GREENWICH

SPECTROSCOPIC AND PHOTOGRAPHIC RESULTS.

1878.

ERRATA.

GREENWICH ASTRONOMICAL RESULTS, 1874.

PAGE

96 1874, May 6. Area for Spot, 83. Penumbra, *for* 145, *read* 167; Umbra, *for* 0, *read* 21; Whole Spot, *for* 145, *read* 188.

Area for Spot, 86. Penumbra, *for* 293, *read* 248; Umbra, *for* 36, *read* 0; Whole Spot, *for* 329, *read* 248.

Area for Day. Penumbra, *for* [750], *read* [727]; Umbra, *for* [47], *read* [32]; Whole Spot, *for* [798], *read* [760].

GREENWICH ASTRONOMICAL RESULTS, 1877.

108 1874, June 19, $169^d \cdot 035$. Area for Day. Whole Spot, *for* (560), *read* (326).

109 1874, July 4, $183^d \cdot 903$. Area for Spot, 98. Umbra, *for* 20, *read* 77; Whole Spot, *for* 351, *read* 620.

Area for Spot, 99. Umbra, *for* 90, *read* 23; Whole Spot, *for* 717, *read* 405.

Area for Day. Umbra, *for* (130), *read* (120); Whole Spot, *for* (1767), *read* (1724).

110 1874, July 9, $189^d \cdot 047$. Latitude of Spot, 101, *for* +4°. 48′, *read* +4°. 28′.

114 1874, Sept. 4, $246^d \cdot 066$. Area for Spot, 118. Umbra, *for* 110, *read* 89; Whole Spot, *for* 641, *read* 522.

Area for Spot, 119. Whole spot, *for* 60, *read* 73.

Area for Day. Umbra, *for* (110), *read* (89); Whole Spot, *for* (701), *read* (595).

1874, Sept. 4, $246^d \cdot 073$. Area for Spot, 118. Whole Spot, *for* 237, *read* 193.

Area for Spot, 119. Whole Spot, *for* 53, *read* 65.

Area for Day. Whole Spot, *for* (290), *read* (258).

117 1874, Oct. 23, $294^d \cdot 995$. Area for Spot, 131. Whole Spot, *for* 13, *read* 26.

Area for Day. Whole Spot, *for* (100), *read* (113).

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121 1875, Mar. 28, $86^d \cdot 023$. Area for Spot, 151. Umbra, *for* 101, *read* 63; Whole Spot, *for* 597, *read* 376.

Area for Day. Umbra, *for* (101), *read* (63); Whole Spot, *for* (641), *read* (420).

1875, Mar. 28, $86^d \cdot 036$. Area for Spot, 151. Umbra, *for* 81, *read* 51; Whole Spot, *for* 451, *read* 284.

Area for Day. Umbra, *for* (81), *read* (51); Whole Spot, *for* (478), *read* (311).

1875, Apr. 14, $103^d \cdot 031$. Area for Spot, 153†. Whole Spot, *for* 54, *read* 79.

Area for Spot, 154. Umbra, *for* 34, *read* 32; Whole Spot, *for* 110, *read* 105.

Area for Spot, 155. Umbra, *for* 93, *read* 80; Whole Spot, *for* 494, *read* 429.

Area for Day. Umbra, *for* (127), *read* (112); Whole Spot, *for* (658), *read* (613).

122 1875, Apr. 28, $117^d \cdot 048$. Area for Spot 157. Umbra, *for* 155, *read* 127; Whole Spot, *for* 951, *read* 773.

Area for Day. Umbra, *for* (183), *read* (155); Whole Spot, *for* (1129), *read* (951).

137 1876, July 21, $202^d \cdot 085$. Latitude of Spot, 216, *for* +7°. 26′, *read* −7°. 26′.

$202^d \cdot 979$. *For* July 23, *read* July 22.

150 Rotation 12. Mean of Daily Areas. Umbræ, *for* 54, *read* 53; Whole Spots, *for* 488, *read* 486.

150 Rotation 39. Mean of Daily Areas. Whole Spots, *for* 248, *read* 246; Faculæ, *for* 510, *read* 509.

Rotation 41, Mean of Daily Areas. Umbræ, *for* 9, *read* 12; Whole Spots, *for* 38, *read* 49.

151 Rotation 53. Mean of Daily Areas. Umbræ, *for* 18, *read* 12; Whole Spots, for 92, *read* 64; Faculæ, *for* 85, *read* 119.

Year 1876. Mean of Daily Areas. Umbræ, *for* 25, *read* 26.

Year 1877. Mean of Daily Areas. Whole Spots, *for* 94, *read* 92. Faculæ, *for* 168, *read* 170.

Q 1217. 250.—5/80. Wt. 1844. E. & S.

ROYAL OBSERVATORY, GREENWICH.

SPECTROSCOPIC OBSERVATIONS

MADE AT THE

ROYAL OBSERVATORY, GREENWICH,

1878.

POSITION-ANGLES and HEIGHTS of SOLAR PROMINENCES, observed with the SPECTROSCOPE, at the ROYAL OBSERVATORY, GREENWICH, in the Year 1878.

Note.—The Heliographic N.P.D. is reckoned from the North Pole of the Sun's Axis along the limb, either through the East or the West point. The reference letters are to the Figures on the Plate. The "Half-prism" Spectroscope was used throughout. The numerals in the second column denote the number of Half-prisms (each composed of a crown prism cemented on to a "half-prism" of flint, so as to form a Direct-vision compound-prism). With one Half-prism, the Spectroscope is equivalent to a Spectroscope with four flint prisms of 60°; with two, to one with about fifteen prisms; and with three, to one with about sixty prisms.

For viewing the prominences, the Spectroscope is reversed end for end, the slit and eye-piece 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 great purity of spectrum is obtained. In order to view a prominence in its proper proportions, the breadth is afterwards magnified by means of a small "Half-prism" (Direct-vision) placed between the eye-piece and the eye.

Observer, M.

1878, Greenwich Mean Solar Time.	Number of Half-Prisms.	Heliographic N.P.D.	Height.	REMARKS.
d h m		° ′ ° ′	″	
Jan. 6. 22. 45	2	E. 47. 49 — 48. 54	30	Seen on C, D_3, and F. No trace visible on any other line. Day cloudy, and Sun never clear from white mist; circumstances very unfavourable for the examination of the limb. The entire limb was examined twice with the slit radial on the C line.
Jan. 9. 0. 30 to 9. 1. 0	2			No prominences were seen. Day variable, and Sun in white mist; circumstances not very favourable for the examination of the limb. The entire limb was examined with the slit radial on the C line.
Jan. 9. 23. 30 to 10. 0. 40	2			No prominences were seen. Chromosphere exceedingly faint. Sun's limb very tremulous. The entire limb was examined twice with the slit radial on the C line.
Jan. 15. 22. 18 to 15. 22. 30	2	E. 75. 24 — 78. 29 W. 125. 16 — 124. 36 W. 48. 16 — 47. 1	46 35 25	The entire limb was examined twice with the slit radial on the C line.
Jan. 16. 22. 25 to 17. 0. 30	2	E. 66. 11 — 68. 11	61	The sky clouded over immediately after this prominence was seen, and the examination of the limb, which had only just been commenced, could not be resumed until an hour later, when the Sun was by no means so clear as it had been before the clouds came up. Although the entire limb was then examined twice, no prominence could be found at this latitude, nor indeed anywhere else. The entire limb was examined twice with the slit radial on the C line.
Jan. 23. 22. 0 to 23. 23. 0	2			No prominences were seen. Chromosphere faint. Sun throughout in much haze. The entire limb was examined with the slit radial on the C line.
Jan. 24. 22. 0 to 24. 23. 0	2			No prominences were seen. The entire limb was examined four times with the slit radial on the C line.
Jan. 28. 22. 45 to 29. 0. 0	2			No prominences were seen. The entire limb was examined three times with the slit radial on the C line.
Jan. 29. 23. 30 to 30. 0. 45	2			No prominences were seen. The C line showed the chromosphere very fairly, but it could be scarcely seen on D_3, for the Sun was throughout in white cloud. The entire limb was examined several times with the slit radial on the C line, and also on the D and *b* lines.

1878, Greenwich Mean Solar Time.	Number of Half-Prisms.	Heliographic N.P.D.	Height.	REMARKS.
d h m		° ′ ° ′	″	
Feb. 7. 0.	2			No prominences were seen. Chromosphere was seen all round. The entire limb was examined several times with the slit radial on the C line.
Feb. 7. 23. 40 to 8. 1. 0	2	E. 100. 22 — 100. 45 W. 116. 40 — 116. 10 W. 88. 35 — 87. 50	25 25 20	Very faint. Could not be picked up again at 0^h. 55^m. (*a*.) When first seen at 23^h. 40^m., it was very nearly detached, but by 0^h. 50^m. it had "settled," resting entirely on the chromosphere, and was not more than 17″ in height. (*b*.) The entire limb was examined twice with the slit radial on the C line. An attempt was also made to examine the limb with the slit tangential, but the Sun was not sufficiently bright.
Feb. 11. 21. 50 to 11. 23. 5	2	E. 45. 24 — 48. 56 128. 56 — 129. 46 133. 36 — 134. 1 W. 95. 24 — 94. 54 49. 49 — 49. 9 41. 34 — 40. 49	35 35 46 12 35 25	Sketched at 2^h. 10^m. (*a*.) The entire limb was examined three times with the slit radial on the C line.
Feb. 21. 1. 10 21. 1. 20 21. 1. 17 21. 1. 15	2	E. 127. 38 — 128. 50 133. 25 — 133. 50 137. 55 — 138. 15 W. 70. 30 — 69. 38	34 29 24 24	Not seen in the first search. These prominences may perhaps have sprung up suddenly, since there seems no reason why they should not have been seen in the first examination, for they were close to the prominence at E. 128°, and nearly as large and bright. Chromosphere averaged 10″ in height. The entire limb was examined twice with the slit radial on the C line.
Mar. 4. 23. 0 to 5. 1. 0	2	E. 37. 47 — 38. 47 39. 7 — 41. 37 133. 7 — 134. 17	20 40 25	Sketch made with eye-piece prism. Very little detail to be seen. (*a*.) (*b*.) The entire limb was examined three times with the slit radial on the C line.
Mar. 11. 22. 0 to 11. 23. 20	2			No prominences were seen. The entire limb of the Sun and the neighbourhood, for a distance of three or four minutes, were examined several times with the slit radial on the C line.
Mar. 22. 22. 0 to 22. 23. 5	2			No prominences were seen. Chromosphere was seen plainly on the C line all the way round, but nothing whatever on the other lines. The entire limb was examined three times with the slit radial on the C line, and once on *b*, and on 1474 K.
Mar. 27. 1. 42 27. 1. 28	2	E. 53. 35 — 54. 50 W. 100. 45 — 99. 25	19 86	Chromosphere 9″ in height. An attempt was made to sketch the larger prominence with the eye-piece prism, but the Sun was never clear enough, and was finally completely lost in cloud. The entire limb was examined twice with the slit radial on the C line.
Mar. 31. 23. 45 31. 23. 47 31. 23. 50 31. 23. 35	2	At E. 33. 50 At 142. 53 At W. 144. 55 W. 126. 5 — 125. 0	19 20 24 30	Detached. (*a*.) Chromosphere varied in height from 8″ to 11″. The entire limb was examined twice with the slit radial on the C line.

1878, Greenwich Mean Solar Time.	Number of Half-Prisms.	Heliographic N.P.D.	Height.	REMARKS.
d h m		° ′ ° ′	″	
Apr. 5. 23. 30	2	E. 79. 10 — 79. 40	24	Faint. Feathery at the top, but without much definite outline. Not seen at the first two examinations. Seen on C and D_3.
5. 22. 42		W. 129. 45 — 128. 40	43	A narrow jet; very bright. Seen on C and D_3. (*a*.)
5. 22. 30		86. 35 — 86. 0	21	Faint. Feathery at the top, but without much definite outline.
				The entire limb was examined three times with the slit radial on the C line, and once on the D lines. A considerable portion of the Sun was also examined on 1474 K and the *b* lines. Line 1474 K showed the chromosphere 2½″ in height whenever the Sun was very clear; C and D_3 gave it an average height of 9½″. The other lines showed nothing.
Apr. 7. 23. 12	2	E. 96. 5 — 96. 57	26	The prominence, when first seen, was only just detached; at $23^h. 56^m.$ it was 10″ clear of the chromosphere. (*a*.)
7. 23. 6		W. 116. 58 — 116. 28	19	Very faint, apparently only a straight jet. No detail visible. (*b*.)
				The entire limb was examined twice with the slit radial on the C line, and also on *b*, D, and 1474 K, but the limb "boiled" too much to allow of a satisfactory examination for prominences.
Apr. 12. 0. 45	2	E. 13. 0 — 13. 45	27	
12. 1. 0		46. 40 — 47. 55	32	
		130. 55		A prominence suspected here.
				Chromosphere 9½″ in height. The Sun in much white haze.
				The entire limb was examined with the slit radial on the C line.
Apr. 18. 1. 30	2	W. 95. 23 — 95. 48	48	} Both prominences were broken and partly detached.
18. 1. 20		42. 18 — 41. 48	34	
				Sun very hazy.
				The entire limb was examined twice with the slit radial on the C line.
Apr. 26. 1. 10 to 26. 1. 45	2			No prominences were seen.
				Chromosphere irregular in outline, varying from 7″ to 15″ in height.
				The entire limb was examined twice with the slit radial on the C line.
Apr. 26. 21. 40 to 26. 22. 25	2			No prominences were seen.
				The Sun was enveloped in white haze, but the chromosphere was distinctly visible, though much fainter than usual.
				The entire limb was examined twice with the slit radial on the C line.
May 1. 21. 30 to 1. 22. 30	2	E. 41. 7 — 42. 47	43	
		W. 78. 28 — 77. 48	24	
		70. 18 — 67. 18	67	
		65. 23 — 63. 53	41	
				The Sun was throughout in white haze, and the prominences were very faint.
				Chromosphere averaged 9″ in height.
				The entire limb was examined five times with the slit radial on the C line.
May 9. 21. 50	2	E. 130. 42 — 131. 18	24	The prominence was faint and showed no detail. It seemed to be simply a straight jet.
				Chromosphere irregular in outline, varying from 6″ to 12″ or 14″ in height.
				The entire limb was examined three times with the slit radial on the C line.
May 18. 1. 45	2	E. 84. 37 — 85. 47	24	
				Chromosphere averaged 10″ in height.
				The entire limb was examined twice with the slit radial on the C line.

