Measures of Positions and Areas of Spots and Faculæ upon the Sun's Disk—*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).
1886.						°	°	°	
132d·145	SP, H	1881*a*	0·417	214·5	278·6	−22·7	4	19	
I.		1881*b*	0·401	207·9	275·5	−23·3	0	14	
			0·904	79·9	200·0	+ 8·0			248
May 13							(9)	(237)	(1047)
133·091	EP, H		0·959	279·7	324·0	+ 8·5			980
		1882	0·905	265·7	316·1	− 5·0	4	32	81*c*
I.		1882*a*	0·881	264·6	313·1	− 6·0	8	48	
			0·867	77·4	192·5	+ 9·6			96
			0·966	81·7	177·1	+ 7·4			98
May 14							(12)	(80)	(1255)
134·386	SP, EP		0·979	264·9	312·5	− 5·5			213
			0·926	203·8	281·5	−59·4			44
			0·862	81·4	175·5	+ 6·2			173
			0·951	105·4	162·6	−15·4			37
May 15							(0)	(0)	(467)
135·087	H, EP		0·953	196·8	270·3	−67·2			57
I.			0·905	163·3	191·7	−61·8			47
			0·946	96·7	154·1	− 7·1			412
May 16							(0)	(0)	(516)
136·263	H, EP		0·857	100·1	150·8	− 9·8			239
I.			0·905	86·0	145·1	+ 2·7			381
May 17							(0)	(0)	(620)
137·392	EP, SP		0·772	85·6	144·2	+ 2·1			163
			0·874	175·0	185·0	−62·4			40
			0·948	111·2	123·7	−20·8			282
May 18							(0)	(0)	(485)
138·100	H, EP		0·942	112·1	115·7	−21·4			695
I.									
May 19							(0)	(0)	(695)
139·097	H, EP	1883	0·589	254·7	206·9	−10·5	5	8	
I.		1883	0·538	254·5	203·4	− 9·9	2	7	
			0·867	115·1	113·8	−22·5			630
May 20							(7)	(15)	(630)
1886.						°	°	°	
140d·403	SP, EP	1884	0·986	100·8	74·3	−11·0	64	287	298*c*
			0·897	106·0	91·6	−15·1			117
May 21							(64)	(287)	(415)
141·194	H, EP	1885*a*	0·666	287·9	184·2	+10·6	0	5	
		1885*b*	0·648	289·5	182·6	+11·2	0	2	
M.		1884	0·939	101·0	74·6	−10·9	53	386	375*c*
			0·893	93·2	81·1	− 3·6			146
May 22							(53)	(393)	(521)
142·678	SP, EP		0·952	279·9	196·0	+ 8·9			161
		1885*a*	0·867	282·6	183·6	+10·2	16	45	227*c*
		1885*c*	0·834	285·9	179·6	+12·3	0	12	
		1884	0·779	102·3	74·1	−10·4	73	380	448*c*
			0·823	91·5	69·4	− 2·1			146
			0·927	112·2	57·9	−21·1			37
May 23							(89)	(437)	(1019)
143·098	H, EP	1885*a*	0·917	281·8	184·6	+10·2	23	109	186*c*
		1885*c*	0·887	284·5	180·2	+12·1	0	29	
I.		1884	0·717	103·5	74·0	−10·6	89	377	72*c*
			0·820	106·5	65·0	−14·3			127
			0·923	91·0	51·9	− 1·5			108
			0·996	95·8	34·2	− 5·9			56
May 24							(112)	(515)	(549)
144·573	SP, EP		0·990	281·8	180·7	+11·5			108
			0·821	260·6	154·3	− 8·5			137
			0·924	194·0	131·0	−64·7			203
		1884	0·457	111·0	73·9	−10·6	81	327	
		1886	0·906	95·7	34·8	− 5·8	11	60	148*c*
			0·952	110·4	28·3	−19·8			261
May 25							(92)	(387)	(857)
145·449	H, EP		0·897	261·0	151·2	− 8·6			217
			0·837	273·2	144·3	+ 2·1			239
		1884	0·287	126·0	74·2	−10·7	63	320	
		1886	0·803	97·2	34·7	− 6·4	5	44	64*c*
			0·926	114·4	21·7	−22·9			206
May 26							(68)	(364)	(726)

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

May 24. Photograph very faint. Spots and faculæ ill-defined.

Group 1883, May 20. Two small spots.

Group 1884, May 21–June 2. A large regular spot.

Group 1885, May 22–24. Two very small spots, *a* and *b*, on May 22. *b* has disappeared by May 23, but a third spot, *c*, has formed by that date and *a* has increased in size.

Group 1886, May 25–31. A small regular spot.

Measures of Positions and Areas of Spots and Faculæ upon the Sun's Disk—*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).
1886.				°	°	°			
146d·526	H, EP		0·940	272·8	143·3	+ 2·3			333
			0·939	253·9	142·6	−15·4			120
			0·902	263·8	137·7	− 6·1			140
			0·776	246·4	121·7	−18·1			231
		1884	0·169	183·1	74·0	−10·7	88	360	
		1886	0·631	98·5	34·8	− 6·2	6	45	
			0·812	99·2	19·7	− 8·0			76
			0·866	115·6	16·0	−22·5			395
May 27							(94)	(405)	(1295)
147·393	H, SP		0·984	273·2	141·6	+ 3·0			178
			0·971	264·8	138·2	− 5·3			142
			0·938	253·0	131·1	−16·3			260
			0·773	243·9	109·8	−20·4			500
		1884	0·269	230·5	74·3	−10·7	70	321	
		1886	0·467	101·2	34·9	− 6·0	7	36	
			0·790	121·0	14·2	−24·6			204
			0·975	80·4	345·5	+ 9·2			440
May 28							(77)	(357)	(1724)
148·529	SP, H		0·905	245·5	109·8	−22·4			293
		1884	0·483	249·0	74·3	−10·6	67	323	
		1886	0·227	112·4	35·0	− 5·8	8	29	
		1887*a*	0·673	72·3	6·5	+11·2	0	10	
		1887*b*	0·694	71·6	5·0	+12·0	0	4	
		1887*c*	0·708	73·0	3·6	+11·3	0	4	
			0·907	78·4	342·8	+10·2			438
			0·975	83·1	330·3	+ 6·6			245
May 29							(75)	(370)	(976)
149·483	H, EP		0·952	250·6	105·6	−18·6			138
			0·923	249·3	100·4	−19·3			197
			0·839	240·6	87·8	−24·7			77
			0·746	266·8	82·5	− 2·8			251
		1888*a*	0·849	255·1	91·6	−13·0	4	32	} 185*c*
		1888*b*	0·835	256·0	90·2	−12·0	7	38	
		1884	0·657	254·5	74·4	−10·6	65	333	
		1886	0·085	186·6	35·1	− 5·4	4	16	
		1887*a*	0·509	66·2	6·3	+11·3	2	40	
		1887*c*	0·540	68·8	3·8	+10·7	0	21	
		1887*d*	0·548	66·9	3·6	+11·9	0	15	
1886.				°	°	°			
149d·483	H, EP		0·792	76·7	343·1	+10·2			641
			0·904	82·9	330·3	+ 6·1			595
			0·916	94·5	328·4	− 4·4			194
May 30							(82)	(495)	(2278)
150·544	SP, EP		0·932	240·7	86·3	−27·3			43
			0·913	276·2	85·9	+ 5·4			70
			0·870	263·9	80·5	− 5·5			264
			0·767	251·8	68·9	−14·2			122
		1888*a*	0·961	257·2	93·9	−12·4	11	138	} 221*c*
		1888*b*	0·936	256·6	89·1	−12·7	56	181	
		1884	0·817	257·3	74·4	−10·6	67	337	136*c*
		1889	0·417	306·9	40·4	+14·0	1	20	
		1886	0·271	251·9	35·3	− 5·3	2	11	
			0·866	77·6	321·3	+10·4			208
			0·883	98·5	318·8	− 7·7			172
May 31							(137)	(687)	(1236)
151·524	H, SP	1888*b*	0·989	257·1	88·6	−12·8	45	241	} 494*c*
		1884	0·924	258·8	74·5	−10·5	66	282	
		1889	0·603	294·8	41·7	+14·3	5	15	
June 1							(116)	(538)	(494)
152·417	H, EP		0·927	266·6	63·3	− 3·3			161
		1884	0·981	259·4	74·0	−10·4	63	235	252*s*
		1889	0·748	289·1	42·2	+14·0	0	10	
		1890	0·313	54·7	340·6	+10·1	2	8	
		1890	0·331	57·2	339·3	+10·0	0	19	
		1890	0·371	64·1	335·9	+ 9·0	0	4	
		1890	0·389	60·8	335·5	+10·6	0	9	
June 2							(65)	(285)	(413)
153·089	H, EP	1890	0·195	24·6	342·0	+10·0	0	6	
		1890	0·213	31·7	340·2	+10·2	8	35	
I.		1890	0·246	37·8	337·9	+11·0	1	9	
		1890	0·262	47·7	335·4	+ 9·9	1	41	
		1891	0·762	109·2	298·8	−14·6	4	17	} 147*c*
		1891	0·807	109·2	297·5	−15·5	0	4	
		1891	0·783	107·6	296·7	−13·8	0	14	
June 3							(14)	(126)	(147)

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June 3. Photograph faint. Faculæ ill-defined.

Group 1887, May 29–30. Three small spots on May 29. One of these has disappeared by May 30, and a new spot has appeared.

Group 1888, May 30–June 1. Two spots, *a* and *b*. Both have increased in size by May 31, and have receded from each other.

Group 1889, May 31–June 2. A small spot.

Group 1890, June 2–8. A number of small spots in a straggling stream. Most of these have coalesced by June 6 to form two spots, *a* and *b*. Only *a* and *b* are seen on June 7 and 8.

Group 1891, June 3–12. Three small spots on June 3. The group has very greatly increased in size by June 4, and forms a fine stream of spots; the preceding spot, *a*, being a large regular spot. The group continues to increase in size until June 8, after which it diminishes again, and the spots nearest to *a* disappear. *a* alone remains by June 11.

Measures of Positions and Areas of Spots and Faculæ upon the Sun's Disk—*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).
1886.				°	°	°			
154d.382	SP, H		0·898	266·5	33·3	− 3·2			87
			0·820	241·8	21·1	−22·7			300
		1892 *a*	0·646	249·0	7·8	−13·3	0	5	
		1890	0·297	302·8	344·3	+ 9·2	0	4	
		1890	0·284	304·7	343·3	+ 9·3	2	8	
		1890	0·275	310·5	341·9	+10·3	0	7	
		1890	0·263	307·8	341·8	+ 9·2	0	24	
		1890	0·238	323·3	338·0	+11·0	0	13	
		1890	0·199	328·6	335·7	+ 9·8	0	11	
		1891 *a*	0·524	118·8	301·5	−14·6	33	202	
		1891	0·570	117·0	298·1	−15·0	0	18	
		1891	0·568	114·2	297·6	−13·4	3	14	
		1891	0·589	119·2	297·4	−16·6	0	12	
		1891	0·590	117·2	296·8	−15·6	0	3	
		1891	0·591	114·0	296·1	−13·8	18	56	
		1891	0·612	118·4	295·6	−16·9	5	20	
June 4							(61)	(397)	(387)
155·473	H, EP		0·886	243·9	14·8	−22·8			157
		1892 *b*	0·840	255·1	11·3	−12·4	0	36	} 66*c*
		1892 *a*	0·809	252·7	7·8	−13·8	0	15	
		1890	0·441	292·0	339·7	+ 9·6	0	11	
		1890	0·440	295·3	339·1	+10·9	0	23	
		1890	0·401	295·2	336·8	+ 9·9	0	10	
		1890	0·409	299·2	336·6	+11·6	5	21	
		1891 *a*	0·322	143·4	303·9	−14·8	82	403	
		1891	0·380	134·1	299·0	−15·1	6	61	
		1891	0·405	127·2	296·0	−14·0	7	53	
		1891	0·448	130·6	294·6	−16·8	10	41	
June 5							(110)	(674)	(223)
156·572	SP, EP		0·932	282·6	8·8	+11·8			65
			0·888	238·0	359·0	−27·9			124
			0·917	190·9	324·0	−64·0			78
		1892 *b*	0·953	257·0	12·3	−12·3	0	18	235*c*
		1890	0·661	283·6	341·1	+ 9·1	0	8	}
		1890 *a*	0·661	286·0	340·8	+10·7	15	79	} 240*p*
		1890 *b*	0·602	287·7	336·3	+10·7	12	47	
		1893 *a*	0·619	262·3	338·5	− 4·6	0	7	
		1893 *b*	0·588	260·7	336·2	− 5·3	0	8	
		1894	0·541	279·2	333·0	+ 5·1	0	5	
		1891 *a*	0·275	196·8	305·4	−15·0	75	398	
1886.				°	°	°			
156d.572	SP, EP	1891	0·234	181·5	301·1	−13·3	0	5	
		1891	0·269	180·2	300·8	−15·3	0	9	
		1891	0·250	172·8	298·9	−14·1	0	11	
		1891	0·292	168·0	297·1	−16·3	9	75	
		1891	0·259	163·9	296·5	−14·2	3	83	
		1891	0·306	160·2	294·5	−16·5	7	60	
June 6							(121)	(813)	(742)
157·429	H, SP		0·985	255·9	8·7	−13·8			150
			0·923	241·2	353·5	−26·2			73
		1890 *a*	0·802	282·6	341·8	+10·3	10	60	173*p*
		1890 *b*	0·739	283·7	336·0	+10·3	0	19	
		1893 *a*	0·773	263·6	339·5	− 4·8	0	19	
		1893 *b*	0·731	262·2	335·8	− 5·4	0	3	
		1891 *a*	0·383	225·0	305·5	−15·4	79	451	
		1891	0·331	219·0	301·7	−14·6	11	72	
		1891	0·317	212·8	299·5	−15·1	0	50	
		1891	0·287	206·1	296·8	−14·6	0	73	
		1891	0·314	202·7	296·5	−16·5	10	76	
		1891	0·304	196·1	294·3	−16·6	11	48	
June 7							(121)	(871)	(396)
158·402	H, EP	1890 *a*	0·918	280·8	342·5	+10·1	0	67	} 325*c*
		1890 *b*	0·867	281·4	335·8	+10·0	0	26	
		1893 *a*	0·896	264·3	339·7	− 5·0	0	14	
		1893 *b*	0·862	264·9	335·6	− 4·2	0	10	
		1891 *a*	0·538	240·6	305·3	−14·9	81	589	
		1891	0·444	232·9	297·8	−15·1	14	74	
		1891	0·442	228·2	296·4	−16·7	6	46	
		1891	0·418	225·5	294·4	−16·6	3	33	
June 8							(104)	(859)	(325)
159·420	EP, SP		0·949	265·2	334·2	− 4·4			237
			0·934	280·1	331·5	+ 9·6			597
			0·848	256·8	319·9	−10·8			59
		1891 *a*	0·704	248·5	305·3	−14·5	94	529	
		1891	0·658	247·0	301·4	−14·4	1	3	
		1891	0·629	246·2	299·2	−14·2	0	10	
		1891	0·621	243·7	298·0	−15·4	13	57	
		1891	0·609	241·0	296·5	−16·6	5	22	
		1891	0·586	240·8	294·9	−16·0	0	9	
		1895	0·931	84·8	194·6	+ 5·1	0	16	129*c*
June 9							(113)	(646)	(1022)

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

Group 1892, June 4–6. A small spot, *a*, on June 4; a second, *b*, has appeared by June 5; *a* has disappeared by June 6.
Group 1893, June 6–8. Two small faint spots, *a* and *b*.
Group 1894, June 6. A very small spot.
Group 1895, June 9–10. A small spot.

Measures of Positions and Areas of Spots and Faculæ upon the Sun's Disk—*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).
1886.				°	°	°			
160d.301	SP, EP		0·966	278·5	326·1	+ 8·4			272
			0·929	261·3	319·0	− 7·8			152
I.		1891*a*	0·824	252·0	305·1	−14·3	102	490	184*c*
		1891	0·759	248·0	298·2	−16·0	3	44	
		1895	0·842	84·5	194·2	+ 5·1	0	7	266*c*
June 10							(105)	(541)	(874)
160·402	H, SP	1891*a*	0·935	254·6	304·9	−14·1	76	475	663*f*
June 11							(76)	(475)	(663)
161·383	H, SP	1891*a*	0·990	255·5	305·0	−14·3	61	377	555*f*
			0·939	94·6	154·3	− 4·0			226
			0·957	80·9	151·0	+ 9·0			85
June 12							(61)	(377)	(866)
163·601	EP, H		0·850	77·5	150·2	+11·1			81
			0·866	93·4	148·0	− 2·4			343
			0·902	105·0	144·5	−13·0			241
June 13							(0)	(0)	(665)
164·199 M.	H, EP								
June 14							(0)	(0)	(0)
165·508	EP, SP		0·942	116·1	194·8	−24·0			156
June 15							(0)	(0)	(156)
166·460	EP, H	1896*a*	0·955	105·7	98·2	−14·6	18	113	209*c*
June 16							(18)	(113)	(~~270~~ 209)
167·500	M, H	1896*a*	0·863	108·2	98·3	−14·9	19	82	131*c*
		1897	0·991	101·9	74·5	−11·6	0	296	61*p*
			0·932	104·8	88·6	−13·2			474
			0·955	92·9	83·7	− 2·3			181
June 17							(19)	(378)	(847)
168·164	H, EP		0·906	253·9	210·8	−13·8			82
		1896*a*	0·784	110·6	98·1	−15·0	22	102	82*c*
I.		1897	0·964	102·5	73·7	−11·6	51	253	103*c*
			0·888	105·5	86·1	−13·0			349
			0·886	94·2	85·3	− 3·0			107
			0·981	95·4	68·8	− 5·0			80
June 18							(73)	(355)	(803)
1886.				°	°	°			
169d.429	EP, H	1896*a*	0·590	118·3	98·1	−14·7	11	118	
		1897	0·845	104·6	74·2	−11·3	42	240	110*c*
			0·898	99·6	67·4	− 7·8			92
June 19							(53)	(358)	(202)
170·366	SP, H	1896*a*	0·440	130·4	97·9	−14·7	11	105	
		1897	0·719	108·3	74·1	−11·7	22	201	69*c*
			0·970	94·0	42·5	− 3·5	0	34	194*c*
June 20							(33)	(340)	(263)
171·196 M.	H, EP	1896*a*	0·325	151·9	98·0	−14·6	15	91	
		1897	0·574	112·6	74·6	−11·0	21	168	
June 21							(36)	(259)	(0)
172·549	SP, H		0·921	260·6	155·4	− 7·8			247
			0·878	270·9	150·3	+ 1·9			78
			0·825	247·1	141·7	−17·4			70
		1898	0·637	280·8	128·2	+ 8·5	6	43	
		1898	0·584	282·3	124·2	+ 8·9	0	35	
		1896*a*	0·329	206·5	97·8	−15·0	15	85	
		1897	0·346	133·1	74·2	−11·6	19	143	
		1899	0·730	96·2	42·7	− 3·1	0	7	87*f*
			0·941	110·6	21·1	+18·5			337
			0·977	103·2	12·4	−12·4			111
June 22							(40)	(313)	(930)
173·385	SP, EP		0·944	266·6	148·5	− 2·5			423
			0·930	253·9	145·0	−14·1			198
		1898	0·785	279·1	129·6	+ 8·5	23	78	
		1898	0·741	280·5	125·6	+ 9·3	2	55	101*c*
		1898	0·718	279·2	123·7	+ 8·1	0	5	
		1896	0·455	233·2	100·1	−13·7	0	5	
		1896*a*	0·445	228·4	98·3	−15·1	10	77	
		1897	0·250	165·4	74·5	−11·7	10	129	
		1899	0·573	99·0	43·8	− 3·3	1	11	
		1899	0·595	98·6	42·2	− 3·3	0	6	
			0·905	113·2	16·2	−19·9			281
June 23							(46)	(366)	(1003)
174·393	SP, H								
		1898	0·915	278·4	130·8	+ 8·6	10	95	118*c*
		1898	0·877	278·6	125·8	+ 8·6	0	16	
		1896*a*	0·608	240·8	98·0	−15·3	14	48	

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

Group 1896, June 16–26. A regular spot, *a*. A small companion is seen near *a* on June 23.
Group 1897, June 17–28. A large regular spot.
Group 1898, June 22–24. Two compact clusters of small spots on June 22. Three spots on June 23; only the largest two remain on June 24.
Group 1899, June 22–23. A very small spot on June 22. A second is seen near it on June 23.

Measures of Positions and Areas of Spots and Faculæ upon the Sun's Disk.—*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).
1886				°	°	°			
174d·393	SP,H	1897	0·291	213·6	74·2	−11·7	7	102	
			0·963	78·7	350·6	+11·5			517
			0·985	94·0	345·1	− 3·6			136
June 24							(31)	(261)	(771)
173·391	EP,H		0·965	278·4	126·3	+ 8·8			401
			0·935	250·8	118·6	−16·9			104
			0·914	245·7	114·4	−20·9			161
		1896*a*	0·762	247·1	98·1	−15·5	10	43	137*c*
		1897	0·448	236·9	74·0	−11·8	9	113	
			0·881	78·5	350·0	+11·3			550
			0·926	94·6	344·2	− 3·3			120
			0·949	82·7	340·0	+ 7·7			523
June 25							(19)	(156)	(1996)
176·417	SP,H		0·979	247·5	114·0	−21·4			106
			0·923	253·5	103·6	−14·1			78
			0·937	237·1	102·4	−29·4			86
			0·852	270·9	96·3	+ 2·1			63
			0·903	232·0	95·2	−32·4			62
			0·833	254·2	92·7	−11·6			88
		1896*a*	0·886	250·7	98·1	−15·7	5	17	:00*c*
		1897	0·626	247·0	73·9	−12·0	13	92	
			0·907	81·7	333·0	+ 8·6			451
June 26							(18)	(109)	(1034)
177·484	EP,H		0·902	255·2	86·7	−12·1			155
		1897	0·786	252·6	73·7	−11·9	7	79	
		1900*a*	0·627	75·6	345·7	+11·1	1	25	
		1900*b*	0·671	76·5	342·3	+11·0	0	36	
		1901*a*	0·990	105·7	303·3	−15·1	0	244	239*c*
June 27							(8)	(384)	(394)
178·398	SP,H		0·953	268·8	83·8	− 0·3			181
			0·952	256·8	82·6	−11·7			169
		1897	0·895	254·7	73·6	−12·4	0	21	162*s*
		1900*a*	0·438	70·5	346·9	+11·0	0	30	
		1900*b*	0·493	72·1	343·2	+11·2	1	32	
		1901*a*	0·943	106·9	302·9	−14·9	52	364	462*c*
		1902*a*	0·950	71·4	300·3	+18·5	7	83	182*f*
June 28							(60)	(530)	(1156)
1886				°	°	°			
179d·406	EP,SP		0·964	254·8	71·4	−13·8			159
			0·950	263·8	69·6	− 5·0			84
			0·720	255·7	43·0	− 8·2			86
		1901	0·825	110·0	305·3	−14·6	0	41	
		1901	0·836	112·3	304·7	−16·8	0	7	
		1901*a*	0·848	109·8	302·9	−15·0	51	369	259*c*
		1902*a*	0·865	70·2	299·5	+18·6	18	77	117*c*
		1903*a*	0·938	112·5	291·5	−19·9	7	144	172*c*
June 29							(76)	(638)	(877)
180·393	SP,EP		0·955	269·3	57·9	+ 0·3			70
			0·849	261·1	42·6	− 5·9			99
		1901	0·692	116·4	305·5	−15·6	5	126	
		1901*a*	0·719	114·3	302·9	−15·0	49	347	302*c*
		1901	0·710	111·1	302·8	−12·6	0	12	
		1901	0·733	117·8	302·7	−17·7	4	96	
		1902*a*	0·738	67·2	299·7	+18·6	17	69	96*c*
		1903*a*	0·849	115·9	291·3	−20·0	13	130	261*f*
			0·918	71·3	279·3	+18·3			60
June 30							(88)	(780)	(888)
181·413	SP,H	1901	0·529	125·3	305·4	−15·0	4	55	
		1901	0·553	128·7	305·0	−17·4	0	27	
		1901	0·540	120·3	303·3	−13·0	0	18	
		1901*a*	0·571	122·7	302·1	−15·2	59	361	
		1901	0·596	127·4	302·0	−18·4	16	153	
		1902*a*	0·583	61·6	299·2	+18·7	8	52	
		1903*a*	0·730	122·2	290·7	−20·5	2	76	
			0·956	87·5	259·0	+ 3·3			100
July 1							(89)	(742)	(100)
182·391	H,EP	1901	0·385	144·5	305·6	−15·1	0	25	
		1901	0·408	146·7	305·4	−16·8	0	20	
		1901*a*	0·422	138·4	302·1	−15·2	59	348	
		1901	0·458	142·2	301·8	−18·1	10	117	
		1902*a*	0·419	50·6	299·0	+18·4	6	52	
		1903	0·602	134·6	291·5	−22·1	0	4	
		1903*a*	0·594	132·2	291·0	−20·6	0	49	
July 2							(75)	(615)	(0)
183·399	H,EP		0·927	247·8	10·6	−19·1			208
		1901	0·316	184·9	307·1	−14·9	3	10	
		1901	0·333	179·2	305·2	−16·0	0	2	

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

June 27. Faculæ very faint.

