GREENWICH

ASTRONOMICAL RESULTS,

1877.

RESULTS

OF THE

ASTRONOMICAL OBSERVATIONS

MADE AT

THE ROYAL OBSERVATORY, GREENWICH,

1877.

(EXTRACTED FROM THE GREENWICH OBSERVATIONS, 1877.)

ROYAL OBSERVATORY, GREENWICH.

CATALOGUE

OF

CONCLUDED MEAN RIGHT ASCENSIONS AND NORTH POLAR DISTANCES,

FOR 1877, JANUARY 1,

OF STARS OBSERVED IN THE YEAR 1877;

WITH THE ANNUAL VARIATIONS:

(The North Polar Distances being corrected for Errors of Division, for the Flexure of the Telescope of the Transit-Circle, and for Discordance of Direct- and Reflexion-Observations; and further corrected for Reduction to Colatitude 38°. 31′. 21″·90 and to Bessel's Refractions of the Tabulæ Regiomontanæ:)

ALSO,

NEW CONSTANTS FOR STARS INCLUDED IN THE CATALOGUE

NOT INCLUDED IN THE

GREENWICH SEVEN-YEAR CATALOGUES FOR 1860 AND 1864,

OR IN THE GREENWICH NINE-YEAR CATALOGUE FOR 1872.

CATALOGUE OF THE CONCLUDED MEAN RIGHT ASCENSIONS AND MEAN NORTH POLAR DISTANCES, FOR 1877, JAN. 1, OF STARS OBSERVED IN THE YEAR 1877; WITH THE ANNUAL VARIATIONS.

(The N.P.D.'s are corrected for Errors of Division, for Flexure of Telescope of the Transit-Circle, and for Discordance of Direct and Reflexion-Observations; and further corrected for Reduction to Colatitude 38°. 31′. 21″·90 and to Bessel's Refractions of the Tabulæ Regiomontanæ.)

No.	Star's Name.	Number of Obs. of R.A.	Mean R.A. 1877, Jan. 1.	Whole Number of Obs. of R.A.	Fraction of Year for Mean of Obs.	Concluded Seconds of R.A.	Annual Variation in R.A.	Number of Obs. of N.P.D. D.	Number of Obs. of N.P.D. R.	Mean N.P.D. 1877, Jan. 1. D.	Mean N.P.D. 1877, Jan. 1. R.	Whole Number of Obs. of N.P.D.	Fraction of Year for Mean of Obs.	Concluded Seconds of N.P.D.	Annual Variation in N.P.D.
			h m s			s	s			° ′ ″	″			″	″
1	10 Cassiopeiæ		0. 0. (3.)					1	1	26. 29. 19·81	20·31	2	0·87	20·06	— 20·05
2	α Andromedæ	2	0. 2. 1·935	2	0·86	1·935	+ 3·088	3	4	61. 35. 19·21	19·46	7	0·89	19·35	19·90
3	Bradley 3217 S.P. .	1	0. 2. 34·700	1	0·98	34·700	3·207	1		10. 58. 8·22		1	0·98	8·22	19·97
4	87 Pegasi.....	1	0. 2. 41·750	1	0·89	41·750	3·090	1		72. 28. 19·35		1	0·72	19·35	20·07
5	γ Pegasi.....	3	0. 6. 54·150	3	0·86	54·150	3·083	1	1	75. 29. 61·09	59·86	2	0·96	60·48	20·03
6	1 Ceti	4	0. 13. 9·583	4	0·90	9·583	3·054	1		99. 30. 22·38		1	0·98	22·38	19·96
7	40 Piscium		....					1		74. 25. 55·51		1	0·77	55·51	20·00
8	Groombridge 48 S.P.	2	0. 14. 2·655	2	0·19	2·655	3·215	2		28. 48. 11·54		2	0·19	11·54	20·02
9	d Piscium	1	0. 14. 16·130	1	0·58	16·130	3·081	1		82. 29. 34·22		1	0·58	34·22	20·03
10	44 Piscium	2	0. 19. 5·770	2	0·77	5·770	3·073			88. 44.					
11	Bradley 24 S.P.....	1	0. 19. 16·830	1	0·22	16·830	3·685	1		10. 37. 45·94		1	0·22	45·94	19·96
12	45 Piscium.....	3	0. 19. 21·513	3	0·83	21·513	3·085	3		82. 59. 20·89		3	0·83	20·89	19·91
13	Bradley 34.....		0. 23. (3.)					1	1	13. 39. 35·68	36·17	2	0·89	35·93	19·94
14	28 Andromedæ		0. 23. (38.)						1	60. 55.	33·21	1	0·86	33·21	19·88
15	12 Ceti.....	2	0. 23. 45·655	2	0·82	45·655	3·059	1		94. 38. 14·44		1	0·72	14·44	19·94
16	Bradley 42 S.P.....	2	0. 26. 0·280	2	0·25	0·280	3·495	2		19. 41. 50·34		2	0·25	50·34	19·95
17	κ Cassiopeiæ		0. 26. (1.)					2	2	27. 44. 50·44	47·75	4	0·81	49·10	19·94
18	51 Piscium	3	0. 26. 3·050	3	0·93	3·050	3·092	3		83. 43. 26·55		3	0·93	26·55	20·00
19	16 Cassiopeiæ		0. 27. (15.)					1	1	23. 55. 41·90	42·46	2	0·96	42·18	19·93
20	15 Ceti.....	4	0. 31. 47·193	4	0·87	47·193	3·064	4		91. 10. 47·91		4	0·87	47·91	19·85
21	ε Andromedæ.....	5	0. 32. 3·468	5	0·85	3·468	3·156	2	2	61. 21. 23·08	24·12	4	0·88	23·60	19·62
22	α Cassiopeiæ		....					1		34. 8. 16·37		1	0·50	16·37	19·80
	α Cassiopeiæ S.P...	2	0. 33. 32·335	2	0·59	32·335	3·366	2		34. 8. 15·33		2	0·59	15·33	
23	Groombridge 120...		0. 34. (44.)					1	1	24. 31. 38·84	38·07	2	0·95	38·46	19·83
24	β Ceti.....	4	0. 37. 24·858	4	0·89	24·858	3·012			108. 39.					
25	ζ Andromedæ		0. 40. (49.)					2	2	66. 24. 8·60	9·01	4	0·86	8·81	19·63
26	η Cassiopeiæ.....	2	0. 41. 40·100	2	0·82	40·100	3·579	2		32. 50. 13·55		2	0·82	13·55	19·24
27	δ Piscium.....	7	0. 42. 18·033	7	0·86	18·033	3·105	4		83. 5. 5·61		4	0·58	5·61	19·67
28	Bradley 74.....		....					1	1	6. 57. 40·49	37·60	2	0·95	39·10	19·66
	Bradley 74 S.P. ...	1	0. 43. 28·910	1	0·37	28·910	5·175	1		6. 57. 42·41		1	0·37	42·41	
29	W. B. 0. 770.....	2	0. 45. 17·135	2	0·83	17·135	3·088	2		86. 38. 49·90		2	0·83	49·90	19·66
30	W. B. 0. 775.....	7	0. 45. 35·533	7	0·83	35·533	3·088	8		86. 36. 32·68		8	0·82	32·68	19·66
31	Bradley 90.....	1	0. 45. 44·450	1	0·99	44·450	3·529	1	1	29. 33. 3·62	3·36	2	0·99	3·49	19·70
32	20 Ceti.....	1	0. 46. 43·260	1	0·83	43·260	3·060			91. 48.					
33	Piazzi 0. 216.....	4	0. 46. 59·510	4	0·87	59·510	3·079	4		86. 34. 52·36		4	0·87	52·36	19·54
34	66 Piscium.....		0. 48. (4.)					1	1	71. 28. 45·77	44·95	2	0·76	45·36	19·65
35	36 Andromedæ		0. 48. (23.)					1	1	67. 2. 17·23	18·10	2	0·95	17·67	19·58
36	γ Cassiopeiæ		0. 49. (17.)					2	1	29. 56. 60·11	58·09	3	0·81	59·44	19·61
37	μ Andromedæ	2	0. 49. 55·810	2	0·86	55·810	3·302	3	1	52. 10. 6·25	5·89	4	0·74	6·16	19·63
38	2 Ursæ Minoris S.P.	1	0. 52. 14·280	1	0·34	14·280	7·061	1		4. 24. 13·39		1	0·34	13·39	19·54
39	70 Piscium.....	2	0. 55. 43·125	2	0·78	43·125	3·110	2		82. 43. 23·45		2	0·78	23·45	19·63
40	Bradley 95.....	1	0. 55. 47·450	1	0·75	47·450	8·152	1		3. 30. 38·97		1	0·75	38·97	19·49
41	Groombridge 215 ..	1	0. 56. 1·440	1	0·95	1·440	4·180	1		16. 17. 20·78		1	0·95	20·78	19·46
42	σ^1 Piscium.....		0. 56. (5.)					2	2	58. 51. 23·43	24·64	4	0·83	24·04	19·45
43	ε Piscium.....	4	0. 56. 33·630	4	0·87	33·630	3·112	2		82. 46. 21·08		2	0·79	21·08	19·45
44	σ^2 Piscium.....		0. 59. (25.)					1	1	58. 28. 38·92	37·99	2	0·81	38·46	19·39
45	75 Piscium	3	1. 0. 5·403	3	0·62	5·403	+ 3·152	3		77. 42. 14·47		3	0·62	14·47	— 19·45

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			h m s			s	s			° ′ ″	″			″	″
46	β Andromedæ	8	1. 2. 50·906	8	0·73	50·906	+ 3·340	3	1	55. 1. 55·00	55·40	4	0·76	55·10	−19·21
47	ζ^1 Piscium	1	1. 7. 18·350	1	0·75	18·350	3·127			83. 4.					
48	ζ^2 Piscium	1	1. 7. 19·660	1	0·75	19·660	3·126			83. 4.					
49	Polaris	55	1. 13. 41·087	113	0·65	41·080	21·163	72	9	1. 20. 48·22	48·39	81	0·60	48·24	19·02
	Polaris S.P.....	58	1. 13. 41·074					82	7	1. 20. 47·88	48·36	89	0·54	47·92	
50	δ Cassiopeiæ S.P. ..	1	1. 17. 47·110	1	0·37	47·110	3·873	1		30. 24. 17·65		1	0·37	17·65	18·86
51	θ Ceti	2	1. 17. 52·545	2	0·50	52·545	2·996			98. 49.					
52	ρ Piscium	1	1. 19. 37·620	1	0·95	37·620	3·219	1		71. 28. 8·05		1	0·95	8·05	18·87
53	94 Piscium.....	1	1. 20. 3·110	1	0·77	3·110	3·228	1		71. 23. 50·94		1	0·77	50·94	18·79
54	A Cassiopeiæ.....	1	1. 22. 6·080	1	0·06	6·080	4·362	1		20. 22. 9·15		1	0·06	9·15	18·70
55	η Piscium.....	12	1. 24. 54·136	12	0·59	54·136	3·200	5		75. 17. 19·74		5	0·70	19·74	18·69
56	40 Cassiopeiæ		....					2	2	17. 35. 16·99	16·68	4	0·93	16·84	18·52
	40 Cassiopeiæ S.P. .	1	1. 28. 43·480	1	0·34	43·480	4·654	1		17. 35. 16·58		1	0·34	16·58	
57	101 Piscium.....	6	1. 29. 11·877	6	0·80	11·877	3·197	6		75. 58. 5·29		6	0·80	5·29	18·55
58	104 Piscium.....	7	1. 32. 40·007	7	0·59	40·007	3·209	8		76. 20. 21·79		8	0·61	21·79	18·45
59	ω Cassiopeiæ		1. 33. (15.)					2	2	22. 34. 49·44	49·00	4	0·90	49·22	18·41
60	W. B. (2) I. 774...	2	1. 34. 57·135	2	0·46	57·135	3·443	3	1	55. 22. 34·38	33·79	4	0·70	34·23	18·36
61	44 Cassiopeiæ S.P. .	2	1. 35. 1·195	2	0·34	1·195	4·029	2		30. 4. 11·99		2	0·34	11·99	18·32
62	ν Piscium	5	1. 35. 1·830	5	0·58	1·830	3·114	1		85. 8. 8·85		1	0·88	8·85	18·31
63	τ Ceti	5	1. 38. 21·230	5	0·54	21·230	2·784	4		106. 35. 9·06		4	0·66	9·06	19·08
64	Piazzi I. 159.....	1	1. 38. 52·170	1	0·99	52·170	4·269	2	2	26. 45. 19·50	20·26	4	0·97	19·88	17·96
65	ο Piscium	7	1. 38. 53·917	7	0·66	53·917	3·163			81. 27.					
66	4 Arietis	4	1. 41. 30·715	4	0·45	30·715	3·247	4		73. 39. 28·12		4	0·45	28·12	18·16
67	54 Ceti.....	1	1. 44. 20·370	1	0·77	20·370	3·173	1		79. 33. 58·78		1	0·77	58·78	17·94
68	ε Cassiopeiæ.....		1. 45. (33.)					2	2	26. 56. 11·33	12·93	4	0·90	12·13	17·95
69	β Arietis	12	1. 47. 50·838	12	0·54	50·838	3·298	3	1	69. 47. 38·27	38·85	4	0·37	38·42	17·76
70	Bradley 253.....	1	1. 48. 38·110	1	0·08	38·110	3·531	1		53. 19. 35·48		1	0·08	35·48	17·86
71	56 Andromedæ	3	1. 48. 51·210	3	0·07	51·210	3·544	3		53. 21. 9·24		3	0·07	9·24	17·88
72	ι Arietis	1	1. 50. 37·900	1	0·81	37·900	3·267	1		72. 47. 3·31		1	0·81	3·31	17·72
73	λ Arietis.....	3	1. 51. 4·623	3	0·89	4·623	3·332	3		67. 0. 17·96		3	0·89	17·96	17·75
74	W. B. (2) I. 1172..	2	1. 51. 6·635	2	0·96	6·635	3·337	2		66. 59. 52·08		2	0·96	52·08	17·74
75	48 Cassiopeiæ S.P..	1	1. 51. 53·000	1	0·41	53·000	4·821	1		19. 41. 27·32		1	0·41	27·32	17·71
76	50 Cassiopeiæ	3	1. 52. 57·920	3	0·91	57·920	4·990	4	2	18. 10. 31·08	31·70	6	0·93	31·29	17·68
77	53 Cassiopeiæ S.P..	1	1. 53. 54·920	1	0·34	54·920	4·369	1		26. 12. 18·19		1	0·34	18·19	17·62
78	α^1 Piscium	1	1. 55. 40·920	1	0·05	40·920	4·000	1		87. 49. 50·76		1	0·05	50·76	17·54
79	γ^1 Andromedæ.....	9	1. 56. 21·241	9	0·59	21·241	3·653	9		48. 15. 40·70		9	0·59	40·70	17·47
80	γ^2 Andromedæ.....	9	1. 56. 22·126	9	0·59	22·126	3·653	9		48. 15. 36·48		9	0·59	36·48	17·47
81	α Arietis	14	2. 0. 14·508	14	0·58	14·508	3·367	3	1	67. 7. 13·07	12·80	4	0·27	13·00	17·21
82	15 Arietis	1	2. 3. 48·620	1	0·73	48·620	3·314	1		71. 4. 51·21		1	0·73	51·21	17·15
83	6 Trianguli		2. 5. (14.)					1	1	60. 16. 28·54	27·71	2	1·00	28·13	17·09
84	ξ^1 Ceti	5	2. 6. 28·892	5	0·93	28·892	3·171			81. 43.					
85	67 Ceti.....	5	2. 10. 50·836	5	0·85	50·836	2·987	1		96. 59. 24·33		1	0·89	24·33	16·73
86	θ Arietis.....	3	2. 11. 17·153	3	0·83	17·153	3·325	2		70. 40. 8·13		2	0·81	8·13	16·85
87	Piazzi II. 61		2. 15. (11.)						1	49. 9.	46·27	1	0·06	46·27	16·57
88	12 Trianguli		2. 20. (57.)					1	1	60. 52. 52·43	51·02	2	1·00	51·73	16·28
89	ξ^2 Ceti	3	2. 21. 37·200	3	0·92	37·200	3·181	2		82. 5. 33·19		2	0·94	33·19	16·32
90	26 Arietis	1	2. 23. 44·870	1	0·06	44·870	3·353	2		70. 41. 30·40		2	0·06	30·40	16·23
91	Bradley 348.....		2. 26. (22.)					1	1	17. 43. 17·17	17·45	2	0·06	17·31	16·10
92	W. B. II. 453.....	6	2. 28. 40·267	6	0·87	40·267	3·161	6		83. 42. 49·24		6	0·87	49·24	16·08
93	Piazzi II. 123	10	2. 29. 20·227	10	0·80	20·227	+ 3·282	9		83. 42. 4·83		9	0·79	4·83	− 17·45

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			h m s			s	s			° ′ ″	″			″	″
94	ν Ceti	1	2. 29. 25·120	1	0·80	25·120	+ 3·137			84. 56.					
95	ν Arietis	3	2. 31. 50·053	3	0·61	50·053	3·393	2		68. 34. 16·83		2	0·47	16·83	— 15·79
96	δ Ceti	3	2. 33. 10·663	3	0·89	10·663	3·072			90. 12.					
97	μ Arietis	2	2. 35. 25·935	2	0·81	25·935	3·368	2		70. 30. 50·10		2	0·81	50·10	15·56
98	θ Persei	3	2. 35. 48·333	3	0·89	48·333	4·063	3		41. 17. 35·34		3	0·89	35·34	15·46
99	γ^2 Ceti	3	2. 36. 55·650	3	0·63	55·650	3·101			87. 17.					
100	41 Arietis		2. 42. (44.)					1	1	63. 14. 51·99	52·01	2	0·06	52·00	15·07
101	σ Arietis	3	2. 44. 42·177	3	0·89	42·177	3·299	2		75. 25. 34·54		2	0·54	34·54	15·04
102	20 Persei	2	2. 45. 57·055	2	0·92	57·055	3·767	2		52. 9. 54·56		2	0·92	54·56	14·95
103	Arg. Zone +70°. No. 215	1	2. 46. 7·670	2	0·67	7·445	5·624	1		19. 8. 39·76		1	0·93	39·76	15·01
	Arg. Zone +70°. No. 215 S.P.	1	2. 46. 7·220					1		19. 8. 39·68		1	0·41	39·68	
104	ε Arietis	3	2. 52. 10·807	3	0·60	10·807	3·419	3		69. 9. 10·19		3	0·86	10·19	14·63
105	Groombridge 598	1	2. 54. 3·260	1	0·89	3·260	3·802	1		51. 36. 36·91		1	0·89	36·91	14·54
106	Lalande (F.) 487	2	2. 54. 3·510	4	0·67	3·598	5·676	2		19. 29. 2·78		2	0·94	2·78	14·54
	Lalande (F.) 487 S.P.	2	2. 54. 3·685					2		19. 29. 3·29		2	0·41	3·29	
107	49 Arietis	1	2. 54. 39·510	1	0·99	39·510	3·517	1		64. 1. 32·59		1	1·00	32·59	14·50
108	α Ceti	1	2. 55. 51·030	1	0·09	51·030	3·129			86. 23.					
109	Bradley 417	1	2. 58. 38·660	1	0·89	38·660	6·306			16. 4.					
110	β Persei		3. 0. (10.)					1	1	49. 31. 10·89	11·31	2	0·06	11·10	14·18
111	Groombridge 612	3	3. 1. 59·247	3	0·95	59·247	6·271	3		16. 35. 48·34		3	0·95	48·34	14·06
112	δ Arietis	2	3. 4. 35·850	2	0·94	35·850	3·419	1	1	70. 44. 22·27	23·47	2	0·09	22·87	13·89
113	12 Eridani	1	3. 6. 50·860	1	0·99	50·860	2·547	1		119. 28. 20·32		1	1·00	20·32	14·37
114	Bradley 448	2	3. 9. 11·050	2	0·94	11·050	5·184			24. 48.					
115	Bradley 449	2	3. 12. 40·010	2	0·94	40·010	6·284	2		17. 13. 57·19		2	0·94	57·19	13·29
116	Piazzi III. 27		3. 14. (0.)					1	1	25. 51. 21·99	21·28	2	0·88	21·64	13·20
117	α Persei	2	3. 15. 32·840	2	0·72	32·840	4·251	2		40. 34. 44·13		2	0·72	44·13	13·14
118	64 Arietis	1	3. 17. 2·770	1	0·88	2·770	3·526	1		65. 42. 47·34		1	0·88	47·34	13·02
119	Groombridge 660	1	3. 17. 17·900	1	0·99	17·900	4·251	1		40. 41. 26·56		1	0·99	26·56	13·07
120	65 Arietis	2	3. 17. 20·690	2	0·53	20·690	3·445	2		69. 38. 4·37		2	0·53	4·37	13·05
121	o Tauri	2	3. 18. 11·590	2	0·91	11·590	3·227			81. 24.					
122	f Tauri	3	3. 24. 4·940	3	0·92	4·940	3·305			77. 29.					
123	ℓ Tauri	2	3. 25. 56·710	2	0·94	56·710	3·240	2		81. 2. 37·74		2	0·94	37·74	12·42
124	ε Eridani	3	3. 27. 8·097	3	0·93	8·097	2·822			99. 52.					
125	7 Tauri	1	3. 27. 9·700	1	0·88	9·700	3·541	2		65. 57. 0·28		2	0·47	0·28	12·34
126	Lalande 6772	1	3. 35. 22·730	1	0·01	22·730	4·052			47. 46.					
127	ν Persei	2	3. 36. 50·450	2	0·44	50·450	4·050	2		47. 48. 42·12		2	0·44	42·12	11·70
128	δ Eridani	2	3. 37. 21·370	2	0·93	21·370	2·869	1		100. 10. 54·60		1	1·00	54·60	12·42
129	17 Tauri	2	3. 37. 34·315	2	0·44	34·315	3·550	2		66. 16. 30·59		2	0·44	30·59	11·64
130	23 Tauri	1	3. 39. 1·590	1	0·81	1·590	3·552	1		66. 26. 11·96		1	0·81	11·96	11·52
131	24 Tauri	1	3. 40. 2·440	1	0·93	2·440	3·553	1		66. 15. 57·31		1	0·93	57·31	11·39
132	η Tauri	4	3. 40. 10·465	4	0·92	10·465	3·553	6		66. 16. 36·07		6	0·74	36·07	11·43
133	27 Tauri	2	3. 41. 50·990	2	0·96	50·990	3·554	2		66. 19. 28·06		2	0·96	28·06	11·30
134	28 Tauri	2	3. 41. 52·250	2	0·96	52·250	3·555	2		66. 14. 25·66		2	0·96	25·66	11·31
135	Bradley 531	1	3. 43. 4·240	1	0·88	4·240	3·037	1		91. 49. 45·43		1	0·88	45·43	11·30
136	Piazzi III. 187	1	3. 46. 8·070	1	0·88	8·070	3·421	1		73. 2. 26·95		1	0·88	26·95	11·00
137	ζ Persei	1	3. 46. 24·140	1	0·06	24·140	3·758			58. 29.					
138	Piazzi III. 186	1	3. 47. 6·900	1	0·01	6·900	4·293	1		42. 29. 30·46		1	0·01	30·46	10·98
139	Piazzi III. 160 S.P.	1	3. 49. 32·480	1	[0·34	32·480	9·704	1		9. 38. 38·97		1	0·34	38·97	10·86
140	ε Persei	1	3. 49. 36·130	1	0·95	36·130	+ 4·002	3	2	50. 20. 50·90	51·11	5	0·59	50·98	— 10·77

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			h m s			s	s			° ′ ″	″			″	″
141	γ^1 Eridani	1	3. 52. 17·420	1	0·89	17·420	+ 2·794	1		103. 51. 35·61		1	0·89	35·61	— 10·48
142	Groombridge 771 ..	1	3. 55. 5·740	1	0·05	5·740	6·866	1		16. 46. 2·92		1	0·05	2·92	10·40
143	A^1 Tauri	3	3. 57. 25·440	3	0·94	25·440	3·535			68. 15.					
144	A^2 Tauri.....	2	3. 58. 3·435	2	0·94	3·435	3·540	2		68. 19. 29·39		2	0·94	29·39	10·04
145	Piazzi III. 237	2	3. 58. 4·325	2	0·94	4·325	3·532	1		68. 16. 41·90		1	0·93	41·90	10·18
146	ω^1 Tauri.....		4. 2. (0.)					1	1	70. 43. 3·43	3·50	2	0·04	3·47	9·83
147	Groombridge 774 ..		4. 3. (7.)					1	1	6. 57. 43·58	42·72	2	0·96	43·15	9·79
148	p Tauri	2	4. 3. 20·450	2	0·92	20·450	3·649	2		63. 50. 30·28		2	0·92	30·28	9·78
149	Lalande 7721–2....	1	4. 4. 56·610	4	0·57	56·720	4·888	1		32. 51. 20·18		1	0·93	20·18	9·65
	Lalande 7721–2 S.P.	3	4. 4. 56·757					4		32. 51. 21·03		4	0·44	21·03	
150	Groombridge 779 ..	1	4. 5. 43·650	1	0·05	43·650	10·108	1		9. 28. 27·94		1	0·05	27·94	9·60
151	o^1 Eridani.....	2	4. 5. 51·645	2	0·50	51·645	2·923	2		97. 9. 34·49		2	0·50	34·49	9·65
152	Piazzi IV. 22		4. 11. (6.)					1	1	29. 33. 34·35	34·65	2	0·96	34·50	9·11
153	56 Tauri.....	2	4. 12. 19·860	2	0·50	19·860	3·547	2		68. 31. 31·85		2	0·50	31·85	9·07
154	Arg. Zone +54°. No. 765 S.P.	2	4. 12. 34·305	2	0·45	34·305	4·741	2		35. 33. 5·18		2	0·45	5·18	9·06
155	ϕ Tauri	2	4. 12. 47·475	2	0·07	47·475	3·676	2		62. 56. 42·69		2	0·07	42·69	8·98
156	γ Tauri.....	2	4. 12. 47·650	2	0·10	47·650	3·409			74. 40.					
157	h Tauri	1	4. 13. 2·170	1	0·05	2·170	3·376	1		76. 15. 46·95		1	0·05	46·95	9·02
158	W. B. IV. 326	2	4. 17. 16·610	2	0·95	16·610	3·130	2		87. 14. 55·56		2	0·95	55·56	8·69
159	W. B. IV. 340	1	4. 18. 1·970	1	0·95	1·970	3·119	1		87. 47. 36·45		1	0·95	36·45	8·63
160	κ^1 Tauri	1	4. 18. 2·320	1	0·05	2·320	3·564	1		67. 59. 21·82		1	0·05	21·82	8·57
161	W. B. IV. 381	1	4. 19. 35·860	1	0·93	35·860	3·088	1		89. 15. 0·26		1	0·93	0·26	8·51
162	υ^2 Tauri		4. 19. (56.)					2	1	67. 16. 57·17	57·79	3	0·34	57·38	8·46
163	ϵ Tauri	1	4. 21. 26·100	1	0·94	26·100	3·494	1	1	71. 5. 38·98	38·41	2	0·01	38·70	8·33
164	W. B. IV. 440	3	4. 22. 25·823	3	0·94	25·823	3·117	3		87. 54. 2·29		3	0·94	2·29	8·28
165	W. B. IV. 520	1	4. 26. 4·030	1	0·93	4·030	3·088	1		89. 17. 1·15		1	0·93	1·15	7·99
166	W. B. IV. 544	1	4. 27. 11·320	1	0·93	11·320	3·089	1		89. 14. 19·57		1	0·93	19·57	7·90
167	Aldebaran	8	4. 28. 51·776	8	0·67	51·776	3·436	8		73. 44. 23·34		8	0·44	23·34	7·59
168	W. B. IV. 632	3	4. 30. 38·650	3	0·95	38·650	3·123	3		87. 40. 18·04		3	0·95	18·04	7·62
169	89 Tauri	1	4. 31. 6·980	1	0·05	6·980	3·435	1		74. 12. 53·53		1	0·05	53·53	7·59
170	W. B. IV. 685	1	4. 32. 46·160	1	0·93	46·160	3·113	1		88. 6. 55·54		1	0·93	55·54	7·45
171	Piazzi IV. 148.....	4	4. 33. 37·953	4	0·29	37·953	3·751	4		61. 37. 31·09		4	0·29	31·09	7·34
172	W. B. IV. 727	3	4. 34. 33·327	3	0·95	33·327	3·122	3		87. 44. 4·07		3	0·95	4·07	7·31
173	τ Tauri.....		4. 34. (51.)					1	1	67. 16. 50·80	50·50	2	0·01	50·65	7·26
174	W. B. IV. 777	1	4. 36. 39·730	1	0·96	39·730	3·091	1		89. 7. 36·44		1	0·96	36·44	7·13
175	Bradley 651.....	1	4. 38. 2·030	1	0·05	2·030	4·887	1		34. 37. 11·22		1	0·05	11·22	6·95
176	Groomb. 870 S.P...	1	4. 38. 29·120	1	0·41	29·120	6·166	1		22. 3. 5·92		1	0·41	5·92	6·99
177	W. B. IV. 817	3	4. 38. 55·040	3	0·94	55·040	3·125	3		87. 35. 27·34		3	0·94	27·34	6·95
178	μ Eridani	2	4. 39. 21·065	2	0·88	21·065	2·998	1		93. 28. 53·31		1	0·07	53·31	6·90
179	1 Aurigæ	2	4. 41. 38·000	2	0·05	38·000	4·029	1		52. 43. 50·89		1	0·04	50·89	6·78
180	W. B. IV. 902	2	4. 43. 9·465	2	0·94	9·465	3·116	1		88. 0. 51·63		1	0·93	51·63	6·60
181	W. B. IV. 936	2	4. 44. 24·480	2	0·96	24·480	3·093	2		89. 3. 52·07		2	0·95	52·07	6·50
182	Piazzi IV. 191.....		4. 46. (45.)					1	1	15. 55. 29·72	30·51	2	0·01	30·17	6·28
183	1 Aurigæ		4. 48. (59.)					1		57. 1. 48·94		1	0·18	48·94	6·09
184	Piazzi IV. 207 S.P.	1	4. 49. 10·440	1	0·50	10·440	7·453	1		16. 7. 7·03		1	0·50	7·03	6·10
185	o^2 Orionis.....	2	4. 49. 27·360	2	0·05	27·360	3·369	1		76. 40. 52·84		1	0·04	52·84	6·03
186	Lalande 9270.....	3	4. 49. 47·467	3	0·91	47·467	3·113	3		88. 9. 14·69		3	0·91	14·69	6·05
187	W. B. IV. 1067 ...	3	4. 49. 47·733	3	0·94	47·733	3·139	3		87. 1. 16·46		3	0·93	16·46	6·05
188	Bradley 671 S.P. ..	1	4. 50. 23·280	1	0·41	23·280	+ 6·044	1		23. 21. 9·82		1	0·41	9·82	— 5·48

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			h m s			s	s			° ′ ″	″			″	″
189	4 Aurigæ	1	4. 50. 54·550	1	0·96	54·550	+ 4·064		1	52. 17.	53·64	1	0·96	53·64	— 5·87
190	W. B. IV. 1149 ...	3	4. 53. 41·443	3	0·92	41·443	3·142	2		86. 53. 56·10		2	0·93	56·10	5·72
191	ζ Aurigæ	1	4. 53. 52·920	1	0·18	52·920	4·183			49. 6.					
192	64 Eridani	1	4. 54. 13·020	1	0·99	13·020	2·789			102. 43.					
193	ι Tauri		4. 55. (44.)					1	1	68. 35. 14·38	15·31	2	0·05	14·85	5·48
194	W. B. IV. 1223....	3	4. 56. 2·790	3	0·93	2·790	3·114	3		88. 7. 53·07		3	0·93	53·07	5·52
195	Piazzi IV. 254 S.P..	1	4. 56. 52·610	1	0·48	52·610	7·478	1		16. 12. 58·46		1	0·48	58·46	5·43
196	η Aurigæ	2	4. 57. 53·420	2	0·13	53·420	4·198	2		48. 56. 1·93		2	0·13	1·93	5·28
197	Lalande 9561.....	3	4. 58. 35·963	3	0·94	35·963	3·128	3		87. 31. 34·94		3	0·94	34·94	5·31
198	ϵ Leporis		5. 0. (15.)					1		112. 32. 14·08		1	0·18	14·08	5·10
199	15 Orionis	2	5. 2. 39·575	2	0·50	39·575	3·429	2		74. 33. 40·91		2	0·50	40·91	5·00
200	Groombridge 928 ..	1	5. 3. 3·820	2	0·70	3·765	7·344			....					
	Groomb. 928 S.P...	1	5. 3. 3·710					1		16. 52. 37·17		1	0·40	37·17	4·93
201	Groomb. 931 S.P...	1	5. 6. 49·110	1	0·36	49·110	9·348	1		11. 42. 53·80		1	0·36	53·80	4·61
202	14 Aurigæ (1st Star)	2	5. 7. 23·055	2	0·89	23·055	3·904	3		57. 27. 36·10		3	0·93	36·10	4·56
203	14 Aurigæ (2nd Star)	2	5. 7. 23·805	2	0·89	23·805	3·904	3		57. 27. 25·16		3	0·93	25·16	4·56
204	Capella	2	5. 7. 36·200	3	0·46	36·200	4·423	3		44. 7. 46·64		3	0·45	46·64	4·11
	Capella S.P.	1	5. 7. 36·200					2		44. 7. 45·71		2	0·46	45·71	
205	Rigel	8	5. 7. 37·620	8	0·52	37·620	2·880	3		98. 20. 42·27		3	0·50	42·27	4·44
206	18 Orionis	1	5. 9. 14·110	1	0·05	14·110	3·335	1		78. 47. 55·73		1	0·05	55·73	4·43
207	Piazzi IV. 311.....	1	5. 9. 32·030	2	0·68	32·075	9·325			....					
	Piazzi IV. 311 S.P..	1	5. 9. 32·120					1		11. 49. 5·66		1	0·40	5·66	4·44
208	λ Aurigæ	2	5. 10. 29·370	2	0·50	29·370	4·211	2		50. 0. 44·08		2	0·50	44·08	3·60
209	Piazzi IV. 317.....		5. 10. (30.)						1	12. 8.	29·03	1	0·06	29·03	4·27
210	Bradley 737.....	2	5. 10. 54·405	2	0·48	54·405	3·939	2		56. 23. 3·83		2	0·48	3·83	4·20
211	Bradley 743.....	1	5. 12. 1·300	1	0·95	1·300	2·755	1		103. 39. 8·10		1	0·14	8·10	4·19
212	Piazzi V. 41	2	5. 13. 15·965	2	0·53	15·965	3·764	1		62. 10. 10·13		1	0·99	10·13	4·00
213	σ Aurigæ	3	5. 16. 17·607	3	0·64	17·607	4·077	2		52. 43. 54·76		2	0·92	54·76	3·80
214	111 Tauri.....	2	5. 17. 14·810	2	0·50	14·810	3·497	1		72. 43. 57·66		1	0·04	57·66	3·72
215	8 Leporis	2	5. 17. 52·450	2	0·96	52·450	2·743	2		104. 2. 39·30		2	0·96	39·30	3·70
216	ϵ Orionis	1	5. 18. 1·240	1	0·05	1·240	2·897	1		97. 55. 20·04		1	0·05	20·04	3·65
217	β Tauri	6	5. 18. 30·980	6	0·59	30·980	3·790	6		61. 29. 54·33		6	0·44	54·33	3·41
218	ο Tauri	2	5. 20. 14·845	2	0·97	14·845	3·599	1		68. 10. 12·89		1	0·99	12·89	3·45
219	Piazzi V. 99	3	5. 21. 51·790	3	0·95	51·790	3·808	2		60. 54. 49·04		2	0·95	49·04	3·27
220	χ Aurigæ	3	5. 24. 43·313	3	0·66	43·313	3·904	3		57. 54. 3·68		3	0·66	3·68	3·09
221	δ Orionis	4	5. 25. 43·320	4	0·75	43·320	3·064			90. 23.					
222	α Leporis	1	5. 27. 18·290	1	0·89	18·290	2·646	1		107. 54. 41·44		1	0·13	41·44	2·85
223	W. B. (2) V. 763–4	2	5. 27. 50·525	2	0·95	50·525	4·142	2		51. 3. 0·64		2	0·95	0·64	2·80
224	121 Tauri	3	5. 27. 56·420	3	0·36	56·420	3·662	3	1	66. 2. 39·46	39·96	4	0·08	39·59	2·76
225	Lalande 10527.....	1	5. 29. 0·230	1	0·99	0·230	2·931	1		96. 5. 32·37		1	0·99	32·37	2·71
226	Lalande 10529.....	1	5. 29. 1·850	1	0·99	1·850	2·931	1		96. 5. 6·44		1	0·99	6·44	2·70
227	ι Orionis.....	2	5. 29. 24·995	2	0·53	24·995	2·934	2		95. 59. 33·60		2	0·53	33·60	2·66
228	Radcliffe 1516		5. 30. (7.)					2	1	24. 22. 21·37	21·35	3	0·05	21·36	2·61
229	26 Aurigæ	1	5. 30. 44·270	1	0·16	44·270	3·847	1		59. 34. 55·60		1	0·16	55·60	2·55
230	B. F. 747	2	5. 31. 29·015	2	0·91	29·015	3·812	2		60. 51. 28·54		2	0·91	28·54	2·49
231	23 Camelopardali...	1	5. 32. 49·960	1	0·07	49·960	5·501			28. 35.					
232	Lalande 10705.....	1	5. 33. 44·130	1	0·95	44·130	3·026	1		91. 59. 43·87		1	0·95	43·87	2·30
233	126 Tauri.....	1	5. 34. 11·120	1	0·05	11·120	3·470	1		73. 31. 54·18		1	0·05	54·18	2·27
234	α Columbæ	2	5. 35. 11·735	2	0·92	11·735	+ 2·179	1		124. 8. 19·80		1	0·95	19·80	— 2·17

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			h m s			s	s			° ′ ″	″			″	″
235	Lalande 10769.....	2	5. 39. 41·715	3	0·51	41·760	+ 6·441	2		21. 34. 5·02		2	0·52	5·02	— 1·77
	Lalande 10769 S.P.	1	5. 39. 41·850							....					
236	κ Orionis	5	5. 41. 55·328	5	0·60	55·328	2·844			....					
237	136 Tauri.....	1	5. 45. 35·710	1	0·07	35·710	3·768	2	1	62. 25. 7·22	7·56	3	0·11	7·33	1·19
238	Piazzi V. 256	2	5. 47. 0·045	2	0·53	0·045	3·894	2		58. 19. 8·65		2	0·53	8·65	1·05
239	Piazzi V. 246.....		5. 48. (3.)					1	1	23. 0. 6·21	5·60	2	0·05	5·91	1·09
240	α Orionis	4	5. 48. 30·785	4	0·36	30·785	3·246	4		82. 37. 3·62		4	0·43	3·62	1·00
241	Piazzi V. 253 S.P...	1	5. 49. 33·510	1	0·45	33·510	6·180			23. 6.					
242	β Aurigæ	2	5. 50. 30·365	2	0·60	30·365	4·406	2		45. 4. 1·68		2	0·60	1·68	0·80
243	θ Aurigæ		5. 51. (20.)					1	1	52. 47. 53·37	54·02	2	0·11	53·70	0·65
244	Bradley 865.....	2	5. 54. 0·115	2	0·12	0·115	4·342	2		46. 37. 31·22		2	0·12	31·22	0·53
245	39 Aurigæ.....	1	5. 56. 12·600	1	0·07	12·600	4·320	1		47. 0. 41·36		1	0·07	41·36	0·26
246	17 Leporis	1	5. 59. 29·710	1	0·99	29·710	2·684	1		106. 28. 41·19		1	1·00	41·19	— 0·02
247	36 Camelopardali ..	2	6. 0. 28·405	2	0·54	28·405	6·028	2	1	24. 15. 37·14	37·59	3	0·36	37·29	+ 0·11
248	ν Orionis.....	3	6. 0. 32·907	3	0·37	32·907	3·426	1	1	75. 13. 6·66	7·18	2	0·06	6·92	0·07
249	40 Camelopardali S.P.	1	6. 4. 37·420	1	0·52	37·420	5·394	1		29. 58. 13·46		1	0·52	13·46	0·45
250	Piazzi V. 335.....	2	6. 5. 17·210	2	0·53	17·210	6·624	1		20. 38. 25·89		1	0·99	25·89	0·55
251	Piazzi V. 337.....	1	6. 5. 57·410	1	0·08	57·410	6·661	1		20. 23. 30·19		1	0·08	30·19	0·60
252	1 Lyncis.....	1	6. 6. 34·020	1	0·20	34·020	5·538	1	1	28. 26. 52·56	51·90	2	0·06	52·23	0·60
253	η Geminorum.....	2	6. 7. 27·155	2	0·58	27·155	3·620			67. 27.					
254	κ Aurigæ	2	6. 7. 32·425	2	0·52	32·425	3·825	2		60. 27. 31·82		2	0·52	31·82	0·95
255	μ Geminorum	4	6. 15. 31·083	4	0·72	31·083	3·632			67. 25.					
256	β Canis Majoris....	2	6. 17. 16·910	2	0·57	16·910	2·643			107. 53.					
257	48 Aurigæ	3	6. 20. 39·623	3	0·35	39·623	3·861	3		59. 25. 58·89		3	0·35	58·89	1·85
258	47 Aurigæ	2	6. 20. 51·485	2	0·52	51·485	4·493	2		43. 14. 18·98		2	0·52	18·98	1·85
259	ν Geminorum.....	1	6. 21. 39·540	1	0·08	39·540	3·562	1	1	69. 42. 43·06	43·16	2	0·16	43·11	1·91
260	Radcliffe 1742	1	6. 22. 22·590	1	0·13	22·590	7·648	1		16. 12. 49·13		1	0·13	49·13	1·96
261	Piazzi VI. 75.....	3	6. 25. 12·360	3	0·05	12·360	10·420	1		10. 18. 25·27		1	0·01	25·27	2·82
262	49 Aurigæ	4	6. 27. 27·220	4	0·30	27·220	3·782	4		61. 53. 1·76		4	0·30	1·76	2·42
263	γ Geminorum.....	8	6. 30. 36·306	8	0·43	36·306	3·466	3	1	73. 29. 51·13	51·42	4	0·23	51·20	2·71
264	ν^2 Canis Majoris....	2	6. 31. 19·170	2	0·07	19·170	2·616	2		109. 9. 7·97		2	0·07	7·97	2·78
265	28 Geminorum	3	6. 36. 57·770	3	0·36	57·770	3·805	3		60. 54. 23·47		3	0·36	23·47	3·25
266	30 Geminorum		6. 37. (3.)					1	1	76. 38. 59·58	59·61	2	0·19	59·60	3·24
267	ξ Geminorum.....	2	6. 38. 23·055	2	0·97	23·055	3·370	1		76. 58. 24·95		1	1·00	24·95	3·56
268	Sirius	4	6. 39. 43·560	4	0·15	43·560	2·646	4		106. 32. 56·75		4	0·15	56·75	4·70
269	Cephei 51	6	6. 42. 14·802	17	0·65	15·034	30·224	19	5	2. 46. 2·96	1·65	24	0·26	2·69	3·78
	Cephei 51 S.P.	11	6. 42. 15·160					34		2. 46. 2·73		34	0·59	2·73	
270	33 Geminorum	1	6. 43. 45·050	1	0·14	45·050	3·460	1		73. 39. 33·21		1	0·14	33·21	3·66
271	37 Geminorum	1	6. 47. 44·770	1	0·82	44·770	3·692	1		64. 28. 21·57		1	0·82	21·57	4·13
272	θ Canis Majoris		6. 48. (28.)					1		101. 53. 9·31		1	0·13	9·31	4·24
273	39 Geminorum	3	6. 51. 12·413	3	0·11	12·413	3·706	3		63. 45. 33·26		3	0·11	33·26	4·35
274	ε Canis Majoris	1	6. 53. 47·540	1	0·16	47·540	2·357	1		118. 48. 20·15		1	0·16	20·15	4·69
275	ζ Geminorum.....	1	6. 56. 48·750	1	0·13	48·750	3·563	2	2	69. 15. 3·35	4·60	4	0·16	3·98	4·94
276	Arg. Zone + 69°. No. 413	1	7. 1. 46·270	1	0·18	46·270	6·431	1		20. 59. 40·80		1	0·18	40·80	5·35
277	δ Canis Majoris	2	7. 3. 23·415	2	0·08	23·415	2·439	2		116. 11. 56·17		2	0·08	56·17	5·47
278	47 Geminorum	1	7. 3. 45·260	1	0·22	45·260	3·726	1		62. 56. 36·50		1	0·22	36·50	5·54
279	Piazzi VI. 292.....		7. 5. (4.)					1	1	7. 21. 30·63	30·62	2	0·11	30·63	5·64
280	51 Geminorum	2	7. 6. 18·435	2	0·14	18·435	+ 3·451	2	1	73. 38. 3·56	3·75	3	0·13	3·62	+ 5·75

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			h m s			s	s			° ′ ″	″			″	″
281	53 Geminorum	4	7. 8. 16·150	4	·014	16·150	+ 3·753	4		61. 53. 25·73		4	0·14	25·73	+ 5·90
282	Piazzi VI. 334	1	7. 12. 9·180	1	0·18	9·180	11·135			8. 51.					6·18
283	δ Geminorum		7. 12. (46.)					3	2	67. 47. 35·36	34·94	5	0·13	35·19	6·28
284	Groombridge 1299 .	1	7. 15. 14·340	1	0·11	14·340	5·993	1		23. 25. 47·12		1	0·11	47·12	6·46
285	A Geminorum	1	7. 15. 58·520	1	0·15	58·520	3·670	1		64. 42. 54·46		1	0·15	54·46	6·55
286	η Canis Majoris	1	7. 19. 13·890	1	0·19	13·890	2·369	1		119. 3. 50·19		1	0·19	50·19	6·79
287	63 Geminorum		7. 20. (26.)					1	1	68. 18. 18·38	18·62	2	0·18	18·50	6·99
288	β Canis Minoris....	3	7. 20. 28·777	3	0·22	28·777	3·257			81. 27.					
289	γ Canis Minoris....	3	7. 21. 27·893	3	0·13	27·893	3·276	2		80. 49. 37·19		2	0·14	37·19	7·00
290	b^2 Geminorum	1	7. 22. 9·550	1	0·11	9·550	3·742	1		61. 49. 55·90		1	0·11	55·90	7·06
291	67 Geminorum	3	7. 26. 23·850	3	0·13	23·850	3·434	2		74. 5. 54·87		2	0·14	54·87	7·35
292	a^1 Geminorum		7. 26. (44.)					1		57. 50. 39·65		1	0·35	39·65	7·49
293	Castor	6	7. 26. 44·987	6	0·42	44·987	3·840	7		57. 50. 37·07		7	0·49	37·07	7·49
294	υ Geminorum.....	2	7. 28. 20·475	2	0·48	20·475	3·707	2		62. 49. 57·47		2	0·48	57·47	7·65
295	f Geminorum.....	1	7. 32. 22·380	1	0·19	22·380	3·471	2	1	72. 2. 48·53	46·73	3	0·08	47·93	7·85
296	Procyon	11	7. 32. 51·697	11	0·41	51·697	3·144	9		84. 27. 40·24		9	0·54	40·24	8·99
297	Piazzi VII. 132....	1	7. 35. 51·180	1	0·18	51·180	10·202	1		9. 25. 51·23		1	0·18	51·23	8·09
298	κ Geminorum.....	3	7. 37. 1·183	3	0·32	1·183	3·627	2		65. 18. 30·83		2	0·07	30·83	8·28
299	Pollux	6	7. 37. 47·277	6	0·48	47·277	3·679	7		61. 40. 42·62		7	0·57	42·62	8·36
300	Groombridge 1363 .	1	7. 38. 48·740	1	0·16	48·740	6·831			17. 54.					
301	g Geminorum	1	7. 39. 0·140	1	0·19	0·140	3·478	1		71. 11. 29·11		1	0·19	29·11	8·44
302	ξ Navis.....	1	7. 44. 7·290	1	0·08	7·290	2·525	1		114. 33. 8·50		1	0·08	8·50	8·79
303	ω^1 Cancri	1	7. 53. 29·130	1	0·22	29·130	3·638	1		64. 16. 20·39		1	0·22	20·39	9·52
304	5 Cancri.....	1	7. 54. 29·540	1	0·09	29·540	3·426	1		73. 12. 28·66		1	0·09	28·66	9·61
305	6 Cancri.....	2	7. 55. 57·605	2	0·07	57·605	3·693			61. 51.					
306	μ^1 Cancri	1	7. 59. 1·100	1	0·22	1·100	3·559	1		67. 0. 54·23		1	0·22	54·23	9·97
307	15 Argûs	1	8. 2. 18·370	1	0·16	18·370	2·554	1		113. 57. 1·06		1	0·16	1·06	10·14
308	β Cancri.....	1	8. 9. 50·690	1	0·16	50·690	3·259			80. 26.					
309	d^1 Cancri	1	8. 16. 19·200	1	0·16	19·200	3·442		1	71. 16.	31·62	1	0·13	31·62	11·26
310	o Ursæ Majoris	1	8. 20. 1·800	1	0·16	1·800	5·039	3	3	28. 52. 21·90	21·74	6	0·17	21·82	11·64
311	v^3 Cancri		8. 24. (14.)					1	1	65. 30. 19·83	20·01	2	0·24	19·92	11·87
312	γ Cancri.....	2	8. 36. 9·985	2	0·18	9·985	3·479	3	2	68. 5. 24·96	25·93	5	0·17	25·35	12·62
313	A^1 Cancri	1	8. 36. 25·520	1	0·12	25·520	3·313	1		76. 52. 45·08		1	0·12	45·08	12·64
314	Groombridge 1463..	1	8. 37. 20·170	1	0·20	20·170	9·268			9. 30.					
315	ι Cancri		8. 39. (15.)					1	1	60. 47. 29·52	30·80	2	0·20	30·16	12·89
316	ε Hydræ.....	1	8. 40. 15·620	1	0·21	15·620	3·183			83. 7.					
317	51 Cancri.....	1	8. 44. 58·530	1	0·12	58·530	3·732	2	1	57. 3. 59·11	58·51	3	0·20	58·91	13·20
318	ι Ursæ Majoris	1	8. 50. 46·670	1	0·16	46·670	4·137	1		41. 28. 36·48		1	0·16	36·48	13·88
319	α Cancri.....	1	8. 51. 45·520	1	0·15	45·520	3·287	2	1	77. 40. 2·42	2·37	3	0·16	2·40	13·70
320	64 Cancri	1	8. 51. 59·200	1	0·09	59·200	3·705	1		57. 6. 18·37		1	0·09	18·37	13·74
321	σ^1 Ursæ Majoris ...		8. 57. (34.)					1	1	22. 38. 5·33	5·12	2	0·24	5·23	14·09
322	σ^2 Ursæ Majoris ...	3	8. 59. 32·650	3	0·15	32·650	5·369	2		22. 22. 5·64		2	0·13	5·64	14·27
323	κ Cancri.....	2	9. 1. 4·985	2	0·13	4·985	3·256	1		78. 50. 17·95		1	0·17	17·95	14·25
324	20 Ursæ Majoris...	4	9. 11. 3·620	4	0·14	3·620	4·663	2		29. 42. 6·68		2	0·17	6·68	14·99
325	83 Cancri	3	9. 12. 6·827	3	0·16	6·827	3·355	3	1	71. 46. 26·85	26·84	4	0·15	26·85	15·07
326	α Lyncis.....		9. 13. (33.)						1	55. 5.	19·88	1	0·13	19·88	15·02
327	Bradley 1310.....	2	9. 14. 8·460	2	0·14	8·460	4·138	2		39. 56. 0·92		2	0·14	0·92	15·07
328	Piazzi IX. 51	3	9. 15. 48·450	3	0·14	48·450	4·911	2		25. 31. 54·03		2	0·16	54·03	15·12
329	α Hydræ	1	9. 21. 32·580	1	0·45	32·580	+ 2·947	2		98. 7. 34·65		2	0·29	34·65	15·42
330	h Ursæ Majoris....		9. 21. (48.)					1	1	26. 24. 7·02	6·25	2	0·16	6·64	+ 15·35

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			h m s			s	s			° ′ ″	″			″	″
331	22 Ursæ Majoris ...	2	9. 23. 14·795	2	0·14	14·795	+ 5·804	2		17. 14. 59·31		2	0·14	59·31	+ 15·65
332	*d* Ursæ Majoris	1	9. 23. 34·370	1	0·13	34·370	5·427	1	1	19. 37. 50·94	50·80	2	0·17	50·87	15·52
333	*θ* Ursæ Majoris	2	9. 24. 37·265	2	0·23	37·265	4·044	2		37. 45. 47·94		2	0·23	47·94	16·19
334	*ξ* Leonis	3	9. 25. 18·787	3	0·12	18·787	3·238	1		78. 9. 22·61		1	0·13	22·61	15·73
335	11 Leonis Minoris..	2	9. 28. 16·610	2	0·15	16·610	3·617	2		53. 38. 3·80		2	0·15	3·80	16·09
336	7 Leonis	1	9. 29. 9·620	1	0·05	9·620	3·292	1		75. 4. 20·89		1	0·05	20·89	15·86
337	8 Leonis	1	9. 30. 15·330	1	0·16	15·330	3·320	1		73. 0. 43·00		1	0·16	43·00	15·85
338	Groombridge 1564 .	2	9. 31. 41·110	2	0·11	41·110	5·263	2		20. 12. 15·55		2	0·07	15·55	16·00
339	*o* Leonis	1	9. 34. 35·080	1	0·16	35·080	3·206			79. 32.					
340	*ϵ* Leonis	4	9. 38. 51·970	4	0·28	51·970	3·418	1		65. 39. 36·55		1	0·45	36·55	16·39
341	16 Leonis Minoris..	1	9. 42. 40·250	1	0·19	40·250	3·711	1		49. 47. 48·66		1	0·19	48·66	16·53
342	*μ* Leonis	1	9. 45. 45·860	1	0·16	45·860	3·421	1	1	63. 24. 52·27	53·43	2	0·17	52·85	16·77
343	*ν* Leonis	1	9. 51. 36·350	1	0·23	36·350	3·232	1		76. 58. 11·41		1	0·23	11·41	17·00
344	*π* Leonis	1	9. 53. 42·720	1	0·08	42·720	3·176	1		81. 21. 59·49		1	0·29	59·49	17·12
345	Groombridge 1609 .		10. 0. (5.)						1	25. 26.	51·35	1	0·17	51·35	17·38
346	Regulus	7	10. 1. 49·200	7	0·44	49·200	3·200	10	2	77. 25. 56·47	57·12	12	0·36	56·58	17·44
347	22 Leonis Minoris..	1	10. 8. 2·370	1	0·19	2·370	3·459	1		57. 55. 20·55		1	0·19	20·55	17·71
348	γ^1 Leonis	3	10. 13. 11·307	3	0·59	11·307	3·315	1		69. 32. 12·48		1	0·43	12·48	18·07
349	W. B. (2) X. 243 ..	1	10. 13. 45·990	1	0·19	45·990	3·607	1		48. 10. 10·87		1	0·19	10·87	17·94
350	Bradley 1433 S.P...	1	10. 14. 51·330	1	0·66	51·330	3·590	1		48. 8. 48·80		1	0·66	48·80	17·99
351	*μ* Ursæ Majoris S.P.	1	10. 14. 59·730	1	0·87	59·730	3·599	1		47. 53. 6·79		1	0·87	6·79	17·96
352	44 Leonis	3	10. 18. 46·220	3	0·22	46·220	3·160	3		80. 35. 25·70		3	0·22	25·70	18·25
353	Piazzi X. 67	1	10. 19. 6·470	1	0·19	6·470	3·174	1		80. 35. 58·89		1	0·19	58·89	18·34
354	45 Leonis	3	10. 21. 9·067	3	0·13	9·067	3·173	3		79. 36. 40·61		3	0·13	40·61	18·23
355	Bradley 1439.....	1	10. 23. 14·390	1	0·31	14·390	6·577	1		8. 52. 22·26		1	0·31	22·26	18·29
356	Bradley 1446.....	2	10. 24. 35·445	2	0·25	35·445	5·295	1		13. 39.					
357	*ρ* Leonis	3	10. 26. 19·970	3	0·38	19·970	3·165	5		80. 3. 39·47		5	0·36	39·47	18·43
358	34 Leonis Minoris..	1	10. 26. 28·750	1	0·26	28·750	3·448	1		54. 22. 42·52		1	0·26	42·52	18·41
359	44 Hydræ	1	10. 28. 10·000	1	0·19	10·000	2·845	1		113. 6. 42·08		1	0·19	42·08	18·44
360	Groombridge 1669 .	1	10. 33. 1·760	1	0·17	1·760	4·368	1		20. 54. 53·43		1	0·17	53·43	18·63
361	39 Leonis Minoris..		10. 33. (32.)					1	1	61. 50. 2·63	2·87	2	0·31	2·75	18·65
362	Piazzi X. 126	2	10. 34. 13·985	2	0·24	13·985	4·398			20. 16.					
363	34 Sextantis	1	10. 36. 16·330	1	0·22	16·330	3·100	1		85. 46. 29·28		1	0·35	29·28	18·72
364	Bradley 1485.....	1	10. 36. 43·550	1	0·33	43·550	3·277			66. 10.					
365	37 Sextantis.....	2	10. 39. 41·470	2	0·27	41·470	3·127	2		82. 58. 45·76		2	0·27	45·76	18·90
366	*l* Leonis	1	10. 42. 47·420	1	0·22	47·420	3·157			78. 48.					
367	46 Leonis Minoris..		10. 46. (25.)					2	2	55. 7. 20·86	21·68	4	0·32	21·27	19·28
368	54 Leonis.....		10. 48. (57.)					1	1	64. 35. 41·26	41·29	2	0·31	41·28	19·10
369	Bradley 1508.....		10. 50. (3.)					1	1	11. 34. 17·88	17·44	2	0·22	17·66	19·17
370	*d* Leonis	1	10. 54. 12·430	1	0·34	12·430	3·099	1		85. 43. 20·47		1	0·26	20·47	19·27
371	*c* Leonis	1	10. 54. 22·280	1	0·23	22·280	3·112	1		83. 14. 17·70		1	0·23	17·70	19·30
372	*α* Ursæ Majoris	1	10. 56. 7·280	1	0·79	7·280	3·759	3	1	27. 35. 7·72	6·83	4	0·48	7·50	19·37
373	W. B. (2) X. 1174 .	1	10. 59. 21·750	1	0·23	21·750	3·011	1		45. 50. 31·63		1	0·23	31·63	18·42
374	W. B. (2) X. 1188 .		11. 0. (12.)					1	1	71. 35. 51·16	51·31	2	0·34	51·24	19·38
375	Oeltz.Arg.(N.)11509	2	11. 4. 18·430	2	0·21	18·430	3·908	2		21. 3. 39·20		2	0·21	39·20	19·47
376	*δ* Leonis	6	11. 7. 33·922	6	0·57	33·922	3·201	7	2	68. 48. 9·84	9·36	9	0·50	9·73	19·67
377	*θ* Leonis		11. 7. (47.)						1	73. 53.	54·80	1	0·33	54·80	19·59
378	ξ^1 Ursæ Majoris ...	1	11. 11. 37·150	1	0·24	37·150	3·212	1		57. 46. 44·85		1	0·24	44·85	20·19
379	*ν* Ursæ Majoris	3	11. 11. 49·847	3	0·23	49·847	3·260	3	1	56. 14. 5·14	5·17	4	0·30	5·15	+ 19·56
380	*δ* Crateris	1	11. 13. 11·470	1	0·16	11·470	+ 2·995			104. 6.					