1878, Greenwich Mean Solar Time.	Number of Half-Prisms.	Heliographic N.P.D.	Height.	REMARKS.
d h m		° ′ ° ′	″	
May 25. 0.	2	E. 44.45 — 46.55	84	D_3 showed this prominence very clearly, and in close agreement with C as to shape and height, but it was seen on no other line, although searched for on F, the D lines, and the *b* lines.
		76.45 — 78.45	29	
		119. 5 — 120. 5	43	
		W. 77.55 — 77.15	33	
				The examination was made under great difficulties, as the Sun was frequently lost in cloud.
				The F line showed the chromosphere very brilliantly, the average height being 10″, but no prominences could be detected. Nothing was seen on the D lines of Sodium, the *b* lines of Magnesium, or the third Hydrogen line, 2796 K, but constant cloud interfered with the examination of these lines very much.
				The entire limb was examined four times with the slit radial.
May 26. 22. 40	2	E. 55. 7 — 58.17	33	A double prominence.
		76.37	12–14	Chromosphere about here 12″ to 14″ in height, and very ragged in outline.
26. 22. 45		W. 50.43 — 50.23	26	
26. 23. 0		43.13 — 42.53	43	
				All the prominences were very faint, and none of any great height. They were not seen on D_3, probably because of their faintness. Chromosphere averaged 8½″ in height.
				The entire limb was examined twice with the slit radial.
Oct. 23. 1.30 to 23. 2. 0	2			No prominences were seen.
				Cloud constantly passing interfered with the examination.
				The entire limb was examined twice with the slit radial on the C line.
Oct. 27. 22. 0	2			No prominences were seen. The examination from E. 66° to E. 134° was interrupted by cloud.
				The entire limb was examined with the slit radial on the C line.
Nov. 28. 22. 30	2	W. 53.31 — 51.36	20	A straight jet.
		49.16	35	
		45. 1 — 44.11	40	A straight jet.
				The average height of the chromosphere was from 7″ to 8″. It was undulating in outline between the prominences.
				The entire limb was examined with the slit radial on the C line. From W. 5° to E. 135° the spectrum was very faint, so that prominences at that part of the limb might have been passed over without detection.

The spectroscopic examination of the Sun's limb for the detection of prominences was intermitted from June 1 to October 22, in order that the reduction of the measurements of the Photographs of the Sun might be completed with greater dispatch. The work frequently suffered a further interruption during the winter months, owing to the freezing of the water for the driving-clock, which prevented the Equatoreal from being used.

MEASURES of DISPLACEMENT of LINES in the SPECTRA of STARS, as compared with those of ROYAL OBSERVATORY, GREENWICH,

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. The numerals in the third column denote the number of "Half-prisms" used. 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 20° 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 75°, equivalent to that produced by fifteen flint prisms of 60°.

Day, and Greenwich Sidereal Time.	Observer.	Number of Half-Prisms.	Reading of Position Circle.	Objects compared.	Micrometer Readings.	Displacement. Measured.	Displacement. Estimated in Terms of the Breadth of the Bright Line of the Micrometer.	Width of Slit.
d h m			°		r	r		r
Jan. 10. 4. 10	M	1	95	Aldebaran b_1	0·512			
				Mg_1	0·628	+ 0·116	$1\frac{1}{2}$ towards red	
4. 45	,,	,,	,,	Aldebaran b_1	0·845			
				Mg_1	0·911	+ 0·066	$\frac{4}{5}$ towards red	
Jan. 10. 5. 15	M	1	95	β Orionis F	0·752			
				H β	0·931	+ 0·179	2 towards red	
5. 20	,,	,,	,,	β Orionis F	0·827			
				H β	0·963	+ 0·136	$1\frac{1}{2}$ towards red	
5. 25	,,	,,	,,	β Orionis F	0·815			
				H β	0·869	+ 0·054	$\frac{2}{3}$ towards red	
Jan. 10. 5. 45	M	1	95	δ Orionis F	0·952			
				H β	1·002	+ 0·050	$\frac{2}{3}$ towards red	
6. 5	,,	,,	,,	δ Orionis F	0·885			
				H β	1·025	+ 0·140	$1\frac{1}{2}$ towards red	
Jan. 17. 3. 50	M	1	5	Moon b_1	0·985			
				Mg_1	0·968	+ 0·017		
4. 10	,,	,,	,,	Moon b_1	0·999			
				Mg_1	0·995	+ 0·004		
4. 30	,,	,,	,,	Moon b_1	0·934			
				Mg_1	0·962	− 0·028		
4. 50	,,	,,	,,	Moon β_1	0·955			
				Mg_1	0·956	− 0·001		
Jan. 23. 4. 45	M	1	95	Aldebaran b_1	0·472			
				Mg_1	0·328	+ 0·144	2 towards red	
5. 0	,,	,,	,,	Aldebaran b_1	0·485			
				Mg_1	0·338	+ 0·147	2 towards red	
Jan. 23. 8. 8	WC	1	95	β Orionis F	0·711			
				H β	0·324	+ 0·387	$1\frac{1}{2}$ towards red	
8. 23	,,	,,	,,	β Orionis F	0·961			
				H β	0·558	+ 0·403	$1\frac{1}{4}$ towards red	
8. 33	,,	,,	,,	β Orionis F	0·344			
				H β	0·138	+ 0·206	1 towards red	
Jan. 23. 9. 3	WC	1	95	δ Orionis F	0·950			
				H β	0·807	+ 0·143	$\frac{2}{3}$ towards red	
9. 23	,,	,,	,,	δ Orionis F	1·088			
				H β	0·821	+ 0·267	$\frac{2}{3}$ towards red	
Jan. 23. 9. 38	WC	1	95	ε Orionis F	0·665			
				H β	0·113	+ 0·552	$1\frac{1}{2}$ towards red	

The day specified in the first column is the Solar Day in ordinary astronomical reckoning; the hours and minutes are those of Greenwich Sidereal Time.

TERRESTRIAL ELEMENTS, and CONCLUDED MOTIONS in the LINE of SIGHT, from OBSERVATIONS at the
in the Year 1878.

1rev. of the micrometer corresponds, with one "half-prism," to 10·3 tenth-metres or 372 miles per second for the *b* lines, and to 7·88 tenth-metres or 303 miles per second for the F line; and with two half-prisms to 2·3 tenth-metres or 83 miles per second for *b*, and to 1·83 tenth-metres or 70 miles per second for F.

1rev. of the screw for opening the slit corresponds to 0·01 inch, or about 10″. The weights are on a scale 1–5 for each observation.

The slit lies north and south when the reading of the Position-Circle is 5°.

Earth's Motion in Miles per Second.	Concluded Motion of Star in Miles per Second.		Weight.	REMARKS.
	Measured.	Estimated.		
+12·8	+ 20·8	+ 20·1	2 2	Indirect comparison. Image very tremulous, and definition poor.
+ 9·5	+ 26·0	+ 21·6	2 2 3	Indirect comparison. The F line in this star, though rather faint, is easy to bisect, being narrow and well-defined, and clear of all other lines. The definition of the spectrum was indifferent, the image being tremulous and watery.
+ 8·7	+ 21·1	+ 17·5	½ ½	Indirect comparison. Definition bad, and results very doubtful.
	− 0·7			The lines in the Moon's spectrum were rather faint, and the observations were much interrupted by light cloud. The results of the comparisons showed very satisfactorily that there was no perceptible instrumental error.
+15·6	+ 38·2	+ 41·3	1 1	Indirect comparison. Definition very bad; the observations were much hindered by passing clouds.
+12·2	(+ 92·0)	+ 17·9	3 3 3	The first two comparisons were indirect, the third direct. The pointer seemed not to follow the micrometer screw properly; the measures are therefore bracketed.
+11·9	(+ 45·9)	0·0	2 1	Indirect comparison.
+11·6	(+ 161·7)	+ 24·5	2	Indirect comparison. After bisecting the comparison line the star-line was seen for an instant, very distinctly on the red side.

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 sign + denotes recession; − denotes approach.

Day, and Greenwich Sidereal Time.	Observer.	Number of Half-Prisms.	Reading of Position Circle.	Objects compared.	Micrometer Readings.	Displacement. Measured.	Displacement. Estimated in Terms of the Breadth of the Bright Line of the Micrometer.	Width of Slit.
d h m			°		r	r		r
Jan. 29. 5. 5	M	1	95	Aldebaran b_1	0·670			
				Mg_1	0·616	+ 0·054	½ towards red	
5. 20	,,	,,	,,	Aldebaran b_1	0·708			
				Mg_1	0·586	+ 0·122	1 towards red	
Jan. 29. 5. 55	M	1	95	β Orionis F	0·393			
				H β	0·286	+ 0·107	1½ towards red	
6. 10	,,	,,	,,	β Orionis F	0·189			
				H β	0·089	+ 0·100	1 towards red	
6. 25	,,	,,	,,	β Orionis F	0·216			
				H β	0·160	+ 0·056	1 towards red	
Jan. 29. 6. 50	M	1	95	γ Orionis F	0·109			
				H β	0·045	+ 0·064	⅔ towards red	
7. 0	,,	,,	,,	γ Orionis F	0·135			
				H β	0·111	+ 0·024	¼ towards red	
7. 10	,,	,,	,,	γ Orionis F	0·089			
				H β	0·086	+ 0·003	Apparently coincident	
7. 20	,,	,,	,,	γ Orionis F	0·177			
				H β	0·104	+ 0·073	1 towards red	
7. 25	,,	,,	,,	γ Orionis F	0·127			
				H β	0·078	+ 0·049	½ towards red	
Jan. 29. 7. 23	M	1	95	γ Orionis F			Apparently coincident	
				H β				
Jan. 29. 8. 5	M	1	95	β Tauri F	0·250			
				H β	0·228	+ 0·022	Apparently coincident	
8. 20	,,	,,	,,	β Tauri F	0·266			
				H β	0·270	− 0·004	Apparently coincident	
8. 30	,,	,,	,,	β Tauri F	0·298			
				H β	0·275	+ 0·023	½ towards red	
							Estimated in Terms of the Breadth of the Comparison Line.	
Feb. 6. 4. 40	M	1	5	α Arietis b_1	0·221			
				Mg_1	0·413	+ 0·192	½ towards red	
5. 0	,,	,,	,,	α Arietis b_1	0·213			
				Mg_1	0·423	+ 0·210	½ towards red	
5. 15	,,	,,	,,	α Arietis b_1	0·208			
				Mg_1	0·465	+ 0·257	⅔ towards red	
Feb. 6. 5. 40	M	1	5	β Orionis F	0·478			
				H β	0·588	+ 0·110	⅔ towards red	
6. 5	,,	,,	,,	β Orionis F	0·343			
				H β	0·547	+ 0·204	½ towards red	
Feb. 17. 6. 50	WC	1	0	Sirius F	0·718			
				H β	0·889	+ 0·171	⅓ towards red	0·048
7. 10	,,	,,	,,	Sirius F	0·006			
				H β	0·128	+ 0·122	¼ towards red	0·015
7. 15	,,	,,	,,	Sirius F	0·014			
				H β	0·065	+ 0·051	¼ towards red	0·033
7. 20	,,	,,	,,	Sirius F	0·015			
				H β	0·019	+ 0·004	¼ towards red	0·033
Feb. 17. 7. 45	WC	1	0	γ Orionis F	0·530			
				H β	0·574	+ 0·044	⅓ towards red	0·138
8. 5	,,	,,	,,	γ Orionis F	0·915			
				H β	1·034	+ 0·119	⅔ towards red	0·156

The day specified in the first column is the Solar Day in ordinary astronomical reckoning; the hours and minutes are those of Greenwich Sidereal Time.