Group 1900, June 27–28. Two small spots, *a* and *b*.

Group 1901, June 27–July 9. A large regular spot, *a*; several small spots have formed near *a* by June 29, and these increase in number and size on the two succeeding days. After July 1 these companion spots begin to diminish again, and by July 8 *a* alone is seen.

Group 1902, June 28–July 4. A regular spot, *a*. A small companion is seen near it on July 3 and a second on July 4.

Group 1903, June 29–July 9. A large but rather faint spot, *a*, on June 29. It diminishes in size on the succeeding days. A small spot appears near *a* on July 2, and others on the succeeding day, when the group has become an irregular stream of small spots. *a* and the other spots in the preceding part of the group have disappeared by July 5.

Measures of Positions and Areas of Spots and Faculæ upon the Sun's Disk—*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).
1886				°	°	°			
183d·399	H,EP	1901	0·353	174·9	303·6	−17·1	1	16	
		1901a	0·323	169·5	302·0	−15·1	61	325	
		1901	0·370	168·7	301·2	−17·8	12	115	
		1902a	0·278	20·9	299·5	+18·4	8	17	
		1902	0·287	31·4	296·5	+17·5	0	4	
		1903a	0·465	151·1	291·7	−20·6	1	37	
		1903	0·480	152·1	291·6	−21·7	0	8	
		1903	0·504	152·4	290·8	−23·2	3	7	
		1903	0·512	140·4	285·3	−20·0	0	4	
			0·912	100·4	240·8	− 8·0			65
July 3							(89)	(545)	(273)
184·404	H,SP		0·895	278·7	355·8	+ 9·3			175
		1901	0·394	210·1	304·1	−16·5	0	11	
		1901a	0·360	206·4	301·8	−15·3	60	336	
		1901	0·390	201·5	300·9	−17·8	10	79	
		1902a	0·285	334·0	299·8	+18·3	0	5	
		1902	0·302	342·4	297·9	+20·1	0	5	
		1902	0·239	341·6	296·8	+16·5	0	2	
		1903a	0·416	180·1	292·4	−20·9	7	35	
		1903	0·453	176·7	290·7	−23·3	0	7	
		1903	0·404	164·3	285·7	−19·3	0	5	
July 4							(77)	(485)	(175)
185·407	EP,SP		0·923	280·5	346·3	+11·1			473
			0·896	264·2	342·0	− 3·6			164
		1901	0·511	224·4	300·9	−18·0	7	27	
		1901	0·490	224·0	299·7	−17·2	0	14	
		1901a	0·486	229·3	301·2	−15·1	60	303	
		1903	0·422	200·1	287·7	−19·7	8	20	
		1903	0·400	196·6	285·8	−18·9	5	46	
July 5							(80)	(410)	(637)
186·402	H,EP		0·971	264·9	341·5	− 4·0			116
			0·947	278·0	337·3	+ 8·8			337
		1901	0·663	238·1	301·9	−17·5	0	24	
		1901a	0·644	240·8	301·4	−15·3	45	308	
		1903	0·533	223·5	288·7	−19·3	7	56	
		1903	0·499	219·6	285·5	−19·0	0	39	
July 6							(52)	(427)	(453)
1886				°	°	°			
187d·500	H,SP		0·983	264·2	330·1	− 5·0			131
			0·964	281·8	326·1	+12·4			194
		1901a	0·800	248·1	301·3	−14·9	65	361	217c
		1901	0·730	246·5	294·8	−14·2	0	5	
		1903	0·700	238·1	290·0	−18·7	0	31	
		1903	0·681	235·5	287·7	−19·6	0	38	
		1903	0·654	233·6	285·1	−19·7	0	43	
July 7							(65)	(478)	(542)
188·518	H,EP		0·865	287·6	297·2	+17·1			199
		1901a	0·912	251·7	301·3	−14·9	51	331	293c
		1903	0·816	242·3	287·7	−19·7	0	16	
		1903	0·785	241·6	284·6	−19·2	0	22	118c
		1903	0·783	239·7	283·4	−19·3	0	12	
July 8							(51)	(381)	(610)
189·420	H,SP		0·947	287·6	297·2	+18·0			209
		1901a	0·974	253·9	300·9	−14·7	47	288	334c
		1903	0·884	245·6	284·1	−19·3	0	6	292c
			0·923	107·3	160·7	−14·1			149
July 9							(47)	(294)	(984)
190·456	EP,SP		0·966	246·1	284·0	−21·8			419
			0·918	111·0	148·5	−17·4			105
			0·965	82·2	137·2	+ 8·6			108
July 10							(0)	(0)	(632)
191·638	EP,SP		0·909	271·2	261·7	+ 2·9			87
			0·885	82·9	134·1	+ 8·2			246
July 11							(0)	(0)	(333)
192·119	H,EP		0·940	271·6	260·1	+ 3·0			143
			0·796	82·6	137·4	+ 8·5			93
I.			0·869	83·1	129·8	+ 8·1			249
July 12							(0)	(0)	(485)
193·472	EP,SP	1904	0·678	250·3	212·5	− 9·8	0	4	
		1904	0·662	248·8	211·0	−10·4	0	4	
			0·929	110·4	106·9	−17·1			155
July 13							(0)	(8)	(155)

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

Group 1904, July 13–14. Two small spots.

Measures of Positions and Areas of Spots and Faculæ upon the Sun's Disk—*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).
1886.				°	°	°			
194d.389	SP,EP	1904	0·819	254·1	213·2	−10·3	0	23	151c
		1904	0·793	253·7	210·6	−10·0	0	32	
		1905	0·515	236·6	186·2	−12·4	2	9	
			0·901	101·4	97·4	− 7·7			360
July 14							(2)	(64)	(511)
195·466	EP,SP		0·914	256·3	210·3	−10·5			90
		1906	0·972	101·6	70·9	−10·2	0	42	330c
July 15							(0)	(42)	(420)
196·387	SP,EP		0·983	258·0	211·8	−10·9			147
		1906	0·894	103·3	71·9	− 9·7	9	80	286c
		1906	0·924	103·1	67·8	−10·2	0	41	
		1907	0·963	111·1	62·2	−18·9	0	13	162c
			0·864	92·3	74·2	+ 0·4			88
July 16					146.8		(9)	(134)	(683)
197·128	H,EP	1906a	0·795	104·7	73·0	− 8·6	17	103	
		1906	0·815	106·4	71·4	−10·4	4	27	288c
I.		1906	0·848	105·5	67·9	−10·4	9	64	
		1907	0·909	113·2	62·1	−18·8	0	16	263f
			0·918	92·2	57·6	− 0·1			48
			0·960	100·2	51·8	− 8·4			119
July 17							(30)	(210)	(718)
198·557	SP,EP	1906a	0·543	113·2	74·9	− 8·2	41	244	
		1906	0·578	113·9	72·8	− 9·5	6	25	
		1906	0·595	112·3	71·4	− 9·1	0	5	
		1906	0·611	114·3	70·7	−10·6	0	16	
		1906	0·649	111·9	67·5	−10·2	7	73	
		1906b	0·666	113·2	66·6	−11·4	18	80	
July 18							(72)	(443)	(0)
199·200	H,EP		0·893	251·4	157·2	−14·1			77
			0·832	244·8	148·6	−17·7			75
M.		1906a	0·412	121·9	76·0	− 8·0	42	216	
		1906	0·445	120·9	74·0	− 8·6	3	33	
		1906	0·471	117·7	71·8	− 8·2	1	12	
		1906b	0·558	117·9	66·6	−10·9	19	125	
July 19							(65)	(386)	(152)
1886.				°	°	°			
200d.403	SP,EP		0·956	257·0	151·9	−10·9			176
			0·878	248·5	138·7	−16·2			239
			0·820	275·6	135·8	+ 7·4			141
			0·869	238·3	134·6	−24·3			50
		1906a	0·243	163·2	76·5	− 8·4	75	315	
		1906	0·323	146·0	70·1	−10·6	15	46	
		1906	0·324	141·4	68·8	− 9·8	0	7	
		1906	0·348	138·7	67·2	−10·2	2	22	
		1906b	0·377	136·5	65·3	−11·0	15	84	
			0·985	78·1	359·9	+12·6			295
July 20							(107)	(474)	(901)
201·421	SP,H		0·906	275·0	132·2	+ 6·7			184
		1906a	0·288	215·7	76·8	− 8·5	71	359	
		1906	0·277	192·5	70·6	−10·5	1	5	
		1906c	0·272	187·8	69·2	−10·4	5	17	
		1906	0·263	184·5	68·3	−10·0	0	38	
		1906	0·273	179·9	67·0	−10·6	0	8	
		1906b	0·280	173·3	65·2	−11·0	8	68	
		1908	0·952	94·4	355·5	− 2·6	13	99	351c
			0·939	79·1	356·8	+12·0			602
July 21							(98)	(594)	(1137)
202·408	EP,SP		0·950	275·3	126·0	+ 6·7			50
			0·867	239·9	108·2	−22·7			84
		1906a	0·454	239·2	77·1	− 8·6	81	360	
		1906	0·457	231·2	75·2	−11·7	0	4	
		1906	0·409	238·5	74·5	− 7·4	0	6	
		1906d	0·425	233·0	74·1	− 9·9	0	29	
		1906	0·455	226·4	73·7	−13·3	0	12	
		1906	0·397	231·0	72·1	− 9·5	0	5	
		1906	0·410	226·4	71·6	−11·4	0	3	
		1906c	0·381	224·6	69·7	−10·7	14	60	
		1906	0·361	216·9	66·7	−11·6	0	22	
		1906b	0·341	215·2	65·5	−11·0	8	63	
		1908	0·851	96·4	356·4	− 2·7	14	98	273c
			0·864	79·4	354·0	+11·8			269
			0·928	125·1	353·1	−29·8			105
July 22							(117)	(662)	(781)
203·217	H,EP	1906a	0·593	248·5	77·0	− 8·1	61	343	
		1906d	0·565	244·4	74·3	− 9·6	0	36	
M.		1906	0·533	243·8	72·1	− 8·9	4	16	

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

July 15. Photograph very faint. Spots and Faculæ ill-defined.

Group 1905, July 14. A small spot.

Group 1906, July 15–26. A small spot on July 15. The group rapidly increases in size on the succeeding days, the preceding spot, *a*, becoming a large regular spot. *a* is followed by a number of spots in a long stream. Some of these spots coalesce to form larger spots, *b*, *c*, and *d*; and on July 22, and the succeeding days, the group consists of the large regular spot, *a*, followed by three smaller spots, *b*, *c*, *d*, with a number of very small spots scattered round them. *a* has undergone a remarkable change of shape by July 24, and a considerable portion has become detached from it by July 25. *b* has disappeared by July 25, *c* and *d* by July 26.

Group 1907, July 16–17. A small spot.

Group 1908, July 21–31. A regular spot.

Measures of Positions and Areas of Spots and Faculæ upon the Sun's Disk—*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).
1886				°	°	°			
203d·217	H,EP	1906*c*	0·515	240·2	70·2	−10·1	5	32	
		1906	0·490	245·1	69·8	− 7·1	0	4	
M.		1906*b*	0·462	234·2	65·6	−10·7	0	18	
		1908	0·741	98·7	356·3	− 2·8	6	76	
			0·901	82·2	338·8	+ 9·3			107
July 23							(76)	(525)	(107)
204·404	H,EP	1906*a*	0·780	254·2	76·8	− 8·8	58	352	
		1906*d*	0·760	251·3	74·5	−10·5	6	56	
		1906*c*	0·721	249·9	70·9	−10·5	0	57	
		1906	0·692	246·8	67·9	−11·7	0	13	
		1906*b*	0·667	246·9	66·1	−11·0	0	8	
		1909	0·494	84·3	358·0	+ 7·4	0	23	
		1909	0·544	84·5	354·6	+ 7·5	0	16	
		1908	0·534	104·2	356·5	− 3·0	11	83	
			0·929	113·7	323·2	−19·7			132
July 24							(75)	(608)	(132)
205·198	H,EP	1906	0·886	259·0	78·2	− 7·1	0	32	
		1906*a*	0·872	256·3	76·1	− 9·2	37	245	
M.		1906*d*	0·859	254·2	74·2	−10·6	0	7	
		1906*c*	0·832	253·5	71·2	−10·5	0	41	
		1909	0·325	83·1	358·3	+ 7·4	0	12	
		1908	0·382	112·1	356·5	− 3·2	16	83	
		1910*a*	0·979	104·6	300·9	−13·1	16	160	
			0·938	112·4	311·1	−18·8			81
July 25							(69)	(580)	(81)
206·388	SP,EP		0·865	240·4	55·5	−22·2			135
		1906*a*	0·972	258·7	76·4	− 9·6	15	177	358*c*
		1908	0·172	151·5	356·7	− 3·2	18	103	
		1911	0·454	102·6	335·2	− 0·7	0	16	
		1911	0·490	102·5	332·9	− 1·2	0	11	
		1911	0·511	100·2	331·3	− 0·5	1	12	
		1911	0·543	99·5	329·2	− 0·5	0	9	
		1912	0·873	73·4	300·5	+17·2	0	9	} 285*c*
		1912	0·899	73·9	297·2	+16·9	8	64	
		1910*a*	0·898	107·6	300·1	−13·1	27	182	201*c*
			0·826	116·3	310·5	−18·0			97
			0·976	113·0	287·4	−21·0			118
July 26							(69)	(583)	(1194)
1886				°	°	°			
207d·492	EP,SP		0·953	245·7	55·2	−21·1			213
			0·894	255·3	48·1	−10·4			104
		1908	0·234	227·9	356·8	− 3·5	16	112	
		1911*a*	0·196	116·9	336·8	+ 0·5	9	37	
		1911*b*	0·254	116·0	333·7	− 0·9	0	21	
		1912	0·747	71·2	299·1	+17·7	11	113	}
		1912	0·760	73·8	297·6	+15·9	4	32	} 277*c*
		1912	0·790	73·7	294·5	+17·2	0	31	}
		1910*a*	0·774	112·6	299·7	−13·5	46	196	166*c*
			0·913	115·9	285·5	−20·9			255
			0·942	87·8	276·4	+ 4·0			223
July 27							(86)	(542)	(1238)
208·433	EP,H	1908	0·412	249·1	357·0	− 3·2	21	113	
		1911*a*	0·091	213·9	337·3	+ 1·4	4	20	
		1911*b*	0·113	170·7	333·4	− 0·7	0	3	
		1912*a*	0·556	67·9	302·0	+16·9	18	96	
		1912	0·579	66·1	300·7	+18·3	0	5	
		1912	0·597	68·9	298·9	+17·1	0	16	
		1912	0·628	70·0	296·5	+16·9	15	119	
		1910*a*	0·633	119·1	299·9	−13·2	28	188	
			0·880	87·8	272·7	+ 4·7			147
July 28							(86)	(560)	(147)
209·448	EP,H	1908	0·610	257·1	357·3	− 3·2	13	108	
		1911*a*	0·303	257·2	338·0	+ 1·7	4	15	
		1912*a*	0·359	56·5	302·8	+16·9	12	132	
		1912	0·390	56·3	301·1	+17·9	0	10	
		1912	0·405	59·0	299·7	+17·4	0	6	
		1912	0·421	63·5	297·9	+16·2	0	7	
		1912	0·438	66·6	296·4	+15·3	0	5	
		1912	0·452	63·1	296·1	+17·1	2	25	
		1912*b*	0·469	65·4	294·6	+16·4	12	83	
		1910*a*	0·468	132·7	300·3	−13·1	17	156	
July 29							(60)	(547)	(0)
210·508	EP,H	1908	0·781	261·3	357·3	− 3·1	12	94	
		1911*a*	0·526	264·5	338·4	+ 2·1	0	8	
		1912*a*	0·204	18·4	303·1	+16·9	12	124	
		1912	0·224	30·5	300·1	+16·8	0	32	
		1912	0·246	41·4	297·2	+16·3	0	43	
		1912*b*	0·283	50·4	293·8	+16·0	5	59	
		1910*a*	0·343	161·7	300·6	−13·2	26	139	
July 30							(55)	(499)	(0)

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

July 24 and 28. Spots and Faculæ ill-defined.

Group 1909, July 24–25. Six small faint spots on July 24, measured in two clusters. Only the preceding cluster is seen on July 25.

Group 1910, July 25–Aug. 5. A regular spot, *a*. Two very small companions are seen near it on July 31.

Group 1911, July 26–30. Four small spots in a scattered stream on July 26. Two small regular spots, *a* and *b*, on July 27 and 28. *b* has disappeared by July 29.

Group 1912, July 26–Aug. 5. Four small spots, three of which are measured together on July 26. The group has greatly increased by July 27, and by July 29, has become a long stream of spots of which the first and last, *a* and *b*—both regular spots—are by far the largest. The smaller spots disappear or coalesce on the succeeding days; and on Aug. 1 the group consists of five spots, *a*, *c*, *d*, *e*, and *b*, of which *e* and *b* have disappeared by Aug. 2. *a* remains alone by Aug. 4.

Measures of Positions and Areas of Spots and Faculæ upon the Sun's Disk—*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).
1886.				°	°	°			
211d·505	EP,H		0·901	281·9	358·4	+13·3			576
		1908	0·902	263·3	357·3	− 3·5	14	90	151*sf*
		1912*a*	0·247	321·2	303·0	+16·9	21	120	
		1912	0·211	330·6	299·9	+16·5	2	27	
		1912	0·186	348·7	295·9	+16·4	3	16	
		1912*b*	0·172	358·9	293·9	+15·7	7	33	
		1910	0·345	206·6	302·7	−12·1	0	3	
		1910*a*	0·350	200·4	300·9	−13·3	23	126	
		1910	0·313	199·6	299·8	−11·2	0	3	
July 31							(70)	(418)	(727)
212·496	EP,H		0·963	277·9	355·6	+ 9·2			237
			0·945	261·9	350·5	− 5·6			133
			0·927	254·1	346·3	−12·3			152
		1912*a*	0·409	298·3	302·7	+16·6	18	105	
		1912*c*	0·374	299·9	300·4	+16·3	0	15	
		1912*d*	0·325	306·3	296·5	+16·8	0	35	
		1912*e*	0·298	304·8	295·3	+15·4	0	23	
		1912*b*	0·276	308·4	293·6	+15·6	0	11	
		1910*a*	0·469	225·4	300·7	−13·6	15	113	
Aug. 1							(33)	(302)	(522)
213·232	H,EP		0·902	280·3	335·7	+11·9			88
		1912*a*	0·542	291·9	302·4	+16·8	36	134	
M.		1912*c*	0·515	291·8	300·6	+16·2	2	13	
		1912*d*	0·454	295·0	296·2	+16·5	6	74	
		1910*a*	0·582	237·0	300·9	−13·3	14	114	
		1913	0·839	100·5	215·1	− 5·5	0	8	
		1913	0·858	99·9	213·0	− 5·3	0	11	171*c*
		1913	0·881	100·5	210·5	− 6·3	0	11	
Aug. 2							(58)	(365)	(259)
214·584	EP,H	1912*a*	0·759	286·7	302·1	+16·6	13	74	
		1912	0·671	286·4	294·7	+15·5	0	9	
		1910*a*	0·782	247·3	300·7	−13·4	20	81	
		1913	0·647	105·3	214·4	− 5·1	0	5	
		1913	0·692	104·0	210·8	− 5·1	0	5	
		1913	0·708	105·0	209·7	− 6·2	0	14	
Aug. 3		1914*a*	0·796	83·8	200·0	+ 8·6	3	22	69*nf*
							(36)	(210)	(69)
215·305	H, M		0·878	240·3	298·9	−22·4			58
		1912*a*	0·857	286·1	302·7	+17·0	10	44	282*f*
I.		1910*a*	0·871	250·9	301·0	−13·3	18	118	138*c*
1886.				°	°	°			
215d·305	H, M	1913	0·510	111·4	215·1	− 5·2	7	33	
		1913	0·528	107·8	213·4	− 3·9	0	8	
		1913	0·559	110·1	211·8	− 5·8	3	13	
		1913	0·582	110·5	210·4	− 6·6	0	12	
		1914	0·649	85·2	202·9	+ 7·8	0	2	
		1914*a*	0·679	84·4	200·6	+ 8·4	12	22	
		1914	0·694	85·9	199·4	+ 7·3	0	2	
		1914	0·697	82·1	199·2	+10·0	0	2	
		1914	0·699	84·3	199·0	+ 8·5	0	2	
			0·878	82·5	181·7	+ 9·6			23
			0·954	103·6	172·9	−11·0			145
Aug. 4							(50)	(258)	(646)
216·426	H, SP	1912*a*	0·954	285·6	302·1	+16·8	0	52	454*c*
		1910*a*	0·963	254·1	300·7	−13·4	13	97	167*c*
		1913*a*	0·281	132·6	216·8	− 4·8	5	52	
		1913	0·300	128·5	215·1	− 4·7	1	7	
		1913	0·292	125·4	215·0	− 3·7	0	5	
		1913	0·348	124·9	212·1	− 5·5	4	24	
		1914*a*	0·459	84·5	201·3	+ 8·1	2	8	
		1914	0·479	82·6	200·1	+ 8·9	0	6	
Aug. 5							(25)	(251)	(621)
217·589	H, EP		0·986	284·9	294·7	+15·7			171
			0·897	270·1	276·9	+ 2·9			212
		1913*a*	0·208	200·6	217·4	− 5·0	19	76	
		1913	0·235	173·7	214·7	− 7·1	0	6	
		1913	0·214	186·6	214·6	− 5·9	0	28	
		1913	0·213	171·8	211·5	− 5·8	7	36	
			0·854	89·2	154·6	+ 4·0			72
			0·919	83·0	146·0	+ 8·9			125
Aug. 6							(26)	(146)	(580)
218·405	SP, EP		0·950	274·0	274·5	+ 5·8			197
		1913*a*	0·321	232·7	217·3	− 5·0	16	98	
		1913	0·286	226·4	214·4	− 5·1	0	9	
		1913	0·291	222·9	213·9	− 6·0	0	9	
		1913	0·289	216·9	212·5	− 7·0	0	16	
		1913	0·264	216·3	211·5	− 5·9	3	36	
			0·826	84·2	146·6	+ 8·4			201
Aug. 7							(19)	(168)	(398)

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

Aug. 3. *Photograph faint. Faculæ ill-defined.*

Group 1913, Aug. 2–12. Three small faint spots on Aug. 2; six, measured in three clusters, on Aug. 3. The group has increased in size by Aug. 4, and by Aug. 5 has become a stream of spots, of which the preceding spot, *a*, is the largest. The smaller spots have all disappeared by Aug. 8, leaving *a* alone; *a* has changed its shape by Aug. 8, and by Aug. 9 a considerable portion has become detached and forms a separate spot, *b*. *b* has greatly diminished in size by Aug. 10, and has disappeared by Aug. 11; whilst *a* has increased in size.