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			h m s			s	s			° ′ ″	″			″	″
381	σ Leonis	2	11. 14. 47·630	2	0·25	47·630	+ 3·094	2		83. 17. 47·73		2	0·25	47·73	+ 19·69
382	71 Leonis		11. 16. (2.)					1	1	71. 53. 21·49	18·94	2	0·31	20·22	19·68
383	81 Leonis		11. 19. (11.)					2	2	72. 52. 4·03	3·60	4	0·34	3·82	19·74
384	τ Leonis	4	11. 21. 36·693	4	0·21	36·693	3·085	7		86. 27. 59·53		7	0·21	59·53	19·79
385	Piazzi XI. 74		11. 22. (2.)					1	1	27. 33. 9·66	9·75	2	0·34	9·71	19·65
386	Groombridge 1782	2	11. 23. 5·225	2	0·23	5·225	4·561	2		8. 11. 45·44		2	0·23	45·44	19·80
387	88 Leonis	1	11. 25. 23·840	1	0·35	23·840	3·105	1		74. 57. 0·58		1	0·35	0·58	20·01
388	2 Draconis		11. 28. (49.)					1	1	19. 59. 34·44	34·33	2	0·35	34·39	19·97
389	Piazzi XI. 111		11. 29. (49.)					1	1	61. 32. 20·55	20·75	2	0·30	20·65	19·93
390	υ Leonis	2	11. 30. 39·025	2	0·16	39·025	3·069	8		90. 8. 40·95		8	0·33	40·95	19·86
391	92 Leonis	1	11. 34. 23·230	1	0·22	23·230	3·130			67. 57.					
392	Piazzi XI. 146		11. 37. (6.)					1	1	47. 35. 41·69	42·07	2	0·30	41·88	19·95
393	Groombridge 1826		11. 40. (28.)					1	1	27. 54. 48·82	49·41	2	0·35	49·12	19·98
394	β Leonis	5	11. 42. 47·086	5	0·57	47·086	3·064	4		74. 44. 26·29		4	0·63	26·29	20·10
395	β Virginis	1	11. 44. 17·250	1	0·34	17·250	3·124	2		87. 32. 31·23		2	0·72	31·23	20·29
396	Groombridge 1830	4	11. 45. 53·055	4	0·28	53·055	3·484	6	2	51. 23. 56·33	56·56	8	0·25	56·39	25·80
397	γ Ursæ Majoris	4	11. 47. 21·260	4	0·45	21·260	3·186	4		35. 37. 16·29		4	0·45	16·29	20·02
398	Groombridge 1838		....					1	1	27. 45. 53·47	52·69	2	0·30	53·08	20·04
	Groomb. 1838 S.P.	1	11. 50. 27·200	1	0·68	27·200	3·178	1		27. 45. 53·76		1	0·68	53·76	
399	1 Comæ	1	11. 55. 26·270	1	0·22	26·270	3·079	1	1	67. 13. 14·37	14·04	2	0·28	14·21	20·07
400	Piazzi XI. 227	1	11. 58. 25·210	1	0·35	25·210	3·084	1		85. 44. 27·42		1	0·35	27·42	20·19
401	Groombridge 1850	2	11. 58. 32·205	2	0·26	32·205	3·203	2		3. 43. 52·32		2	0·26	52·32	20·05
402	o Virginis	1	11. 58. 56·630	1	0·16	56·630	3·061			80. 35.					
403	Groombridge 1853		....					3	3	26. 22. 47·28	47·52	6	0·28	47·40	20·05
	Groomb. 1853 S.P.	1	11. 59. 26·080	1	0·89	26·080	3·079	1		26. 22. 45·95		1	0·89	45·95	
404	ε Corvi	2	12. 3. 48·065	2	0·26	48·065	3·076			111. 56.					
405	4 Comæ		12. 5. (36.)					1	1	63. 26. 41·07	40·42	2	0·31	40·75	20·09
406	Groomb. 1863 S.P.	4	12. 9. 15·773	4	0·80	15·773	2·916	4		19. 6. 54·20		4	0·80	54·20	20·04
407	7 Comæ		12. 10. (7.)					1	1	65. 22. 15·19	14·11	2	0·34	14·65	20·04
408	η Virginis	2	12. 13. 36·845	2	0·35	36·845	+ 3·065	1		89. 58. 58·13		1	0·41	58·13	20·05
409	Bradley 1672	1	12. 14. 19·220	1	0·25	19·220	− 0·034	1		1. 37. 5·20		1	0·25	5·20	19·95
410	11 Comæ		12. 14. (30.)					2	2	71. 31. 38·05	37·90	4	0·27	37·98	19·94
411	Groombridge 1888		12. 19. (21.)					2	2	25. 30. 55·96	55·45	4	0·31	55·71	19·99
412	γ Comæ	2	12. 20. 48·455	2	0·37	48·455	+ 2·997	4	3	61. 2. 50·97	50·90	7	0·34	50·94	20·07
413	Piazzi XII. 91	2	12. 21. 32·890	2	0·09	32·890	3·065	2		93. 56. 3·86		2	0·09	3·86	20·00
414	δ^2 Corvi	1	12. 23. 30·040	1	0·36	30·040	3·105	1		105. 49. 50·18		1	0·95	50·18	20·10
415	Piazzi XII. 111	1	12. 25. 19·220	1	0·01	19·220	3·071	1		94. 22. 26·49		1	0·01	26·49	19·92
416	β Canum Venaticûm		12. 27. (53.)					1	1	47. 58. 26·24	26·20	2	0·26	26·22	19·61
417	β Corvi		12. 27. (55.)					2		112. 42. 57·98		2	0·32	57·98	19·98
418	κ Draconis		12. 28. (13.)					2	2	19. 32. 1·28	1·27	4	0·35	1·28	19·94
419	Groombridge 1909	1	12. 30. 22·500	1	0·16	22·500	1·966	1		9. 4. 16·84		1	0·16	16·84	19·88
420	f Virginis	3	12. 30. 27·243	3	0·26	27·243	3·084	3		95. 9. 12·75		3	0·26	12·75	19·91
421	χ Virginis	4	12. 32. 53·960	4	0·63	53·960	3·091	4		97. 19. 5·76		4	0·63	5·76	19·89
422	26 Comæ		12. 33. (0.)					1	1	68. 15. 38·75	39·51	2	0·34	39·13	19·84
423	γ^1 Virginis	2	12. 35. 25·560	2	0·35	25·560	3·038	1		90. 46. 23·88		1	0·42	23·88	19·87
424	γ^2 Virginis	1	12. 35. 25·650	1	0·42	25·650	3·038	1		90. 46. 29·24		1	0·42	29·24	19·87
425	ρ Virginis		12. 35. (39.)					1		79. 5. 10·51		1	0·38	10·51	19·92
426	76 Ursæ Majoris		12. 36. (11.)					1	1	26. 36. 40·27	41·79	2	0·36	41·03	19·85
427	35 Virginis	2	12. 41. 35·575	2	0·31	35·575	3·053			85. 45.					
428	Groombridge 1926	3	12. 42. 3·310	3	0·27	3·310	+ 2·584	3		26. 32. 49·96		3	0·27	49·96	+ 19·72

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			h m s			s	s			° ′ ″	″			″	″
429	7 Draconis		12. 42. (32.)					2	2	22. 32. 17·00	16·22	4	0·31	16·61	+ 19·70
430	Groombridge 1930	1	12. 43. 17·830	1	0·26	17·830	+ 2·619	1		29. 0. 32·86		1	0·26	32·86	19·70
431	Groombridge 1931	2	12. 44. 19·845	2	0·21	19·845	2·870	2		51. 48. 47·49		2	0·21	47·49	19·68
432	31 Comæ	2	12. 45. 42·265	2	0·28	42·265	2·934	1		61. 47. 22·23		1	0·28	22·23	19·66
433	ψ Virginis	5	12. 47. 57·424	5	0·46	57·424	3·113	5		98. 52. 13·48		5	0·46	13·48	19·65
434	ϵ Ursæ Majoris	1	12. 48. 36·750	1	0·52	36·750	2·658	1		33. 22. 20·29		1	0·52	20·29	19·66
435	δ Virginis	3	12. 49. 24·387	3	0·28	24·387	3·022	2		85. 56. 0·40		2	0·56	0·40	19·68
436	Bradley 1724	1	12. 50. 14·980	1	0·30	14·980	2·816			51. 1.					
437	α Canum Venaticûm	6	12. 50. 16·325	6	0·59	16·325	2·814	8	2	51. 1. 1·41	1·68	10	0·50	1·46	19·51
438	8 Draconis	2	12. 50. 34·320	2	0·30	34·320	2·425	2	2	23. 53. 38·45	38·67	4	0·30	38·56	19·63
439	9 Draconis		12. 55. (16.)					1	1	22. 44. 20·94	19·70	2	0·32	20·32	19·50
440	ϵ Virginis	5	12. 56. 3·234	5	0·43	3·234	2·988	3		78. 22. 45·24		3	0·46	45·24	19·42
441	39 Comæ	3	13. 0. 21·497	3	0·21	21·497	2·928	2		68. 11. 10·43		2	0·24	10·43	19·42
442	B. F. 1805	1	13. 2. 7·720	1	0·41	7·720	3·124	1		98. 19. 30·85		1	0·41	30·85	19·32
443	θ Virginis	3	13. 3. 34·913	3	0·53	34·913	3·100			94. 52.					
444	58 Virginis	1	13. 11. 0·490	1	0·32	0·490	3·137	1		99. 53. 50·64		1	0·32	50·64	19·09
445	Spica	20	13. 18. 42·843	20	0·64	42·843	3·151	14		100. 31. 7·23		14	0·53	7·23	18·92
446	*i* Virginis	1	13. 20. 13·380	1	0·34	13·380	3·161	2		102. 4. 0·67		2	0·32	0·67	18·88
447	Piazzi XIII. 109	1	13. 22. 59·700	1	0·01	59·700	1·524			16. 58.					
448	Piazzi XIII. 110 S.P.	1	13. 23. 55·850	1	0·86	55·850	2·224	1		29. 25. 7·36		1	0·86	7·36	18·74
449	B. F. 1857	1	13. 25. 2·280	1	0·43	2·280	2·848			65. 7.					
450	Piazzi XIII. 133		13. 25. (55.)					1	1	10. 43. 13·03	14·20	2	0·32	13·62	18·64
451	Piazzi XIII. 126	1	13. 28. 8·240	1	0·09	8·240	3·187	2		102. 34. 58·57		2	0·09	58·57	18·65
452	ζ Virginis	7	13. 28. 25·546	7	0·67	25·546	3·053	2		89. 57. 58·88		2	0·50	58·88	18·52
453	Oeltz. Arg. (N.) 13800	1	13. 30. 51·580	1	0·31	51·580	2·378	1		36. 38. 16·76		1	0·31	16·76	18·50
454	Bradley 1794	2	13. 31. 42·710	2	0·32	42·710	2·373	2		36. 41. 1·02		2	0·32	1·02	18·48
455	1 Boötis	1	13. 34. 48·030	1	0·37	48·030	2·866	1	1	69. 25. 17·05	17·73	2	0·37	17·39	18·34
456	*m* Virginis	3	13. 35. 9·383	3	0·61	9·383	3·139			98. 4.					
457	Piazzi XIII. 184		13. 37. (40.)					1	1	24. 33. 22·84	22·07	2	0·41	22·46	18·53
458	85 Virginis	2	13. 38. 57·760	2	0·61	57·760	3·220	2		105. 8. 55·30		2	0·61	55·30	18·25
459	τ Boötis	5	13. 41. 25·000	5	0·51	25·000	2·852	1		71. 55. 48·16		1	0·09	48·16	18·07
460	η Ursæ Majoris	6	13. 42. 41·518	9	0·62	41·526	2·372	5		40. 4. 19·97		5	0·52	19·97	18·10
	η Ursæ Majoris S.P.	3	13. 42. 41·543					4		40. 4. 20·85		4	0·84	20·85	
461	υ Boötis	1	13. 43. 32·660	1	0·37	32·660	2·893	1		73. 35. 28·66		1	0·37	28·66	18·00
462	h^1 Centauri	1	13. 44. 43·930	1	0·98	43·930	+ 3·444	1		122. 23. 0·08		1	0·98	0·08	18·10
463	Piazzi XIII. 263 S.P.	1	13. 45. 55·380	1	0·87	55·380	− 2·079			6. 37.					
464	*i* Draconis		13. 47. (50.)					2	2	24. 40. 7·50	8·28	4	0·33	7·89	17·91
465	η Boötis	8	13. 48. 49·645	8	0·56	49·645	+ 2·858	4	1	70. 59. 6·08	7·17	5	0·62	6·30	18·19
466	10 Boötis	2	13. 52. 53·135	2	0·65	53·135	2·816	3	1	67. 42. 11·08	10·12	4	0·53	10·84	17·69
467	11 Boötis	1	13. 55. 35·770	1	0·31	35·770	2·724			62. 1.					
468	Piazzi XIII. 286	1	13. 57. 47·530	1	0·31	47·530	3·244	1		104. 22. 46·04		1	0·31	46·04	17·50
469	Piazzi XIII. 306	2	13. 59. 8·120	3	0·52	8·013	1·337	2	2	20. 43. 44·07	44·17	4	0·35	44·12	17·44
	Piazzi XIII. 306 S.P.	1	13. 59. 7·800					2		20. 43. 43·17		2	0·79	43·17	
470	94 Virginis	1	13. 59. 47·070	1	0·34	47·070	3·168			98. 18.					
471	α Draconis		14. 1. (3.)					2	2	25. 2. 8·39	9·83	4	0·41	9·11	17·32
472	96 Virginis	1	14. 2. 27·460	1	0·34	27·460	3·193	2		99. 45. 2·58		2	0·34	2·58	17·26
473	13 Boötis	1	14. 3. 41·600	1	0·36	41·600	2·244			39. 57.					
474	Piazzi XIII. 317	2	14. 4. 7·525	2	0·39	7·525	3·262	2		105. 43. 11·32		2	0·39	11·32	17·25
475	3 Ursæ Minoris							1	1	14. 49. 24·66	23·41	2	0·37	24·04	+ 17·03
	3 Ursæ Minoris S.P.	3	14. 5. 59·277	3	0·81	59·277	+ 0·433	3		14. 49. 23·84		3	0·81	23·84	

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			h m s			s	s			° ′ ″	″			″	″
476	Piazzi XIV. 22	2	14. 8. 37·630	2	0·28	37·630	+ 3·307	2		107. 37. 32·83		2	0·28	32·83	+ 16·99
477	4 Ursæ Minoris....	1	14. 9. 21·380	1	0·34	21·380	— 0·344	1	1	11. 52. 28·76	28·78	2	0·26	28·77	16·91
478	Arcturus	14	14. 10. 3·089	14	0·79	3·089	+ 2·734	17	3	70. 10. 35·24	34·89	20	0·70	35·19	18·84
479	Lalande 26150	1	14. 11. 50·380	1	0·34	50·380	3·311	1		108. 8. 43·38		1	0·34	43·38	16·83
480	A Boötis		14. 12. (47.)					1	1	53. 55. 20·26	19·40	2	0·41	19·83	16·78
481	*f* Boötis	2	14. 20. 44·050	2	0·37	44·050	2·796			70. 13.					
482	ρ Boötis	1	14. 26. 31·590	1	0·41	31·590	2·587	1	1	59. 5. 16·64	16·68	2	0·48	16·66	15·95
483	Groomb. 2123 S.P..	1	14. 27. 50·900	1	0·95	50·900	1·444	1		26. 16. 12·83		1	0·95	12·83	16·02
484	c^1 Centauri	1	14. 36. 8·260	1	0·41	8·260	3·647			124. 38.					
485	ϵ^2 Boötis.....	7	14. 39. 36·880	7	0·72	36·880	2·619	7	1	62. 24. 22·33	22·51	8	0·73	22·35	15·37
486	8 Libræ	2	14. 43. 53·220	2	0·37	53·220	3·308	2		105. 29. 3·81		2	0·37	3·81	15·21
487	α Libræ	3	14. 44. 4·487	3	0·48	4·487	3·309	3		105. 31. 45·04		3	0·55	45·04	15·19
488	ξ^2 Libræ.....	1	14. 50. 5·710	1	0·40	5·710	3·246			100. 54.					
489	Piazzi XIV. 212 ...	2	14. 50. 17·245	2	0·29	17·245	+ 3·486	2		110. 51. 32·26		2	0·29	32·26	16·54
490	β Ursæ Minoris....	8	14. 51. 4·864	9	0·77	4·872	— 0·241	9	2	15. 20. 30·77	31·13	11	0·67	30·84	14·75
	β Ursæ Minoris S.P.	1	14. 51. 4·940					1		15. 20. 30·38		1	0·99	30·38	
491	β Boötis	1	14. 57. 18·740	1	0·93	18·740	+ 2·261	1		49. 7. 23·86		1	0·93	23·86	14·41
492	ψ Boötis.....	1	14. 59. 10·560	1	0·41	10·560	2·570	1		62. 34. 18·72		1	0·50	18·72	14·23
493	*b* Boötis		15. 3. (5.)					1	1	63. 13. 34·31	35·32	2	0·40	34·82	14·01
494	χ Boötis.....		15. 9. (20.)					1	1	60. 22. 42·01	40·48	2	0·37	41·25	13·56
495	β Libræ	1	15. 10. 23·270	1	0·51	23·270	3·219	1		98. 55. 39·72		1	0·64	39·72	13·53
496	7 Serpentis		15. 16. (33.)					1	1	76. 59. 28·09	27·57	2	0·40	27·83	13·13
497	μ Boötis		15. 19. (50.)					2	2	52. 11. 26·55	26·44	4	0·39	26·50	12·81
498	Groomb. 2241 S.P..	1	15. 25. 25·160	1	0·01	25·160	1·181			28. 54.					
499	α Coronæ	6	15. 29. 28·792	6	0·78	28·792	2·539	7	1	62. 52. 13·25	14·65	8	0·71	13·43	12·31
500	42 Libræ	1	15. 33. 0·860	1	0·40	0·860	+ 3·533	1		113. 25. 0·05		1	0·40	0·05	12·02
501	Groombridge 2275 .	1	15. 36. 23·390	10	0·85	24·088	— 3·722			....					
	Groomb. 2275 S.P..	9	15. 36. 24·166					9		9. 8. 40·94		9	0·91	40·94	11·63
502	Groombridge 2276 .	1	15. 36. 36·250	10	0·85	36·785	— 3·717			....					
	Groomb. 2276 S.P..	9	15. 36. 36·844					8		9. 8. 36·21		8	0·90	36·21	11·57
503	α Serpentis.....	2	15. 38. 12·570	2	0·80	12·570	+ 2·951	3		83. 11. 10·12		3	0·71	10·12	11·58
504	β Serpentis.....		15. 40. (30.)					2	2	74. 11. 31·53	31·69	4	0·47	31·61	11·47
505	*b* Scorpii	2	15. 43. 35·045	2	0·38	35·045	3·592	2		115. 22. 31·88		2	0·38	31·88	11·27
506	ε Serpentis.....	1	15. 44. 41·070	1	0·66	41·070	+ 2·988			85. 9.					
507	ζ Ursæ Minoris	1	15. 48. 28·710	1	0·95	28·710	— 2·259	1		11. 49. 40·48		1	0·95	40·48	10·97
508	γ Serpentis.....	3	15. 50. 46·327	3	0·49	46·327	+ 2·769			73. 56.					
509	λ Coronæ	1	15. 51. 19·230	1	0·40	19·230	2·182	1		51. 41. 48·55		1	0·40	48·55	10·59
510	δ Scorpii.....	1	15. 53. 3·840	1	0·42	3·840	+ 3·537	1		112. 16. 12·98		1	0·42	12·98	10·56
511	π Serpentis.....		15. 57. (0.)					1		66. 51. 10·93		1	0·46	10·93	10·21
512	17 Ursæ Minoris S.P.	1	15. 57. 57·760	1	0·01	57·760	— 1·503	1		14. 4. 25·47		1	0·01	25·47	10·20
513	β^1 Scorpii.....	1	15. 58. 17·180	1	0·36	17·180	+ 3·478			109. 28.					
514	Piazzi XV. 266....		15. 58. (48.)					1	1	53. 1. 39·41	39·57	2	0·45	39·49	10·15
515	Groombridge 2320 .		16. 5. (59.)					1	1	21. 51. 56·62	57·34	2	0·42	56·98	9·50
516	δ Ophiuchi	1	16. 7. 53·980	1	0·43	53·980	3·136	1		93. 22. 33·09		1	0·52	33·09	9·55
517	σ Coronæ (2nd Star)	1	16. 10. 4·260	1	0·17	4·260	2·239	1		55. 49. 42·24		1	0·17	42·24	9·30
518	υ Coronæ		16. 11. (49.)					1	1	60. 32. 38·96	38·98	2	0·46	38·97	9·16
519	σ Scorpii	2	16. 13. 42·875	2	0·44	42·875	3·635	2		115. 17. 44·19		2	0·44	44·19	8·97
520	γ Herculis	3	16. 16. 29·617	3	0·47	29·617	2·644	1		70. 33. 22·76		1	0·60	22·76	8·69
521	ξ Coronæ	1	16. 17. 18·230	1	0·45	18·230	2·342	1		58. 49. 17·26		1	0·45	17·26	8·56
522	Lalande (F.) 2763 .	1	16. 18. 18·730	1	0·36	18·730	+ 0·975	1		29. 56. 14·13		1	0·36	14·13	+ 8·61

No.	Star's Name.	Number of Obs. of R.A.	Mean R.A. 1877, Jan. 1.	Whole Number of Obs. of R.A.	Fraction of Year for Mean of Obs.	Concluded Seconds of R.A.	Annual Variation in R.A.	Number of Obs. of N.P.D. D.	R.	Mean N.P.D. 1877, Jan. 1. D.	R.	Whole Number of Obs. of N.P.D.	Fraction of Year for Mean of Obs.	Concluded Seconds of N.P.D.	Annual Variation in N.P.D.
			h m s			s	s			° ′ ″	″			″	″
523	ω Herculis		16. 19. (44.)					1	1	75. 40. 56·41	56·64	2	0·47	56·53	+ 8·52
524	η Ursæ Minoris	1	16. 21. 7·170	1	0·40	7·170	− 1·807			13. 57.					
525	Antares	2	16. 21. 52·030	2	0·50	52·030	+ 3·669	3		116. 9. 24·72		3	0·61	24·72	8·35
526	η Draconis	4	16. 22. 19·635	4	0·83	19·635	0·808	5	2	28. 12. 25·16	25·75	7	0·66	25·33	8·28
527	β Herculis		16. 24. (56.)						1	68. 14.	27·65	1	0·52	27·65	8·08
528	B. F. 2270	2	16. 26. 0·245	2	0·43	0·245	2·818	2		78. 18. 34·06		2	0·43	34·06	8·00
529	34 Herculis	1	16. 26. 43·400	1	0·43	43·400	1·645	1		40. 46. 14·65		1	0·43	14·65	8·01
530	τ Scorpii	1	16. 28. 13·620	1	0·40	13·620	3·725	1		117. 57. 29·09		1	0·40	29·09	7·83
531	32 Herculis		16. 28. (41.)					1	1	59. 14. 31·08	28·38	2	0·45	29·73	7·83
532	σ Herculis		16. 30. (8.)					1	1	47. 18. 29·79	30·39	2	0·42	30·09	7·62
533	ζ Ophiuchi	4	16. 30. 23·168	4	0·54	23·168	3·298	2		100. 18. 59·08		2	0·62	59·08	7·62
534	Piazzi XVI. 140 ...	1	16. 30. 41·360	1	0·42	41·360	0·853	1		28. 55. 7·07		1	0·42	7·07	7·57
535	Groombridge 2370 .		16. 35. (40.)					1	1	26. 40. 45·98	46·50	2	0·47	46·24	7·22
536	ζ Herculis	9	16. 36. 38·966	9	0·61	38·966	2·263	6	1	58. 10. 24·09	23·32	7	0·69	23·98	6·68
537	Piazzi XVI. 159 ...	2	16. 37. 18·750	2	0·43	18·750	3·740	2		118. 16. 42·00		2	0·43	42·00	7·08
538	g Draconis		16. 40. (4.)					1	1	25. 10. 39·86	40·61	2	0·45	40·24	6·87
539	ε Scorpii	3	16. 42. 11·963	3	0·44	11·963	3·874	3		124. 4. 4·36		3	0·44	4·36	7·01
540	Lalande 30599	1	16. 43. 51·340	1	0·49	51·340	3·652	1		114. 37. 16·69		1	0·49	16·69	6·54
541	50 Herculis		16. 45. (50.)					3	3	59. 58. 56·93	58·04	6	0·44	57·49	6·35
542	Groombridge 2391 .		16. 48. (35.)					2	2	12. 16. 31·12	31·47	4	0·49	31·30	6·15
543	24 Ophiuchi	2	16. 49. 23·055	2	0·44	23·055	3·615	2		112. 57. 10·44		2	0·44	10·44	6·15
544	κ Ophiuchi	5	16. 51. 50·828	5	0·63	50·828	2·834	3		80. 25. 57·13		3	0·73	57·13	5·85
545	Groombridge 2390 .	1	16. 52. 21·670	1	0·36	21·670	0·806	1		29. 26. 25·36		1	0·36	25·36	5·83
546	57 Herculis	1	16. 52. 27·970	1	0·45	27·970	2·465	1	1	64. 27. 22·73	22·51	2	0·46	22·62	5·81
547	26 Ophiuchi	1	16. 52. 37·480	1	0·49	37·480	3·665	1		114. 47. 57·70		1	0·49	57·70	5·95
548	Groombridge 2393 .	1	16. 53. 32·610	1	0·48	32·610	0·632	1		27. 42. 15·31		1	0·48	15·31	5·73
549	h^1 Draconis		16. 55. (21.)					1	1	24. 40. 38·69	38·38	2	0·42	38·54	5·53
550	ϵ Herculis	2	16. 55. 35·015	2	0·75	35·015	2·292	3	1	58. 53. 29·05	29·11	4	0·55	29·07	5·52
551	k Scorpii	1	16. 56. 43·960	1	0·41	43·960	+ 3·932	1		123. 56. 50·38		1	0·41	50·38	5·51
552	ϵ Ursæ Minoris	1	16. 58. 37·590	1	0·48	37·590	− 6·374	1		7. 45. 49·22		1	0·48	49·22	5·30
553	c Herculis	1	16. 59. 5·250	1	0·43	5·250	+ 2·164	1		54. 24. 39·65		1	0·43	39·65	5·31
554	η Ophiuchi		17. 3. (19.)					2		105. 34. 14·46		2	0·52	14·46	4·79
555	Bradley 2174	4	17. 6. 34·760	4	0·45	34·760	3·724	4		116. 50. 6·13		4	0·45	6·13	4·63
556	A^1 Ophiuchi	2	17. 7. 47·020	2	0·48	47·020	3·682	2		116. 25. 11·45		2	0·48	11·45	5·65
557	A^2 Ophiuchi	2	17. 7. 47·270	2	0·48	47·270	3·682	2		116. 25. 7·23		2	0·48	7·23	5·64
558	ζ Draconis		17. 8. (26.)					1	1	24. 8. 2·57	1·99	2	0·52	2·28	4·41
559	α^1 Herculis	2	17. 9. 2·375	2	0·44	2·375	2·731	3	2	75. 28. 5·10	5·34	5	0·50	5·20	4·38
560	α^2 Herculis		17. 9. (2.)					1		75. 28. 7·52		1	0·64	7·52	4·42
561	θ Ophiuchi	1	17. 14. 27·330	1	0·62	27·330	3·677			114. 52.					
562	Groombridge 2432 .	1	17. 14. 34·940	1	0·47	34·940	0·723	2	1	29. 9. 17·36	15·00	3	0·48	16·57	3·94
563	Groombridge 2433 .	1	17. 14. 59·780	1	0·47	59·780	0·726	1		29. 11. 55·09		1	0·47	55·09	3·91
564	43 Ophiuchi	2	17. 15. 37·280	2	0·44	37·280	3·770	2		118. 1. 16·57		2	0·44	16·57	3·89
565	70 Herculis		....					3	3	65. 22. 36·05	35·52	6	0·52	35·79	3·84
566	ρ^1 Herculis	1	17. 19. 26·150	1	0·66	26·150	2·069	1		52. 44. 21·47		1	0·66	21·47	3·52
567	ρ^2 Herculis	1	17. 19. 26·330	1	0·66	26·330	2·069	3	2	52. 44. 23·29	23·11	5	0·51	23·22	3·52
568	d Ophiuchi	1	17. 19. 30·090	1	0·63	30·090	3·822	1		119. 45. 13·29		1	0·63	13·29	3·71
569	σ Ophiuchi	2	17. 20. 24·690	2	0·49	24·690	2·975	1		85. 45. 4·33		1	0·64	4·33	3·43
570	Piazzi XVII. 109 ..	1	17. 21. 30·630	1	0·47	30·630	+ 2·595	1		69. 48. 46·90		1	0·47	46·90	+ 3·48

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			h m s			s	s			o ′ ″	″			″	″
571	Radcliffe 3714.....	1	17. 24. 6·140	1	0·50	6·140	+ 0·771	5	5	29. 50. 52·47	53·14	10	0·46	52·81	+ 3·12
572	λ Herculis	1	17. 25. 46·220	1	0·62	46·220	2·421	2	2	63. 47. 44·24	44·30	4	0·60	44·22	2·95
573	78 Herculis	1	17. 26. 59·730	1	0·50	59·730	2·357	1		61. 30. 8·41		1	0·50	8·41	2·82
574	β Draconis.....	3	17. 27. 39·237	3	0·62	39·237	1·351	3		37. 36. 24·66	.	3	0·62	24·66	2·82
575	α Ophiuchi	2	17. 29. 13·535	2	0·43	13·535	+ 2·779	3	2	77. 20. 57·35	55·97	5	0·59	56·80	2·88
576	Piazzi XVII. 176..		17. 31. (55.)					1	1	59. 8. 17·15	16·69	2	0·40	16·92	2·44
577	*f* Draconis.....	1	17. 32. 27·430	1	0·53	27·430	− 0·255	3	3	21. 47. 12·23	12·55	6	0·48	12·39	2·29
578	Piazzi XVII. 237..	1	17. 37. 7·670	1	0·41	7·670	0·315	1		21. 26. 28·89		1	0·41	28·89	2·00
579	Oeltz.Arg.(N.)17419	1	17. 37. 17·280	1	0·51	17·280	− 0·296	1		21. 33. 8·74		1	0·51	8·74	1·98
580	β Ophiuchi	2	17. 37. 23·780	2	0·55	23·780	+ 2·960			85. 22.					
581	ω Draconis.....	1	17. 37. 40·370	1	0·46	40·370	− 0·357	1	1	21. 11. 8·60	7·48	2	0·46	8·04	1·64
582	84 Herculis	2	17. 38. 18·710	2	0·44	18·710	+ 2·463	1		65. 37. 2·53		1	0·40	2·53	1·78
583	3 Sagittarii	1	17. 39. 49·160	1	0·40	49·160	3·764	1		117. 46. 54·69		1	0·40	54·69	1·78
584	μ Herculis	5	17. 41. 38·664	5	0·49	38·664	+ 2·344			62. 12.					
585	87 Herculis		17. 43. (50.)					1	1	64. 20. 5·89	5·50	2	0·62	5·70	1·45
586	ψ¹ Draconis (1st Star)..		....					2	2	17. 47. 29·45	29·53	4	0·43	29·49	1·65
	ψ¹ Draconis(1stStar)S.P.	3	17. 44. 7·530	3	0·39	7·530	− 1·086	3		17. 47. 30·02		3	0·39	30·02	
587	ψ¹ Draconis (2nd Star).		....					1		17. 46. 59·45		1	0·40	59·45	1·67
	ψ¹Draconis(2ndStar)S.P.	3	17. 44. 9·253	3	0·39	9·253	− 1·085	3		17. 46. 59·00		3	0·39	59·00	
588	Lalande 32727.....	1	17. 48. 55·880	1	0·64	55·880	+ 3·784	1		118. 2. 35·97		1	0·64	35·97	0·97
589	89 Herculis	2	17. 50. 27·510	2	0·61	27·510	2·420	1		63. 55. 45·26		1	0·66	45·26	0·81
590	γ Draconis.....	4	17. 53. 45·010	6	0·74	45·033	1·392	4		38. 29. 45·70		4	0·83	45·70	0·59
	γ Draconis S.P.....	2	17. 53. 45·080					2		38. 29. 46·33		2	0·57	46·33	
591	35 Draconis.....		17. 54. (57.)					1	1	13. 1. 20·32	20·59	2	0·43	20·46	0·20
592	9 Sagittarii	1	17. 56. 19·950	1	0·55	19·950	3·671	1		114. 21. 38·42		1	0·55	38·42	0·34
593	γ¹ Sagittarii.....	2	17. 57. 9·880	2	0·48	9·880	3·842	2		119. 34. 57·70		2	0·48	57·70	0·33
594	96 Herculis	1	17. 57. 7·570	1	0·74	7·570	2·562	1		69. 9. 56·21		1	0·74	56·21	0·24
595	Piazzi XVII. 359..	1	18. 0. 17·670	1	0·62	17·670	3·796	1		118. 28. 7·64		1	0·62	7·64	+ 0·08
596	72 Ophiuchi.....	7	18. 1. 31·126	7	0·67	31·126	2·842	2		80. 27. 8·20		2	0·85	8·20	− 0·19
597	ο Herculis.....	2	18. 2. 44·645	2	0·51	44·645	2·338	1		61. 15. 11·83		1	0·57	11·83	0·25
598	101 Herculis.....	1	18. 3. 34·650	1	0·53	34·650	2·584	2	2	69. 58. 22·04	21·33	4	0·54	21·69	0·28
599	Piazzi XVIII. 23..		18. 5. (18.)					1	1	23. 4. 14·29	15·10	2	0·49	14·70	0·47
600	μ Sagittarii	2	18. 6. 24·420	2	0·46	24·420	3·584	1		111. 5. 19·60		1	0·18	19·60	0·55
601	A Herculis		18. 7. (16.)					1	1	58. 37. 27·89	26·49	2	0·43	27·19	0·73
602	Piazzi XVIII. 24..	1	18. 10. 21·290	1	0·48	21·290	+ 3·760	1		117. 5. 6·23		1	0·48	6·23	0·85
603	δ Ursæ Minoris....	12	18. 11. 60·363	19	0·66	60·153	− 19·407	38	11	3. 23. 30·33	30·35	49	0·58	30·33	1·07
	δ Ursæ Minoris S.P.	7	18. 11. 59·791					20		3. 23. 30·27		20	0·36	30·27	
604	Lalande 33738.....	1	18. 14. 13·260	1	0·45	13·260	+ 3·796	1		118. 29. 0·65		1	0·45	0·65	1·24
605	η Serpentis.....	1	18. 14. 56·680	1	0·68	56·680	3·102			92. 55.					
606	Bradley 2302.....	1	18. 15. 7·140	1	0·48	7·140	2·323	1		60. 23. 9·63		1	0·48	9·63	1·29
607	κ Lyræ	1	18. 15. 33·090	1	0·74	33·090	+ 2·101	1		53. 59. 23·00		1	0·74	23·00	1·39
608	24 Ursæ Minoris S.P.	1	18. 16. 19·610	1	0·09	19·610	− 22·183	1		3. 0. 45·01		1	0·09	45·01	1·44
609	μ Lyræ.....	1	18. 20. 10·500	1	0·58	10·500	+ 1·974	1	1	50. 33. 31·73	34·64	2	0·64	33·19	1·76
610	λ Sagittarii.....	1	18. 20. 22·730	1	0·55	22·730	+ 3·702	2		115. 29. 15·10		2	0·45	15·10	1·54
611	φ Draconis.....	1	18. 22. 30·870	1	0·66	30·870	− 0·851	1	2	18. 43. 43·23	42·01	3	0·65	42·42	1·99
612	Piazzi XVIII. 100.		18. 24. (29.)					1	1	66. 12. 52·53	51·31	2	0·56	51·92	2·14
613	Piazzi XVIII. 116.	2	18. 27. 39·090	2	0·45	39·090	+ 2·499	3	1	66. 28. 25·04	25·35	4	0·47	25·12	2·42
614	Piazzi XVIII. 132.	3	18. 30. 23·280	3	0·47	23·280	2·505	3		66. 29. 34·22		3	0·47	34·22	2·60
615	α Lyræ.....	15	18. 32. 46·432	15	0·63	46·432	+ 2·030	23	9	51. 19. 47·46	47·47	32	0·59	47·46	− 3·14

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			h m s			s	s			° ′ ″	″			″	″
616	2 Aquilæ	5	18. 35. 32·298	5	0·45	32·298	+ 3·285	1		99. 10. 5·90		1	0·43	5·90	— 3·08
617	Groomb. 2655 S.P..	3	18. 35. 40·917	3	0·09	40·917	— 2·861	2		12. 33. 0·30		2	0·14	0·30	3·11
618	Piazzi XVIII. 170 .	2	18. 37. 3·205	2	0·49	3·205	+ 1·394	2		37. 55. 9·80		2	0·49	9·80	3·26
619	ϕ Sagittarii	3	18. 37. 58·317	3	0·38	58·317	3·752	3		117. 6. 53·59		3	0·38	53·59	3·32
620	Groombridge 2644 .	2	18. 39. 10·660	2	0·54	10·660	1·999	2		50. 49. 20·92		2	0·54	20·92	3·41
621	Bradley 2347	1	18. 40. 34·500	1	0·49	34·500	3·569	1		110. 24. 25·04		1	0·49	25·04	3·39
622	111 Herculis	1	18. 41. 35·270	1	0·18	35·270	2·654			71. 57.					
623	29 Sagittarii	1	18. 42. 22·080	1	0·43	22·080	3·561	1		110. 27. 44·74		1	0·43	44·74	3·72
624	β^1 Lyræ	2	18. 45. 32·325	2	0·93	32·325	2·212	4		56. 46. 44·65		4	0·77	44·65	3·93
625	β^2 Lyræ	1	18. 45. 34·130	1	0·43	34·130	2·214	1		56. 47. 24·77		1	0·43	24·77	3·97
626	σ Sagittarii	3	18. 47. 38·233	3	0·43	38·233	3·723	3		116. 26. 49·53		3	0·43	49·53	4·06
627	50 Draconis		18. 50. (19.)					2	2	14. 42. 43·15	44·78	4	0·60	43·97	4·44
628	13 Lyræ	3	18. 51. 35·473	3	0·61	35·473	1·822	3		46. 12. 53·88		3	0·61	53·88	4·47
629	Piazzi XVIII. 259 .	2	18. 53. 37·030	2	0·66	37·030	2·725			75. 2.					
630	ϵ Aquilæ.....	5	18. 54. 2·404	5	0·61	2·404	2·718	4	3	75. 5. 50·36	49·43	7	0·60	49·96	4·59
631	γ Lyræ		18. 54. (20.)					2	2	57. 28. 40·85	42·68	4	0·56	41·77	4·71
632	Groombridge 2742 .		18. 56. (3.)					1	2	27. 46. 8·66	10·08	3	0·66	9·61	4·85
633	τ Sagittarii	1	18. 59. 15·650	1	0·33	15·650	3·748	1		117. 50. 51·34		1	0·33	51·34	4·87
634	ζ Aquilæ	4	18. 59. 45·415	4	0·61	45·415	2·752	3	3	76. 19. 5·23	5·46	6	0·64	5·35	5·10
635	ι Lyræ	3	19. 2. 54·743	3	0·69	54·743	2·144	5	2	54. 5. 30·72	31·02	7	0·66	30·81	5·47
636	Bradley 2440.....		19. 3. (5.)					1	1	13. 7. 33·16	35·05	2	0·58	34·11	5·46
637	19 Lyræ.....		19. 7. (3.)					1	1	58. 55. 14·69	15·00	2	0·57	14·85	5·85
638	ψ Sagittarii	3	19. 7. 59·847	3	0·55	59·847	3·682	1		115. 28. 1·00		1	0·73	1·00	5·86
639	55 Draconis.....		19. 9. (18.)					2	2	24. 13. 38·18	38·23	4	0·65	38·21	5·96
640	1 Vulpeculæ		19. 10. (55.)					2	2	68. 49. 31·72	32·89	4	0·66	32·31	6·11
641	ω Aquilæ	3	19. 12. 2·483	3	0·57	2·483	2·814			78. 37.					
642	θ Lyræ		19. 12. (6.)					1	1	52. 5. 3·78	3·97	2	0·72	3·88	6·13
643	δ Draconis	1	19. 12. 31·160	1	0·66	31·160	0·033	4	4	22. 33. 17·15	17·62	8	0·66	17·39	6·31
644	3 Vulpeculæ		19. 17. (48.)					1	1	63. 58. 21·40	20·57	2	0·49	20·99	6·69
645	τ Draconis		19. 17. (54.)					1	1	16. 52. 25·09	23·93	2	0·74	24·51	6·78
646	b Aquilæ		19. 19. (6.)					1	1	78. 19. 3·61	3·21	2	0·58	3·41	6·79
647	δ Aquilæ	1	19. 19. 17·720	1	0·89	17·720	3·023	1		87. 7. 45·58		1	0·89	45·58	6·90
648	π Draconis		19. 20. (2.)					1	1	24. 31. 22·84	22·84	2	0·76	22·84	6·89
649	Bradley 2459.....		19. 20. (20.)					2	2	65. 18. 27·83	29·24	4	0·57	28·54	6·25
650	α Vulpeculæ	2	19. 23. 35·200	2	0·62	35·200	2·494	2		65. 34. 58·65		2	0·76	58·65	7·06
651	8 Vulpeculæ	4	19. 23. 49·068	4	0·69	49·068	+ 2·504	4		65. 29. 2·36		4	0·69	2·36	7·07
652	β Cygni		19. 25. (45.)					1	1	62. 17. 52·38	51·63	2	0·68	52·01	7·34
653	Lalande 37241 S.P..	1	19. 25. 54·250	1	0·18	54·250	— 2·037	1		13. 41. 6·53		1	0·18	6·53	7·35
654	μ Aquilæ	1	19. 28. 4·780	1	0·66	4·780	+ 2·931			82. 52.					
655	9 Vulpeculæ		19. 29. (10.)					2	2	70. 29. 39·51	38·90	4	0·74	39·21	7·64
656	h^2 Sagittarii.....		19. 29. (13.)					2		115. 9. 10·98		2	0·49	10·98	7·63
657	11 Cygni	1	19. 31. 23·080	1	0·52	23·080	2·158	2	1	53. 19. 39·37	39·50	3	0·66	39·41	7·82
658	ϵ Sagittæ	5	19. 31. 43·304	5	0·78	43·304	2·719	6		73. 48. 44·09		6	0·77	44·09	7·88
659	W. B. (2) XIX. 956	3	19. 31. 49·590	3	0·78	49·590	+ 2·715	4		73. 48. 30·26		4	0·77	30·26	7·82
660	σ Draconis	1	19. 32. 35·690	1	0·60	35·690	— 0·112	1	1	20. 32. 53·53	53·69	2	0·60	53·61	6·09
661	Groomb. 2899 S.P..	1	19. 33. 27·670	1	0·16	27·670	+ 0·647			26. 50.					
662	e^1 Sagittarii	1	19. 33. 40·440	1	0·66	40·440	3·439	2		106. 34. 24·20		2	0·58	24·20	7·95
663	Oeltz.Arg.(S.)19857	1	19. 33. 42·690	1	0·66	42·690	3·438	1		106. 33. 51·92		1	0·66	51·92	7·97
664	ϕ Cygni		19. 34. (31.)					1	1	60. 7. 42·53	43·36	2	0·49	42·95	8·10
665	γ Aquilæ	6	19. 40. 24·686	6	0·58	24·686	+ 2·853	3		79. 41. 7·31		3	0·39	7·31	— 8·51

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			h m s			s	s			° ′ ″	″			″	″
666	π Aquilæ		19. 42. (54.)					1	1	78. 29. 21·63	21·00	2	0·72	21·32	— 8·67
667	Groombridge 2952 .	1	19. 44. 28·490	1	0·53	28·490	— 0·061	2	1	20. 57. 49·60	48·80	3	0·59	49·33	8·83
668	α Aquilæ	11	19. 44. 46·877	11	0·63	46·877	+ 2·928	6		81. 27. 19·31		6	0·25	19·31	9·23
669	λ Ursæ Minoris	15	19. 47. 15·305	17	0·68	15·165	—61·391	29	6	1. 3. 50·37	50·09	35	0·63	50·32	9·03
	λ Ursæ Minoris S.P.	2	19. 47. 14·120					14	4	1. 3. 50·09	49·06	18	0·16	49·86	
670	13 Vulpeculæ	1	19. 48. 13·940	1	0·72	13·940	+ 2·549	1		66. 14. 25·26		1	0·72	25·26	9·17
671	β Aquilæ	2	19. 49. 16·195	2	0·86	16·195	2·947	2		83. 53. 57·24		2	0·86	57·24	8·74
672	14 Vulpeculæ		19. 53. (53.)					1	1	67. 13. 57·32	57·85	2	0·74	57·59	9·57
673	15 Vulpeculæ	1	19. 56. 2·070	1	0·72	2·070	2·468			62. 35.					
674	17 Vulpeculæ		20. 1. (36.)					2	2	66. 44. 21·11	20·73	4	0·73	20·92	10·15
675	ρ Draconis S.P.....	1	20. 2. 15·500	1	0·08	15·500	0·289	1		22. 28. 38·64		1	0·08	38·64	10·24
676	66 Draconis	2	20. 3. 35·280	2	0·85	35·280	0·960	3	2	28. 21. 40·81	41·04	5	0·72	40·90	10·35
677	b^2 Cygni.....		20. 4. (51.)					1	1	53. 31. 18·19	17·60	2	0·62	17·90	10·45
678	θ Aquilæ	9	20. 4. 57·436	9	0·78	57·436	3·097	2		91. 11. 4·88		2	0·83	4·88	10·40
679	Lacaille 8386	1	20. 8. 12·000	1	0·68	12·000	3·736	1		120. 22. 40·91		1	0·68	40·91	10·64
680	Oeltz.Arg.(S.) 20345	3	20. 8. 28·080	3	0·62	28·080	3·379	3		105. 9. 15·46		3	0·62	15·46	10·66
681	ρ Aquilæ		20. 8. (35.)					1	1	75. 10. 33·97	33·25	2	0·64	33·61	10·74
682	23 Vulpeculæ	1	20. 10. 40·270	1	0·89	40·270	2·484	3	2	62. 33. 43·43	44·15	5	0·82	43·74	10·84
683	4 Capricorni	1	20. 10. 47·530	1	0·49	47·530	3·533	1		112. 11. 15·61		1	0·49	15·61	10·77
684	a^1 Capricorni.....	2	20. 10. 49·720	2	0·75	49·720	3·328			102. 53.					
685	a^2 Capricorni.....	3	20. 11. 13·700	3	0·66	13·700	3·331			102. 55.					
686	Piazzi XX. 66.....	3	20. 12. 8·843	3	0·60	8·843	3·365	3		104. 40. 23·49		3	0·60	23·49	10·93
687	Oeltz.Arg.(S.) 20407	2	20. 12. 57·555	2	0·65	57·555	+ 3·380	2		105. 23. 59·83		2	0·65	59·83	10·99
688	κ^1 Cephei	2	20. 13. 0·050	2	0·73	0·050	— 1·902	3	3	12. 39. 35·72	36·73	6	0·69	36·23	11·00
689	Groombridge 3133 .	1	20. 14. 40·860	1	0·85	40·860	+ 2·174	1		51. 6. 42·76		1	0·85	42·76	11·12
690	Groombridge 3140 .	2	20. 15. 47·755	2	0·77	47·755	2·174	2		50. 59. 2·59		2	0·77	2·59	11·20
691	Piazzi XX. 102....	3	20. 16. 33·353	3	0·62	33·353	3·375	3		104. 38. 57·61		3	0·62	57·61	11·14
692	Lalande 39210.....	1	20. 18. 24·650	1	0·69	24·650	3·372	1		105. 13. 1·33		1	0·69	1·33	11·39
693	Lalande 39247.....	2	20. 19. 9·945	2	0·64	9·945	3·374	2		105. 22. 46·04		2	0·68	46·04	11·44
694	Bradley 2636.....		20. 19. (32.)					1	1	21. 30. 47·55	46·52	2	0·64	47·04	11·44
695	ρ Capricorni.....	3	20. 21. 50·573	3	0·76	50·573	3·425	1		108. 13. 8·01		1	0·74	8·01	11·63
696	Oeltz.Arg.(S.) 20541	3	20. 22. 8·447	3	0·66	8·447	3·373	3		105. 28. 0·18		3	0·66	0·18	11·65
697	Lacaille 8466.....	2	20. 23. 24·610	2	0·70	24·610	3·686	2		119. 31. 22·52		2	0·70	22·52	11·74
698	41 Cygni	3	20. 24. 22·220	3	0·85	22·220	2·450	3		60. 2. 27·47		3	0·85	27·47	11·81
699	W. B. XX. 588....	3	20. 25. 1·830	3	0·56	1·830	3·345	3		104. 11. 20·99		3	0·56	20·99	11·86
700	ε Delphini	3	20. 27. 20·113	3	0·73	20·113	2·866	1		79. 6.					
701	Piazzi XX. 187....	5	20. 27. 20·776	5	0·62	20·776	3·342	5		104. 8. 32·95		5	0·62	32·95	12·02
702	θ Cephei	1	20. 27. 30·990	1	0·79	30·990	1·015			27. 25.					
703	W. B. XX. 664....	1	20. 27. 53·310	1	0·69	53·310	3·356	1		104. 51. 43·25		1	0·69	43·25	12·06
704	η Delphini		20. 28. (8.)					1	1	77. 23. 36·13	35·50	2	0·74	35·82	12·16
705	47 Cygni	1	20. 29. 7·210	1	0·80	7·210	2·335	1		55. 10. 9·47		1	0·80	9·47	12·09
706	Lalande 39671 (1st Star)	2	20. 29. 24·375	2	0·55	24·375	3·372	2		105. 44. 0·19		2	0·56	0·19	12·17
707	Lalande 39671 (2d Star)	1	20. 29. 24·590	1	0·56	24·590	+ 3·372	1		105. 43. 57·40		1	0·56	57·40	12·17
708	73 Draconis		....					2	2	15. 28. 2·26	3·06	4	0·70	2·66	12·40
	73 Draconis S.P....	1	20. 33. 6·560	1	0·09	6·560	— 0·727	1		15. 28. 0·88		1	0·09	0·88	
709	Bradley 2667.....	7	20. 33. 22·583	7	0·72	22·583	+ 2·784	3		74. 35. 35·24		3	0·71	35·24	12·46
710	α Delphini	5	20. 33. 55·444	5	0·73	55·444	2·777			74. 31.					
711	Groombridge 3252 .	1	20. 36. 24·270	1	0·80	24·270	2·242	1		51. 21. 17·34		1	0·80	17·34	12·65
712	α Cygni	4	20. 37. 14·258	4	0·60	14·258	2·042	5		45. 9. 30·68		5	0·51	30·68	12·71
713	δ Delphini	4	20. 37. 42·950	4	0·69	42·950	+ 2·801	4		75. 21. 56·67		4	0·69	56·67	— 12·69