Earth's Motion in Miles per Second.	Concluded Motion of Star in Miles per Second.		Weight.	REMARKS.
	Measured.	Estimated.		
+16·6	+ 15·9	+ 4·8	1 1	Indirect comparison. Images very unsteady, and definition bad.
+13·2	+ 14·1	+ 13·0	½ 1½ 1	Indirect comparison. Definition even worse than in the case of Aldebaran. It would have been impossible to bisect a less easy line than the F line in this star.
+14·0	− 0·5	− 2·4	2 2 2 2 2	Indirect comparison. Definition much improved. The F line in this star is very black, quite isolated, no broader than in the Sun, and as well defined. It is therefore specially fitted for measurement.
+14·0		− 14·0		The instrument was accidentally disturbed after bisecting the star-line and making the estimation.
+14·2	− 9·8	− 10·2	1 1 1	Indirect comparison. Definition fairly good. The F line in this star is broad, with ill-defined edges; not so broad as the same line in Altair or Vega, but broader and more fuzzy than in γ Orionis.
+18·2	+ 63·1	+ 45·5	2 2 2	Indirect comparison. Spectrum rather tremulous. The *b* lines in the star are well defined and sharp. Direct comparison showed a considerable displacement to red.
+14·4	+ 34·9	+ 38·4	1 1	Indirect comparison. Spectrum very tremulous.
+10·5	+ 22·1	+ 8·3	2 1 1 1	First two comparisons direct, last two indirect. Star-line distinct, but very broad, and consequently not easy to bisect accurately.
+16·9	+ 2·8	+ 11·0	3 1	Indirect comparison. Star-line very distinct. Observation made through light cloud.

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 sign + denotes recession; − approach.

Day, and Greenwich Sidereal Time.	Observer.	Number of Half-Prisms.	Reading of Position Circle.	Objects compared.	Micrometer Readings.	Displacement. Measured.	Displacement. Estimated in Terms of the Breadth of the Bright Line of the Micrometer.	Width of Slit.
d h m			°		r	r		r
Feb. 17. 8. 20	WC	1	0	Moon F.....	0·167			
				H β	0·147	− 0·020	Sensibly coincident	0·156
Feb. 18. 5. 40	M	1	6	δ Orionis F	0·148			
				H β	0·305	+ 0·157	$\frac{2}{5}$ towards red	
6. 0	,,	,,	,,	δ Orionis F	0·172			
				H β	0·338	+ 0·166	$\frac{2}{5}$ towards red	
Feb. 18. 6. 20	M	1	6	ε Orionis F	0·315			
				H β	0·390	+ 0·075	$\frac{1}{3}$ towards red	
6. 30	,,	,,	,,	ε Orionis F	0·333			
				H β	0·472	+ 0·139	$\frac{1}{2}$ towards red	
6. 40	,,	,,	,,	ε Orionis F	0·340			
				H β	0·478	+ 0·138	$\frac{1}{3}$ towards red	
Feb. 18. 7. 5	M	1	6	ζ Orionis F	0·243			
				H β	0·304	+ 0·061	$\frac{1}{5}$ towards red	
7. 25	,,	,,	,,	ζ Orionis F	0·138			
				H β	0·288	+ 0·150	$\frac{1}{2}$ towards red	
Feb. 18. 8. 0	M	1	6	Sirius F.....	0·192			
				H β	0·302	+ 0·110	$\frac{1}{3}$ towards red	
8. 15	,,	,,	,,	Sirius F.....	0·162			
				H β	0·314	+ 0·152	$\frac{2}{3}$ towards red	
Feb. 18. 9. 10	M	1	6	α Orionis b_1.....	0·582			
				Mg_1	0·693	+ 0·111	$\frac{3}{10}$ towards red	
9. 20	,,	,,	,,	α Orionis b_1.....	0·495			
				Mg_1	0·673	+ 0·178	$\frac{5}{7}$ towards red	
9. 35	,,	,,	,,	α Orionis b_1.....	0·545			
				Mg_1	0·662	+ 0·117	$\frac{1}{2}$ towards red	
Feb. 18. 10. 15	M	1	6	Pollux b_1	0·708			
				Mg_1	0·682	− 0·026	$\frac{1}{10}$ towards blue	
10. 30	,,	,,	,,	Pollux b_1	0·574			
				Mg_1	0·631	+ 0·057	$\frac{1}{5}$ towards red	
10. 45	,,	,,	,,	Pollux b_1	0·647			
				Mg_1	0·688	+ 0·041	$\frac{1}{5}$ towards red	
11. 0	,,	,,	,,	Pollux b_1	0·572			
				Mg_1	0·655	+ 0·083	$\frac{1}{4}$ towards red	
Feb. 25. 9. 20	M	1	95	Procyon F.....	0·470			
				H β	0·388	+ 0·082	$\frac{1}{5}$ towards red	
9. 40	,,	,,	,,	Procyon F.....	0·528			
				H β	0·432	+ 0·096	$\frac{1}{3}$ towards red	
Feb. 25. 10. 15	M	1	95	Castor F	0·562			
				H β	0·408	+ 0·154	$\frac{3}{4}$ towards red	
10. 40	,,	,,	,,	Castor F	0·502			
				H β	0·396	+ 0·106	$\frac{1}{2}$ towards red	
Feb. 25. 11. 15	M	1	95	Pollux b_1	0·947			
				Mg_1	0·869	+ 0·078	1 towards red	

The day specified in the first column is the Solar Day in ordinary astronomical reckoning; the hours and minutes are those of Greenwich Sidereal Time.

Earth's Motion in Miles per Second.	Concluded Motion of Star in Miles per Second. Measured.	Estimated.	Weight.	REMARKS.
	− 6·3	0·0		
+16·1	+ 34·6	+ 45·3	1 1	Indirect comparison. Star spectrum rather too narrow, rendering bisection somewhat difficult.
+15·9	+ 20·9	+ 23·3	1 1 1	Indirect comparison.
+15·7	+ 17·4	+ 29·8	1 1	Indirect comparison. The spectra of the three stars in Orion's Belt are very similar, the F line showing dark, but not being very broad, broadest in ζ if there be any difference. The definition was only fair at the best, and got worse as the evening went on. The spectra were all rather too narrow for very accurate work.
+10·7	+ 30·4	+ 32·8	3 3	Indirect comparison. Tried also the *b* and D lines, but found the former too faint and the latter too broad, masked perhaps by absorption lines due to our atmosphere.
+16·1	+ 33·9	+ 36·4	4 4 4	Indirect comparison. The three magnesium lines in this star were easily separable; indeed, so well could the individual lines be made out that the banded appearance, which is so marked a feature of this spectrum with low dispersion, was scarcely noticeable. Definition good.
+11·5	+ 6·2	+ 7·7	2 3 3 4	Indirect comparison. Definition variable, sometimes very good; on the whole improving as the evening went on. The displacement is evidently very small.
+12·3	+ 15·6	+ 20·0	3 3	Indirect comparison. Image tremulous, spectrum watery. Star-line much better defined in the centre than that in Sirius.
+13·9	+ 26·9	+ 38·4	1 1	Indirect comparison. Line very broad and ill-defined at the edges. Bisection difficult and uncertain.
+13·1	+ 15·7	+ 15·3	1	Indirect comparison. Definition bad.

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Day, and Greenwich Sidereal Time.	Observer.	Number of Half-Prisms.	Reading of Position Circle.	Objects compared.	Micrometer Readings.	Displacement. Measured.	Displacement. Estimated in Terms of the Breadth of the Bright Line of the Micrometer.	Width of Slit.
d h m			°		r	r		r
Mar. 13. 10. 0	WC	1	90	Moon b_1	0·932			
				Mg_1	0·937	+ 0·005		0·120
				Moon b_1	0·919			
				Mg_1	0·975	+ 0·056		0·120
				Moon b_1	0·921			
				Mg_1	0·934	+ 0·013		0·120
				Moon b_1	0·993			
				Mg_1	0·041	− 0·053		0·120
Mar. 13. 11. 10	WC	1	90	Pollux b_1	0·313			
				Mg_1	0·246	− 0·067	$\frac{1}{4}$ towards blue	0·120
11. 15	,,	,,	,,	Pollux b_1	0·372			
				Mg_1	0·222	− 0·150	$\frac{1}{5}$ towards blue	0·120
Mar. 13. 11. 45	WC	1	90	α Hydræ b_1	0·828			
				Mg_1	1·005	+ 0·177	$\frac{2}{3}$ towards red	0·120
11. 50				α Hydræ b_1	0·732			
				Mg_1	0·933	+ 0·201	$\frac{2}{3}$ towards red	0·120
11. 55				α Hydræ b_1	0·849			
				Mg_1	0·980	+ 0·131	$\frac{1}{2}$ towards red	0·120
Mar. 13. 12. 20	WC	1	90	γ Leonis b_1	0·843			
				Mg_1	?		$\frac{1}{4}$ towards red	0·120
12. 25	,,	,,	,,	γ Leonis b_1	1·006			
				Mg_1	0·928	− 0·078	$\frac{1}{10}$ towards blue	0·120
12. 30	,,	,,	,,	γ Leonis b_1	0·835			
				Mg_1	0·946	+ 0·111	$\frac{1}{6}$ towards r ed	0·120
Mar. 15. 8. 55	M	1	5	α Orionis b_4	0·330			
				Mg_3	0·448	+ 0·118	$\frac{1}{2}$ towards red	0·098
9. 10	,,	,,	,,	α Orionis b_4	0·470			
				Mg_3	0·517	+ 0·047	$\frac{1}{5}$ towards red	0·098
Mar. 15. 9. 40	M	1	5	Capella b_1	0·998			
				Mg_1	1·143	+ 0·155	$\frac{2}{3}$ towards red	0·085
9. 50	,,	,,	,,	Capella b_1	0·992			
				Mg_1	1·145	+ 0·153	$\frac{2}{3}$ towards red	0·085
Mar. 15. 10. 20	M	1	5	Pollux b_1	0·502			
				Mg_1	0·556	+ 0·054	$\frac{1}{4}$ towards red	0·085
10. 25	,,	,,	,,	Pollux b_1	0·479			
				Mg_1	0·578	+ 0·099	$\frac{2}{3}$ towards red	0·085
10. 40	,,	,,	,,	Pollux b_1	0·492			
				Mg_1	0·562	+ 0·070	$\frac{1}{2}$ towards red	0·085
Mar. 16. 9. 10	WC	1	120	Capella F	0·677			
				H β	0·804	+ 0·127	$\frac{1}{2}$ towards red	0·080
9. 40	,,	,,	,,	Capella F	0·325			
				H β	0·250	− 0·075	$\frac{1}{3}$ towards red	0·080
9. 50	,,	,,	,,	Capella F	0·205			
				H β	0·163	− 0·042	$\frac{1}{3}$ towards red	0·080
Mar. 16. 10. 30	WC	1	120	Capella b_1	0·496			
				Mg_1	0·415	− 0·081	$\frac{1}{3}$ towards red	0·073
10. 40	,,	,,	,,	Capella b_1	0·359			
				Mg_1	0·398	+ 0·039	$\frac{1}{4}$ towards red	0·073
10. 45	,,	,,	,,	Capella b_1	0·342			
				Mg_1	0·398	+ 0·056	$\frac{1}{4}$ towards red	0·073

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Earth's Motion in Miles per Second.	Concluded Motion of Star in Miles per Second.		Weight.	REMARKS.
	Measured.	Estimated.		
	− 1·9			
+16·1	− 56·2	− 34·9	1½ 1½	Indirect comparison. Star spectra throughout the evening not in perfect adjustment, rendering the measures more difficult and less accurate.
+ 8·0	+ 57·6	+ 24·2	1½ 2 1	Indirect comparison.
+ 7·9	− 13·5	− 3·4	1 2 1	Indirect comparison. The magnesium lines were in good focus throughout the evening, but the star spectrum was not in equally good adjustment with regard to its breadth, the lower edge being bright, but the rest of the spectrum much fainter. This made the observations proportionately more difficult and the measures rough.
+17·9	+ 16·8	+ 15·8	2 1	Indirect comparison. Image tremulous, the *b* lines in the star spectrum being often not sufficiently well-defined to be easily separated. Definition still worse.
+17·0	+ 39·9	+ 42·0	4 4	Indirect comparison. Definition much better than in the case of α Orionis; star-lines very distinct.
+16·4	+ 9·2	+ 10·4	3 1½ ½	Indirect comparison. Definition fair at first, but becoming rapidly worse.
+17·0	(− 11·0)	+ 9·7	1 ½ 1	Direct comparison. The H β line is a broad haze, brighter in the middle, and very difficult to bisect. The bright line of the micrometer was ragged on one side, making the measures throughout the evening much less trustworthy than the estimations. The measures have been bracketed. The H β line was estimated to be 1½ times the breadth of the bright line of the micrometer. This value has been used in the reduction of the estimations.
+17·0	(− 13·5)	− 2·6	2 3 2	Indirect comparison. The *b* lines in the star spectrum were fine and sharp, and seen very distinctly. Estimations in terms of the breadth of the bright line of the micrometer.