Group 1914, Aug. 3–5. A small regular spot, *a*. On Aug. 4 four very small spots are seen near it. On Aug. 5 one very small spot is seen near it.

Measures of Positions and Areas of Spots and Faculæ upon the Sun's Disk—*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).
1886.				°	°	°			
219d·414	SP,H	1913*a*	0·504	249·2	217·2	− 4·7	17	96	
			0·954	103·1	118·5	−10·4			125
Aug. 8							(17)	(96)	(125)
220·576	EP,H	1913*b*	0·714	258·6	218·2	− 3·5	0	25	
		1913*a*	0·707	255·5	217·1	− 5·5	8	49	
			0·852	107·1	118·0	−10·9			138
Aug. 9							(8)	(74)	(138)
221·364	H,M		0·940	275·6	233·8	+ 7·5			49
		1913*b*	0·831	261·0	218·5	− 3·8	0	9	} 119
I.		1913*a*	0·824	259·1	217·5	− 5·1	13	72	
			0·812	91·0	109·2	+ 3·0			92
			0·987	97·2	83·7	− 6·0			238
Aug. 10							(13)	(81)	(498)
222·400	EP,SP		0·781	275·5	201·2	+ 8·4			116
		1913*a*	0·929	261·6	216·7	− 5·3	14	72	305*c*
		1915*a*	0·960	101·1	77·5	− 8·6	25	128	379*c*
			0·943	107·4	81·6	−14·0			154
Aug. 11							(39)	(200)	(954)
223·407	H,EP		0·912	276·1	202·5	+ 8·3			159
		1913*a*	0·989	263·5	216·8	− 5·4	0	93	322*f*
		1915*b*	0·800	104·2	85·1	− 7·2	3	17	261*c*
		1915*a*	0·869	104·2	78·0	− 8·9	25	126	330*c*
Aug. 12							(28)	(236)	(1072)
224·445	SP,EP		0·968	277·1	198·8	+ 8·6			223
		1915*b*	0·632	109·9	86·1	− 7·0	3	9	
		1915*a*	0·732	108·9	78·4	− 8·9	22	112	117*c*
Aug. 13							(25)	(121)	(340)
225·228	H,EP	1915*a*	0·606	115·3	78·7	− 9·4	12	111	
M			0·893	121·2	55·8	−23·9			107
Aug. 14							(12)	(111)	(107)
226·335	EP,SP		0·958	261·2	169·7	− 6·4			54
			0·865	247·1	153·4	−15·9			60
			0·786	276·2	149·7	+ 9·0			75
		1915*a*	0·420	130·6	78·8	− 9·5	12	83	
Aug. 15							(12)	(83)	(189)
1886.				°	°	°			
227d·393	SP,EP	1916	0·855	283·9	142·8	+15·4	0	10	231*c*
		1915*a*	0·298	163·8	78·8	− 9·8	13	79	
			0·913	106·6	20·4	−12·1			101
			0·967	80·5	7·6	+10·9			140
Aug. 16							(13)	(89)	(472)
228·466	H,EP		0·965	279·8	145·1	+11·3			109
			0·859	281·3	129·2	+13·2			80
		1915*a*	0·328	210·6	79·2	− 9·6	12	69	
			0·911	78·6	3·2	+13·1			488
			0·946	98·6	359·7	− 5·8			253
Aug. 17							(12)	(69)	(930)
229·411	H,EP	1915*a*	0·472	234·5	79·8	− 9·6	13	55	
			0·805	77·5	3·1	+14·1			261
			0·879	101·5	357·1	− 6·7			151
			0·898	85·1	352·8	+ 7·4			176
Aug. 18							(13)	(55)	(588)
230·240	H,M		0·879	272·0	107·6	+ 5·1			196
		1915*a*	0·612	244·2	79·9	− 9·7	8	38	
I.			0·757	102·7	358·3	− 5·0			49
			0·880	126·0	353·1	−27·0			60
			0·863	108·9	349·5	−12·5			45
			0·878	46·3	348·7	+41·2			23
			0·878	91·7	344·8	+ 1·9			217
			0·965	126·2	339·2	−32·2			31
			0·925	78·2	337·6	+13·5			114
Aug. 19							(8)	(38)	(735)
231·406	EP,SP		0·946	266·9	101·2	− 0·7			96
			0·881	258·7	90·8	− 6·6			371
			0·864	248·5	86·6	−14·6			82
			0·825	268·1	86·0	+ 2·4			59
		1915*a*	0·788	252·1	79·9	− 9·6	2	17	94*c*
		1917	0·728	95·2	344·3	+ 1·1	0	6	
			0·728	89·7	343·8	+ 5·0			49
			0·862	80·6	330·6	+11·6			122
Aug. 20							(2)	(23)	(873)
232·434	SP,EP		0·952	262·9	88·2	− 4·6			218
			0·901	253·6	78·7	−11·5			284
			0·972	73·7	299·4	+17·4			217
Aug. 21							(0)	(0)	(719)

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

Group 1915, Aug. 11–20. A regular spot, *a*, with a small companion, *b*, on Aug. 12 and 13.
Group 1916, Aug. 16. Two very small spots, measured together.
Group 1917, Aug. 20. One very small spot.

Measures of Positions and Areas of Spots and Faculæ upon the Sun's Disk—*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).
1886.				°	°	°			
233d·498	EP,H		0·970	255·9	76·8	−11·8			251
			0·906	72·0	297·4	+19·2			340
			0·931	110·9	296·1	−16·5			90
Aug. 22							(0)	(0)	(681)
234·502	SP,H	1918*a*	0·935	108·0	283·5	−14·0	0	6	196*c*
			0·834	117·7	298·8	−18·4			103
			0·795	72·1	296·8	+18·4			230
Aug. 23							(0)	(6)	(529)
235·494	EP,SP	1918*a*	0·841	111·9	283·2	−14·1	0	6	190*c*
Aug. 24							(0)	(6)	(190)
236·228	H,EP		0·906	280·2	32·5	+12·3			42
		1918*a*	0·748	116·1	283·2	−14·1	0	2	191*c*
I.		1918	0·776	116·8	281·1	−15·6	0	2	
Aug. 25							(0)	(4)	(233)
237·389	H,EP		0·796	282·2	4·7	+14·0			238
		1919*a*	0·688	125·6	275·8	−17·8	17	86	
I.		1919	0·723	127·2	273·9	−20·3	0	4	
		1919*b*	0·733	125·8	272·5	−19·9	9	75	
Aug. 26							(26)	(165)	(238)
238·575	EP,SP		0·901	281·5	0·8	+13·4			107
		1919*a*	0·526	143·0	276·5	−18·1	1	60	
		1919*b*	0·586	140·1	272·4	−20·2	0	53	
Aug. 27							(1)	(113)	(107)
239·414	SP,H		0·975	284·2	3·1	+15·4			115
			0·904	270·6	349·5	+ 3·6			79
		1919*a*	0·453	162·8	276·7	−18·4	2	35	
		1919*b*	0·506	155·2	271·8	−20·3	0	17	
			0·914	98·2	219·9	− 4·5			222
Aug. 28							(2)	(52)	(416)
240·641	EP,SP	1919*a*	0·459	196·9	276·7	−18·9	0	12	
			0·769	103·4	220·1	− 5·5			170
Aug. 29							(0)	(12)	(170)
241·466	H,SP	1920*a*	0·937	79·8	187·4	+12·0	7	37	285*c*
		1920*b*	0·956	80·0	183·9	+11·7	12	56	
Aug. 30							(19)	(93)	(285)
1886.				°	°	°			
242d·405	EP,SP		0·802	290·0	298·4	+20·3			156
			0·854	241·8	298·0	−19·5			54
		1920*a*	0·831	80·3	188·5	+12·1	10	67	300*c*
		1920*b*	0·877	80·7	183·4	+11·6	13	83	
Aug. 31							(23)	(150)	(510)
243·441	EP,H		0·932	246·1	295·9	−19·2			92
			0·884	283·3	294·4	+15·1			253
			0·789	238·9	277·0	−19·0			344
		1920*a*	0·677	80·0	188·8	+12·1	10	106	222*c*
		1920*b*	0·744	80·9	183·2	+11·6	29	198	
Sept. 1							(39)	(304)	(911)
244·431	H,EP		0·970	293·0	297·1	+24·0			144
			0·965	284·1	294·5	+15·4			138
I.			0·893	253·6	279·2	−11·1			74
			0·877	244·7	274·9	−18·1			122
		1920*a*	0·487	77·6	189·6	+12·3	6	72	
		1920	0·533	78·3	186·4	+12·3	0	6	
		1920	0·537	79·5	186·1	+11·7	0	2	
		1920*b*	0·577	80·0	183·3	+11·6	23	165	
			0·901	84·5	153·9	+ 8·1			130
			0·983	101·5	141·0	− 9·8			225
Sept. 2							(29)	(245)	(833)
245·337	H,EP		0·969	256·2	280·0	−11·4			75
			0·948	280·0	278·7	+11·7			21
I.			0·953	247·4	274·7	−18·9			178
		1920*a*	0·289	70·3	190·4	+12·5	9	83	
		1920	0·341	72·8	187·1	+12·6	0	3	
		1920*b*	0·400	76·5	183·2	+12·0	21	148	
		1921	0·896	103·2	144·8	− 8·5	0	19	202*f*
Sept. 3							(30)	(253)	(476)
246·465	EP,SP	1920*a*	0·091	13·5	190·5	+12·3	20	129	
		1920	0·122	53·2	186·0	+11·3	0	20	
		1920*b*	0·174	60·4	182·8	+12·0	10	90	
		1921	0·756	108·9	145·5	− 9·2	0	13	160*c*
Sept. 4							(30)	(252)	(160)
247·507	H,EP	1920*a*	0·254	293·8	191·7	+12·8	16	122	
		1920	0·244	303·5	190·1	+14·8	0	13	
		1920	0·204	293·2	189·0	+11·7	0	20	

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

Aug. 24. Photograph faint. Faculæ ill-defined.

Aug. 27. Photograph over-exposed. Spots and Faculæ ill-defined.

Aug. 28. Spots and Faculæ ill-defined.

Group 1918, Aug. 23–25. A very small spot, *a*, followed on Aug. 25 by a second.

Group 1919, Aug. 26–29. Two spots, *a* and *b*, with a very small spot between them on Aug. 26. *b* has divided into two spots which are still measured together by Aug. 28, and has disappeared by Aug. 29.

Group 1920, Aug. 30–Sept. 10. Two spots, *a* and *b*. They tend to separate in longitude and some very small spots appear between them. *b* diminishes rapidly after Sept. 3, and has disappeared by Sept. 7. *a* suffers daily changes of shape and size from Sept. 4–Sept. 8. On Sept. 8 it is a regular spot. Several portions which have become detached from it form distinct spots in its immediate neighbourhood on Sept. 5 and the succeeding days, but all have disappeared by Sept. 10.

Group 1921, Sept. 3–4. A small spot.

Measures of Positions and Areas of Spots and Faculæ upon the Sun's Disk—*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).
1886.				°	°	°			
247d.507	H, EP	1920	0·150	303·0	185·4	+11·9	0	2	
		1920*b*	0·124	315·6	183·1	+12·3	3	37	
Sept. 5							(19)	(194)	(0)
248·440	EP, H		0·839	260·8	221·5	− 3·6			102
		1920	0·481	282·5	194·2	+12·4	0	5	
		1920	0·457	280·5	192·8	+11·3	0	7	
		1920*a*	0·452	285·1	192·1	+13·3	25	154	
		1920	0·427	291·4	189·9	+15·6	0	3	
		1920	0·418	285·1	189·9	+12·9	0	13	
		1920*b*	0·307	287·3	183·0	+12·2	0	10	
			0·857	105·6	109·1	− 9·3			56
			0·953	99·3	94·6	− 6·6			177
Sept. 6							(25)	(192)	(335)
249·496	H, EP		0·948	263·8	222·3	− 3·5			130
		1920*a*	0·662	282·3	193·2	+13·6	22	175	
		1920	0·634	285·3	190·9	+15·3	0	12	
		1920	0·632	280·2	191·0	+12·1	1	38	
		1920	0·622	283·1	190·1	+13·8	0	4	
		1922*a*	0·506	232·1	175·6	−11·4	0	8	
		1922*b*	0·477	229·7	173·4	−11·1	3	9	
			0·873	97·8	91·9	− 3·2			146
			0·944	105·8	83·5	−12·3			277
Sept. 7							(26)	(246)	(553)
250·398	EP, H	1920*a*	0·806	280·8	193·9	+13·0	20	120	} 213*c*
		1920	0·784	279·5	191·8	+12·0	10	68	
		1922*a*	0·664	243·2	176·9	−11·6	0	9	
		1922*b*	0·616	240·8	172·9	−11·4	0	25	
			0·877	109·9	82·0	−13·5			187
Sept. 8							(30)	(222)	(400)
251·468	EP, H		0·835	278·1	182·7	+10·7			251
		1920*a*	0·923	280·6	193·8	+12·6	29	117	} 348*c*
		1920	0·912	278·8	192·1	+11·0	0	26	
		1922*b*	0·772	248·7	172·7	−11·4	0	8	102*c*
		1923*a*	0·991	78·5	42·3	+12·3	0	32	192*c*
			0·744	117·4	82·8	−14·8			54
			0·815	109·6	74·3	−11·4			220
			0·988	96·2	45·5	− 5·0			289
Sept. 9							(29)	(183)	(1456)
1886.				°	°	°			
252d.398	H, EP		0·903	254·1	175·3	−11·0			250
		1920*a*	0·984	281·8	194·0	+12·8	13	145	525*8f*
I.		1924*a*	0·592	116·0	80·8	− 9·0	0	5	} 90*c*
		1924*a*	0·619	114·9	78·8	− 9·2	0	3	
		1924*b*	0·776	113·0	66·4	−12·8	0	10	
		1925	0·716	97·6	68·3	− 0·4	0	17	
		1923*a*	0·928	79·0	44·5	+12·8	32	242	} 428*c*
		1923	0·964	79·8	37·9	+11·7	0	13	
			0·929	98·5	46·2	− 5·1			529
Sept. 10							(45)	(435)	(1822)
253·503	H, EP	1924*a*	0·407	131·2	80·8	− 8·6	4	14	
		1924*a*	0·438	128·0	78·4	− 8·8	0	13	
		1924*a*	0·466	127·0	76·7	− 9·6	0	12	
		1925	0·528	102·4	67·9	− 0·3	0	4	
		1923*a*	0·803	79·2	45·0	+13·0	34	239	333*f*
			0·830	101·2	44·2	− 5·2			247
Sept. 11							(38)	(282)	(580)
254·339	H, EP		0·848	254·7	143·4	− 8·9			116
		1924*a*	0·302	157·5	81·0	− 9·0	0	16	
		1924*a*	0·315	150·9	78·8	− 8·8	3	24	
		1924*a*	0·345	147·6	76·9	− 9·8	0	20	
		1924*b*	0·480	134·2	67·1	−12·8	0	9	
		1923*a*	0·673	78·9	45·3	+12·8	33	221	138*c*
		1923	0·771	78·7	36·9	+13·3	0	7	69*c*
			0·772	102·4	38·7	− 4·8			169
Sept. 12							(36)	(297)	(492)
255·396	EP, H		0·890	256·0	134·5	− 8·9			162
		1924	0·315	177·3	72·9	−11·1	4	39	
		1924	0·357	172·1	70·9	−13·4	0	15	
		1924	0·316	169·1	70·3	−10·9	2	12	
		1924	0·385	167·8	69·0	−14·9	0	8	
		1924	0·336	165·0	68·7	−11·7	0	8	
		1924	0·381	160·9	66·5	−13·9	1	9	
		1924	0·355	159·5	66·5	−12·2	0	7	
		1925	0·135	148·0	69·7	+ 0·7	0	11	
		1925	0·191	143·1	67·2	− 1·6	0	19	
		1923*a*	0·480	76·8	45·2	+12·6	22	184	
		1926	0·667	104·4	33·6	− 4·0	6	27	
		1926	0·701	101·3	30·5	− 2·7	0	19	
			0·916	75·5	6·7	+16·2			178
Sept. 13							(35)	(358)	(340)

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

Group 1922, Sept. 7–9. Two small spots, *a* and *b*. Only *b* is seen on Sept. 9.

Group 1923, Sept. 9–21. A large regular spot, *a*, which has divided into two portions, *b* and *c*, by Sept. 18. Several very small spots are seen from time to time following the principal spot.

Group 1924, Sept. 10–15. This group extends over a large area, in which small spots appear and disappear in a very irregular manner. On Sept. 10 the group consists of two widely separated clusters, *a* and *b*. *b* is not seen on Sept. 11, and is represented only by a single spot on Sept. 12. But by Sept. 13 the whole of the preceding cluster, *a*, has disappeared, and a number of small spots are seen irregularly distributed over the greater part of the area, which on Sept. 10 and 12 lay vacant, between *a* and *b*. On Sept. 14 and 15 the group forms three compact clusters of very small spots; but the clusters on Sept. 15 do not correspond precisely to those seen on Sept. 14.

Group 1925, Sept. 10–15. A small spot on Sept. 10 and 11. No spot is seen on Sept. 12, but on Sept. 13 the group is seen again as a number of very small spots arranged in two clusters. The group forms an irregular stream of very small spots on Sept. 15.

Group 1926, Sept. 13–20. A number of small spots following one another in a straggling stream. The first spot, *a*, is the largest and best defined, but it suffers continual change of shape and area, alternately coalescing with small spots near it, and having portions separated from it.

Measures of Positions and Areas of Spots and Faculæ upon the Sun's Disk—*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).
1886.				°	°	°			
256d·127	H,EP		0·925	256·1	129·7	− 9·9			188
		1924	0·357	206·4	73·5	−11·5	7	41	
I.		1924	0·369	200·7	71·9	−13·0	0	13	
		1924	0·336	199·7	70·8	−11·2	6	21	
		1925	0·162	244·5	70·7	+ 0·6	1	6	
		1925	0·164	200·2	66·4	− 1·6	0	11	
		1923*a*	0·333	72·8	45·3	+12·4	23	166	
		1923	0·471	77·2	36·3	+12·4	0	6	
		1927	0·380	121·2	45·2	− 4·6	0	2	
		1926	0·518	111·4	35·4	− 4·6	12	41	
		1926	0·575	105·1	30·6	− 2·6	7	22	
			0·841	75·8	6·5	+15·8			300
			0·926	86·5	356·2	+ 6·0			379
Sept. 14							(56)	(329)	(867)
257·293	H,EP		0·988	258·4	128·0	−10·2			159
		1924	0·520	234·6	74·2	−11·0	4	27	
I.		1924	0·509	230·6	72·3	−12·2	0	6	
		1924	0·485	230·3	71·0	−11·3	0	3	
		1925	0·425	257·2	73·1	+ 1·2	3	26	
		1925	0·426	253·3	72·7	− 0·4	1	13	
		1925	0·390	248·8	70·0	− 1·3	4	20	
		1925	0·380	251·8	69·8	− 0·1	0	2	
		1923*a*	0·116	33·5	45·0	+12·8	24	157	
		1923	0·193	52·2	39·7	+13·9	0	2	
		1923	0·202	62·2	38·2	+12·5	0	11	
		1926*a*	0·287	138·6	37·8	− 5·4	7	39	
		1926	0·288	132·7	36·5	− 4·2	0	2	
		1926	0·307	130·7	35·3	− 4·6	5	9	
		1926	0·313	124·5	33·8	− 3·2	0	1	
		1926	0·345	129·9	33·3	− 5·8	3	7	
		1926	0·359	126·9	32·0	− 5·5	0	2	
		1926	0·342	119·7	31·5	− 2·8	4	18	
			0·829	88·5	352·6	+ 5·4			245
Sept. 15							(55)	(345)	(404)
258·585	H,EP	1923*a*	0·251	295·1	45·1	+13·1	24	148	
		1923	0·163	309·2	39·2	+13·1	0	20	
		1926*a*	0·239	208·9	38·3	− 4·9	6	27	
		1926	0·225	201·4	36·4	− 4·9	0	11	
		1926	0·228	187·3	33·4	− 5·8	0	16	
			0·956	104·9	321·1	−12·0	0		155
Sept. 16							(30)	(222)	(155)
1886.				°	°	°			
259d·420	E,PH		0·947	261·4	90·6	− 5·8			73
			0·879	254·3	79·7	−10·2			288
			0·801	263·8	73·2	− 0·7			107
		1923*a*	0·418	284·8	45·0	+12·6	19	142	
		1926*a*	0·368	233·4	37·8	− 5·9	14	61	
		1926	0·348	227·1	35·4	− 6·8	4	45	
		1926	0·303	229·7	33·9	− 4·4	0	20	
		1926	0·313	221·5	32·6	− 6·6	0	64	
			0·892	107·8	320·3	−12·4			146
			0·983	95·8	302·0	− 4·4			112
Sept. 17							(37)	(332)	(726)
260·478	H,EP		0·928	255·3	72·5	−10·7			223
			0·909	265·6	71·5	− 1·0			159
		1923*b*	0·615	281·5	44·7	+12·7	23	122	
		1923*c*	0·602	284·2	43·6	+14·2	7	24	
		1926*a*	0·561	248·4	38·2	− 5·8	8	57	
		1926	0·537	246·5	36·3	− 6·2	0	37	
		1926	0·494	246·6	33·7	− 5·0	3	18	
		1926	0·490	242·7	32·6	− 6·6	0	10	
			0·802	113·2	317·5	−13·8			109
			0·909	98·0	302·4	− 4·2			159
			0·926	75·0	298·1	+16·5			98
Sept. 18							(41)	(268)	(748)
261·117	EP,M		0·961	267·0	71·7	− 0·9			235
			0·958	254·8	69·1	−12·3			239
I.			0·767	256·9	46·6	− 5·3			214
		1923*b*	0·724	281·0	44·8	+12·9	25	117	
		1923*c*	0·720	283·6	44·3	+14·7	9	49	
		1923	0·700	280·6	42·8	+12·5	0	2	359*c*
		1923	0·685	281·9	41·6	+13·3	0	3	
		1923	0·683	283·6	41·3	+14·5	0	5	
		1926*a*	0·660	252·8	37·4	− 5·8	15	80	
		1926	0·629	253·4	35·3	− 4·7	0	3	
		1926	0·632	251·4	35·1	− 5·9	0	1	
		1926	0·604	252·6	33·4	− 4·6	11	50	
		1926	0·607	249·7	33·0	− 6·3	0	2	
			0·959	176·8	350·5	−65·9			124
			0·851	99·4	301·1	− 4·2			355
			0·911	117·2	298·1	−21·1			90
			0·878	86·4	296·5	+ 6·6			23
			0·885	74·8	295·3	+16·8			66
			0·922	62·0	290·6	+28·5			67
Sept. 19							(60)	(312)	(1772)

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

Group 1927, Sept. 14. A very small spot.