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			h m s			s	s			° ′ ″	″			″	″
714	17 Capricorni	1	20. 39. 2·050	1	0·56	2·050	+ 3·486	1		111. 57. 34·02		1	0·56	34·02	— 12·82
715	ϵ Aquarii	1	20. 41. 0·850	1	0·52	0·850	+ 3·251			99. 56.					
716	Radcliffe 4976 S.P..	2	20. 41. 12·500	2	0·17	12·500	— 5·474	2		6. 48. 12·88		2	0·17	12·88	12·97
717	ε Cygni.....	1	20. 41. 14·010	1	0·66	14·010	+ 2·426	2	2	56. 29. 22·82	23·07	4	0·71	22·95	13·29
718	Piazzi XX. 310....	1	20. 42. 21·840	1	0·74	21·840	3·408	1		108. 29. 18·82		1	0·74	18·82	12·96
719	μ Aquarii.....	2	20. 46. 1·060	2	0·62	1·060	3·239	1		99. 26. 37·26		1	0·62	37·26	13·25
720	31 Vulpeculæ		20. 46. (51.)					3	3	63. 21. 45·70	45·58	6	0·77	45·64	13·27
721	19 Capricorni	1	20. 47. 50·830	1	0·79	50·830	3·403	1		108. 23. 16·34		1	0·79	16·34	13·44
722	32 Vulpeculæ	3	20. 49. 19·080	3	0·70	19·080	+ 2·554	2	2	62. 24. 33·63	33·80	4	0·76	33·72	13·51
723	76 Draconis.....		....					1	2	7. 55. 33·58	33·03	3	0·62	33·21	13·64
	76 Draconis S.P. ..	1	20. 51. 22·060	1	0·12	22·060	— 3·962	1		7. 55. 33·81		1	0·12	33·81	
724	33 Vulpeculæ		20. 52. (46.)					2	2	68. 8. 55·88	55·29	4	0·65	55·59	13·80
725	Bradley 2749		20. 53. (6.)					1	1	9. 54. 37·67	36·48	2	0·74	37·08	13·75
726	f^1 Cygni	4	20. 55. 38·603	4	0·77	38·603	+ 2·033	4		42. 57. 30·90		4	0·77	30·90	13·90
727	Piazzi XX. 452....		20. 57. (37.)					1	1	50. 58. 32·55	30·59	2	0·76	31·57	13·99
728	Piazzi XX. 443....	1	20. 57. 56·810	1	0·64	56·810	3·382	1		107. 39. 2·37		1	0·64	2·37	14·13
729	Piazzi XX. 465 ...		20. 59. (15.)					1	1	48. 51. 28·20	28·20	2	0·74	28·20	14·10
730	ξ Cygni	1	21. 0. 27·500	2	0·58	27·535	2·180	1		46. 33. 43·04		1	0·95	43·04	14·23
	ξ Cygni S.P.	1	21. 0. 27·570					1		46. 33. 44·63		1	0·20	44·63	
731	61^1 Cygni	1	21. 1. 23·060	1	0·81	23·060	2·673	1		51. 51. 16·95		1	0·81	16·95	17·48
732	61^2 Cygni	1	21. 1. 24·660	1	0·81	24·660	2·679	1		51. 51. 25·28		1	0·81	25·28	17·26
733	Piazzi XXI. 1.....		21. 3. (25.)					1	1	60. 17. 27·98	26·31	2	0·82	27·15	14·39
734	Groombridge 3409 .	1	21. 5. 38·760	1	0·79	38·760	0·405	3	4	19. 3. 40·78	40·47	7	0·68	40·60	14·52
735	ζ Cygni	6	21. 7. 42·142	6	0·79	42·142	2·548	1		60. 16. 36·39		1	0·95	36·39	14·58
736	77 Draconis.....		21. 7. (55.)					2	2	12. 22. 23·27	21·80	4	0·74	22·54	14·69
737	Lalande 41221	1	21. 9. 4·120	1	0·56	4·120	3·571	1		118. 46. 49·19		1	0·56	49·19	14·73
738	α Equulei.....	2	21. 9. 40·525	2	0·81	40·525	2·999			85. 15.					
739	31 Capricorni	5	21. 11. 22·560	5	0·64	22·560	3·368	5		107. 58. 38·37		5	0·64	38·37	14·94
740	ι Capricorni	3	21. 15. 23·740	3	0·81	23·740	3·347	3		107. 21. 25·78		3	0·79	25·78	15·12
741	α Cephei.....	2	21. 15. 38·540	3	0·41	38·520	1·436	6	4	27. 56. 7·12	7·06	10	0·68	7·10	15·13
	α Cephei S.P.	1	21. 15. 38·480					1		27. 56. 6·67		1	0·13	6·67	
742	6 Cephei S.P.	1	21. 16. 48·840	1	0·20	48·840	1·253	1		25. 38. 56·36		1	0·20	56·36	15·18
743	Piazzi XXI. 142 ..		....					1	1	26. 18. 4·64	4·86	2	0·61	4·75	15·49
	Piazzi XXI. 142 S.P.	1	21. 19. 50·620	1	0·07	50·620	1·340	1		26. 18. 4·22		1	0·07	4·22	
744	35 Vulpeculæ	2	21. 22. 14·800	2	0·77	14·800	2·650	3	1	62. 55. 34·75	35·71	4	0·78	34·99	15·56
745	2 Pegasi.....		21. 24. (22.)					1	1	66. 53. 58·23	59·81	2	0·66	59·02	15·62
746	β Aquarii	3	21. 25. 4·927	3	0·83	4·927	3·161	2		96. 6. 41·33		2	0·84	41·33	15·65
747	7 Cephei S.P.	1	21. 25. 23·580	1	0·21	23·580	1·169	1		23. 43. 38·54		1	0·21	38·54	15·63
748	β^1 Cephei.....	2	21. 27. 1·450	2	0·66	1·450	0·796	1		19. 58. 48·65		1	0·58	48·65	15·75
749	β^2 Cephei	4	21. 27. 3·975	5	0·48	3·864	0·796	5	2	19. 58. 45·01	45·98	7	0·64	45·29	15·71
	β^2 Cephei S.P.....	1	21. 27. 3·420					1		19. 58. 45·95		1	0·20	45·95	
750	ξ Aquarii	1	21. 31. 12·090	1	0·77	12·090	3·196			98. 24.					
751	5 Pegasi.....		21. 32. (0.)					1	1	71. 14. 3·36	3·61	2	0·61	3·49	16·10
752	γ Capricorni.....	5	21. 33. 16·466	5	0·71	16·466	3·332	5		107. 13. 0·59		5	0·71	0·59	16·05
753	44 Capricorni	3	21. 36. 21·630	3	0·78	21·630	3·285	3		104. 57. 39·85		3	0·78	39·85	16·27
754	Nova Cygni.....	5	21. 36. 52·866	5	0·77	52·866	2·361	5		47. 43. 7·41		5	0·77	7·41	16·27
755	Arg. Zone + 42°. No. 4184	3	21. 37. 17·710	3	0·77	17·710	2·363	3		47. 44. 21·29		3	0·77	21·29	16·29
756	45 Capricorni	3	21. 37. 17·843	3	0·77	17·843	3·284	3		105. 18. 43·41		3	0·77	43·41	16·10
757	ϵ Pegasi.....	2	21. 38. 8·630	2	0·74	8·630	+ 2·948			80. 41.					
758	9 Pegasi.....		21. 38. (41.)					1	1	73. 12. 48·60	49·14	2	0·66	48·87	— 16·36

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			h m s			s	s			° ′ ″	″			″	″
759	11 Cephei		21. 40. (6.)					1	1	19. 15. 17·63	16·74	2	0·80	17·19	− 16·51
760	δ Capricorni	3	21. 40. 15·007	3	0·81	15·007	+ 3·315	3		106. 41. 2·86		3	0·67	2·86	16·16
761	ν Cephei S.P.....	1	21. 41. 54·040	1	0·20	54·040	1·730	1		29. 26. 46·49		1	0·20	46·49	16·50
762	13 Pegasi		21. 44. (17.)					1	1	73. 17. 7·80	7·23	2	0·68	7·52	16·63
763	Groomb. 3588 S.P..	1	21. 45. 9·000	1	0·20	9·000	1·510	1		25. 24. 6·78		1	0·20	6·78	16·69
764	μ Capricorni	1	21. 46. 35·230	1	0·58	35·230	3·278	1		104. 7. 46·15		1	0·58	46·15	16·77
765	Groomb. 3594 S.P..	1	21. 46. 38·550	1	0·16	38·550	1·521	1		25. 20. 27·57		1	0·16	27·57	16·76
766	16 Pegasi	9	21. 47. 27·913	9	0·82	27·913	2·727	3	3	64. 39. 11·34	10·87	6	0·82	11·11	16·79
767	17 Pegasi.....		21. 50. (56.)					1	1	78. 30. 24·65	26·10	2	0·75	25·36	16·94
768	79 Draconis		21. 51. (20.)					1	1	16. 52. 46·63	45·91	2	0·80	46·27	16·96
769	20 Pegasi.....		21. 55. (5.)					1	1	77. 28. 7·09	7·69	2	0·68	7·39	17·10
770	16 Cephei	1	21. 57. 29·110	3	0·33	29·120	0·876	2	2	17. 24. 19·99	19·74	4	0·70	19·87	17·06
	16 Cephei S.P.	2	21. 57. 29·125					2		17. 24. 18·29		2	0·18	18·29	
771	α Aquarii	4	21. 59. 27·930	4	0·83	27·930	3·080	1		90. 55. 1·00		1	1·00	1·00	17·32
772	ι Aquarii	4	21. 59. 47·565	4	0·79	47·565	3·244	4		104. 27. 55·99		4	0·79	55·99	17·29
773	23 Pegasi.....	2	22. 0. 0·340	2	0·83	0·340	2·713	5	4	61. 37. 59·18	58·73	9	0·80	58·98	17·41
774	18 Cephei S.P.	1	22. 0. 11·840	1	0·16	11·840	1·783	1		27. 28. 42·66		1	0·16	42·66	17·38
775	ι Pegasi	3	22. 1. 17·127	3	0·81	17·127	2·788	2	2	65. 15. 19·00	18·12	4	0·75	18·56	17·44
776	19 Cephei.....		22. 1. (21.)					1	1	28. 19. 5·81	5·63	2	0·68	5·72	17·39
777	Bradley 2904.....	2	22. 3. 0·325	2	0·81	0·325	3·174	2		98. 8. 8·11		2	0·81	8·11	17·05
778	e^2 Aquarii	1	22. 4. 2·960	1	0·79	2·960	3·220	1		102. 10. 8·43		1	0·79	8·43	17·58
779	W. B. (2) XXII. 154	3	22. 7. 33·933	3	0·92	33·933	2·755	3		63. 17. 17·09		3	0·92	17·09	17·69
780	Groomb. 3719 S.P..	3	22. 7. 50·143	3	0·15	50·143	1·427	3		20. 28. 29·25		3	0·15	29·25	17·78
781	Piazzi XXII. 42 ...		....						1	27. 18.	60·90	1	0·75	60·90	17·77
	Piazzi XXII. 42 S.P.	1	22. 8. 32·700	1	0·17	32·700	1·856	1		27. 18. 59·08		1	0·17	59·08	
782	Bradley 2938.....		22. 9. (57.)					1		27. 26. 51·60		1	0·75	51·60	17·86
783	θ Aquarii	2	22. 10. 20·500	2	0·82	20·500	3·169			98. 23.					
784	ε Cephei	1	22. 10. 30·490	1	0·87	30·490	2·201	1		33. 34. 9·22		1	0·87	9·22	17·83
785	Groombridge 3739 .		....					1	1	24. 29. 10·15	11·45	2	0·68	10·80	17·94
	Groomb. 3739 S.P..	1	22. 13. 35·190	1	0·16	35·190	1·757	1		24. 29. 9·19		1	0·16	9·19	
786	W. B. (2) XXII. 324	3	22. 15. 17·343	3	0·92	17·343	2·780	3		63. 40. 58·01		3	0·92	58·01	18·00
787	γ Aquarii	3	22. 15. 18·137	3	0·76	18·137	3·100			92. 0.					
788	32 Pegasi.....		22. 15. (38.)					3	3	62. 17. 18·76	18·79	6	0·77	18·78	18·02
789	Groombridge 3760 .	1	22. 18. 5·670	2	0·51	5·545	1·775	2	2	23. 54. 53·09	53·24	4	0·74	53·17	18·11
	Groomb. 3760 S.P. .	1	22. 18. 5·420					1		23. 54. 53·21		1	0·27	53·21	
790	Piazzi XXII. 113 ..		22. 21. (8.)					1	1	58. 47. 16·95	16·30	2	0·68	16·63	18·26
791	W. B. (2) XXII. 474	3	22. 22. 24·910	3	0·92	24·910	2·823	3		65. 45. 25·20		3	0·92	25·20	18·26
792	W. B. (2) XXII. 475	3	22. 22. 25·937	3	0·92	25·937	2·825	3		65. 50. 5·98		3	0·92	5·98	18·26
793	σ Aquarii.....	5	22. 24. 8·208	5	0·82	8·208	3·177	4		101. 18. 24·66		4	0·81	24·66	18·38
794	Bradley 2972.....	1	22. 24. 35·280	1	0·62	35·280	2·218	1		32. 13. 31·44		1	0·62	31·44	18·35
795	δ Cephei	1	22. 24. 36·440	1	0·62	36·440	2·216	1		32. 12. 50·86		1	0·62	50·86	18·32
796	58 Aquarii	7	22. 25. 9·954	7	0·76	9·954	3·185	7		101. 32. 7·00		7	0·76	7·00	18·33
797	α Lacertæ.....	1	22. 26. 13·660	1	0·62	13·660	2·461	1		40. 20. 58·34		1	0·62	58·34	18·40
798	39 Pegasi.....		22. 26. (38.)					1	1	70. 24. 13·06	12·73	2	0·86	12·90	18·44
799	ρ Cephei S.P.....	1	22. 28. 46·520	1	0·33	46·520	0·591	1		11. 48. 25·03		1	0·33	25·03	18·47
800	η Aquarii	5	22. 29. 2·132	5	0·86	2·132	3·082			90. 45.					
801	Arg. Zone + 25°. No. 4779	3	22. 31. 57·530	3	0·91	57·530	2·830	3		64. 12. 59·04		3	0·91	59·04	18·59
802	31 Cephei	1	22. 32. 43·740	2	0·58	43·675	1·490	2	1	16. 59. 43·26	44·80	3	0·78	43·77	18·65
	31 Cephei S.P.	1	22. 32. 43·610					1		16. 59. 41·90		1	0·27	41·90	
803	64 Aquarii	2	22. 32. 47·615	2	0·80	47·615	+ 3·167	2		100. 40. 1·70		2	0·80	1·70	− 18·64

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			h m s			s	s			° ′ ″	″			″	″
804	10 Lacertæ.....	2	22. 33. 44·640	2	0·81	44·640	+ 2·682	5	4	51. 35. 22·99	22·96	9	0·86	22·98	— 18·67
805	30 Cephei		22. 34. (17.)					1	1	27. 3. 17·67	16·65	2	0·68	17·16	18·64
806	Piazzi XXII. 186..	1	22. 34. 46·970	1	0·87	46·970	2·952	1		76. 5. 48·56		1	0·87	48·56	18·69
807	ζ Pegasi	4	22. 35. 19·653	4	0·58	19·653	2·987	1		79. 48. 37·85		1	0·74	37·85	18·70
808	Piazzi XXII. 195..	2	22. 35. 52·990	2	0·80	52·990	2·949	2		76. 7. 32·28		2	0·80	32·28	18·71
809	67 Aquarii.....	1	22. 36. 48·810	1	0·58	48·810	3·133	1		97. 36. 21·36		1	0·58	21·36	18·77
810	η Pegasi		22. 37. (14.)					2	2	60. 25. 18·25	17·56	4	0·85	17·91	18·72
811	20 Piscis Australis .	2	22. 38. 47·380	2	0·87	47·380	3·297	2		115. 52. 59·18		2	0·87	59·18	18·81
812	Groomb. 3887 S.P..	1	22. 39. 6·790	1	0·33	6·790	0·236	1		9. 15. 3·36		1	0·33	3·36	18·82
813	ξ Pegasi	3	22. 40. 32·833	3	0·82	32·833	2·992	4	1	78. 27. 27·54	26·78	5	0·84	27·38	18·37
814	λ Pegasi		22. 40. (36.)					1	1	67. 4. 53·29	53·14	2	0·83	53·22	18·86
815	μ Pegasi.....	9	22. 44. 4·046	9	0·83	4·046	2·888	2	2	66. 2. 51·86	51·44	4	0·83	51·65	18·93
816	Groomb. 3904 S.P.	1	22. 44. 49·440	1	0·33	49·440	2·011	1		22. 4. 55·91		1	0·33	55·91	18·98
817	Oeltz. Arg. (N.) 24748 S.P.	1	22. 44. 50·160	1	0·33	50·160	2·011	1		22. 4. 54·29		1	0·33	54·29	18·98
818	ι Cephei		....					2	2	24. 26. 47·36	46·59	4	0·91	46·98	18·85
	ι Cephei S.P.....	1	22. 45. 18·180	1	0·26	18·180	2·119	1		24. 26. 46·86		1	0·26	46·86	
819	λ Aquarii.....	9	22. 46. 11·789	9	0·83	11·789	3·128	6		98. 14. 0·93		6	0·83	0·93	19·06
820	74 Aquarii.....	10	22. 47. 0·018	10	0·65	0·018	3·164	9		102. 16. 12·33		9	0·65	12·33	19·03
821	75 Aquarii.....	5	22. 47. 37·784	5	0·79	37·784	3·167	5		102. 50. 34·57		5	0·79	34·57	19·06
822	Bradley 3038.....		22. 47. (54.)					1	1	7. 29. 57·15	58·56	2	0·94	57·86	19·12
823	Fomalhaut		22. 50. (51.)					1		120. 16. 24·78		1	0·66	24·78	18·97
824	W. B. XXII. 1047.	5	22. 51. 39·550	5	0·77	39·550	3·154	5		101. 47. 21·53		5	0·77	21·53	19·17
825	Piazzi XXII. 264..	5	22. 53. 6·920	5	0·62	6·920	3·184	5		103. 43. 46·17		5	0·62	46·17	19·23
826	81 Aquarii.....	1	22. 55. 0·150	1	0·80	0·150	3·121	1		97. 43. 17·14		1	0·80	17·14	19·24
827	Bradley 3058.....		22. 55. (18.)					2	2	6. 18. 43·82	43·88	4	0·92	43·85	19·31
828	W. B. XXII. 1156.	5	22. 56. 5·526	5	0·71	5·526	3·150	5		101. 55. 34·90		5	0·72	34·90	19·28
829	82 Aquarii.....	2	22. 56. 9·350	2	0·83	9·350	3·120	2		97. 14. 2·21		2	0·83	2·21	19·29
830	o Andromedæ.....		22. 56. (15.)					1	1	48. 20. 8·47	6·74	2	0·94	7·61	19·28
831	Bradley 3044.....	1	22. 56. 18·890	1	0·89	18·890	2·519	1		33. 33. 18·41		1	0·89	18·41	19·30
832	W. B. XXII. 1204.	5	22. 58. 2·934	5	0·81	2·934	3·154	5		102. 50. 29·07		5	0·81	29·07	19·33
833	α Pegasi	5	22. 58. 38·048	5	0·72	38·048	2·984	1		75. 27. 22·77		1	0·66	22·77	19·32
834	Bradley 3054.....	1	22. 58. 52·190	1	0·75	52·190	2·261	1		23. 27. 13·61		1	0·75	13·61	19·35
835	W. B. XXII. 1232.	5	22. 59. 27·844	5	0·62	27·844	3·141	4		101. 6. 3·80		4	0·63	3·80	19·36
836	W. B. XXII. 1249.	6	23. 0. 31·595	6	0·80	31·595	3·154	6		103. 23. 27·58		6	0·80	27·58	19·38
837	W. B. XXII. 1261.	5	23. 0. 57·912	5	0·74	57·912	3·148	5		102. 28. 15·87		5	0·74	15·87	19·39
838	π Cephei.....		23. 3. (59.)					1	1	15. 16. 37·50	38·75	2	0·94	38·13	19·42
839	W. B. XXIII. 49..	4	23. 5. 4·010	4	0·71	4·010	3·135	4		101. 10. 32·08		4	0·71	32·08	19·48
840	W. B. XXIII. 57 (1st Star)	2	23. 5. 33·430	2	0·89	33·430	3·143	1		102. 36. 1·02		1	0·91	1·02	19·49
841	W.B.XXIII.57 (as one mass)	4	23. 5. 33·445	4	0·75	33·445	3·143	4		102. 36. 2·75		4	0·81	2·75	19·49
842	W. B. XXIII. 57 (2nd Star)	2	23. 5. 33·665	2	0·89	33·665	3·143	1		102. 36. 2·68		1	0·91	2·68	19·49
843	W. B. XXIII. 97..	5	23. 7. 21·592	5	0·96	21·592	3·149	5		104. 3. 47·13		5	0·96	47·13	19·53
844	W. B. XXIII. 123.	4	23. 8. 15·395	4	0·81	15·395	3·132	4		101. 21. 25·57		4	0·81	25·57	19·55
845	Lalande 45504	4	23. 8. 55·913	4	0·86	55·913	3·136	4		102. 14. 5·62		4	0·86	5·62	19·56
846	W. B. XXIII. 138.	4	23. 9. 11·205	4	0·87	11·205	3·136	4		102. 18. 8·95		4	0·87	8·95	19·56
847	B. F. 3183.....	2	23. 9. 13·970	2	0·69	13·970	3·094	2		94. 9. 59·53		2	0·69	59·53	19·56
848	ψ^1 Aquarii	5	23. 9. 26·818	5	0·80	26·818	3·146	5		99. 45. 27·73		5	0·80	27·73	19·54
849	γ Piscium.....	2	23. 10. 47·305	2	0·74	47·305	3·106	1		87. 23. 22·41		1	0·66	22·41	19·58
850	W. B. XXIII. 185.	5	23. 11. 14·728	5	0·90	14·728	+ 3·134	6		102. 23. 4·39		6	0·90	4·39	19·60

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			h m s			s	s			o ′ ″	″			″	″
851	ψ^3 Aquarii.....	9	23. 12. 33·690	9	0·65	33·690	+ 3·121	9		100. 16. 58·22		9	0·65	58·22	— 19·63
852	W. B. XXIII. 228.	4	23. 12. 37·050	4	0·90	37·050	3·135	4		102. 50. 34·00		4	0·90	34·00	19·63
853	94 Aquarii.....	5	23. 12. 38·390	5	0·74	38·390	3·163	5		104. 7. 39·92		5	0·74	39·92	19·52
854	96 Aquarii.....	1	23. 13. 1·280	1	0·87	1·280	3·111	1		95. 47. 43·39		1	0·87	43·39	19·62
855	W. B. XXIII. 265.	5	23. 14. 28·552	5	0·88	28·552	3·124	5		101. 12. 20·72		5	0·88	20·72	19·66
856	τ Pegasi.....		23. 14. (33.)					1		66. 55. 56·99		1	0·67	56·99	19·65
857	Piazzi XXIII. 64..	5	23. 16. 37·488	5	0·74	37·488	3·123	5		101. 26. 51·53		5	0·74	51·53	19·70
858	W. B. XXIII. 315.	5	23. 16. 54·406	5	0·86	54·406	3·117	5		100. 3. 33·19		5	0·86	33·19	19·70
859	W. B. XXIII. 377.	5	23. 20. 13·364	5	0·84	13·364	3·116	5		100. 42. 37·65		5	0·84	37·65	19·75
860	κ Piscium.....	4	23. 20. 37·545	4	0·83	37·545	3·075			89. 25.					
861	W. B. XXIII. 402.	5	23. 21. 41·100	5	0·70	41·100	3·120	5		102. 7. 33·68		5	0·70	33·68	19·77
862	W. B. XXIII. 427.	7	23. 22. 38·829	7	0·84	38·829	3·110	6		99. 56. 33·71		6	0·84	33·71	19·79
863	q Pegasi.....		23. 22. (56.)					1	1	77. 55. 4·52	5·67	2	0·95	5·10	19·81
864	11 Piscium.....	3	23. 23. 8·203	3	0·83	8·203	3·082	3		92. 28. 5·06		3	0·83	5·06	19·81
865	W. B. XXIII. 497.	4	23. 26. 3·413	4	0·74	3·413	3·113	6		101. 40. 39·85		6	0·75	39·85	19·83
866	W. B. XXIII. 571.	5	23. 29. 5·676	5	0·85	5·676	3·108	5		101. 14. 5·47		5	0·85	5·47	19·87
867	W. B. XXIII. 583.	6	23. 29. 35·498	6	0·89	35·498	3·108	6		101. 22. 4·12		6	0·89	4·12	19·88
868	W. B. XXIII. 585.	5	23. 29. 38·516	5	0·89	38·516	3·108	4		101. 22. 52·54		4	0·90	52·54	19·88
869	W. B. XXIII. 586.	5	23. 29. 39·276	5	0·79	39·276	3·102	5		99. 26. 42·53		5	0·79	42·53	19·88
870	W. B. XXIII. 629.	6	23. 31. 51·282	6	0·73	51·282	3·099	5		99. 18. 28·71		5	0·77	28·71	19·90
871	ι Andromedæ.....	2	23. 32. 6·345	2	0·74	6·345	2·922	2		47. 24. 45·70		2	0·74	45·70	19·92
872	ι Piscium.....	8	23. 33. 37·399	8	0·87	37·399	3·084	2		85. 2. 25·70		2	0·95	25·70	19·47
873	γ Cephei.....		....					2	2	13. 3. 14·45	14·13	4	0·87	14·29	20·08
	γ Cephei S.P.	3	23. 34. 18·787	3	0·31	18·787	2·408	2		13. 3. 14·02		2	0·34	14·02	
874	Piazzi XXIII. 153.	2	23. 34. 46·865	2	0·67	46·865	3·114	2		102. 21. 44·59		2	0·67	44·59	19·97
875	λ Piscium.....	2	23. 35. 46·270	2	0·76	46·270	3·059	2		88. 53. 48·17		2	0·76	48·17	19·77
876	76 Pegasi.....		23. 36. (29.)					1	1	74. 20. 49·07	48·85	2	0·88	48·96	19·96
877	78 Pegasi.....		23. 37. (48.)					1	1	61. 18. 6·35	4·98	2	0·87	5·67	19·92
878	Bradley 3166.....		23. 42. (2.)					1	1	22. 52. 36·49	35·99	2	0·88	36·24	19·98
879	δ Sculptoris	6	23. 42. 30·978	6	0·68	30·978	3·137			118. 48.					
880	6 Cassiopeiæ S.P...	1	23. 42. 51·290	1	0·25	51·290	2·885	1		28. 28. 7·88		1	0·25	7·88	20·01
881	21 Piscium.....	2	23. 43. 9·615	2	0·91	9·615	3·070	2		89. 36. 23·34		2	0·91	23·34	19·96
882	79 Pegasi.....		23. 43. (26.)					1	1	61. 50. 33·16	33·52	2	0·95	33·34	20·05
883	Piazzi XXIII. 200.	6	23. 43. 53·812	6	0·61	53·812	3·092	5		100. 39. 38·32		5	0·61	38·32	19·85
884	22 Piscium.....	5	23. 45. 40·036	5	0·73	40·036	3·068	5		87. 45. 12·00		5	0·73	12·00	19·98
885	Piazzi XXIII. 218.		23. 46. (25.)					1	2	15. 8. 28·19	28·17	3	0·78	28·18	20·02
886	25 Piscium	1	23. 46. 46·760	1	0·88	46·760	3·071	1		88. 35. 34·99		1	0·88	34·99	20·04
887	Groombridge 4163..	1	23. 48. 51·610	1	0·95	51·610	2·877	1		16. 16. 26·97		1	0·95	26·97	20·14
888	Piazzi XXIII. 229.		23. 49. (7.)					1	1	64. 43. 45·38	45·44	2	0·87	45·41	20·03
889	ψ Pegasi.....	3	23. 51. 29·523	3	0·72	29·523	3·052	4	2	65. 32. 32·72	32·63	6	0·86	32·69	20·03
890	ω Piscium.....	4	23. 52. 59·695	4	0·78	59·695	3·078	3		83. 49. 3·74		3	0·68	3·74	19·91
891	Bradley 3195.....		23. 55. (21.)					1	1	29. 27. 44·35	44·64	2	0·95	44·50	20·02
892	Bradley 3202.....	3	23. 56. 18·570	3	0·78	18·570	3·025	3		24. 35. 9·88		3	0·78	9·88	20·06
893	Oeltz.Arg.(N.)26322	3	23. 56. 20·927	3	0·78	20·927	3·026	3		24. 35. 4·42		3	0·78	4·42	20·05
894	2 Ceti.....	1	23. 57. 26·090	1	0·66	26·090	+ 3·077			108. 1.					
895	86 Pegasi.....		23. 59. (23.)					1	1	77. 17. 17·01	17·91	1	0·95	17·46	— 20·09

NEW CONSTANTS FOR STARS IN THE CATALOGUE NOT INCLUDED IN THE GREENWICH SEVEN-YEAR CATALOGUE OF STARS FOR 1860, IN THE GREENWICH SEVEN-YEAR CATALOGUE FOR 1864, OR IN THE GREENWICH NINE-YEAR CATALOGUE FOR 1872.

(N.B.—*New Constants are also given for all Stars within 5° of the Pole.*)

No. in Star-Catalogue for 1877.	Star's Name.	Logarithms of e	f	g	h	Value of l	Logarithms of e′	f′	g′	h′	Value of l′
						s					″
29	W. B. 0. 770	0·10226	0·08390	1·44851	0·08056	84·235	9·89115	0·05793	0·72722	0·14498	120·664
38	2 Ursæ Minoris	0·31087	0·14496	1·50510	0·31034	34·470	0·14367	9·35936	0·73746	0·15412	127·272
40	Bradley 95	0·35347	0·16504	1·52275	0·35309	20·669	0·15039	9·36412	0·74324	0·15862	126·208
49	Polaris	†..	..	..	..	..	0·17774	9·40053	0·77623	0·18070	121·002
103	Arg. Zone +70°. No. 215.	0·13102	0·12539	1·48607	0·12832	72·486	0·22632	9·69259	0·99936	0·27019	97·029
106	Lalande (F.) 487	0·12875	0·12637	1·48680	0·12607	72·699	0·23160	9·71281	1·01935	0·27611	94·723
136	Piazzi III. 187	0·09288	0·09973	1·45351	0·08322	83·210	0·01216	0·01665	1·14430	0·30839	90·729
149	Lalande 7721–2	0·10006	0·11652	1·47549	0·09679	78·724	0·23073	9·90086	1·18623	0·31738	77·231
154	Arg. Zone +54°. No. 765.	0·09754	0·11470	1·47336	0·09418	79·405	0·22363	9·92029	1·20241	0·32058	75·929
158	W. B. IV. 326	0·08953	0·10042	1·44917	0·07968	83·983	9·90838	0·07159	1·21242	0·32247	88·175
159	W. B. IV. 340	0·08945	0·10045	1·44899	0·07958	84·006	9·90369	0·07316	1·21399	0·32276	88·179
161	W. B. IV. 381	0·08929	0·10051	1·44853	0·07932	84·068	9·89109	0·07713	1·21740	0·32339	88·248
164	W. B. IV. 440	0·08904	0·10063	1·44897	0·07954	84·027	9·90298	0·07367	1·22319	0·32444	87·552
165	W. B. IV. 520	0·08869	0·10077	1·44851	0·07931	84·093	9·89076	0·07737	1·23077	0·32578	87·338
166	W. B. IV. 544	0·08858	0·10081	1·44853	0·07932	84·096	9·89120	0·07727	1·23307	0·32617	87·169
168	W. B. IV. 632	0·08826	0·10096	1·44906	0·07955	84·051	9·90536	0·07354	1·23997	0·32735	86·306
170	W. B. IV. 685	0·08806	0·10104	1·44891	0·07948	84·074	9·90151	0·07470	1·24427	0·32806	86·109
172	W. B. IV. 727	0·08789	0·10111	1·44904	0·07953	84·068	9·90499	0·07390	1·24784	0·32865	85·759
174	W. B. IV. 777	0·08768	0·10117	1·44857	0·07932	84·130	9·89226	0·07724	1·25207	0·32932	85·820
175	Bradley 651	0·09380	0·11725	1·47548	0·09124	79·516	0·23664	9·95995	1·25478	0·32975	69·098
177	W. B. IV. 817	0·08747	0·10127	1·44909	0·07953	84·083	9·90639	0·07386	1·25649	0·33002	85·099
180	W. B. IV. 902	0·08706	0·10140	1·44896	0·07946	84·117	9·90276	0·07501	1·26483	0·33129	84·613
181	W. B. IV. 936	0·08692	0·10144	1·44860	0·07932	84·161	9·89298	0·07727	1·26733	0·33166	84·730
184	Piazzi IV. 207	0·10485	0·15496	1·51161	0·10388	71·723	0·29990	9·95795	1·27643	0·33296	60·944
186	Lalande 9270	0·08640	0·10161	1·44891	0·07942	84·155	9·90151	0·07565	1·27768	0·33314	83·734
187	W. B. IV. 1067	0·08641	0·10163	1·44930	0·07956	84·113	9·91185	0·07346	1·27761	0·33313	83·409
190	W. B. IV. 1149	0·08602	0·10175	1·44935	0·07955	84·129	9·91302	0·07356	1·28500	0·33413	82·833
194	W. B. IV. 1223	0·08578	0·10179	1·44892	0·07940	84·187	9·90179	0·07592	1·28951	0·33473	82·878
197	Lalande 9561	0·08553	0·10187	1·44914	0·07946	84·176	9·90757	0·07501	1·29424	0·33532	82·343
206	18 Orionis	0·08455	0·10254	1·45225	0·08023	83·900	9·98403	0·06345	1·31374	0·33758	77·866
210	Bradley 737	0·08530	0·10661	1·46151	0·08257	82·654	0·13978	0·03434	1·31673	0·33790	69·137
219	Piazzi V. 99	0·08373	0·10559	1·45948	0·08140	83·082	0·11401	0·04902	1·33604	0·33969	68·843
223	W. B. (2) V. 763–4	0·08350	0·10886	1·46452	0·08190	82·420	0·17176	0·04613	1·34625	0·34048	63·681
225	Lalande 10527	0·08244	0·10258	1·44609	0·07884	84·620	9·82184	0·08434	1·34825	0·34062	81·526
226	Lalande 10529	0·08244	0·10258	1·44609	0·07884	84·620	9·82184	0·08434	1·34825	0·34062	81·526
241	Piazzi V. 253	0·08197	0·13660	1·49417	0·08176	77·947	0·28966	0·06371	1·38173	0·34222	48·467
269	Cephei 51	9·97628	0·40776	1·74239	9·97641	32·413	0·33463	0·14087	1·45755	0·33906	32·408
353	Piazzi X. 67	0·05647	0·08949	1·44973	0·07556	87·258	9·92505	0·12962	1·63490	0·21115	62·844
401	Groombridge 1850	9·24476	0·08155	1·45030	9·25008	137·153	0·07115	0·34201	1·65375	0·08147	41·376
409	Bradley 1672	‡..	..	..	..	..	0·05127	0·34196	1·65338	0·05598	44·466
522	Lalande (F.) 2763	0·05792	0·03315	1·41456	0·06081	94·523	9·30276	0·19644	1·52643	9·47245	117·933
529	34 Herculis	0·06431	0·04385	1·42567	0·06796	92·141	9·34479	0·17603	1·51770	9·44974	120·407
547	26 Ophiuchi	0·07141	0·05297	1·45733	0·08240	87·670	0·08189	0·12109	1·28304	9·38546	117·674
548	Groombridge 2393	0·06408	0·02636	1·40878	0·06584	94·611	9·17551	0·16225	1·48755	9·38325	127·014
603	δ Ursæ Minoris	0·10004	8·87373	0·74397	0·10000	138·527	9·24895	0·05982	1·37929	9·30402	143·099
604	Lalande 33738	0·08088	0·05088	1·45934	0·07837	87·275	0·11214	0·08975	1·37578	9·30521	113·340

† For No. 49, log. e = 0·59010, log. f = 0·32148, log. g = 1·66317, log. h = 0·59002, and l = − 92ˢ·213.

‡ For No. 409, log. e = − 0·06295, log. f = 0·02234, log. g = 1·40005, log. h = − 0·06260, and l = 211ˢ·309.

No. in Star-Catalogue for 1877.	Star's Name.	Logarithms of				Value of	Logarithms of				Value of
		e	f	g	h	l	e′	f′	g′	h′	l′
						s					s
608	24 Ursæ Minoris	†..	..	..	..	..	9·25792	0·05268	1·37242	9·30649	143·897
669	λ Ursæ Minoris	‡..	..	..	..	..	9·47654	9·87445	1·20283	9·48793	156·954
680	Oeltz. Arg. (S.) 20345....	0·09228	0·05747	1·45299	0·07569	86·730	0·00113	0·12676	1·15650	9·54780	125·430
686	Piazzi XX. 66	0·09257	0·05776	1·45279	0·07573	86·704	9·99660	0·12642	1·14820	9·55832	125·826
687	Oeltz. Arg. (S.) 20407....	0·09269	0·05773	1·45301	0·07553	86·693	0·00156	0·12886	1·14638	9·56064	125·374
689	Groombridge 3133	0·09605	0·05258	1·43416	0·08984	87·240	9·53110	9·93036	1·14244	9·56556	154·359
691	Piazzi XX. 102	0·09296	0·05803	1·45273	0·07563	86·669	9·99542	0·12773	1·13814	9·57094	125·911
692	Lalande 39210	0·09316	0·05811	1·45288	0·07544	86·651	9·99887	0·13002	1·13394	9·57620	125·582
693	Lalande 39247	0·09323	0·05814	1·45292	0·07539	86·645	9·99965	0·13073	1·13217	9·57837	125·501
696	Oeltz. Arg. (S.) 20541....	0·09350	0·05833	1·45290	0·07528	86·621	9·99939	0·13188	1·12532	9·58683	125·496
699	W. B. XX. 588	0·09366	0·05865	1·45247	0·07557	86·603	9·98985	0·12869	1·11857	9·59512	126·345
701	Piazzi XX. 187	0·09385	0·05880	1·45243	0·07552	86·586	9·98900	0·12922	1·11317	9·60168	126·398
703	W. B. XX. 664	0·09394	0·05877	1·45264	0·07531	86·579	9·99370	0·13171	1·11196	9·60316	125·949
706	Lalande 39671	0·09413	0·05879	1·45288	0·07504	86·564	9·99909	0·13498	1·10830	9·60757	125·412
711	Groombridge 3252.....	0·09823	0·05452	1·43525	0·09118	86·780	9·57565	9·90638	1·09175	9·62731	155·016
737	Lalande 41221	0·09895	0·06009	1·45592	0·06933	86·281	0·05934	0·19137	1·01151	9·71723	117·138
754	Nova Cygni	0·10486	0·05968	1·43714	0·09663	85·426	9·68628	9·81570	0·94105	9·78911	155·645
755	Arg. Zone +42°. No. 4184	0·10490	0·05973	1·43717	0·09666	85·416	9·68726	9·81533	0·93991	9·79015	155·622
779	W. B. (2) XXII. 154	0·10237	0·06627	1·44334	0·08977	85·188	9·77859	9·90495	0·86398	9·86264	147·905
786	W. B. (2) XXII. 324	0·10270	0·06714	1·44374	0·08977	85·074	9·78916	9·90412	0·84529	9·88014	147·193
791	W. B. (2) XXII. 474	0·10264	0·06811	1·44441	0·08897	85·018	9·80264	9·91696	0·82844	9·89595	145·723
792	W. B. (2) XXII. 475	0·10263	0·06812	1·44443	0·08894	85·018	9·80277	9·91758	0·82842	9·89599	145·686
801	Arg. Zone +25°. No. 4779	0·10334	0·06902	1·44452	0·08985	84·836	9·81043	9·90130	0·80668	9·91659	145·604
811	20 Piscis Australis.....	0·10363	0·06978	1·45175	0·06806	85·706	9·98277	0·20667	0·79184	9·93095	116·980
821	75 Aquarii	0·10209	0·07142	1·44974	0·07393	85·467	9·92732	0·14956	0·77360	9·94914	124·212
824	W. B. XXII. 1047	0·10212	0·07188	1·44954	0·07434	85·421	9·92179	0·14464	0·76584	9·95714	124·590
825	Piazzi XXII. 264.....	0·10234	0·07198	1·44973	0·07350	85·441	9·92783	0·15462	0·76296	9·96013	123·376
828	W. B. XXII. 1156.....	0·10227	0·07234	1·44948	0·07426	85·389	9·92033	0·14567	0·75749	9·96597	124·246
831	Bradley 3044	0·11926	0·06703	1·43964	0·11283	82·488	9·86427	9·60049	0·75706	9·96647	151·745
832	W. B. XXII. 1204.....	0·10240	0·07252	1·44953	0·07386	85·390	9·92231	0·15047	0·75389	9·96987	123·610
835	W. B. XXII. 1232.....	0·10229	0·07272	1·44933	0·07459	85·350	9·91619	0·14171	0·75139	9·97263	124·498
836	W. B. XXII. 1249.....	0·10252	0·07277	1·44954	0·07360	85·382	9·92288	0·15342	0·74957	9·97464	123·151
837	W. B. XXII. 1261.....	0·10245	0·07285	1·44944	0·07399	85·362	9·91976	0·14884	0·74878	9·97555	123·638
839	W. B. XXIII. 49.....	0·10244	0·07330	1·44925	0·07452	85·312	9·91397	0·14243	0·74193	9·98342	124·101
841	W. B. XXIII. 57.....	0·10257	0·07333	1·44936	0·07391	85·332	9·91803	0·14984	0·74113	9·98434	123·273
843	W. B. XXIII. 97.....	0·10275	0·07348	1·44946	0·07325	85·347	9·92143	0·15735	0·73824	9·98777	122·347
844	W. B. XXIII. 123.....	0·10253	0·07364	1·44921	0·07443	85·290	9·91312	0·14358	0·73678	9·98953	123·787
845	Lalande 45504	0·10262	0·07369	1·44927	0·07405	85·301	9·91529	0·14819	0·73573	9·99076	123·259
846	W. B. XXIII. 138.....	0·10263	0·07372	1·44927	0·07402	85·301	9·91535	0·14855	0·73534	9·99126	123·205
850	W. B. XXIII. 185.....	0·10268	0·07393	1·44923	0·07396	85·291	9·91461	0·14911	0·73223	9·99515	123·021
852	W. B. XXIII. 228.....	0·10275	0·07407	1·44924	0·07376	85·289	9·91524	0·15158	0·73023	9·99770	122·674
855	W. B. XXIII. 265.....	0·10265	0·07430	1·44908	0·07447	85·244	9·90993	0·14315	0·72759	0·00117	123·445
857	Piazzi XXIII. 64.....	0·10271	0·07452	1·44906	0·07435	85·235	9·90961	0·14457	0·72468	0·00506	123·163
858	W. B. XXIII. 315.....	0·10261	0·07458	1·44896	0·07496	85·203	9·90607	0·13726	0·72423	0·00566	123·882
859	W. B. XXIII. 377.....	0·10272	0·07492	1·44895	0·07467	85·193	9·90623	0·14087	0·71993	0·01172	123·295
861	W. B. XXIII. 402.....	0·10286	0·07506	1·44902	0·07404	85·211	9·90891	0·14838	0·71811	0·01435	122·438
862	W. B. XXIII. 427.....	0·10271	0·07519	1·44887	0·07499	85·159	9·90342	0·13688	0·71698	0·01609	123·524
865	W. B. XXIII. 497.....	0·10289	0·07553	1·44891	0·07422	85·173	9·90580	0·14622	0·71312	0·02221	122·357
866	W. B. XXIII. 571.....	0·10290	0·07586	1·44883	0·07440	85·143	9·90342	0·14397	0·70995	0·02759	122·364
867	W. B. XXIII. 583.....	0·10292	0·07591	1·44883	0·07435	85·142	9·90347	0·14468	0·70949	0·02847	122·258
868	W. B. XXIII. 585.....	0·10292	0·07592	1·44883	0·07434	85·142	9·90347	0·14478	0·70941	0·02856	122·245
869	W. B. XXIII. 586.....	0·10277	0·07594	1·44873	0·07519	85·100	9·89966	0·13441	0·70941	0·02859	123·242
870	W. B. XXIII. 629.....	0·10279	0·07617	1·44869	0·07523	85·084	9·89851	0·13375	0·70731	0·03243	123·139

† For No. 608, log. e = 0·11067, log. f = − 8·81445, log. g = 0·43685, log. h = 0·11062, and l = 143ˢ·842.
‡ For No. 669, log. e = 0·45022, log. f = − 0·30197, log. g = − 1·55845, log. h = 0·45018, and l = 162ˢ·538.

ROYAL OBSERVATORY, GREENWICH.

HORIZONTAL AND VERTICAL DIAMETERS

AND

RIGHT ASCENSIONS AND NORTH POLAR DISTANCES

OF THE

SUN, MOON, AND PLANETS,

(The Right Ascensions of the Sun, Moon, and Planets corrected for Personal Equation when required; and the North Polar Distances corrected for Errors of Division; for Flexure of the Telescope of the Transit-Circle; for Discordance of Direct and Reflexion Results; and for Reduction to Colatitude 38°. 31′. 21″·40,)

DEDUCED FROM THE OBSERVATIONS,

AND

COMPARED WITH THE CORRESPONDING RESULTS OF THE NAUTICAL ALMANAC:

WITH

THE INFERRED POSITION OF THE ECLIPTIC; THE GEOCENTRIC ERRORS OF THE SUN, MOON, AND PLANETS IN LONGITUDE AND ECLIPTIC POLAR DISTANCE;

AND

THE EQUATIONS BETWEEN THE GEOCENTRIC ERRORS OF THE PLANETS AND THE HELIOCENTRIC ERRORS OF THE EARTH AND PLANETS, IN LONGITUDE AND ECLIPTIC POLAR DISTANCE.

1877.

SIDEREAL TIMES occupied by the TRANSIT of the SUN'S DIAMETER; and VERTICAL DIAMETERS of the SUN, corrected for Refraction and Parallax: compared with the corresponding Results of the Nautical Almanac.