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Day, and Greenwich Sidereal Time.	Observer.	Number of Half-Prisms.	Reading of Position Circle.	Objects compared.	Micrometer Readings.	Displacement. Measured.	Displacement. Estimated in Terms of the Breadth of the Bright Line of the Micrometer.	Width of Slit.
d h m			°		r	r		r
Mar. 16. 11. 5	WC	1	120	Pollux b_1	0·187			
				Mg_1	0·145	− 0·042	$\frac{1}{2}$ towards blue	0·073
11. 15	,,	,,	,,	Pollux b_1	0·100			
				Mg	0·121	+ 0·021	$\frac{1}{6}$ towards red	0·073
Mar. 16. 11. 50	WC	1	120	Procyon b_1	0·806			
				Mg_1	0·631	− 0·175	$\frac{1}{3}$ towards blue	0·073
	,,	,,	,,	Procyon b_1	0·590		Nearly coincident,	
				Mg_1	0·582	− 0·008	slight to red $\frac{1}{8}$.	0·073
Mar. 16.	WC	1	120	Moon b_1	0·858			
				Mg_1	0·817	− 0·041	Coincident	0·073
	,,	,,	,,	Moon b_1	0·872			
				Mg_1	0·858	− 0·014	Coincident	0·073
	,,	,,	,,	Moon b_1	0·915			
				Mg_1	0·820	− 0·095	Towards blue	0·073
	,,	,,	,,	Moon b_1	0·826			
				Mg_1	0·907	+ 0·081	Coincident	0·073
Mar. 25. 9. 15	M	1	95	Sirius F	0·708			
				H β	0·778	+ 0·070	$\frac{1}{3}$ towards red	0·151
9. 30	,,	,,	,,	Sirius F	0·692			
				H β	0·859	+ 0·167	$\frac{2}{3}$ towards red	0·151
Mar. 25. 10. 5	M	1	95	Capella F	0·132			
				H β	0·238	+ 0·106	$\frac{1}{3}$ towards red	0·151
10. 15	,,	,,	,,	Capella F	0·138			
				H β	0·238	+ 0·100	$\frac{1}{3}$ towards red	0·151
Mar. 25. 10. 35	M	1	95	Procyon F	0·745			
				H β	0·817	+ 0·072	$\frac{3}{10}$ towards red	0·141
10. 45	,,	,,	,,	Procyon F	0·746			
				H β	0·832	+ 0·086	$\frac{1}{3}$ towards red	0·141
Mar. 25. 11. 0	M	1	95	Castor F	0·118			
				H β	0·273	+ 0·155	$\frac{1}{2}$ towards red	0·141
11. 10	,,	,,	,,	Castor F	0·133			
				H β	0·303	+ 0·170	$\frac{3}{5}$ towards red	0·141
Mar. 25. 11. 40	M	1	95	Pollux F	0·958			
				H β	0·795	− 0·163	$\frac{3}{5}$ towards blue	0·141
11. 50	,,	,,	,,	Pollux F	0·935			
				H β	0·893	− 0·042	$\frac{1}{8}$ towards blue	0·141
12. 5	,,	,,	,,	Pollux F	0·993			
				H β	0·925	− 0·068	$\frac{1}{5}$ towards blue	0·141
12. 20	,,	,,	,,	Pollux F	1·018			
				H β	0·908	− 0·110	$\frac{1}{3}$ towards blue	0·141
Mar. 25. 12. 45	M	1	95	β Leonis F	0·132			
				H β	0·273	+ 0·141	$\frac{3}{5}$ towards red	0·141
13. 3	,,	,,	,,	β Leonis F	0·123			
				H β	0·295	+ 0·172	$\frac{3}{4}$ towards red	0·141
Mar. 25. 13. 20	M	1	95	α Coronæ F	0·948			
				H β	1·081	+ 0·133	$\frac{1}{2}$ towards red	0·141
13. 35	,,	,,	,,	α Coronæ F	0·922			
				H β	1·162	+ 0·240	$\frac{3}{4}$ towards red	0·141
13. 45	,,	,,	,,	α Coronæ F	1·105			
				H β	1·231	+ 0·126	$\frac{1}{2}$ towards red	0·141

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Earth's Motion in Miles per Second.	Concluded Motion of Star in Miles per Second.		Weight.	REMARKS.
	Measured.	Estimated.		
+16·5	− 20·4	− 25·2	3 3	Indirect comparison. Estimations in terms of the breadth of the bright line of the micrometer.
+15·7	(− 59·8)	(− 25·2)	1 ½	Indirect comparison. The *b* lines in this star are very faint. Estimations in terms of the breadth of the bright line of the micrometer. The observations have been bracketed, being discordant *inter se*.
	− 6·4			
+14·1	+ 23·2	+ 41·8	2 2	Indirect comparison. Star low, and the image very tremulous.
+16·4	+ 15·9	+ 20·9	5 5	Indirect comparison. Star-line seen very distinctly.
+16·7	+ 7·5	+ 10·3	5 3	Indirect comparison. The F line in this star is rather peculiar, resembling a fine line on a wide haze. Star much fainter at the second observation.
+17·6	+ 33·7	+ 30·5	3 4	Indirect comparison. Star-line broad and very dark, and somewhat difficult to bisect. The star-line shades off gradually from the centre in both directions.
+17·5	− 52·3	− 49·8	3 1 2 2	Indirect comparison. Definition becoming worse, and star-line faint.
+ 4·8	+ 44·3	+ 53·4	2 2	Indirect comparison. Star-line broad, fuzzy at the edges, and not very dark. Definition becoming worse.
− 7·6	+ 54·3	+ 54·4	3 1 2	Indirect comparison. Star-line broad and fuzzy at the edges. Definition only occasionally good. *Note.*—The Spectroscope was directed to the Sun on the following morning, care having been taken that nothing was disturbed in the interval. No want of coincidence between the H β line and the F line of the solar spectrum could be detected.

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Day, and Greenwich Sidereal Time.	Observer.	Number of Half-Prisms.	Reading of Position Circle.	Objects compared.	Micrometer Readings.	Displacement. Measured.	Displacement. Estimated in Terms of the Breadth of the Bright Line of the Micrometer.	Width of Slit.
d h m			°		r	r		r
Mar. 30. 10. 50	M	1	5	Procyon F.....	0·063			
				H β	0·232	+ 0·169	$\frac{2}{3}$ towards red	0·123
11. 10	,,	,,	,,	Procyon F.....	0·028			
				H β	0·221	+ 0·193	$\frac{3}{5}$ towards red	0·123
Mar. 30. 11. 25	M	1	5	Pollux F.....	0·652			
				H β	0·606	− 0·046	$\frac{1}{8}$ towards blue	0·123
11. 40	,,	,,	,,	Pollux F.....	0·777			
				H β	0·725	− 0·052	$\frac{1}{8}$ towards blue	0·123
Mar. 30. 11. 55	M	1	5	Castor F.....	0·963			
				H β	1·188	+ 0·225	$\frac{3}{4}$ towards red	0·073
12. 10	,,	,,	,,	Castor F.....	0·943			
				H β	1·179	+ 0·236	$\frac{3}{5}$ towards red	0·073
Mar. 30. 12. 30	M	1	5	Regulus F.....	0·426			
				H β	0·544	+ 0·118	$\frac{2}{5}$ towards red	0·073
12. 45	,,	,,	,,	Regulus F.....	0·474			
				H β	0·562	+ 0·088	$\frac{1}{3}$ towards red	0·073
Mar. 30. 12. 58	M	1	5	β Leonis F	0·015			
				H β	0·198	+ 0·183	$\frac{3}{5}$ towards red	0·073
13. 12	,,	,,	,,	β Leonis F	0·925			
				H β	1·196	+ 0·271	1 towards red	0·073
13. 20	,,	,,	,,	β Leonis F	0·017			
				H β	0·191	+ 0·174	$\frac{3}{5}$ towards red	0·073
Mar. 30. 13. 40	M	1	5	Spica F.....	0·577			
				H β	0·553	− 0·024	$\frac{1}{10}$ towards blue	0·073
13. 50	,,	,,	,,	Spica F.....	0·582			
				H β	0·533	− 0·049	$\frac{1}{10}$ towards blue	0·073
14. 5	,,	,,	,,	Spica F.....	0·562			
				H β	0·583	+ 0·021	Nil	0·073
14. 15	,,	,,	,,	Spica F.....	0·662			
				H β	0·636	− 0·026	$\frac{1}{10}$ towards blue	0·073
Mar. 30. 14. 30	M	1	5	Arcturus F	0·153			
				H β	0·112	− 0·041	$\frac{1}{8}$ towards blue	0·073
14. 40	,,	,,	,,	Arcturus F	0·134			
				H β	0·092	− 0·042	$\frac{1}{5}$ towards blue	0·073
14. 47	,,	,,	,,	Arcturus F	1·043			
				H β	0·967	− 0·076	$\frac{1}{4}$ towards blue	0·073
14. 55	,,	,,	,,	Arcturus F	0·086			
				H β	0·005	− 0·083	$\frac{3}{10}$ towards blue	0·073
Apr. 1. 10. 0	M	1	5	α Orionis b_1.....	0·097			
				Mg_1	0·204	+ 0·107	$\frac{1}{3}$ towards red	0·128
10. 15	,,	,,	,,	α Orionis b_1.....	0·118			
				Mg_1	0·207	+ 0·089	$\frac{1}{3}$ towards red	0·128
10. 30	,,	,,	,,	α Orionis b_1.....	0·104			
				Mg_1	0·213	+ 0·109	$\frac{1}{3}$ towards red	0·128
Apr. 1. 11. 0	M	1	5	Capella b_1	0·959			
				Mg_1	1·154	+ 0·195	$\frac{2}{3}$ towards red	0·128
11. 15	,,	,,	,,	Capella b_1	0·789			
				Mg_1	0·981	+ 0·192	$\frac{2}{3}$ towards red	0·128

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Earth's Motion in Miles per Second.	Concluded Motion of Star in Miles per Second.		Weight.	REMARKS.
	Measured.	Estimated.		
+17·2	+ 39·6	+ 46·2	2½ 2½	Indirect comparison. Definition poor, and image tremulous.
+17·9	− 33·3	− 34·2	1½ 1½	Indirect comparison. Definition poor.
+17·9	+ 54·4	+ 43·7	1 1	Indirect comparison. The line in this star, being broad and ill-defined at the edges, is difficult to bisect. Definition poor.
+12·3	+ 18·5	+ 18·6	2 4	Indirect comparison. Definition improving. Star-line much easier to bisect than that in Castor.
+ 6·2	+ 57·0	+ 54·6	3 2 3	Indirect comparison. Definition improving. Star-line darker and a little broader than that in Regulus, but not nearly so ill-defined at the edges as that in Castor.
− 3·8	− 0·5	− 2·3	3 1 3 3	Indirect comparison. The line in this star resembles that in Procyon rather than that in Castor. It is rather faint, fairly defined in the centre, but with a slight fringe on either side.
− 3·3	− 17·2	− 16·9	3 3 5 5	Indirect comparison. Definition good.
+17·1	+ 20·5	+ 19·3	4 4 4	Indirect comparison. Spectrum tremulous, but the star-line was seen very distinctly from time to time.
+15·7	+ 55·8	+ 57·0	3 3	Indirect comparison. Spectrum very tremulous, giving much trouble.