Measures of Positions and Areas of Spots and Faculæ upon the Sun's Disk—*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).
1886.				°	°	°			
262d·315	EP, M		0·917	260·2	47·4	− 6·1			185
			0·965	202·1	26·5	−58·7			27
I.		1923*c*	0·883	283·1	44·9	+14·9	10	44	
		1923*b*	0·879	280·6	44·4	+12·7	26	125	512*c*
		1923	0·857	280·7	41·8	+12·8	0	5	
		1923	0·845	282·2	40·4	+14·1	0	18	
		1926*a*	0·832	258·7	37·1	− 5·4	12	80	451*c*
		1926	0·790	258·4	33·0	− 4·7	0	12	
			0·939	184·1	350·6	−62·4			30
			0·950	136·4	283·7	−40·0			70
			0·939	114·0	276·8	−19·7			38
			0·988	95·1	262·0	− 3·9			42
Sept. 20							(48)	(284)	(1355)
263·442	EP, H		0·926	261·5	34·1	− 5·1			175
		1923*b*	0·969	280·9	44·1	+12·3	6	90	171*c*
Sept. 21							(6)	(90)	(346)
264·509	H, M	1928	0·095	62·7	308·1	+ 9·5	0	20	
		1928	0·158	77·3	304·6	+ 8·9	0	12	
Sept. 22							(0)	(32)	(0)
265·328	EP, M		0·781	274·2	354·2	+ 7·7			255
			0·716	288·7	348·0	+18·2			111
I.			0·897	283·6	7·0	+15·3			333
			0·899	264·9	6·0	− 1·5			99
		1928	0·131	292·1	309·6	+ 9·8	0	9	
		1928	0·049	309·4	304·8	+ 8·8	0	9	
Sept. 23							(0)	(18)	(798)
266·303	EP, H		0·897	275·4	354·1	+ 7·9			122
			0·880	101·7	229·8	− 6·9			24
I.			0·956	98·5	218·1	− 6·0			52
Sept. 24							(0)	(0)	(198)
267·123	H, EP		0·937	280·4	349·2	+12·1			122
		1928	0·522	277·9	310·5	+10·0	0	5	
I.			0·883	97·8	218·0	− 3·6			44
Sept. 25							(0)	(5)	(166)
268·106	H, EP		0·879	251·9	324·6	−12·3			74
		1928	0·710	277·5	311·5	+10·2	0	2	
I.		1928	0·659	277·2	307·4	+10·0	0	3	
1886.				°	°	°			
268d·106	H, EP	1928	0·632	276·4	305·4	+ 9·4	4	18	
		1929	0·717	103·0	221·7	− 4·4	3	13	
I.			0·943	80·1	194·8	+11·6			278
Sept. 26							(7)	(36)	(352)
269·104	H, EP		0·958	254·4	323·7	−12·7			146
			0·786	257·6	303·1	− 5·4			160
I.		1928	0·819	276·5	308·1	+ 9·2	0	5	143*c*
		1928	0·790	276·7	305·3	+ 9·5	0	2	
			0·881	78·9	190·5	+13·0			347
			0·956	102·4	181·6	− 9·8			259
Sept. 27							(0)	(7)	(1055)
270·461									
Sept. 28							(0)	(0)	(0)
271·565	H, EP		0·933	99·9	152·9	− 6·7			53
			0·989	107·1	141·5	−15·7			147
Sept. 29							(0)	(0)	(200)
272·170	H, EP		0·937	270·2	281·8	+ 2·5			77
		1930*a*	0·956	108·9	142·6	−15·8	8	26	199*c*
I.		1930*b*	0·978	109·5	137·5	−17·4	5	38	
			0·870	87·0	151·8	+ 5·9			66
Sept. 30							(13)	(64)	(342)
273·453	H, EP	1930*a*	0·818	113·4	144·7	−14·9	4	28	
		1930*b*	0·882	112·6	137·7	−16·3	0	9	
Oct. 1							(4)	(37)	(0)
274·415	H, EP	1930*a*	0·670	120·7	146·3	−14·7	6	36	
		1930	0·682	119·7	145·1	−14·6	0	9	
Oct. 2							(6)	(45)	(0)
275·191	EP, M		0·928	222·4	226·7	−39·6			41
			0·863	178·4	170·2	−52·8			75
I.			0·902	163·3	146·5	−53·9			76

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

Sept. 21 and 22. Photograph very faint. Faculæ ill-defined.
Sept. 28. Photograph over-exposed.
Oct. 1 and 2, Photograph faint. Faculæ ill-defined.
Group 1928, Sept. 22–27. Two small spots on Sept. 22 and 23. The group is not seen on Sept. 24. On Sept. 25 a single spot is seen. On Sept. 26 four very small spots are seen, the last two being measured together. By Sept. 27 only two very small spots remain.
Group 1929, Sept. 26. A small spot.
Group 1930, Sept. 30–Oct. 10. Two regular spots, *a* and *b*, on Sept. 30. *b* has disappeared by Oct. 2. *a* moves rapidly forward in longitude until Oct. 5. It is followed by one or two small spots on each day from Oct. 2 to Oct. 6.

Sept. 24. Photograph very faint. Limb hardly visible. Faculæ ill-defined.
Sept. 29. Photograph slightly over-exposed. Faculæ hard to see.

Measures of Positions and Areas of Spots and Faculæ upon the Sun's Disk—*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).
1886.				°	°	°			
275d·191	EP,M	1930*a*	0·546	131·2	147·4	−15·1	17	77	
		1930	0·597	128·7	143·6	−16·2	0	14	
I.			0·918	114·4	110·3	−19·3			25
			0·937	83·9	102·6	+ 8·0			80
			0·950	94·8	101·4	− 2·5			151
			0·975	102·2	97·0	−10·3			146
			0·964	70·1	96·7	+20·9			24
Oct. 3							(17)	(91)	(618)
276·541	H,EP	1930*a*	0·390	162·8	147·9	−15·4	13	81	
		~~1929~~	0·430	150·4	142·6	−15·6	0	7	
		1930	0·879	102·3	94·9	− 7·6			126
Oct. 4							(13)	(88)	(126)
277·481	H,EP	1930*a*	0·390	196·4	148·9	−15·5	16	79	
		1930	0·394	189·0	146·1	−16·4	0	18	
			0·869	99·8	83·3	− 5·2			133
			0·933	95·5	74·2	− 2·8			119
Oct. 5							(16)	(97)	(252)
278·273	EP,M		0·950	252·9	201·1	−14·0			41
			0·822	283·8	187·4	+15·0			102
I.			0·807	278·5	184·9	+ 4·4			100
		1931	0·495	237·1	156·7	− 9·8	2	6	
		1930*a*	0·468	217·2	148·9	−15·8	22	78	
		1930	0·470	214·3	147·9	−16·7	0	6	
		1932*a*	0·728	105·6	87·2	− 6·8	2	8	
		1932	0·737	107·0	86·7	− 8·1	0	3	96*c*
		1932	0·751	106·0	85·4	− 7·6	0	4	
		1932	0·766	107·0	84·3	− 8·7	1	3	
			0·882	94·9	70·6	− 1·3			83
Oct. 6							(27)	(108)	(422)
279·357	EP,M		0·952	281·7	190·5	+13·1			405
			0·943	254·5	185·8	−12·4			87
I.		1930*a*	0·610	234·3	148·4	−15·5	24	79	
		1932*a*	0·551	113·0	87·0	− 7·1	12	45	
			0·905	95·9	53·5	− 2·7			55
			0·948	74·9	45·4	+16·3			193
			0·971	101·0	42·9	− 9·1			31
			0·982	105·1	40·7	−13·5			71
Oct. 7							(36)	(124)	(842)
1886.				°	°	°			
280d·290	EP,M		0·924	241·7	167·3	+23·2			54
		1930*a*	0·740	242·8	148·0	−15·2	16	65	49*c*
I.		1932*a*	0·387	126·0	86·9	− 7·2	3	35	
		1932	0·440	131·1	85·6	−10·9	0	6	
			0·795	99·4	53·6	− 3·6			68
			0·892	75·7	41·7	+15·6			84
			0·960	108·9	34·4	−16·2			92
			0·955	96·7	33·4	− 4·5			143
Oct. 8							(19)	(106)	(490)
281·143	EP,M		0·968	245·4	165·3	−21·9			58
			0·898	243·2	152·8	−20·8			47
I.			0·786	205·3	119·7	−39·7			21
		1930*a*	0·843	247·6	147·5	−15·1	12	69	60*c*
		1932*a*	0·259	152·3	87·0	− 7·1	0	5	
			0·867	103·6	35·6	− 8·6			55
			0·936	112·5	28·3	−18·6			43
			0·929	97·1	26·5	− 4·3			72
			0·949	77·9	21·7	+13·4			91
Oct. 9							(12)	(74)	(447)
282·456	H,EP	1930*a*	0·962	252·2	148·2	−15·3	0	69	
Oct. 10							(0)	(69)	(0)
283·500	H,EP	1933	0·119	30·0	59·4	+11·9	0	9	
		1933	0·124	52·9	57·2	+10·3	0	18	
Oct. 11							(0)	(27)	(0)
284·158	EP,M	1934	0·150	108·8	46·2	+ 3·1	0	4	
I.			0·953	99·6	343·2	− 7·3			43
Oct. 12							(0)	(4)	(43)
285·507	H,EP		0·900	259·4	99·2	− 6·9			61
			0·867	265·5	96·0	− 0·9			82
Oct. 13							(0)	(0)	(143)
286·463	H,EP		0·977	253·4	99·3	−14·9			74
			0·967	261·3	97·9	− 6·9			116
			0·951	269·0	95·6	+ 0·9			81
			0·903	258·9	86·9	− 7·4			82
			0·902	243·3	83·3	−21·0			113
Oct. 14							(0)	(0)	(466)

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Oct. 4. Photograph faint. Faculæ ill-defined.

Oct. 5, 10, and 11. Faculæ ill-defined.

Group 1931, Oct. 6. A very small spot.

Group 1932, Oct. 6-9. A small spot, *a*, with a number of very small spots close to it on Oct. 6. *a* is seen alone on Oct. 7 and 9, but has one very small companion on Oct. 8. *a* has increased in size by Oct. 7, but diminishes again on the succeeding days.

Group 1933, Oct. 11. Three small spots, two of which are measured together.

Group 1934, Oct. 12. A very small spot.

Measures of Positions and Areas of Spots and Faculæ upon the Sun's Disk—*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).
1886.				°	°	°			
287d·149	EP,M		0·963	259·4	87·6	− 8·5			32
			0·888	264·1	76·6	− 2·6			56
I.			0·868	250·6	71·9	−13·7			15
		1935	0·599	118·9	342·4	−11·9	2	22	
		1935	0·615	115·2	340·4	−10·4	8	20	
			0·883	100·2	314·0	− 6·2			22
Oct. 15							(10)	(42)	(125)
288·230	EP,M	1935	0·414	137·0	343·8	−12·2	8	88	
I.		1935	0·419	130·9	341·8	−10·6	0	5	
		1935	0·444	128·1	339·8	−10·6	13	66	
Oct. 16							(21)	(159)	(0)
289·130	EP,M		0·935	264·2	57·2	− 3·5			43
			0·831	285·1	44·9	+15·6			68
I.		1935	0·319	166·9	344·5	−12·6	10	101	
		1935	0·320	156·9	341·4	−11·6	0	6	
		1935	0·346	156·9	340·7	−13·0	0	7	
		1935	0·311	151·5	340·1	−10·4	9	40	
Oct. 17							(19)	(154)	(111)
290·286	EP,M		0·958	286·0	47·4	+16·9			139
			0·924	256·6	42·4	−16·0			14
I.			0·916	248·1	36·5	−17·9			70
			0·932	235·9	35·1	−29·0			30
		1935	0·370	213·0	345·3	−12·3	6	30	
		1935	0·309	205·6	341·2	−10·7	2	21	
			0·895	48·8	273·5	+39·0			34
			0·937	107·0	266·3	−13·8			19
Oct. 18							(8)	(51)	(306)
291·253	EP,M		0·956	261·9	132·6	− 6·0			29
			0·891	279·1	24·0	+10·6			71
I.		1935	0·459	231·5	342·1	−11·4	0	15	
			0·936	176·8	314·0	−63·5			34
Oct. 19							(0)	(15)	(134)
292·376	EP,M		0·949	284·5	18·0	+15·4			63
			0·874	288·9	6·7	+19·1			105
I.			0·876	296·4	6·2	+25·7			30
		1935	0·643	245·7	342·4	−11·0	0	11	
			0·849	349·8	324·3	+61·6			144
Oct. 20							(0)	(11)	(342)
1886.				°	°	°			
293d·157	EP,M		0·862	287·6	355·0	+17·8			17
			0·857	283·4	354·7	+14·2			32
I.			0·841	269·8	352·9	+ 4·4			20
			0·765	249·8	342·6	−11·7			108
			0·941	287·6	6·3	+18·4			81
			0·934	295·0	4·6	+25·2			15
Oct. 21							(0)	(0)	(273)
294·492	H,EP	1935	0·934	255·6	345·0	−11·4	0	19	386c
			0·971	104·9	203·7	−13·1			413
Oct. 22							(0)	(19)	(799)
295·121	EP,M		0·967	256·2	343·1	−12·0			510
			0·955	324·7	336·9	+53·3			39
I.			0·927	252·2	335·0	−14·4			30
			0·897	304·0	331·4	+32·6			32
			0·881	263·0	330·6	− 3·7			20
			0·902	231·3	325·1	−31·5			27
		1936a	0·993	74·0	185·4	+16·5	0	62	
			0·917	147·7	223·4	−47·3			23
			0·943	106·2	201·3	−13·4			803
			0·929	76·9	201·0	+14·0			112
Oct. 23							(0)	(62)	(1596)
296·507	H,EP	1936a	0·905	75·2	186·4	+15·5	8	55	} 238c
		1936b	0·933	74·4	182·2	+16·3	0	33	
Oct. 24							(8)	(88)	(238)
297·130	EP,H	1936a	0·842	74·6	186·0	+15·5	9	50	} 221c
		1936b	0·884	73·6	181·1	+16·7	0	44	
I.			0·783	115·4	195·9	−16·4			91
Oct. 25							(9)	(94)	(312)
298·146	EP,M	1936a	0·703	72·8	185·7	+15·4	7	40	} 133c
		1936b	0·761	71·8	180·9	+16·8	0	7	
I.			0·900	100·0	166·9	− 6·9			52
			0·948	76·5	158·9	+14·3			96
			0·983	108·9	152·4	−17·7			124
Oct. 26							(7)	(47)	(405)
299·135	H,EP	1936a	0·539	68·2	185·4	+15·6	11	39	
		1936	0·566	68·3	183·6	+15·9	0	3	
I.			0·921	109·5	149·5	−19·8			181
Oct. 27							(11)	(42)	(181)

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Group 1935, Oct. 15–22. A number of small spots following each other in an irregular stream. The individual members of the group differ from day to day. The group is not seen on Oct. 21, and only one spot appears on Oct. 22.

Group 1936, Oct. 23–29. Two spots, *a* and *b*. *b* has broken up by Oct. 25 into a cluster of small spots which are, however, still measured as one. Only one of these small spots remains by Oct. 26. Only *a* remains on Oct. 29. *b* is not seen on Oct. 27, but *a* is followed on that day by a very small spot.

Measures of Positions and Areas of Spots and Faculæ upon the Sun's Disk—*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).
1886.				°	°	°			
300d·145	EP,H	1936*a*	0·352	56·6	185·5	+15·5	7	29	
		1936*b*	0·420	57·6	181·5	+17·2	0	8	
I.			0·941	174·1	190·1	−64·8			139
			0·948	150·1	152·6	−52·6			87
			0·862	114·4	147·6	−18·3			122
			0·942	112·4	136·1	−19·3			87
Oct. 28							(7)	(37)	(435)
301·469	H,EP	1937*a*	0·941	261·5	255·1	− 6·4	0	6	94*c*
		1937*b*	0·925	261·5	252·6	− 6·1	0	5	
		1936*a*	0·189	4·0	185·1	+15·3	4	31	
Oct. 29							(4)	(42)	(94)
302·105	H,EP	1937*b*	0·968	262·3	252·1	− 6·3	0	47	98*c*
I.									
Oct. 30							(0)	(47)	(98)
303·180	H,EP		0·941	182·3	168·5	−65·5			117
I.			0·893	98·1	100·9	− 5·2			274
			0·975	115·4	89·5	−23·6			120
Oct. 31							(0)	(0)	(511)
304·143	H,EP		0·948	281·3	222·3	+12·1			33
			0·919	289·4	217·2	+19·5			143
I.			0·830	251·2	204·1	−13·0			328
			0·957	202·4	195·9	−59·2			99
			0·955	191·2	177·3	−65·7			79
			0·852	196·1	172·5	−50·8			96
			0·804	97·0	97·7	− 3·1			129
			0·927	109·7	85·3	−16·5			220
Nov. 1							(0)	(0)	(1127)
305·498	H,EP		0·933	283·2	201·7	+13·8			87
			0·931	253·6	199·3	−13·7			520
			0·780	290·3	182·9	+18·3			103
Nov. 2							(0)	(0)	(710)
306·397	H,EP		0·968	254·1	194·7	−14·4			100
			0·881	288·5	182·2	+18·1			128
Nov. 3							(0)	(0)	(228)

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).
1886.				°	°	°			
307d·423	H,EP		0·965	289·1	182·4	+19·5			110
			0·923	97·7	41·0	− 5·6			70
			0·941	108·3	39·5	−15·7			39
			0·976	110·7	32·4	−19·2			84
Nov. 4							(0)	(0)	(303)
308·360	H,EP		0·901	281·4	159·4	+11·9			42
			0·827	246·0	147·2	−17·4			269
I.			0·847	108·4	39·6	−13·4			73
			0·864	98·8	36·2	− 5·7			34
			0·917	112·8	31·8	−19·2			108
			0·923	85·2	27·7	+ 5·9			114
Nov. 5							(0)	(0)	(640)
309·139	H,EP		0·967	281·2	160·1	+11·7			96
			0·906	283·4	149·6	+13·7			71
I.			0·902	249·7	146·5	−16·6			174
			0·769	99·4	35·3	− 4·9			56
			0·845	115·8	31·1	−19·4			127
			0·842	107·0	29·4	−12·2			46
			0·875	75·3	23·9	+14·6			22
Nov. 6							(0)	(0)	(592)
310·209	H,EP		0·935	246·2	136·6	−20·8			166
I.			0·937	118·4	5·4	−25·0			64
Nov. 7							(0)	(0)	(230)
311·418	H,EP		0·843	259·1	111·0	− 7·3			258
			0·911	106·9	351·1	−13·8			48
			0·956	103·1	343·1	−11·4			84
Nov. 8							(0)	(0)	(390)
312·312	H,EP		0·944	255·1	112·0	−12·8			163
			0·879	268·4	104·1	+ 0·3			167
I.			0·846	252·8	98·6	−12·6			33
			0·846	109·0	347·5	−14·1			200
Nov. 9							(0)	(0)	(563)
313·166	H,EP		0·925	267·5	98·9	− 1·1			181
			0·908	256·3	95·4	−11·0			120
I.			0·837	243·1	84·1	−20·3			146
Nov. 10							(0)	(0)	(447)

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

Nov. 2. Photograph over-exposed.
Group 1937, Oct. 29–30. Two small spots, *a* and *b*, on Oct. 29. Only *b* is seen on Oct. 30.

Nov. 3. Photograph over-exposed Faculæ ill-defined.

1386

Pg	Line	Col	fr	to
~~37~~	29	20	1397	1387
~~40~~	23	18	28	14
~~43~~	6	9	1895	1882
~~43~~	31	9	2122	2222
~~43~~	7	20	675	780
~~43~~	26	19	2453	2425
~~45~~	31	8	69	71
~~48~~	9	9	1863	1663
~~56~~	22	10	270	209
68	25	6	1326	326
~~40~~	23	21	251	171
67	10	3	1929	1930
~~46~~	29	7	+207	-207

Measures of Positions and Areas of Spots and Faculæ upon the Sun's Disk—*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).
1886.				°	°	°			
314d.148	H,EP		0·889	259·3	80·4	− 8·0			92
I.			0·900	247·7	79·8	−18·4			87
			0·783	110·3	329·8	−13·7			72
Nov. 11							(0)	(0)	(251)
315·332	H,EP	1938*a*	0·584	120·0	331·7	−14·5	1	7	
I.			0·874	136·4	314·0	−37·3			39
Nov. 12							(1)	(7)	(39)
316·148	H,EP		0·876	283·3	53·1	+13·0			46
		1938*a*	0·447	132·0	332·3	−14·7	2	9	
I.			0·898	111·0	291·0	−17·4			121
			0·939	100·4	283·4	− 8·8			62
Nov. 13							(2)	(9)	(229)
317·205	H,EP	1938*a*	0·320	161·5	332·4	−14·9	0	5	
		1938*b*	0·338	154·9	329·9	−15·1	0	3	
I.			0·836	10·5	321·9	+57·7			66
			0·947	75·6	267·3	+14·5			36
			0·972	95·7	262·5	− 4·9			334
Nov. 14							(0)	(8)	(436)
318·280	H,EP		0·913	195·0	351·7	−59·3			49
			0·935	189·0	344·3	−64·8			149
I.		1939	0·890	97·0	262·9	− 5·0	0	1	
			0·944	256·5	33·7	−11·9			138
			0·894	285·8	27·1	+15·3			35
			0·844	265·4	21·3	− 2·4			48
			0·888	96·2	262·1	− 4·3			219
Nov. 15							(0)	(1)	(638)
319·191	H,EP		0·962	189·6	338·8	−69·1			65
			0·773	97·2	262·1	− 4·0			168
I.			0·874	116·7	255·2	−21·8			72
		1939	0·744	100·4	265·0	− 6·0	0	3	
		1939	0·756	98·6	263·8	− 4·8	0	2	
Nov. 16							(0)	(5)	(305)
320·462	H, M	1939	0·532	99·2	263·9	− 2·8	0	6	
		1939	0·542	104·3	263·8	− 5·6	0	6	
Nov. 17							(0)	(12)	(0)
321·493	H,EP		0·960	286·1	355·0	+ 6·1			280
Nov. 18							(0)	(0)	(280)

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).
1886.				°	°	°			
322d.164	H,EP		0·965	255·8	346·7	−13·1			108
I.			0·877	251·6	332·4	−15·0			99
			0·909	108·8	209·7	−16·1			216
Nov. 19							(0)	(0)	(423)
323·119	H,EP		0·952	253·5	331·1	−15·0			28
			0·880	225·3	311·7	−36·9			22
I.			0·847	217·6	303·1	−40·6			52
			0·805	110·7	209·3	−15·3			115
			0·829	73·9	205·3	+14·4			88
			0·904	109·8	197·9	−16·9			81
Nov. 20							(0)	(0)	(386)
324·244	H,EP		0·894	282·8	308·2	+12·3			61
			0·802	114·0	195·2	−17·8			61
I.			0·919	64·5	180·2	+24·1			97
Nov. 21							(0)	(0)	(219)
325·282	H,EP		0·920	229·7	291·3	−35·6			27
I.			0·791	61·6	182·8	+23·2			48
Nov. 22							(0)	(0)	(75)
326·341	H,EP		0·921	101·0	151·8	− 9·5			124
			0·946	118·2	150·3	−25·9			24
I.			0·981	77·7	139·3	+12·4			108
Nov. 23							(0)	(0)	(256)
327·251	H,EP		0·882	280·9	267·5	+10·3			90
			0·840	261·1	262·6	− 6·7			116
I.			0·859	117·3	150·7	−22·4			176
			0·920	77·3	139·7	+12·3			121
Nov. 24							(0)	(0)	(503)
328·352	H,EP		0·971	211·5	254·2	−55·2			53
			0·951	174·9	177·4	−69·9			41
I.			0·816	76·1	137·7	+12·0			75
			0·945	144·2	134·0	−49·2			137
			0·925	101·5	124·8	−10·1			133
			0·930	89·2	123·4	+ 1·2			104
Nov. 25							(0)	(0)	(543)

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

Nov. 17. Photograph over-exposed. Spots and Faculæ ill-defined.
Group 1938, Nov. 12–14. A very small spot, *a*. A second, *b*, is seen near it on Nov. 14.
Group 1939, Nov. 15–17. A very small spot on Nov. 15. Two very small spots on Nov. 16 and 17.