DAY.	Observer.	Observed Duration of Transit.	Seconds of Nautical Almanac.	Apparent Error of Nautical Almanac.	Observed Vertical Diameter.	Seconds of Nautical Almanac.	Apparent Error of Nautical Almanac.
1877.		m s	s	s	′ ″	″	″
Jan. 2	C	2. 21·98	22·02	+ 0·04	32. 32·80	36·60	+ 3·80
5	HP	2. 21·55	21·68	+ 0·13	32. 34·76	36·40	+ 1·64
13	AD	2. 20·30	20·46	+ 0·16	32. 33·01	35·60	+ 2·59
15	C	2. 20·05	20·10	+ 0·05	32. 30·77	35·40	+ 4·63
22	AD	2. 18·50	18·68	+ 0·18	32. 32·07	34·20	+ 2·13
23	C	2. 18·44	18·46	+ 0·02	....	...	...
26	AD	2. 17·68	17·80	+ 0·12	32. 32·74	33·20	+ 0·46
29	HP	2. 16·96	17·12	+ 0·16	32. 31·41	32·60	+ 1·19
31	FD	....	...	...	32. 31·06	32·00	+ 0·94
Feb. 8	JB	....	...	...	32. 28·42	29·20	+ 0·78
16	AD	2. 13·00	13·08	+ 0·08	32. 23·22	26·00	+ 2·78
19	L	2. 12·37	12·50	+ 0·13	32. 24·65	24·80	+ 0·15
23	HP	2. 11·64	11·76	+ 0·12	32. 21·83	23·00	+ 1·17
28	JB	2. 10·82	10·94	+ 0·12	32. 21·25	20·80	− 0·45
Mar. 1	C	2. 10·67	10·78	+ 0·11	....	...	...
9	BD	2. 9·50	9·78	+ 0·28	32. 15·25	16·00	+ 0·75
14	JB	2. 9·10	9·34	+ 0·24	32. 12·71	13·40	+ 0·69
16	T	2. 9·19	9·20	+ 0·01	32. 13·74	12·40	− 1·34
22	L	2. 8·56	8·94	+ 0·38	32. 9·78	9·20	− 0·58
23	C	2. 8·93	8·92	− 0·01	....	...	...
April 13	B	2. 9·77	9·80	+ 0·03	31. 54·98	57·00	+ 2·02
23	AD	2. 10·91	10·96	+ 0·05	....	...	...
May 2	BD	2. 12·04	12·30	+ 0·26	31. 45·05	47·40	+ 2·35
8	C	2. 13·33	13·28	− 0·05	31. 39·42	44·60	+ 5·18
10	T	2. 13·44	13·60	+ 0·16	31. 44·25	43·80	− 0·45
18	L	2. 14·87	14·90	+ 0·03	31. 42·90	40·60	− 2·30
25	C	2. 15·92	15·96	+ 0·04	31. 35·05	38·20	+ 3·15
June 8	BD	....	...	...	31. 32·92	34·40	+ 1·48
9	T	2. 17·54	17·56	+ 0·02	31. 35·38	34·20	− 1·18
11	C	2. 17·59	17·68	+ 0·09	31. 31·05	33·80	+ 2·75
12	BD	2. 17·58	17·74	+ 0·16	31. 31·00	33·60	+ 2·60
14	AD	2. 17·81	17·82	+ 0·01	31. 31·05	33·40	+ 2·35
15	T	2. 17·91	17·86	− 0·05	31. 33·40	33·20	− 0·20
16	C	2. 17·90	17·88	− 0·02	31. 32·31	33·00	+ 0·69
18	AD	2. 17·87	17·92	+ 0·05	31. 29·65	32·80	+ 3·15
19	WL	2. 17·83	17·92	+ 0·09	31. 31·54	32·60	+ 1·06
22	AD	2. 17·79	17·92	+ 0·13	31. 28·71	32·40	+ 3·69
25	BD	2. 17·58	17·84	+ 0·26	31. 31·00	32·20	+ 1·20
28	C	2. 17·59	17·72	+ 0·13	31. 30·94	32·00	+ 1·06
29	L	2. 17·70	17·66	− 0·04	31. 34·96	32·00	− 2·96
July 3	W	2. 17·18	17·36	+ 0·18	31. 30·62	31·80	+ 1·18
4	HP	2. 17·27	17·28	+ 0·01	31. 31·75	31·80	+ 0·05
1877. July 5	T	2. 17·27	17·18	− 0·09	31. 32·53	31·80	− 0·73
10	C	2. 16·64	16·64	0·00	31. 28·70	32·20	+ 3·50
18	L	2. 15·44	15·54	+ 0·10	31. 34·95	33·00	− 1·95
20	AD	2. 15·18	15·24	+ 0·06	31. 30·23	33·40	+ 3·17
21	T	2. 15·09	15·08	− 0·01	31. 34·81	33·60	− 1·21
24	AD	2. 14·40	14·58	+ 0·18	....	...	...
30	R	2. 13·47	13·56	+ 0·09	31. 35·13	35·40	+ 0·27
31	W	2. 13·36	13·38	+ 0·02	31. 33·98	35·60	+ 1·62
Aug. 17	JB	....	...	...	31. 38·23	40·80	+ 2·57
20	T	2. 10·06	10·14	+ 0·08	31. 43·19	42·00	− 1·19
21	JP	2. 9·94	10·00	+ 0·06	31. 42·07	42·40	+ 0·33
22	G	2. 9·70	9·88	+ 0·18	31. 43·87	42·80	− 1·07
29	JP	2. 8·77	9·06	+ 0·29	31. 45·18	45·80	+ 0·62
Sept. 4	AD	2. 8·53	8·54	+ 0·01	....	...	...
5	JB	....	...	...	31. 48·84	49·00	+ 0·16
6	T	2. 8·46	8·40	− 0·06	31. 51·68	49·60	− 2·08
8	L	....	...	...	31. 50·59	50·60	+ 0·01
22	C	2. 8·38	8·18	− 0·20	31. 54·37	58·00	+ 3·63
29	R	2. 8·56	8·56	0·00	31. 59·64	61·80	+ 2·16
Oct. 3	AD	2. 8·82	8·92	+ 0·10	32. 2·80	3·80	+ 1·00
11	T	2. 9·86	9·90	+ 0·04	32. 8·23	8·40	+ 0·17
17	AD	2. 10·79	10·88	+ 0·18	32. 10·02	11·80	+ 1·78
18	BD	2. 10·89	11·06	+ 0·17	32. 9·90	12·20	+ 2·30
20	R	2. 11·60	11·42	− 0·18	32. 11·97	13·40	+ 1·43
24	C	....	...	...	32. 16·25	15·60	− 0·65
26	T	2. 12·61	12·64	+ 0·03	32. 15·50	16·60	+ 1·10
31	BD	2. 13·45	13·74	+ 0·29	....	...	...
Nov. 1	L	....	...	...	32. 20·19	19·60	− 0·59
3	T	2. 14·42	14·42	0·00	32. 21·18	20·40	− 0·78
8	T	2. 15·50	15·60	+ 0·10	....	...	...
12	C	2. 16·59	16·56	− 0·03	32. 24·35	24·60	+ 0·25
14	AD	2. 16·90	17·04	+ 0·14	32. 21·68	25·60	+ 3·92
22	JP	2. 18·63	18·88	+ 0·25	32. 30·46	28·80	− 1·66
23	G	2. 18·95	19·08	+ 0·13	32. 28·32	29·20	+ 0·88
28	JB	2. 19·84	20·10	+ 0·26	32. 29·67	30·80	+ 1·13
Dec. 8	AD	2. 21·57	21·68	+ 0·11	....	...	...
13	BD	2. 21·92	22·20	+ 0·28	32. 31·09	34·80	+ 3·71
14	B	2. 21·95	22·28	+ 0·33	32. 35·06	35·00	− 0·06
18	T	2. 22·42	22·52	+ 0·10	32. 34·80	35·60	+ 0·80
26	BD	2. 22·21	22·52	+ 0·31	32. 33·98	36·40	+ 2·42
27	JP	....	...	...	32. 32·49	36·40	+ 3·91
31	L	2. 22·21	22·22	+ 0·01	32. 38·60	36·40	− 2·20

SIDEREAL TIMES occupied by the TRANSIT of the MOON'S DIAMETER; and VERTICAL DIAMETERS of the MOON, corrected for Refraction, Parallax, and Defect of Illumination: compared with the corresponding Results of the Nautical Almanac.

DAY.	Observer.	Observed Duration of Transit.	Seconds of Nautical Almanac.	Apparent Error of Nautical Almanac.	Observed Vertical Diameter.	Seconds of Nautical Almanac.	Apparent Error of Nautical Almanac.
1877.		m s	s	s	′ ″	″	″
Jan. 25	L	....	...	...	32. 40·30	41·00	+ 0·70
29	HP	....	...	...	33. 25·88	28·40	+ 2·52
Feb. 27	BD	2. 18·51	18·58	+ 0·07	33. 11·47	8·40	− 3·07
April 26	C	....	...	...	31. 48·73	48·40	− 0·33
July 21	T	....	...	...	30. 10·86	8·40	− 2·46
Aug. 23	AD	....	...	...	29. 28·71	28·40	− 0·31
Sept. 21	JB	....	...	...	29. 39·97	39·60	− 0·37
Nov. 19	L	....	...	...	30. 58·16	55·20	− 2·96
20	C	2. 23·55	23·58	+ 0·03	....	...	...
Dec. 18	T	....	...	...	31. 38·81	36·20	− 2·61

VERTICAL DIAMETERS of MERCURY, corrected for Refraction, Parallax, and Defect of Illumination: compared with the corresponding Results of the Nautical Almanac.

DAY.	Observer.	Observed Vertical Diameter.	Diameter from Nautical Almanac.	Apparent Error of Nautical Almanac.
1877.		″	″	″
June 17	AD	9·70	8·60	− 1·10
Aug. 22	G	6·86	6·30	− 0·56

SIDEREAL TIMES occupied by the TRANSIT of the DIAMETER of VENUS, and VERTICAL DIAMETERS of VENUS, corrected for Refraction, Parallax, and Defect of Illumination: compared with the corresponding Results of the Nautical Almanac.

DAY.	Observer.	Observed Duration of Transit.	Seconds of Nautical Almanac.	Apparent Error of Nautical Almanac.	Observed Vertical Diameter.	Diameter from Nautical Almanac.	Apparent Error of Nautical Almanac.
1877.		s	s	s	″	″	″
Feb. 27	JB	....	...	...	11·32	10·30	−1·02
June 8	BD	....	...	...	8·52	9·80	+1·28
14	AD	....	...	...	11·50	9·80	−1·70
15	T	....	...	...	13·29	9·80	−3·49
16	C	1·04	0·78	−0·26	10·12	9·80	−0·32
18	AD	....	...	...	12·78	10·00	−2·78
21	L	....	...	...	13·17	10·00	−3·17
25	BD	....	...	...	11·25	10·00	−1·25
29	L	....	...	...	14·12	10·00	−4·12
July 10	C	....	...	...	11·72	10·20	−1·52
20	AD	....	...	...	12·08	10·60	−1·48
30	R	....	...	...	12·08	10·80	−1·28
31	W	....	...	...	11·73	10·80	−0·93
Aug. 14	JP	....	...	...	12·34	11·30	−1·04
31	R	....	...	...	13·76	12·00	−1·76
Sept. 5	JB	....	...	...	13·19	12·40	−0·79
29	R	....	...	...	14·66	13·90	−0·76
Oct. 2	JB	....	...	...	14·42	14·20	−0·22
5	T	....	...	...	12·49	14·40	+1·91
18	BD	....	...	...	14·51	15·60	+1·09
20	R	....	...	...	15·98	15·80	−0·18
24	BD	....	...	...	13·60	16·40	+2·80
Nov. 8	T	....	...	...	18·94	18·20	−0·74
14	AD	....	...	...	20·60	19·10	−1·50
23	G	....	...	...	26·01	20·60	−5·41
29	T	....	...	...	27·07	21·80	−5·27
Dec. 12	AD	....	...	...	26·91	25·10	−1·81
14	B	....	...	...	26·95	25·70	−1·25
24	R	....	...	...	32·27	29·00	−3·27
31	L	....	...	...	35·11	31·80	−3·31

SIDEREAL TIMES occupied by the TRANSIT of the DIAMETER of MARS, corrected for Defect of Illumination, and VERTICAL DIAMETERS of MARS, corrected for Refraction, Parallax, and Defect of Illumination: compared with the corresponding Results of the Nautical Almanac.

DAY.	Observer.	Observed Duration of Transit.	Seconds of Nautical Almanac.	Apparent Error of Nautical Almanac.	Observed Vertical Diameter.	Diameter from Nautical Almanac.	Apparent Error of Nautical Almanac.
1877.		s	s	s	"	"	"
July 2	BD	....	...	...	16·61	19·00	+2·39
6	L	....	...	...	20·48	19·80	−0·68
29	T	1·66	1·66	0·00	23·46	24·60	+1·14
30	C	1·73	1·67	−0·06	23·86	24·80	+0·94
Aug. 2	B	1·71	1·72	+0·01	27·03	25·40	−1·63
7	HP	1·61	1·79	+0·18	23·83	26·40	+2·57
11	AD	1·89	1·85	−0·04	26·53	27·20	+0·67
16	R	1·83	1·90	+0·07	26·95	28·00	+1·05
17	JB	1·71	1·91	+0·20	26·48	28·20	+1·72
23	AD	2·00	1·97	−0·03	30·07	28·90	−1·17
29	JP	1·75	1·99	+0·24	24·49	29·30	+4·81
30	HP	1·82	2·00	+0·18	26·33	29·40	+3·07
31	R	2·04	2·00	−0·04	28·53	29·40	+0·87
Sept. 2	AD	1·77	2·00	+0·23	27·27	29·40	+2·13
5	JB	1·84	2·00	+0·16	27·46	29·40	+1·94
6	T	2·12	1·99	−0·13	29·08	29·30	+0·22
7	AD	2·14	1·98	−0·16	28·64	29·20	+0·56
11	T	1·95	1·98	+0·03	31·10	29·00	−2·10
21	JB	1·93	1·88	−0·05	27·29	27·60	+0·31
26	C	1·73	1·82	+0·09	21·87	26·60	+4·73
27	JP	1·61	1·80	+0·19	26·02	26·40	+0·38
28	G	1·78	1·78	0·00	29·09	26·10	−2·99
29	R	1·76	1·76	0·00	24·59	25·80	+1·21
Oct. 2	JB	1·51	1·72	+0·21	24·13	25·20	+1·07
3	AD	1·74	1·70	−0·04	24·21	25·00	+0·79
4	C	1·73	1·70	−0·03	22·73	24·80	+2·07
Oct. 6	L	1·56	1·66	+0·10	23·25	24·30	+1·05
15	T	....	...	...	22·52	22·20	−0·32
16	HP	1·51	1·48	−0·03	21·45	21·90	+0·45
18	BD	....	...	...	20·75	21·40	+0·65
20	R	....	...	...	19·13	21·00	+1·87
23	C	....	...	...	19·09	20·40	+1·31
26	T	....	...	...	20·98	19·60	−1·38
27	JP	....	...	...	19·60	19·40	−0·20
Nov. 1	L	....	...	...	21·77	18·40	−3·37
3	T	....	...	...	18·48	18·00	−0·48
8	T	....	...	...	17·56	17·00	−0·56
9	R	....	...	...	16·84	16·80	−0·04
12	C	....	...	...	16·25	16·40	+0·15
13	T	....	...	...	17·67	16·20	−1·47
14	AD	....	...	...	15·55	16·00	+0·45
16	C	....	...	...	15·55	15·60	+0·05
20	C	....	...	...	13·97	15·00	+1·03
22	JP	....	...	...	15·99	14·80	−1·19
29	T	....	...	...	14·98	13·70	−1·28
30	AD	....	...	...	14·01	13·60	−0·41
Dec. 1	L	....	...	...	14·92	13·50	−1·42
12	AD	....	...	...	12·85	12·00	−0·85
13	BD	....	...	...	12·12	11·90	−0·22
14	B	....	...	...	16·22	11·80	−4·42
18	T	....	...	...	13·24	11·40	−1·84
24	R	....	...	...	14·01	10·80	−3·21
27	JP	....	...	...	13·49	10·60	−2·89
31	L	....	...	...	12·13	10·30	−1·83

SIDEREAL TIMES occupied by the TRANSIT of the DIAMETER of JUPITER; and VERTICAL DIAMETERS of JUPITER, corrected for Refraction and Parallax: compared with the corresponding results of the Nautical Almanac.

May 2	L	3·32	3·17	−0·15	44·88	40·50	−4·38
4	T	3·39	3·19	−0·20	43·15	40·70	−2·45
11	JB	3·20	3·24	+0·04	43·14	41·40	−1·74
15	G	3·30	3·26	−0·04	45·07	41·80	−3·27
26	BD	3·18	3·33	+0·15	44·13	42·50	−1·63
28	T	3·44	3·34	−0·10	46·68	42·60	−4·08
29	B	3·39	3·34	−0·05	46·13	42·60	−3·53
June 5	T	3·70	3·38	−0·32	48·46	43·10	−5·36
6	C	3·58	3·38	−0·20	43·51	43·20	−0·31
15	T	3·67	3·41	−0·26	46·38	43·60	−2·78
16	C	3·63	3·42	−0·21	45·57	43·60	−1·97
18	AD	3·40	3·42	+0·02	44·16	43·60	−0·56
19	WL	3·40	3·42	+0·02	45·29	43·60	−1·69
20	T	3·56	3·42	−0·14	48·60	43·60	−5·00
23	T	3·55	3·42	−0·13	46·09	43·60	−2·49
25	BD	3·38	3·42	+0·04	45·96	43·60	−2·36
27	T	3·66	3·42	−0·24	46·43	43·60	−2·83
29	L	3·74	3·41	−0·33	48·61	43·60	−5·01
July 2	G	3·62	3·40	−0·22	....	...	...
3	W	3·32	3·40	+0·08	47·27	43·40	−3·87
July 4	HP	3·42	3·40	−0·02	44·36	43·40	−0·96
7	JB	3·32	3·38	+0·06	45·93	43·20	−2·73
12	AD	3·36	3·36	0·00	43·94	43·00	−0·94
20	AD	3·37	3·32	−0·05	42·36	42·40	+0·04
24	AD	3·30	3·29	−0·01	43·14	42·00	−1·14
26	BD	3·28	3·28	0·00	43·34	42·00	−1·34
27	C	3·40	3·27	−0·13	....	...	...
30	R	....	...	...	43·83	41·60	−2·23
Aug. 2	B	3·18	3·23	+0·05	43·45	41·30	−2·15
10	C	3·02	3·15	+0·13	40·80	40·30	−0·50
14	JP	3·06	3·13	+0·07	41·97	39·90	−2·07
15	AD	3·16	3·12	−0·04	40·19	39·80	−0·39
16	R	3·08	3·10	+0·02	35·59	39·70	+4·11
17	JB	3·08	3·08	0·00	39·11	39·60	+0·49
21	JP	3·08	3·06	−0·02	39·54	39·20	−0·34
22	G	3·20	3·05	−0·15	42·92	39·10	−3·82
23	AD	3·10	3·04	−0·06	40·03	39·00	−1·03
29	JP	2·80	2·98	+0·18	39·21	38·20	−1·01
31	R	2·96	2·96	0·00	39·98	38·00	−1·98
Sept. 1	L	3·07	2·95	−0·12	39·72	37·90	−1·82
5	JB	2·90	2·91	+0·01	38·27	37·30	−0·97

SIDEREAL TIMES occupied by the TRANSIT of the DIAMETER of SATURN; and VERTICAL DIAMETERS of SATURN, corrected for Refraction and Parallax: compared with the corresponding results of the Nautical Almanac.

DAY.	Observer.	Observed Duration of Transit.	Duration from Nautical Almanac.	Apparent Error of Nautical Almanac.	Observed Vertical Diameter.	Diameter from Nautical Almanac.	Apparent Error of Nautical Almanac.
1877.		s	s	s	"	"	"
July 30	C	1·44	1·22	−0·22	18·16	16·80	−1·36
Aug. 2	B	1·28	1·24	−0·04	20·08	17·00	−3·08
7	HP	1·27	1·24	−0·03	17·94	17·00	−0·94
11	AD	1·36	1·24	−0·12	19·29	17·10	−2·19
16	R	1·35	1·24	−0·11	18·83	17·20	−1·63
17	JB	1·21	1·24	+0·03	19·51	17·20	−2·31
23	AD	1·34	1·24	−0·10	....	...	...
30	HP	1·24	1·26	+0·02	17·67	17·40	−0·27
31	R	1·47	1·26	−0·21	20·93	17·40	−3·53
Sept. 5	JB	1·31	1·26	−0·05	20·87	17·40	−3·47
7	AD	1·27	1·26	−0·01	17·95	17·40	−0·55
11	T	1·16	1·26	+0·10	18·98	17·40	−1·58
12	G	1·16	1·26	+0·10	21·07	17·40	−3·67
24	L	1·45	1·26	−0·19	20·34	17·30	−3·04
26	C	1·31	1·26	−0·05	16·65	17·20	+0·55
27	JP	1·16	1·26	+0·10	19·70	17·20	−2·50
28	G	1·39	1·26	−0·13	21·12	17·20	−3·92
29	R	1·39	1·26	−0·13	19·44	17·20	−2·24
Oct. 2	JB	1·17	1·26	+0·09	19·25	17·20	−2·05
3	AD	1·28	1·26	−0·02	18·63	17·20	−1·43
1877.		s	s	s	"	"	"
Oct. 4	C	1·39	1·26	−0·13	18·89	17·20	−1·69
5	T	1·10	1·26	+0·16	21·80	17·20	−4·60
6	L	1·44	1·26	−0·18	19·64	17·20	−2·44
15	T	1·46	1·24	−0·22	20·41	17·00	−3·41
16	HP	1·28	1·24	−0·04	18·50	17·00	−1·50
18	BD	1·26	1·24	−0·02	18·92	16·90	−2·02
20	R	1·38	1·24	−0·14	17·58	16·80	−0·78
23	C	1·36	1·24	−0·12	18·40	16·80	−1·60
27	JP	1·18	1·22	+0·04	19·20	16·60	−2·60
Nov. 1	L	1·45	1·22	−0·23	20·75	16·60	−4·15
5	L	1·43	1·20	−0·23	19·86	16·60	−3·26
8	T	1·37	1·20	−0·17	18·69	16·60	−2·09
9	R	1·30	1·20	−0·10	....	...	...
12	C	1·39	1·20	−0·19	17·70	16·40	−1·30
13	T	1·41	1·20	−0·21	18·88	16·40	−2·48
14	AD	1·22	1·20	−0·02	18·29	16·40	−1·89
20	C	1·32	1·18	−0·14	16·84	16·20	−0·64
29	T	1·33	1·18	−0·15	17·51	16·00	−1·51
Dec. 31	L	1·16	1·10	−0·06	17·39	15·00	−2·39

SIDEREAL TIMES occupied by the TRANSIT of the DIAMETER of URANUS; and VERTICAL DIAMETERS of URANUS, corrected for Refraction and Parallax: compared with the corresponding results of the Nautical Almanac.

Jan. 26	AD	....	...	...	5·59	4·20	−1·39	Feb. 27	BD	....	...	...	5·18	4·20	−0·98
30	AD	....	...	...	4·63	4·20	−0·43	Mar. 10	AD	0·46	0·30	−0·16	5·94	4·20	−1·74
Feb. 2	BD	....	...	...	5·83	4·20	−1·63	17	L	0·47	0·30	−0·17	6·56	4·20	−2·36
14	FD	....	...	...	5·53	4·20	−1·33								

RIGHT ASCENSIONS and NORTH POLAR DISTANCES of the CENTER of the SUN.

Mean Solar Time of Transit of Center.	Observer.	R.A. from Observation.	Seconds of R.A. in Nautical Almanac.	Apparent Error of Nautical Almanac in R.A.	N.P.D. from Observation.	Seconds of N.P.D. in Nautical Almanac.	Apparent Error of Nautical Almanac in N.P.D.
1877. d h m s		h m s	s	s	° ′ ″	″	″
Jan. 2. 0. 4. 28·1	C	18. 53. 22·99	23·33	+ 0·34	112. 53. 21·37	24·00	+ 2·63
5. 0. 5. 50·0	HP	19. 6. 34·95	34·98	+ 0·03	112. 34. 27·96	30·40	+ 2·44
13. 0. 9. 7·0	AD	19. 41. 24·92	24·88	− 0·04	111. 24. 41·89	43·70	+ 1·81
15. 0. 9. 50·3	C	19. 50. 1·45	1·39	− 0·06	111. 3. 0·42	3·50	+ 3·08
22. 0. 11. 59·1	AD	20. 19. 46·46	46·35	− 0·11	109. 34. 48·46	50·20	+ 1·74
23. 0. 12. 14·2	C	20. 23. 58·18	58·24	+ 0·06	....	...	...
26. 0. 12. 55·1	AD	20. 36. 28·91	28·99	+ 0·08	108. 36. 18·40	21·00	+ 2·60
29. 0. 13. 28·7	HP	20. 48. 52·25	52·33	+ 0·08	107. 48. 53·29	56·50	+ 3·21
31. 0. 13. 47·0	FD	....	...	...	107. 15. 42·99	44·70	+ 1·71

RIGHT ASCENSIONS and NORTH POLAR DISTANCES of the CENTER of the SUN—*continued.*

Mean Solar Time of Transit of Center.	Observer.	R.A. from Observation.	Seconds of R.A. in Nautical Almanac.	Apparent Error of Nautical Almanac in R.A.	N.P.D. from Observation.	Seconds of N.P.D. in Nautical Almanac.	Apparent Error of Nautical Almanac in N.P.D.
1877. d h m s		h m s	s	s	° ′ ″	″	″
Feb. 8. 0. 14. 27·9	JB	21. 29. 17·22	17·23	+ 0·01	104. 51. 14·83	17·40	+ 2·57
16. 0. 14. 19·2	AD	22. 0. 40·89	40·87	— 0·02	102. 10. 48·28	49·40	+ 1·12
19. 0. 14. 3·8	L	22. 12. 15·09	15·08	— 0·01	101. 7. 14·66	16·20	+ 1·54
23. 0. 13. 33·7	HP	22. 27. 31·18	31·18	0·00	99. 40. 10·79	10·30	— 0·49
28. 0. 12. 42·3	JB	22. 46. 22·39	22·41	+ 0·02	97. 48. 6·53	7·40	+ 0·87
Mar. 1. 0. 12. 30·4	C	22. 50. 6·97	7·01	+ 0·04	....	...	...
9. 0. 10. 38·9	BD	23. 19. 47·62	47·78	+ 0·16	94. 19. 49·07	51·50	+ 2·43
14. 0. 9. 17·9	JB	23. 38. 9·21	9·22	+ 0·01	92. 21. 51·72	54·00	+ 2·28
16. 0. 8. 43·8	T	23. 45. 28·08	27·95	— 0·13	91. 34. 33·21	30·60	— 2·61
22. 0. 6. 56·5	L	0. 7. 19·81	19·66	— 0·15	89. 12. 18·50	18·20	— 0·30
23. 0. 6. 38·0	C	0. 10. 57·84	57·81	— 0·03	88. 48. 39·48	39·90	+ 0·42
April 13. 0. 0. 28·2	B	1. 27. 34·66	34·52	— 0·14	80. 48. 29·22	30·60	+ 1·38
22. 23. 58. 12·9	AD	2. 4. 44·54	44·51	— 0·03	....	...	...
May 1. 23. 56. 49·4	BD	2. 38. 49·80	49·78	— 0·02	74. 30. 17·65	19·20	+ 1·55
6. 23. 56. 22·1	L	....	...	...	73. 4. 36·56	36·50	— 0·06
7. 23. 56. 18·4	C	3. 1. 58·00	58·00	0·00	72. 48. 20·68	17·20	— 3·48
8. 23. 56. 14·9	BD	3. 5. 51·12	51·42	+ 0·30	72. 32. 12·22	14·90	+ 2·68
9. 23. 56. 12·7	T	3. 9. 45·53	45·42	— 0·11	72. 16. 28·75	30·10	+ 1·35
17. 23. 56. 13·0	L	3. 41. 18·17	18·30	+ 0·13	70. 21. 33·35	36·20	+ 2·85
24. 23. 56. 41·7	C	4. 9. 22·83	22·85	+ 0·02	68. 58. 30·25	31·50	+ 1·25
June 6. 23. 58. 35·0	L	....	...	...	67. 11. 58·78	60·00	+ 1·22
7. 23. 58. 46·3	BD	....	...	...	67. 6. 31·07	31·90	+ 0·83
8. 23. 58. 57·8	T	5. 10. 47·75	47·90	+ 0·15	67. 1. 26·45	27·90	+ 1·45
10. 23. 59. 21·9	C	5. 19. 5·03	5·08	+ 0·05	66. 52. 31·88	32·80	+ 0·92
11. 23. 59. 34·1	BD	5. 23. 13·82	14·00	+ 0·18	66. 48. 40·27	41·90	+ 1·63
13. 23. 59. 59·4	AD	5. 31. 32·29	32·31	+ 0·02	66. 42. 13·24	13·60	+ 0·36
15. 0. 0. 12·1	T	5. 35. 41·60	41·66	+ 0·06	66. 39. 36·29	36·50	+ 0·21
16. 0. 0. 24·9	C	5. 39. 51·01	51·10	+ 0·09	66. 37. 23·65	24·10	+ 0·45
18. 0. 0. 50·9	AD	5. 48. 10·11	10·14	+ 0·03	66. 34. 11·68	13·60	+ 1·92
19. 0. 1. 3·7	WL	5. 52. 19·57	19·69	+ 0·12	66. 33. 15·01	15·60	+ 0·59
22. 0. 1. 42·6	AD	6. 4. 48·28	48·28	0·00	66. 32. 49·20	50·30	+ 1·10
25. 0. 2. 20·8	BD	6. 17. 16·27	16·28	+ 0·01	66. 36. 6·16	7·70	+ 1·54
28. 0. 2. 58·1	C	6. 29. 43·27	43·16	— 0·11	66. 43. 4·77	6·70	+ 1·93
29. 0. 3. 10·0	L	6. 33. 51·76	51·77	+ 0·01	66. 46. 13·85	15·40	+ 1·55
July 3. 0. 3. 55·9	W	6. 50. 24·05	23·97	— 0·08	67. 2. 53·25	53·70	+ 0·45
4. 0. 4. 6·6	HP	6. 54. 31·39	31·36	— 0·03	67. 8. 6·58	3·70	— 2·88
5. 0. 4. 17·2	T	6. 58. 38·47	38·45	— 0·02	67. 13. 36·69	37·50	+ 0·81
10. 0. 5. 4·3	C	7. 19. 8·58	8·70	+ 0·12	67. 47. 19·61	21·00	+ 1·39
12. 0. 5. 20·6	AD	7. 27. 17·96	17·94	— 0·02	....	...	...
18. 0. 5. 57·1	L	7. 51. 33·53	33·72	+ 0·19	69. 1. 1·58	1·30	— 0·28
20. 0. 6. 4·6	AD	7. 59. 34·65	34·64	— 0·01	69. 23. 2·36	3·10	+ 0·74
21. 0. 6. 7·7	T	8. 3. 34·21	34·25	+ 0·04	69. 34. 34·61	35·20	+ 0·59
24. 0. 6. 13·3	AD	8. 15. 29·54	29·58	+ 0·04	....	...	...
30. 0. 6. 8·6	R	8. 39. 4·13	4·28	+ 0·15	71. 33. 11·94	15·90	+ 3·96
31. 0. 6. 5·9	W	8. 42. 58·04	57·99	— 0·05	71. 48. 0·03	1·60	+ 1·57
Aug. 14. 0. 4. 25·2	JP	9. 36. 28·80	28·73	— 0·07	75. 43. 48·45	51·40	+ 2·95
17. 0. 3. 49·1	JB	9. 47. 42·26	42·23	— 0·03	76. 40. 39·88	39·30	— 0·58
20. 0. 3. 8·2	T	9. 58. 50·99	51·03	+ 0·04	77. 39. 19·75	20·40	+ 0·65
21. 0. 2. 53·7	JP	10. 2. 33·02	32·98	— 0·04	77. 59. 17·59	17·80	+ 0·21
22. 0. 2. 38·5	G	10. 6. 14·27	14·46	+ 0·19	78. 19. 26·36	26·60	+ 0·24
28. 0. 0. 59·5	JB	10. 28. 14·39	14·50	+ 0·11	....	...	...
29. 0. 0. 41·7	JP	10. 31. 53·09	53·20	+ 0·11	80. 45. 20·51	21·10	+ 0·59
Sept. 3. 23. 58. 48·7	AD	10. 53. 39·11	39·18	+ 0·07	....	...	...
4. 23. 58. 29·0	JB	10. 57. 15·91	15·96	+ 0·05	83. 18. 33·19	34·70	+ 1·51
5. 23. 58. 9·4	T	11. 0. 52·78	52·53	— 0·25	83. 40. 56·01	57·50	+ 1·49
7. 23. 57. 28·9	L	11. 8. 5·32	5·08	— 0·24	84. 26. 1·50	1·60	+ 0·10

RIGHT ASCENSIONS and NORTH POLAR DISTANCES of the CENTER of the SUN—*concluded.*

Mean Solar Time of Transit of Center.	Observer.	R.A. from Observation.	Seconds of R.A. in Nautical Almanac.	Apparent Error of Nautical Almanac in R.A.	N.P.D. from Observation.	Seconds of N.P.D. in Nautical Almanac.	Apparent Error of Nautical Almanac in N.P.D.
1877. d h m s		h m s	s	s	° ′ ″	″	″
Sept. 21. 23. 52. 34·5	C	11. 58. 21·78	21·90	+ 0·12	89. 49. 20·55	21·30	+ 0·75
28. 23. 50. 11·8	R	12. 23. 34·62	34·79	+ 0·17	92. 33. 4·72	6·10	+ 1·38
Oct. 2. 23. 48. 55·9	AD	12. 38. 4·66	4·83	+ 0·17	94. 6. 17·19	18·40	+ 1·21
10. 23. 46. 41·8	T	13. 7. 22·66	22·80	+ 0·14	97. 10. 1·35	2·30	+ 0·95
16. 23. 45. 20·9	AD	13. 29. 40·87	41·08	+ 0·21	99. 23. 50·53	51·70	+ 1·17
17. 23. 45. 9·6	BD	13. 33. 26·07	26·08	+ 0·01	99. 45. 40·89	43·30	+ 2·41
19. 23. 44. 48·2	R	13. 40. 57·71	57·91	+ 0·20	100. 28. 57·43	60·60	+ 3·17
23. 23. 44. 13·6	L	13. 56. 9·31	9·48	+ 0·17	101. 53. 39·32	40·30	+ 0·98
25. 23. 44. 0·8	T	14. 3. 49·49	49·53	+ 0·04	102. 34. 55·41	56·90	+ 1·49
26. 23. 43. 55·2	JP	14. 7. 40·45	40·67	+ 0·22	102. 55. 14·38	18·00	+ 3·62
30. 23. 43. 41·3	BD	14. 23. 12·81	13·05	+ 0·24	104. 14. 36·46	38·90	+ 2·44
31. 23. 43. 40·1	L	14. 27. 8·12	8·15	+ 0·03	104. 33. 55·52	56·10	+ 0·58
Nov. 2. 23. 43. 39·7	T	14. 35. 0·80	0·83	+ 0·03	105. 11. 45·90	47·80	+ 1·90
7. 23. 43. 53·2	T	14. 54. 57·13	57·14	+ 0·01	....	...	...
11. 23. 44. 19·0	C	15. 11. 9·19	9·24	+ 0·05	107. 49. 1·26	2·40	+ 1·14
13. 23. 44. 36·8	AD	15. 19. 20·24	20·28	+ 0·04	108. 20. 42·79	44·20	+ 1·41
21. 23. 46. 21·2	JP	15. 52. 37·30	37·45	+ 0·15	110. 14. 2·39	4·40	+ 2·01
22. 23. 46. 37·9	G	15. 56. 50·60	50·74	+ 0·14	110. 26. 36·16	37·80	+ 1·64
27. 23. 48. 12·8	JB	16. 18. 8·58	8·79	+ 0·21	111. 23. 36·56	38·80	+ 2·24
Dec. 7. 23. 52. 13·6	AD	17. 1. 35·60	35·62	+ 0·02	112. 46. 42·43	41·30	− 1·13
12. 23. 54. 32·4	BD	17. 23. 37·59	37·59	0·00	113. 11. 34·35	37·40	+ 3·05
13. 23. 55. 1·1	B	17. 28. 2·97	2·97	0·00	113. 15. 11·60	13·90	+ 2·30
17. 23. 56. 58·3	T	17. 45. 46·67	46·73	+ 0·06	113. 24. 58·81	60·50	+ 1·69
26. 0. 0. 57·0	BD	18. 21. 18·50	18·65	+ 0·15	113. 21. 58·93	60·80	+ 1·87
27. 0. 1. 26·8	JP	18. 25. 44·98	44·96	− 0·02	113. 19. 30·29	31·10	+ 0·81
31. 0. 3. 23·7	L	18. 43. 28·38	28·39	+ 0·01	113. 4. 49·90	51·70	+ 1·80

RIGHT ASCENSIONS and NORTH POLAR DISTANCES of the CENTER of the MOON.

Jan. 4. 16. 49. 35·0	WC	11. 49. 8·25	9·15	+ 0·90	90. 17. 37·73	44·40	+ 6·67
5. 17. 35. 11·6	C	12. 38. 48·86	49·53	+ 0·67	96. 54. 17·95	27·10	+ 9·15
Jan. 21. 5. 6. 23·0	L	1. 11. 2·25	2·57	+ 0·32	78. 53. 36·81	33·70	− 3·11
22. 5. 52. 0·9	AD	2. 0. 44·17	44·38	+ 0·21	73. 17. 18·09	16·50	− 1·59
23. 6. 42. 17·4	C	2. 55. 5·51	5·68	+ 0·17	68. 18. 55·40	54·40	− 1·00
24. 7. 38. 13·6	JB	3. 55. 7·38	7·81	+ 0·43	64. 23. 57·92	55·30	− 2·62
25. 8. 39. 49·8	L	5. 0. 50·35	50·97	+ 0·62	62. 2. 38·01	39·80	+ 1·79
26. 9. 45. 24·8	AD	6. 10. 32·64	33·17	+ 0·53	61. 43. 16·54	15·90	− 0·64
27. 10. 51. 42·6	P	7. 20. 57·89	58·79	+ 0·90	63. 39. 30·62	35·00	+ 4·38
28. 11. 55. 21·5	C	8. 28. 43·77	44·71	+ 0·94	67. 42. 28·39	35·50	+ 7·11
29. 12. 54. 24·5	HP	9. 31. 53·10	54·10	+ 1·00	73. 23. 21·93	32·70	+ 10·77
30. 13. 48. 41·8	AD	10. 30. 15·84	16·72	+ 0·88	80. 5. 10·56	15·80	+ 5·24
Feb. 2. 16. 14. 25·7	AD	13. 8. 13·36	14·16	+ 0·80	100. 49. 40·41	49·50	+ 9·09
3. 17. 1. 49·5	W	13. 59. 41·44	42·04	+ 0·60	106. 40. 6·30	13·00	+ 6·70
Feb. 20. 5. 29. 2·7	T	3. 32. 2·33	2·75	+ 0·42	....	...	...
23. 8. 31. 52·1	HP	6. 47. 11·39	11·69	+ 0·30	62. 22. 43·11	45·70	+ 2·59
24. 9. 34. 56·4	T	7. 54. 22·64	23·25	+ 0·61	65. 20. 34·22	34·70	+ 0·48
25. 10. 34. 59·9	C	8. 58. 32·51	33·13	+ 0·62	70. 8. 49·29	54·10	+ 4·81
26. 11. 31. 7·1	AD	9. 58. 45·53	46·29	+ 0·76	76. 19. 21·78	29·90	+ 8·12
27. 12. 23. 39·4	BD	10. 55. 23·02	23·80	+ 0·78	83. 18. 46·76	54·30	+ 7·54
28. 13. 13. 40·4	JB	11. 49. 28·82	29·64	+ 0·82	90. 34. 22·33	29·60	+ 7·27
Mar. 7. 19. 10. 15·9	T	18. 14. 38·75	39·42	+ 0·67	....	...	...
Mar. 21. 5. 19. 59·6	T	5. 17. 17·74	18·17	+ 0·43	61. 43. 3·09	5·10	+ 2·01
23. 7. 22. 56·3	G	7. 28. 27·77	28·34	+ 0·57	63. 59. 18·11	20·30	+ 2·19
25. 9. 17. 47·5	T	9. 31. 31·01	31·61	+ 0·60	73. 22. 18·42	22·60	+ 4·18

RIGHT ASCENSIONS and NORTH POLAR DISTANCES of the CENTER of the MOON—*continued.*

Mean Solar Time of Transit of Center.	Observer.	R.A. from Observation.	Seconds of R.A. in Nautical Almanac.	Apparent Error of Nautical Almanac in R.A.	N.P.D. from Observation.	Seconds of N.P.D. in Nautical Almanac.	Apparent Error of Nautical Almanac in N.P.D.
1877. d h m s		h m s	s	s	° ′ ″	″	″
Mar. 27. 11. 0. 20·2	C	11. 22. 13·65	14·22	+ 0·57	86. 52. 51·71	57·10	+ 5·39
29. 12. 38. 0·6	T	13. 8. 3·13	3·72	+ 0·59	100. 49. 27·03	36·10	+ 9·07
30. 13. 27. 51·4	G	14. 1. 58·67	59·39	+ 0·72	106. 54. 27·67	33·20	+ 5·53
Apr. 19. 5. 17. 3·6	AD	7. 8. 41·35	41·74	+ 0·39	....	....	...
21. 7. 11. 30·9	HP	....	...	...	71. 31. 18·15	24·10	+ 5·95
23. 8. 52. 41·9	AD	11. 0. 41·29	41·85	+ 0·56	84. 7. 36·12	41·70	+ 5·58
24. 9. 40. 27·5	T	11. 52. 31·37	31·93	+ 0·56	91. 2. 41·54	48·40	+ 6·86
25. 10. 28. 2·1	JB	12. 44. 10·27	10·90	+ 0·63	97. 51. 12·41	19·90	+ 7·49
26. 11. 16. 36·1	C	13. 36. 48·85	49·46	+ 0·61	104. 10. 43·73	50·90	+ 7·17
May 2. 16. 35. 11·9	L	19. 19. 56·24	56·89	+ 0·65	116. 8. 1·00	2·00	+ 1·00
5. 18. 52. 32·4	T	21. 49. 29·04	29·68	+ 0·64	104. 25. 42·64	41·60	− 1·04
6. 19. 33. 40·7	L	22. 34. 40·64	41·29	+ 0·65	99. 5. 16·15	15·60	− 0·55
7. 20. 14. 2·3	C	....	....	...	93. 20. 8·87	6·10	− 2·77
May 24. 9. 59. 16·9	T	14. 9. 40·53	41·10	+ 0·57	107. 41. 36·85	39·70	+ 2·85
26. 11. 43. 28·0	BD	16. 2. 1·83	2·48	+ 0·65	115. 47. 14·70	17·00	+ 2·30
28. 13. 33. 1·8	T	17. 59. 46·71	47·12	+ 0·41	118. 1. 38·13	37·30	− 0·83
29. 14. 26. 11·8	B	18. 57. 2·02	2·47	+ 0·45	116. 49. 50·19	50·00	− 0·19
30. 15. 16. 30·8	AD	19. 51. 25·91	26·30	+ 0·39	114. 17. 40·00	39·80	− 0·20
June 5. 19. 29. 54·5	C	0. 29. 10·56	10·98	+ 0·42	83. 46. 25·66	22·60	− 3·06
June 15. 3. 55. 32·4	T	9. 31. 40·50	41·08	+ 0·58	74. 2. 48·11	54·10	+ 5·99
16. 4. 47. 1·0	C	10. 27. 14·17	14·85	+ 0·68	80. 23. 37·11	44·40	+ 7·29
17. 5. 35. 23·0	L	11. 19. 40·70	41·35	+ 0·65	87. 8. 25·03	33·00	+ 7·97
18. 6. 22. 5·6	AD	12. 10. 27·51	27·97	+ 0·46	93. 53. 48·17	55·90	+ 7·73
19. 7. 8. 34·3	WL	13. 1. 0·40	0·86	+ 0·46	100. 20. 4·42	9·50	+ 5·08
20. 7. 56. 3·9	T	13. 52. 34·38	35·11	+ 0·73	106. 9. 26·04	31·50	+ 5·46
23. 10. 30. 50·4	T	16. 39. 35·95	36·75	+ 0·80	117. 13. 25·11	29·50	+ 4·39
24. 11. 25. 14·7	C	17. 38. 5·70	6·37	+ 0·67	118. 4. 14·36	16·80	+ 2·44
25. 12. 18. 49·7	BD	18. 35. 46·14	46·85	+ 0·71	117. 22. 54·59	55·70	+ 1·11
27. 13. 58. 21·1	T	20. 23. 26·95	27·44	+ 0·49	111. 59. 60·69	59·10	− 1·59
29. 15. 25. 33·8	T	21. 58. 47·11	47·54	+ 0·43	102. 52. 24·44	23·50	− 0·94
July 2. 17. 25. 0·9	BD	0. 10. 23·55	24·18	+ 0·63	85. 57. 56·36	53·60	− 2·76
4. 18. 50. 23·3	T	1. 43. 53·10	53·51	+ 0·41	74. 37. 33·85	30·40	− 3·45
5. 19. 38. 44·6	C	2. 36. 18·85	19·29	+ 0·44	....	....	...
July 15. 4. 18. 15·5	C	11. 52. 44·14	44·61	+ 0·47	91. 46. 24·88	32·80	+ 7·92
21. 9. 20. 20·7	T	17. 19. 18·26	19·17	+ 0·91	118. 3. 14·62	17·20	+ 2·58
22. 10. 13. 51·7	L	18. 16. 54·61	55·42	+ 0·81	117. 49. 28·02	23·70	− 4·32
24. 11. 54. 40·0	AD	20. 5. 52·64	53·16	+ 0·52	113. 13. 17·85	15·80	− 2·05
26. 13. 23. 37·1	BD	21. 42. 57·43	58·16	+ 0·73	104. 32. 62·29	59·70	− 2·59
29. 15. 23. 7·9	T	23. 54. 37·56	37·90	+ 0·34	87. 53. 31·39	36·30	(+ 4·91)
30. 16. 3. 9·5	C	0. 38. 42·25	42·75	+ 0·50	82. 7. 31·22	28·20	− 3·02
Aug. 14. 4. 37. 23·4	JP	14. 10. 11·91	12·50	+ 0·59	108. 13. 45·54	52·80	+ 7·26
17. 7. 15. 58·8	JB	17. 1. 2·98	3·76	+ 0·78	117. 53. 37·06	40·70	+ 3·64
20. 9. 51. 48·0	T	19. 49. 7·48	8·07	+ 0·59	114. 19. 25·81	24·60	− 1·21
22. 11. 22. 20·7	G	21. 27. 48·13	48·56	+ 0·43	106. 10. 33·33	30·30	− 3·03
23. 12. 3. 48·8	AD	22. 13. 19·58	20·13	+ 0·55	101. 2. 57·84	54·00	− 3·84
31. 18. 3. 10·6	L	4. 45. 12·93	13·76	+ 0·83	62. 26. 3·80	2·90	− 0·90
Sept. 21. 11. 22. 33·0	JB	23. 26. 17·09	17·52	+ 0·43	91. 40. 46·63	44·60	− 2·03
22. 12. 2. 16·6	C	0. 10. 3·76	4·30	+ 0·54	85. 50. 41·69	38·10	− 3·59
23. 12. 43. 11·2	T	0. 55. 1·67	2·18	+ 0·51	80. 5. 53·59	51·50	− 2·09
24. 13. 26. 18·9	L	1. 42. 12·98	13·64	+ 0·66	74. 39. 60·59	58·20	− 2·39
27. 15. 57. 17·1	L	4. 25. 25·65	26·38	+ 0·73	63. 6. 18·55	18·20	− 0·35
Oct. 14. 6. 30. 31·8	C	20. 4. 8·67	9·36	+ 0·69	113. 11. 9·84	8·70	− 1·14
15. 7. 16. 32·0	T	20. 54. 12·94	13·38	+ 0·44	109. 15. 60·37	58·80	− 1·57
16. 7. 59. 34·7	HP	21. 41. 19·34	19·77	+ 0·43	104. 35. 8·12	5·70	− 2·42
17. 8. 40. 30·5	AD	22. 26. 18·37	18·77	+ 0·40	99. 20. 59·80	58·00	− 1·80
18. 9. 20. 18·2	BD	23. 10. 9·19	9·55	+ 0·36	93. 44. 40·68	38·30	− 2·38
20. 10. 40. 42·0	R	0. 38. 39·30	39·77	+ 0·47	82. 8. 26·17	23·10	− 3·07

RIGHT ASCENSIONS and NORTH POLAR DISTANCES of the CENTER of the MOON—*concluded.*

Mean Solar Time of Transit of Center.	Observer.	R.A. from Observation.	Seconds of R.A. in Nautical Almanac.	Apparent Error of Nautical Almanac in R.A.	N.P.D. from Observation.	Seconds of N.P.D. in Nautical Almanac.	Apparent Error of Nautical Almanac in N.P.D.
1877. d h m s		h m s	s	s	° ′ ″	″	″
Oct. 22. 12. 9. 18·0	T	2. 15. 22·91	23·49	+ 0·58	71. 26. 5·53	2·80	− 2·73
23. 12. 59. 0·5	C	3. 9. 10·13	10·81	+ 0·68	67. 6. 56·70	55·20	− 1·50
24. 13. 52. 50·6	L	4. 7. 5·67	6·50	+ 0·83	63. 56. 49·54	48·50	− 1·04
26. 15. 49. 29·2	C	6. 11. 56·55	57·36	+ 0·81	62. 20. 27·97	29·80	+ 1·83
27. 16. 48. 35·1	L	7. 15. 8·68	9·54	+ 0·86	64. 13. 35·61	37·50	+ 1·89
29. 18. 39. 52·9	T	....	...	...	72. 47. 5·01	13·50	+ 8·49
30. 19. 31. 20·1	BD	10. 10. 10·14	11·19	+ 1·05	78. 49. 22·62	29·90	+ 7·28
31. 20. 20. 53·4	L	11. 3. 48·14	48·97	+ 0·83	85. 31. 40·60	49·70	+ 9·10
Nov. 10. 4. 22. 2·8	AD	19. 41. 45·56	45·95	+ 0·39	114. 18. 54·95	51·30	− 3·65
12. 5. 54. 28·8	C	21. 22. 19·89	20·30	+ 0·41	106. 18. 43·46	41·30	− 2·16
13. 6. 36. 12·3	T	22. 8. 6·78	7·22	+ 0·44	101. 16. 61·39	59·10	− 2·29
14. 7. 16. 14·1	AD	22. 52. 11·66	12·11	+ 0·45	95. 50. 33·29	30·20	− 3·09
16. 8. 34. 44·2	C	0. 19. 47·92	48·44	+ 0·52	84. 23. 10·18	8·20	− 1·90
17. 9. 17. 33·5	T	1. 5. 40·68	41·04	+ 0·36	78. 43. 23·65	21·30	− 2·35
18. 10. 2. 18·9	AD	1. 54. 30·05	30·51	+ 0·46	73. 24. 5·93	4·10	− 1·83
19. 10. 51. 1·4	L	2. 47. 17·08	17·75	+ 0·67	68. 43. 28·65	26·00	− 2·65
20. 11. 44. 15·5	C	3. 44. 36·51	37·17	+ 0·66	65. 3. 37·86	36·10	− 1·76
21. 12. 41. 42·9	T	4. 46. 9·87	10·70	+ 0·83	62. 48. 16·83	18·20	+ 1·37
22. 13. 41. 55·4	JP	5. 50. 28·77	29·50	+ 0·73	62. 17. 12·53	13·20	+ 0·67
23. 14. 42. 30·1	G	6. 55. 10·06	10·91	+ 0·85	63. 39. 0·54	3·20	+ 2·66
27. 18. 17. 33·0	C	10. 46. 34·49	35·23	+ 0·74	83. 35. 29·28	38·40	+ 9·12
29. 19. 52. 58·1	AD	12. 30. 8·36	9·22	+ 0·86	97. 2. 55·62	64·30	+ 8·68
Dec. 9. 3. 47. 52·6	L	21. 1. 49·92	50·31	+ 0·39	108. 1. 43·42	38·80	− 4·62
11. 5. 11. 29·5	G	22. 33. 33·66	33·85	+ 0·19	97. 53. 34·74	32·40	− 2·34
12. 5. 50. 51·2	AD	23. 16. 58·36	58·49	+ 0·13	92. 19. 18·72	16·00	− 2·72
13. 6. 30. 7·8	BD	0. 0. 18·04	18·18	+ 0·14	86. 38. 3·15	1·00	− 2·15
14. 7. 10. 33·0	B	0. 44. 46·43	46·62	+ 0·19	80. 59. 23·64	21·10	− 2·54
17. 9. 30. 52·0	AD	3. 17. 18·15	18·51	+ 0·36	66. 31. 24·11	17·70	− 6·41
18. 10. 26. 52·8	T	4. 17. 24·69	25·15	+ 0·46	63. 36. 28·07	27·20	− 0·87
26. 17. 51. 0·3	L	12. 14. 17·65	18·46	+ 0·81	95. 17. 52·19	58·80	+ 6·61
27. 18. 39. 0·2	B	13. 6. 21·93	22·78	+ 0·85	101. 41. 47·74	57·20	+ 9·46

RIGHT ASCENSIONS and NORTH POLAR DISTANCES of the CENTER of MERCURY.

May 9. 1. 15. 23·6	BD	4. 25. 12·84	12·94	+ 0·10	66. 4. 37·24	39·40	+ 2·16
June 17. 22. 28. 36·4	AD	4. 15. 40·51	40·54	+ 0·03	72. 29. 34·08	35·40	+ 1·32
July 3. 22. 50. 37·4	HP	5. 40. 50·11	50·22	+ 0·11	67. 29. 32·86	32·60	− 0·26
30. 0. 52. 26·8	R	9. 25. 30·02	30·03	+ 0·01	73. 4. 26·41	28·10	+ 1·69
31. 0. 55. 53·8	W	9. 32. 54·06	54·10	+ 0·04	73. 42. 55·77	57·50	+ 1·73
Aug. 2. 1. 2. 18·4	B	....	...	...	75. 2. 15·45	16·70	+ 1·25
22. 1. 36. 31·1	G	11. 40. 22·28	22·39	+ 0·11	88. 54. 21·53	22·60	+ 1·07
31. 1. 36. 18·1	R	12. 15. 38·24	38·14	− 0·10	94. 14. 55·19	56·40	+ 1·31
Oct. 17. 22. 47. 29·9	BD	12. 35. 36·85	36·89	+ 0·04	91. 37. 24·91	25·10	+ 0·19
19. 22. 50. 46·7	R	12. 46. 47·34	47·39	+ 0·05	92. 49. 39·46	40·00	+ 0·54
30. 23. 13. 40·0	BD	13. 53. 6·51	6·65	+ 0·14	100. 15. 20·04	21·20	+ 1·16

RIGHT ASCENSIONS and NORTH POLAR DISTANCES of the CENTER of VENUS.