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Day, and Greenwich Sidereal Time.	Observer.	Number of Half-Prisms.	Reading of Position Circle.	Objects compared.	Micrometer Readings.	Displacement. Measured.	Displacement. Estimated in Terms of the Breadth of the Bright Line of the Micrometer.	Width of Slit.
d h m			°		r	r		r
Apr. 1. 11. 45	M	1	5	Pollux b_1	0·993			
				Mg_1	0·968	− 0·025	Nil	0·128
11. 55	,,	,,	,,	Pollux b_1	1·032			
				Mg_1	0·953	− 0·079	$\frac{1}{3}$ towards blue	0·128
12. 15	,,	,,	,,	Pollux b_1	0·490			
				Mg_1	0·462	− 0·028	$\frac{1}{10}$ towards blue	0·128
12. 30	,,	,,	,,	Pollux b_1	0·513			
				Mg_1	0·507	− 0·006	$\frac{1}{10}$ towards blue	0·128
Apr. 1. 13. 0	M	1	5	γ Leonis b_1	0·992			
				Mg_1	0·908	− 0·084	$\frac{1}{3}$ towards blue	0·096
13. 20	,,	,,	,,	γ Leonis b_1	0·989			
				Mg_1	0·911	− 0·078	$\frac{1}{3}$ towards blue	0·096
Apr. 1. 13. 40	M	1	5	ε Leonis b_1	0·069			
				Mg_1	0·039	− 0·030	$\frac{1}{10}$ towards blue	0·128
14. 0	,,	,,	,,	ε Leonis b_1	0·121			
				Mg_1	0·065	− 0·056	$\frac{3}{10}$ towards blue	0·128
Apr. 1. 14. 15	M	1	5	η Boötis b_1	0·618			
				Mg_1	0·713	+ 0·095	$\frac{1}{3}$ towards red	0·128
14. 25	,,	,,	,,	η Boötis b_1	0·623			
				Mg_1	0·717	+ 0·094	$\frac{1}{3}$ towards red	0·128
Apr. 1. 14. 45	M	1	5	ε^2 Boötis b_1	0·822			
				Mg_1	0·744	− 0·078	$\frac{1}{3}$ towards blue	0·096
15. 0	,,	,,	,,	ε^2 Boötis b_1	0·781			
				Mg_1	0·703	− 0·078	$\frac{1}{3}$ towards blue	0·096
15. 10	,,	,,	,,	ε^2 Boötis b_1	0·755			
				Mg_1	0·670	− 0·085	$\frac{1}{3}$ towards blue	0·096
Apr. 2. 0.	M	1	5	Sky b_1	0·358			
				Mg_1	0·363	+ 0·005		0·096
Apr. 7. 10. 45	WC	2	90	Pollux b_1	0·573			
				Mg_1	0·426	− 0·147	$\frac{1}{5}$ towards blue	0·070
10. 55	,,	,,	,,	Pollux b_1	0·655			
				Mg_1	0·369	− 0·286	$\frac{1}{4}$ towards blue	0·070
11. 0	,,	,,	,,	Pollux b_1	0·500			
				Mg_1	0·300	− 0·200	$\frac{1}{6}$ towards blue	0·070
Apr. 7. 11. 40	WC	2	90	Arcturus b_1	0·458			
				Mg_1	0·368	− 0·090	$\frac{1}{4}$ towards blue	0·070
11. 55	,,	,,	,,	Arcturus b_1	0·710			
				Mg_1	0·522	− 0·188	$\frac{1}{5}$ towards blue	0·070
Apr. 7. 23. 0	WC & M.	2	90	Sky b_1	1·202			
				Mg_1	1·201	− 0·001		0·072
	,,	,,	,,	Sky b_2	5·909			
				Mg_2	5·949	+ 0·040		0·072
	,,	,,	,,	Sky b_4	8·173			
				Mg_3	8·213	+ 0·040		0·072
Apr. 8. 9. 30	M	2	5	Aldebaran b_1	0·145			
				Mg_1	0·467	+ 0·322	$\frac{1}{2}$ towards red	0·072
9. 45	,,	,,	,,	Aldebaran b_1	0·122			
				Mg_1	0·498	+ 0·376	$\frac{1}{2}$ towards red	0·072

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Earth's Motion in Miles per Second.	Concluded Motion of Star in Miles per Second.		Weight.	REMARKS.
	Measured.	Estimated.		
+ 18·0	− 28·0	− 31·1	2 2 4 5	Indirect comparison. The definition of the star spectrum was very good for the third and fourth measures.
+ 12·7	− 42·5	− 40·4	3 4	Indirect comparison. Definition good, especially for the second measure.
+ 14·5	− 30·4	− 36·3	1½ 1½	Indirect comparison. Spectrum tremulous and faint, but lines dark and distinct.
− 1·5	− 33·4	− 34·9	2 2	Indirect comparison. Spectrum not quite so faint as that of α Leonis.
− 3·4	− 26·3	− 24·3	3 3 3	Indirect comparison. Definition better than in the case of the two preceding stars, but star-lines not quite so dark.
	+ 1·8			Mean of fifteen comparisons.
+ 18·1	− 35·6	− 26·3	2 2 2	Indirect comparison. Star-lines seen fairly distinctly.
− 1·2	− 10·3	− 7·8	1 1	Indirect comparison. Star-lines not seen so distinctly as in the case of Pollux.
	+ 2·1			The magnesium and *b* lines appeared perfectly coincident. Each measure is the mean of three.
+ 13·8	+ 15·2	+ 18·0	3 3	Indirect comparison. Star spectrum rather narrow, and much brighter at the upper edge than at the lower.

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Day, and Greenwich Sidereal Time.	Observer.	Number of Half-Prisms.	Reading of Position Circle.	Objects compared.	Micrometer Readings.	Displacement. Measured.	Displacement. Estimated in Terms of the Breadth of the Bright Line of the Micrometer.	Width of Slit.
d h m			°		r	r		r
Apr. 8. 10. 0	M	2	5	α Orionis b_1	0·013			
				Mg_1	0·323	+ 0·310	$\frac{3}{7}$ towards red	0·072
10. 30	,,	,,	,,	α Orionis b_1	0·024			
				Mg_1	0·263	+ 0·239	$\frac{1}{3}$ towards red	0·072
10. 40	,,	,,	,,	α Orionis b_1	0·014			
				Mg_1	0·358	+ 0·344	$\frac{3}{7}$ towards red	0·072
Apr. 8. 11. 0	M	2	5	Moon b_1	0·973			
				Mg_1	1·027	+ 0·054		0·072
	,,	,,	,,	Moon b_2	5·987			
				Mg_2	5·959	− 0·028		0·072
	,,	,,	,,	Moon b_4	8·363			
				Mg_3	8·304	− 0·059		0·072
	,,	,,	,,	Moon b_1	1·032			
				Mg_1	1·053	+ 0·021		0·072
	,,	,,	,,	Moon b_2	6·089			
				Mg_2	6·068	− 0·021		0·072
	,,	,,	,,	Moon b_4	8·407			
				Mg_3	8·418	+ 0·011		0·072
Apr. 8. 12. 30	M	2	5	Pollux b_1	0·843			
				Mg_1	0·762	− 0·081	$\frac{1}{6}$ towards blue	0·072
12. 37	,,	,,	,,	Pollux b_1	0·892			
				Mg_1	0·823	− 0·069	$\frac{1}{10}$ towards blue	0·072
12. 45	,,	,,	,,	Pollux b_1	0·862			
				Mg_1	0·833	− 0·029	$\frac{1}{10}$ towards blue	0·072
Apr. 8. 13. 0	M	2	5	γ Leonis b_1	0·477			
				Mg_1	0·405	− 0·072	$\frac{1}{7}$ towards blue	0·072
13. 10	,,	,,	,,	γ Leonis b_1	0·476			
				Mg_1	0·372	− 0·104	$\frac{1}{7}$ towards blue	0·072
13. 25	,,	,,	,,	γ Leonis b_1	0·528			
				Mg_1	0·461	− 0·067	$\frac{1}{7}$ towards blue	0·072
Apr. 8. 13. 45	M	2	5	Arcturus b_1	0·848			
				Mg_1	0·681	− 0·167	$\frac{1}{5}$ towards blue	0·072
13. 55	,,	,,	,,	Arcturus b_1	0·998			
				Mg_1	0·767	− 0·231	$\frac{1}{3}$ towards blue	0·072
14. 5	,,	,,	,,	Arcturus b_1	1·022			
				Mg_1	0·753	− 0·269	$\frac{3}{7}$ towards blue	0·072
Apr. 8. 23. 0	M	2	5	Sky b_1	0·282			
				Mg_1	0·296	+ 0·014		0·072
	,,	,,	,,	Sky b_2	5·205			
				Mg_2	5·198	− 0·007		0·072
	,,	,,	,,	Sky b_4	7·374			
				Mg_3	7·403	+ 0·029		0·072
Apr. 11.	M	1	5	Moon F	0·558			
				H β	0·562	+ 0·004		0·072
	,,	,,	,,	Moon F	0·564			
				H β	0·547	− 0·017		0·072
	,,	,,	,,	Moon F	0·555			
				H β	0·566	+ 0·011		0·072
	,,	,,	,,	Moon F	0·558			
				H β	0·565	+ 0·007		0·072

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Earth's Motion in Miles per Second.	Concluded Motion of Star in Miles per Second.		Weight.	REMARKS.
	Measured.	Estimated.		
+ 16·3	+ 9·0	+ 9·5	3 2 3	Indirect comparison. Star spectrum rather narrow, and tremulous from the varying refraction.
	0·0			
+ 18·1	− 23·0	− 25·9	1 1 1	Indirect comparison. The comparison spectrum was unsteady.
+ 14·1	− 20·8	− 23·2	1 1 1	Indirect comparison. The comparison spectrum was unsteady.
− 0·9	− 18·3	− 20·7	3 4 5	Indirect comparison. Definition improving, and finally very good.
	+ 0·8			Mean of three measures. Mean of three measures. Mean of two measures.
	0·0			

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Day, and Greenwich Sidereal Time.	Observer.	Number of Half-Prisms.	Reading of Position Circle.	Objects compared.	Micrometer Readings.	Displacement. Measured.	Displacement. Estimated in Terms of the Breadth of the Bright Line of the Micrometer.	Width of Slit.
d h m			°		r	r		r
Apr. 11. 10. 40	M	1	5	β Aurigæ F.....	0·515			
				H β	0·495	− 0·020	$\frac{1}{10}$ towards blue	0·072
11. 5	,,	,,	,,	β Aurigæ F.....	0·322			
				H β	0·502	+ 0·180	$\frac{4}{5}$ towards red	0·072
11. 20	,,	,,	,,	β Aurigæ F.....	0·388			
				H β	0·492	+ 0·104	$\frac{2}{5}$ towards red	0·072
11. 40	,,	,,	,,	β Aurigæ F.....	0·390			
				H β	0·472	+ 0·082	$\frac{2}{5}$ towards red	0·072
Apr. 11. 12. 10	M	1	5	Regulus F.....	0·308			
				H β	0·465	+ 0·157	$\frac{2}{5}$ towards red	0·072
12. 25	,,	,,	,,	Regulus F.....	0·302			
				H β	0·478	+ 0·176	$\frac{2}{5}$ towards red	0·072
12. 35	,,	,,	,,	Regulus F.....	0·388			
				H β	0·468	+ 0·080	$\frac{3}{10}$ towards red	0·072
Apr. 11. 13. 45	M	1	5	Spica F.....	0·152			
				H β	0·229	+ 0·077	$\frac{1}{4}$ towards red	0·072
14. 10	,,	,,	,,	Spica F.....	0·143			
				H β	0·237	+ 0·094	$\frac{1}{4}$ towards red	0·072
Apr. 11. 14. 35	M	1	5	γ Virginis F.....	0·380			
				H β	0·506	+ 0·126	$\frac{3}{10}$ towards red	0·072
14. 45	,,	,,	,,	γ Virginis F.....	0·471			
				H β	0·575	+ 0·104	$\frac{3}{10}$ towards red	0·072
Apr. 11. 15. 0	M	1	5	α Ophiuchi F.....	0·142			
				H β	0·083	− 0·059	$\frac{1}{5}$ towards blue	0·072
15. 10	,,	,,	,,	α Ophiuchi F.....	0·124			
				H β	0·072	− 0·052	$\frac{1}{5}$ towards blue	0·072
15. 20	,,	,,	,,	α Ophiuchi F.....	0·148			
				H β	0·051	− 0·097	$\frac{1}{5}$ towards blue	0·072
Apr. 20. 12. 0	M	2	5	Procyon F.....	0·653			
				H β	1·137	+ 0·484	$\frac{2}{3}$ towards red	0·100
12. 15	,,	,,	,,	Procyon F.....	0·775			
				H β	1·254	+ 0·479	$\frac{1}{2}$ towards red	0·100
May 8. 12. 45	M	2	5	Moon F.....	0·816			
				H β	0·821	+ 0·005		
12. 49	,,	,,	,,	Moon F.....	0·780			
				H β	0·823	+ 0·043		
12. 56	,,	,,	,,	Moon F.....	0·822			
				H β	0·824	+ 0·002		
13. 0	,,	,,	,,	Moon F.....	0·878			
				H β	0·846	− 0·032		
May 11. 13. 57	M	1	5	Moon F.....	0·586			
				H β	0·576	− 0·010		
14. 3	,,	,,	,,	Moon F.....	0·537			
				H β	0·572	+ 0·035		
14. 6	,,	,,	,,	Moon F.....	0·602			
				H β	0·596	− 0·006		
14. 10	,,	,,	,,	Moon F.....	0·598			
				H β	0·580	− 0·018		
May 11. 14. 25	M	1	5	Spica F.....	0·622			
				H β	0·588	− 0·034	Nil	
14. 40	,,	,,	,,	Spica F.....	0·632			
				H β	0·662	+ 0·030	Nil	

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Earth's Motion in Miles per Second.	Concluded Motion of Star in Miles per Second.		Weight.	REMARKS.
	Measured.	Estimated.		
+ 15·6	+ 11·5	+ 22·3	½ ½ ½ ½	Indirect comparison. Definition good. The line in this star is as difficult to bisect accurately as is that in Altair. It is broad, ill-defined at the edges, and has nothing like a central condensation.
+ 14·8	+ 26·6	+ 21·6	3 3 4	Indirect comparison. Definition fair.
0·0	+ 26·8	+ 25·3	1 1	Indirect comparison. Definition bad, and the observations frequently interrupted by the passage of cloud.
+ 4·3	+ 31·8	+ 26·0	1½ 1½	Indirect comparison. Definition better than for Spica.
− 12·7	− 9·0	− 7·5	1 1 1	Indirect comparison. The star-line was very difficult to bisect, as it was broad and ill-defined at the edges.
+ 17·4	+ 16·4	+ 34·2	2 2	Indirect comparison. The observations were much interrupted by the passing of light cloud, but in the intervals the sky was very clear. Estimations in terms of the breadth of a bar in the field.
	+ 0·3			The coincidence of the lines in the two spectra seemed to be very perfect.
	+ 0·1			
+ 8·7	− 9·3	− 8·7	2 2	Indirect comparison. The star spectrum was very watery and tremulous, and the star-line badly defined.