Measures of Positions and Areas of Spots and Faculæ upon the Sun's Disk—*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).
1886.				°	°	°			
329d·348	H,EP	1940	0·304	246·4	194·6	− 5·8	1	6	
			0·895	102·4	115·8	−10·6			143
I.			0·896	87·7	115·0	+ 2·6			96
Nov. 26							(1)	(6)	(239)
330·171	H,EP		0·825	106·5	113·6	−12·9			96
I.									
Nov. 27							(0)	(0)	(96)
331·346									
I.									
Nov. 28							(0)	(0)	(0)
332·357	H,EP		0·953	254·7	210·0	−14·3			49
			0·850	273·5	196·7	+ 3·4			20
I.			0·841	261·9	195·4	− 6·3			99
Nov. 29							(0)	(0)	(168)
333·429	H,M		0·949	253·0	195·4	−15·8			83
Nov. 30							(0)	(0)	(83)
334·320	H,EP		0·895	250·4	174·6	−17·2			40
I.			0·830	80·2	57·3	+ 8·5			46
Dec. 1							(0)	(0)	(86)
335·322	H,EP		0·947	180·9	102·1	−70·4			105
			0·892	174·5	89·2	−61·9			40
I.			0·943	171·7	78·1	−68·3			49
			0·880	99·9	38·6	− 8·5			45
			0·933	93·0	31·0	− 2·7			109
			0·952	108·7	28·7	−17·6			138
Dec. 2							(0)	(0)	(486)
336·152	H,EP		0·891	248·8	149·8	−18·7			54
			0·840	93·0	31·8	− 2·3			41
I.			0·942	96·4	18·7	− 5·9			30
Dec. 3							(0)	(0)	(125)
337·150	H,EP		0·875	95·3	14·9	− 4·6			99
I.			0·978	91·9	357·9	− 1·8			136
Dec. 4							(0)	(0)	(235)
1886.				°	°	°			
338d·177	H,EP		0·899	265·9	125·8	− 3·6			128
I.			0·856	91·6	3·4	− 1·3			82
Dec. 5							(0)	(0)	(210)
339·240									
I.									
Dec. 6							(0)	(0)	(0)
340·170									
I.									
Dec. 7							(0)	(0)	(0)
341·457	EP,H		0·963	76·2	305·2	+13·3			70
Dec. 8							(0)	(0)	(70)
342·193	H,M		0·913	75·1	304·4	+13·4			291
M.									
Dec. 9							(0)	(0)	(291)
343·502	EP,M	1941*a*	0·873	68·7	293·3	+18·1	0	12	100*c*
		1941*b*	0·912	68·5	288·1	+19·3	0	18	
Dec. 10							(0)	(30)	(100)
344·399	H,EP	1941*a*	0·764	65·8	293·2	+17·7	0	28	219*c*
		1941	0·790	65·4	290·9	+18·7	0	11	
M.		1941*b*	0·822	65·9	287·6	+19·2	3	47	
Dec. 11							(3)	(86)	(219)
345·485	EP,M	1942	0·560	64·2	294·6	+13·4	1	20	
		1941*a*	0·601	58·3	293·4	+17·7	4	28	
		1941	0·638	58·6	290·8	+18·7	0	5	
		1941*b*	0·675	60·0	287·7	+19·0	9	51	
			0·858	94·3	266·9	− 4·1			229
Dec. 12							(14)	(104)	(229)
346·212	H,EP		0·973	179·1	313·5	−70·7			118
		1942	0·422	54·1	295·7	+13·4	3	15	
I.		1941	0·491	45·7	294·5	+19·1	0	4	
		1941*a*	0·486	47·6	294·1	+18·2	3	12	
		1941	0·558	50·8	289·0	+19·8	0	3	
		1941*b*	0·566	52·3	288·0	+19·4	13	51	
			0·990	94·0	234·6	− 4·1			843
Dec. 13							(19)	(85)	(961)

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

Dec. 12. Faculæ ill-defined.

Group 1940. Nov. 26. A very small spot.

Group 1941. Dec. 10–21. Two small spots, *a* and *b*, on Dec. 10, other spots appear between them on the succeeding days, and the group has become by Dec. 15 a stream of spots, of which *a* and *b*, the first and last, are the largest. Both *a* and *b* undergo frequent changes in shape and size.

Group 1942. Dec. 12–13. A small spot.

Measures of Positions and Areas of Spots and Faculæ upon the Sun's Disk—*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).
1886.				°	°	°			
347d·296	EP,M		0·939	200·3	346·5	−62·4			114
		1941*a*	0·362	23·5	293·6	+18·2	2	12	
I.		1941	0·371	25·3	292·3	+18·4	2	8	
		1941	0·383	26·4	291·6	+18·9	0	2	
		1941*b*	0·419	32·4	288·2	+19·6	17	67	
Dec. 14							(21)	(89)	(114)
348·362	H,EP		0·948	196·3	329·2	−66·2			110
			0·907	185·8	300·7	−15·5			98
I.		1941*a*	0·340	344·8	293·4	+17·9	14	57	
		1941	0·299	344·8	292·6	+15·5	0	2	
		1941	0·351	351·6	291·1	+19·0	0	3	
		1941	0·332	352·9	290·5	+18·0	0	12	
		1941*b*	0·357	0·6	287·8	+19·6	26	125	
			0·951	105·5	216·6	−15·1			205
Dec. 15							(40)	(199)	(413)
349·282	H,EP		0·965	200·8	330·6	−65·2			152
			0·930	189·5	299·3	−67·5			71
I.		1941*a*	0·450	314·4	295·3	+16·9	12	83	
		1941	0·419	323·7	290·8	+18·3	0	8	
		1941*b*	0·411	330·4	288·1	+19·5	22	136	
			0·857	108·1	217·9	−16·2			88
Dec. 16							(34)	(227)	(311)
350·334	H,EP		0·754	289·9	308·6	+13·8			122
			0·901	192·8	287·6	−62·6			133
I.			0·886	171·4	245·3	−62·4			34
		1941*a*	0·613	300·2	295·3	+16·6	20	106	
		1941	0·602	304·6	293·3	+18·6	2	14	
		1941	0·584	301·4	293·1	+16·4	5	12	
		1941	0·590	307·0	291·8	+19·5	0	2	
		1941*b*	0·553	310·7	288·2	+19·7	20	119	
			0·937	96·2	192·6	− 6·3			54
Dec. 17							(47)	(253)	(343)
351·552	EP,M		0·885	286·8	306·5	+14·0			126
		1941*a*	0·798	292·3	296·1	+16·6	23	105	
		1941	0·798	289·6	296·7	+14·5	0	11	271*c*
		1941	0·782	296·1	293·7	+19·0	0	13	
1886.				°	°	°			
351d·552	EP,M	1941	0·774	294·0	293·5	+17·2	0	20	
		1941	0·750	296·2	290·8	+18·1	0	15	
		1941*b*	0·732	299·6	288·4	+20·0	22	67	
Dec. 18							(45)	(231)	(397)
352·250	H,EP		0·944	285·6	306·1	+14·1			224
		1941*a*	0·884	289·4	296·7	+16·2	36	101	
I.		1941	0·840	292·7	291·0	+17·9	0	4	
		1941*b*	0·823	295·7	288·5	+19·8	20	60	518*c*
		1941	0·791	296·6	285·2	+19·6	1	7	
Dec. 19							(57)	(172)	(742)
353·182		1941*a*	0·960	287·1	296·7	+15·9	4	67	
		1941	0·949	289·5	294·2	+17·8	0	47	
I.		1941	0·932	289·7	291·2	+17·6	1	17	634*c*
		1941	0·932	288·4	291·1	+16·0	0	15	
		1941*b*	0·915	291·8	288·2	+19·0	0	47	
Dec. 20							(5)	(193)	(634)
354·198	H,EP		0·825	267·2	266·4	− 3·4			163
		1941*b*	0·979	289·6	287·7	+18·7	0	30	
I.		1941	0·968	290·4	284·7	+19·2	2	25	398*c*
		1941	0·957	291·0	282·1	+19·4	0	32	
Dec. 21							(2)	(87)	(561)
355·238 M.	H, M	1943	0·922	100·1	130·2	−10·1	0	7	130*c*
Dec. 22							(0)	(7)	(130)
356·514	EP,M	1943	0·784	101·0	129·2	−10·0	3	15	
		1943	0·807	101·2	127·0	−10·3	7	33	
		1943	0·835	102·2	124·3	−11·4	9	66	122*c*
		1943	0·853	102·9	122·4	−12·1	0	12	
		1944*a*	0·943	98·1	110·0	− 8·3	31	252	
		1944	0·963	100·0	106·1	−10·2	0	13	205*c*
		1944	0·982	99·8	101·4	−10·0	0	61	
Dec. 23							(50)	(452)	(327)
357·548	H,EP	1945	0·258	341·0	171·6	+11·8	0	5	
		1945	0·278	345·2	170·9	+13·2	0	6	
		1943	0·629	103·3	128·4	−10·1	0	44	

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

Dec. 18 and 23. Photograph faint. Faculæ ill-defined.

Group 1943, Dec. 22–29. A very small spot on Dec. 22. Four spots following each other in a straight line on Dec. 23. The group has further increased in size by Dec. 24, when it is measured in three clusters. Only two of these clusters remain by Dec. 25, and only one by Dec. 28.

Group 1944, 1886, Dec. 23–1887, Jan. 3. A large regular spot, *a*, followed by a stream of smaller spots. *a* has suffered a great change in shape by Dec. 28, and has become an elongated spot with several distinct nuclei. The smaller spots have disappeared by Dec. 29, and *a* has broken up by Dec. 30, principally into two regular spots, *b* and *c*. Only *b* remains by Jan. 2.

Group 1945, Dec. 24-26. A number of very small spots irregularly distributed.

Measures of Positions and Areas of Spots and Faculæ upon the Sun's Disk—*concluded.*

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).
1886.				°	°	°			
357d·548	H,EP	1943	0·656	103·6	126·4	−10·6	0	14	
		1943	0·687	104·5	124·1	−11·6	11	101	
		1944*a*	0·841	98·1	109·7	− 8·1	25	273	
		1944	0·872	101·1	106·3	−10·8	0	42	461*c*
		1944	0·889	99·7	104·2	− 9·7	0	21	
		1944	0·913	100·4	101·0	−10·4	0	41	
Dec. 24							(36)	(547)	(461)
358·502	H,EP	1945	0·362	308·5	170·9	+10·7	0	5	
		1945	0·395	311·6	170·7	+12·8	0	5	
		1945	0·352	313·4	169·3	+12·7	0	4	
		1943	0·450	108·7	128·6	−10·4	0	24	
		1943	0·535	108·9	123·2	−12·0	4	53	
		1944*a*	0·693	98·5	110·6	− 7·6	49	313	
		1944	0·729	101·3	107·9	− 9·9	0	38	
		1944	0·759	100·5	105·2	− 9·5	0	68	
		1944	0·803	101·3	101·2	−10·5	0	28	
			0·912	96·4	98·5	− 6·8			26
Dec. 25							(53)	(538)	(26)
359·180	H,EP	1945	0·517	299·7	172·7	+12·6	1	10	
		1945	0·501	297·0	172·3	+10·9	2	8	
M.		1945	0·506	301·4	171·6	+13·0	0	7	
		1945	0·483	299·4	170·7	+11·4	0	4	
		1943	0·310	117·0	129·2	−10·5	4	15	
		1943	0·400	115·0	123·7	−12·0	8	41	
		1944*a*	0·565	99·9	111·4	− 7·7	50	331	
		1944	0·611	98·3	108·0	− 7·1	0	7	
		1944	0·632	101·8	106·7	− 9·4	4	140	
		1944	0·702	102·3	101·4	−10·4	0	9	
			0·837	95·9	88·7	− 6·3			113
Dec. 26							(69)	(572)	(113)
360·156	H,EP	1943	0·149	154·7	128·9	−10·3	2	14	
I.		1943	0·228	138·6	123·8	−12·4	7	52	

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).
1886.				°	°	°			
360d·156		1944	0·361	97·9	111·7	− 5·2	0	7	
		1944*a*	0·371	104·9	111·5	− 7·9	89	353	
		1944	0·440	105·2	107·3	− 9·0	4	76	
		1944	0·471	103·4	105·1	− 8·6	4	43	
		1944	0·487	107·0	104·5	−10·5	3	28	
		1944	0·531	104·8	101·3	−10·0	0	4	
Dec. 27							(109)	(577)	(0)
361·229	H, M		0·827	285·3	172·4	+10·9			83
		1943	0·190	208·1	124·2	−12·4	2	22	
M.		1944*a*	0·142	130·2	112·0	− 8·0	38	301	
		1944	0·245	119·0	105·8	− 9·5	0	81	
		1944	0·305	114·5	102·0	−10·0	0	25	
		1946	0·979	106·7	40·0	−16·9	0	50	
Dec. 28							(40)	(479)	(83)
362·477	H,EP	1943	0·420	244·9	124·8	−12·9	2	9	
		1944*a*	0·198	242·6	112·1	− 8·1	30	250	
		1944	0·149	214·3	106·8	− 9·9	0	5	
		1944	0·120	202·5	104·6	− 9·2	0	3	
		1944	0·085	203·7	103·9	− 7·3	0	3	
		1944	0·117	185·7	102·6	− 9·6	0	8	
		1946	0·908	106·9	37·2	−16·5	12	102	90*c*
Dec. 29							(44)	(380)	(90)
363·159	H,EP	1944*b*	0·362	254·7	113·6	− 8·3	23	125	
		1944	0·337	253·7	112·0	− 8·2	0	7	
I.		1944*c*	0·310	254·1	110·4	− 7·7	18	100	
		1946	0·835	107·8	37·2	−16·5	15	108	165*f*
Dec. 30							(56)	(340)	(165)
364·522	H,EP	1944*b*	0·629	261·1	113·6	− 8·2	18	100	
		1944	0·599	261·5	111·5	− 7·7	0	7	
		1944*c*	0·577	261·3	109·9	− 7·6	0	25	
		1946	0·636	112·7	37·3	−16·7	12	81	
Dec. 31							(30)	(213)	(0)

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

Dec. 25. Photograph faint. Spots and Faculæ ill-defined.
Group 1946, 1886, Dec. 28–1887, Jan. 8. A regular spot.

Dec. 29 and 31. Photograph faint. Faculæ ill-defined.

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ROYAL OBSERVATORY, GREENWICH.

LEDGERS

OF

AREAS AND POSITIONS OF SPOT GROUPS

UPON THE SUN'S DISK,

DEDUCED FROM THE MEASUREMENT

OF THE

SOLAR PHOTOGRAPHS,

FOR EACH DAY IN THE YEAR

1886.

AREAS and HELIOGRAPHIC POSITIONS of the SPOT GROUPS on the SUN'S DISK 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 1886.

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.

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 1819.							
1885. d					°	°	°
Dec. 25·130	9	45	8	39	243·4	+ 7·9	− 53·3
26·143	9	32	5	21	244·0	+ 7·1	− 39·4
27·143	35	251	20	144	242·8	+ 7·0	− 27·4
28·144	24	228	12	119	244·9	+ 7·0	− 12·1
29·516	25	225	12	115	243·8	+ 7·5	+ 4·9
30·127	53	309	28	160	244·1	+ 7·0	+ 12·6
31·150	45	258	26	146	244·4	+ 6·8	+ 26·9
1886.							
Jan. 1·210	14	142	10	98	245·5	+ 7·3	+ 42·0
2·424	13	68	13	70	247·2	+ 7·6	+ 59·7
Means ...	...	...	15	101	244·48	+ 7·24	...
Group 1820.							
1885.							°
Dec. 31·150	0	64	0	143	141·0	+ 9·2	− 76·5
1886.							
Jan. 1·210	9	152	10	168	141·5	+ 8·9	− 62·0
2·424	10	86	8	64	141·4	+ 9·0	− 46·1
3·							
4·240	12	58	7	32	141·6	+ 9·5	− 22·3
5·492	7	32	4	17	141·6	+ 9·5	− 5·5
6·216	10	20	5	10	141·2	+ 9·6	+ 3·7
7·148	2	13	1	7	141·7	+ 9·4	+ 16·4
Means ...	...	...	5	63	141·43	+ 9·30	...

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 1821.							
1886. d					°	°	°
Jan. 2·424	4	133	12	403	106·4	− 13·0	− 81·1
3·							
4·240	92	629	89	617	104·6	− 13·3	− 59·3
5·492	112	832	76	565	104·9	− 13·9	− 42·2
6·216	123	809	74	491	104·4	− 13·8	− 33·1
7·148	202	1020	110	556	103·9	− 14·2	− 21·4
8·216	124	957	57	490	104·5	− 14·3	− 6·7
9·196	118	868	61	445	104·7	− 13·9	+ 6·4
10·155	147	848	79	453	103·2	− 14·0	+ 17·5
11·210	123	680	75	410	104·8	− 14·2	+ 33·1
12·231	87	481	64	353	105·3	− 13·5	+ 47·0
13·266	62	350	64	361	105·9	− 14·4	+ 61·2
14·524	8	80	18	170	105·2	− 14·1	+ 77·1
15·257	0	17	0	100	105·1	− 14·3	+ 86·5
Means ...	...	...	60	416	104·84	− 13·92	...
Group 1822.							
Jan. 4·240	2	27	1	22	111·6	− 7·1	− 52·3
Group 1823.							
Jan. 7·148	13	59	6	29	124·6	− 6·1	− 0·7
8·216	5	53	3	28	126·5	− 6·1	+ 15·3
9·196	0	13	0	7	126·9	− 6·1	+ 28·6
10·155	0	7	0	4	126·0	− 6·6	+ 40·3
Means ...	...	...	2	17	126·00	− 6·23	...

AREAS and HELIOGRAPHIC POSITIONS of SPOT GROUPS on the SUN'S DISK—*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 1824.							
1886. d					°	°	°
Jan. 7·148	0	11	0	7	95·8	+ 12·6	− 29·5
8·216	0	17	0	10	94·4	+ 13·4	− 16·8
9·196	0	6	0	3	98·2	+ 11·9	− 0·1
10·155	0	7	0	4	97·6	+ 11·7	+ 11·9
Means ...	...	...	0	6	96·50	+ 12·40	...
Group 1825.							
Jan. 8·216	0	4	0	4	54·5	− 9·7	− 56·7
Group 1826.							
Jan. 8·216	10	157	25	406	32·1	− 4·1	− 79·1
9·196	59	366	70	453	31·9	− 4·0	− 66·4
10·155	114	532	95	448	32·5	− 3·9	− 53·2
11·210	112	737	72	480	32·4	− 4·0	− 39·3
12·231	104	714	58	395	33·1	− 3·6	− 25·2
13·266	88	747	46	382	32·9	− 3·8	− 11·8
14·524	35	415	18	208	33·4	− 3·3	+ 5·3
15·257	55	431	28	222	33·4	− 3·4	+ 14·8
16·451	50	311	28	181	33·4	− 3·7	+ 30·6
17·541	5	137	3	95	32·1	− 3·5	+ 43·8
Means ...	...	...	44	327	32·72	− 3·73	...
Group 1827.							
Jan. 11·210	3	118	2	80	114·8	−11·2	+ 43·1
12·231	20	151	19	138	115·4	−10·3	+ 57·1
13·266	10	76	17	122	117·2	−11·8	+ 72·5
Means ...	...	...	13	113	115·80	−11·10	...
Group 1828.							
1886. d					°	°	°
Jan. 12·231	28	181	17	107	26·4	− 9·7	− 31·9
13·266	106	668	55	350	28·5	−10·4	− 16·2
14·524	153	1242	77	625	30·7	−10·2	+ 2·6
15·257	173	1407	89	722	31·0	−10·1	+ 12·4
16·451	174	1299	100	741	31·1	−10·2	+ 28·3
17·541	111	1428	77	956	30·1	− 9·9	+ 41·8
18·							
19·508	27	517	34	650	29·7	−10·0	+ 67·2
20·514	14	175	39	530	30·6	− 9·8	+ 81·1
21·142	0	27	0	161	27·2	−10·5	+ 86·2
Means ...	...	...	54	538	29·48	−10·09	...
Group 1829.							
Jan. 13·266	0	44	0	90	329·9	+ 9·4	− 74·8
14·524	6	233	10	224	330·7	+ 8·7	− 57·4
15·257	43	254	32	189	332·8	+ 9·1	− 45·8
16·451	42	326	24	195	333·2	+ 8·6	− 29·6
17·541	26	207	15	111	333·5	+ 8·8	− 14·8
18·							
19·508	0	47	0	24	337·1	+ 9·1	+ 14·6
20·514	4	38	2	22	337·5	+ 9·8	+ 28·0
21·142	5	64	4	42	338·1	+ 9·4	+ 37·1
22·213	2	8	2	7	339·4	+ 9·6	+ 52·5
Means ...	...	...	10	100	334·69	+ 9·17	...
Group 1830.							
Jan. 16·451	0	21	0	43	286·4	− 2·7	− 76·4
17·541	0	5	0	5	287·9	− 2·2	− 60·4
Means ...	...	...	0	24	287·15	− 2·45	...
Group 1831.							
Jan. 17·541	0	10	0	14	279·3	− 5·8	− 69·0

AREAS and HELIOGRAPHIC POSITIONS of SPOT GROUPS on the SUN'S DISK—*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 1832.							
1886. d					°	°	°
Jan. 23·239	0	20	0	11	281·9	− 8·3	+ 8·6
Group 1833.							
Jan. 30·263	0	110	0	196	106·3	−14·7	− 74·7
31·231	20	159	21	167	106·1	−14·8	− 62·0
Feb. 1·480	32	254	23	182	106·1	−15·0	− 45·6
2·289	67	403	41	246	107·1	−15·6	− 34·0
3·280	81	403	44	219	107·4	−15·0	− 20·6
4·567	45	419	24	213	108·4	−15·4	− 2·7
5·148	39	360	23	209	109·4	−15·3	+ 6·0
6·479	30	201	16	109	108·3	−14·6	+ 22·4
7·239	15	172	9	102	107·5	−15·1	+ 31·7
8·459	22	101	16	78	109·7	−14·9	+ 49·8
9·449	9	54	10	68	113·8	−13·5	+ 67·0
10·150	0	10	0	13	106·2	−15·0	+ 68·5
11·151	0	7	0	18	104·5	−14·9	+ 80·0
Means ...	...	...	17	140	107·75	−14·91	...
Group 1834.							
Feb. 4·567	0	26	0	13	115·4	− 7·0	+ 4·3
Group 1835.							
Feb. 4·567	23	229	45	441	35·3	−10·0	− 75·8
5·148	55	348	75	476	34·2	− 9·4	− 69·2
6·479	66	567	52	449	34·6	− 9·8	− 51·3
7·239	182	757	120	498	34·5	− 9·5	− 41·3
8·459	128	820	71	453	35·0	− 9·5	− 24·9
9·449	134	861	69	441	35·3	− 9·5	− 11·5
10·150	167	892	83	446	35·8	− 9·5	− 1·9
11·151	152	957	77	486	35·3	− 9·3	+ 10·8
12·180	160	817	89	454	35·5	− 9·4	+ 24·6
13·170	136	684	87	438	36·1	− 9·4	+ 38·3
14·186	67	425	52	333	35·4	− 9·5	+ 51·0
15·250	56	262	66	311	36·1	− 9·3	+ 65·7
16·186	24	115	53	259	36·3	− 9·4	+ 78·1
Means ...	...	...	72	422	35·34	− 9·50	...

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 1836.							
1886. d					°	°	°
Feb. 7·239	12	75	6	41	56·4	+ 7·0	− 19·4
8·459	18	89	9	46	58·8	+ 7·0	− 1·1
9·449	12	29	6	16	59·6	+ 6·9	+ 12·8
10·150	4	20	2	11	60·7	+ 6·6	+ 23·0
11·151	0	9	0	6	60·9	+ 6·9	+ 36·4
Means ...	...	...	5	24	59·28	+ 6·88	...
Group 1837.							
Feb. 8·459	0	12	0	10	116·3	− 6·6	+ 56·4
9·449	7	72	11	99	116·2	− 6·5	+ 69·4
10·150	0	21	0	50	116·1	− 7·5	+ 78·4
Means ...	...	...	4	53	116·20	− 6·87	...
Group 1838.							
Feb. 8·459	14	57	8	31	35·1	− 4·1	− 24·8
9·449	0	26	0	13	35·4	− 4·3	− 11·4
10·150	0	60	0	30	37·2	− 4·4	− 0·5
Means ...	...	...	3	25	35·90	− 4·27	...
Group 1839.							
Feb. 11·151	5	15	3	10	67·7	− 9·2	+ 43·2
Group 1840.							
Feb. 11·151	0	8	0	4	22·6	− 6·0	− 1·9
12·180	0	49	0	25	25·0	− 6·1	+ 14·1
13·170	26	182	14	103	26·2	− 5·3	+ 28·4
14·186	18	115	12	75	24·5	− 5·6	+ 40·1
15·250	0	59	0	55	27·8	− 5·0	+ 57·4
16·186	8	71	10	90	25·5	− 6·5	+ 67·3
17·251	3	37	10	126	26·4	− 5·6	+ 82·3
Means ...	...	...	7	68	25·43	− 5·73	...