Jan. 22. 22. 23. 12·7	C	18. 34. 38·77	38·77	0·00	....	...	...
Feb. 27. 23. 8. 40·2	JB	21. 42. 9·76	9·58	− 0·18	104. 54. 42·31	44·40	+ 2·09

RIGHT ASCENSIONS and NORTH POLAR DISTANCES of the CENTER of VENUS—*concluded.*

Mean Solar Time of Transit of Center.	Observer.	R.A. from Observation.	Seconds of R.A. in Nautical Almanac.	Apparent Error of Nautical Almanac in R.A.	N.P.D. from Observation.	Seconds of N.P.D. in Nautical Almanac.	Apparent Error of Nautical Almanac in N.P.D.
1877. d h m s		h m s	s	s	° ′ ″	″	″
Mar. 6. 23. 14. 57·4	HP	22. 16. 3·83	3·81	− 0·02	102. 5. 1·71	3·00	+ 1·29
June 8. 0. 36. 39·0	BD	5. 44. 38·58	38·64	+ 0·06	66. 1. 21·23	22·60	+ 1·37
14. 0. 45. 16·5	AD	6. 16. 56·86	56·93	+ 0·07	65. 48. 50·52	51·10	+ 0·58
15. 0. 46. 42·9	T	6. 22. 19·99	20·19	+ 0·20	65. 49. 15·37	16·50	+ 1·13
16. 0. 48. 9·2	C	6. 27. 43·12	43·33	+ 0·21	65. 50. 23·05	25·00	+ 1·95
18. 0. 51. 1·3	AD	6. 38. 28·80	29·02	+ 0·22	65. 54. 49·92	51·30	+ 1·38
19. 0. 52. 26·9	WL	....	...	...	65. 58. 9·13	8·80	− 0·30
21. 0. 55. 17·0	L	6. 54. 34·85	35·18	+ 0·33	66. 6. 51·41	52·10	+ 0·69
25. 1. 0. 51·6	BD	7. 15. 56·61	56·57	− 0·04	66. 32. 43·95	46·00	+ 2·05
28. 1. 4. 55·3	C	7. 31. 50·64	50·63	− 0·01	66. 59. 26·63	26·80	+ 0·17
29. 1. 6. 14·5	L	7. 37. 6·67	7·06	+ 0·39	67. 9. 39·68	41·60	+ 1·92
July 10. 1. 19. 46·1	C	8. 34. 2·65	2·75	+ 0·10	69. 44. 33·02	34·10	+ 1·08
20. 1. 30. 0·8	AD	9. 23. 44·62	44·65	+ 0·03	73. 5. 3·46	4·20	+ 0·74
30. 1. 38. 11·9	R	10. 11. 22·60	22·75	+ 0·15	77. 10. 46·50	48·40	+ 1·90
31. 1. 38. 54·9	W	10. 16. 2·32	2·27	− 0·05	77. 37. 22·48	24·50	+ 2·02
Aug. 14. 1. 47. 18·6	JP	11. 19. 39·18	39·13	− 0·05	84. 18. 5·65	7·20	+ 1·55
31. 1. 55. 6·9	R	12. 34. 30·18	30·26	+ 0·08	93. 1. 49·26	50·30	+ 1·04
Sept. 5. 1. 57. 21·5	JB	12. 56. 27·90	27·97	+ 0·07	95. 35. 57·26	58·20	+ 0·94
6. 1. 57. 49·2	T	13. 0. 52·26	52·31	+ 0·05	....	...	...
27. 2. 9. 46·2	JP	14. 35. 38·80	38·84	+ 0·04	106. 3. 22·24	22·30	+ 0·06
29. 2. 11. 13·5	R	14. 44. 59·46	59·50	+ 0·04	106. 53. 29·55	29·90	+ 0·35
Oct. 2. 2. 13. 32·2	JB	14. 59. 8·15	8·29	+ 0·14	108. 5. 41·00	42·80	+ 1·80
5. 2. 16. 0·4	T	15. 13. 26·48	26·71	+ 0·23	109. 14. 2·31	4·00	+ 1·69
18. 2. 28. 31·7	BD	16. 17. 15·03	14·93	− 0·10	113. 17. 42·46	44·70	+ 2·24
20. 2. 30. 40·9	R	16. 27. 17·66	17·72	+ 0·06	113. 46. 38·74	39·80	+ 1·06
24. 2. 35. 8·0	BD	16. 47. 31·74	31·83	+ 0·09	114. 36. 52·90	55·00	+ 2·10
Nov. 8. 2. 52. 37·3	T	18. 4. 12·24	12·23	− 0·01	116. 8. 55·45	56·30	+ 0·85
14. 2. 59. 20·9	AD	18. 34. 36·30	36·37	+ 0·07	116. 1. 28·00	28·20	+ 0·20
16. 3. 1. 28·4	C	18. 44. 37·21	37·29	+ 0·08	115. 53. 25·06	24·60	− 0·46
20. 3. 5. 28·7	C	19. 4. 24·43	24·52	+ 0·09	....	...	...
23. 3. 8. 13·8	G	19. 18. 59·68	59·76	+ 0·08	115. 4. 3·29	4·30	+ 1·01
29. 3. 12. 56·8	T	19. 47. 22·79	22·90	+ 0·11	113. 57. 9·70	10·40	+ 0·70
Dec. 12. 3. 18. 37·9	AD	20. 44. 20·13	20·11	− 0·02	110. 25. 44·20	45·70	+ 1·50
14. 3. 18. 50·9	B	20. 52. 26·26	26·25	− 0·01	109. 46. 32·93	35·20	+ 2·27
18. 3. 18. 40·9	T	21. 8. 2·44	2·32	− 0·12	108. 24. 3·03	4·50	+ 1·47
24. 3. 16. 48·2	R	21. 29. 48·79	48·85	+ 0·06	106. 11. 53·49	54·40	+ 0·91
26. 3. 15. 42·8	BD	21. 36. 36·30	36·38	+ 0·08	105. 26. 7·47	8·70	+ 1·23
31. 3. 11. 53·1	L	21. 52. 28·78	28·86	+ 0·08	103. 29. 16·42	18·90	+ 2·48

RIGHT ASCENSIONS and NORTH POLAR DISTANCES of the CENTER of MARS.

July 2. 16. 14. 40·6	BD	22. 59. 51·67	52·18	+ 0·51	101. 2. 10·85	10·80	− 0·05
6. 16. 4. 39·2	L	23. 5. 34·89	35·31	+ 0·42	100. 40. 38·92	35·40	− 3·52
29. 14. 55. 26·7	T	23. 26. 51·76	52·05	+ 0·29	99. 45. 2·37	0·90	− 1·47
30. 14. 51. 54·5	C	23. 27. 15·49	15·88	+ 0·39	99. 45. 37·78	34·70	− 3·08
Aug. 2. 14. 40. 59·6	B	23. 28. 8·55	9·06	+ 0·51	99. 48. 52·55	51·50	− 1·05
7. 14. 21. 45·9	HP	23. 28. 34·43	34·94	+ 0·51	99. 59. 33·21	30·90	− 2·31
11. 14. 5. 26·0	AD	23. 27. 58·05	58·46	+ 0·41	100. 12. 25·07	21·60	− 3·47
16. 13. 43. 52·0	R	23. 26. 3·32	3·78	+ 0·46	100. 32. 55·49	51·00	− 4·49
17. 13. 39. 24·4	JB	23. 25. 31·56	32·10	+ 0·54	100. 37. 28·95	25·50	− 3·45
23. 13. 11. 44·4	AD	23. 21. 26·32	26·84	+ 0·52	101. 7. 7·95	6·60	− 1·35

RIGHT ASCENSIONS and NORTH POLAR DISTANCES of the CENTER of MARS—*concluded.*

Mean Solar Time of Transit of Center.	Observer.	R.A. from Observation.	Seconds of R.A. in Nautical Almanac.	Apparent Error of Nautical Almanac in R.A.	N.P.D. from Observation.	Seconds of N.P.D. in Nautical Almanac.	Apparent Error of Nautical Almanac in N.P.D.
1877. d h m s		h m s	s	s	° ′ ″	″	″
Aug. 29. 12. 42. 45·2	JP	23. 16. 1·74	2·31	+ 0·57	101. 38. 17·14	15·80	− 1·34
30. 12. 37. 49·4	HP	23. 15. 1·74	2·36	+ 0·62	101. 43. 24·65	21·30	− 3·35
31. 12. 32. 52·5	R	23. 14. 0·48	1·11	+ 0·63	101. 48. 26·20	22·20	− 4·00
Sept. 2. 12. 22. 55·4	AD	23. 11. 54·92	55·50	+ 0·58	101. 58. 9·98	6·10	− 3·88
5. 12. 7. 54·6	JB	23. 8. 41·30	41·89	+ 0·59	102. 11. 43·48	40·50	− 2·98
6. 12. 2. 53·9	T	23. 7. 36·28	36·75	+ 0·47	102. 15. 53·61	51·10	− 2·51
7. 11. 57. 53·0	AD	23. 6. 31·11	31·64	+ 0·53	102. 19. 52·26	49·50	− 2·76
11. 11. 37. 53·7	T	23. 2. 14·80	15·34	+ 0·54	102. 33. 23·96	22·20	− 1·76
21. 10. 49. 25·3	JB	22. 53. 3·95	4·62	+ 0·67	102. 47. 10·74	8·90	− 1·84
26. 10. 26. 30·9	C	22. 49. 48·56	49·14	+ 0·58	102. 42. 9·67	7·20	− 2·47
27. 10. 22. 3·9	JP	22. 49. 17·36	17·90	+ 0·54	102. 40. 11·13	9·30	− 1·83
28. 10. 17. 39·7	G	22. 48. 49·03	49·42	+ 0·39	102. 37. 53·90	52·40	− 1·50
29. 10. 13. 18·2	R	22. 48. 23·38	23·75	+ 0·37	102. 35. 18·32	16·40	− 1·92
Oct. 2. 10. 0. 30·9	JB	22. 47. 23·58	24·09	+ 0·51	102. 25. 38·96	36·50	− 2·46
3. 9. 56. 21·1	AD	22. 47. 9·64	10·10	+ 0·46	102. 21. 47·68	46·30	− 1·38
4. 9. 52. 14·2	C	22. 46. 58·63	59·11	+ 0·48	102. 17. 38·92	38·10	− 0·82
6. 9. 44. 9·4	L	22. 46. 45·66	46·23	+ 0·57	102. 8. 29·85	27·90	− 1·95
15. 9. 10. 17·1	T	22. 48. 16·77	17·11	+ 0·34	101. 13. 22·00	21·20	− 0·80
16. 9. 6. 45·8	HP	22. 48. 41·45	41·75	+ 0·30	101. 5. 58·94	56·70	− 2·24
18. 8. 59. 51·4	BD	22. 49. 38·99	39·28	+ 0·29	100. 50. 26·47	26·00	− 0·47
20. 8. 53. 7·6	R	22. 50. 47·17	47·44	+ 0·27	100. 34. 3·54	1·80	− 1·74
23. 8. 43. 20·6	C	22. 52. 48·28	48·72	+ 0·44	100. 7. 53·95	51·80	− 2·15
26. 8. 33. 55·4	T	22. 55. 11·20	11·60	+ 0·40	99. 39. 57·47	56·60	− 0·87
27. 8. 30. 51·7	JP	22. 56. 3·53	3·79	+ 0·26	99. 30. 17·39	16·20	− 1·19
Nov. 1. 8. 16. 4·3	L	23. 0. 56·47	57·06	+ 0·59	98. 39. 19·64	17·70	− 1·94
3. 8. 10. 24·0	T	....	...	...	98. 17. 46·51	45·20	− 1·31
8. 7. 56. 45·5	T	23. 9. 10·37	10·60	+ 0·23	97. 21. 14·22	14·00	− 0·22
9. 7. 54. 7·1	R	23. 10. 28·09	28·28	+ 0·19	97. 9. 31·35	30·10	− 1·25
12. 7. 46. 21·3	C	23. 14. 30·68	31·08	+ 0·40	96. 33. 30·33	31·00	+ 0·67
13. 7. 43. 49·5	T	23. 15. 55·04	55·14	+ 0·10	96. 21. 16·63	16·20	− 0·43
14. 7. 41. 18·7	AD	23. 17. 20·39	20·68	+ 0·29	96. 8. 54·83	54·40	− 0·43
16. 7. 36. 21·7	C	23. 20. 15·77	16·01	+ 0·24	95. 43. 50·89	50·30	− 0·59
20. 7. 26. 43·7	C	23. 26. 22·40	22·64	+ 0·24	94. 52. 28·15	26·90	− 1·25
22. 7. 22. 2·2	JP	23. 29. 33·17	33·35	+ 0·18	94. 26. 11·64	10·40	− 1·24
29. 7. 6. 11·0	T	23. 41. 15·33	15·51	+ 0·18	92. 51. 32·65	33·80	+ 1·15
30. 7. 3. 59·2	AD	23. 42. 59·74	59·92	+ 0·18	92. 37. 45·49	44·30	− 1·19
Dec. 1. 7. 1. 48·2	L	23. 44. 44·87	45·29	+ 0·42	92. 23. 50·54	50·50	− 0·04
12. 6. 38. 47·5	AD	0. 5. 2·52	2·62	+ 0·10	89. 46. 54·55	55·40	+ 0·85
13. 6. 36. 46·7	BD	0. 6. 57·96	58·06	+ 0·10	89. 32. 21·74	21·60	− 0·14
14. 6. 34. 46·6	B	0. 8. 54·09	54·21	+ 0·12	89. 17. 43·02	45·60	+ 2·58
18. 6. 26. 53·0	T	0. 16. 45·41	45·59	+ 0·18	88. 19. 2·23	2·60	+ 0·37
24. 6. 15. 21·2	R	0. 28. 51·10	51·31	+ 0·21	86. 50. 19·45	18·30	− 1·15
27. 6. 9. 43·3	JP	0. 35. 1·97	1·96	− 0·01	86. 5. 46·87	46·00	− 0·87
31. 6. 2. 20·1	L	0. 43. 23·77	23·97	+ 0·20	85. 6. 18·77	18·40	− 0·37

RIGHT ASCENSIONS and NORTH POLAR DISTANCES of CERES (1).

Mean Solar Time of Observation.	R.A. from Observation.	Seconds of R.A. in Nautical Almanac.	Apparent Error of Nautical Almanac in R.A.	N.P.D. from Observation.	Seconds of N.P.D. in Nautical Almanac.	Apparent Error of Nautical Almanac in N.P.D.
1877. d h m s	h m s	s	s	° ′ ″	″	″
July 24. 12. 57. 44·0	21. 9. 7·01	1·25	− 5·76	118. 47. 13·45	29·70	+ 16·25
Aug. 15. 11. 11. 44·7	20. 49. 34·50	28·72	− 5·78	120. 39. 30·97	41·30	+ 10·33
16. 11. 6. 58·0	20. 48. 43·63	38·12	− 5·51	120. 42. 48·93	65·00	+ 16·07
22. 10. 38. 36·6	20. 43. 56·85	51·16	− 5·69	120. 59. 37·99	54·40	+ 16·41

RIGHT ASCENSIONS and NORTH POLAR DISTANCES of CERES ①—*concluded.*

Mean Solar Time of Observation.	R.A. from Observation.	Seconds of R.A. in Nautical Almanac or Berliner Jahrbuch.	Apparent Error of Nautical Almanac or Berliner Jahrbuch in R.A.	N.P.D. from Observation.	Seconds of N.P.D. in Nautical Almanac or Berliner Jahrbuch.	Apparent Error of Nautical Almanac or Berliner Jahrbuch in N.P.D.
1877. d h m s	h m s	s	s	° ′ ″	″	″
Aug. 23. 10. 24. 37·4 P	20. 43. 12·67	6·84	− 5·83	121. 1. 57·40	66·20	+ 8·80
23. 10. 33. 56·4	20. 43. 12·49	6·55	− 5·94	121. 1. 56·02	67·00	+10·98
27. 10. 6. 6·4 P	20. 40. 24·83	19·13	− 5·70	121. 9. 10·30	16·40	+ 6·10

RIGHT ASCENSIONS and NORTH POLAR DISTANCES of PALLAS ②.

June 19. 13. 30. 36·1	19. 24. 4·90	5·44	+ 0·54	68. 26. 44·99	46·00	+ 1·01
30. 12. 29. 39·4 P	19. 15. 41·35	42·09	+ 0·74	68. 27. 7·70	8·50	+ 0·80
July 20. 11. 4. 14·3	18. 59. 32·40	33·15	+ 0·75	69. 51. 19·16	21·20	+ 2·04
24. 10. 45. 32·4	18. 56. 33·67	34·45	+ 0·78	70. 20. 21·11	22·20	+ 1·09
26. 10. 26. 56·4 P	18. 55. 8·82	9·22	+ 0·40	70. 36. 8·10	9·40	+ 1·30
30. 10. 8. 31·4 P	18. 52. 26·73	27·17	+ 0·44	71. 10. 19·40	18·70	− 0·70
31. 10. 3. 57·4 P	18. 51. 48·33	48·70	+ 0·37	71. 19. 18·00	20·30	+ 2·30
Aug. 2. 9. 54. 51·4 P	18. 50. 33·97	34·40	+ 0·43	71. 37. 56·20	56·20	0·00
3. 9. 50. 20·4 P	18. 49. 58·29	58·62	+ 0·33	71. 47. 29·80	29·80	0·00
4. 9. 45. 49·4 P	18. 49. 23·19	23·80	+ 0·61	71. 57. 12·60	13·60	+ 1·00

RIGHT ASCENSIONS and NORTH POLAR DISTANCES of JUNO ③.

May 31. 11. 58. 10·4 P	16. 45. 50·33	47·81	− 2·52	93. 52. 45·80	43·80	− 2·00
June 2. 11. 48. 37·4 P	16. 44. 8·76	6·28	− 2·48	93. 48. 17·90	15·50	− 2·40
7. 11. 24. 45·4 P	16. 39. 55·55	52·90	− 2·65	93. 39. 20·70	18·40	− 2·30
9. 11. 15. 13·4 P	16. 38. 15·32	12·65	− 2·67	93. 36. 43·70	38·90	− 4·80
15. 10. 56. 5·4	....	...	...	93. 31. 58·67	56·00	− 2·67
16. 10. 51. 22·7	16. 32. 35·66	33·12	− 2·54	93. 31. 41·02	37·70	− 3·32
19. 10. 37. 17·7	16. 30. 18·11	15·77	− 2·34	93. 31. 34·75	32·00	− 2·75
25. 10. 0. 9·4 P	16. 26. 3·48	0·93	− 2·55	93. 34. 59·00	57·40	− 1·60
27. 9. 50. 59·4 P	16. 24. 44·95	42·56	− 2·39	93. 37. 11·20	8·60	− 2·60

RIGHT ASCENSIONS and NORTH POLAR DISTANCES of VESTA ④.

Sept. 7. 12. 49. 54·4	23. 58. 41·11	40·33	− 0·78	102. 28. 48·22	54·70	+ 6·48
Oct. 9. 10. 17. 5·7	....	...	...	105. 12. 59·53	66·30	+ 6·77
15. 9. 50. 5·2	23. 28. 11·37	10·59	− 0·78	105. 18. 32·10	36·40	+ 4·30
18. 9. 36. 55·4	23. 26. 49·06	48·25	− 0·81	105. 18. 1·52	8·10	+ 6·58

RIGHT ASCENSIONS and NORTH POLAR DISTANCES of HEBE ⑥.

May 15. 12. 32. 57·8	16. 8. 17·59	11·71	− 5·88	87. 41. 41·27	22·30	−18·97
28. 11. 20. 21·4 P	15. 55. 64·75	58·85	− 5·90	87. 13. 69·90	46·80	−23·10
31. 11. 5. 46·4 P	15. 53. 17·36	11·55	− 5·81	87. 12. 55·00	31·50	−23·50
June 2. 10. 56. 5·4 P	15. 51. 27·83	22·12	− 5·71	87. 12. 70·60	47·90	−22·70
7. 10. 32. 3·4 P	15. 47. 4·70	...	...	87. 17. 46·60	...	...
9. 10. 22. 31·4 P	15. 45. 24·51	...	...	87. 21. 10·80	...	...

RIGHT ASCENSIONS and NORTH POLAR DISTANCES of IRIS ⑦.*

Oct. 23. 13. 37. 41·1	3. 47. 57·11	51·82	− 5·29	63. 30. 39·84	46·91	+ 7·07
Nov. 13. 12. 0. 7·8	3. 32. 55·44	49·57	− 5·87	65. 33. 38·92	49·16	+10·24

* The tabular places of Iris are taken from the ephemeris in the Berliner Jahrbuch Circulars, Nos. 78 and 79.

The letter P signifies that the observation was made at the Observatory of Paris; the time given is Mean Solar Time of Greenwich.

RIGHT ASCENSIONS and NORTH POLAR DISTANCES of IRIS (7)—*concluded.*

Mean Solar Time of Observation.	R.A. from Observation.	Seconds of R.A. in Berliner Jahrbuch.	Apparent Error of Berliner Jahrbuch in R.A.	N.P.D. from Observation.	Seconds of N.P.D. in Berliner Jahrbuch.	Apparent Error of Berliner Jahrbuch in N.P.D.
1877. d h m s	h m s	s	s	° ′ ″	″	″
Nov. 16. 11. 45. 40·3	3. 30. 15·22	9·49	− 5·73	65. 57. 33·15	43·92	+10·77
20. 12. 26. 26·8	3. 26. 44·85	39·18	− 5·67	66. 30. 44·86	55·94	+11·12
22. 11. 16. 53·3	3. 24. 62·94	57·31	− 5·63	66. 47. 42·83	53·56	+10·73
28. 10. 39. 17·4 P	3. 20. 21·11	15·52	− 5·59	67. 38. 47·30	60·60	+13·00
Dec. 6. 10. 12. 15·6	3. 15. 26·40	21·14	− 5·26	68. 44. 9·48	21·03	+11·55
10. 9. 54. 50·7	3. 13. 44·88	39·91	− 4·97	69. 13. 58·11	69·83	+11·72
14. 9. 38. 0·4	3. 12. 38·01	33·16	− 4·85	69. 41. 11·46	21·78	+10·32

RIGHT ASCENSIONS and NORTH POLAR DISTANCES of PARTHENOPE (12).

May	15. 12. 58. 17·6	16. 33. 41·58	40·24	− 1·34	104. 51. 44·24	39·66	− 4·58
	28. 11. 45. 40·4 P	16. 21. 28·69	27·35	− 1·34	104. 30. 54·60	47·60	− 7·00
	31. 11. 30. 57·4 P	16. 18. 32·57	31·13	− 1·44	104. 27. 29·20	20·30	− 8·90
June	2. 11. 21. 9·4 P	16. 16. 35·85	34·44	− 1·41	104. 25. 31·50	23·90	− 7·60
	7. 10. 56. 45·4 P	16. 11. 51·22	49·81	− 1·41	104. 21. 64·90	57·40	− 7·50
	14. 10. 32. 27·0	16. 5. 43·79	42·54	− 1·25	104. 20. 63·87	59·50	− 4·37

RIGHT ASCENSIONS and NORTH POLAR DISTANCES of MELPOMENE (18).*

Nov.	20. 12. 48. 38·4	4. 49. 9·94	2·24	− 7·70	88. 1. 11·02	16·40	+ 5·38
	27. 12. 14. 13·7	4. 42. 15·51	7·84	− 7·67	88. 11. 35·33	41·41	+ 6·08
Dec.	6. 11. 29. 48·1	4. 33. 11·59	4·03	− 7·56	88. 2. 57·90	63·51	+ 5·61
	7. 11. 24. 54·2	4. 32. 13·51	5·90	− 7·61	88. 0. 26·53	33·27	+ 6·74
	12. 11. 0. 38·9	4. 27. 36·94	29·66	− 7·28	87. 43. 30·11	35·15	+ 5·04
	13. 10. 55. 51·4	4. 26. 45·22	37·91	− 7·31	87. 39. 14·73	20·20	+ 5·47
	14. 10. 51. 5·1	4. 25. 54·71	47·50	− 7·21	87. 34. 44·24	48·85	+ 4·61
	17. 10. 36. 55·1	4. 23. 32·12	25·06	− 7·06	87. 19. 36·52	40·67	+ 4·15
	20. 10. 13. 41·4 P	4. 21. 24·10	...	...	87. 1. 18·90	...	...
	24. 9. 55. 20·4 P	4. 18. 46·93	...	...	86. 33. 34·30	...	...

RIGHT ASCENSIONS and NORTH POLAR DISTANCES of THEMIS (24).

July	30. 11. 31. 29·4 P	20. 15. 37·81	37·90	+ 0·09	110. 57. 56·10	55·70	− 0·40
	31. 11. 26. 46·4 P	20. 14. 50·97	50·97	0·00	111. 0. 20·30	22·10	+ 1·80
Aug.	2. 11. 17. 21·4 P	20. 13. 17·75	17·92	+ 0·17	111. 5. 8·20	8·20	0·00
	4. 11. 7. 58·4 P	20. 11. 46·35	46·23	− 0·12	111. 9. 43·30	44·80	+ 1·50

RIGHT ASCENSIONS and NORTH POLAR DISTANCES of BELLONA (26).

Mar.	5. 11. 22. 4·4 P	10. 26. 37·99	...	...	76. 13. 12·50	...	...
	8. 11. 8. 10·4 P	10. 24. 31·55	...	...	75. 48. 37·20	...	...
	9. 11. 3. 34·4 P	10. 23. 51·01	...	...	75. 40. 42·90	...	...
	10. 10. 58. 58·4 P	10. 23. 11·21	...	...	75. 32. 59·30	...	...

RIGHT ASCENSIONS and NORTH POLAR DISTANCES of EUPHROSYNE (31).

Dec.	6. 12. 56. 0·7	5. 59. 38·43	45·98	+ 7·55	32. 17. 21·47	7·95	−13·52
	12. 12. 23. 32·9	5. 50. 44·59	52·65	+ 8·06	31. 19. 15·08	8·64	− 6·44
	17. 11. 55. 51·8	5. 42. 41·74	49·50	+ 7·76	30. 42. 26·57	12·12	−14·45
	20. 11. 29. 49·4 P	5. 37. 45·46	52·67	+ 7·21	30. 25. 37·10	19·60	−17·50
	24. 11. 7. 31·4 P	5. 31. 9·62	17·01	+ 7·39	30. 18. 79·20	59·30	−19·90

* The tabular places of Melpomene are taken from the ephemeris in the Berliner Jahrbuch Circular, No. 79.
The letter P signifies that the observation was made at the Observatory of Paris; the time given is Mean Solar Time of Greenwich.

RIGHT ASCENSION and NORTH POLAR DISTANCE of LEUCOTHEA (35).

Mean Solar Time of Observation.	R.A. from Observation.	Seconds of R.A. in Berliner Jahrbuch.	Apparent Error of Berliner Jahrbuch in R.A.	N.P.D. from Observation.	Seconds of N.P.D. in Berliner Jahrbuch.	Apparent Error of Berliner Jahrbuch in N.P.D.
1877. d h m s	h m s	s	s	° ′ ″	″	″
Sept. 4. 10. 47. 30·4 P	21. 53. 27·76	30·26	+ 2·50	108. 15. 48·90	40·60	− 8·30

RIGHT ASCENSION and NORTH POLAR DISTANCE of FIDES (37).

Dec.	24. 11. 48. 31·4 P	6. 12. 16·81	28·58	+11·77	60. 59. 32·30	30·90	− 1·40

RIGHT ASCENSIONS and NORTH POLAR DISTANCES of ARIADNE (43).

July	20. 12. 23. 47·8	20. 19. 18·98	28·12	+ 9·14	104. 58. 82·49	53·12	−29·37
	26. 11. 45. 6·4 P	20. 13. 31·67	40·73	+ 9·06	105. 2. 54·00	26·90	−27·10
	30. 11. 25. 37·4 P	20. 9. 45·43	54·49	+ 9·06	105. 5. 86·40	57·60	−28·80
	31. 11. 20. 47·4 P	20. 8. 50·75	59·57	+ 8·82	105. 6. 84·30	56·70	−27·60
Aug.	2. 11. 11. 8·4 P	20. 7. 3·41	12·34	+ 8·93	105. 9. 31·50	1·10	−30·40
	3. 11. 6. 20·4 P	20. 6. 11·42	20·24	+ 8·82	105. 10. 32·10	6·00	−26·10
	4. 11. 1. 33·4 P	20. 5. 20·46	29·30	+ 8·84	105. 11. 41·70	12·20	−29·50
	*15. 10. 19. 58·4	19. 57. 39·73	44·20	+ 4·47	105. 23. 70·76	57·52	−13·24
	23. 9. 36. 4·4 P	19. 54. 31·08	...	...	105. 31. 53·20	...	...
	27. 9. 19. 38·4 P	19. 53. 48·57	...	...	105. 35. 8·10	...	...
	28. 9. 15. 36·4 P	19. 53. 43·36	...	...	105. 35. 47·60	...	...
	29. 9. 11. 38·4 P	19. 53. 40·70	...	...	105. 36. 26·90	...	...

RIGHT ASCENSIONS and NORTH POLAR DISTANCES of MELETE (36).

Mar.	30. 11. 15. 55·4 P	11. 59. 11·90	13·62	+ 1·72	92. 18. 8·00	20·00	+12·00
	31. 11. 11. 20·4 P	11. 58. 22·78	24·62	+ 1·84	92. 9. 37·00	49·80	+12·80
April	7. 10. 38. 21·4 P	11. 52. 54·36	56·37	+ 2·01	91. 11. 4·00	15·50	+11·50

RIGHT ASCENSIONS and NORTH POLAR DISTANCES of ELPIS (39).

June	7. 12. 13. 36·4 P	17. 28. 54·68	54·14	− 0·54	99. 53. 6·70	9·70	+ 3·00
	9. 12. 4. 0·4 P	17. 27. 9·76	9·44	− 0·32	99. 50. 29·00	31·60	+ 2·60
	25. 10. 47. 17·4 P	17. 13. 19·78	19·40	− 0·38	99. 45. 23·50	25·10	+ 1·60
	27. 10. 37. 50·4 P	17. 11. 43·52	43·21	− 0·31	99. 46. 47·50	48·90	+ 1·40
	28. 10. 33. 7·4 P	17. 10. 56·43	56·20	− 0·23	99. 47. 36·40	40·90	+ 4·50
	30. 10. 23. 44·4 P	17. 9. 25·12	...	...	99. 49. 44·20	...	...

RIGHT ASCENSIONS and NORTH POLAR DISTANCES of ECHO (60).

April	7. 12. 9. 45·4 P	13. 24. 33·68	32·58	− 1·10	97. 53. 42·50	38·50	− 4·00
May	2. 10. 10. 57·4 P	13. 3. 59·32	...	...	95. 11. 5·20	...	...
	3. 10. 6. 25·4 P	13. 3. 22·60	...	...	95. 6. 6·90	...	...
	5. 9. 57. 23·4 P	13. 2. 13·03	...	...	94. 56. 38·80	...	...

RIGHT ASCENSION and NORTH POLAR DISTANCE of ERATO (62).

Nov.	28. 10. 23. 1·4 P	3. 4. 2·54	7·59	+ 5·05	76. 4. 32·40	69·00	+36·60

* August 15. The observation of Ariadne on this day is compared with the ephemeris in the Berliner Jahrbuch Circular No. 74.
The letter P signifies that the observation was made at the Observatory of Paris; the time given is Mean Solar Time of Greenwich.

Right Ascension and North Polar Distance of Freia (70).

Mean Solar Time of Observation.	R.A. from Observation.	Seconds of R.A. in Berliner Jahrbuch.	Apparent Error of Berliner Jahrbuch in R.A.	N.P.D. from Observation.	Seconds of N.P.D. in Berliner Jahrbuch.	Apparent Error of Berliner Jahrbuch in N.P.D.
1877. d h m s	h m s	s	s	° ′ ″	″	″
Mar. 9. 11. 51. 43·4 P	11. 11. 67·48	38·92	−28·56	87. 3. 68·00	4·60	−63·40

Right Ascensions and North Polar Distances of Antiope (90).

Sept. 28. 10. 30. 27·4 P	23. 10. 59·70	54·64	− 5·06	98. 58. 26·90	59·40	+32·50
29. 10. 25. 55·4 P	23. 10. 23·32	18·30	− 5·02	99. 1. 23·30	56·20	+32·90
Oct. 1. 10. 16. 54·4 P	23. 9. 13·45	...	...	99. 6. 53·70	...	...

Right Ascension and North Polar Distance of Ægle (96).

Dec. 24. 10. 13. 33·4 P	4. 37. 2·92	...	...	46. 41. 14·90	...	...

Right Ascensions and North Polar Distances of Hecate (100).

Mar. 5. 10. 45. 28·4 P	9. 49. 55·35	54·91	− 0·44	73. 25. 58·40	54·90	− 3·50
8. 10. 31. 43·4 P	9. 47. 57·80	57·58	− 0·22	73. 13. 39·20	35·50	− 3·70
9. 10. 27. 9·4 P	9. 47. 20·16	19·91	− 0·25	73. 9. 38·20	40·40	+ 2·20
10. 10. 22. 36·4 P	9. 46. 43·07	43·01	− 0·06	73. 5. 49·80	51·40	+ 1·60

Right Ascension and North Polar Distance of Helena (101).

Dec. 24. 10. 51. 28·4 P	5. 14. 64·74	52·03	−12·71	51. 26. 88·60	9·30	−79·30

Right Ascensions and North Polar Distances of Hecuba (108).

Sept. 28. 10. 43. 47·4 P	23. 24. 21·59	30·52	+ 8·93	93. 32. 92·80	25·90	−66·90
29. 10. 39. 12·4 P	23. 23. 42·01	50·60	+ 8·59	93. 35. 122·10	45·40	−76·70
Oct. 1. 10. 30. 3·4 P	23. 22. 25·07	32·41	+ 7·34	93. 42. 77·90	14·50	−63·40

Right Ascension and North Polar Distance of Lydia (110).

Dec. 24. 11. 51. 34·4 P	6. 15. 19·88	24·54	+ 4·66	61. 7. 8·40	53·80	+45·40

Right Ascension and North Polar Distance of Ate (111).

Mar. 31. 11. 37. 13·4 P	12. 24. 19·82	10·85	− 8·97	100. 35. 45·00	154·50	+109·50

The letter P signifies that the observation was made at the Observatory of Paris; the time given is Mean Solar Time of Greenwich.

RIGHT ASCENSIONS and NORTH POLAR DISTANCES of ALTHÆA (119).*

Mean Solar Time of Observation.	R.A. from Observation.	Seconds of R.A. in Berliner Jahrbuch.	Apparent Error of Berliner Jahrbuch in R.A.	N.P.D. from Observation.	Seconds of N.P.D. in Berliner Jahrbuch.	Apparent Error of Berliner Jahrbuch in N.P.D.
1877. d h m s	h m s	s	s	° ′ ″	″	″
July 11. 11. 59. 30·4	19. 19. 28·55	29·19	+ 0·64	102. 31. 41·05	156·46	+115·41
12. 11. 54. 35·5	19. 18. 29·37	33·86	+ 4·49	102. 33. 37·98	133·87	+ 95·89

RIGHT ASCENSIONS and NORTH POLAR DISTANCES of HERMIONE (121).

Mar. 10. 12. 8. 31·4 P	11. 32. 55·55	59·85	+ 4·30	75. 58. 31·90	65·90	+ 34·00
31. 10. 32. 21·4 P	11. 19. 17·37	...	...	74. 50. 26·20	...	...

RIGHT ASCENSIONS and NORTH POLAR DISTANCES of ALCESTIS (124).

Nov. 10. 11. 39. 51·4	3. 0. 46·10	47·31	+ 1·21	75. 51. 19·24	10·08	− 9·16
28. 10. 4. 41·4 P	2. 45. 38·87	...	...	77. 5. 20·20	...	...

RIGHT ASCENSIONS and NORTH POLAR DISTANCES of CYRENE (133).

Mar. 30. 12. 2. 44·4 P	12. 45. 58·31	66·11	+ 7·80	104. 43. 12·40	81·50	+ 69·10
31. 11. 57. 58·4 P	12. 45. 8·43	16·34	+ 7·91	104. 40. 22·30	91·10	+ 67·80
April 7. 11. 24. 39·4 P	12. 39. 19·13	27·07	+ 7·94	104. 17. 26·90	93·90	+ 67·00

RIGHT ASCENSIONS and NORTH POLAR DISTANCES of SOPHROSYNE (134).

Sept. 28. 10. 27. 45·4 P	23. 8. 17·22	95·89	+78·67	92. 14. 865·90	29·00	−836·90
29. 10. 22. 56·4 P	23. 7. 23·40	101·90	+78·50	92. 15. 842·30	4·60	−837·70
Oct. 1. 10. 13. 20·4 P	23. 5. 39·32	117·15	+77·83	92. 16. 838·10	5·40	−832·70

RIGHT ASCENSION and NORTH POLAR DISTANCE of AUSTRIA (136).

Jan. 30. 11. 47. 18·4 P	8. 37. 52·89	39·75	−13·14	84. 54. 31·60	95·80	+ 64·20

RIGHT ASCENSIONS and NORTH POLAR DISTANCES of SIWA (140).

Mar. 30. 10. 48. 19·4 P	11. 31. 21·24	...	...	82. 4. 17·70	...	...
31. 10. 43. 37·4 P	11. 30. 35·17	...	...	81. 59. 37·00	...	...
April 7. 10. 11. 10·4 P	11. 25. 38·35	...	...	81. 31. 0·60	...	...
11. 9. 52. 5·8 P	11. 23. 9·84	...	...	81. 17. 35·20	...	...

RIGHT ASCENSION and NORTH POLAR DISTANCE of GALLIA (148).

Jan. 30. 11. 16. 45·4 P	8. 7. 14·59	...	...	84. 4. 34·90	...	...

* It is not certain that either of the objects observed for Althæa is the planet.

The letter P signifies that the observation was made at the Observatory of Paris; the time given is Mean Solar Time of Greenwich.

RIGHT ASCENSION and NORTH POLAR DISTANCE of NUWA (150).

Mean Solar Time of Observation.	R.A. from Observation.	Seconds of R.A. in Berliner Jahrbuch.	Apparent Error of Berliner Jahrbuch in R.A.	N.P.D. from Observation.	Seconds of N.P.D. in Berliner Jahrbuch.	Apparent Error of Berliner Jahrbuch in N.P.D.
1877. d h m s	h m s	s	s	° ′ ″	″	″
Jan. 30. 10. 32. 0·4 P	7. 22. 22·65	...	...	71. 9. 23·30	...	...

RIGHT ASCENSION and NORTH POLAR DISTANCE of ÆMILIA (159).

Mar. 8. 11. 16. 55·4 P	10. 33. 16·25	...	...	76. 54. 16·60	...	...

RIGHT ASCENSIONS and NORTH POLAR DISTANCES of the CENTER of JUPITER.

Mean Solar Time of Transit of Center.	Observer.	R.A. from Observation.	Seconds of R.A. in Nautical Almanac.	Apparent Error of Nautical Almanac in R.A.	N.P.D. from Observation.	Seconds of N.P.D. in Nautical Almanac.	Apparent Error of Nautical Almanac in N.P.D.
1877. d h m s		h m s	s	s	° ′ ″	″	″
May 2. 15. 30. 2·6	L	18. 14. 36·30	35·17	− 1·13	113. 2. 26·72	33·30	+ 6·58
4. 15. 21. 48·6	T	18. 14. 14·06	12·65	− 1·41	113. 2. 39·93	48·70	+ 8·77
11. 14. 52. 34·5	JB	18. 12. 31·06	29·75	− 1·31	113. 3. 42·13	51·20	+ 9·07
15. 14. 35. 36·1	G	18. 11. 16·09	14·92	− 1·17	113. 4. 21·83	31·30	+ 9·47
26. 13. 48. 3·3	BD	18. 6. 57·57	56·20	− 1·37	113. 6. 19·46	27·40	+ 7·94
28. 13. 39. 17·3	T	18. 6. 3·31	1·88	− 1·43	113. 6. 39·47	47·90	+ 8·43
29. 13. 34. 53·6	B	18. 5. 35·37	34·00	− 1·37	113. 6. 49·67	57·90	+ 8·23
June 5. 13. 3. 55·5	T	18. 2. 8·11	6·84	− 1·27	113. 7. 55·54	62·60	+ 7·06
6. 12. 59. 28·7	C	18. 1. 37·17	35·77	− 1·40	113. 8. 2·35	10·90	+ 8·55
15. 12. 19. 15·4	T	17. 56. 46·32	44·96	− 1·36	113. 9. 4·68	11·50	+ 6·82
16. 12. 14. 46·5	C	17. 56. 13·21	11·84	− 1·37	113. 9. 8·65	16·60	+ 7·95
18. 12. 5. 48·5	AD	17. 55. 6·87	5·40	− 1·47	113. 9. 18·77	25·70	+ 6·93
19. 12. 1. 19·3	WL	17. 54. 33·44	32·14	− 1·30	113. 9. 23·04	29·60	+ 6·56
20. 11. 56. 50·4	T	17. 53. 60·35	58·87	− 1·48	113. 9. 26·09	33·20	+ 7·11
23. 11. 43. 23·2	T	17. 52. 20·67	19·27	− 1·40	113. 9. 33·47	41·70	+ 8·23
25. 11. 34. 25·5	BD	17. 51. 14·65	13·28	− 1·37	113. 9. 38·55	45·60	+ 7·05
27. 11. 25. 28·5	T	17. 50. 9·23	7·80	− 1·43	113. 9. 41·17	48·10	+ 6·93
29. 11. 16. 31·9	L	17. 49. 4·32	3·03	− 1·29	113. 9. 42·25	49·40	+ 7·15
July 2. 11. 3. 9·1	G	17. 47. 28·97	27·57	− 1·40	....	....	....
3. 10. 58. 41·9	W	17. 46. 57·64	56·28	− 1·36	113. 9. 41·08	48·30	+ 7·22
4. 10. 54. 15·2	HP	17. 46. 26·74	25·30	− 1·44	113. 9. 40·30	47·50	+ 7·20
6. 10. 45. 22·5	C	....	...	...	113. 9. 37·11	45·20	+ 8·09
7. 10. 40. 56·7	JB	17. 44. 55·69	54·40	− 1·29	113. 9. 36·43	43·70	+ 7·27
12. 10. 18. 54·1	AD	17. 42. 32·33	30·94	− 1·39	113. 9. 28·30	34·30	+ 6·00
20. 9. 44. 4·3	AD	17. 39. 9·20	7·78	− 1·42	113. 9. 10·34	16·60	+ 6·26
24. 9. 26. 53·5	AD	17. 37. 41·88	40·49	− 1·39	113. 9. 3·95	9·40	+ 5·45
26. 9. 18. 22·0	BD	17. 37. 2·10	0·77	− 1·33	113. 9. 1·31	6·80	+ 5·49
27. 9. 14. 7·3	C	17. 36. 43·23	41·93	− 1·30	113. 9. 0·39	5·90	+ 5·51
30. 9. 1. 27·4	R	....	...	...	113. 8. 59·51	64·70	+ 5·19
Aug. 2. 8. 48. 54·0	B	17. 35. 5·13	3·77	− 1·36	113. 8. 59·17	66·10	+ 6·93
10. 8. 15. 58·2	C	17. 33. 36·39	35·04	− 1·35	113. 9. 21·73	26·80	+ 5·07
14. 7. 59. 49·4	JP	17. 33. 11·15	9·70	− 1·45	113. 9. 41·37	47·60	+ 6·23
15. 7. 55. 49·1	AD	17. 33. 6·72	5·39	− 1·33	113. 9. 47·35	53·90	+ 6·55
16. 7. 51. 49·8	R	17. 33. 3·33	1·90	− 1·43	113. 9. 52·34	60·70	+ 8·36
17. 7. 47. 51·1	JB	17. 32. 60·53	59·22	− 1·31	113. 10. 4·20	7·90	+ 3·70
21. 7. 32. 4·9	JP	17. 32. 57·95	56·60	− 1·35	113. 10. 37·27	42·00	+ 4·73
22. 7. 28. 10·2	G	17. 32. 59·16	57·98	− 1·18	113. 10. 45·99	51·80	+ 5·81
23. 7. 24. 16·6	AD	17. 33. 1·49	0·16	− 1·33	113. 10. 57·40	62·00	+ 4·60
29. 7. 1. 11·1	JP	17. 33. 31·50	30·18	− 1·32	113. 12. 8·51	13·10	+ 4·59
31. 6. 53. 35·6	R	17. 33. 47·85	46·58	− 1·27	113. 12. 35·34	40·60	+ 5·26

The letter P signifies that the observation was made at the Observatory of Paris; the time given is Mean Solar Time of Greenwich.

RIGHT ASCENSIONS and NORTH POLAR DISTANCES of the CENTER of JUPITER—*concluded.*

Mean Solar Time of Transit of Center.	Observer.	R.A. from Observation.	Seconds of R.A. in Nautical Almanac.	Apparent Error of Nautical Almanac in R.A.	N.P.D. from Observation.	Seconds of N.P.D. in Nautical Almanac.	Apparent Error of Nautical Almanac in N.P.D.
1877. d h m s		h m s	s	s	° ′ ″	″	″
Sept. 1. 6. 49. 48·9	L	17. 33. 57·09	55·97	− 1·12	113. 12. 49·96	54·90	+ 4·94
5. 6. 34. 50·8	JB	17. 34. 42·74	41·44	− 1·30	113. 13. 52·20	56·20	+ 4·00

RIGHT ASCENSIONS and NORTH POLAR DISTANCES of the CENTER of SATURN.

July	30. 14. 49. 57·5	C	23. 25. 18·31	17·27	− 1·04	96. 5. 54·75	48·90	− 5·85
Aug.	2. 14. 37. 38·5	B	23. 24. 46·91	46·03	− 0·88	96. 9. 55·06	49·20	− 5·86
	7. 14. 17. 1·3	HP	23. 23. 49·15	48·23	− 0·92	96. 17. 10·26	2·50	− 7·76
	11. 14. 0. 26·9	AD	23. 22. 58·23	57·24	− 0·99	96. 23. 22·63	15·60	− 7·03
	16. 13. 39. 38·4	R	23. 21. 49·05	48·22	− 0·83	96. 31. 36·62	29·60	− 7·02
	17. 13. 35. 28·0	JB	23. 21. 34·59	33·77	− 0·82	96. 33. 20·15	11·50	− 8·65
	23. 13. 10. 22·4	AD	23. 20. 4·12	3·28	− 0·84	96. 43. 50·14	42·00	− 8·14
	30. 12. 40. 58·8	HP	23. 18. 11·66	10·98	− 0·68	96. 56. 34·47	26·20	− 8·27
	31. 12. 36. 46·5	R	23. 17. 55·21	54·49	− 0·72	96. 58. 24·17	17·00	− 7·17
Sept.	5. 12. 15. 43·6	JB	23. 16. 31·60	30·87	− 0·73	97. 7. 41·07	32·90	− 8·17
	7. 12. 7. 18·1	AD	23. 15. 57·81	57·05	− 0·76	97. 11. 22·84	15·10	− 7·74
	11. 11. 50. 26·8	T	23. 14. 49·96	49·21	− 0·75	97. 18. 46·23	36·70	− 9·53
	12. 11. 46. 14·0	G	23. 14. 32·99	32·27	− 0·72	97. 20. 35·48	26·20	− 9·28
	24. 10. 55. 44·3	L	23. 11. 13·66	13·22	− 0·44	97. 41. 34·64	25·10	− 9·54
	26. 10. 47. 20·8	C	23. 10. 41·92	41·43	− 0·49	97. 44. 50·74	41·50	− 9·24
	27. 10. 43. 9·4	JP	23. 10. 26·31	25·74	− 0·57	97. 46. 26·09	17·80	− 8·29
	28. 10. 38. 58·0	G	23. 10. 10·78	10·21	− 0·57	97. 47. 62·49	52·90	− 9·59
	29. 10. 34. 46·7	R	23. 9. 55·37	54·83	− 0·54	97. 49. 35·72	26·80	− 8·92
Oct.	2. 10. 22. 13·9	JB	23. 9. 10·21	9·73	− 0·48	97. 53. 68·08	59·80	− 8·28
	3. 10. 18. 3·5	AD	23. 8. 55·64	55·08	− 0·56	97. 55. 36·69	27·90	− 8·79
	4. 10. 13. 53·1	C	23. 8. 41·12	40·62	− 0·50	97. 56. 63·22	54·40	− 8·82
	5. 10. 9. 42·7	T	23. 8. 26·55	26·37	− 0·18	97. 58. 28·07	19·30	− 8·77
	6. 10. 5. 32·9	L	23. 8. 12·63	12·33	− 0·30	97. 59. 50·86	42·50	− 8·36
	15. 9. 28. 14·9	T	23. 6. 17·54	17·08	− 0·46	98. 10. 58·39	49·90	− 8·49
	16. 9. 24. 7·6	HP	23. 6. 6·12	5·62	− 0·50	98. 11. 65·22	54·30	−10·92
	18. 9. 15. 53·8	BD	23. 5. 43·99	43·58	− 0·41	98. 13. 66·91	56·90	−10·01
	20. 9. 7. 41·1	R	23. 5. 23·13	22·75	− 0·38	98. 15. 60·85	51·10	− 9·75
	23. 8. 55. 24·5	C	23. 4. 54·19	53·88	− 0·31	98. 18. 35·88	26·30	− 9·58
	27. 8. 39. 7·1	JP	23. 4. 20·30	19·97	− 0·33	98. 21. 33·13	22·00	−11·13
Nov.	1. 8. 18. 52·8	L	23. 3. 45·48	45·33	− 0·15	98. 24. 20·68	9·50	−11·18
	5. 8. 2. 48·1	L	23. 3. 24·33	24·17	− 0·16	98. 25. 53·68	40·40	−13·28
	8. 7. 50. 48·6	T	23. 3. 12·59	12·25	− 0·34	98. 26. 31·88	22·80	− 9·08
	9. 7. 46. 49·6	R	23. 3. 9·40	9·04	− 0·36	98. 26. 42·31	31·90	−10·41
	12. 7. 34. 54·4	C	23. 3. 1·91	1·74	− 0·17	98. 26. 53·80	44·40	− 9·40
	13. 7. 30. 57·0	T	23. 3. 0·44	0·08	− 0·36	98. 26. 53·06	43·60	− 9·46
	14. 7. 26. 59·7	AD	23. 2. 59·11	58·82	− 0·29	98. 26. 50·71	40·20	−10·51
	20. 7. 3. 24·9	C	23. 2. 59·73	59·45	− 0·28	98. 25. 38·53	28·10	−10·43
	29. 6. 28. 29·1	T	23. 3. 27·22	26·86	− 0·36	98. 20. 64·26	54·10	−10·16
Dec.	31. 4. 28. 21·5	L	23. 9. 9·77	9·59	− 0·18	97. 39. 40·77	30·90	− 9·87

RIGHT ASCENSIONS and NORTH POLAR DISTANCES of the CENTER of URANUS.

Jan.	20. 13. 42. 32·2	C	9. 44. 39·64	39·63	− 0·01	75. 36. 43·41	44·40	+ 0·99
	26. 13. 18. 0·2	AD	9. 43. 42·98	43·08	+ 0·10	75. 31. 47·98	49·70	+ 1·72
	29. 13. 5. 43·5	HP	9. 43. 13·89	13·76	− 0·13	75. 29. 17·66	18·10	+ 0·44
	30. 13. 1. 37·6	AD	9. 43. 3·87	3·87	0·00	75. 28. 28·49	27·10	− 1·39
Feb.	2. 12. 49. 20·0	BD	9. 42. 33·95	33·88	− 0·07	75. 25. 54·14	53·00	− 1·14
	14. 12. 0. 6·9	FD	9. 40. 31·39	31·36	− 0·03	75. 15. 31·49	31·80	+ 0·31

RIGHT ASCENSIONS and NORTH POLAR DISTANCES of the CENTER of URANUS—*concluded.*

Mean Solar Time of Transit of Center.	Observer.	R.A. from Observation.	Seconds of R.A. in Nautical Almanac.	Apparent Error of Nautical Almanac in R.A.	N.P.D. from Observation.	Seconds of N.P.D. in Nautical Almanac.	Apparent Error of Nautical Almanac in N.P.D.
1877. d h m s		h m s	s	s	° ′ ″	″	″
Feb. 15. 11. 56. 0·8	B	9. 40. 21·24	21·13	− 0·11	75. 14. 40·41	40·50	+ 0·09
20. 11. 35. 30·6	T	9. 39. 30·46	30·37	− 0·09	75. 10. 25·95	27·00	+ 1·05
27. 11. 6. 50·2	BD	9. 38. 21·16	21·19	+ 0·03	75. 4. 44·43	44·80	+ 0·37
28. 11. 2. 44·8	JB	9. 38. 11·64	11·56	− 0·08	75. 3. 56·00	57·50	+ 1·50
Mar. 8. 10. 30. 3·8	T	9. 36. 57·70	57·65	− 0·05	74. 57. 57·40	57·50	+ 0·10
10. 10. 21. 54·6	AD	9. 36. 40·34	40·18	− 0·16	74. 56. 32·54	33·30	+ 0·76
14. 10. 5. 37·4	JB	9. 36. 6·61	6·66	+ 0·05	74. 53. 52·39	52·60	+ 0·21
16. 9. 57. 29·8	T	9. 35. 50·76	50·67	− 0·09	74. 52. 34·67	36·50	+ 1·83
17. 9. 53. 25·9	L	9. 35. 42·83	42·88	+ 0·05	74. 51. 58·87	59·50	+ 0·63
27. 9. 12. 57·7	C	9. 34. 33·45	33·32	− 0·13	74. 46. 32·98	33·50	+ 0·52
April 10. 8. 16. 46·6	WL	9. 33. 24·90	24·84	− 0·06	74. 41. 25·23	25·70	+ 0·47
21. 7. 33. 4·6	HP	9. 32. 57·88	57·87	− 0·01	....	....	....

RIGHT ASCENSIONS and NORTH POLAR DISTANCES of the CENTER of NEPTUNE.