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d h m			°		r	r		
Sept. 18. 23. 25	M	1		ϵ Pegasi b_4	0·578			
				Mg_3	0·592	− 0·014	$\frac{1}{10}$ towards blue	
23. 35	,,	,,		ϵ Pegasi b_4	0·583			
				Mg_3	0·614	− 0·031	$\frac{1}{10}$ towards blue	
Sept. 18. 0. 30	M	1		α Arietis b_1	0·402			
				Mg_1	0·448	− 0·046	$\frac{1}{4}$ towards blue	
0. 45	,,	,,		α Arietis b_1	0·338			
				Mg_1	0·452	− 0·114	$\frac{1}{2}$ towards blue	
Sept. 18. 1. 0	M	1		Moon b_1	0·712			
				Mg_1	0·704	+ 0·008		
	,,	,,		Moon b_1	0·764			
				Mg_1	0·759	+ 0·005		
	,,	,,		Moon b_1	0·716			
				Mg_1	0·742	− 0·026		
	,,	,,		Moon b_1	0·735			
				Mg_1	0·751	− 0·016		
Oct. 22. 22. 35	M	1	5	ϵ Pegasi b_1	0·336			
				Mg_1	0·368	− 0·032	$\frac{1}{10}$ towards blue	0·033
23. 0	,,	,,	,,	ϵ Pegasi b_1	0·372			
				Mg_1	0·378	− 0·006	$\frac{1}{20}$ towards blue	0·033
Oct. 22. 0. 0	M	1	5	ϵ Cygni b_1	0·405			
				Mg_1	0·352	+ 0·053	$\frac{1}{4}$ towards red	0·033
0. 25	,,	,,	,,	ϵ Cygni b_1	0·421			
				Mg_1	0·341	+ 0·080	$\frac{2}{5}$ towards red	0·033
Oct. 22. 0. 55	M	1	5	α Arietis b_1	1·017			
				Mg_1	1·049	− 0·032	$\frac{1}{4}$ towards blue	0·033
1. 15	,,	,,	,,	α Arietis b_1	0·982			
				Mg_1	1·049	− 0·067	$\frac{1}{3}$ towards blue	0·033
Oct. 22. 1. 30	M	1	5	α Ceti b_1	0·943			
				Mg_1	1·046	− 0·103	$\frac{1}{2}$ towards blue	0·033
1. 35	,,	,,	,,	α Ceti b_1	0·998			
				Mg_1	1·066	− 0·068	$\frac{1}{3}$ towards blue	0·033
Oct. 22. 1. 45	M	1	5	α Ceti b_4	0·286			
				Mg_3	0·392	− 0·106	$\frac{4}{7}$ towards blue	0·033
1. 50	,,	,,	,,	α Ceti b_4	0·307			
				Mg_3	0·405	− 0·098	$\frac{4}{7}$ towards blue	0·033
Oct. 22. 13. 0	M	2	5	Sky b_1	0·110			
				Mg_1	0·109	+ 0·001		
Oct. 25. 22. 55	WC	2	5	ϵ Pegasi b_1	0·555			
				Mg_1	0·664	− 0·109	$\frac{1}{8}$ towards blue	0·130
Oct. 25. 12. 0	WC	2	5	Sky b_1	0·183			
				Mg_1	0·165	+ 0·018		
Nov. 2. 22. 18	WC	2	0	Moon b_1	0·867			
				Mg_1	0·824	+ 0·043		0·120
	,,	,,	,,	Moon b_1	1·002			
				Mg_1	0·732	+ 0·270		0·120
	,,	,,	,,	Moon b_1	0·873			
				Mg_1	1·012	− 0·139		0·120

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Earth's Motion in Miles per Second.	Concluded Motion of Star in Miles per Second.		Weight.	REMARKS.
	Measured.	Estimated.		
+ 7·2	− 15·7	− 14·7	1 1	Indirect comparison. Wind high, and definition poor.
− 11·5	− 18·1	− 14·5	1½ 1½	Indirect comparison. Definition still indifferent, but wind not so high as in the case of ε Pegasi.
	− 2·7			Coincidence of the lines in the two spectra apparently very exact.
+ 14·8	− 20·8	− 20·5	2 3	Indirect comparison. Definition variable, but improving on the whole.
+ 10·8	+ 14·8	+ 17·4	2 3	Indirect comparison. Image unsteady at first, but definition better for the second measure. The high wind made the light for illuminating the bright line micrometer flicker a good deal.
− 2·1	− 16·2	− 22·1	2 2	Indirect comparison. Definition fair. Wind lower than in the case of ε Cygni.
− 4·1	− 27·5	− 30·4	1 1	Indirect comparison.
− 4·1	− 33·5	− 43·1	1 1	Indirect comparison. Definition poor. The b_1 line in the star spectrum was faint, and the b_4 line could not be satisfactorily isolated.
	+ 0·1			The mean of six measures.
+ 15·2	− 23·5	− 21·6	2	Indirect comparison.
	+ 1·3			The mean of four measures.
	+ 4·4			

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Day, and Greenwich Sidereal Time.	Observer.	Number of Half-Prisms.	Reading of Position Circle.	Objects compared.	Micrometer Readings.	Displacement. Measured.	Displacement. Estimated in Terms of the Breadth of the Bright Line of the Micrometer.	Width of Slit.
d h m			°		r	r		r
Nov. 2. 23. 0	M	2	0	Moon b_1	0·353			
				Mg_1	0·386	− 0·033		0·120
	,,	,,	,,	Moon b_1	0·223			
				Mg_1	0·347	− 0·124		0·120
	,,	,,	,,	Moon b_1	0·449			
				Mg_1	0·404	+ 0·045		0·120
Nov. 2. 23. 55	WC	2	0	ε Pegasi b_1	0·553			
				Mg_1	0·223	+ 0·330	$\frac{1}{3}$ towards red	0·120
	,,	,,	,,	ε Pegasi b_1	0·438			
				Mg_1	0·334	+ 0·104	$\frac{1}{4}$ towards red	0·120
Nov. 2. 23. 58	M	2	0	ε Pegasi b_1	0·024			
				Mg_1	0·178	− 0·154	$\frac{1}{4}$ towards blue	0·120
0. 35	,,	,,	,,	ε Pegasi b_1	0·956			
				Mg_1	0·987	− 0·031	$\frac{1}{20}$ towards blue	0·120
Nov. 2. 1. 5	M	2	0	α Arietis b_1	0·479			
				Mg_1	0·538	− 0·059	$\frac{1}{10}$ towards blue	0·120
1. 35	,,	,,	,,	α Arietis b_1	0·528			
				Mg_1	0·478	+ 0·050	$\frac{1}{10}$ towards red	0·120
Nov. 2. 2. 45	M	1	0	β Andromedæ b_1	0·643			
				Mg_1	0·611	+ 0·032	$\frac{1}{4}$ towards red	0·113
3. 10	,,	,,	,,	β Andromedæ b_1	0·698			
				Mg_1	0·647	+ 0·051	$\frac{1}{3}$ towards red	0·113
3. 25	,,	,,	,,	β Andromedæ b_1	0·652			
				Mg_1	0·629	+ 0·023	$\frac{1}{5}$ towards red	0·113
Nov. 2. 3. 55	M	1	0	γ Andromedæ b_1	0·452			
				Mg_1	0·444	+ 0·008	$\frac{1}{10}$ towards red	0·113
4. 15	,,	,,	,,	γ Andromedæ b_1	0·453			
				Mg_1	0·443	+ 0·010	$\frac{1}{10}$ towards red	0·113

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Earth's Motion in Miles per Second.	Concluded Motion of Star in Miles per Second.		Weight.	REMARKS.
	Measured.	Estimated.		
	− 2·9			
+ 16·3	+ 0·2	− 4·8	1 1	Indirect comparison. Star-line, after bisection of the magnesium line, seen distinctly to the red of it.
+ 16·3	− 24·9	− 23·5	1 ½	Indirect comparison. Displacement only small. Neither bisection good, the comparison spectrum flickering a good deal.
+ 1·4	− 1·7	− 1·4	½ ½	Indirect comparison. Dispersion rather too high for a star of this magnitude, especially as there was a slight mist.
+ 3·4	+ 9·6	+ 17·8	3 3 3	Indirect comparison. Spectrum tremulous, but occasionally well-defined.
− 0·6	+ 3·9	+ 8·7	2 2	Indirect comparison. Spectrum tremulous, but occasionally well-defined.

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The sign + denotes recession; − approach.

COLLECTED RESULTS for MOTIONS of STARS and of the MOON in the line of Sight, from SPECTROSCOPIC OBSERVATIONS made at the ROYAL OBSERVATORY, GREENWICH, in the Year 1878.

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

(+ denotes Recession; — Approach.)

Date.	Observer.	Number of Measures.	Weight.	Number of Prisms.	Position Circle.	Width of Slit.	Line.	Earth's Motion in Miles per Second.	Concluded Motion of Star. Measured.	Concluded Motion of Star. Estimated.
							β ANDROMEDÆ.			
					°	r				
1878, November 2	M	3	9	I.	0	0·113	b_1	+ 3·4	+ 9·6	+ 17·8
							γ ANDROMEDÆ.			
1878, November 2	M	2	4	I.	0	0·113	b_1	− 0·6	+ 3·9	+ 8·7
							α ARIETIS.			
1878, February 6	M	3	6	I.	5	..	b_1	+ 18·2	(+ 63·1)	(+ 45·5)
September 18	M	2	3	I.	..	..	b_1	− 11·5	− 18·1	− 14·5
October 22	M	2	4	I.	5	0·033	b_1	− 2·1	− 16·2	− 22·1
November 2	M	2	1	II.	0	0·120	b_1	+ 1·4	− 1·7	− 1·4
							α CETI.			
1878, October 22	M	2	2	I.	5	0·033	b_1	− 4·1	− 27·5	− 30·4
22	M	2	2	I.	5	0·033	b_4	− 4·1	− 33·5	− 43·1
							α TAURI (*Aldebaran*).			
1878, January 10	M	2	4	I.	95	..	b_1	+ 12·8	+ 20·8	+ 20·1
17	M	2	2	I.	95	..	b_1	+ 15·6	+ 38·2	+ 41·3
29	M	2	2	I.	95	..	b_1	+ 16·6	+ 15·9	+ 4·8
April 8	M	2	6	II.	5	0·072	b_1	+ 13·8	+ 15·2	+ 18·0
							α AURIGÆ (*Capella*).			
1878, March 15	M	2	8	I.	5	0·085	b_1	+ 17·0	+ 39·9	+ 42·0
16	WC	3	2½	I.	120	0·080	F	+ 17·0	(− 11·0)	+ 9·7
16	WC	3	7	I.	120	0·073	b_1	+ 17·0	(− 13·5)	− 2·6
25	M	2	10	I.	95	0·151	F	+ 16·4	+ 15·9	+ 20·9
April 1	M	2	6	I.	5	0·128	b_1	+ 15·7	+ 55·8	+ 57·0

Date.		Observer.	Number of Measures.	Weight.	Number of Prisms.	Position Circle.	Width of Slit.	Line.	Earth's Motion in Miles per Second.	Concluded Motion of Star.	
										Measured.	Estimated.
						β ORIONIS (*Rigel*).					
						°	r				
1878, January	10	M	3	7	I.	95	..	F	+ 9·5	+ 26·0	+ 21·6
	23	WC	3	9	I.	95	..	F	+ 12·2	..	+ 17·9
	29	M	3	3	I.	95	..	F	+ 13·2	+ 14·1	+ 13·0
February	6	M	2	2	I.	5	..	F	+ 14·4	+ 34·9	+ 38·4
						β TAURI.					
1878, January	29	M	3	3	I.	95	..	F	+ 14·2	− 9·8	− 10·2
						γ ORIONIS.					
1878, January	29	M	5	10	I.	95	..	F	+ 14·0	− 0·5	− 2·4
	29	M	1 est.	2	I.	95	..	F	+ 14·0	..	− 14·0
February	17	WC	2	4	I.	0	0·138 & 0·156	F	+ 16·9	+ 2·8	+ 11·0
						δ ORIONIS.					
1878, January	10	M	2	1	I.	95	..	F	+ 8·7	+ 21·1	+ 17·5
	23	WC	2	3	I.	95	..	F	+ 11·9	..	0·0
February	18	M	2	2	I.	6	..	F	+ 16·1	+ 34·6	+ 45·3
						ε ORIONIS.					
1878, January	23	WC	1	2	I.	95	..	F	+ 11·6	..	+ 24·5
February	18	M	3	3	I.	6	..	F	+ 15·9	+ 20·9	+ 23·3
						ζ ORIONIS.					
1878, February	18	M	2	2	I.	6	..	F	+ 15·7	+ 17·4	+ 29·8
						α ORIONIS.					
1878, February	18	M	3	12	I.	6	..	b_1	+ 16·1	+ 33·9	+ 36·4
March	15	M	2	3	I.	5	0·098	b_4	+ 17·9	+ 16·8	+ 15·8
April	1	M	3	12	I.	5	0·128	b_1	+ 17·1	+ 20·5	+ 19·3
	8	M	3	8	II.	5	0·072	b_1	+ 16·3	+ 9·0	+ 9·5
						β AURIGÆ.					
1878, April	11	M	4	2	I.	5	0·072	F	+ 15·6	+ 11·5	+ 22·3