AREAS and HELIOGRAPHIC POSITIONS of SPOT GROUPS on the SUN'S DISK—*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 1841.							
1886. d					°	°	°
Feb. 11·151	0	10	0	12	317·5	−11·2	− 67·0
12·180	0	36	0	29	317·9	− 9·8	− 53·0
13·170	0	5	0	3	319·1	− 9·7	− 38·7
Means ...	...	...	0	15	318·16	−10·23	...
Group 1842.							
Feb. 17·251	2	19	4	45	225·1	−15·7	− 79·0
18·181	3	38	4	47	224·8	−16·3	− 67·0
19·277	8	39	7	32	224·6	−17·1	− 52·8
20·162	4	45	3	30	224·4	−17·4	− 41·3
21·112	3	12	2	7	224·3	−17·6	− 28·8
22·525	0	17	0	8	224·7	−17·8	− 9·9
23·157	0	15	0	8	224·9	−17·8	− 1·5
Means ...	...	...	3	25	224·69	−17·10	...
Group 1843.							
Feb. 20·162	14	193	7	100	251·2	−14·4	−14·5
21·112	23	104	12	54	252·3	−14·5	− 0·8
22·525	0	86	0	46	252·6	−14·1	+18·0
23·157	0	15	0	9	256·6	−13·0	+30·2
24·429	0	0	0	0	...	...	...
25·200	0	3	0	3	256·4	−12·3	+57·0
Means ...	...	...	3	35	253·82	−13·66	...
Group 1844.							
Feb. 25·200	0	32	0	35	135·7	− 9·1	−63·7
26·428	11	81	7	57	138·2	− 9·3	−44·9
27·472	0	44	0	25	140·1	− 9·3	−29·3
28·196	7	84	4	44	140·5	− 8·8	−19·4
Mar. 1·207	5	64	2	31	138·1	− 9·9	− 8·6
2·454	2	8	1	4	142·3	− 9·4	+12·0
3·435	0	11	0	6	142·3	− 9·5	+25·1
4·473	0	13	0	9	142·7	− 9·6	+34·9
Means ...	...	...	2	26	139·99	− 9·36	...
Group 1845.							
1886. d					°	°	°
Feb. 26·428	1	15	1	8	187·7	+ 5·6	+ 4·6
Group 1846.							
Feb. 28·196	0	32	0	17	174·7	−14·3	+14·8
Mar. 1·207	16	44	10	26	174·2	−14·2	+27·5
2·454	0	16	0	12	178·5	−13·9	+48·2
3·435	0	17	0	17	179·0	−13·4	+61·8
Means ...	...	...	3	18	176·60	−13·95	...
Group 1847.							
Feb. 28·196	8	138	15	283	82·5	−16·7	−77·4
Mar. 1·207	66	770	72	876	81·9	−16·8	−64·8
2·454	95	1280	71	961	82·2	−17·2	−48·1
3·435	95	1317	57	808	82·7	−17·3	−34·5
4·473	120	1285	64	703	82·3	−17·5	−21·3
5·217	139	1165	79	603	83·6	−17·4	−10·1
6·226	92	959	47	489	84·2	−17·3	+ 3·7
7·507	67	705	36	384	83·8	−17·2	+20·2
8·430	71	654	43	396	84·4	−17·3	+33·0
9·448	51	436	37	318	84·4	−17·0	+46·5
10·419	18	288	17	276	84·6	−17·0	+59·4
11·465	5	136	8	210	83·9	−17·2	+72·5
Means ...	...	...	46	526	83·38	−17·16	...
Group 1848.							
Feb. 28·196	0	22	0	80	77·3	− 5·2	−82·6
Mar. 1·207	19	87	27	120	77·6	− 5·4	−69·1
2·454	21	106	17	86	77·7	− 6·0	−52·6
3·435	22	110	14	72	77·3	− 6·0	−39·9
4·473	6	78	3	44	76·9	− 5·9	−26·7
5·217	27	71	14	37	77·7	− 5·8	−16·0
6·226	5	22	3	11	78·0	− 5·9	− 2·5
7·507	0	14	0	7	78·3	− 5·8	+14·7
Means ...	...	...	10	57	77·60	− 5·75	...

AREAS and HELIOGRAPHIC POSITIONS of SPOT GROUPS on the SUN'S DISK—*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 1849.							
1886. d					°	°	°
Mar. 2·454	16	75	8	38	123·9	− 1·5	− 6·4
3·435	17	195	8	99	124·6	− 1·3	+ 7·4
4·473	11	382	6	205	124·0	− 1·6	+20·4
5·217	61	479	36	284	125·8	− 1·2	+32·1
6·226	99	822	75	602	127·3	− 1·2	+46·8
7·507	88	541	99	618	127·5	− 0·7	+63·9
8·430	44	449	85	890	126·7	− 1·5	+75·3
Means ...	...	...	45	391	125·69	− 1·29	...
Group 1850.							
Mar. 3·435	3	24	2	14	130·2	+10·2	+13·0
4·473	0	27	0	16	130·3	+ 9·5	+26·7
5·217	6	27	4	17	131·8	+ 9·5	+38·1
6·226	1	13	1	12	135·3	+ 9·0	+54·8
Means ...	...	...	2	15	131·90	+ 9·55	...
Group 1851.							
Mar. 3·435	9	58	20	127	39·9	− 3·4	− 77·3
4·473	16	96	18	108	39·5	− 3·1	− 64·1
5·217	25	149	21	126	40·3	− 2·7	− 53·4
6·226	38	194	24	126	40·6	− 2·2	− 39·9
7·507	30	213	16	117	41·0	− 2·7	− 22·6
8·430	28	279	14	144	41·1	− 2·8	− 10·3
9·448	20	231	10	116	41·4	− 2·6	+ 3·5
10·419	18	227	9	118	42·0	− 2·7	+ 16·8
11·465	24	157	14	91	42·1	− 2·7	+ 30·7
12·207	17	132	12	93	42·4	− 2·5	+ 40·9
13·569	6	44	5	43	42·7	− 2·2	+ 59·0
14·219	2	34	3	44	42·8	− 2·3	+ 67·7
Means ...	...	...	14	104	41·32	− 2·66	...
Group 1852.							
Mar. 3·435	8	62	24	194	35·4	− 8·8	− 81·8
4·473	24	164	32	220	34·7	− 8·8	− 68·9
5·217	31	228	29	214	35·4	− 8·4	− 58·3
6·226	50	316	35	220	35·7	− 8·1	− 44·8
7·507	52	338	29	192	35·7	− 8·6	− 27·9
8·430	52	378	27	196	35·9	− 8·6	− 15·5
9·448	46	374	23	186	35·9	− 8·4	− 2·0
Group 1852—*continued.*							
1886. d					°	°	°
Mar. 10·419	50	368	26	188	36·0	− 8·3	+ 10·8
11·405	37	576	20	317	35·9	− 9·3	+ 24·5
12·207	75	480	48	307	36·1	− 9·2	+ 34·6
13·569	38	341	31	274	35·5	− 9·0	+ 51·8
14·219	44	246	45	244	35·5	− 9·0	+ 60·4
15·229	12	101	21	182	36·2	− 8·9	+ 74·5
Means ...	...	...	30	226	35·68	− 8·72	...
Group 1853.							
Mar. 4·473	12	74	32	196	23·8	− 5·0	− 79·8
5·217	45	473	62	701	23·4	− 4·8	− 70·3
6·226	123	819	112	762	22·7	− 4·6	− 57·8
7·507	168	1143	110	763	22·3	− 5·2	− 41·3
8·430	197	1397	112	799	22·6	− 5·5	− 28·8
9·448	129	1469	67	765	22·2	− 5·2	− 15·7
10·419	178	1329	88	660	22·5	− 5·3	− 2·7
11·465	153	1383	78	705	22·6	− 5·3	+ 11·2
12·207	178	1175	99	653	22·7	− 5·3	+ 21·2
13·569	142	969	92	629	23·0	− 5·0	+ 39·3
14·219	201	798	149	592	23·0	− 5·0	+ 47·9
15·229	104	601	109	632	23·5	− 5·1	+ 61·8
16·327	56	296	113	603	23·4	− 4·3	+ 76·1
Means ...	...	...	94	651	22·90	− 5·05	...
Group 1854.							
Mar. 16·327	5	32	3	17	331·2	− 10·1	+ 23·9
17·440	18	103	11	68	333·7	− 9·3	+ 41·1
18·202	19	179	15	142	334·0	− 9·5	+ 51·5
19·465	5	45	8	60	334·7	− 8·8	+ 68·7
20·159	8	74	21	171	334·8	− 8·9	+ 78·0
Means ...	...	...	12	92	333·68	− 9·32	...
Group 1855.							
Mar. 18·202	0	6	0	9	211·1	− 12·3	− 71·4
19·465	0	11	0	9	213·2	− 12·4	− 52·8
20·159	4	15	2	11	209·6	− 11·8	− 47·2
21·196	2	27	1	16	211·7	− 12·6	− 31·4
22·205	0	4	0	2	210·7	− 12·3	− 19·1
Means ...	...	...	1	9	211·26	− 12·28	...

AREAS and HELIOGRAPHIC POSITIONS of SPOT GROUPS on the SUN'S DISK—*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 1856.							
1886. d					°	°	°
Mar. 18·202	8	65	35	268	200·2	+ 5·0	− 82·3
19·465	30	215	39	275	200·1	+ 4·9	− 65·9
20·159	46	335	46	329	198·5	+ 5·2	− 58·3
21·196	62	390	45	280	199·2	+ 5·3	− 43·9
22·205	97	592	57	354	199·3	+ 5·6	− 30·5
23·141	164	594	88	319	199·1	+ 5·5	− 18·3
24·466	97	633	50	325	199·3	+ 5·4	− 0·7
25·594	62	557	33	294	199·7	+ 5·3	+ 14·5
26·426	70	516	40	295	199·8	+ 5·5	+ 25·6
27·116	78	428	48	262	200·0	+ 5·5	+ 34·9
28·188	42	281	33	221	199·8	+ 5·4	+ 48·9
29·421	22	143	27	176	199·6	+ 5·6	+ 65·0
30·232	9	57	28	172	200·2	+ 5·5	+ 76·3
Means ...	...	...	44	275	199·60	+ 5·36	...
Group 1857.							
Mar. 19·465	0	52	0	36	311·4	− 13·0	+ 45·4
20·159	0	14	0	12	312·9	− 12·8	+ 56·1
Means	...	...	0	24	312·15	− 12·90	...
Group 1858.							
Mar. 20·159	4	97	2	51	244·3	+ 2·5	− 12·5
21·196	50	210	24	106	244·3	+ 2·2	+ 1·2
22·205	45	184	24	98	246·7	+ 1·8	+ 16·9
23·141	36	187	21	110	247·5	+ 1·7	+ 30·1
24·466	8	54	6	42	249·0	+ 1·1	+ 49·0
25·594	2	26	3	30	248·9	+ 0·1	+ 63·7
Means ...	...	...	13	73	246·78	+ 1·57	...
Group 1859.							
Mar. 23·141	0	70	0	203	137·2	− 1·0	− 80·2
24·466	32	415	38	505	134·4	− 1·6	− 65·6
25·594	79	559	64	441	135·1	− 1·1	− 50·1
26·426	63	733	41	481	134·2	− 1·3	− 40·0
27·116	113	741	64	420	134·8	− 1·2	− 30·3
28·188	80	668	41	348	135·3	− 1·1	− 15·6
29·421	94	488	47	244	135·8	− 1·0	+ 1·2
30·232	73	525	38	273	136·5	− 1·2	+ 12·6
31·418	60	438	35	264	137·1	− 1·2	+ 28·7
Group 1859—*continued.*							
1886. d					°	°	°
Apr. 1·386	37	331	25	225	137·6	− 1·2	+ 42·0
2·432	36	234	32	205	136·7	− 1·4	+ 54·9
3·567	15	178	22	249	135·7	− 1·8	+ 69·0
4·102	23	158	49	341	136·3	− 1·8	+ 76·6
Means ...	...	...	38	323	135·90	− 1·30	...
Group 1860.							
Mar. 26·426	0	22	0	22	113·2	−15·8	− 61·0
27·116	23	118	19	95	112·8	−16·6	− 52·3
28·188	81	483	52	303	114·1	−16·8	− 36·8
29·421	51	929	27	499	114·9	−16·7	− 19·7
30·232	127	1008	65	518	115·3	−16·8	− 8·6
31·418	113	939	58	487	116·5	−17·0	+ 8·1
Apr. 1·386	132	1027	73	566	117·2	−17·1	+ 21·6
2·432	123	1352	78	849	117·4	−17·2	+ 35·6
3·567	123	1024	99	808	117·0	−17·4	+ 50·3
4·102	129	796	126	755	118·0	−17·0	+ 58·3
5·446	13	205	30	453	120·0	−16·3	+ 78·1
Means ...	...	...	57	487	116·04	−16·79	...
Group 1861.							
Mar. 29·421	0	13	0	27	57·3	−11·8	− 77·3
30·232	8	34	12	47	53·7	−11·9	− 70·2
31·418	0	61	0	48	57·2	−11·4	− 51·2
Apr. 1·386	12	218	4	143	55·8	−11·9	− 39·8
2·432	10	119	6	66	56·9	−11·5	− 24·9
3·567	44	360	23	185	54·7	−11·8	− 12·0
4·102	43	373	22	190	55·4	−11·7	− 4·3
5·446	22	368	13	210	55·8	−11·7	+ 13·9
6·419	29	409	17	234	56·9	−11·4	+ 27·8
7·286	63	474	40	303	55·9	−11·8	+ 38·2
8·544	8	154	7	135	56·2	−11·8	+ 55·1
9·417	10	89	12	101	54·3	−12·3	+ 64·7
Means ...	...	...	13	141	55·84	−11·75	...

AREAS and HELIOGRAPHIC POSITIONS of SPOT GROUPS on the SUN'S DISK—*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 1862.							
1886. d					°	°	°
Mar. 30·232	0	14	0	18	56·1	− 8·7	− 67·8
31·418	0	5	0	4	57·7	− 9·0	− 50·7
Apr. 1·386	0	9	0	6	54·9	− 8·8	− 40·7
Means ...	...	...	0	9	56·23	− 8·83	...
Group 1863.							
Mar. 31·418	0	13	0	19	37·8	− 10·7	− 70·6
Apr. 1·386	0	15	0	14	37·6	− 11·0	− 58·0
2·432	0	30	0	21	37·8	− 11·9	− 44·0
3·567	0	48	0	28	38·2	− 11·6	− 28·5
4·102	19	86	10	46	38·3	− 11·9	− 21·4
5·446	0	16	0	8	37·9	− 11·0	− 4·0
6·419	0	8	0	4	37·1	− 10·7	+ 8·0
7·286	0	7	0	4	37·2	− 11·9	+ 19·5
Means ...	...	...	1	18	37·74	− 11·34	...
Group 1864.							
Mar. 31·418	0	57	0	217	25·5	− 4·6	− 82·9
Apr. 1·386	44	170	65	248	25·4	− 4·9	− 70·2
2·432	44	286	40	256	25·6	− 5·3	− 56·2
3·567	79	430	52	283	25·8	− 5·3	− 40·9
4·102	101	476	61	288	25·8	− 5·4	− 33·9
5·446	112	511	58	260	26·4	− 5·5	− 15·5
6·419	118	538	59	270	26·3	− 5·4	− 2·8
7·286	119	518	60	263	27·0	− 5·6	+ 9·3
8·544	105	481	58	268	27·0	− 5·9	+ 25·9
9·417	93	420	59	267	27·7	− 5·8	+ 38·1
10·479	73	341	60	279	28·0	− 5·5	+ 52·4
11·627	37	195	48	253	28·0	− 5·5	+ 67·7
12·437	6	73	15	176	28·1	− 5·7	+ 78·5
Means ...	...	...	49	256	26·66	− 5·42	...
Group 1865.							
Apr. 2·432	0	20	0	10	89·8	+ 7·5	+ 8·0
3·567	0	28	0	16	90·8	+ 7·3	+ 24·1
4·102	9	71	5	43	91·6	+ 7·4	+ 31·9
5·446	0	24	0	20	92·9	+ 7·6	+ 51·0
6·419	0	14	0	18	94·5	+ 8·0	+ 65·4
7·286	0	3	0	8	96·2	+ 8·1	+ 78·5
Means ...	...	...	1	19	92·63	+ 7·65	...

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 1866.							
1886. d					°	°	°
Apr. 7·286	0	17	0	9	23·9	+ 15·4	+ 6·2
8·544	1	20	1	11	24·7	+ 14·5	+ 23·6
Means ...	...	...	1	10	24·30	+ 14·95	...
Group 1867.							
Apr. 10·479	0	26	0	19	293·2	− 24·3	− 42·4
11·627	0	47	0	26	294·2	− 25·0	− 26·1
Means ...	...	...	0	23	293·70	− 24·65	...
Group 1868.							
Apr. 15·557	0	15	0	8	243·2	− 8·7	− 25·4
16·389	0	8	0	4	244·3	− 8·8	− 13·2
Means ...	...	...	0	6	243·75	− 8·75	...
Group 1869.							
Apr. 15·557	20	106	26	141	201·4	+ 4·7	− 67·2
16·389	19	146	17	134	201·4	+ 4·2	− 56·1
17·102	36	162	27	121	201·2	+ 4·4	− 46·9
18·103	29	222	18	136	201·2	+ 4·4	− 33·6
19·391	19	213	10	112	201·4	+ 4·3	− 16·4
20·578	23	187	12	95	201·9	+ 4·0	− 0·3
21·159	33	220	17	113	202·1	+ 4·3	+ 7·6
22·430	18	111	10	62	202·3	+ 4·2	+ 24·6
23·451	19	121	13	78	202·1	+ 4·2	+ 37·8
24·499	21	78	17	66	203·3	+ 3·8	+ 53·0
25·582	0	27	0	34	201·6	+ 4·2	+ 65·6
26·564	0	25	0	62	201·3	+ 4·3	+ 78·1
Means ...	...	...	14	96	201·77	+ 4·25	...
Group 1870.							
Apr. 16·389	7	33	4	17	264·3	+ 11·7	+ 6·8
17·102	5	52	3	28	265·0	+ 12·1	+ 16·9
Means ...	...	...	4	23	264·65	+ 11·90	...

AREAS and HELIOGRAPHIC POSITIONS of SPOT GROUPS on the SUN'S DISK—*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 1871.							
1886. d					°	°	°
Apr. 19·391	4	34	6	52	147·8	+ 8·9	−70·0
20·578	18	92	16	81	148·7	+ 9·1	−53·5
21·159	23	122	17	91	148·9	+ 9·3	−45·6
22·430	14	56	8	33	150·0	+ 8·2	−27·7
23·451	0	12	0	6	150·4	+ 7·9	−13·9
Means ...	...	...	9	53	149·16	+ 8·68	...
Group 1872.							
Apr. 19·391	4	58	12	165	137·9	− 1·6	−79·9
20·578	21	214	24	247	138·1	− 1·3	−64·1
21·159	38	151	35	137	138·4	− 0·9	−56·1
22·430	25	214	16	136	139·2	− 1·3	−38·7
23·451	15	171	9	95	139·1	− 1·6	−25·2
24·499	35	172	18	89	139·3	− 2·0	−11·0
25·582	20	171	10	86	139·4	− 1·7	+ 3·4
26·564	13	150	7	77	139·7	− 1·5	+16·5
27·388	12	47	7	26	139·9	− 1·3	+27·7
28·524	5	325	3	220	139·7	− 1·7	+42·5
29·511	18	413	17	370	140·3	− 1·5	+56·2
30·389	15	291	20	413	141·8	− 1·1	+69·3
May 1·433	0	51	0	148	138·9	− 0·5	+80·2
Means ...	...	...	14	170	139·36	− 1·38	...
Group 1873.							
Apr. 20·578	0	11	0	25	126·4	+10·1	−75·8
21·159	2	26	4	42	124·5	+12·1	−70·0
22·430	3	67	3	60	124·1	+12·0	−53·6
23·451	0	38	0	25	125·7	+ 9·9	−38·6
24·499	1	25	1	14	125·3	+10·0	−25·0
Means ...	...	...	2	33	125·20	+10·82	...
Group 1874.							
Apr. 20·578	18	128	67	463	118·9	−17·6	−83·3
21·159	71	249	137	480	118·7	−18·1	−75·8
22·430	64	503	62	495	118·3	−18·4	−59·4
23·451	98	691	72	508	118·0	−18·8	−46·3
24·499	96	653	59	398	117·8	−18·4	−32·5
25·582	101	783	54	425	117·5	−18·8	−18·5
Group 1874—*continued.*							
1886. d					°	°	°
Apr. 26·564	98	764	51	395	117·9	−18·3	− 5·3
27·388	130	774	67	399	117·9	−18·5	+ 5·7
28·524	134	677	74	373	117·4	−18·4	+20·2
29·511	99	634	61	388	116·9	−18·1	+32·8
30·389	60	548	43	393	117·2	−18·1	+44·7
May 1·433	72	333	69	320	116·8	−18·0	+58·1
2·406	26	257	40	385	116·4	−18·1	+70·6
3·418	10	95	38	365	115·9	−18·0	+83·3
Means ...	...	...	64	413	117·54	−18·26	...
Group 1875.							
Apr. 23·451	0	13	0	6	163·0	− 6·5	− 1·3
Group 1876.							
Apr. 27·388	0	47	0	143	31·3	− 6·6	− 80·9
28·524	17	136	21	164	31·5	− 6·5	− 65·7
29·511	28	228	23	185	31·9	− 6·6	− 52·2
30·389	29	285	19	188	31·7	− 6·6	− 40·8
May 1·433	52	350	29	196	32·2	− 6·8	− 26·5
2·406	51	357	26	186	32·3	− 6·6	− 13·5
3·418	45	341	23	172	32·6	− 6·5	0·0
4·432	52	329	27	171	32·7	− 6·7	+ 13·5
5·553	45	309	26	179	32·7	− 6·6	+ 28·4
6·454	48	224	32	146	32·4	− 6·4	+ 40·0
7·462	17	179	14	151	32·5	− 6·2	+ 53·5
8·185	26	146	29	162	32·8	− 6·5	+ 63·3
9·524	0	47	0	131	31·6	− 6·0	+ 79·8
Means ...	...	...	21	167	32·17	− 6·51	...
Group 1877.							
Apr. 28·524	0	29	0	19	55·9	− 3·3	− 41·3
29·511	0	10	0	6	55·2	− 4·2	− 28·9
30·389	0	25	0	12	55·9	− 3·6	− 16·6
Means ...	...	...	0	12	55·67	− 3·70	...