Jan. 1. 7. 17. 42·4	P	2. 3. 52·05	51·88	− 0·17	79. 19. 17·92	20·00	+ 2·08
23. 5. 51. 11·7	C	2. 3. 51·40	51·21	− 0·19	79. 17. 57·12	59·20	+ 2·08
30. 5. 23. 53·4	AD	2. 4. 4·55	4·44	− 0·11	79. 16. 20·62	21·40	+ 0·78
Sept. 24. 14. 5. 13·0	L	2. 21. 13·44	13·22	− 0·22	77. 51. 9·82	10·80	+ 0·98
27. 13. 53. 9·8	JP	2. 20. 57·94	57·87	− 0·07	77. 52. 34·03	34·90	+ 0·87
29. 13. 45. 7·3	R	2. 20. 47·29	47·26	− 0·03	77. 53. 31·36	32·70	+ 1·34
Oct. 4. 13. 25. 0·2	C	2. 20. 19·66	19·51	− 0·15	77. 56. 1·20	2·40	+ 1·20
5. 13. 20. 58·4	T	2. 20. 13·72	13·77	+ 0·05	77. 56. 32·95	33·20	+ 0·25
16. 12. 36. 37·2	HP	2. 19. 7·36	7·22	− 0·14	78. 2. 25·37	25·10	− 0·27
18. 12. 28. 32·9	BD	2. 18. 54·77	54·60	− 0·17	78. 3. 31·04	31·00	− 0·04
22. 12. 12. 23·8	T	2. 18. 29·24	29·06	− 0·18	78. 5. 42·83	43·40	+ 0·57
23. 12. 8. 21·3	C	2. 18. 22·70	22·62	− 0·08	78. 6. 15·75	16·70	+ 0·95
27. 11. 52. 12·0	JP	2. 17. 56·90	56·75	− 0·15	78. 8. 28·90	29·70	+ 0·80
29. 11. 44. 7·3	HP	2. 17. 43·95	43·77	− 0·18	78. 9. 35·31	36·00	+ 0·69
31. 11. 37. 2·2	BD	2. 17. 30·83	30·78	− 0·05	78. 10. 41·77	42·20	+ 0·43
Nov. 5. 11. 15. 50·6	L	2. 16. 58·54	58·45	− 0·09	78. 13. 25·85	25·80	− 0·05
10. 10. 55. 39·3	AD	2. 16. 26·70	26·57	− 0·13	78. 16. 4·20	5·50	+ 1·30
13. 10. 43. 32·9	T	2. 16. 7·95	7·80	− 0·15	78. 17. 37·86	38·80	+ 0·94
14. 10. 39. 30·7	AD	2. 16. 1·69	1·62	− 0·07	78. 18. 9·14	9·40	+ 0·26
19. 10. 19. 21·1	L	2. 15. 31·56	31·39	− 0·17	....	....	....
20. 10. 15. 19·3	C	2. 15. 25·62	25·50	− 0·12	78. 21. 6·92	6·80	− 0·12
22. 10. 7. 15·8	JP	2. 15. 13·98	13·88	− 0·10	78. 22. 2·42	3·30	+ 0·88
Dec. 6. 9. 10. 59·8	T	2. 14. 0·49	0·33	− 0·16	78. 27. 50·67	52·40	+ 1·73
10. 8. 54. 58·1	T	2. 13. 42·37	42·34	− 0·03	78. 29. 12·74	14·70	+ 1·96
13. 8. 42. 58·0	BD	2. 13. 30·03	29·87	− 0·16	78. 30. 10·23	10·60	+ 0·37
14. 8. 38. 58·2	B	2. 13. 26·08	25·92	− 0·16	78. 30. 27·05	28·10	+ 1·05
26. 7. 51. 8·5	BD	2. 12. 47·27	47·10	− 0·17	78. 33. 10·57	10·40	− 0·17
27. 7. 47. 10·2	JP	2. 12. 44·85	44·62	− 0·23	78. 33. 18·58	19·80	+ 1·22

COMET (*b*) 1877.*

May 7. 9. 1. 26·3	M	0. 4. 38·90	47·61	+ 8·71	17. 51. 99·92	18·99	− 80·93
15. 13. 29. 17·1	G	5. 4. 46·18	95·22	+49·04	10. 12. 182·59	22·41	−160·18

* The tabular places are taken from the ephemeris by Bakhuyzen and Kapteyn in the Astronomische Nachrichten, No. 2128.

INVESTIGATION of the POSITION of the ECLIPTIC, from the OBSERVATIONS of the SUN.

Mean Tabular Errors of the Sun in R.A. and N.P.D.; and Errors in Ecliptic North Polar Distance, deduced from the Formula,

Error in Ecliptic North Polar Distance = R × Error of R.A. + S × Error of N.P.D.

Extent of Group.	Mean Day, 1877.	Error in R.A.	Number of Obs.	Error in N.P.D.	Number of Obs.	Error in Ecliptic N.P.D.
		s		″		″
January 2 to January 31	January 17	+ 0·048	8	+ 2·403	8	+ 2·489
February 8 to February 28	February 19	0·000	5	+ 1·122	5	+ 1·049
March 1 to March 23	March 16	− 0·017	6	+ 0·444	5	+ 0·307
April 13 to May 2	April 23	− 0·063	3	+ 1·465	2	+ 1·063
May 7 to May 25	May 14	+ 0·068	5	+ 0·765	6	+ 0·984
June 7 to June 29	June 17	+ 0·051	12	+ 1·121	14	+ 1·140
July 3 to July 31	July 16	+ 0·030	11	+ 0·706	9	+ 0·622
August 14 to August 29	August 21	+ 0·044	7	+ 0·677	6	+ 0·410
September 4 to September 29	September 13	− 0·013	6	+ 1·046	5	+ 1·038
October 3 to October 31	October 20	+ 0·156	9	+ 1·938	9	+ 0·978
November 1 to November 28	November 14	+ 0·083	8	+ 1·560	7	+ 1·205
December 8 to December 31	December 20	+ 0·037	7	+ 1·484	7	+ 1·480

Equations formed by assuming the Error in Ecliptic North Polar Distance to be represented by the Formula,

$x \times$ cos Sun's longitude $+ y \times$ sin Sun's longitude $+ z$,

and altering the number of observations so as to make the assumed weights of opposite parts of the year equal:

Spring	$+ 2''.489 = + 0.4628 \times x - 0.8865 \times y + z$	Weight	7
	$+ 1.049 = + 0.8746 \times x - 0.4848 \times y + z$	,,	4
	$+ 0.307 = + 0.9976 \times x - 0.0692 \times y + z$	,,	5
Summer	$+ 1.063 = + 0.8347 \times x + 0.5507 \times y + z$	,,	2
	$+ 0.984 = + 0.5913 \times x + 0.8064 \times y + z$	,,	4
	$+ 1.140 = + 0.0640 \times x + 0.9980 \times y + z$	,,	10
Autumn	$+ 0.622 = - 0.4065 \times x + 0.9137 \times y + z$	,,	7
	$+ 0.410 = - 0.8524 \times x + 0.5228 \times y + z$	,,	5
	$+ 1.038 = - 0.9870 \times x + 0.1605 \times y + z$	,,	4
Winter	$+ 0.978 = - 0.8893 \times x - 0.4573 \times y + z$	,,	6
	$+ 1.205 = - 0.6120 \times x - 0.7908 \times y + z$	,,	5
	$+ 1.480 = - 0.0213 \times x - 0.9998 \times y + z$	,,	5

Equations multiplied by the Weights:

Spring	$+17.423 = + 3.2396 \times x - 6.2055 \times y + 7z$
	$+ 4.196 = + 3.4984 \times x - 1.9392 \times y + 4z$
	$+ 1.535 = + 4.9880 \times x - 0.3460 \times y + 5z$
Summer	$+ 2.126 = + 1.6694 \times x + 1.1014 \times y + 2z$
	$+ 3.936 = + 2.3652 \times x + 3.2256 \times y + 4z$
	$+11.400 = + 0.6400 \times x + 9.9800 \times y + 10z$
Autumn	$+ 4.354 = - 2.8455 \times x + 6.3959 \times y + 7z$
	$+ 2.050 = - 4.2620 \times x + 2.6140 \times y + 5z$
	$+ 4.152 = - 3.9480 \times x + 0.6420 \times y + 4z$
Winter	$+ 5.868 = - 5.3358 \times x - 2.7438 \times y + 6z$
	$+ 6.025 = - 3.0600 \times x - 3.9540 \times y + 5z$
	$+ 7.400 = - 0.1065 \times x - 4.9990 \times y + 5z$

New Equations formed by adding and subtracting those above, as indicated below:

Spring + Summer + Autumn + Winter

$$+ 70''.465 = - 3.1572 \times x + 3.7714 \times y + 64z$$

Spring + Summer − Autumn − Winter

$$+ 10''.767 = + 35.9584 \times x + 7.8612 \times y$$

Spring − Summer − Autumn + Winter

$$+ 14''.429 = + 9.6046 \times x - 44.1464 \times y$$

Solution of these Equations:

$$x = + 0''.354$$
$$y = - 0.250$$
$$z = + 1''.133$$

The first term, taken alone, indicates that, at the first point of Aries, the error of the tabular Ecliptic N.P.D. is positive, or the assumed Ecliptic is south of the Sun's true path, by $0''.354$, and therefore that the right ascensions of all stars ought to be increased by $\frac{0^s.354}{15 \times \sin 23°.27'} = 0^s.059$.

The second term, taken alone, indicates that the obliquity assumed in the Nautical Almanac ought to be diminished by $0''.250$.

The third term indicates that the obliquity deduced from the southern solstice is less than that deduced from the northern solstice by $2''.266$; or that the mean of observed distances from the pole to the ecliptic is too small by $1''.133$.

MEAN ERRORS of the TABULAR GEOCENTRIC PLACES of the SUN and PLANETS.

THE SUN.

Extent of Group.	Number of Obs. of R.A.	Number of Obs. of N.P.D.	Mean Day, 1877.	Mean Error in R.A.	Mean Error in N.P.D.	Error in Longitude.	Error in E.N.P.D.
				°	″	″	″
Jan. 2 to Jan. 31	8	8	January 17	+ 0·048	+ 2·40	+ 0·18	+ 2·49
Feb. 8 to Feb. 28	5	5	February 19	0·000	+ 1·12	− 0·40	+ 1·05
March 1 to March 23	6	5	March 16	− 0·017	+ 0·44	− 0·41	+ 0·31
April 13 to May 2	3	2	April 23	− 0·063	+ 1·47	− 1·37	+ 1·06
May 7 to May 25	5	6	May 14	+ 0·068	+ 0·77	+ 0·74	+ 0·98
June 7 to June 29	12	14	June 17	+ 0·051	+ 1·12	+ 0·67	+ 1·14
July 3 to July 31	11	9	July 16	+ 0·030	+ 0·71	+ 0·54	+ 0·62
Aug. 14 to Aug. 29	7	6	August 21	+ 0·044	+ 0·68	+ 0·84	+ 0·41
Sept. 4 to Sept. 29	6	5	September 13	− 0·013	+ 1·05	+ 0·23	+ 1·04
Oct. 3 to Oct. 31	9	9	October 20	+ 0·156	+ 1·94	+ 2·85	+ 0·98
Nov. 1 to Nov. 28	8	7	November 14	+ 0·083	+ 1·56	+ 1·54	+ 1·21
Dec. 8 to Dec. 31	7	7	December 20	+ 0·037	+ 1·48	+ 0·52	+ 1·48

MERCURY.

May 9	1	1	May 9	+ 0·100	+ 2·16	+ 1·00	+ 2·35
June 17	1	1	June 18	+ 0·030	+ 1·32	+ 0·19	+ 1·38
July 3	1	1	July 4	+ 0·110	− 0·26	+ 1·53	− 0·21
July 30 to Aug. 2	2	3	July 31	+ 0·025	+ 1·56	+ 0·84	+ 1·36
Aug. 22 to Aug. 31	2	2	August 27	+ 0·005	+ 1·19	+ 0·54	+ 1·06
Oct. 17 to Oct. 19	2	2	October 19	+ 0·045	+ 0·37	+ 0·77	+ 0·08
Oct. 31	1	1	October 31	+ 0·140	+ 1·16	+ 2·34	+ 0·36

VENUS.

Feb. 27 to March 6	2	2	March 4	− 0·100	+ 1·69	− 1·96	+ 1·08
June 8 to June 19	5	6	June 15	+ 0·152	+ 1·02	+ 2·12	+ 0·93
June 21 to June 29	4	4	June 26	+ 0·168	+ 1·21	+ 2·46	+ 0·89
July 10 to July 31	4	4	July 23	+ 0·058	+ 1·44	+ 1·26	+ 1·09
Aug. 14 to Sept. 6	4	3	August 28	+ 0·038	+ 1·18	+ 0·99	+ 0·86
Sept. 27 to Oct. 5	4	4	October 1	+ 0·113	+ 0·98	+ 1·83	+ 0·47
Oct. 18 to Oct. 24	3	3	October 21	+ 0·017	+ 1·80	+ 0·50	+ 1·75
Nov. 8 to Nov. 16	3	3	November 13	+ 0·047	+ 0·20	+ 0·62	+ 0·23
Nov. 20 to Nov. 29	3	2	November 25	+ 0·093	+ 0·86	+ 1·12	+ 1·04
Dec. 12 to Dec. 31	6	6	December 21	+ 0·012	+ 1·64	− 0·34	+ 1·61

MARS.

Extent of Group.	Number of Obs. of R.A.	Number of Obs. of N.P.D.	Mean Day, 1877.	Mean Error in R.A.	Mean Error in N.P.D.	Error in Longitude.	Error in E.N.P.D.
				s	″	″	″
July 2 to Aug. 2	5	5	July 21	+ 0·424	− 1·83	+ 6·50	+ 0·78
Aug. 7 to Aug. 23	5	5	August 16	+ 0·488	− 3·01	+ 7·83	+ 0·09
Aug. 29 to Sept. 11	8	8	September 4	+ 0·566	− 2·82	+ 8·80	+ 0·66
Sept. 21 to Oct. 6	9	9	September 30	+ 0·508	− 1·80	+ 7·59	+ 1·16
Oct. 15 to Nov. 3	8	9	October 23	+ 0·361	− 1·41	+ 5·48	+ 0·73
Nov. 8 to Dec. 1	11	11	November 19	+ 0·241	− 0·55	+ 3·53	+ 0·91
Dec. 12 to Dec. 31	7	7	December 20	+ 0·129	+ 0·18	+ 1·70	+ 0·93

CERES.

July 24	1	1	July 24	− 5·760	+16·25	−78·83	− 7·10
Aug. 15 to Aug. 16	2	2	August 16	− 5·645	+13·20	−75·50	− 7·26
Aug. 22 to Aug. 27	4	4	August 24	− 5·790	+10·57	−76·34	− 9·62

PALLAS.

June 19 to June 30	2	2	June 25	+ 0·640	+ 0·91	+11·81	+ 2·61
July 20 to July 26	3	3	July 23	+ 0·643	+ 1·48	+11·84	+ 2·69
July 30 to Aug. 4	5	5	August 1	+ 0·436	+ 0·52	+ 8·20	+ 1·25

JUNO.

May 31 to June 9	4	4	June 4	− 2·580	− 2·88	−40·72	+ 2·46
June 15 to June 27	4	5	June 22	− 2·455	− 2·59	−38·65	+ 3·46

VESTA.

Sept. 7	1	1	September 7	− 0·780	+ 6·48	−13·57	+ 1·15
Oct. 9 to Oct. 18	2	3	October 15	− 0·795	+ 5·88	−13·22	+ 0·77

JUPITER.

May 2 to May 29	7	7	May 17	− 1·313	+ 8·36	−18·28	+ 7·98
June 5 to June 29	11	11	June 19	− 1·376	+ 7·30	−18·92	+ 7·44
July 2 to Aug. 2	10	11	July 17	− 1·368	+ 6·42	−18·63	+ 7·07
Aug. 10 to Sept. 5	12	12	August 22	− 1·312	+ 5·32	−17·81	+ 6·21

SATURN.

Extent of Group.	Number of Obs. of R.A.	Number of Obs. of N.P.D.	Mean Day, 1877.	Mean Error in R.A.	Mean Error in N.P.D.	Error in Longitude.	Error in E.N.P.D.
July 30 to Aug. 31	9	9	August 16	− 0ˢ·858	− 7″·31	− 8″·88	−11″·74
Sept. 5 to Sept. 29	9	9	September 19	− 0·619	− 8·92	− 4·98	−11·79
Oct. 2 to Oct. 27	11	11	October 13	− 0·401	− 9·35	− 1·85	−10·93
Nov. 1 to Nov. 29	9	9	November 12	− 0·274	−10·43	+ 0·29	−11·19
Dec. 31	1	1	December 31	− 0·180	− 9·87	+ 1·38	−10·13

URANUS.

Jan. 20 to Feb. 2	5	5	January 29	− 0·022	− 0·12	− 0·34	− 0·01
Feb. 14 to Feb. 28	5	5	February 21	− 0·056	+ 0·66	− 0·55	+ 0·89
March 8 to March 17	5	5	March 13	− 0·040	+ 0·71	− 0·32	+ 0·86
March 27 to April 21	3	2	April 7	− 0·067	+ 0·51	− 0·76	+ 0·79

NEPTUNE.

Jan. 1 to Jan. 30	3	3	January 18	− 0·157	+ 1·65	− 2·74	+ 0·76
Sept. 24 to Oct. 5	5	5	October 1	− 0·084	+ 0·93	− 1·47	+ 0·48
Oct. 16 to Oct. 31	7	7	October 24	− 0·136	+ 0·45	− 2·04	− 0·22
Nov. 5 to Nov. 22	7	6	November 14	− 0·119	+ 0·54	− 1·83	− 0·07
Dec. 6 to Dec. 27	6	6	December 16	− 0·152	+ 1·03	− 2·45	+ 0·23

Errors of the Tabular Heliocentric Places of the Planets.

Mercury.

Day, 1877.	Error of the Tables of the Planet in Geocentric Longitude, expressed in terms of Error of Heliocentric Longitude of Planet (δL), of Error of Projection of Radius Vector of Planet ($\delta \rho$), of Error of Earth's Longitude (δl), and of Error of Earth's Radius Vector (δr). ($\delta \rho$ and δr are expressed in terms of the Earth's Mean Distance from the Sun.)					Error of Tables in Hel. E. P. D.
	"		"	"	"	"
May 9	+ 1·00	=	− 0·319 δL	+235613 $\delta \rho$	+ 1·318 δl − 95106 δr	+ 4·16
June 18	+ 0·19	=	− 0·207	−242941	+ 1·203 + 99101	+ 2·58
July 4	+ 1·53	=	+ 0·132	−164665	+ 0·868 + 53410	− 0·70
31	+ 0·84	=	+ 0·243	+ 86808	+ 0·758 − 32460	+ 4·68
August 27	+ 0·54	=	+ 0·100	+200863	+ 0·899 − 92591	+ 2·28
October 19	+ 0·77	=	+ 0·170	−145118	+ 0·830 + 48736	+ 0·26
31	+ 2·34	=	+ 0·278	− 53391	+ 0·722 + 21687	+ 1·20

Venus.

March 4	− 1·96	=	+ 0·414 δL	− 48239 $\delta \rho$	+ 0·586 δl + 35427 δr	+ 2·42
June 15	+ 2·12	=	+ 0·410	+ 31857	+ 0·590 − 22493	+ 2·19
26	+ 2·46	=	+ 0·407	+ 41393	+ 0·593 − 29205	+ 2·05
July 23	+ 1·26	=	+ 0·396	+ 66411	+ 0·605 − 46923	+ 2·39
August 28	+ 0·99	=	+ 0·372	+104021	+ 0·628 − 74600	+ 1·65
October 1	+ 1·83	=	+ 0·331	+147571	+ 0·669 −107305	+ 0·76
21	+ 0·50	=	+ 0·289	+179796	+ 0·711 −131492	+ 2·50
November 13	+ 0·62	=	+ 0·208	+226872	+ 0·791 −166472	+ 0·28
25	+ 1·12	=	+ 0·142	+257442	+ 0·857 −189112	+ 1·14
December 21	− 0·34	=	− 0·124	+343092	+ 1·124 −251849	+ 1·34

Mars.

July 21	+ 6·50	=	+ 2·372 δL	−230972 $\delta \rho$	− 1·374 δl +315588 δr	+ 0·28
August 16	+ 7·83	=	+ 3·316	−157503	− 2·321 +215006	+ 0·03
September 4	+ 8·80	=	+ 3·669	− 12895	− 2·673 + 17670	+ 0·18
30	+ 7·59	=	+ 3·036	+165546	− 2·038 −230415	+ 0·36
October 23	+ 5·48.	=	+ 2·182	+203803	− 1·183 −288742	+ 0·28
November 19	+ 3·53	=	+ 1·518	+179862	− 0·518 −261276	+ 0·46
December 20	+ 1·70	=	+ 1·116	+139059	− 0·116 −207960	− 0·62

Day, 1877.		Error of the Tables of the Planet in Geocentric Longitude, expressed in terms of Error of Heliocentric Longitude of Planet (δL), of Error of Projection of Radius Vector of Planet ($\delta \rho$), of Error of Earth's Longitude (δl), and of Error of Earth's Radius Vector (δr). ($\delta \rho$ and δr are expressed in terms of the Earth's Mean Distance from the Sun.)	Error of Tables in Hel. E. P. D.
CERES.			
July	24	$-78''.83 = +1''.518\,\delta L - 6020\,\delta\rho$	$-5''.38 + 4945\,\delta\rho$
August	16	$-75''.50 = +1''.493 + 10790$	$-3''.85 + 5119$
	24	$-76''.34 = +1''.452 + 15639$	$-5''.00 + 4994$
PALLAS.			
June	15	$+11''.81 = +1''.496\,\delta L - 14318\,\delta\rho$	$+1''.64 - 17367\,\delta\rho$
July	23	$+11''.84 = +1''.518 + 7725$	$+2''.76 - 16403$
August	1	$+8''.20 = +1''.474 + 13802$	$+1''.58 - 15427$
JUNO.			
June	4	$-40''.72 = +1''.457\,\delta L + 2059\,\delta\rho$	$+1''.59 - 6338\,\delta\rho$
	22	$-38''.65 = +1''.406 + 12450$	$+1''.40 - 6049$
VESTA.			
September	7	$-13''.57 = +1''.727\,\delta L - 10972\,\delta\rho$	$+0''.57 + 7302\,\delta\rho$
October	15	$-13''.22 = +1''.533 + 33023$	$+0''.90 + 6476$
JUPITER.			
May	17	$-18''.28 = +1''.186\,\delta L - 5264\,\delta\rho - 0''.186\,\delta l + 27371\,\delta r$	$+6''.69$
June	19	$-18''.92 = +1''.240 - 85 - 0''.240 + 481$	$+6''.00$
July	17	$-18''.63 = +1''.204 + 4531 - 0''.204 - 23361$	$+5''.85$
August	22	$-17''.81 = +1''.088 + 7678 - 0''.088 - 39694$	$+5''.62$
SATURN.			
August	16	$-8''.88 = +1''.105\,\delta L - 1051\,\delta\rho - 0''.105\,\delta l + 9998\,\delta r$	$-10''.61$
September	19	$-4''.98 = +1''.114 + 450 - 0''.114 - 4314$	$-10''.58$
October	13	$-1''.85 = +1''.092 + 1409 - 0''.092 - 13642$	$-9''.99$
November	12	$+0''.29 = +1''.043 + 2111 - 0''.043 - 20589$	$-10''.68$
December	31	$+1''.38 = +0''.959 + 1920 + 0''.041 - 18772$	$-10''.52$

URANUS.

Day, 1877.	Error of the Tables of the Planet in Geocentric Longitude, expressed in terms of Error of Heliocentric Longitude of Planet (δL), of Error of Projection of Radius Vector of Planet ($\delta \rho$), of Error of Earth's Longitude (δl), and of Error of Earth's Radius Vector (δr). ($\delta \rho$ and δr are expressed in terms of the Earth's Mean Distance from the Sun.)	Error of Tables in Hel. E. P. D.
	$''$ $''$ $''$ $''$ $''$	$''$
January 29	$-0\cdot34 = +1\cdot055\,\delta L - 148\,\delta\rho - 0\cdot055\,\delta l + 2760\,\delta r$	$-0\cdot01$
February 21	$-0\cdot55 = +1\cdot056 + 117 - 0\cdot056 - 2219$	$+0\cdot84$
March 13	$-0\cdot32 = +1\cdot048 + 336 - 0\cdot048 - 6177$	$+0\cdot82$
April 7	$-0\cdot76 = +1\cdot031 + 529 - 0\cdot031 - 9722$	$+0\cdot77$

NEPTUNE.

January 18	$-2\cdot74 = +1\cdot002\,\delta L + 228\,\delta\rho - 0\cdot002\,\delta l - 6921\,\delta r$	$+0\cdot76$
October 1	$-1\cdot47 = +1\cdot030 - 114 - 0\cdot030 + 3400$	$+0\cdot46$
October 24	$-2\cdot04 = +1\cdot034 - 21 - 0\cdot034 + 634$	$-0\cdot22$
November 14	$-1\cdot83 = +1\cdot033 + 67 - 0\cdot033 - 2037$	$-0\cdot07$
December 16	$-2\cdot45 = +1\cdot022 + 177 - 0\cdot022 - 5393$	$+0\cdot22$

ERRORS of the MOON'S TABULAR PLACE in RIGHT ASCENSION, NORTH POLAR DISTANCE, LONGITUDE, and ECLIPTIC NORTH POLAR DISTANCE.

Day, 1877.	Errors of Moon's Tabular Place from Observations with Transit-Circle.				Observer.	Errors of Moon's Tabular Place from Observations with Altazimuth.				Observer.
	In R.A.	In N.P.D.	In Longitude.	In E.N.P.D.		In R.A.	In N.P.D.	In Longitude.	In E.N.P.D.	
	s	"	"	"		s	"	"	"	
Jan. 1						+ 0·90	+ 3·97	+13·24	+ 0·45	AD
3						+ 1·17	− 2·24	+15·23	− 8·69	BD
4	+ 0·90	+ 6·67	+15·05	+ 0·74	WC	+ 0·36	+13·51	+10·32	+10·27	C
5	+ 0·67	+ 9·15	+12·78	+ 4·51	C	+ 0·77	+ 6·88	+13·25	+ 1·83	AD
6						+ 0·53	+ 3·50	+ 8·53	+ 0·33	L
Jan. 19						+ 0·05	− 4·97	+ 2·67	− 4·26	L
20						+ 0·14	+ 0·97	+ 1·54	+ 1·72	AD
21	+ 0·32	− 3·11	+ 5·55	− 1·09	L	+ 0·17	− 4·66	+ 4·09	− 3·36	B
22	+ 0·21	− 1·59	+ 3·39	− 0·45	AD	+ 0·24	− 1·52	+ 3·78	− 0·22	C
23	+ 0·17	− 1·00	+ 2·57	− 0·28	C	+ 0·63	− 2·22	+ 9·09	+ 0·45	L
24	+ 0·43	− 2·62	+ 6·26	− 1·36	JB	+ 0·69	− 0·88	+ 9·37	+ 1·18	AD
25	+ 0·62	+ 1·79	+ 8·02	+ 2·63	L	+ 0·41	− 9·34	+ 6·40	− 8·73	BD
26	+ 0·53	− 0·64	+ 7·01	− 0·79	AD	+ 0·88	+ 2·11	+11·68	+ 2·03	C
27	+ 0·90	+ 4·38	+12·62	+ 2·69	P	+ 1·38	− 1·96	+18·18	− 3·98	L
28	+ 0·94	+ 7·11	+14·40	+ 3·77	C	+ 0·98	+ 2·07	+13·65	− 0·81	AD
29	+ 1·00	+10·77	+17·08	+ 5·63	HP	+ 0·88	+ 4·75	+13·46	+ 0·62	G
30	+ 0·88	+ 5·24	+14·02	+ 0·07	AD	+ 0·71	+ 9·99	+13·33	+ 5·60	C
Feb. 2	+ 0·80	+ 9·09	+14·39	+ 4·20	AD	+ 0·58	+ 4·38	+ 9·62	+ 0·76	B
3	+ 0·60	+ 6·70	+10·44	+ 3·30	W	+ 0·37	+ 7·08	+ 7·49	+ 4·78	C
Feb. 16						− 0·03	− 1·63	+ 0·24	− 1·68	G
17						+ 0·30	− 0·82	+ 4·42	+ 0·95	L
19						− 0·04	+ 1·03	− 0·86	+ 0·80	AD
20	+ 0·42				T	+ 0·26	− 1·23	+ 3·75	− 0·36	AD
21						+ 0·46	+ 0·17	+ 6·07	+ 1·05	L
23	+ 0·30	+ 2·59	+ 4·21	+ 2·25	HP	+ 0·34	− 0·83	+ 4·45	− 1·17	C
24	+ 0·61	+ 0·48	+ 8·27	− 1·14	T	+ 0·67	+ 0·82	+ 9·13	− 0·84	AD
25	+ 0·62	+ 4·81	+ 9·76	+ 2·15	C	+ 0·85	+ 2·42	+12·14	− 0·85	L
26	+ 0·76	+ 8·12	+13·21	+ 3·79	AD	+ 0·79	+ 0·30	+11·79	− 3·49	T
27	+ 0·78	+ 7·54	+13·63	+ 2·52	BD	+ 0·60	+ 6·53	+10·73	+ 2·66	C
28	+ 0·82	+ 7·27	+14·20	+ 1·78	JB	+ 0·73	+ 9·37	+ 6·34	+ 4·27	AD
March 4						+ 0·52	+ 4·58	+ 8·07	+ 2·69	AD
7	+ 0·67				T					
March 16						− 0·12	+ 3·53	− 3·02	+ 2·56	C
17						+ 0·44	− 2·85	+ 7·01	− 0·35	T
18						+ 0·38	+ 2·15	+ 4·42	+ 3·75	AD
19						+ 0·17	− 1·45	+ 2·62	− 0·83	W
21	+ 0·43	+ 2·01	+ 5·53	+ 2·44	T	+ 0·17	+ 0·37	+ 2·22	+ 0·53	C
22						+ 0·35	+ 4·07	+ 4·84	+ 3·84	AD
23	+ 0·57	+ 2·19	+ 7·95	+ 1·02	C	+ 0·15	− 5·33	+ 1·20	− 5·57	T
24						+ 0·26	− 0·76	+ 3·32	− 1·60	L
25	+ 0·60	+ 4·18	+ 9·52	+ 1·22	T	+ 0·46	+ 1·51	+ 6·75	− 0·64	C
27	+ 0·57	+ 5·39	+ 9·98	+ 1·60	C	+ 0·34	+ 1·28	+ 5·19	− 0·81	T
28						+ 0·68	+ 5·49	+11·54	+ 0·97	L
29	+ 0·59	+ 9·07	+11·52	+ 5·07	T	+ 0·46	+ 6·49	+ 8·79	+ 3·39	C
30	+ 0·72	+ 5·53	+11·65	+ 1·62	G	+ 0·38	+ 3·72	+ 6·44	+ 1·58	AD
April 4						+ 0·46	+ 1·73	+ 5·97	+ 2·23	AD
6						+ 0·27	+ 1·69	+ 3·24	+ 2·54	C
April 16						+ 0·34	+ 2·61	+ 4·04	+ 3·40	C
17						+ 0·39	+ 5·56	+ 4·70	+ 5·97	AD
19	+ 0·39				AD	+ 0·68	+ 3·41	+ 9·53	+ 2·20	BD

Remarks on TRANSIT-CIRCLE Observations :—January 23 and February 20. Observed only over one wire in R.A.; cloudy. February 3. Very faint; observed in dark field.

Remarks on ALTAZIMUTH Observations :—March 24. Cloudy; the Moon observed in only one position of the instrument, and no star either for zero of Azimuth or Clock-error.

ERRORS of the MOON'S TABULAR PLACE—*continued.*

Day, 1877.	Errors of Moon's Tabular Place from Observations with Transit-Circle.				Observer.	Errors of Moon's Tabular Place from Observations with Altazimuth.				Observer.
	In R.A.	In N.P.D.	In Longitude.	In E.N.P.D.		In R.A.	In N.P.D.	In Longitude.	In E.N.P.D.	
	s	"	"	"		s	"	"	"	
April 20						+ 0·21	+ 8·06	+ 4·68	+ 7·19	C
21		+ 5·95			HP	+ 0·61	+ 2·98	+ 9·19	+ 0·22	AD
22						+ 0·37	+ 0·16	+ 5·14	− 1·78	T
23	+ 0·56	+ 5·58	+ 9·86	+ 1·94	AD	+ 0·60	+ 2·05	+ 9·05	− 1·53	L
24	+ 0·56	+ 6·86	+10·45	+ 2·95	T	+ 0·50	+ 6·16	+ 9·35	+ 2·67	C
25	+ 0·63	+ 7·49	+11·56	+ 3·23	JB	+ 0·62	+ 6·48	+11·04	+ 2·34	AD
26	+ 0·61	+ 7·17	+10·90	+ 3·44	C	+ 0·74	+ 3·04	+11·18	− 1·13	T
May 2	+ 0·65	+ 1·00	+ 8·55	+ 2·19	L	+ 0·21	+ 1·76	+ 2·58	+ 2·11	C
3						+ 0·25	+ 2·40	+ 2·86	+ 3·07	AD
4						+ 0·40	− 6·27	+ 7·17	− 4·46	T
5	+ 0·64	− 1·04	+ 9·11	+ 2·12	T					
6	+ 0·65	− 0·55	+ 9·14	+ 3·07	L	+ 0·05	+ 0·45	+ 0·52	+ 0·69	C
7		− 2·77			C					
May 15						+ 0·44	+ 6·48	+ 5·79	+ 6·52	C
16						+ 0·40	+ 7·49	+ 6·17	+ 6·86	HP
17						+ 0·52	+ 7·03	+ 8·44	+ 5·41	AD
18						+ 0·61	+ 6·45	+10·14	+ 3·69	T
19						+ 0·36	+ 9·84	+ 8·37	+ 7·39	C
24	+ 0·57	+ 2·85	+ 8·66	− 0·08	T	+ 0·73	+ 4·74	+11·47	+ 0·92	L
25						+ 0·65	+ 3·64	+ 9·72	+ 0·94	AD
26	+ 0·65	+ 2·30	+ 9·10	+ 0·56	BD	+ 0·92	− 5·06	+11·18	− 7·52	T
28	+ 0·41	− 0·83	+ 5·45	− 0·83	T	+ 0·57	− 2·57	+ 7·55	− 2·62	L
29	+ 0·45	− 0·19	+ 6·03	+ 0·39	B	+ 0·43	− 1·67	+ 5·89	− 1·15	AD
30	+ 0·39	− 0·20	+ 5·28	+ 0·80	AD	+ 0·39	− 4·22	+ 6·01	− 3·19	T
June 2						+ 0·25	+ 0·55	+ 3·24	+ 1·82	AD
3						+ 0·15	− 8·65	+ 5·37	− 7·15	T
5	+ 0·42	− 3·06	+ 6·97	− 0·33	C	+ 0·40	− 6·45	+ 8·06	− 3·55	L
June 13						+ 0·34	+ 2·79	+ 5·06	+ 1·94	T
14						+ 0·61	+ 8·47	+10·55	+ 5·87	C
15	+ 0·58	+ 5·99	+ 9·84	+ 3·02	T	+ 0·77	+ 8·78	+13·45	+ 4·61	L
16	+ 0·68	+ 7·29	+12·03	+ 3·10	C	+ 0·08	+ 4·73	+ 2·86	+ 3·95	AD
17	+ 0·65	+ 7·97	+12·10	+ 3·52	L	+ 0·67	+ 6·91	+11·98	+ 2·40	T
18	+ 0·46	+ 7·73	+ 9·41	+ 4·35	AD					
19	+ 0·46	+ 5·08	+ 8·25	+ 2·07	WL	+ 0·95	+ 2·94	+14·10	− 2·65	L
20	+ 0·73	+ 5·46	+11·81	+ 1·40	T	+ 0·64	+ 5·41	+10·55	+ 1·86	AD
23	+ 0·80	+ 4·39	+11·21	+ 2·89	T	+ 0·94	+ 0·08	+12·48	− 1·73	HP
24	+ 0·67	+ 2·44	+ 8·97	+ 2·13	C	+ 0·66	− 3·19	+ 8·62	− 3·55	AD
25	+ 0·71	+ 1·11	+ 9·39	+ 1·70	BD	+ 0·94	− 3·21	+12·70	− 2·51	T
26						+ 0·52	+ 2·40	+ 6·62	+ 3·42	C
27	+ 0·49	− 1·59	+ 7·01	+ 0·05	T	+ 1·08	− 3·54	+15·41	− 0·13	B
28						+ 0·17	+ 0·50	+ 2·17	+ 1·18	AD
29	+ 0·43	− 0·94	+ 6·23	+ 1·29	T	+ 0·76	− 7·32	+12·90	− 3·16	T
July 2	+ 0·63	− 2·76	+ 9·76	+ 1·22	BD	+ 0·13	− 2·06	+ 2·61	− 1·12	AD
3						+ 0·08	− 2·99	+ 2·27	− 2·29	T
4	+ 0·41	− 3·45	+ 6·80	− 1·10	T	+ 0·28	+ 0·66	+ 3·55	+ 2·11	C
5	+ 0·44				C	+ 0·42	− 3·77	+ 6·87	+ 1·65	B
6						+ 0·62	− 4·78	+ 9·50	− 2·43	L
7						+ 0·76	− 7·83	+11·46	− 5·92	T
July 15	+ 0·47	+ 7·92	+ 9·64	+ 4·47	C	+ 0·24	+10·23	+ 7·38	+ 7·94	G
20						+ 1·00	+ 4·93	+14·10	+ 2·60	L
21	+ 0·91	+ 2·58	+12·24	+ 1·74	T	+ 0·67	+ 7·19	+ 9·38	+ 6·56	C

Remarks on TRANSIT-CIRCLE Observations:—April 21. Cloudy; no R.A. Only two contacts in N.P.D. May 2. Only two contacts in N.P.D. May 24. Only one contact in N.P.D.

Remarks on ALTAZIMUTH Observations:—April 20 and May 16. Cloudy; no star observed either for zero of Azimuth or Clock-error. April 22. Cloudy; the Z.D. observation in only one position of the instrument; no star observed either for zero of Azimuth or Clock-error. May 30. Cloudy; the Azimuth observation of the Moon was in only one position of the instrument, and no star observed for zero of Azimuth. June 28. Cloudy; the observation of the Moon in only one position of the instrument. July 4. Very cloudy; observed in only one position of the instrument.

ERRORS of the MOON'S TABULAR PLACE—*continued.*

Day, 1877.	Errors of Moon's Tabular Place from Observations with Transit-Circle.				Observer.	Errors of Moon's Tabular Place from Observations with Altazimuth.				Observer.
	In R. A.	In N. P. D.	In Longitude.	In E.N.P.D.		In R. A.	In N. P. D.	In Longitude.	In E.N.P.D.	
	s	"	"	"		s	"	"	"	
July 22	+ 0·81	− 4·32	+10·89	− 4·02	L	+ 0·82	+ 2·16	+10·85	+ 2·39	AD
24	+ 0·52	− 2·05	+ 7·44	− 0·54	AD	+ 0·91	− 1·74	+12·63	+ 0·86	L
26	+ 0·73	− 2·59	+10·87	+ 1·05	BD	+ 0·35	− 1·86	+ 5·41	− 0·11	AD
27						+ 0·49	− 5·30	+ 8·67	− 2·31	T
28						+ 0·46	− 2·57	+ 7·34	+ 0·28	B
29	+ 0·34	(+ 4·91)			T	+ 0·12	− 0·40	+ 1·81	+ 0·35	C
30	+ 0·50	− 3·02	+ 8·03	+ 0·14	C	+ 0·29	− 4·74	+ 5·84	− 2·65	AD
August 1						+ 0·73	− 8·84	+12·88	− 4·72	T
2						+ 0·27	− 1·44	+ 4·02	− 0·30	C
5						+ 0·33	− 6·23	+ 4·42	− 6·20	T
7						+ 1·56	− 4·71	+20·03	− 9·40	T
August 14	+ 0·59	+ 7·26	+10·39	+ 4·02	JP	+ 0·38	+10·71	+ 8·67	+ 8·31	G
15						+ 0·75	+ 4·90	+11·32	+ 1·96	C
16						+ 0·62	+ 3·22	+ 8·83	+ 1·60	WC
17	+ 0·78	+ 3·64	+10·71	+ 2·55	JB	+ 0·81	+ 2·58	+10·98	+ 1·53	AD
20	+ 0·59	− 1·21	+ 8·17	+ 0·27	T	+ 0·53	+ 0·38	+ 7·07	− 0·94	W
21						+ 0·69	− 3·24	+10·17	− 0·71	AD
22	+ 0·43	− 3·03	+ 6·84	− 0·93	G	+ 0·42	− 5·64	+ 7·49	− 3·49	T
23	+ 0·55	− 3·84	+ 8·94	− 0·71	AD	+ 0·61	− 2·33	+ 9·21	+ 0·96	HP
28						+ 0·57	− 4·75	+ 9·36	− 1·60	B
29						+ 0·97	− 2·35	+13·74	+ 2·00	AD
30						+ 0·84	− 4·63	+12·29	− 1·74	G
31	+ 0·83	− 0·90	+11·10	+ 0·54	L	+ 0·75	− 8·32	+11·24	− 6·65	T
Sept. 1						+ 1·04	− 3·50	+13·95	− 2·83	BD
2						+ 0·77	+ 4·53	+10·57	+ 3·81	AD
4						+ 0·43	+ 2·31	+ 6·48	+ 0·57	T
5						+ 0·80	+ 2·34	+11·77	− 1·68	HP
Sept. 19						+ 0·62	− 1·11	+ 8·90	+ 2·09	G
20						+ 0·06	− 1·61	+ 1·44	− 1·16	C
21	+ 0·43	− 2·03	+ 6·74	+ 0·67	JB	+ 0·46	− 6·40	+ 8·87	− 3·19	T
22	+ 0·54	− 3·59	+ 8·86	− 0·08	C	+ 0·31	− 0·36	+ 4·41	+ 1·52	L
23	+ 0·51	− 2·09	+ 7·78	+ 0·99	T	+ 0·54	− 6·34	+ 9·87	− 2·70	BD
24	+ 0·66	− 2·39	+ 9·80	+ 1·19	L	+ 0·45	− 1·27	+ 6·57	+ 1·22	C
25						+ 0·39	− 2·91	+ 6·20	− 0·94	T
26						+ 0·63	− 2·38	+ 9·03	+ 0·02	L
27	+ 0·73	− 0·35	+ 9·73	+ 1·24	L	+ 0·69	− 1·37	+ 9·42	+ 0·39	T
28						+ 0·63	+ 5·68	+ 7·87	+ 6·36	C
29						+ 1·04	− 6·02	+13·71	− 6·31	T
30						+ 1·30	− 2·45	+17·07	− 4·82	L
Oct. 3						+ 0·64	− 2·59	+ 7·87	− 5·85	T
4						+ 0·86	+ 3·39	+13·20	− 1·91	BD
Oct. 14	+ 0·69	− 1·14	+ 9·55	+ 0·84	C	+ 0·86	+ 2·62	+11·10	+ 4·92	L
15	+ 0·44	− 1·57	+ 6·42	+ 0·21	T	+ 0·48	− 0·04	+ 6·54	+ 1·81	AD
16	+ 0·43	− 2·42	+ 6·69	− 0·26	HP	+ 0·46	− 0·57	+ 6·50	+ 1·64	C
17	+ 0·40	− 1·80	+ 6·17	+ 0·50	AD	+ 0·35	− 5·00	+ 6·63	− 2·80	T
18	+ 0·36	− 2·38	+ 5·90	− 0·09	BD	+ 0·74	− 2·88	+11·33	+ 1·64	L
19						+ 0·46	− 2·07	+ 7·17	+ 0·84	AD
20	+ 0·47	− 3·07	+ 7·64	− 0·08	R	+ 0·42	− 1·13	+ 6·19	+ 1·43	C
22	+ 0·58	− 2·73	+ 8·72	+ 0·06	T	+ 0·53	− 4·24	+ 8·57	− 1·46	G
23	+ 0·68	− 1·50	+ 9·49	+ 1·11	C	+ 0·81	− 2·91	+11·65	+ 0·39	AD

Remarks on TRANSIT-CIRCLE Observations :—September 23. Very faint ; observed in dark field.

Remarks on ALTAZIMUTH Observations:—August 1, 7. Cloudy ; the Moon observed in only one position of the instrument, and no star for zero of Azimuth. On August 7 the Moon was very low, Z.D. 82°. 20′. September 25. Very faint; cloudy ; no star observed for Clock-error.

ERRORS of the MOON'S TABULAR PLACE—*concluded.*

Day, 1877.	Errors of Moon's Tabular Place from Observations with Transit-Circle. In R.A.	In N.P.D.	In Longitude.	In E.N.P.D.	Observer.	Errors of Moon's Tabular Place from Observations with Altazimuth. In R.A.	In N.P.D.	In Longitude.	In E.N.P.D.	Observer.
	s	"	"	"		s	"	"	"	
Oct. 24	+ 0·83	− 1·04	+11·23	+ 1·08	L	− 0·64	− 4·42	+ 9·45	− 2·48	T
26	+ 0·81	+ 1·83	+10·83	+ 1·60	C	+ 0·82	+ 0·60	+10·89	+ 0·67	L
27	+ 0·86	+ 1·89	+11·78	+ 0·37	L	+ 0·94	+ 2·33	+12·83	+ 1·01	AD
28						+ 0·50	+ 3·82	+ 7·52	+ 2·37	T
29		+ 8·49			T	+ 0·74	+ 4·22	+11·30	+ 1·08	C
30	+ 1·05	+ 7·28	+17·04	+ 1·32	BD	+ 0·70	+ 6·33	+11·84	+ 2·35	L
31	+ 0·83	+ 9·10	+14·98	+ 3·61	L	+ 0·70	+ 4·85	+11·52	+ 0·48	AD
Nov. 10	+ 0·39	− 3·65	+ 5·88	− 2·69	AD					
12	+ 0·41	− 2·16	+ 6·28	− 0·23	C	+ 0·57	+ 3·89	+ 6·63	+ 6·20	AD
13	+ 0·44	− 2·29	+ 6·87	+ 0·13	T	+ 0·53	− 3·33	+ 8·46	− 0·41	L
14	+ 0·45	− 3·09	+ 7·39	− 0·30	AD	+ 0·24	− 2·67	+ 4·33	− 1·11	C
16	+ 0·52	− 1·90	+ 7·89	+ 1·34	C	+ 0·64	− 0·10	+ 8·83	+ 3·71	AD
17	+ 0·36	− 2·35	+ 5·81	− 0·14	T	+ 0·73	− 5·60	+12·13	− 1·02	L
18	+ 0·46	− 1·83	+ 6·85	+ 0·59	AD	+ 0·73	− 3·62	+11·16	+ 0·36	C
19	+ 0·67	− 2·65	+ 9·77	+ 0·25	L	+ 0·30	− 3·04	+ 4·94	− 1·63	HP
20	+ 0·66	− 1·76	+ 9·19	+ 0·29	C	+ 0·51	+ 0·81	+ 6·60	+ 2·46	AD
21	+ 0·83	+ 1·37	+10·85	+ 2·73	T	+ 0·93	+ 4·26	+11·91	+ 5·52	L
22	+ 0·73	+ 0·67	+ 9·71	+ 0·80	JP	+ 0·58	+ 2·94	+ 7·59	+ 3·26	C
23	+ 0·85	+ 2·66	+11·65	+ 1·54	G	+ 1·03	− 1·68	+13·67	− 2·53	T
24						+ 0·55	+ 8·19	+ 9·19	+ 6·40	AD
25						+ 0·80	+ 2·41	+11·55	− 0·63	JP
27	+ 0·74	+ 9·12	+13·68	+ 4·26	C	+ 0·95	− 1·15	+12·68	− 6·32	T
29	+ 0·86	+ 8·68	+15·20	+ 2·93	AD					
Dec. 9	+ 0·39	− 4·62	+ 6·64	− 2·86	L	+ 0·20	+ 3·94	+ 1·61	+ 4·59	C
10						+ 0·37	+ 1·05	+ 4·75	+ 2·80	AD
11	+ 0·19	− 2·34	+ 3·49	− 1·13	G	+ 0·58	− 1·10	+ 8·42	+ 2·16	L
12	+ 0·13	− 2·72	+ 2·86	− 1·75	AD	+ 0·35	− 1·77	+ 5·53	+ 0·41	T
13	+ 0·14	− 2·15	+ 2·78	− 1·13	BD	− 0·11	+ 4·57	− 3·34	+ 3·53	C
14	+ 0·19	− 2·54	+ 3·59	− 1·24	B	+ 0·27	+ 0·45	+ 3·51	+ 1·99	JP
15						+ 0·60	− 2·64	+ 9·13	+ 0·81	AD
17	+ 0·36	− 6·41	+ 6·49	− 4·89	AD	+ 0·77	− 5·92	+11·86	− 2·87	L
18	+ 0·46	− 0·87	+ 6·26	+ 0·23	T	+ 0·38	+ 1·44	+ 4·77	+ 2·41	C
23						+ 0·77	+ 5·20	+12·16	+ 1·57	AD
24						+ 0·53	+ 1·56	+ 7·88	− 1·35	T
26	+ 0·81	+ 6·61	+13·77	+ 1·26	L	+ 0·64	+ 6·88	+11·55	+ 2·50	WC
27	+ 0·85	+ 9·46	+15·19	+ 3·97	B	+ 0·45	+10·12	+10·03	+ 6·80	AD
30						+ 0·61	+ 1·50	+ 8·44	− 0·34	T

Remarks on TRANSIT-CIRCLE Observations:—October 27. Only two contacts in N.P.D. October 29. Only two contacts in N.P.D.; no R.A. November 21. Only three wires in R.A. and two contacts in N.P.D.; cloudy.

ROYAL OBSERVATORY, GREENWICH.

OBSERVATIONS OF γ DRACONIS

WITH THE

REFLEX ZENITH TUBE;

AND

REDUCTION OF THE OBSERVATIONS.

1877.

Day and Hour of Observation, 1877.	Observer.	Position of Mic. A.	Wire used.	Micrometer Readings. A	Micrometer Readings. B	Level Readings.		Equivalents for Level.	Sum of Equivalents for Wire, for Micrometer-Readings, and for Level Readings.	Assumed Instrumental Constant.	Star's Z.D. North from Observation.	Correction to Mean Z.D. North for 1877, Jan. 1.	Mean Zenith Distance North, 1877, Jan. 1, from each Observation.	Concluded Mean Zenith Distance North, 1877, Jan. 1.
d h				r	r	div.	div.	"	"	"	"	"	"	"
February 2. 21	HP	Left	16	70·000	24·272	30·7	92·5	0·80	457·76	382·73	75·03	+22·94	97·97	97·24
" "		Right	15	74·122	24·272	8·5	70·2	0·51	309·16		73·57		96·51	
March 8. 18	BD	Left	16	65·000	28·814	26·8	89·5	0·75	450·02		67·29	+28·66	95·95	95·95
May 11. 15	JB	Left	16	65·553	28·795	17·5	76·4	0·61	458·83		76·10	+20·54	96·64	96·20
" "		Right	15	69·490	28·795	23·6	82·7	0·69	307·51		75·22		95·76	
May 29. 13	B	Left	16	67·642	27·160	18·0	76·8	0·61	466·45		83·72	+14·98	98·70	98·71
" "		Right	15	70·619	27·160	22·3	80·2	0·66	299·00		83·73		98·71	
June 6. 13	C	Left	16	69·000	25·776	24·4	82·5	0·69	466·11		83·38	+12·36	95·74	96·47
" "		Right	15	71·935	25·776	25·0	83·8	0·70	297·90		84·83		97·19	
June 15. 12	T	Left	16	72·000	22·936	14·6	70·0	0·55	468·64		85·91	+ 9·39	95·30	95·74
" "		Right	15	74·656	22·936	30·7	86·2	0·76	295·95		86·78		96·17	
June 16. 12	C	Left	16	75·000	20·208	14·5	70·0	0·55	473·21		90·48	+ 9·06	99·54	98·88
" "		Right	15	77·244	20·208	28·8	84·6	0·73	293·57		89·16		98·22	
June 23. 12	HP	Left	16	77·200	18·009	14·0	70·3	0·55	473·23		90·50	+ 6·78	97·28	96·56
" "		Right	15	79·449	18·009	29·4	86·0	0·74	293·68		89·05		95·83	
June 25. 12	T	Left	16	79·450	15·950	12·6	69·1	0·53	476·41		93·68	+ 6·14	99·82	99·82
June 29. 11	L	Left	16	79·498	15·942	11·8	68·0	0·52	477·07		94·34	+ 4·86	99·20	97·52
" "		Right	15	81·398	15·942	32·4	89·6	0·79	291·75		90·98		95·84	
July 2. 11	G	Right	15	83·491	13·941	31·0	87·3	0·76	293·26		89·47	+ 3·92	93·39	94·67
" "		Left	16	83·491	11·810	12·5	69·0	0·53	474·75		92·02		95·94	
July 4. 11	HP	Left	16	83·500	11·923	13·0	69·0	0·53	476·80		94·07	+ 3·30	97·37	97·31
" "		Right	15	85·240	11·923	32·0	88·2	0·78	288·78		93·95		97·25	
July 7. 11	JB	Left	16	85·000	10·397	11·0	67·8	0·51	476·34		93·61	+ 2·37	95·98	99·13
" "		Right	15	86·410	10·397	33·2	90·7	0·80	282·82		99·91		102·28	
July 12. 0	AD	Left	16	85·200	10·283	14·0	70·0	0·54	477·81		95·08	+ 0·86	95·94	95·66
" "		Right	15	86·848	10·283	30·0	86·0	0·75	288·21		94·52		95·38	
July 20. 10	AD	Right	15	86·589	10·320	30·0	86·0	0·75	284·48		98·25	− 1·46	96·79	97·73
" "		Left	16	86·589	9·195	13·0	69·0	0·53	500·86		100·13		98·67	
July 24. 10	AD	Left	16	86·590	9·119	14·0	70·0	0·54	481·61		98·88	− 2·46	96·42	96·40
" "		Right	15	87·756	9·119	29·0	85·0	0·74	283·90		98·83		96·37	
July 26. 10	BD	Left	16	86·000	9·597	15·1	71·2	0·56	479·75		97·02	− 2·96	94·06	93·38
" "		Right	15	87·467	9·597	29·4	85·1	0·74	287·08		95·65		92·69	
July 27. 10	C	Left	16	87·000	8·794	14·0	70·5	0·54	483·04		100·31	− 3·21	97·10	96·76
" "		Right	15	88·035	8·794	27·0	83·5	0·71	283·10		99·63		96·42	

The numerical value of the Sum of Equivalents in column 10, $= w +$ (sum of Micrometer Readings $- 80^r$) $\times$ 16″·780 + sum of Level Readings $\times$ 0″·00646; where w, for wire 15, $= 0$, and for wire 16, $= 3'.37''.47$. The numerical difference between this value and that of the Instrumental Constant is the Star's Z.D. North.