Date.		Observer.	Number of Measures.	Weight.	Number of Prisms.	Position Circle.	Width of Slit.	Line.	Earth's Motion in Miles per Second.	Concluded Motion of Star.	
										Measured.	Estimated.
							α CANIS MAJORIS (*Sirius*).				
						°	r				
1878, February	17	WC	4	5	I.	0	0·048, 0·015, 0·033	F	+ 10·5	+ 22·1	+ 8·3
	18	M	2	6	I.	6	..	F	+ 10·7	+ 30·4	+ 32·8
March	25	M	2	4	I.	95	0·151	F	+ 14·1	+ 23·2	+ 41·8
							α^2 GEMINORUM (*Castor*).				
1878, February	25	M	2	2	I.	95	..	F	+ 13·9	+ 26·9	+ 38·4
March	25	M	2	7	I.	95	0·141	F	+ 17·6	+ 33·7	+ 30·5
	30	M	2	2	I.	5	0·073	F	+ 17·9	+ 54·4	+ 43·7
							α CANIS MINORIS (*Procyon*).				
1878, February	25	M	2	6	I.	95	..	F	+ 12·3	+ 15·6	+ 20·0
March	16	WC	2	1½	I.	120	0·073	b_1	+ 15·7	(− 59·8)	(− 25·2)
	25	M	2	8	I.	95	0·141	F	+ 16·7	+ 7·5	+ 10·3
	30	M	2	5	I.	5	0·123	F	+ 17·2	+ 39·6	+ 46·2
April	20	M	2	4	II.	5	0·100	F	+ 17·4	+ 16·4	+ 34·2
							β GEMINORUM (*Pollux*).				
1878, February	18	M	4	12	I.	6	..	b_1	+ 11·5	+ 6·2	+ 7·7
	25	M	1	1	I.	95	..	b_1	+ 13·1	+ 15·7	+ 15·3
March	13	WC	2	3	I.	90	0·120	b_1	+ 16·1	− 56·2	− 34·9
	15	M	3	5	I.	5	0·085	b_1	+ 16·4	+ 9·2	+ 10·4
	16	WC	2	6	I.	120	0·073	b_1	+ 16·5	− 20·4	− 25·2
	25	M	4	8	I.	95	0·141	F	+ 17·5	− 52·3	− 49·8
	30	M	2	3	I.	5	0·123	F	+ 17·9	− 33·3	− 34·2
April	1	M	4	13	I.	5	0·128	b_1	+ 18·0	− 28·0	− 31·1
	7	WC	3	6	II.	90	0·070	b_1	+ 18·1	− 35·6	− 26·3
	8	M	3	3	II.	5	0·072	b_1	+ 18·1	− 23·0	− 25·9
							α HYDRÆ.				
1878, March	13	WC	3	4½	I.	90	0·120	b_1	+ 8·0	+ 57·6	+ 24·2
							ε LEONIS.				
1878, April	1	M	2	3	I.	5	0·128	b_1	+ 14·5	− 30·4	− 36·3
							α LEONIS (*Regulus*).				
1878, March	30	M	2	6	I.	5	0·073	F	+ 12·3	+ 18·5	+ 18·6
April	11	M	3	10	I.	5	0·072	F	+ 14·8	+ 26·6	+ 21·6

Date.		Observer.	Number of Measures.	Weight.	Number of Prisms.	Position Circle.	Width of Slit.	Line.	Earth's Motion in Miles per Second.	Concluded Motion of Star. Measured.	Concluded Motion of Star. Estimated.
							γ LEONIS.				
						°	r				
1878, March	13	WC	3	4	I.	90	0·120	b_1	+ 7·9	− 13·5	− 3·4
April	1	M	2	7	I.	5	0·096	b_1	+ 12·7	− 42·5	− 40·4
	8	M	3	3	II.	5	0·072	b_1	+ 14·1	− 20·8	− 23·2
							β LEONIS.				
1878, March	25	M	2	4	I.	95	0·141	F	+ 4·8	+ 44·3	+ 53·4
	30	M	3	8	I.	5	0·073	F	+ 6·2	+ 57·0	+ 54·6
							γ VIRGINIS.				
1878, April	11	M	2	3	I.	5	0·072	F	+ 4·3	+ 31·8	+ 26·0
							α VIRGINIS (*Spica*).				
1878, March	30	M	4	10	I.	5	0·073	F	− 3·8	− 0·5	− 2·3
April	11	M	2	2	I.	5	0·072	F	0·0	+ 26·8	+ 25·3
May	11	M	2	4	I.	5	..	F	+ 8·7	− 9·3	− 8·7
							η BOÖTIS.				
1878, April	1	M	2	4	I.	5	0·128	b_1	− 1·5	− 33·4	− 34·9
							α BOÖTIS (*Arcturus*).				
1878, March	30	M	4	16	I.	5	0·073	F	− 3·3	− 17·2	− 16·9
April	7	WC	2	2	II.	90	0·070	b_1	− 1·2	− 10·3	− 7·8
	8	M	3	12	II.	5	0·072	b_1	− 0·9	− 18·3	− 20·7
							ι^2 BOÖTIS.				
1878, April	1	M	3	9	I.	5	0·096	b_1	− 3·4	− 26·3	− 24·3
							α CORONÆ.				
1878, March	25	M	3	6	I.	95	0·141	F	− 7·6	+ 54·3	+ 54·4
							α OPHIUCHI.				
1878, April	11	M	3	3	I.	5	0·072	F	− 12·7	− 9·0	− 7·5

COLLECTED RESULTS FOR MOTIONS OF STARS IN THE LINE OF SIGHT, AND OBSERVATION OF THE SPECTRUM OF THE ILLUMINATED MOON, THE ECLIPSED MOON, AND THE SKY,

Date.	Observer.	Number of Measures.	Weight.	Number of Prisms.	Position Circle.	Width of Slit.	Line.	Earth's Motion in Miles per Second.	Concluded Motion of Star. Measured.	Concluded Motion of Star. Estimated.
							ε CYGNI.			
					°	r				
1878, October 22	M	2	5	I.	5	0·033	b_1	+ 10·8	+ 14·8	+ 17·4
							ε PEGASI.			
1878, September 18	M	2	2	I.	..	..	b_4	+ 7·2	− 15·7	− 14·7
October 22	M	2	5	I.	5	0·033	b_1	+ 14·8	− 20·8	− 20·5
25	WC	1	2	II.	5	0·130	b_1	+ 15·2	− 23·5	− 21·6
November 2	WC	2	2	II.	0	0·120	b_1	+ 16·3	+ 0·2	− 4·8
2	M	2	2½	II.	0	0·120	b_1	+ 16·3	− 24·9	− 23·5
							MOON.			
1878, January 17	M	4	..	I.	5	..	b_1	0·0	− 0·7	..
February 17	WC	1	..	I.	0	0·156	F	..	− 6·3	0·0
March 13	WC	4	..	I.	90	0·120	b_1	..	− 1·9	..
16	WC	4	..	I.	120	0·073	b_1	..	− 6·4	..
April 8	M	6	..	II.	5	0·072	b_1,b_2,b_4	..	0·0	..
11	M	4	..	I.	5	0·072	F	..	0·0	..
May 8	M	4	..	II.	5	..	F	..	+ 0·3	..
11	M	4	..	I.	5	..	F	..	+ 0·1	..
September 18	M	4	..	I.	..	..	b_1	..	− 2·7	..
November 2	WC	3	..	II.	0	0·120	b_1	..	+ 4·4	..
2	M	3	..	II.	0	0·120	b_1	..	− 2·9	..
							SKY SPECTRUM.			
1878, April 2	M	15	..	I.	5	0·096	b_1	0·0	+ 1·8	..
7	WC & M.	9	..	II.	90	0·072	b_1,b_2,b_4	..	+ 2·1	..
8	M	8	..	II.	5	0·072	b_1,b_2,b_4	..	+ 0·8	..
October 22	M	6	..	II.	5	..	b_1	..	+ 0·1	..
25	WC	4	..	II.	5	..	b_1	..	+ 1·3	..

1878, August 12^{d}. 10^{h}. 47^{m}. to 12^{h}. 30^{m}.

SPECTRUM OF THE ECLIPSED MOON.

Single-prism Spectroscope.

Observer, M.

The spectrum of the portion of the Moon in the shadow presented a remarkable contrast to that observed in the Total Eclipse of 1877, August 23. On that occasion the spectrum of the part in the umbra was very faint, and cut off on the violet side between *b* and F in the green, whilst to the eye the eclipsed bright was fairly bright and of a coppery hue, and the details of the surface were seen with great distinctness. In this partial eclipse, on the other hand, the spectrum was very bright, (that of the uneclipsed part being only three or four times as bright,) and could be traced nearly from C in the red to beyond *h* in the violet, though the umbra seemed to the eye to cut off the Moon completely. In the finder no details could be seen, the features being completely obliterated, except just at the edge of the shadow, which was fairly sharp. No colour was shown. The spectrum showed faintly the atmospheric band δ in the yellow, band β near C, band ϵ between F and G, and band G in the violet, the last two being only distinguishable as slight darkenings of the spectrum. The absorption at the red end varied, being greatest in the deepest part of the shadow.

The points of the Moon to which the spectroscope was directed were, Schickard, Grimaldi, and the district lying between Tycho, Walter, Hipparchus, and Ptolemy in shadow, and the Mares Crisium and Nectaris in full light. The slit was also placed on the Mare Vaporum when the edge of the shadow was passing across it.

Slit $3^{d}\cdot0$ in width, just sufficiently narrow to separate b_2 from b_4, and to divide the D lines.

ROYAL OBSERVATORY, GREENWICH.

MEASURES OF POSITIONS AND AREAS

OF

SPOTS AND FACULÆ

UPON THE SUN'S DISK

ON

PHOTOGRAPHS

TAKEN WITH THE

PHOTOHELIOGRAPH;

WITH THE DEDUCED

HELIOGRAPHIC LONGITUDES AND LATITUDES.

1878.

MEASURES of POSITIONS and AREAS of SPOTS and FACULÆ upon the SUN'S DISK on PHOTOGRAPHS taken at the ROYAL OBSERVATORY, GREENWICH, in the Year 1878.

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

Mean Solar Time.	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).
1878.			° ′	° ′	° ′			
6d·012		0·908	286. 40					78
		0·892	259. 40					109
		0·914	114. 10					222
Jan. 7								(409)
9·048		0·939	273. 0					90
Jan. 10								(90)
15·955		0·866	104. 40					80
		0·896	78. 40					264
Jan. 17								(344)
15·973		0·844	100. 30					452
		0·873	78. 10					499
Jan. 17								(951)
22·078	266a	0·312	316. 8	328. 13	+ 7. 34	32	50	
	266b	0·274	327. 48	324. 7	+ 7. 55	16	57	
Jan. 23						(48)	(107)	
22·089	266a	0·312	315. 29	328. 12	+ 7. 26	24	61	
	266b	0·273	327. 33	323. 59	+ 7. 49	19	83	
Jan. 23						(43)	(144)	
38·045	267	0·730	265. 43	152. 32	− 7. 38	0	15	380c
	268	0·476	263. 7	133. 56	− 9. 4	0	21	
Feb. 8						(0)	(36)	(380)
62·013	269a	0·181	359. 9	149. 56	+ 3. 8	18	43	
	269b	0·209	2. 20	149. 18	+ 4. 45	0	13	
	269c	0·207	12. 28	147. 14	+ 4. 22	17	72	
	270	0·846	84. 50	92. 36	+ 0. 26	3	23	404f
Mar. 4						(38)	(151)	(404)
62·028	269a	0·181	357. 55	149. 59	+ 3. 8	20	54	
	269b	0·213	1. 13	149. 20	+ 4. 59	0	5	
	269c	0·208	11. 25	147. 15	+ 4. 28	4	54	
	270	0·842	84. 41	92. 52	+ 0. 30	4	18	357f
Mar. 4						(28)	(131)	(357)
62·945	269a	0·288	308. 42	150. 27	+ 3. 16	7	23	
	269c	0·264	321. 23	146. 59	+ 4. 42	8	38	
	270	0·709	81. 48	93. 7	+ 0. 37	0	6	728f
Mar. 5						(15)	(67)	(728)
62·952	269a	0·291	308. 25	150. 33	+ 3. 19	3	33	
	270	0·710	81. 26	92. 59	+ 0. 53	0	10	570f
Mar. 5						(3)	(43)	(570)