AREAS and HELIOGRAPHIC POSITIONS of SPOT GROUPS on the SUN'S DISK—*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 1878.							
1886. d					°	°	°
Apr. 29·511	12	96	6	50	68·9	− 11·3	− 15·2
30·389	8	145	4	73	68·5	− 11·4	− 4·0
May 1·433	51	463	26	238	69·5	− 11·4	+ 10·8
2·406	135	1472	75	819	69·7	− 11·6	+ 23·9
3·418	159	1417	104	910	70·3	− 11·5	+ 37·7
4·432	136	1099	112	888	70·2	− 11·6	+ 51·0
5·553	58	841	73	983	68·9	− 11·2	+ 64·6
6·454	56	456	116	884	67·7	− 11·6	+ 75·3
Means ...	...	...	65	606	69·21	− 11·45	...
Group 1879.							
May 1·433	0	23	0	21	0·7	− 11·5	− 58·0
Group 1880.							
May 2·406	13	344	31	809	328·9	+ 8·7	− 76·9
3·418	71	746	87	942	327·1	+ 8·4	− 65·5
4·432	93	1111	80	944	326·9	+ 8·6	− 52·3
5·553	83	1600	54	1048	326·5	+ 8·6	− 37·8
6·454	287	1987	163	1125	328·1	+ 8·7	− 24·3
7·462	151	2027	79	1054	328·6	+ 8·4	− 10·4
8·185	193	1794	100	925	328·8	+ 8·5	− 0·7
9·524	73	1435	40	778	330·5	+ 8·4	+ 18·7
10·460	91	1066	57	651	331·9	+ 9·0	+ 32·4
11·265	104	674	77	495	334·4	+ 8·8	+ 45·6
12·160	37	254	38	258	337·2	+ 8·7	+ 60·3
13·145	3	72	5	131	337·4	+ 8·3	+ 73·6
Means ...	...	...	68	763	330·53	+ 8·59	...
Group 1881.							
May 12·160	0	33	0	18	276·9	− 22·8	0·0
13·145	8	60	4	33	277·3	− 23·0	+ 13·5
Means ...	...	...	2	26	277·10	− 22·90	...

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 1882.							
1886. d					°	°	°
May 13·145	0	95	0	73	313·2	− 5·8	+ 49·4
14·091	12	73	12	80	314·3	− 5·6	+ 62·9
Means ...	...	...	6	77	313·75	− 5·70	...
Group 1883.							
May 20·097	11	24	7	15	205·3	− 10·2	+ 33·5
Group 1884.							
May 21·403	22	99	64	287	74·3	− 11·0	− 80·3
22·194	37	267	53	386	74·6	− 10·9	− 69·6
23·678	92	478	73	380	74·1	− 10·4	− 50·5
24·098	124	529	89	377	74·0	− 10·6	− 45·0
25·573	144	577	81	327	73·9	− 10·6	− 25·6
26·449	121	611	63	320	74·2	− 10·7	− 13·6
27·526	173	708	88	360	74·0	− 10·7	+ 0·5
28·393	135	618	70	321	74·3	− 10·7	+ 12·1
29·529	117	560	67	323	74·3	− 10·6	+ 27·2
30·483	98	502	65	333	74·4	− 10·6	+ 39·9
31·544	77	389	67	337	74·4	− 10·6	+ 54·0
June 1·524	51	217	66	282	74·5	− 10·5	+ 67·0
2·417	25	93	63	235	74·0	− 10·4	+ 78·4
Means ...	...	...	70	328	74·23	− 10·64	...
Group 1885.							
May 22·194	0	10	0	7	183·7	+ 10·8	+ 39·5
23·678	16	58	16	57	182·8	+ 10·6	+ 58·2
24·098	18	115	23	138	183·7	+ 10·6	+ 64·7
Means ...	...	...	13	67	183·40	+ 10·67	...

AREAS and HELIOGRAPHIC POSITIONS of SPOT GROUPS on the SUN'S DISK—*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 1886.							
1886. d					°	°	°
May 24·098	0	11	0	56	34·2	− 5·9	− 84·8
25·573	9	51	11	60	34·8	− 5·8	− 64·7
26·449	6	52	5	44	34·7	− 6·4	− 53·1
27·526	9	70	6	45	34·8	− 6·2	− 38·7
28·393	13	64	7	36	34·9	− 6·0	− 27·3
29·529	16	56	8	29	35·0	− 5·8	− 12·1
30·483	8	32	4	16	35·1	− 5·4	+ 0·6
31·544	4	22	2	11	35·3	− 5·3	+ 14·9
Means ...	...	...	5	37	34·85	− 5·85	...
Group 1887.							
May 29·529	0	27	0	18	5·5	+ 11·4	− 41·6
30·483	4	128	2	76	5·0	+ 11·2	− 29·5
Means ...	...	...	1	47	5·25	+ 11·30	...
Group 1888.							
May 30·483	12	75	11	70	90·8	− 12·5	+ 56·3
31·544	46	206	67	319	91·2	− 12·6	+ 70·8
June 1·524	14	73	45	241	88·6	− 12·8	+ 81·1
Means ...	...	...	41	210	90·20	− 12·63	...
Group 1889.							
May 31·544	0	36	1	20	40·4	+ 14·0	+ 20·0
June 1·524	8	24	5	15	41·7	+ 14·3	+ 34·2
2·417	0	13	0	10	42·2	+ 14·0	+ 46·6
Means ...	...	...	2	15	41·43	+ 14·10	...
Group 1890.							
1886. d					°	°	°
June 2·417	3	74	2	40	338·4	+ 10·1	− 17·2
3·089	20	176	10	91	337·9	+ 10·1	− 8·8
4·382	4	128	2	67	340·4	+ 9·8	+ 10·7
5·473	9	119	5	65	338·0	+ 10·8	+ 22·7
6·572	40	206	27	134	339·2	+ 10·6	+ 38·5
7·429	12	96	10	79	340·4	+ 10·3	+ 51·1
8·402	0	79	0	93	340·6	+ 10·1	+ 64·2
Means ...	...	...	8	81	339·27	+ 10·26	...
Group 1891.							
June 3·089	6	45	4	35	297·8	− 14·4	− 48·9
4·382	98	541	59	325	299·8	− 14·7	− 29·9
5·473	197	1048	105	558	301·9	− 14·9	− 13·4
6·572	179	1232	94	641	302·1	− 15·2	+ 1·4
7·429	207	1440	111	770	302·3	− 15·4	+ 13·0
8·402	177	1259	104	742	303·5	− 15·1	+ 27·1
9·420	163	914	113	630	304·1	− 14·7	+ 41·2
10·301	119	613	105	534	304·5	− 14·4	+ 53·2
11·402	54	339	76	475	304·9	− 14·1	+ 68·1
12·383	18	110	61	377	305·0	− 14·3	+ 81·2
Means ...	...	...	83	509	302·59	− 14·72	...
Group 1892.							
June 4·382	0	8	0	5	7·8	− 13·3	+ 38·1
5·473	0	58	0	51	10·3	− 12·8	+ 55·0
6·572	0	12	0	18	12·3	− 12·3	+ 71·6
Means ...	...	...	0	25	10·13	− 12·80	...
Group 1893.							
June 6·572	0	24	0	15	337·3	− 5·0	+ 36·6
7·429	0	28	0	22	339·0	− 4·9	+ 49·7
8·402	0	23	0	24	338·0	− 4·7	+ 61·6
Means ...	...	...	0	20	338·10	− 4·86	...

AREAS and HELIOGRAPHIC POSITIONS of SPOT GROUPS on the SUN'S DISK—*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 1894.							
1886. d June 6·572	0	8	0	5	° 333·0	° + 5·1	° + 32·3
Group 1895.							
June 9·420	0	11	0	16	194·6	+ 5·1	− 68·3
10·301	0	8	0	7	194·2	+ 5·1	− 57·1
Means ...	...	...	0	12	194·40	+ 5·10	...
Group 1896.							
June 16·460	11	68	18	113	98·2	− 14·6	− 71·6
17·500	19	84	19	82	98·3	− 14·9	− 57·8
18·164	27	127	22	102	98·1	− 15·0	− 49·2
19·429	17	190	11	118	98·1	− 14·7	− 32·4
20·366	20	188	11	105	97·9	− 14·7	− 20·2
21·196	29	173	15	91	98·0	− 14·6	− 9·1
22·549	28	161	15	85	97·8	− 15·0	+ 8·7
23·385	18	145	10	82	98·4	− 15·0	+ 20·2
24·393	22	76	14	48	98·0	− 15·3	+ 33·2
25·391	13	56	10	43	98·1	− 15·5	+ 46·6
26·417	5	16	5	17	98·1	− 15·7	+ 60·1
Means ...	...	...	14	81	98·09	− 15·00	...
Group 1897.							
June 17·500	0	82	0	296	74·5	−11·6	−81·6
18·164	27	136	51	253	73·7	−11·6	−73·6
19·429	45	257	42	240	74·2	−11·3	−56·3
20·366	30	278	22	201	74·1	−11·7	−44·0
21·196	35	276	21	168	74·6	−11·0	−32·5
22·549	37	270	19	143	74·2	−11·6	−14·9
23·385	19	250	10	129	74·5	−11·7	− 3·7
24·393	13	197	7	102	74·2	−11·7	+ 9·4
25·391	17	203	9	113	74·0	−11·8	+22·5
26·417	20	144	13	92	73·9	−12·0	+35·9
27·484	8	97	7	79	73·7	−11·9	+49·9
28·398	0	19	0	21	73·6	−12·4	+61·9
Means ...	...	...	17	153	74·10	−11·69	...
Group 1898.							
1886. d June 22·549	9	124	6	78	° 126·4	° +8·7	° +37·3
23·385	31	177	25	138	127·8	+8·8	+49·6
24·393	8	93	10	111	130·1	+8·6	+65·3
Means ...	...	...	14	109	128·10	+8·70	...
Group 1899.							
June 20·366	0	17	0	34	42·5	−3·5	−75·6
21·196	0	0	0	0	...	...	...
22·549	0	10	0	7	42·7	−3·1	−46·4
23·385	2	27	1	17	43·2	−3·3	−35·0
Means ...	...	...	1	15	42·80	−3·30	...
Group 1900.							
June 27·484	2	92	1	61	343·7	+11·0	−40·1
28·398	2	110	1	62	345·0	+11·1	−26·7
Means ...	...	...	1	62	344·35	+11·05	...
Group 1901.							
June 27·484	0	71	0	244	303·3	−15·1	−80·5
28·398	35	245	52	364	302·9	−14·9	−68·8
29·406	54	446	51	417	303·2	−15·0	−55·2
30·393	81	811	58	581	303·4	−15·5	−42·0
July 1·413	129	1000	79	614	302·5	−16·0	−29·3
2·391	123	918	69	510	302·3	−15·9	−16·6
3·399	145	883	77	468	302·0	−15·8	− 3·5
4·404	131	792	70	426	301·7	−15·8	+ 9·4
5·407	117	600	67	344	301·1	−15·4	+22·2
6·402	69	512	45	332	301·4	−15·5	+35·5
7·500	79	442	65	366	301·2	−14·9	+49·9
8·518	42	275	51	331	301·3	−14·9	+63·5
9·420	22	133	47	288	300·9	−14·7	+75·1
Means ...	...	...	56	407	302·09	−15·34	...

AREAS and HELIOGRAPHIC POSITIONS of SPOT GROUPS on the SUN'S DISK—*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 1902.							
1886. d					°	°	°
June 28·398	5	52	7	83	300·3	+18·5	−71·4
29·406	18	77	18	77	299·5	+18·6	−58·9
30·393	23	93	17	69	299·7	+18·6	−45·7
July 1·413	13	84	8	52	299·2	+18·7	−32·6
2·391	11	95	6	52	299·0	+18·4	−19·9
3·399	15	40	8	21	298·9	+18·2	− 6·6
4·404	0	25	0	12	298·5	+18·8	+ 6·2
Means ...	...	...	9	52	299·30	+18·54	...
Group 1903.							
June 29·406	5	100	7	144	291·5	−19·9	−66·9
30·393	14	137	13	130	291·3	−20·0	−54·1
July 1·413	3	104	2	76	290·7	−20·5	−41·1
2·391	0	86	0	53	291·0	−20·7	−27·9
3·399	6	100	4	56	291·1	−21·0	−14·4
4·404	13	85	7	47	291·4	−21·1	− 0·9
5·407	23	121	13	66	286·4	−19·1	+ 7·5
6·402	11	162	7	95	287·4	−19·2	+21·5
7·500	0	165	0	112	288·1	−19·4	+36·8
8·518	0	61	0	50	285·3	−19·4	+47·5
9·420	0	5	0	6	284·1	−19·3	+58·3
Means ...	...	...	5	76	288·94	−19·96	...
Group 1904.							
July 13·472	0	12	0	8	211·8	−10·1	+ 39·5
14·389	0	66	0	55	211·7	−10·1	+ 51·5
Means ...	...	...	0	32	211·75	−10·10	...
Group 1905.							
July 14·389	4	15	2	9	186·2	−12·4	+ 26·0
Group 1906.							
1886. d					°	°	°
July 15·466	0	20	0	42	70·9	−10·2	− 75·1
16·387	8	105	9	121	70·5	− 9·9	− 63·2
17·128	36	225	30	194	71·1	− 9·4	− 52·8
18·557	114	713	72	443	71·9	− 9·3	− 33·2
19·200	117	682	65	386	72·7	− 9·0	− 23·9
20·403	205	911	107	474	73·3	− 9·2	− 7·3
21·421	162	950	85	495	74·1	− 9·1	+ 7·0
22·408	185	1016	103	564	74·3	− 9·4	+ 20·3
23·217	114	738	70	449	75·4	− 8·8	+ 32·1
24·404	81	624	64	486	75·4	− 9·3	+ 47·8
25·198	36	325	37	325	75·6	− 9·2	+ 58·4
26·388	7	85	15	177	76·4	− 9·6	+ 75·0
Means ...	...	...	55	346	73·47	− 9·37	...
Group 1907.							
July 16·387	0	7	0	13	62·2	−18·9	− 71·5
17·128	0	12	0	16	62·1	−18·8	− 61·8
Means ...	...	...	0	15	62·15	−18·85	...
Group 1908.							
July 21·421	8	62	13	99	355·5	− 2·6	− 71·6
22·408	15	102	14	98	356·4	− 2·7	− 57·6
23·217	8	103	6	76	356·3	− 2·8	− 47·0
24·404	19	141	11	83	356·5	− 3·0	− 31·1
25·198	29	153	16	83	356·5	− 3·2	− 20·7
26·388	36	204	18	103	356·7	− 3·2	− 4·7
27·492	31	220	16	112	356·8	− 3·5	+ 10·0
28·433	39	205	21	113	357·0	− 3·2	+ 22·6
29·448	20	170	13	108	357·3	− 3·2	+ 36·4
30·508	15	117	12	94	357·3	− 3·1	+ 50·4
31·505	13	78	14	90	357·3	− 3·5	+ 63·6
Means ...	...	...	14	96	356·69	− 3·09	...
Group 1909.							
July 24·404	0	66	0	39	356·6	+ 7·4	− 31·0
25·198	0	22	0	12	358·3	+ 7·4	− 18·9
Means ...	...	...	0	26	357·45	+ 7·40	...

AREAS and HELIOGRAPHIC POSITIONS of SPOT GROUPS on the SUN'S DISK—*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 1910.							
1886. d					°	°	°
July 25·198	7	67	16	160	300·9	−13·1	− 76·3
26·388	24	161	27	182	300·1	−13·1	− 61·3
27·492	59	249	46	196	299·7	−13·5	− 47·1
28·433	43	292	28	188	299·9	−13·2	− 34·5
29·448	30	274	17	156	300·3	−13·1	− 20·6
30·508	48	261	26	139	300·6	−13·2	− 6·3
31·505	43	248	23	132	300·9	−13·2	+ 7·2
Aug. 1·496	27	199	15	113	300·7	−13·6	+ 20·0
2·232	23	185	14	114	300·9	−13·3	+ 30·0
3·584	25	100	20	81	300·7	−13·4	+ 47·7
4·305	18	117	18	118	301·0	−13·3	+ 57·5
5·426	7	53	13	97	300·7	−13·4	+ 72·0
Means ...	...	...	22	140	300·53	−13·28	...
Group 1911.							
July 26·388	2	83	1	48	332·6	− 0·7	− 28·8
27·492	18	112	9	58	335·7	0·0	− 11·1
28·433	8	45	4	23	336·8	+ 1·1	+ 2·4
29·448	7	28	4	15	338·0	+ 1·7	+ 17·1
30·508	0	13	0	8	338·4	+ 2·1	+ 31·5
Means ...	...	...	4	30	336·30	+ 0·84	...
Group 1912.							
July 26·388	7	65	8	73	297·6	+16·9	− 63·8
27·492	21	230	15	176	298·0	+17·3	− 48·8
28·433	52	376	33	236	299·0	+16·9	− 35·4
29·448	48	489	26	268	299·3	+16·8	− 21·6
30·508	34	501	17	258	299·6	+16·6	− 7·3
31·505	66	381	33	196	300·5	+16·6	+ 6·8
Aug. 1·496	33	349	18	189	299·9	+16·5	+ 19·2
2·232	74	378	44	221	300·2	+16·7	+ 29·3
3·584	17	109	13	83	301·3	+16·5	+ 48·3
4·305	9	43	10	44	302·7	+17·0	+ 59·2
5·426	0	31	0	52	302·1	+16·8	+ 73·4
Means ...	...	...	20	163	300·02	+16·78	...
Group 1913.							
1886. d					°	°	°
Aug. 2·232	0	30	0	30	212·6	− 5·7	− 58·3
3·584	0	36	0	24	210·9	− 5·7	− 42·1
4·305	17	112	10	66	213·4	− 5·4	− 30·1
5·426	20	169	10	88	215·3	− 4·9	− 13·4
6·589	52	285	26	146	215·3	− 5·5	+ 2·1
7·405	37	323	19	168	215·3	− 5·4	+ 12·8
8·414	29	166	17	96	217·2	− 4·7	+ 28·1
9·576	11	104	8	74	217·5	− 4·8	+ 43·7
10·364	15	91	13	81	217·6	− 5·0	+ 54·2
11·400	10	54	14	72	216·7	− 5·3	+ 67·1
12·407	0	28	0	93	216·8	− 5·4	+ 80·5
Means ...	...	...	11	85	215·33	− 5·25	...
Group 1914.							
Aug. 3·584	4	27	3	22	200·0	+ 8·6	− 53·0
4·305	17	43	12	30	200·5	+ 8·4	− 43·0
5·426	4	25	2	14	200·8	+ 8·4	− 27·9
Means ...	...	...	6	22	200·43	+ 8·47	...
Group 1915.							
Aug. 11·400	14	69	25	128	77·5	− 8·6	− 72·1
12·407	29	146	28	143	78·9	− 8·7	− 57·4
13·445	35	167	25	121	79·0	− 8·8	− 43·7
14·228	18	177	12	111	78·7	− 9·4	− 33·6
15·335	22	152	12	83	78·8	− 9·5	− 18·8
16·393	26	152	13	79	78·8	− 9·8	− 4·8
17·466	23	131	12	69	79·2	− 9·6	+ 9·7
18·411	23	98	13	55	79·8	− 9·6	+ 22·8
19·240	12	60	8	38	79·9	− 9·7	+ 33·9
20·406	2	21	2	17	79·9	− 9·6	+ 49·3
Means ...	...	...	15	84	79·05	− 9·33	...
Group 1916.							
Aug. 16·393	0	10	0	10	142·8	+15·4	+ 59·2

AREAS and HELIOGRAPHIC POSITIONS of SPOT GROUPS on the SUN'S DISK—*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 1917.							
1886. d					°	°	°
Aug. 20·406	0	8	0	6	344·3	+ 1·1	− 46·3
Group 1918.							
Aug. 23·502	0	4	0	6	283·5	−14·0	− 66·2
24·494	0	7	0	6	283·2	−14·1	− 53·4
25·228	0	6	0	4	282·2	−14·9	− 44·7
Means ...	...	...	0	5	282·97	−14·33	...
Group 1919.							
Aug. 26·389	37	233	26	165	274·3	−18·8	− 37·3
27·575	2	187	1	113	274·6	−19·1	− 21·3
28·414	4	91	2	52	275·1	−19·0	− 9·7
29·641	0	22	0	12	276·7	−18·9	+ 8·1
Means ...	...	...	7	86	275·18	−18·95	...
Group 1920.							
Aug. 30·466	12	59	19	93	185·3	+11·8	− 72·4
31·405	24	155	23	150	185·7	+11·8	− 59·5
Sept. 1·441	52	419	39	304	185·2	+11·8	− 46·4
2·431	48	408	29	245	185·3	+11·8	− 33·3
3·337	56	433	30	234	185·8	+12·2	− 20·7
4·465	60	476	30	239	187·2	+12·1	− 4·5
5·507	36	378	19	194	189·6	+12·7	+ 11·6
6·440	44	343	25	192	191·5	+13·2	+ 25·9
7·496	35	349	23	229	192·8	+13·4	+ 41·1
8·398	36	230	30	188	193·1	+12·6	+ 53·3
9·468	23	111	29	143	193·5	+12·3	+ 67·8
10·398	5	53	13	145	194·0	+12·8	+ 80·7
Means ...	...	...	26	196	189·08	+12·38	...
Group 1921.							
Sept. 3·337	0	17	0	19	144·8	− 8·5	− 61·7
4·465	0	19	0	13	145·5	− 9·2	− 46·2
Means ...	...	...	0	16	145·15	− 8·85	...
Group 1922.							
1886. d					°	°	°
Sept. 7·496	5	31	3	17	174·4	−11·2	+ 22·7
8·398	0	53	0	34	174·0	−11·5	+ 34·2
9·468	0	10	0	8	172·7	−11·4	+ 47·0
Means ...	...	...	1	20	173·70	−11·37	...
Group 1923.							
Sept. 9·468	0	9	0	32	42·3	+ 12·3	− 83·4
10·398	24	190	32	255	44·2	+ 12·7	− 69·1
11·503	41	287	34	239	45·0	+ 13·0	− 53·8
12·339	49	337	33	228	45·0	+ 12·8	− 42·7
13·396	39	322	22	184	45·2	+ 12·6	− 28·6
14·127	44	329	23	172	45·0	+ 12·4	− 19·2
15·293	49	337	24	170	44·5	+ 12·8	− 4·2
16·585	46	326	24	168	44·4	+ 13·1	+ 12·7
17·420	35	257	19	142	45·0	+ 12·6	+ 24·4
18·478	48	232	30	146	44·5	+ 13·0	+ 37·8
19·117	47	242	34	176	44·5	+ 13·4	+ 46·3
20·315	35	188	36	192	44·1	+ 13·3	+ 61·8
21·442	3	45	6	90	44·1	+ 12·3	+ 76·6
Means ...	...	...	24	169	44·45	+ 12·79	...
Group 1924.							
Sept. 10·398	0	27	0	18	72·5	− 11·1	− 40·8
11·503	7	68	4	39	78·7	− 9·0	− 20·1
12·339	5	128	3	69	77·2	− 9·7	− 10·5
13·396	13	187	7	98	70·5	− 12·1	− 3·3
14·127	25	140	13	75	72·5	− 11·7	+ 8·3
15·293	7	63	4	36	73·6	− 11·2	+ 24·9
Means ...	...	...	5	56	74·17	− 10·80	...
Group 1925.							
Sept. 10·398	0	24	0	17	68·3	− 0·4	− 45·0
11·503	0	6	0	4	67·9	− 0·3	− 30·9
12·339	0	0	0	0	...	...	...
13·396	0	60	0	30	68·1	− 0·8	− 5·7
14·127	2	33	1	17	67·9	− 0·8	+ 3·7
15·293	16	109	8	61	71·9	0·0	+ 23·2
Means ...	...	...	2	22	68·82	− 0·46	...