June 6d. The instrument was adjusted to focus.
June 23d. The reading of Microscope A, Left, was set down 78r·200.
July 2d. The reading of Microscope B, Right, was set down 15r·941.

June 15d. Very diffused.
June 29d. Diffused.
July 2d., 4d., 12d., 20d. Image ill-defined.

Day and Hour of Observation, 1877.	Observer.	Position of Mic. A.	Wire used.	Micrometer Readings. A	Micrometer Readings. B	Level Readings.		Equivalents for Level.	Sum of Equivalents for Wire, for Micrometer-Readings, and for Level Readings.	Assumed Instrumental Constant.	Star's Z. D. North from Observation.	Correction to Mean Z. D. North for 1877, Jan. 1.	Mean Zenith Distance North, 1877, Jan. 1, from each Observation.	Concluded Mean Zenith Distance North, 1877, Jan. 1.
				r	r	div.	div.	"	"	"	"	"	"	"
July 30. 9 h	R	Right	15	70·329	26·521	28·0	82·1	0·71	283·45	382·73	99·28	− 3·96	95·32	96·35
" "		Left	16	70·329	25·524	19·3	73·0	0·59	484·07		101·34		97·38	
August 2. 9	B	Left	16	70·330	25·471	16·8	73·0	0·58	483·19		100·46	− 4·62	95·84	97·05
" "		Right	15	71·165	25·471	27·2	83·4	0·71	279·86		102·87		98·25	
August 10. 9	C	Left	16	71·000	25·010	16·0	72·6	0·57	486·69		103·96	− 6·34	97·62	97·80
" "		Right	15	71·538	25·010	30·0	86·5	0·75	278·42		104·31		97·97	
August 15. 8	AD	Right	15	71·624	25·000	30·0	85·0	0·74	279·70		103·03	− 7·24	95·79	95·94
" "		Left	16	71·624	24·350	14·0	69·0	0·54	486·06		103·33		96·09	
August 16. 8	R	Left	16	71·624	24·410	14·8	69·5	0·55	487·07		104·34	− 7·42	96·92	97·69
" "		Right	15	72·045	24·410	29·9	84·9	0·74	276·85		105·88		98·46	
August 17. 8	JB	Right	15	72·250	24·400	33·0	88·0	0·78	280·17		102·56	− 7·60	94·96	96·01
" "		Left	16	72·250	23·803	14·2	69·8	0·54	487·38		104·65		97·05	
August 21. 8	JP	Left	16	72·250	23·654	15·7	70·0	0·55	484·89		102·16	− 8·24	93·92	95·56
" "		Right	15	72·827	23·654	31·0	85·5	0·75	277·30		105·43		97·19	
August 22. 8	G	Right	15	72·829	23·654	30·0	85·0	0·74	277·32		105·41	− 8·38	97·03	97·16
" "		Left	16	72·829	23·284	12·0	72·0	0·54	488·39		105·66		97·28	
August 29. 7	JP	Left	16	72·828	23·243	17·0	72·5	0·58	487·73		105·00	− 9·36	95·64	96·54
" "		Right	15	73·157	23·243	30·5	85·0	0·74	275·93		106·80		97·44	
August 31. 7	R	Right	15	73·161	23·243	27·9	85·0	0·73	275·99		106·74	− 9·54	97·20	97·93
" "		Left	16	73·161	23·100	16·0	73·1	0·58	490·92		108·19		98·65	
September 5. 7	JB	Left	16	73·200	22·994	16·0	73·7	0·58	489·79		107·06	− 9·99	97·07	98·32
" "		Right	15	73·243	22·994	27·0	85·0	0·72	273·18		109·55		99·56	
September 17. 6	JP	Right	15	73·286	22·994	23·9	81·0	0·68	273·86		108·87	−10·71	98·16	98·16
September 28. 5	G	Left	16	73·315	22·853	17·0	76·0	0·60	489·37		106·64	−10·66	95·98	97·28
" "		Right	15	73·405	22·853	24·0	82·2	0·69	273·50		109·23		98·57	
September 29. 5	R	Right	15	73·540	22·854	24·4	83·3	0·70	275·79		106·94	−10·60	96·34	98·57
" "		Left	16	73·540	22·911	16·8	75·5	0·60	494·12		111·39		100·79	
October 2. 5	JB	Left	16	73·460	22·733	17·0	76·1	0·60	489·79		107·06	−10·42	96·64	98·36
" "		Right	15	73·448	22·733	25·1	84·5	0·71	272·23		110·50		100·08	

The numerical value of the Sum of Equivalents in column 10, $= w +$ (sum of Micrometer Readings $- 80^r$) $\times 16''\cdot780 +$ sum of Level Readings $\times 0''\cdot00646$; where w, for wire 15, $= 0$, and for wire 16, $= 3'\cdot37''\cdot47$. The numerical difference between this value and that of the Instrumental Constant is the Star's Z.D. North.

July 30d. August 2d., 16d. Very tremulous.
August 21d., 29d., 31d. Image very diffused.
October 2d. Very faint.

August 2d. The reading of Microscope A, Right, was set down $70^r\cdot165$.
September 28d., 29d. Very ill-defined.

ROYAL OBSERVATORY, GREENWICH.

MICROMETER MEASURES AND ESTIMATIONS

OF

THE POSITIONS OF

THE SATELLITES OF MARS AND SATURN,

MADE WITH

THE SOUTH-EAST EQUATOREAL.

1877.

OBSERVATIONS of the SATELLITES of MARS, made with the SOUTH-EAST EQUATOREAL at the ROYAL OBSERVATORY, GREENWICH, in the Year 1877.

OUTER SATELLITE.

Date.	Sidereal Time.	Position Angle.	Distance.		Observer.	Remarks.
			Radii of Mars.	″		
	d h m	h m	°			
September	5. 9. 33	20. 33	270	..	60±	M	Rough estimation.
	5. 9. 50	20. 50	240	4	59	M	Estimation.
	5. 10. 33	21. 33	230	3¼	48	M	Estimation.
	5. 11. 0	22. 0	225±	4±	59±	WC	Rough estimation.
	19. 12. 21	0. 17	190 to 195	2	28	M	Very rough estimation.
	28. 10. 36	23. 7	110 to 115	2½	33	M	Estimation.
	29. 8. 55	21. 30	248°. 31′	..	80·4	M	Measure.
	29. 9. 10	21. 45	255	6	77	M	Estimation.

INNER SATELLITE.

September	28. 10. 21	22. 52	280 to 285	2¼	29	M	Estimation.
	28. 10. 41	23. 12	285	2½	33	M	Estimation.

The observations were made with a general knowledge of the time of E. or W. elongation, but without any ephemeris of position angles and distances, so that the observer did not know whether the satellite would be N. or S. of *Mars*.

No red colour was noticed in the outer satellite. The planet was wholly or partly hidden when observing the satellites. The outer one was well seen when fully half the disk of *Mars* was uncovered.

MICROMETER-MEASURES of SATURN'S SATELLITES, made with the SOUTH-EAST EQUATOREAL, at the ROYAL OBSERVATORY, GREENWICH, in the Year 1877.

TITAN.

Day, 1877.	Observer.	Object.	Time by Sidereal Standard at observation of Distance.	Greenwich Sidereal Time at observation of Distance.	Micrometer.	Reading of Micrometer.	Instrumental Constant.	Concluded Distance in Arc.	Concluded Distance from Center of Saturn.	Limb or Center of Saturn.	Time by Sidereal Standard at observation of Position-angle.	Greenwich Sidereal Time at observation of Position-angle.	Reading of Position-circle.	Instrumental Constant.	Concluded Position-angle from Center of Saturn.
			h m s	h m s		rev.	rev.	′ ″	′ ″		h m s	h m s	° ′	° ′	° ′
Nov. 3	M	Saturn A.	1. 46. 14	1. 46. 53	P	24·544	40·061	2. 57·94		C	1. 44. 34	1. 45. 13	5. 23	90. 4	
		Titan			O	24·713			3. 7·60	C	1. 51. 14	1. 51. 53	185. 25		95. 28
		Saturn B.	1. 48. 54	1. 49. 33	P	25·290		3. 17·25		C	2. 41. 28	2. 42. 7	185. 59		
		Titan			O	24·965				C	3. 18. 1	3. 18. 40	5. 28		95. 48
		Saturn B.	1. 55. 30	1. 56. 9	P	14·401		3. 17·64							
		Titan			O	15·446			3. 8·02						
		Saturn A.	1. 56. 35	1. 57. 14	P	15·157		2. 58·40							
		Titan			O	15·684									
		Saturn A.	2. 43. 33	2. 44. 12	O	23·856		2. 58·52							
		Titan			P	25·431			3. 7·38						
		Saturn B.	2. 46. 48	2. 47. 27	O	23·949		3. 16·23							
		Titan			P	26·253									
		Saturn A.	3. 19. 31	3. 20. 10	O	15·488		2. 57·42							
		Titan			P	15·404			3. 6·76						
		Saturn B.	3. 20. 41	3. 21. 20	O	15·674		3. 16·11							
		Titan			P	14·252									

RHEA.

Oct. 3	M	Saturn B.	22. 9. 58	22. 10. 21	P	20·566	40·050	0. 39·18		C	22. 13. 13	22. 13. 36	174. 33	89. 58	
		Rhea.....			O	21·509			0. 29·50	C	22. 13. 13	22. 13. 36	354. 33		84. 31
		Saturn A.	22. 11. 58	22. 11. 21	P	19·782		0. 19·81							
		Rhea.....			O	21·292									
		Saturn B.	22. 16. 8	22. 16. 31	O	19·205		0. 37·95							
		Rhea.....			P	18·884			0. 28·67						
		Saturn A.	22. 17. 58	22. 18. 21	O	21·371		0. 19·38							
		Rhea.....			P	17·677									
Oct. 15	M	Saturn B.	0. 40. 49	0. 41. 18	O	22·251	40·058	1. 32·05		C	0. 46. 59	0. 47. 28	183. 6	89. 54	
		Rhea.....			P	22·564			1. 21·79	C	0. 54. 39	0. 55. 8	184. 14		273. 34
		Saturn A.	0. 43. 9	0. 43. 38	O	21·201		1. 11·52							
		Rhea.....			P	22·553									
		Saturn A.	0. 50. 9	0. 50. 38	P	18·854		1. 12·37							
		Rhea.....			O	17·464			1. 21·86						
		Saturn B.	0. 51. 34	0. 52. 3	P	17·803		1. 31·35							
		Rhea.....			O	17·534									
Nov. 3	M	Saturn A.	1. 33. 3	1. 33. 42	O	20·157	40·061	0. 24·63		C	1. 31. 3	1. 31. 42	13. 51	90. 4	284. 27
		Rhea.....			P	21·177			0. 33·69	C	2. 7. 50	2. 8. 29	194. 55		
		Saturn B.	1. 34. 53	1. 35. 32	O	20·936		0. 42·74		C	2. 28. 39	2. 29. 18	195. 22		285. 54
		Rhea.....			P	21·334				C	3. 0. 25	3. 1. 4	16. 17		
		Saturn A.	2. 10. 6	2. 10. 45	O	18·288		0. 40·36							
		Rhea.....			P	19·687			0. 31·11						
		Saturn B.	2. 12. 21	2. 13. 0	O	19·315		0. 21·86							
		Rhea.....			P	19·616									
		Saturn B.	2. 29. 37	2. 30. 16	P	20·414		0. 38·16							
		Rhea.....			O	21·619			0. 28·26						
		Saturn A.	2. 31. 22	2. 32. 1	O	20·583		0. 18·36							
		Rhea.....			P	20·427									
		Saturn A.	3. 3. 20	3. 3. 59	P	20·175		0. 16·37							
		Rhea.....			O	19·040			0. 26·55						
		Saturn B.	3. 5. 0	3. 5. 39	P	19·226		0. 36·73							
		Rhea.....			O	18·937									
Nov. 5	M	Saturn A.	1. 31. 20	1. 32. 0	P	21·563	40·053	0. 48·70		C	1. 29. 10	1. 29. 50	9. 45	90. 13	99. 32
		Rhea.....			O	21·007			0. 58·17	C	1. 35. 50	1. 36. 30	188. 53		
		Saturn B.	1. 33. 20	1. 34. 0	P	22·472		1. 7·63		C	1. 39. 40	1. 40. 20	9. 37		99. 27
		Rhea.....			O	21·076				C	1. 44. 25	1. 45. 5	188. 51		

DIONE.

Day, 1877.	Observer.	Object.	Time by Sidereal Standard at observation of Distance.	Greenwich Sidereal Time at observation of Distance.	Micrometer.	Reading of Micrometer.	Instrumental Constant.	Concluded Distance in Arc.	Concluded Distance from Center of Saturn.	Limb or Center of Saturn.	Time by Sidereal Standard at observation of Position-angle.	Greenwich Sidereal Time at observation of Position-angle.	Reading of Position-circle.	Instrumental Constant.	Concluded Position-angle from Center of Saturn.
			h m s	h m s		rev.	rev.	′ ″	′ ″		h m s	h m s	° ′	° ′	° ′
Oct. 3	M	Saturn A.	21. 55. 8	21. 55. 31	O	19·458	40·050	0. 29·76		C	21. 58. 28	21. 58. 51	186. 7	89. 58	
		Dione			P	19·054			0. 39·64	C	21. 58. 28	21. 58. 51	6. 7		96. 5
		Saturn B.	22. 0. 18	22. 0. 41	O	18·368		0. 49·52							
		Dione			P	19·123									
		Saturn B.	22. 2. 13	22. 2. 36	P	20·027		0. 51·28							
		Dione			O	22·673			0. 39·26						
		Saturn A.	22. 3. 48	22. 4. 11	P	20·125		0. 27·24							
		Dione			O	21·333									
Oct. 15	M	Saturn B.	0. 7. 19	0. 7. 48	O	21·553	40·058	1. 6·49		C	0. 16. 9	0. 16. 38	186. 17	89. 54	
		Dione			P	21·941			0. 56·55	C	0. 23. 9	0. 23. 38	186. 38		276. 22
		Saturn A.	0. 10. 59	0. 11. 28	O	20·552		0. 46·61							
		Dione			P	21·915									
		Saturn A.	0. 18. 34	0. 19. 3	P	19·567		0. 47·08							
		Dione			O	18·058			0. 57·22						
		Saturn B.	0. 20. 49	0. 21. 18	P	18·054		1. 7·36							
		Dione			O	18·523									
Nov. 3	M	Saturn A.	1. 23. 42	1. 24. 21	O	21·266	40·061	0. 47·66		C	1. 26. 58	1. 27. 37	4. 28	90. 4	
		Dione			P	21·258			0. 56·60	C	2. 16. 51	2. 17. 30	185. 31		275. 4
		Saturn B.	1. 28. 18	1. 28. 57	O	21·749		1. 5·54		C	2. 23. 7	2. 23. 46	185. 31		
		Dione			P	21·699				C	3. 10. 40	3. 11. 19	6. 22		276. 1
		Saturn A.	2. 18. 36	2. 19. 15	O	18·971		0. 47·87							
		Dione			P	18·616			0. 57·07						
		Saturn B.	2. 20. 21	2. 21. 0	O	18·124		1. 6·27							
		Dione			P	18·512									
		Saturn B.	2. 24. 7	2. 24. 46	P	21·572		1. 5·60							
		Dione			O	21·879			0. 56·60						
		Saturn A.	2. 26. 7	2. 26. 46	P	20·713		0. 47·60							
		Dione			O	21·808									
		Saturn A.	3. 12. 40	3. 13. 19	P	19·526		0. 49·77							
		Dione			O	17·963			1. 0·25						
		Saturn B.	3. 14. 25	3. 15. 4	P	18·054		1. 10·72							
		Dione			O	18·352									

TETHYS.

Oct. 3	M	Saturn A.	21. 35. 54	21. 36. 17	O	20·117	40·050	0. 35·97		C	21. 35. 54	21. 36. 17	185. 39	89. 58	
		Tethys ...			P	21·792			0. 46·34	C	21. 41. 9	21. 41. 32	185. 30		275. 33
		Saturn B.	21. 41. 9	21. 41. 32	O	22·129		0. 56·71		C	21. 49. 58	21. 50. 21	187. 2		
		Tethys ...			P	20·852				C	21. 49. 58	21. 50. 21	7. 2		277. 0
		Saturn A.	21. 46. 4	21. 46. 27	P	19·289		0. 32·41							
		Tethys ...			O	19·086			0. 43·10						
		Saturn B.	21. 48. 14	21. 48. 37	P	18·257		0. 53·79							
		Tethys ...			O	19·013									
Oct. 15	M	Saturn A.	0. 26. 39	0. 27. 8	O	19·289	40·058	0. 32·45		C	0. 30. 49	0. 31. 18	184. 44	89. 54	
		Tethys ...			P	19·092			0. 42·86	C	0. 36. 49	0. 37. 18	185. 28		95. 0
		Saturn B.	0. 28. 54	0. 29. 23	O	18·218		0. 53·27							
		Tethys ...			P	19·087									
		Saturn A.	0. 33. 29	0. 33. 58	P	20·073		0. 31·81							
		Tethys ...			O	21·629			0. 42·62						
		Saturn B.	0. 34. 59	0. 35. 28	P	21·195		0. 53·43							
		Tethys ...			O	21·624									

TETHYS—*concluded.*

Day, 1877.	Observer.	Object.	Time by Sidereal Standard at observation of Distance.	Greenwich Sidereal Time at observation of Distance.	Micrometer.	Reading of Micrometer.	Instrumental Constant.	Concluded Distance in Arc.	Concluded Distance from Center of Saturn.	Limb or Center of Saturn.	Time by Sidereal Standard at observation of Position-angle.	Greenwich Sidereal Time at observation of Position-angle.	Reading of Position-circle.	Instrumental Constant.	Concluded Position-angle from Center of Saturn.
			h m s	h m s		rev.	rev.	″	″		h m s	h m s	° ′	° ′	° ′
Nov. 3	M	Saturn A.	1. 41. 4	1. 41. 43	P	21·032	40·061			C	1. 38. 53	1. 39. 32	6. 24	90. 4	
		Tethys ...			O	20·848		0. 35·20		C	2. 2. 5	2. 2. 44	185. 25		95. 59
		Saturn B.	1. 42. 9	1. 42. 48	P	21·370			0. 44·92	C	2. 34. 17	2. 34. 56	186. 25		
		Tethys ...			O	21·515		0. 54·64		C	2. 53. 9	2. 53. 48	6. 20		96. 27
		Saturn B.	2. 3. 20	2. 3. 59	P	18·468									
		Tethys ...			O	18·717		0. 55·65							
		Saturn A.	2. 5. 50	2. 6. 29	P	19·595			0. 45·89						
		Tethys ...			O	18·599		0. 36·13							
		Saturn A.	2. 36. 53	2. 37. 32	O	21·108									
		Tethys ...			P	20·723		0. 34·25							
		Saturn B.	2. 38. 58	2. 39. 37	O	21·644			0. 45·14						
		Tethys ...			P	21·312		0. 56·02							
		Saturn A.	2. 55. 19	2. 55. 58	O	19·960									
		Tethys ...			P	18·416		0. 32·60							
		Saturn B.	2. 57. 16	2. 57. 55	O	19·537			0. 42·40						
		Tethys ...			P	17·827		0. 52·19							

ENCELADUS.

Oct. 3	M	Saturn C. Enceladus.	22. 25. 43	22. 26. 6					0. 32 ±		22. 25. 43	22. 26. 6			275 ±

NOTES.

The distances of the Satellite were measured alternately from the nearer limb A and the more distant limb B of the planet. The position-angles were measured from the center of Saturn C by placing the middle wire of the system of three parallel wires on the Satellite and the two outer wires tangentially on the limbs of the planet. Two observations in reversed positions of the micrometer were usually made. The position-angles are reckoned from the N. point (true), in the direction N, E, S, W.

October 3. Definition occasionally good for short intervals. Measures interrupted at last by fog and cloud. Enceladus was seen only in a momentary glimpse, and was estimated to be just half-way between Tethys and the point of the ring nearest to it.

October 15. Definition very bad. Saturn's limb very tremulous. Wires illuminated. The illumination of the wires was very difficult to manage, as the wind blew the gas flame about very violently.

November 3. The definition at first was very good, but rapidly deteriorated as the planet approached the horizon. Wires illuminated, except for the first three sets of measures of Titan. The wind made the gaslight flicker a great deal, spoiling the illumination of the wires.

November 5. Planet faint; limb ill-defined and fuzzy. The ansæ even were not visible. Tethys once visible for a few seconds. Rhea frequently seen, but very faint. No others seen except Titan. Satellites lost in haze after the above measures were taken. Wires illuminated.

ROYAL OBSERVATORY, GREENWICH.

RIGHT ASCENSIONS AND NORTH POLAR DISTANCES

OF

COMET (*b*) 1877,

AND NEIGHBOURING STARS,

OBSERVED WITH

THE SOUTH-EAST EQUATOREAL.

1877.

Right Ascensions and North Polar Distances of Comet (*b*) 1877, and neighbouring Stars, observed with the South-East Equatoreal,

Right Ascensions of Comet (*b*), 1877, and Stars,

DAY, 1877.	Mean Solar Time for Observation of Comet.	Observer.	Object.	Seconds of Transit.						
				Bar I.		Bar II.	Centre between Bar II. and Bar III.	Bar III.	Bar IV.	
				Disap.	Reap.	Disap.		Reap.	Disap.	Reap.
	h m s			s	s	s	s	s	s	s
Apr. 14		M	W. B. (2) XXII. 154.....	42·8	45·2	4·4	6·5	8·5	26·3	29·0
	14. 46. 8		Comet (*b*) 1877.....	28·3	32·4	50·7	53·3	55·8	12·4	16·6
			W. B. (2) XXII. 703.....	6·2	9·5	27·9	28·4	31·9	49·8	52·6
			W. B. (2) XXII. 324.....	9·9	13·3	31·7	34·3	37·0	54·7	57·3
	15. 23. 49		Comet (*b*) 1877.....	15·0	19·1	37·0	40·0	42·1	58·8	3·3
	15. 49. 45		Comet (*b*) 1877.....	15·2	19·3	36·8	39·6	42·3	59·5	3·8
			W. B. (2) XXII. 475.....	18·3	21·7	40·0	42·0	44·6	1·6	4·8
	16. 9. 57		Comet (*b*) 1877.....	31·5	35·4	53·3	56·1	58·4	15·2	19·6
			W. B. (2) XXII. 474.....	32·4	35·6	53·3	55·4	57·7	15·1	18·8

North Polar Distances of Comet (*b*), 1877, and Stars,

DAY, 1877.	Mean Solar Time for Observation of Comet.	Observer.	Object.	Declination Circle.		
				Pointer.	Micrometer M.	Micrometer N.
	h m s			° ′	r	r
Apr. 14		M	W. B. (2) XXII. 154	63. 20	3·268	3·162
	14. 46. 8		Comet (*b*) 1877	63. 15	3·449	3·331
			W. B. (2) XXII. 703	64. 15	3·602	3·508
			W. B. (2) XXII. 324			
	15. 23. 49		Comet (*b*) 1877	63. 15	2·128	1·564
	15. 49. 45		Comet (*b*) 1877	63. 15	1·065	0·492
			W. B. (2) XXII. 475	65. 55	2·297	2·117
	16. 9. 57		Comet (*b*) 1877	63. 10	4·452	4·285
			W. B. (2) XXII. 474	65. 50	2·509	2·307

The Comet was circular. The center very considerably condensed. The entire disk was about 2½′ to 3′ in diameter. The central point was pretty fairly defined.

The last transit was rendered rather rough by daylight, both the star and the Comet being faint.

observed with the SOUTH-EAST EQUATOREAL.

Clock Slow.	Sidereal Time of Transit.	Approx. Hour Angle East.	Approx. N.P.D.	Correction for Refraction in R.A.	Correction for Parallax in R.A.	Assumed R.A. of Star.	R.A. of Comet from the Observation.
s	h m s	h m	° ′	s	s	h m s	h m s
44·03	16. 10. 50·13	5. 57	63. 17	+ 7·41		22. 7. 33·93	
44·03	16. 19. 36·67	5. 57	63. 13	+ 7·40	— 0·36		22. 16. 20·08
44·03	16. 35. 13·50	5. 57	64. 13	+ 7·59		22. 31. 57·44	
44·05	16. 56. 18·08	5. 19	63. 41	+ 5·86		22. 15. 17·31	
44·05	16. 57. 23·38	5. 19	63. 10	+ 5·81	— 0·35		22. 16. 22·21
44·06	17. 23. 23·56	4. 53	63. 9	+ 4·98	— 0·34		22. 16. 23·04
44·06	17. 29. 25·92	4. 53	65. 50	+ 5·17		22. 22. 25·93	
44·07	17. 43. 39·71	4. 33	63. 7	+ 4·43	— 0·31		22. 16. 24·63
44·07	17. 49. 39·54	4. 33	65. 45	+ 4·56		22. 22. 24·90	

observed with the SOUTH-EAST EQUATOREAL.

Concluded Circle-Reading.	Approx. Hour Angle East.	Approx. N.P.D.	Correction for Refraction in N.P.D.	Correction for Parallax in N.P.D.	Assumed N.P.D. of Star.	N.P.D. of Comet from the Observation.
° ′ ″	h m	° ′	′ ″	′ ″	° ′ ″	° ′ ″
63. 23. 21·5	5. 57	63. 17	+ 1. 50·8		63. 17. 27·3	
63. 18. 39·0	5. 57	63. 13	+ 1. 50·4	— 0. 5·3		63. 12. 39·8
64. 18. 55·5	5. 57	64. 13	+ 1. 55·3		64. 13. 7·3	
	5. 19	63. 41				
63. 17. 4·6	5. 19	63. 10	+ 1. 22·3	— 0. 4·9		
63. 15. 57·85	4. 53	63. 9	+ 1. 8·95	— 0. 4·7		63. 8. 40·1
65. 57. 20·7	4. 53	65. 50	+ 1. 15·9		65. 50. 14·6	
63. 14. 36·8	4. 33	63. 7	+ 1. 0·8	— 0. 4·5		63. 7. 19·5
65. 52. 40·8	4. 33	65. 45	+ 1. 6·7		65. 45. 33·9	

A bar eye-piece (power 75) was used, having four bars perpendicular and a pair of bars parallel to the equator. The two central bars are narrower than the others, and have a narrow interval between them.

ROYAL OBSERVATORY, GREENWICH.

ECLIPSES, OCCULTATIONS, AND TRANSITS

OF

JUPITER'S SATELLITES,

COMPARED WITH THE NAUTICAL ALMANAC:

AND

OCCULTATIONS OF STARS BY THE MOON,

WITH THE

EQUATIONS DEDUCED FROM THE OCCULTATIONS.

1877.

ECLIPSES, OCCULTATIONS, and TRANSITS of JUPITER'S SATELLITES, 1877.

Day of Observation, 1877.	Satellite.	Phenomenon.	Phase of Phenomenon.	Observer.	Instrument.	Power.	Clock or Chronometer.	Time Noted.	Time by Transit Clock.	Sidereal Time.	Mean Solar Time.	Mean Time of Nautical Almanac.	Apparent Error of Nautical Almanac.
								h m s	h m s	h m s	h m s	h m s	m s
May 7	II	(*a*) Occ. reap.	Bisection	M	S.E. Eq.	220	Sid. S. .	16. 8. 15	16. 8. 15	16. 8. 17·7	13. 4. 25·1		
7	II	Occ. reap....	Last contact...	M	S.E. Eq.	,,	Sid. S. .	16. 10. 18	16. 10. 18	16. 10. 20·7	13. 6. 27·8		
7	II	(*b*) Occ. reap.	First contact ..	L	E. Eq.	70	Sid. S. .	16. 4. 50	16. 4. 50	16. 4. 52·4	13. 1. 0·4	13. 0.	
7	II	Occ. reap....	Bisection	L	E. Eq.	,,	Sid. S. .	16. 6. 26·3	16. 6. 26·3	16. 6. 28·7	13. 2. 36·5		
7	II	Occ. reap....	Last contact...	L	E. Eq.	,,	Sid. S. .	16. 9. 22·7	16. 9. 22·7	16. 9. 25·1	13. 5. 32·4		
June 20	I	(*c*) Tr. Ingress	Last contact...	T	E. Eq.	140	Dent 1915	16. 44 ±	16. 45. 2·7	16. 45. 35·5	10. 48. 36·7	10. 50.	
July 20	I	Tr. Ingress..	First contact ..	AD	E. Eq.	,,	Dent 1915	20. 6. 20	20. 8. 6·0	20. 8. 54·2	12. 13. 24·7	12. 16.	
20	I	Tr. Ingress..	Last contact...	AD	E. Eq.	,,	Dent 1915	20. 9. 30	20. 11. 16·0	20. 12. 4·2	12. 16. 34·2		
24	II	(*d*) Occ. disap.	Last contact...	AD	E. Eq.	,,	Dent 1915	19. 20. 35	19. 22. 27·0	19. 23. 17·0	11. 12. 11·3	11. 11.	
26	II	(*e*) Tr. Egress	Bisection	BD	E. Eq.	,,	Dent 1915	17. 18. 30 ±	17. 20. 24·7	17. 21. 15·5	9. 2. 38·0	9. 3.	
26	II	Tr. Egress ..	Last contact...	BD	E. Eq.	,,	Dent 1915	17. 21. 40 ±	17. 23. 34·7	17. 24. 25·5	9. 5. 47·5		
29	I	(*f*) Tr. Egress	First contact ..	C	E. Eq.	,,	Dent 1915	19. 10. 30	19. 12. 29·2	19. 13. 21·6	10. 42. 38·0	10. 45.	
29	I	Tr. Egress ..	Bisection	C	E. Eq.	,,	Dent 1915	19. 11. 30	19. 13. 29·2	19. 14. 21·6	10. 43. 37·8		
29	I	Tr. Egress ..	Last contact...	C	E. Eq.	,,	Dent 1915	19. 13. 0	19. 14. 59·2	19. 15. 51·6	10. 45. 7·6		
30	I	Ecl. reap....	First seen.....	M	S.E. Eq.	285	Sid. S. .	17. 30. 2	17. 30. 2	17. 30. 54·8	8. 56. 32·1	8. 56. 37	+0. 4·9
30	I	Ecl. reap....	Full brightness	M	S.E. Eq.	,,	Sid. S. .	17. 30. 27	17. 30. 27	17. 31. 19·8	8. 56. 57·1		
30	I	Ecl. reap....	Full brightness	R	E. Eq.	140	Dent 1915	17. 28. 30	17. 30. 30·5	17. 31. 23·7	8. 57. 0·9		
Sept. 5	II	Ecl. reap....	....	JB	E. Eq.	,,	Dent 1915	18. 9. 55	18. 13. 52·1	18. 13. 59·6	7. 14. 1·2	7. 14. 36	+0. 34·8

(*a*.) Jupiter was very tremulous, and the limb badly defined.
(*b*.) Image bad, the observation very unsatisfactory.
(*c*.) The definition of the planet was bad, owing to light cloud.
(*d*.) The observation unsatisfactory; a diffused light round Jupiter.
(*e*.) Jupiter was very tremulous, and the observation uncertain.
(*f*.) Image bad.

OCCULTATIONS of STARS by the MOON, 1877.

Day of Observation, 1877.	Name of Object.	Phenomenon.	Moon's Limb.	Observer.	Instrument.	Clock or Chronometer.	Time Noted.	Time by Transit Clock.	Sidereal Time.	Mean Solar Time.
							h m s	h m s	h m s	h m s
Jan. 30	45 Leonis	Reappearance ...	Dark	AD	Altazimuth	Sid. S.	5. 56. 38·3	5. 56. 38·3	5. 56. 39·50	9. 15. 50·29
30	ρ Leonis	Disappearance...	Bright	AD	Altazimuth	Sid. S.	7. 32. 23·0	7. 32. 23·0	7. 32. 24·25	10. 51. 19·35
30	ρ Leonis	Reappearance ...	Dark	AD	Altazimuth	Sid. S.	8. 38. 17·2	8. 38. 17·2	8. 38. 18·49	11. 57. 2·79
Feb. 26	Regulus	Disappearance...	Dark	M	E. Eq.	A. 1	11. 12. 52·2	11. 13. 1·3	11. 13. 34·47	12. 45. 43·78
26	(*a*) Regulus ..	Disappearance...	Dark	WC	S.E. Eq.	Sid. S.	11. 13. 1·5	11. 13. 1·5	11. 13. 34·67	12. 45. 43·98
26	Regulus	Disappearance...	Dark	AD	Altazimuth	Sid. S.	11. 13. 1·8	11. 13. 1·8	11. 13. 34·97	12. 45. 44·28
Mar. 21	Piazzi V. 136.	Disappearance...	Dark	T	Altazimuth	Sid. S.	10. 18. 17·2	10. 18. 17·2	10. 18. 39·47	10. 20. 31·90
Nov. 20	(*b*) 19 Tauri..	Disappearance...	Bright	M	S.E. Eq.	Sid. S.	23. 41. 10·5	23. 41. 10·5	23. 42. 0·93	7. 42. 19·71
20	(*c*) 20 Tauri..	Disappearance...	Bright	M	S.E. Eq.	Sid. S.	23. 48. 32·0	23. 48. 32·0	23. 49. 22·44	7. 49. 40·01
20	17 Tauri.....	Reappearance ...	Bright	M	S.E. Eq.	Sid. S.	0. 9. 26·5	0. 9. 26·5	0. 10. 16·95	8. 10. 31·09
20	19 Tauri.....	Reappearance ...	Bright	M	S.E. Eq.	Sid. S.	0. 38. 11·0	0. 38. 11·0	0. 39. 1·46	8. 39. 10·90
20	(*d*) 20 Tauri .	Reappearance ...	Bright	M	S.E. Eq.	Sid. S.	0. 54. 58·3	0. 54. 58·3	0. 55. 48·77	8. 55. 55·46

(*a*.) The star disappeared instantaneously; sky cloudy.
(*b*.) The Moon's limb was exceedingly tremulous. The star was lost to view several times before reaching the limb, and finally disappeared in a hollow.
(*c*.) The time of disappearance was very difficult to ascertain, owing to the glare of the Moon, which was sensibly full.
(*d*.) The Moon's limb was fairly steady.

Reappearance of 45 Leonis, 1877, January $30^d.\ 9^h.\ 15^m.\ 50^s.3 + t^s$, Greenwich Mean Solar Time.

Right Ascension of Zenith in arc	$89.\ 9.\ 52.50 \quad + 15.0 \times t$
Moon's Right Ascension in arc	$154.\ 58.\ 55.35 + x + 0.5729 \times t$
Moon's N.P.D.	$78.\ 48.\ 57.79 + y + 0.2776 \times t$
Moon's Horizontal Equatoreal Parallax	$60.\ 56.13 \times \left(1 + \frac{m}{1000}\right)$
Moon's Semidiameter	$16.\ 37.90 \times \left(1 + \frac{n}{1000}\right)$
Star's Right Ascension in arc	$155.\ 17.\ 45.45 + e''$
Star's N.P.D.	$79.\ 36.\ 48.70 + f$
Geocentric R.A. of corresponding point in arc	$154.\ 42.\ 18.99 + e + 0''.0649 \times t - 2''.1265 \times m$
Geocentric N.P.D. of corresponding point	$78.\ 52.\ 56.64 + f + 0.0264 \times t - 2.6321 \times m$

Geocentric distance of center from corresponding point,

$$\begin{aligned} 16'.\ 46''.31 &+ 0.9532 \times \{ - e'' + x'' + 0''.5080 \times t + 2''.1265 \times m \} \\ &+ 0.2379 \times \{ f'' + 0''.0264 \times t - 2''.6321 \times m \} \\ &- 0.2369 \times \{ y'' + 0''.2776 \times t \} \end{aligned}$$

Final Equation.

$$-8''.41 = -0.9532 \times e'' + 0.2379 \times f'' + 0.9532 \times x'' - 0.2369 \times y'' + 0''.4247 \times t + 1''.4008 \times m - 0''.9979 \times n$$

Disappearance of ρ Leonis, 1877, January $30^d.\ 10^h.\ 51^m.\ 19^s.4 + t^s$, Greenwich Mean Solar Time.

Right Ascension of Zenith in arc	$113.\ 6.\ 3.75 \quad + 15.0 \times t$
Moon's Right Ascension in arc	$155.\ 53.\ 28.05 + x + 0.5698 \times t$
Moon's N.P.D.	$79.\ 15.\ 33.16 + y + 0.2792 \times t$
Moon's Horizontal Equatoreal Parallax	$60.\ 53.94 \times \left(1 + \frac{m}{1000}\right)$
Moon's Semidiameter	$16.\ 37.26 \times \left(1 + \frac{n}{1000}\right)$
Star's Right Ascension in arc	$156.\ 35.\ 29.85 + e''$
Star's N.P.D.	$80.\ 3.\ 48.40 + f$
Geocentric R.A. of corresponding point in arc	$156.\ 8.\ 53.03 + e + 0''.1191 \times t - 1''.5968 \times m$
Geocentric N.P.D. of corresponding point	$79.\ 21.\ 52.21 + f + 0.0199 \times t - 2.5162 \times m$

Geocentric distance of center from corresponding point,

$$\begin{aligned} 16'.\ 24''.80 &+ 0.9070 \times \{ + e'' - x'' - 0''.4507 \times t - 1''.5968 \times m \} \\ &+ 0.3853 \times \{ f'' + 0''.0199 \times t - 2''.5162 \times m \} \\ &- 0.3845 \times \{ y'' + 0''.2792 \times t \} \end{aligned}$$

Final Equation.

$$+12''.46 = +0.9070 \times e'' + 0.3853 \times f'' - 0.9070 \times x'' - 0.3845 \times y'' - 0''.5085 \times t - 2''.4178 \times m - 0''.9973 \times n$$

Reappearance of ρ Leonis, 1877, January $30^d.\ 11^h.\ 57^m.\ 2^s.8 + t^s$, Greenwich Mean Solar Time.

	° ′ ″	″	″	
Right Ascension of Zenith in arc	129. 34. 37·35		+ 15·0	× t
Moon's Right Ascension in arc	156. 30. 52·50	+ x	+ 0·5683	× t
Moon's N. P. D.	79. 33. 55·48	+ y	+ 0·2800	× t
Moon's Horizontal Equatoreal Parallax	60. 52·13	× $\left(1 + \frac{m}{1000}\right)$		
Moon's Semidiameter	16. 36·82	× $\left(1 + \frac{n}{1000}\right)$		
Star's Right Ascension in arc	156. 35. 29·85	+ e''		
Star's N. P. D.	80. 3. 48·40	+ f		
Geocentric R. A. of corresponding point in arc	156. 17. 56·59	+ e	+ 0″·1459 × t	− 1″·0533 × m
Geocentric N. P. D. of corresponding point	79. 22. 57·91	+ f	+ 0·0132 × t	− 2·4505 × m

Geocentric distance of center from corresponding point,

$$1'.6.''47 + 0.''7447 \times \{ -e'' + x'' + 0.''4224 \times t + 1.''0533 \times m \}$$
$$- 0.6525 \times \{ f'' + 0.''0132 \times t - 2.''4505 \times m \}$$
$$+ 0.6531 \times \{ y'' + 0.''2800 \times t \}$$

Final Equation.

$$-10.''33 = -0.7447 \times e'' - 0.6525 \times f'' + 0.7447 \times x'' + 0.6531 \times y'' + 0.''4889 \times t + 2.''3834 \times m - 0.''9968 \times n$$

Disappearance of Regulus, 1877, February $26^d.\ 12^h.\ 45^m.\ 44^s.0 + t^s$, Greenwich Mean Solar Time.

	° ′ ″	″	″	
Right Ascension of Zenith in arc	168. 23. 40·50		+ 15·0	× t
Moon's Right Ascension in arc	150. 25. 9·60	+ x	+ 0·5830	× t
Moon's N. P. D.	76. 39. 33·84	+ y	+ 0·2701	× t
Moon's Horizontal Equatoreal Parallax	60. 59·39	× $\left(1 + \frac{m}{1000}\right)$		
Moon's Semidiameter	16. 38·83	× $\left(1 + \frac{n}{1000}\right)$		
Star's Right Ascension in arc	150. 27. 52·65	+ e''		
Star's N. P. D.	77. 26. 4·10	+ f		
Geocentric R. A. of corresponding point in arc	150. 39. 54·79	+ e	+ 0″·1573 × t	+ 0″·7221 × m
Geocentric N. P. D. of corresponding point	76. 47. 35·71	+ f	− 0·0107 × t	− 2·3084 × m

Geocentric distance of center from corresponding point,

$$1'.6.''27 + 0.''8494 \times \{ +e'' - x'' - 0.''4257 \times t + 0.''7221 \times m \}$$
$$+ 0.4877 \times \{ f'' - 0.''0107 \times t - 2.''3084 \times m \}$$
$$- 0.4885 \times \{ y'' + 0.''2701 \times t \}$$

Final Equation.

$$+11.''69 = +0.8494 \times e'' + 0.4877 \times f'' - 0.8494 \times x'' - 0.4885 \times y'' - 0.''4987 \times t - 0.''5124 \times m - 0.''9988 \times n$$

Disappearance of Piazzi V. 136, 1877, March $21^d.\ 10^h.\ 20^m.\ 31^s.9 + t^s$, Greenwich Mean Solar Time.

Right Ascension of Zenith in arc	$154.\,39.\,52''.05 + 15''.0 \times t$
Moon's Right Ascension in arc	$82.\,35.\,6''.45 + x + 0''.6525 \times t$
Moon's N.P.D.	$61.\,35.\,25''.97 + y - 0''.0188 \times t$
Moon's Horizontal Equatoreal Parallax	$58.\,29''.02 \times \left(1 + \frac{m}{1000}\right)$
Moon's Semidiameter	$15.\,57''.78 \times \left(1 + \frac{n}{1000}\right)$
Star's Right Ascension in arc	$82.\,3.\,19''.50 + e''$
Star's N. P. D.	$62.\,24.\,58''.40 + f$
Geocentric R. A. of corresponding point in arc	$82.\,42.\,50''.14 + e + 0''.0487 \times t + 2''.3706 \times m$
Geocentric N. P. D. of corresponding point	$61.\,49.\,45''.10 + f - 0''.0678 \times t - 2''.1133 \times m$

Geocentric distance of center from corresponding point,

$$15'.\,51''.22 + 0.3779 \times \{ + e'' - x'' - 0''.6038 \times t + 2''.3706 \times m \}$$
$$+ 0.9034 \times \{ f'' - 0''.0678 \times t - 2''.1133 \times m \}$$
$$- 0.9030 \times \{ y'' - 0''.0188 \times t \}$$

Final Equation.

$$+6''.56 = +0.3779 \times e'' + 0.9034 \times f'' - 0.3779 \times x'' - 0.9030 \times y'' - 0''.2725 \times t - 1''.0132 \times m - 0''.9578 \times n$$

Disappearance of 19 Tauri, 1877, November $20^d.\ 7^h.\ 42^m.\ 19^s.7 + t^s$, Greenwich Mean Solar Time.

Right Ascension of Zenith in arc	$355.\,30.\,13''.95 + 15''.0 \times t$
Moon's Right Ascension in arc	$53.\,45.\,31''.35 + x + 0''.5913 \times t$
Moon's N. P. D.	$65.\,34.\,3''.16 + y - 0''.1297 \times t$
Moon's Horizontal Equatoreal Parallax	$57.\,9''.61 \times \left(1 + \frac{m}{1000}\right)$
Moon's Semidiameter	$15.\,36''.11 \times \left(1 + \frac{n}{1000}\right)$
Star's Right Ascension in arc	$54.\,29.\,34''.35 + e''$
Star's N. P. D.	$65.\,54.\,50''.70 + f$
Geocentric R. A. of corresponding point in arc	$53.\,55.\,56''.21 + e + 0''.0834 \times t - 2''.0181 \times m$
Geocentric N. P. D. of corresponding point	$65.\,21.\,46''.21 + f + 0''.0518 \times t - 1''.9845 \times m$

Geocentric distance of center from corresponding point,

$$15'.\,30''.71 + 0.5557 \times \{ + e'' - x'' - 0''.5079 \times t - 2''.0181 \times m \}$$
$$- 0.7914 \times \{ f'' + 0''.0518 \times t - 1''.9845 \times m \}$$
$$+ 0.7922 \times \{ y'' - 0''.1297 \times t \}$$

Final Equation.

$$+5''.40 = +0.5557 \times e'' - 0.7914 \times f'' - 0.5557 \times x'' + 0.7922 \times y'' - 0''.4259 \times t + 0''.4491 \times m - 0''.9361 \times n$$

Disappearance of 20 Tauri, 1877, November 20d. 7h. 49m. 40s·0 + t^s, Greenwich Mean Solar Time.

Right Ascension of Zenith in arc	357. 20. 36·60 + 15·0 × t
Moon's Right Ascension in arc	53. 49. 51·60 + x + 0·5913 × t
Moon's N. P. D.	65. 33. 5·83 + y − 0·1297 × t
Moon's Horizontal Equatoreal Parallax	57. 9·84 × $\left(1 + \frac{m}{1000}\right)$
Moon's Semidiameter	15. 36·16 × $\left(1 + \frac{n}{1000}\right)$
Star's Right Ascension in arc	54. 38. 54·15 + e''
Star's N. P. D.	66. 0. 42·90 + f
Geocentric R. A. of corresponding point in arc	54. 5. 54·03 + e + 0·0883 × t − 1·9801 × m
Geocentric N. P. D. of corresponding point	65. 27. 56·28 + f + 0·0507 × t − 1·9666 × m

Geocentric distance of center from corresponding point,

$$15'.28''.93 + 0''.8580 \times \{ + e'' - x'' - 0''.5030 \times t - 1''.9801 \times m \} - 0''.3323 \times \{ f'' + 0''.0507 \times t - 1''.9666 \times m \} + 0''.3341 \times \{ y'' - 0''.1297 \times t \}$$

Final Equation.

$$+ 7''.23 = + 0''.8580 \times e'' - 0''.3323 \times f'' - 0''.8580 \times x'' + 0''.3341 \times y'' - 0''.6434 \times t - 1''.0455 \times m - 0''.9362 \times n$$

Reappearance of 17 Tauri, 1877, November 20d. 8h. 10m. 31s·1 + t^s, Greenwich Mean Solar Time.

Right Ascension of Zenith in arc	2. 34. 14·25 + 15·0 × t
Moon's Right Ascension in arc	54. 2. 11·40 + x + 0·5913 × t
Moon's N. P. D.	65. 30. 23·57 + y − 0·1297 × t
Moon's Horizontal Equatoreal Parallax	57. 10·35 × $\left(1 + \frac{m}{1000}\right)$
Moon's Semidiameter	15. 36·29 × $\left(1 + \frac{n}{1000}\right)$
Star's Right Ascension in arc	54. 24. 52·20 + e''
Star's N. P. D.	66. 16. 7·40 + f
Geocentric R. A. of corresponding point in arc	53. 54. 5·74 + e + 0·1004 × t − 1·8465 × m
Geocentric N. P. D. of corresponding point	65. 44. 17·31 + f + 0·0478 × t − 1·9101 × m

Geocentric distance of center from corresponding point,

$$15'.43''.82 + 0''.4268 \times \{ - e'' + x'' + 0''.4909 \times t + 1''.8465 \times m \} + 0''.8835 \times \{ f'' + 0''.0478 \times t - 1''.9101 \times m \} - 0''.8831 \times \{ y'' - 0''.1297 \times t \}$$

Final Equation.

$$- 7''.53 = - 0''.4268 \times e'' + 0''.8835 \times f'' + 0''.4268 \times x'' - 0''.8831 \times y'' + 0''.3662 \times t - 0''.8995 \times m - 0''.9363 \times n$$

Reappearance of 19 Tauri, 1877, November 20d. 8h. 39m. 10s·9 + t^s, Greenwich Mean Solar Time.

	° ′ ″	″	″
Right Ascension of Zenith in arc	9. 45. 21·90	+ 15·0	× t
Moon's Right Ascension in arc	54. 19. 9·45	+ x + 0·5930	× t
Moon's N. P. D.	65. 26. 42·11	+ y − 0·1275	× t
Moon's Horizontal Equatoreal Parallax	57. 10·94	× $\left(1 + \frac{m}{1000}\right)$	
Moon's Semidiameter	15. 36·49	× $\left(1 + \frac{n}{1000}\right)$	
Star's Right Ascension in arc	54. 29. 34·35	+ e''	
Star's N. P. D.	65. 54. 50·70	+ f	
Geocentric R. A. of corresponding point in arc	54. 1. 56·97	+ e + 0″·1158 × t	− 1″·6574 × m
Geocentric N. P. D. of corresponding point	65. 24. 34·78	+ f + 0·0431 × t	− 1·8159 × m

Geocentric distance of center from corresponding point,

$$15'.47''.57 + 0.9012 \times \left\{ -e'' + x'' + 0''.4772 \times t + 1''.6574 \times m \right\}$$
$$- 0.1334 \times \left\{ f'' + 0''.0431 \times t - 1''.8159 \times m \right\}$$
$$+ 0.1354 \times \left\{ y'' - 0''.1275 \times t \right\}$$

Final Equation.

$$-11''.08 = -0.9012 \times e'' - 0.1334 \times f'' + 0.9012 \times x'' + 0.1354 \times y'' + 0''.4071 \times t + 1''.7360 \times m - 0''.9365 \times n$$

Reappearance of 20 Tauri, 1877, November 20d. 8h. 55m. 55s·5 + t^s, Greenwich Mean Solar Time.

	° ′ ″	″	″
Right Ascension of Zenith in arc	13. 57. 11·55	+ 15·0	× t
Moon's Right Ascension in arc	54. 29. 4·65	+ x + 0·5930	× t
Moon's N. P. D.	65. 24. 33·59	+ y − 0·1275	× t
Moon's Horizontal Equatoreal Parallax	57. 11·39	× $\left(1 + \frac{m}{1000}\right)$	
Moon's Semidiameter	15. 36·59	× $\left(1 + \frac{n}{1000}\right)$	
Star's Right Ascension in arc	54. 38. 54·15	+ e''	
Star's N. P. D.	66. 0. 42·90	+ f	
Geocentric R. A. of corresponding point in arc	54. 13. 19·91	+ e + 0″·1240 × t	− 1″·5342 × m
Geocentric N. P. D. of corresponding point	65. 31. 3·80	+ f + 0·0400 × t	− 1·7791 × m

Geocentric distance of center from corresponding point,

$$15'.43''.86 + 0.8283 \times \left\{ -e'' + x'' + 0''.4690 \times t + 1''.5342 \times m \right\}$$
$$+ 0.4143 \times \left\{ f'' + 0''.0400 \times t - 1''.7791 \times m \right\}$$
$$- 0.4125 \times \left\{ y'' - 0''.1275 \times t \right\}$$

Final Equation.

$$-7''.27 = 0.8283 \times e'' + 0.4143 \times f'' + 0.8283 \times x'' - 0.4125 \times y'' + 0''.4577 \times t + 0''.5337 \times m - 0''.9366 \times n$$

ROYAL OBSERVATORY, GREENWICH.

SPECTROSCOPIC OBSERVATIONS

MADE AT THE

ROYAL OBSERVATORY, GREENWICH,

1877.

POSITION-ANGLES and HEIGHTS of SOLAR PROMINENCES, observed with the SPECTROSCOPE, at the ROYAL OBSERVATORY, GREENWICH, in the Year 1877.

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 Ten-prism Spectroscope was used till 1877, July 25, and after that date Mr. Christie's Half-prism Spectroscope. With the latter the Roman numerals 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°, and with two to one with about fifteen.

Observer, M.

1877, G.M.T.	No. of Prisms.	Heliographic N.P.D.	Height.	REMARKS.
d h m		° ′ ° ′	″	
Feb. 23.	10			No prominences were seen. The chromosphere was very irregular and serrated in outline, the average height being about 11″. The limb was examined on the C line from W. 165° to E. 50°, through the S. point.
Feb. 27. 23. 30 to 28. 2. 0	10 & 6			No prominences were seen. The chromosphere was very irregular and undulating. The Sun was enveloped in haze, and the limb "boiling," so that no sketch of the outline could be obtained. The entire limb was examined on both the C and *b* lines with 10 prism train, and on the C line with 6 prism train, the slit being radial; and part of the limb was examined from E. 176° to W. 74°, with the slit tangential, on the C line.
Mar. 16. 1. 30	10	W. 112. 9	27	Small prominence. The limb was examined on the C line from E. 114° to W. 101°, through the S. point.
Mar. 24. 1. 0 to 24. 2. 0	10 & 6			No prominences were seen. The day was very variable, and the Sun was often hidden by light cloud. The chromosphere was never well defined, and sometimes was quite invisible. The entire limb was examined on the C line with the slit tangential, once with 10 prisms and once with 6.
Mar. 27. 1. 0	4			No prominences were seen, but chromosphere, 10″ in height, was noted everywhere. The limb was examined on the C line from E. 179° to W. 153°, through the S. point.
Mar. 30. 22. 30		E. 49. 1 — 51. 1 E. 41. 46 — 42. 16	42 45	The entire limb was examined on the C line with the slit radial.
Apr. 19. 23. 0 to 20. 1. 0	10 & 6	W. 125. 25 — 124. 20	60	The prominence could not be detected on any other line than the C line, and was very faint on that. The Sun was not sufficiently clear for the prominence to be sketched with the slit tangential. The limb was examined from W. 160° to 60°, with the slit radial, on the C line. The neighbourhood of the prominence was examined with the slit both radial and tangential, and on the entire length of the spectrum.
Apr. 22. 21. 15 to 22. 21. 45	10			No prominences were seen. The Sun was enveloped in much white haze, and the chromosphere was very faint and ill-defined, and could only be detected to a distance of 3″ to 5″ from the limb. The entire limb was examined on the C line with the slit radial.