Mean Solar Time.	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).
1878.			° ′	° ′	° ′			
69d·979	271a	0·371	48. 9	28. 42	+ 7. 22	30	130	
	271b	0·424	56. 7	24. 8	+ 6. 54	11	40	
Mar. 12						(41)	(170)	
70·003	271a	0·369	48. 17	28. 27	+ 7. 15	22	104	
	271b	0·427	56. 40	23. 32	+ 6. 49	11	61	
Mar. 12						(33)	(165)	
71·989	271a	0·330	318. 7	31. 5	+ 7. 11	27	93	
	271b	0·289	327. 9	27. 22	+ 6. 56	0	18	
	271c	0·281	338. 22	24. 18	+ 7. 58	0	22	
Mar. 14						(27)	(133)	
128·981		0·852	96. 20					112
May 10								(112)
129·016		0·860	96. 20					108
May 10								(108)
145·962	272a	0·795	82. 23	69. 7	+ 5. 25	13	60	
	272b	0·885	79. 51	59. 43	+ 8. 28	54	232	810sp
May 27						(67)	(292)	(810)
146·110	272a	0·773	82. 2	69. 13	+ 5. 30	17	55	
	272b	0·871	79. 41	59. 28	+ 8. 28	48	214	851sp
May 27						(65)	(269)	(851)
149·910	272a	0·211	35. 32	61. 54	+ 9. 19	61	240	
	272c	0·132	341. 45	71. 22	+ 6. 38	7	44	
	273	0·910	84. 59	3. 53	+ 4. 20	0	20	528c
May 31						(68)	(304)	(528)
149·929	272a	0·211	35. 23	61. 39	+ 9. 20	46	238	
	272c	0·136	341. 38	71. 12	+ 6. 51	8	32	
	273	0·914	84. 49	3. 2	+ 4. 31	0	6	583c
May 31						(54)	(276)	(583)
153·936	272	0·763	281. 24	64. 39	+ 8. 37	9	52	530s
June 4						(9)	(52)	(530)
156·005	272	0·978	279. 54	65. 53	+ 9. 43	0	27	656s
June 6						(0)	(27)	(656)
159·951	274	0·747	260. 23	343. 46	− 6. 41	0	14	
June 10						(0)	(14)	
162·017		0·968	263. 20					200
June 12								(200)

The Groups of Spots are numbered in the order of their appearance at the E. limb of the Sun. When there is no number in the second 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.

Groups 266*a* and 266*b*. A pair of regular well-defined spots. Group 267. A small regular spot. Group 268. A small regular spot.
Group 269*a*. A regular well-defined spot. Group 269*b*. Two or three small specks.
Group 269*c*. A small spot. Group 269*b* disappears on March 5, and Group 269*c* is not seen on the second photograph on that day (62·952). Group 270. One small spot.
Group 271*a*. A long straight spot, which divides into two parts on March 14. Group 271*b*. Two or three small specks. Group 272*a*. Small regular spot.
Group 272*b*. A much larger spot surrounded by faint markings. The two spots gradually approach each other, and are measured together on June 6.
Group 273. A very small faint spot, almost entirely hidden by faculæ. Group 274. Two small spots.

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

Mean Solar Time.	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).
1878.			° ′	° ′	° ′			
170d·906		0·905	66. 0					278
June 21								(278)
171·896		0·788	62. 20					137
		0·903	85. 10					425
June 22								(562)
175·928	275*a*	0·689	287. 52	126. 57	+14. 3	0	20	
	275*b*	0·653	287. 41	124. 11	+13. 22	4	20	
		0·970	81. 20					86
June 26						(4)	(40)	(86)
176·103	275*a*	0·726	287. 18	127. 45	+14. 14	12	46	
	275*b*	0·684	287. 1	124. 23	+13. 25	7	25	
		0·963	81. 20					136
June 26						(19)	(71)	(136)
176·900	275*a*	0·843	285. 4	128. 34	+14. 5	7	45	180*c*
	275*b*	0·797	285. 3	123. 52	+13. 33	24	102	
		0·910	81. 30					140
June 27						(31)	(147)	(320)
177·101	275*a*	0·873	284. 21	129. 24	+13. 48	11	68	322*c*
	275*b*	0·823	284. 21	123. 52	+13. 18	29	119	
		0·892	81. 50					118
June 27						(40)	(187)	(440)
177·897	275*a*	0·950	283. 21	130. 13	+13. 32	29	130	176*c*
	275*b*	0·918	283. 16	124. 56	+13. 15	17	93	
	275*c*	0·904	282. 48	122. 58	+12. 44	15	85	
		0·787	81. 40					102
		0·947	98. 40					114
June 28						(61)	(308)	(392)
178·106	275*a*	0·964	284. 1	130. 17	+14. 14	18	131	128*c*
	275*b*	0·932	284. 4	124. 19	+14. 6	18	59	
	275*c*	0·922	283. 22	122. 47	+13. 23	11	56	
		0·761	80. 50					57
		0·929	99. 50					120
June 28						(47)	(246)	(305)
178·948	275*c*	0·980	283. 3	123. 12	+13. 21	15	68	137*c*
June 29						(15)	(68)	(137)
179·067	275*c*	0·981	282. 51	122. 2	+13. 10	0	120	61*c*
June 29						(0)	(120)	(61)

Mean Solar Time.	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).
1878.			° ′	° ′	° ′			
195d·918		0·778	76. 50					368
July 16								(368)
196·111		0·768	78. 40					339
July 16								(339)
196·910		0·967	75. 0					120
July 17								(120)
197·115		0·940	76. 30					115
July 17								(115)
205·906	276	0·590	288. 34	83. 10	+15. 17	3	11	
		0·864	91. 40					267
July 26						(3)	(11)	(267)
206·999		0·947	67. 30					54
July 27								(54)
207·021		0·948	68. 0					54
July 27								(54)
216·934		0·961	87. 10					89
Aug. 6								(89)
217·088		0·960	87. 10					190
Aug. 6								(190)
217·890		0·893	86. 40					46
Aug. 7								(46)
218·104		0·860	82. 10					149
Aug. 7								(149)
226·990		0·929	226. 0					101
Aug. 16								(101)
244·027	277	0·978	88. 11	186. 3	+ 3. 18	23	146	147*nf*
Sept. 2						(23)	(146)	(147)
244·077	277	0·973	87. 37	186. 37	+ 4. 0	24	136	115*nf*
Sept. 2						(24)	(136)	(115)
244·949	277	0·910	89. 45	186. 23	+ 3. 15	34	127	298*nf*
Sept. 3						(34)	(127)	(298)
245·115	277	0·887	89. 24	187. 9	+ 3. 53	26	141	283*nf*
Sept. 3						(26)	(141)	(283)

The Groups of Spots are numbered in the order of their appearance at the E. limb of the Sun. When there is no number in the second 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 275*a* and 275*b*. Two small regular spots. They increase in size on the following days, and on June 28, 275*b* divides into two parts. July 16. The photographs on this day show a very curious group of faculæ. Group 276. One small spot. Group 277. One regular spot.

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

Mean Solar Time.	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).
1878.			° ′	° ′	° ′			
245d·905 Sept. 4	277	0·794	90. 17	187. 12	+ 4. 12	31 (31)	165 (165)	229*f* (229)
248·007 Sept. 6	277	0·413	96. 25	187. 13	+ 3. 59	43 (43)	145 (145)	
248·079 Sept. 6	277	0·399	97. 0	187. 15	+ 3. 53	35 (35)	138 (138)	
248·893 Sept. 7	277	0·218	104. 1	187. 36	+ 4. 5	33 (33)	148 (148)	
251·060 Sept. 9	277	0·299	258. 5	188. 8	+ 3. 25	27 (27)	139 (139)	
252·005 Sept. 10	277	0·498 0·963	265. 56 71. 40	188. 26	+ 4. 16	34 (34)	148 (148)	94 (94)
252·117 Sept. 10	277	0·525 0·967	265. 30 71. 20	188. 43	+ 3. 49	30 (30)	142 (142)	227 (227)
252·907 Sept. 11	277	0·671 0·916	267. 22 70. 10	188. 47	+ 3. 37	27 (27)	118 (118)	298 (298)
253·091 Sept. 11	277	0·707 0·901	268. 47 72. 20	189. 18	+ 4. 17	34 (34)	172 (172)	485 (485)
253·899 Sept. 12	277	0·824 0·903 0·819	270. 3 289. 30 70. 20	189. 10	+ 4. 9	32 (32)	126 (126)	146*sf* 431 207 (784)
254·899 Sept. 13	277	0·937 0·919	271. 38 291. 30	190. 5	+ 4. 4	23 (23)	49 (49)	407*sf* 229 (636)
255·101 Sept. 13	277	0·951 0·931	272. 0 292. 0	189. 53	+ 4. 8	33 (33)	150 (150)	260*sf* 359 (619)
256·014 Sept. 14		0·981 0·969	292. 20 272. 0					144 118 (262)

Mean Solar Time.	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).
1878.			° ′	° ′	° ′			
271d·894 Sept. 30		0·914	88. 30					207 (207)
272·017 Sept. 30		0·907	89. 10					302 (302)
272·933 Oct. 1		0·807	88. 0					401 (401)
280·004 Oct. 8		0·901	75. 30					78 (78)
280·065 Oct. 8		0·896	76. 30					58 (58)
291·045 Oct. 19		0·897 0·876	296. 30 106. 20					177 134 (311)
292·967 Oct. 21		0·705	269. 40					227 (227)
303·968 Nov. 1	278	0·504 0·941 0·878	75. 55 262. 40 129. 50	163. 24	+10. 38	20 (20)	103 (103)	97 98 (195)
304·021 Nov. 1	278	0·493 0·942 0·878	75. 40 261. 40 130. 0	163. 28	+10. 38	17 (17)	79 (79)	85 90 (175)
308·047 Nov. 5	278	0·404	286. 30	162. 50	+10. 1	17 (17)	71 (71)	
310·008 Nov. 7	278	0·770	280. 47	163. 35	+10. 32	20 (20)	71 (71)	
318·986 Nov. 16		0·948	62. 40					166 (166)
321·983 Nov. 19		0·943	276. 0					168 (168)
331·978 Nov. 29		0·775	276. 10					167 (167)
332·071 Nov. 29		0·774	275. 40					174 (174)

The photographs taken on the following days show no Sun-spots:—January 3, 7, 9, 10, 11, 17, 18, 29, 30, and 31; February 1, 12, 16, 18, 21, and 23; March 2, 25, and 27; April 1, 2, 4, 6, 8, 9, 12, 13, 18, 25, 27, and 30; May 1, 4, 6, 9, 10, 13, 16, 17, 18, and 25; June 12, 13, 18, 20, 21, 22, and 25; July 4, 5, 6, 8, 9, 10, 11, 13, 16, 17, 18, 19, 20, 22, 23, 25, 27, and 30; August 1, 2, 5, 6, 7, 8, 9, 12, 14, 15, 16, 17, 19, 22, 26, 28, 29, and 30; September 14, 16, 19, 20, 26, 27, and 30; October 1, 2, 3, 4, 5, 7, 8, 9, 10, 11, 14, 19, 21, 23, 25, 26, and 28; November 11, 12, 16, 18, 19, 23, and 29; December 13 and 30.

The Groups of Spots are numbered in the order of their appearance at the E. limb of the Sun. When there is no number in the second 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.

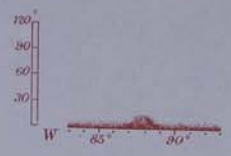
Group 277. One regular spot.

Group 278. One regular spot.

SOLAR PROMINENCES OBSERVED AT THE ROYAL OBSERVATORY, GREENWICH,

IN THE YEAR 1878.

Feb. 8.
b.



Feb. 8.
a.

Feb. 12.
a.

Mar. 5.
b.

Mar. 5.
a.

April 1.
a.

April 6.
a.

April 8.
b.

April 8.
a.

The horizontal scales give the Heliographic N. P. D., E or W. along the Sun's Limb.

The vertical scales give heights above the Sun's limb in seconds of arc.

F. Dangerfield, lith. London.

MEAN AREAS of UMBRÆ, WHOLE SPOTS, and FACULÆ upon the SUN'S DISK, as measured on PHOTOGRAPHS taken at the ROYAL OBSERVATORY, GREENWICH, for each ROTATION of the SUN, in the Year 1878.

The Mean Areas have been formed by taking the Means of the Areas for each day of observation throughout 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.	Mean of Daily Areas.		
		Umbræ.	Whole Spots.	Faculæ.
65	1877 December 22	0	5	128
66	1878 January 16	6	20	129
67	February 10	5	25	129
68	March 8	11	50	0
69	April 2	0	0	0
70	April 28	0	0	11
71	May 23	17	83	347
72	June 17	6	35	105
73	July 13	0	1	64
74	August 7	0	0	8
75	September 1	19	90	180
76	September 27	0	0	90
77	October 22	6	23	35
78	November 17	0	0	85
79	December 12	0	0	0

MEAN AREAS of UMBRÆ, WHOLE SPOTS, and FACULÆ upon the SUN'S DISK, as measured on PHOTOGRAPHS taken at the ROYAL OBSERVATORY, GREENWICH, in the Year 1878.

The Mean Areas are expressed in Millionths of the Sun's visible Hemisphere.

Year.	Mean of Daily Areas.		
	Umbræ.	Whole Spots.	Faculæ.
1878	5	22	87