AREAS and HELIOGRAPHIC POSITIONS of SPOT GROUPS on the SUN'S DISK—*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 1926.							
1886. d					°	°	°
Sept. 13·396	9	69	6	46	32·3	− 3·5	− 41·5
14·127	33	108	19	63	33·7	− 3·9	− 30·5
15·293	37	148	19	78	35·4	− 4·7	− 13·3
16·585	12	103	6	54	36·5	− 5·2	+ 4·8
17·420	33	358	18	190	35·1	− 6·2	+ 14·5
18·478	18	204	11	122	36·5	− 5·9	+ 29·8
19·117	39	209	26	136	35·8	− 5·3	+ 37·6
20·315	13	103	12	92	36·6	− 5·3	+ 54·3
Means ...	...	...	15	98	35·24	− 5·00	...
Group 1927.							
Sept. 14·127	0	5	0	2	45·2	− 4·6	− 19·0
Group 1928.							
Sept. 22·509	0	64	0	32	306·8	+ 9·3	− 6·7
23·328	0	35	0	18	307·2	+ 9·3	+ 4·6
24·303	0	0	0	0	...	...	...
25·123	0	8	0	5	310·5	+ 10·0	+ 31·5
26·106	6	36	4	23	306·2	+ 9·5	+ 40·2
27·104	0	8	0	7	307·3	+ 9·3	+ 54·5
Means ...	...	...	1	14	307·60	+ 9·48	...
Group 1929.							
Sept. 26·106	5	18	3	13	221·7	− 4·4	− 44·3
Group 1930.							
Sept. 30·170	7	32	13	64	139·6	− 16·8	− 72·8
Oct. 1·453	5	41	4	37	143·0	− 15·2	− 52·5
2·415	9	68	6	45	146·1	− 14·7	− 36·6
3·191	28	150	17	91	146·8	− 15·3	− 25·7
4·541	24	163	13	88	147·5	− 15·4	− 7·2
5·481	28	177	16	97	148·4	− 15·7	+ 6·0
Group 1930—*continued.*							
1886. d					°	°	°
Oct. 6·273	39	149	22	84	148·8	− 15·9	+ 16·9
7·357	38	127	24	79	148·4	− 15·5	+ 30·8
8·290	22	88	16	65	148·0	− 15·2	+ 42·8
9·143	13	75	12	69	147·5	− 15·1	+ 53·6
10·456	0	38	0	69	148·2	− 15·3	+ 71·5
Means ...	...	...	13	72	146·57	− 15·46	...
Group 1931.							
Oct. 6·273	3	10	2	6	156·7	− 9·8	+ 24·8
Group 1932.							
Oct. 6·273	5	24	3	18	86·2	− 7·5	− 45·7
7·357	20	75	12	45	87·0	− 7·1	− 30·6
8·290	6	76	3	41	86·7	− 7·7	− 18·5
9·143	0	9	0	5	87·0	− 7·1	− 6·9
Means ...	...	...	5	27	86·73	− 7·35	...
Group 1933.							
Oct. 11·500	0	53	0	27	57·9	−10·8	− 5·0
Group 1934.							
Oct. 12·158	0	9	0	4	46·2	+ 3·1	− 8·1

AREAS and HELIOGRAPHIC POSITIONS of SPOT GROUPS on the SUN'S DISK—*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 1935.							
1886. d					°	°	°
Oct. 15·149	15	67	10	42	341·4	−11·2	−33·3
16·230	41	287	21	159	342·1	−11·5	−18·4
17·130	37	290	19	154	343·1	−12·0	− 5·6
18·286	15	96	8	51	343·6	−11·6	+10·2
19·253	0	26	0	15	342·1	−11·4	+21·4
20·376	0	17	0	11	342·4	−11·0	+36·5
21·157	0	0	0	0	...	...	...
22·492	0	14	0	19	345·0	−11·4	+67·1
Means ...	...	...	7	56	342·81	−11·44	...
Group 1936.							
Oct. 23·121	0	15	0	62	185·4	+16·5	−84·2
24·507	7	71	8	88	184·8	+15·8	−66·6
25·130	10	95	9	94	184·7	+16·0	−58·5
26·146	10	66	7	47	185·0	+15·6	−44·7
27·135	19	69	11	42	185·3	+15·6	−31·3
28·145	13	69	7	37	184·6	+15·9	−18·6
29·469	8	61	4	31	185·1	+15·3	− 0·8
Means ...	...	...	7	57	184·99	+15·81	...
Group 1937.							
Oct. 29·469	0	8	0	11	254·0	− 6·3	+68·1
30·105	0	24	0	47	252·1	− 6·3	+74·6
Means ...	...	...	0	29	253·05	− 6·30	...
Group 1938.							
Nov. 12·332	1	11	1	7	331·7	−14·5	−31·4
13·148	4	17	2	9	332·3	−14·7	−20·0
14·205	0	16	0	8	331·5	−15·0	− 6·9
Means ...	...	...	1	8	331·83	−14·73	...
Group 1939.							
1886. d					°	°	°
Nov. 15·280	0	1	0	1	262·9	− 5·0	−61·3
16·191	0	7	0	5	264·5	− 5·5	−47·7
17·462	0	20	0	12	263·9	− 4·2	−31·6
Means ...	...	...	0	6	263·77	− 4·90	...
Group 1940.							
Nov. 26·348	2	12	1	6	194·6	− 5·8	+16·2
Group 1941.							
Dec. 10·502	0	27	0	30	290·2	+18·8	−61·7
11·399	4	104	3	86	289·8	+18·6	−50·2
12·485	21	128	13	84	289·8	+18·6	−35·9
13·212	27	115	16	70	289·5	+19·2	−26·7
14·295	37	162	21	89	289·4	+19·3	−12·5
15·362	75	372	40	199	289·7	+19·0	+ 1·7
16·282	63	411	34	227	290·8	+18·5	+15·1
17·334	77	412	47	253	291·7	+18·2	+29·8
18·552	57	295	45	231	293·2	+17·8	+47·3
19·250	59	178	57	172	293·2	+17·6	+56·5
20·182	3	132	5	193	293·1	+17·3	+68·7
21·198	1	45	2	87	284·8	+19·1	+73·8
Means ...	...	...	24	143	290·43	+18·50	...
Group 1942.							
Dec. 12·485	2	33	1	20	294·6	+13·4	−31·1
13·212	5	28	3	15	295·7	+13·4	−20·5
Means ...	...	...	2	18	295·15	+13·40	...
Group 1943.							
Dec. 22·238	0	5	0	7	130·2	−10·1	−67·0
23·514	22	144	19	126	125·4	−11·0	−55·0
24·548	16	234	11	159	125·5	−11·1	−41·2
25·502	7	133	4	77	124·9	−11·5	−29·3

AREAS and HELIOGRAPHIC POSITIONS of SPOT GROUPS on the SUN'S DISK—*concluded.*

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 1943—*continued.*							
1886. d					°	°	°
26·180	21	102	12	56	125·2	−11·6	−20·2
27·156	17	128	9	66	124·9	−12·0	− 7·7
28·229	3	42	2	22	124·2	−12·4	+ 5·3
29·477	3	17	2	29	124·8	−12·9	+22·9
Means ...	...	...	7	68	125·64	−11·58	...
Group 1944.							
Dec. 23·514	21	200	31	326	108·2	− 8·7	−72·2
24·548	27	388	25	377	108·1	− 8·7	−58·6
25·502	71	629	49	447	108·9	− 8·3	−45·3
26·180	89	786	54	487	109·8	− 8·2	−35·6
27·156	185	939	100	511	109·9	− 8·2	−22·7
28·229	74	795	38	407	110·2	− 8·4	− 8·1
29·477	59	527	30	269	111·5	− 8·2	+ 9·6
30·159	76	439	41	232	112·2	− 8·0	+19·2
31·522	20	177	18	132	112·7	− 8·0	+37·8
1887. Jan. 1·							
2·193	13	89	13	90	113·6	− 8·5	+60·6
3·244	5	31	8	52	111·9	− 8·2	+72·8
Means ...	...	...	37	303	110·64	− 8·31	...
Group 1945.							
1886. d					°	°	°
Dec. 24·548	0	22	0	11	171·2	+12·6	+ 4·5
25·502	0	27	0	14	170·7	+12·0	+16·5
26·180	5	50	3	29	172·0	+12·1	+26·6
Means ...	...	...	1	18	171·30	+12·23	...
Group 1946.							
Dec. 28·229	0	21	0	50	40·0	−16·9	−78·3
29·477	10	86	12	102	37·2	−16·5	−64·7
30·159	17	119	15	108	37·2	−16·5	−55·8
31·522	27	157	12	81	37·3	−16·7	−37·6
1887. Jan. 1·							
2·193	36	157	19	84	37·6	−16·7	−15·4
3·244	19	121	10	63	37·5	−16·5	− 1·7
4·226	19	94	10	49	38·1	−16·3	+11·9
5·471	19	51	11	30	37·9	−16·2	+28·1
6·186	13	58	8	38	37·6	−16·2	+37·2
7·182	8	22	7	17	37·1	−16·0	+49·9
8·161	6	15	6	16	37·6	−16·8	+63·2
Means ..	...	...	10	58	37·74	−16·48	...

ROYAL OBSERVATORY, GREENWICH.

TOTAL PROJECTED AREAS

OF

UMBRÆ, WHOLE SPOTS, AND FACULÆ

UPON THE SUN'S DISK

FOR EACH DAY,

DEDUCED FROM THE MEASUREMENT

OF

SOLAR PHOTOGRAPHS

IN THE YEAR

1886.

TOTAL PROJECTED AREAS OF UMBRÆ, WHOLE SPOTS, AND FACULÆ UPON THE SUN'S DISK FOR EACH DAY IN THE YEAR 1886.

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.

Greenwich Civil Time.		Projected Area.		
		Umbræ.	Whole Spots.	Faculæ.
	d			
Jan.	1·2	24	294	607
	2·4	27	287	734
	3·	...	...	...
	4·2	106	715	1432
	5·5	120	865	343
	6·2	133	829	611
	7·1	217	1103	584
	8·2	140	1186	789
	9·2	176	1251	828
	10·2	260	1394	1329
	11·2	238	1534	1283
	12·2	240	1527	525
	13·3	266	1887	1322
	14·5	202	1970	449
	15·3	272	2109	868
	16·5	266	1956	566
	17·5	142	1789	996
	18·	...	...	...
	19·5	27	563	269
	20·5	18	214	376
	21·1	5	91	938
	22·2	2	8	320
	23·2	0	20	381
	24·5	0	0	146
	25·2	0	0	394
	26·4	0	0	275
	27·5	0	0	510
	28·4	0	0	271
	29·2	0	0	591
	30·3	0	110	416
	31·2	20	159	581
Feb.	1·5	32	254	444
	2·3	67	403	323
	3·3	81	403	378
	4·6	68	673	636
	5·1	93	708	770
	6·5	96	768	808
	7·2	209	1004	1113
	8·5	180	1078	1033
	9·4	162	1042	1060
	10·2	171	1004	1213
	11·2	156	1006	486
	12·2	160	902	240
	13·2	161	870	765
	14·2	84	540	608
	15·3	56	322	1155
	16·2	31	186	949
	17·3	5	56	83
	18·2	3	38	355
	19·3	8	39	473
	20·2	18	238	254
	21·1	26	115	199
	22·5	0	102	101

Greenwich Civil Time.		Projected Area.		
		Umbræ.	Whole Spots.	Faculæ.
	d			
Feb.	23·2	0	30	254
	24·4	0	0	87
	25·2	0	36	497
	26·4	12	96	966
	27·5	0	44	0
	28·2	16	275	358
Mar.	1·2	106	965	844
	2·5	134	1484	1888
	3·4	153	1793	1236
	4·5	188	2117	335
	5·2	334	2589	1022
	6·2	409	3146	1092
	7·5	404	2953	728
	8·4	391	3157	413
	9·4	246	2509	139
	10·4	263	2212	864
	11·5	219	2252	636
	12·2	269	1787	512
	13·6	185	1354	712
	14·2	247	1078	1026
	15·2	116	702	1550
	16·3	61	328	799
	17·4	18	103	179
	18·2	27	251	439
	19·5	36	321	793
	20·2	62	537	746
	21·2	114	627	454
	22·2	143	779	176
	23·1	200	851	337
	24·5	137	1102	921
	25·6	144	1142	1218
	26·4	133	1271	324
	27·1	215	1287	590
	28·2	202	1431	944
	29·4	167	1574	742
	30·2	217	1641	878
	31·4	173	1513	737
April	1·4	226	1771	935
	2·4	214	2042	401
	3·6	262	2072	771
	4·1	323	1961	1169
	5·4	147	1125	716
	6·4	147	968	572
	7·3	181	1019	315
	8·5	114	655	822
	9·4	103	509	457
	10·5	73	367	908
	11·6	37	242	639
	12·4	6	73	147
	13·5	0	0	184
	14·1	0	0	0
	15·6	20	121	454

Greenwich Civil Time.		Projected Area.		
		Umbræ.	Whole Spots.	Faculæ.
	d			
April	16·4	26	186	383
	17·1	42	214	351
	18·1	29	222	0
	19·4	27	305	343
	20·6	81	631	797
	21·2	165	768	737
	22·4	124	951	564
	23·5	133	1046	588
	24·5	153	928	564
	25·6	120	982	540
	26·6	111	938	558
	27·4	142	867	416
	28·5	156	1168	412
	29·5	157	1378	981
	30·4	112	1294	1472
May	1·4	175	1220	1164
	2·4	225	2431	573
	3·4	285	2598	690
	4·4	280	2539	992
	5·6	186	2749	597
	6·5	391	2669	176
	7·5	168	2207	150
	8·2	219	1940	599
	9·5	72	1483	166
	10·5	91	1066	72
	11·3	104	674	799
	12·2	37	281	578
	13·1	11	226	917
	14·1	11	73	784
	15·4	0	0	320
	16·1	0	0	345
	17·3	0	0	574
	18·4	0	0	430
	19·1	0	0	473
	20·1	11	24	630
	21·4	22	99	244
	22·2	37	275	382
	23·7	108	536	1054
	24·1	143	655	497
	25·6	153	628	608
	26·4	126	662	683
	27·5	182	778	1207
	28·4	148	681	1396
	29·5	132	643	729
	30·5	122	737	2291
	31·5	128	652	1176
June	1·5	73	315	418
	2·4	28	181	257
	3·1	26	221	183
	4·4	102	677	422
	5·5	206	1227	222
	6·6	220	1481	732

Greenwich Civil Time.		Projected Area.		
		Umbræ.	Whole Spots.	Faculæ.
	d			
June	7·4	218	1564	298
	8·4	177	1362	282
	9·4	163	926	733
	10·3	119	621	733
	11·4	54	339	575
	12·4	18	110	489
	13·6	0	0	640
	14·2	0	0	0
	15·5	0	0	106
	16·5	11	68	125
	17·5	19	165	645
	18·2	54	263	681
	19·4	62	447	199
	20·4	50	483	190
	21·2	64	449	0
	22·5	74	565	741
	23·4	70	598	799
	24·4	43	366	435
	25·4	30	259	1545
	26·4	25	160	863
	27·5	10	260	201
	28·4	42	425	766
	29·4	77	623	768
	30·4	117	1041	982
July	1·4	144	1187	60
	2·4	134	1098	0
	3·4	166	1023	210
	4·4	143	901	157
	5·4	140	721	512
	6·4	80	675	277
	7·5	79	608	412
	8·5	42	336	569
	9·4	22	139	672
	10·5	0	0	362
	11·6	0	0	305
	12·1	0	0	461
	13·5	0	12	116
	14·4	4	81	494
	15·5	0	20	284
	16·4	8	111	460
	17·1	36	238	635
	18·6	114	713	0
	19·2	117	682	154
	20·4	205	911	654
	21·4	169	1011	759
	22·4	200	1118	726
	23·2	122	841	94
	24·4	100	834	99
	25·2	72	569	57
	26·4	76	597	956
	27·5	128	810	1160
	28·4	142	917	140
	29·4	105	959	0

TOTAL PROJECTED AREAS OF UMBRÆ, WHOLE SPOTS, AND FACULÆ—*concluded.*

Greenwich Civil Time.		Projected Area.			Greenwich Civil Time.		Projected Area.			Greenwich Civil Time.		Projected Area.			Greenwich Civil Time.		Projected Area.		
		Umbræ.	Whole Spots.	Faculæ.			Umbræ.	Whole Spots.	Faculæ.			Umbræ.	Whole Spots.	Faculæ.			Umbræ.	Whole Spots.	Faculæ.
	d					d					d					d			
July	30·5	98	892	0	Sept.	6·4	44	343	278	Oct.	15·1	15	66	106	Nov.	23·3	0	0	155
	31·5	121	707	648		7·5	39	379	412		16·2	41	287	0		24·3	0	0	488
						8·4	36	281	447		17·1	37	290	107		25·4	0	0	408
Aug.	1·5	61	548	332		9·5	23	130	116		18·3	15	96	214		26·3	2	12	213
	2·2	97	593	253		10·4	29	294	1350		19·3	0	26	106		27·2	0	0	109
	3·6	45	271	79		11·5	48	361	636		20·4	0	17	323		28·3	0	0	0
	4·3	62	317	636		12·3	54	467	636		21·2	0	0	290		29·4	0	0	158
	5·4	32	277	441		13·4	62	637	292		22·5	0	14	500		30·4	0	0	53
	6·6	52	285	419		14·1	105	616	818		23·1	0	15	1029					
	7·4	37	323	354		15·3	108	657	327		24·5	7	71	185	Dec.	1·3	0	0	87
	8·4	29	166	76		16·6	58	428	92		25·1	10	95	331		2·3	0	0	344
	9·6	11	104	146		17·4	68	615	628		26·1	10	66	323		3·2	0	0	114
	10·4	15	91	352		18·5	66	435	641		27·1	19	69	143		4·2	0	0	153
	11·4	24	123	749		19·1	86	451	1708		28·1	13	69	336		5·2	0	0	198
	12·4	29	174	892		20·3	48	291	1312		29·5	8	69	66		6·2	0	0	0
	13·4	35	167	270		21·4	3	45	220		30·1	0	24	50		7·2	0	0	0
	14·2	18	177	97		22·5	0	64	0		31·2	0	0	382		8·5	0	0	38
	15·3	22	152	185		23·3	0	35	858							9·2	0	0	233
	16·4	26	162	374		24·3	0	0	163	Nov.	1·1	0	0	1027		10·5	0	27	83
	17·5	23	131	713		25·1	0	8	128		2·5	0	0	378		11·4	4	104	254
	18·4	23	98	614		26·1	11	53	258		3·4	0	0	175		12·5	23	161	236
	19·2	12	60	696		27·1	0	8	937		4·4	0	0	179		13·2	32	143	300
	20·4	2	28	879		28·5	0	0	0		5·4	0	0	624		14·3	37	162	79
	21·4	0	0	489		29·6	0	0	83		6·1	0	0	538		15·4	75	372	281
	22·5	0	0	480		30·2	7	32	226		7·2	0	0	163		16·3	63	411	224
	23·5	0	4	522							8·4	0	0	368		17·3	77	412	348
	24·5	0	7	197	Oct.	1·5	5	41	0		9·3	0	0	519		18·6	57	295	463
	25·2	0	6	282		2·4	9	68	0		10·2	0	0	401		19·3	59	178	691
	26·4	37	233	290		3·2	28	150	423		11·1	0	0	253		20·2	3	132	466
	27·6	2	187	93		4·5	24	163	121		12·3	1	11	39		21·2	1	45	382
	28·4	4	91	301		5·5	28	177	217		13·1	4	17	195		22·2	0	5	91
	29·6	0	22	217		6·3	47	182	326		14·2	0	16	257		23·5	42	344	256
	30·5	12	59	179		7·4	58	201	526		15·3	0	1	526		24·5	43	644	461
	31·4	24	155	551		8·3	27	164	406		16·2	0	7	321		25·5	77	790	22
						9·1	13	83	360		17·5	0	20	0		26·2	115	938	124
Sept.	1·4	52	419	1035		10·5	0	38	0		18·5	0	0	158		27·2	202	1067	0
	2·4	48	407	526		11·5	0	53	0		19·2	0	0	336		28·2	77	858	93
	3·3	56	451	322		12·2	0	9	26		20·1	0	0	399		29·5	72	630	74
	4·5	60	493	196		13·5	0	0	136		21·2	0	0	205		30·2	93	558	174
	5·5	36	378	0		14·5	0	0	312		22·3	0	0	81		31·5	46	334	0

MEAN AREAS of UMBRÆ, WHOLE SPOTS, and FACULÆ upon the SUN'S DISK, as measured on PHOTOGRAPHS taken at the ROYAL OBSERVATORY, GREENWICH, at DEHRA DÛN, INDIA, and in MAURITIUS, for each ROTATION of the SUN, from 1885 December 21 to 1887 January 6.

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 (as in former years) in millionths of the Sun's visible hemisphere.

The rotations adopted in the following table (which is in continuation of those for the years 1873–1884 and 1885 printed in the Greenwich Observations for 1884 and 1885) 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.
431	1885	December	20·33	26	138	951	835	90	655	975
432	1886	January	16·66	26	65	469	576	43	348	712
433		February	13·00	28	126	1070	600	90	766	717
434		March	12·33	27	156	1091	713	108	800	894
435		April	8·63	27	110	916	574	87	745	710
436		May	5·88	27	92	641	655	68	459	756
437		June	2·09	27	70	489	476	52	370	611
438		June	29·29	28	85	575	401	56	397	499
439		July	26·49	27	46	320	425	30	205	505
440		August	22·72	27	40	317	422	26	206	516
441		September	18·98	28	16	95	316	11	69	377
442		October	16·27	27	4	35	335	3	27	421
443		November	12·57	27	0	3	194	0	2	236
444		December	9·89	27	49	341	254	32	232	324

MEAN AREAS of UMBRÆ, WHOLE SPOTS, and FACULÆ upon the SUN'S DISK, as measured on PHOTOGRAPHS taken at the ROYAL OBSERVATORY, GREENWICH, at DEHRA DÛN, INDIA, and in MAURITIUS, for the YEAR 1886.

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.
1886	363	71	527	473	50	381	579

MEAN HELIOGRAPHIC LATITUDE of the SPOTS upon the SUN'S DISK, as measured on PHOTOGRAPHS taken at the ROYAL OBSERVATORY, GREENWICH, at DEHRA DÛN, INDIA, and in MAURITIUS, for each ROTATION of the SUN, from 1885 December 21 to 1886 December 9.

The numbers given in the accompanying table have been formed as follows :—

The Heliographic Latitude of each Spot for each day has been multiplied by its Area (corrected for foreshortening), and the sum of the products for Spots North of the Sun's 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			°		°	°	°
431	1885 Dec. 20·33	26	159	12·58	496	10·32	− 4·77	10·87
432	1886 Jan. 16·66	26	13	8·33	335	10·75	− 10·05	10·66
433	Feb. 13·00	28	11	2·13	754	9·04	− 8·88	8·94
434	Mar. 12·33	27	154	5·06	647	8·80	− 6·13	8·08
435	Apr. 8·63	27	204	7·58	541	11·87	− 6·54	10·70
436	May 5·88	27	213	8·77	246	10·45	− 1·57	9·67
437	June 2·09	27	42	10·49	328	13·90	− 11·12	13·51
438	June 29·29	28	15	16·94	382	12·59	− 11·51	12·75
439	July 26·49	27	70	15·79	135	8·77	− 0·41	11·16
440	Aug. 22·72	27	153	12·49	53	10·11	+ 6·70	11·88
441	Sept. 18·98	28	21	12·47	48	12·33	− 4·91	12·37
442	Oct. 16·27	27	15	16·07	12	10·79	+ 4·25	13·75
443	Nov. 12·57	27	0	0	2	9·17	− 9·17	9·17
444	Dec. 9·89	27	67	18·12	165	9·84	− 1·78	12·23

MEAN HELIOGRAPHIC LATITUDE of SPOTS upon the SUN'S DISK, as measured on the PHOTOGRAPHS taken at the ROYAL OBSERVATORY, GREENWICH, at DEHRA DÛN, INDIA, and in MAURITIUS, for the YEAR 1886.

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.		
			°		°	°	°
1886	363	76	9·93	305	10·50	− 6·42	10·38

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 whole 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 Spots 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 :—

$$-\ 0^\circ{\cdot}05 \times \frac{\text{Mean Area N.} - \text{Mean Area S.}}{\text{Mean Area N.} + \text{Mean Area S.}}$$

These corrections have been applied in computing the Mean Heliographic Latitudes and Mean Distance from the Equator given in the above Tables for 1886.

GREENWICH

SPECTROSCOPIC AND PHOTOGRAPHIC RESULTS.

1886.