1877, G.M.T.	No. of Prisms.	Heliographic N.P.D.	Height.	REMARKS.
d h m		° ′ ° ′	″	
Apr. 24. 22. 0 to 25. 0. 0	10 & 6			No prominences were seen, the Sun being enveloped in light cloud. The chromosphere was faint, and could only be traced to a height of 7″, as a rule. Occasionally, when the limb was a little clearer, it could be traced as high as 12″ or 13″. The definition of the Fraunhofer lines in the general spectrum of the disk was very fair. The entire limb was examined on the C line with the slit radial.
May 6. 21. 0 to 6. 23. 0	10			No prominences were seen, the Sun being enveloped in thick white haze. The chromosphere could be seen, but faintly, to an average height of 8″. The entire limb was examined once, and from E. 107° to W. 73°, through the S. point, a second time. The slit radial on the C line.
7. 0. 20 to 7. 0. 45	8			A second examination with 8 prisms showed no prominences, but the chromosphere was more distinct. The limb was examined from E. 107° to W. 73°, through the S. point.
May 10. 0. 0 to 10. 1. 0				No prominences were seen. The limb was examined from W. 73° to W. 163°, through the W. point.
June 3. 23. 5	10	E. 42. 52 — 45. 32	49	The prominence was much bent and broken. Chromosphere, 8″ in average height, was seen round the entire limb. The limb was examined from W. 90° to W. 160°, through the N. point. The slit radial on the C line.
4. 0. 20	10	W. 129. 40 — 129. 30	25	A straight narrow jet. The prominence seen at the first examination was observed again, but no sketches could be made, the Sun being involved in too much haze to allow of a wide slit being used. The entire limb was examined with the slit radial on the C line.
				SPOT SPECTRUM.—The definition was very poor, but a considerable broadening over the nucleus was suspected in some lines near b. The D lines were slightly thickened, perhaps by one fourth of their normal breadth. The b lines—that is the Magnesium lines b_1, b_2, and b_4, not b_3,—were decidedly broader, perhaps by a half or two thirds of their normal breadth. A number of Iron lines seemed to be double their usual breadth; among these were—K 1577, K 1570, K 1528, the E lines, K 1467, and both the lines K 1463. The coronal line, K 1474, and the iron line close to it, could not be separated, and the two seen together as one seemed, if anything, narrower and fainter than usual. The lines were distorted as well as broadened, a very slight displacement to the blue being noticed in one part, and to the red in another. As the sky clouded over, only the part of the spectrum from K 1463 to b_4 and in the neighbourhood of D was examined. A train of four prisms employed.
June 7.	II.	W. 53. ±	30	A very thin jet was seen on C and D_3, but not on the D lines of sodium nor on the b lines of magnesium. The entire limb was examined twice, and much of it a third time. The new Half-prism Spectroscope was employed for the first time.
July 3. 22. 30 to 3. 23. 29	6			No prominences were seen. The chromosphere was seen very distinctly all the way round, except near E. 85°, where it was faint. Average height 13″. The entire limb was examined twice with the slit radial on the C line. The Ten-prism Spectroscope was used.

1877, G.M.T.	No. of Prisms.	Heliographic N.P.D.	Height.	REMARKS.
d h m		° ′ ° ′	″	
July 5. 0. 58	6	E. 134. 26—E. 135. 26	42	Very faint prominence, apparently quite detached from the limb. Chromosphere was seen all the way round, averaging 12″ to 14″ in height. The entire limb was examined twice with the slit radial on the C line.
July 5. 21. 30 to 5. 23. 30	8 & 4			No prominences were seen. Chromosphere was seen all the way round, of average height 13″, but always very faint, the Sun being in much haze. The entire limb was examined three times with the slit radial on the C line, twice with 8 prisms, and the third time with 4. A partial examination with 8 prisms, from W. 95° to W. 50°, was also made.
July 7. 1. 35	6	E. 58. 50—E. 59. 40	49	The chromosphere averaged from 12″ to 13″ in height. The entire limb was examined with the slit radial on the C line.
July 10. 0. 3	6	W.111. 21—W.110. 41	34	Faint prominence.
10. 0. 7		115. 21— 112. 6	37	Bright prominence.
10. 0. 17		E. 67. 39—E. 69. 9	82	Moderately bright prominence.
10. 0. 23		W. 52. 1—W. 51. 1	41	Very faint prominence.
10. 0. 36		84. 21— 83. 51	48	Detached cloud. The chromosphere here is 12″ in height, the cloud about 19″ broad, and the space between the two about 17″. Average height of the chromosphere about 11″; it was very irregular in outline. The first three prominences were examined on D_3 and F; all were seen on D_3, but the first could not be distinguished on F, most probably on account of its faintness. The entire limb was examined with the slit radial on the C line. The entire limb was also examined with the slit radial on K 1474. Only the prominence E. 67°. 39′ to E. 69°. 9′ was distinguished. It tapered to a point, and being very faint its height was very difficult to judge. It was roughly estimated at 20″. On the red side of this line the spectrum appeared brighter than usual, suggesting a faint bright line by the side of the dark one. The appearance extended about 100″ from the limb. A similar appearance, the effect of contrast, is often seen by the side of very dark lines, but it was not seen at all on the blue side of K 1474, and seemed brighter at times than any mere effect of contrast would account for. It disappeared when the Sun was moved a little distance off the slit.
July 19. 22. 30	6	E. 59. 15	20	A very small detached cloud. The entire limb was examined with the slit radial on the C line.
July 20. 22. 10	6	W.146. 1—W.145. 41	38	Very small prominence. Chromosphere averaged 11″ in height. The prominence could not be detected at the later examinations.
21. 1. 14	6	E. 0. 45—E. 2. 45	27	Very small prominence. A third examination at $2^h.\ 15^m.$ failed to show this prominence, but there was then much cloud about. The entire limb was examined three times with the slit radial on the C line.
July 24. 22. 4	6	W.123. 21—W.121. 56	49	There was much difficulty in seeing the chromosphere, as the Sun was constantly being hidden by cloud. It was only seen distinctly from E. 166° to W. 114°. From about W. 15° to E. 6° there was a faint appearance, as if the C line were reversed, but it may have been only an effect of contrast, and it did not seem to have any defined limits. The entire limb examined with the slit radial on the C line.
July 29. 23. 0 to 30. 1. 0	II.	E. 141. 36—E. 142. 36	50	The prominence was seen equally well on the C, D_3, and F lines. The entire limb was examined with the slit radial. NOTE. — From this date the Half-prism Spectroscope was regularly employed in the examination of the Sun's limb.

1877, G.M.T.	No. of Prisms.	Heliographic N.P.D.	Height.	REMARKS.
d h m July 30. 23. 0 to 30. 23. 52	II.	° ′ ° ′	″	No prominences were seen. The entire limb was examined twice with the slit radial on the C line.
Aug. 13. 22. 0 to 13. 23. 40	II.			No prominences were seen. The chromosphere, which was readily seen on C, D_3, and F, but not on the *b* lines, varied in height, but was lower than usual on the whole. The entire limb was examined with the slit radial four times on the C line, and once on *b*.
Aug. 15. 0. 0 to 15. 2. 0	II.	W.147. 41—W.147. 21	23	The chromosphere averaged 8″ in height. The entire limb was examined with the slit radial on the C line.
Aug. 15. 22. 0	II.	E. 142. 22—E. 141. 42 W.148. 31—W.147. 11	18 23	The chromosphere averaged from 8″ to 10″ in height. The entire limb was examined three times with the slit radial on the C line.
Aug. 16. 22. 0 to 17. 0. 30	II.			No prominences were seen. The chromosphere was rather low, 6″ to 8″ being the average height. The entire limb was examined with the slit radial on the C line.
Aug. 17. 21. 40 to 17. 22. 30	II.			No prominences were seen. Definition only moderate. Much white haze round the Sun. The entire limb was examined with the slit radial on the C line.
Aug. 20. 0.	I. & II.			No prominences were seen. The Sun always in much haze. Chromosphere slightly higher than on the previous days, being from 8″ to 10″ and 12″. in height. The entire limb was examined with the slit radial on the C line, once with one "half-prism," and twice with two.
Aug. 20. 23. 20 to 20. 23. 48	II.	E. 46. 0—E. 46. 40 W.119. 0—W.118. 20	25 56	A straight jet. A broken jet. Chromosphere averaged 10″ in height. The sky very clear between the clouds, and the definition good. The entire limb was examined with the slit radial on the C line.
Aug. 21. 23. 30 to 22. 0. 30	II.	W.116. 35—W.115. 35	20	A straight jet. It is situated just over a small spot, and was seen on C, D_3, and F. Chromosphere averaged 10″ in height. The entire limb was examined with the slit radial on the C line.
Aug. 22. 21. 20 to 22. 23. 10	II.	W.115. 57—W.114. 57 W.121. 5—W.121. 39	34 24	Partly detached. A straight jet. Chromosphere averaged 8″ in height. The entire limb was examined twice with the slit radial on the C line.
Aug. 27. 23. 30 to 28. 0. 30	II.			No prominences were seen. Chromosphere was seen all round the limb, average height 10″ to 12″. The entire limb was examined with the slit radial on the C line.
Aug. 29. 0. 15	II.	W. 41. 7—W. 40. 34	32	Very narrow and faint jet. Chromosphere low, average height about 7″; about W. 154° it was a little higher, about 10″. The entire limb was examined with the slit radial on the C line.

1877, G.M.T.	No. of Prisms.	Heliographic N.P.D.	Height.	REMARKS.
d h m		° ′ ° ′	″	
Aug. 30. 22. 0	II.	E. 41. 20—E. 42. 20		A broken prominence.
to		151. 20— 152. 20		A broken prominence. Immediately before coming to this prominence in turning the circle, the edge of the C line towards the red showed a faint momentary flash, as if the prominence light was reflected from the edge of the slit before it actually came into the field.
30. 23. 15				
		W. 36. 55		Very narrow jet.
		26. 40		A slight elevation of the chromosphere.
31. 0. 30		E. 24. 29	18	Slight elevation of chromosphere.
		28. 59	20	A small detached cloud, perhaps 4″ in height.
to		107. 39	12	Small elevation of chromosphere.
31. 1. 10		152. 29	35	
		W.132. 51	15	Small elevation of chromosphere.
		34. 21	28	
		27. 41	12	
		21. 41	24	Small elevation of chromosphere.
				The entire limb was examined five times with the slit radial on the C line, three times between $22^h.\ 0^m.$ and $23^h.\ 15^m.$, and twice between $0^h.\ 30^m.$ and $1^h.\ 10^m.$
				Of the prominences seen at the first three examinations, the first (that at E. 42°) was not visible at the fourth and fifth examinations, but instead a small prominence was seen at E. 29°. There seems a discrepancy in the position circle readings for the prominence at E. 29° or E. 24° between the fourth and fifth examinations. Perhaps, however, that at E. 29° had disappeared, and that at E. 24° was a small eruption which had been passed over before or had just sprung up. The sky clouded over before it could be determined whether this was correct, or whether one of the readings was in error.
Aug. 31. 23. 30	II.	E. 2. 3	13	Not seen at the second and third examinations.
to		102. 23	15	Not seen at the first examination.
Sept. 1. 1. 0		110. 36	15	Not seen at the first examination.
				Two slight elevations of chromosphere, each occupying about 45′ of the limb.
				The entire limb was examined three times with the slit radial on the C line.
Sept. 3. 23. 0	II.	E. 57. 19	12	
to		W.133. 41 — 134. 21	28	A broken jet.
3. 23. 45				The chromosphere was undulating, the minimum height being 6″ and the maximum about 12″.
				The entire limb was examined twice with the slit radial on the C line.
Sept. 4. 22. 0	II.	E. 82. 44 — 83. 42	18	Seen only at the second examination. Not visible at $23^h.\ 15^m.$
to		W.129. 18 — 128. 18	17	Seen at the second and third examinations.
4. 23. 15		58. 43 — 60. 23	45	Seen at the first examination.
		41. 54 — 40. 20	61	Seen at the first examination. Seen readily on C and D_3. It was not so bright on D_3 as on C, but appeared 3″ higher on D_3 than on C. Seen with much difficulty on F. No trace on b, D_1, or D_2, nor on 1474 K, so far as could be perceived.
				The prominences at W. 60° and W. 129° were seen readily on C, but with difficulty on D_3, and just suspected on F. No trace on b, D_1, D_2, or 1474 K.
				Chromosphere 9″ in height.
				The Sun was in much white haze; prominences faint.
				The entire limb was examined three times with the slit radial on the C line.
Sept. 20. 22. 0	II.	W.112. 25	26	A glimpse was obtained of a faint feathery jet shooting up about 50″ higher from the brighter portion of the prominence. The prominence was very narrow.
to				The chromosphere averaged 8″ in height, but near 180° was very billowy and often 12″ in height.
20. 22. 45				The entire limb was examined twice with the slit radial on the C line.

1877, G.M.T.	No. of Prisms.	Heliographic N.P.D.	Height.	REMARKS.
d h m Sept. 21. 23. 30 to 22. 1. 0	II.	° ′ ° ′ E. 9. 55 — 10. 33 W. 260. 30 — 261. 55	″ 16 25	Chromosphere 8″. The entire limb was examined twice with the slit radial on the C line.
Sept. 23. 22. 0 to 23. 23. 45	II.	E. 102. 22 W. 160. 38 75. 38	20—30 20—30 20—30	} Each prominence was about 1° of the Sun's circumference in breadth. The chromosphere averaged from 8″ to 10″ in height. Measures rough; observation continually interrupted by cloud. The entire limb was examined several times with the slit radial on the C line.
Sept. 25. 1. 30 to 25. 2. 30	II.	W. 132. 23 — 133. 19 102. 23 — 104. 3 65. 53 — 67. 23	27 28 19	The entire limb was examined three times with the slit radial on the C line.
Sept. 27. 0. 50 to 27. 1. 50	II.	W. 101. 1 — 100. 39 66. 55 — 68. 46	41 35	Not seen at the first examination. Seen only at the first and second examinations. The chromosphere 8″ in height. The limb was boiling very much, and the Sun enveloped in white haze; the definition was never good, sometimes very bad. The entire limb was examined three times with the slit radial on the C line.
Sept. 27. 21. 30 to 27. 22. 30	II.	W. 33. 57 — 34. 7	20	The chromosphere 8″ in height. The definition was very bad, the Sun being in much white haze. The entire limb was examined twice with the slit radial on the C line.
Sept. 28. 22. 35 to 28. 23. 15	II.	W. 44. 2 — 43. 12	41	Small and faint. The chromosphere 8″ in height. The entire limb was examined twice with the slit radial on the C line.
Sept. 30. 22. 0 to Oct. 1. 1. 15	II.	W. 74. 33 — 72. 9 71. 8 — 70. 8 36. 45 — 35. 23	27 25 30	The chromosphere 8″ in height. The entire limb was examined three times with the slit radial on the C line.
Oct. 3. 0. 15 to 3. 1. 10	II.	W. 72. 41 — 71. 20	30	The chromosphere 8″ in height. The entire limb was examined twice with the slit radial on the C line.
Oct. 4. 22. 0 to 4. 22. 45	II.	E. 173. 7 W. 45. 40 — 43. 38	16 40	Seen only at the third examination. Not seen at the first examination. At the second examination it appeared about 40″ in height, but at the third, when the Sun was in white haze, it appeared only 17″ or 18″ high. The chromosphere 8″ in height. The prominence at W. 45° was seen of equal heights on C, D_3, and F lines. No trace on D_1, D_2, the b lines, or 1474 K. The entire limb was examined three times with the slit radial on the C line.
Oct. 5. 22. 35 to 5. 23. 40	II.	E. 88. 27	25	Very narrow; too narrow to allow measurement of breadth. Seen on D_3 of the same height as on C. Definition variable. The chromosphere averaged 8″ in height. The entire limb was examined three times with the slit radial on the C line.

1877, G.M.T.	No. of Prisms.	Heliographic N.P.D.	Height.	REMARKS.
d h m		° ′ ° ′	″	
Oct. 8. 0. 30	II.	E. 77. 55 — 77. 5	38	Small. The C line of the prominence was plainly displaced to the red, but the amount could not be measured, the interval of brightness being very brief. The aspect of the C line radial on the limb is exactly that of a narrow slit; the first token of the coming prominence was a red flush along the edge of the C line nearer the red. The prominence itself was only small, and did not seem so high as the red flush, which was plainly seen 10″ above the prominence. The chromosphere averaged 8″ in height. The entire limb was examined once with the slit radial on the C line.
Oct. 8. 23. 0 to 9. 0. 10	II.	E. 39. 40 — 42. 5 W. 106. 26 — 105. 55	46 39	Two thin straight jets. A thin jet, mainly detached from the limb. The chromosphere about 8″ in height. The work was constantly interrupted by passing clouds, but the definition was occasionally very fine in the intervals, the feathery character of the upper surface of the chromosphere being very distinctly seen. The chromosphere was very level, only very gently undulating; but the actual surface was composed of an infinite number of very fine filaments, averaging perhaps 0″·5 to 1″ in height, above the mass of the chromosphere, giving it a very feathery or fringed appearance. These filaments are much fainter than the body of the chromosphere. The prominence at E. 40° was seen of equal heights on the C, D_3, and F lines, but only very faintly on 1474 K; the exact height of it, therefore, could not be made out. The prominence at W. 106° appeared at $0^h.\ 10^m.$ to be completely detached from the limb, and to be growing smaller and fainter rather rapidly. It was seen on C, faintly on D_3, but could not be found on F. It was suspected on 1474 K, not as a tiny detached cloud as on the other lines, but as a jet continuous from the limb. Neither prominence was seen on the E, the D, or the *b* lines. The entire limb was examined three times with the slit radial on the C line.
Oct. 10. 22. 0 to 10. 23. 0	II.	E. 38. 10 — 42. 31 W. 52. 14 — 50. 54	56 75	Seen well and easily on C and D_3, faintly on F, suspected on 1474 K, but on no other line. Seen well and easily on C and D_3, faintly on F, but on no other line. The chromosphere about 8″ in height. Examined the chromosphere with tangential slit, and saw distinctly C, D_3, F, and 2796 K and 1474 K faintly. This last line seemed rather to vanish than to be reversed in the chromosphere. *h* was just suspected. This part of the spectrum is very faint. The *b*, D, and E lines were not reversed. The entire limb was examined twice with the slit radial on the C line.
Oct. 11. 21. 15 to 11. 22. 0	II.	W. 96. 3 — 95. 28 86. 13 — 85. 58	35 20	The chromosphere 8″ in height. The entire limb was examined twice with the slit radial on the C line.
Oct. 12. 23. 10 to 12. 23. 30	II.	W. 73. 27 — 71. 49	35	The chromosphere 8″ in height. The limb from W. 32° to E. 168°, through the W. point, examined once with the slit radial on the C line.
Oct. 14. 22. 0 to 14. 22. 30 and 15. 1. 0 to 15. 1. 30	II.	E. 103. 59 — 104. 51	30	Was seen of about equal height on C, D_3, and F lines. Was not seen on 1474 K, the *b* lines, E, D_1, or D_2. The chromosphere 8″ in height. Examined also with the tangential slit, and saw C, D_3, and F all plainly reversed. 1474 K was reversed, but was only faint. The sky clouded over before the spectrum beyond F to the blue could be examined. The entire limb examined once with the slit radial on the C line.

1877, G.M.T.	No. of Prisms.	Heliographic N.P.D.	Height.	REMARKS.
d h m		° ′ ° ′	″	
Oct. 24.	II.	E. 30. 52 — 32. 26	20	Much broken.
		93. 12 — 93. 32	41	Broken.
		120. 50 — 122. 14	30	Broken.
				The chromosphere averaged 8″ in height.
				The entire limb was examined twice with the slit radial on the C line.
Oct. 30. 1. 50 to 30. 2. 10	II.			No prominences were seen. The chromosphere averaged 8″ in height. The limb was examined from W. 30° to E. 20°, through the N. point, with the slit radial on the C line.
Oct. 30. 21. 40 to 30. 22. 20	II.	E. 101. 1 — 101. 28	25	Was seen very distinctly and of about equal heights on C, D_3, and F. No trace on D, *b*, E, or 1474 K. The chromosphere 8″ in height. The entire limb was examined three times with the slit radial.
Nov. 2. 23. 40 to 3. 1. 30	II.			No prominences. Chromosphere averaging 8″ in height was seen readily all the way round. The Sun was in a yellow mist all the time of search. The entire limb was examined twice with the slit radial on the C line.
Nov. 4.	II.	W. 111. 21 — 109. 21	61	Much broken.
		72. 56 — 66. 16	30	Broken.
				Both prominences were seen on C, D_3, 1474 K, and F; on 1474 K they could not be certainly traced higher than 10″ in the one case and 20″ in the other. On the other three lines they were sensibly of the same height. They were not seen on *b* or D.
				The chromosphere averaged 8″ in height.
				The entire limb was examined twice with the slit radial.
Nov. 8.	II.	E. 63. 26 — 63. 46	20	Small detached jet.
		138. 46 — 139. 6	50	A continuous jet.
		W. 107. 29 — 107. 54	20	Small detached jet.
		123. 14 — 125. 54	35	A small jet, and a small detached cloud some little way to the south of it.
				The chromosphere averaged 8″ in height.
				The entire limb was examined three times with the slit radial.
Nov. 10.	II.	E. 84. 28 — 85. 56	20	}
		131. 58 — 133. 38	25	
		W. 129. 17 — 128. 57	41	} Very faint.
		80. 52 — 80. 2	25	
		38. 29 — 35. 42	90	}
				The chromosphere averaged 8″ in height.
				The entire limb was examined once with the slit radial on the C line.
Nov. 12.	II.	E. 45. 31 — 48. 1	50	Much broken and twisted.
		135. 41 — 136. 21	15	Merely an undulation in the chromosphere, and perfectly regular in outline.
		W. 103. 9 — 102. 4	80	Much broken and twisted.
		62. 4 — 59. 49	70	Do. do.
		41. 41 — 36. 54	70	Do. do.
				The chromosphere averaged 8″ in height. The Sun in much haze; consequently the prominences appeared very faint; but from their being visible at all they were probably really unusually brilliant.
				The entire limb was examined twice with the slit radial on the C line.
Nov. 13. 21. 45 to 14. 0. 15	II.	W. 60. 59 — 59. 29	56	Seen on C, D_3, 1474 K, and F. Not on D or *b*. Much fainter on the third examination.
				The chromosphere averaged 8″ in height.
				The entire limb was examined three times with the slit radial.

1877, G.M.T.	No. of Prisms.	Heliographic N.P.D.	Height.	REMARKS.
d h m		° ′ ° ′	″	
Dec. 12. 22. 0 to 12. 23. 45	I. & II.			No prominences were seen. The chromosphere averaged 8″ in height and was fairly bright everywhere, but very irregular in outline. An attempt was made to examine the limb on the D lines, but the sky was not sufficiently clear. The examinations were unsatisfactory, the sky being very misty. The entire limb was examined twice with the slit radial.
Dec. 14. 0. 3	I. & II.	E. 49. 23 — 50. 22	27	Seen on D_3 and F as well as on C, but on no other line. The chromosphere averaged 8″ in height, and was serrated in outline. The Sun was very yellow, and the chromosphere faint. The entire limb was examined with the slit radial on the C line, twice with one prism, and once with two.
Dec. 31. 0. 15	II.	E. 56. 27 — 55. 5	46	
31. 0. 27		W. 101. 33 — 100. 25	30	Very bright. Seen on D_3 and F as well as on C, but on no other lines.
31. 0. 20		41. 53 — 40. 29	48	The day was misty and the Sun yellow. The entire limb was examined twice with the slit radial on the C line.

EXAMINATION of the SPECTRUM of the SUN SPOT of 1877, October 25—November 7, made at the ROYAL OBSERVATORY, GREENWICH.

This fine spot was examined with the "Half-prism" Spectroscope, with a train of two "half-prisms reversed," to give great purity of spectrum, on 1877, October 31, November 3, and November 5. Observers W C and M.

The lines of the following elements suffered change over the nucleus of the spot:—

Element.	Number of Lines observed.	Character of Change.
Calcium	12	Very much darker and about doubled in breadth.
Sodium	2	Very much darker. The two D lines almost meet over the nucleus.
Titanium	11	Very much darker and about doubled in breadth.
Iron	30	Slightly broader, by about one-tenth, and decidedly darker, perhaps by one-half.
Barium	4	About twice as dark and twice as broad.
Magnesium	4	Much broader and darker.
Nickel	6	Broader by one-half, slightly darker.
Chromium	3	Somewhat darker, and broader by about one-tenth.
Hydrogen	3	Much fainter and less distinct. F line reversed in the neighbourhood of the spot, due north of the centre on November 5.
Coronal line	1	Much fainter over the spot.
D_3	1	Not seen, either bright or dark, in spot or bridge.
Telluric bands	1	Band α broader and darker.

The following lines and bands were also altered:—

Line.	Wave-length, tenth-metres.	Character of Change.
K 588	6927	Darkened.
B	6869	Darkened and slightly broadened on the red side, by about 1 tenth-metre of wave-length.
K 712	6517	Double the usual breadth. This is probably one of the lines of Barium.
K 765±	6380±	An appearance as of a dark-shaded band, sharp towards the blue, and shaded off towards the red. Nothing seen on the general disk of the Sun to correspond to it.
K 1493	5297	A cluster of several lines, of which only those on the blue side are affected. Much darker, and wider on the blue side, by 0·3 tenth-metre of wave-length. Two of these probably belong to Titanium.

Lines from Kirchhoff's map are denoted by the letter K, and the No. on his scale.
The Wave-lengths are taken from Ångström's Normal Spectrum.

Besides the increase in breadth, displacements to the red or blue were noted, especially in the case of the F and D lines. On October 31 the F line was twisted, the part over the following half of the spot being displaced to the red, and the other half to the blue, by amounts corresponding respectively to a recession or downward motion of nine miles, and an approach or upward motion of three miles a second. On the darkest part of the spot the D lines were broadened on the red side to the extent of $\frac{1}{2}(D_1-D_2)$, the more refrangible edge being sharp and not sensibly displaced. This would indicate a large downward motion of perhaps thirty miles a second. On other parts the haze appeared to be chiefly on the blue side.

The spot, which was first seen (after an interval of cloudy weather) on October 30, when it was well advanced on the disk, would appear to have passed off about November $7^d.6^h$; but clouds prevented any observations between November 5 and 8. On November 8 the only indication of the position of the spot was a small jet rising about 20″ from the otherwise quiescent chromosphere. There was also a group of faculæ near the limb.

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 Ten-prism Spectroscope was used up to 1877, July 25, and the "Half-prism" Spectroscope from that date. Arabic numerals denote the number of prisms used with the former, and Roman numerals the number of "Half-prisms" used with the latter. 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

Date, 1877, Greenwich Sidereal Time.	Observer.	Number of Prisms.	Position Circle.	Objects compared.	Micrometer Readings.	Displacement.		Width of Slit.
						Measured.	Estimated in Terms of the Breadth of the Comparison Line.	
d h m			°		r	r		d
Feb. 28. 7. 55	M	4	6	Sirius F	0·105			
				H β	0·216	+ 0·111	$\frac{1}{4}$ to red	5·1
28. 8. 15	,,	,,	,,	Sirius F	0·114			
				H β	0·258	+ 0·144	$\frac{1}{3}$ to red	2·7
Feb. 28. 9. 0	M	2	6	α Orionis b_4	0·912			
				Mg_3	0·975	+ 0·063	$\frac{1}{4}$ to red	1·4
28. 9. 20	,,	,,	,,	α Orionis b_4	0·059			
				Mg_3	0·213	+ 0·154	$\frac{1}{2}$ to red	2·0
28. 9. 35	,,	,,	,,	α Orionis b_4	0·143			
				Mg_3	0·219	+ 0·076	$\frac{1}{4}$ to red	2·0
Feb. 28. 10. 20	M	2	6	Pollux b_1	0·527			
				Mg_1	0·407	− 0·120	1 to blue	1·0
28. 10. 35	,,	,,	,,	Pollux b_1	0·146			
				Mg_1	0·059	− 0·086	$\frac{1}{2}$ to blue	1·8
Mar. 5. 10. 20	M	2	10	Procyon F	0·368			
				H β	0·540	+ 0·172	$\frac{1}{2}$ to red	2·0
5. 10. 50	,,	,,	,,	Procyon F	0·373			
				H β	0·485	+ 0·112	$\frac{1}{4}$ to red	2·0
Mar. 5. 11. 30	M	2	10	Regulus F	0·075			
				H β	0·170	+ 0·095	$\frac{1}{3}$ to red	1·7
Mar. 5. 12. 35	M	4	$5\frac{1}{2}$	Arcturus b_1	0·740			
				Mg_1	0·624	− 0·116	$\frac{1}{2}$ to blue	2·5
5. 13. 0	,,	,,	,,	Arcturus b_1	0·803			
				Mg_1	0·653	− 0·150	$\frac{3}{5}$ to blue	2·5
Mar. 10. 7. 35	M	4	$2\frac{1}{2}$	Rigel F	0·501			
				H β	0·655	+ 0·154	$\frac{1}{3}$ to red	2·5
10. 7. 55	,,	,,	,,	Rigel F	0·955			
				H β	1·128	+ 0·133	$\frac{1}{3}$ to red	2·5
Mar. 10. 8. 20	M	4	$2\frac{1}{2}$	ε Orionis F	0·530			
				H β	0·217	− 0·313		
10. 8. 35	,,	,,	,,	ε Orionis F	0·830			
				H β	1·065	+ 0·135		
Mar. 10. 8. 55	M	2	$2\frac{1}{2}$	ϵ Orionis F	0·915			
				H β	0·856	− 0·059	$\frac{1}{5}$ to blue	4·6
	,,	,,	,,	ϵ Orionis F	1·027			
				H δ	0·893	− 0·134	$\frac{1}{3}$ to blue	4·6
Mar. 10. 9. 35	M	4	$2\frac{1}{2}$	α Orionis b_4	0·985			
				Mg_3	1·218	+ 0·233	$\frac{3}{5}$ to red	2·6
10. 9. 55	,,	,,	,,	α Orionis b_4	0·042			
				Mg_3	0·228	+ 0·186	$\frac{1}{4}$ to red	2·6

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

TERRESTRIAL ELEMENTS, and CONCLUDED MOTIONS in the LINE of SIGHT, from OBSERVATIONS at the in the Year 1877.

of a direct-vision prism. With one such half-prism, a dispersion of 20° from A to H, equivalent to four flint prisms of 60°, is obtained; and with a train of two, a dispersion of 75°, equivalent to fifteen flint prisms of 60°.

1 div. in the width of the slit corresponds to 0·0013 inch, or about 1″·3. The weights are on a scale 1–5 for each observation.

The slit lies north and south, and the deviation of the ray by the prisms, in the case of the Ten-prism Spectroscope, is towards the east when the reading of the Position-Circle is 5ʰ.

Earth's Motion in Miles per Second.	Concluded Motion of Star in Miles per Second.		Weight.	REMARKS.
	Measured.	Estimated.		
+12·2	+ 9·3	+ 14·5	2	Direct comparison.
			3	Direct comparison. Definition poor. Moon bright, and much haze.
+17·2	+ 19·2	+ 17·1	1	Indirect comparison.
			1	Indirect comparison.
			1	Indirect comparison. Definition poor.
+13·8	− 52·1	− 89·8	1	Indirect comparison.
			1	Indirect comparison. Definition poor.
+14·0	+ 30·7	+ 19·6	2	Indirect comparison. Star spectrum bright, and image steady, but the star-line very diffused.
			3	Indirect comparison.
+ 5·6	+ 25·7	+ 23·7	3	Indirect comparison. Line darker and better defined than that in Procyon.
− 9·6	− 16·2	− 50·9	3	Indirect comparison. Lines fairly well defined. Stars often lost in cloud, but shining brightly in the intervals.
			4	Indirect comparison.
+15·8	+ 7·2	+ 9·4	1	Indirect comparison.
			2	Indirect comparison. The star was more distinctly seen at the second observation than at the first.
+16·9	(− 46·1)		0	The star-line was exceedingly difficult to see with this high dispersion, and on placing the pointer near it, it became quite invisible.
			0	A displacement to the blue seemed to be shown by flashing in occasionally the light from the comparison tube.
+16·9	− 48·7	− 61·4	3	Indirect comparison.
			3	Indirect comparison.
+17·8	+ 22·1	+ 11·0	4	Indirect comparison. Line well seen in both instances.
			4	Indirect comparison.

+ denotes recession; − denotes approach.

Date, 1877, Greenwich Sidereal Time.	Observer.	Number of Prisms.	Position Circle.	Objects compared.	Micrometer Readings.	Displacement.		Width of Slit.
						Measured.	Estimated in Terms of the Breadth of the Comparison Line.	
d h m			°		r	r		d
Mar. 10. 10. 25	M	4	2½	Pollux b_1	0·293			
				Mg_1	0·201	− 0·092	⅓ to blue	2·6
10. 10. 50	,,	,,	,,	Pollux b_1	0·289			
				Mg_1	0·229	− 0·061	¼ to blue	2·6
Mar. 10. 11. 15	M	4	2½	Castor F	0·735			
				H β	0·810	+ 0·075	¼ to red	3·4
April 14. 12. 40	M	2	5	β Ursæ Majoris F	0·073			
				H β	0·135	+ 0·062	⅕ to red	3·9
14. 13. 20	,,	,,	,,	β Ursæ Majoris F	0·277			
				H β	0·422	+ 0·145	⅖ to red	3·6
May 2. 12. 34	M	2	3	β Ursæ Majoris F	0·858			
				H β	1·043	+ 0·185	½ to red	3·0
2. 12. 59	,,	,,	,,	β Ursæ Majoris F	0·863			
				H β	1·005	+ 0·142	½ to red	3·0
May 2. 13. 44	M	2	3	γ Ursæ Majoris F	0·792			
				H β	0·953	+ 0·161	⅓ to red	3·2
2. 14. 4	,,	,,	,,	γ Ursæ Majoris F	0·993			
				H β	1·055	+ 0·062	⅙ to red	3·2
May 2. 14. 24	M	2	3	ε Ursæ Majoris F	0·084			
				H β	0·132	+ 0·048	⅙ to red	3·3
2. 14. 39	,,	,,	,,	ε Ursæ Majoris F	0·062			
				H β	0·108	+ 0·046	⅙ to red	3·3
May 2.	M	2	3	δ Ursæ Majoris F	1·067			
				H β	1·120	+ 0·053		
2. 15. 19	,,	,,	,,	δ Ursæ Majoris F	0·923			
				H β	1·105	+ 0·182	½ to red	3·3
2. 15. 27	,,	,,	,,	δ Ursæ Majoris F	1·235			
				H β	1·093	− 0·142	⅛ to blue	3·3
May 2. 15. 44	M	2	3	ζ Ursæ Majoris F	0·001			
				H β	0·043	+ 0·042	⅕ to red	3·0
2. 16. 9	,,	,,	,,	ζ Ursæ Majoris F	0·005			
				H β	0·049	+ 0·044	⅕ to red	3·0
Aug. 23. 20. 10	M	I.		ζ Aquilæ F	0·868			
				H β	0·999	− 0·131	⅓ to blue	
23. 20. 20	,,	,,		ζ Aquilæ F	0·662			
				H β	1·053	− 0·391	⅔ to blue	
23. 20. 30	,,	,,		ζ Aquilæ F	0·992			
				H β	1·122	− 0·130	⅓ to blue	
Aug. 31. 20. 20	M	I.		α Coronæ F	0·138			
				H β	0·022	+ 0·116	⅓ to red	
31. 20. 30	,,	,,		α Coronæ F	1·312			
				H β	0·959	+ 0·353	⅔ to red	
31. 20.	,,	,,		α Coronæ F	1·120			
				H β	0·993	+ 0·127	⅓ to red	
Aug. 31. 21. 0	M	I.		α Ophiuchi F	0·727			
				H β	0·422	+ 0·305	⅗ to red	
31. 21. 10	,,	,,		α Ophiuchi F	0·612			
				H β	0·438	+ 0·174	½ to red	

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

Earth's Motion in Miles per Second.	Concluded Motion of Star in Miles per Second.		Weight.	REMARKS.
	Measured.	Estimated.		
+15·7	− 30·2	− 45·7	3 3	Indirect comparison. Indirect comparison.
+16·2	− 3·9	+ 5·7	2	Indirect comparison.
+11·9	+ 22·2	+ 30·8	3 3	Indirect comparison. Star-line broad, dark and diffused at the edges. Spectrum fairly defined. Indirect comparison.
+12·7	+ 41·1	+ 48·9	3 3	Indirect comparison. Star-line and spectrum seen very well, considering the comparative faintness of the star. The line is very broad, and shaded off at the edges. Indirect comparison.
+11·8	+ 24·9	+ 20·4	3 3	Indirect comparison. Spectrum seen as well as that of β Ursæ Majoris, or perhaps better. Indirect comparison.
+ 9·6	+ 5·9	+ 12·3	3 3	Indirect comparison. Indirect comparison.
+10·8	+ 3·9	+ 0·1	3 $\frac{1}{2}$ $\frac{1}{2}$	Mean of six measures. No estimation. Indirect comparison. Indirect comparison.
+ 8·6	+ 5·5	+ 16·1	3 3	Indirect comparison. Images very steady. Clouds frequently passing, but definition good in the intervals. Indirect comparison.
+ 9·9	− 60·3	− 70·3	4 1 4	Indirect comparison. The position of the pointer after bisecting the star-line was compared with the H β line, and after bisecting the H β line it was compared with the star-line; each comparison giving the displacement in the same direction. Indirect comparison. NOTE.—The Half-prism Spectroscope was used regularly from this date.
+11·4	+ 54·4	+ 67·9	2 3 3	Indirect comparison. Star-line broad and dark, but the edges being ill-defined exact bisection is difficult. Indirect comparison. Direct comparison showed a marked displacement to the red. Indirect comparison.
+14·3	+ 61·3	+ 89·6	4 4	Both direct and indirect comparisons. The direct gave slightly the larger displacement. Both direct and indirect comparisons. Estimations alike in both cases, but the exact amount of displacement was difficult to estimate.

+ denotes recession; − denotes approach.

Date, 1877, Greenwich Sidereal Time.	Observer.	Number of Prisms.	Position Circle.	Objects compared.	Micrometer Readings.	Displacement.		Width of Slit.
						Measured.	Estimated in Terms of the Breadth of the Bright Line of the Micrometer.	
d h m			°		r	r		d
Nov. 14. 22. 30	M	I.	95	γ Aquilæ b_1	0·308			
				Mg_1	0·272	+ 0·036	½ to red	
14. 22. 40	,,	,,	,,	γ Aquilæ b_1	0·375			
				Mg_1	0·354	+ 0·021	¼ to red	
Nov. 14. 23. 20	M	I.	95	ε Cygni b_1	1·085			
				Mg_1	0·974	+ 0·111	2 to red	
14. 23. 40	,,	,,	,,	ε Cygni b_1	0·957			
				Mg_1	0·863	+ 0·094	1 to red	
Nov. 14. 0. 5	M	I.	95	γ Cygni b_1	0·758			
				Mg_1	0·803	− 0·045	1 to blue	
14. 0. 50	,,	,,	,,	γ Cygni b_1	0·532			
				Mg_1	0·590	− 0·058	1 to blue	
Nov. 14. 1. 5	M	I.	95	α Cygni b_2	0·367			
				Mg_2	0·552	− 0·185	2 to blue	
14. 1. 15	,,	,,	,,	α Cygni b_1	0·502			
				Mg_1	0·648	− 0·146	1½ to blue	
Nov. 14. 2. 10	M	I.	95	Aldebaran b_4	0·438			
				Mg_3	0·334	+ 0·104	1 to red	
14. 2. 50	,,	,,	,,	Aldebaran b_1	0·008			
				Mg_1	0·148	− 0·140	1½ to blue	
Dec. 31. 4. 0	WC	I.	95	Aldebaran b_1	0·964			
				Mg_1	0·861	+ 0·103	½ to red	
31. 4. 25	,,	,,	,,	Aldebaran b_1	0·951			
				Mg_1	0·878	+ 0·073	⅓ to red	
Dec. 31. 4. 10	M	I.	95	Aldebaran b_1	0·866			
				Mg_1	0·775	+ 0·091	1 to red	
31. 4. 40	,,	,,	,,	Aldebaran b_1	0·949			
				Mg_1	0·871	+ 0·078	1 to red	
Dec. 31. 5. 10	M	I.	95	α Orionis b_4	1·045			
				Mg_3	0·998	+ 0·047	⅔ to red	
31. 5. 25	,,	,,	,,	α Orionis b_4	0·859			
				Mg_3	0·792	+ 0·067	⅔ to red	
Dec. 31. 6. 10	M	I.	95	ε Orionis F	0·479			
				H β	0·402	+ 0·077	½ to red	
31. 6. 20	,,	,,	,,	ε Orionis F	0·546			
				H β	0·415	+ 0·131	¼ to red	
Dec. 31. 6. 35	M	I.	95	δ Orionis F				
				H β			½ to blue	
Dec. 31. 7. 0	M	I.	95	β Orionis F	0·858			
				H β	0·758	+ 0·100	1 to red	
31. 7. 20	,,	,,	,,	β Orionis F	0·823			
				H β	0·736	+ 0·087	1 to red	
31. 7. 35	,,	,,	,,	β Orionis F	0·743			
				H β	0·672	+ 0·071	⅔ to red	

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

Earth's Motion in Miles per Second.	Concluded Motion of Star in Miles per Second.		Weight.	REMARKS.
	Measured.	Estimated.		
+14·8	− 3·7	− 2·6	3 2	Indirect comparison. An immense number of lines seen in the star spectrum, the magnesium lines being neither the darkest nor the best defined. Indirect comparison.
+12·2	+ 24·2	+ 25·7	1 3	Indirect comparison. Definition of the star-lines inferior to those of γ Aquilæ. Image tremulous. Indirect comparison.
+10·2	− 27·9	− 40·5	2 ½	Indirect comparison. Definition much worse. Observations interrupted by cloud. Indirect comparison.
+ 9·3	− 69·5	− 61·3	3 4	Indirect comparison. Definition improved. Indirect comparison.
− 4·9	(− 1·8)	(− 2·7)	0 0	Indirect comparison. Images very watery and tremulous. Observations discordant. Indirect comparison.
+10·1	+ 22·5	+ 1·8	2 2	Indirect comparison. Indirect comparison.
+10·1	+ 21·2	+ 18·5	2 2	Indirect comparison. Indirect comparison.
+ 4·2	+ 16·9	+ 14·9	2 2	Indirect comparison. b_4 in the star spectrum was distinct, b_2 suspected, but b_1 was not visible. Indirect comparison. The spectrum was very tremulous, and the definition never good for long together.
+ 5·5	+ 29·9	+ 18·7	1 2	Indirect comparison. Star-line faint, but not very broad. Indirect comparison. Image of star tremulous. The pointer overlapped the spectrum a long way, and made bisection difficult.
+ 5·9		− 18·0	1	Direct comparison obtained by flashing in the light from the comparison-tube. The two spectra could not be seen together.
+ 7·0	+ 20·0	+ 14·5	2 2 2	Indirect comparison. The rough comparisons are more trustworthy than the measures, the overlapping of the pointer rendering these uncertain. Indirect comparison. Image steadier than in the cases of the preceding stars. Definition fair. Indirect comparison.

+ denotes recession ; − denotes approach.

COLLECTED RESULTS for MOTIONS of STARS in the line of Sight, from SPECTROSCOPIC OBSERVATIONS made at the ROYAL OBSERVATORY, GREENWICH, in the Year 1877.

(F for the Star 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.	Estimated.
α TAURI (*Aldebaran*).										
					°	d				
1877, November 14	M	2	0	I.	95	..	b_4 & b_1	− 4·9	(− 1·8)	(− 2·7)
December 31	WC	2	4	I.	95	..	b_1	+ 10·1	+ 22·5	+ 1·8
31	M	2	4	I.	95	..	b_1	+ 10·1	+ 21·2	+ 18·5
β ORIONIS (*Rigel*).										
1877, March 10	M	2	3	4	2½	2·5	F	+ 15·8	+ 7·2	+ 9·4
December 31	M	3	6	I.	95	..	F	+ 7·0	+ 20·0	+ 14·5
δ ORIONIS.										
1877, December 31	M	1 est.	1	I.	95	..	F	+ 5·9	..	− 18·0
ε ORIONIS.										
1877, March 10	M	2	0	4	2½	..	F	+ 16·9	(− 46·1)	..
10	M	2	6	2	2½	4·6	F	+ 16·9	− 48·7	− 61·4
December 31	M	2	3	I.	95	..	F	+ 5·5	+ 29·9	+ 18·7
α ORIONIS.										
1877, February 28	M	3	3	2	6	1·4 & 2·0	b_4	+ 17·2	+ 19·2	+ 17·1
March 10	M	2	8	4	2½	2·6	b_4	+ 17·8	+ 22·1	+ 11·0
December 31	M	2	4	I.	95	..	b_4	+ 4·2	+ 16·9	+ 14·9
α CANIS MAJORIS (*Sirius*).										
1877, February 28	M	2	5	4	6	5·1 & 2·7	F	+ 12·2	+ 9·3	+ 14·5

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^2 Geminorum (*Castor*).										
1877, March 10	M	1	2	4	° $2\frac{1}{2}$	d 3·4	F	+ 16·2	− 3·9	+ 5·7
α Canis Minoris (*Procyon*).										
1877, March 5	M	2	5	2	10	2·0	F	+ 14·0	+ 30·7	+ 19·6
β Geminorum (*Pollux*).										
1877, February 28	M	2	2	2	6	1·0 & 1·8	b_1	+ 13·8	− 52·1	− 89·8
March 10	M	2	6	4	$2\frac{1}{2}$	2·6	b_1	+ 15·7	− 30·2	− 45·7
α Leonis (*Regulus*).										
1877, March 5	M	1	3	2	10	1·7	F	+ 5·6	+ 25·7	+ 23·7
β Ursæ Majoris.										
1877, April 14	M	2	6	2	5	3·9 & 3·6	F	+ 11·9	+ 22·2	+ 30·8
May 2	M	2	6	2	3	3·0	F	+ 12·7	+ 41·1	+ 48·9
γ Ursæ Majoris.										
1877, May 2	M	2	6	2	3	3·2	F	+ 11·8	+ 24·9	+ 20·4
δ Ursæ Majoris.										
1877, May 2	M	8	4	2	3	3·3	F	+ 10·8	+ 3·9	+ 0·1
ε Ursæ Majoris.										
1877, May 2	M	2	6	2	3	3·3	F	+ 9·6	+ 5·9	+ 12·3
ζ Ursæ Majoris.										
1877, May 2	M	2	6	2	3	3·0	F	+ 8·6	+ 5·5	+16·1

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 BOÖTIS (*Arcturus*).										
1877, March 5	M	2	7	4	° 5½	d 2·5	b_1	— 9·6	— 16·2	— 50·9
α CORONÆ.										
1877, August 31	M	3	8	I.	..	..	F	+ 11·4	+ 54·4	+ 67·9
α OPHIUCHI.										
1877, August 31	M	2	8	I.	..	..	F	+ 14·3	+ 61·3	+ 89·6
ζ AQUILÆ.										
1877, August 23	M	3	9	I.	..	..	F	+ 9·9	— 60·3	— 70·3
γ AQUILÆ.										
1877, November 14	M	2	5	I.	95	..	b_1	+ 14·8	— 3·7	— 2·6
γ CYGNI.										
1877, November 14	M	2	2½	I.	95	..	b_1	+ 10·2	— 27·9	— 40·5
α CYGNI.										
1877, November 14	M	2	7	I.	95	..	b_2 & b_1	+ 9·3	— 69·5	— 61·3
ε CYGNI.										
1877, November 14	M	2	4	I.	95	..	b_1	+ 12·2	+ 24·2	+ 25·7

MEASURES of DARK BANDS in PLANETARY, COMETARY, and STELLAR SPECTRA.

Note.—The same Nos. are given throughout to the bands corresponding to those in the Spectrum of β Pegasi, observed on 1876, October 18.

MIRA CETI, NEAR MAXIMUM.

The maximum (= α Ceti) occurred on 1877, January 5, according to Dr. Schmidt's observations (Astronomische Nachrichten, No. 2121).

1877, January 30.

Single-prism Spectroscope. Position-circle 90°. Micrometer B. Eye-piece No. 1.

Observer, W C.

The spectrum of Mira Ceti showed strong absorption lines, with a shading of fine lines towards the red of Bands VI., VII., and II.; this feature was not so marked in the case of the other lines or bands. I. was perhaps 70 tenth-metres, and IV. about 25 tenth-metres in breadth. The strong lines (on the blue side) in Bands II., V., VI., and VII., were also about 40 tenth-metres broad. Beyond VIII. a band (nearly continuous) commenced at a distance of about 30 tenth-metres, and extended as far as the spectrum could be traced into the violet.

No. of Band.	Wave-length.	Breadth of Shading.	REMARKS.
	Tenth-metres.	Tenth-metres.	
II.	5828	..	Sharp edge of dark band.
V.	5443	..	Faint band.
VI.	5215	..	Sharp edge of dark band.
VII.	5020	..	Broad dark band, shaded towards the red.
	Slit $0^{in}\cdot005$. Spectrum faint; measures very rough.		
I.	6129	70	Dark band, forming end of spectrum.
II.	5870	120	Broad band, composed of fine lines.
IV.	5580	50	Narrower than any of the other bands.
V.	5477		Dark band with sharp edges, *not* shaded off to the red.
VI.	5177	100	Very dark band, composed of fine lines shading off towards the red.
VII.	4951	120	Very dark band, the shading darker than in Band VII.
VIII.	4870		Approximate edges of a band which shows little shading, being nearly uniform throughout.
VIII.	4778		
IX.	4500		Commencement of a band extending into the violet. Estimated, not measured.
	Slit $0^{in}\cdot009$. Spectrum much brighter; measures more accurate.		

1877, February 16^d. $7\frac{1}{2}^h$. — $9\frac{1}{2}^h$.

Ten-prism Spectroscope. Half-prism and plane reflector. Position-circle $0°\cdot0$.

Observer, W C.

A determination was made of the wave-lengths of the sharp and shaded edges of Bands VI. and VII., their positions being compared with the b lines of Magnesium, and the strong double line of Air in the green. Owing to the faintness of the star it was necessary to employ a wide slit, rendering the measures less accurate than would otherwise have been the case, the Magnesium lines being seen as one mass.

The following results were obtained:—

		Tenth-metres.
Band VI.	Shaded edge.....	5218
	Sharp edge	5169
Band VII.	Shaded edge.....	5017
	Sharp edge.....	4995

1877, February 26d. 7h.

Single-prism Spectroscope.

Observer, M.

The star was very faint at first, owing to mist and moonlight, and the spectrum was only visible from the yellow to the blue. As the mist cleared off, the spectrum was seen much further in both directions, but no dark bands could be detected either in the red or in the violet.

Six bands were seen; three of them strong, viz., Nos. II., VI., and VII.; one of them faint, No. VIII.: two more reduced apparently to mere lines, and these exceedingly feeble, Nos. IV. and V. Bands I. in the red, and IX. and X. in the violet could not be traced.

Band VII. was very black, and was about 140 tenth-metres in breadth. Band VI. was not so dark, and scarcely 100 tenth-metres in breadth.

A bright line was suspected just beyond the sharp edge of Band VI. on the blue side.

The colour of the star was a very ruddy orange.

1877, February 28d. 7h.

Small eye-piece Spectroscope.

Observer, M.

The star was very faint and in much haze, but Bands I. (in the red), II., VI., and VII., were very clearly seen; the bright spaces between looking very brilliant by contrast; but no bright lines could be detected. Bands IV. and V. could not be distinguished, nor could the spectrum be traced in the violet. Band I. was very distinct, instead of being invisible, as on February 26.

α HERCULIS.

Maxima occurred on 1877, March 27 and July 5, and a minimum on May 29, according to Dr. Schmidt's observations (Astronomische Nachrichten, No 2122).

1877, April 23.

Single-prism Spectroscope.

Observer, M.

The star shows a continuous spectrum crossed by shaded bands. The bands usually terminate towards the blue, in an intensely dark line, and grow gradually fainter towards the red.

No. of Band.	REMARKS.
I.	A band in the red. Not very dark, the blue edge not the darkest part.
II.	A band on both sides of D, not very dark, the darkest part of the band being in the centre.
IV.	A very faint band midway between II. and V. Band III. of the spectrum of β Pegasi could not be detected, probably because α Herculis is the fainter star.
V.	A short band by no means so broad as the foregoing; gradually deepens to a black sharp edge towards the blue.
VI.	Darker than the preceding bands; gradually deepens to a black sharp edge towards the blue. Blue edge nearly coincident with b_4. The breadth of the band was about twice the distance between b_1 and b_4.
VII.	Very dark band, double the breadth of VI. The bright space between the end of VI. and the beginning of VII. is about double the breadth of Band VI., and is very brilliant. This Band VII. commences less gradually than V. and VI. do; the fine lines composing it being from the commencement darker than those in the two preceding bands.
VIII.	Is separated by a very short bright space from Band VII. It is by no means so dark a band, and is somewhat more uniform in intensity.
IX.	Follows after another short space, and is fainter than Band VIII.

No other band could be clearly made out.

No *bright* lines could be seen. The observer suspected that the three Bands V., VI., and VII., were composed of a great number of distinct fine lines, but the power of the spectroscope was not sufficiently high to certainly isolate them.

1877, May 7^{d}. 9^{h}. 30^{m}.

Single-prism Spectroscope. Position-circle 5°. Micrometer B.

Observer, M.

No. of Band.	Wave-length.	Intensity of Dark Band.	Brightness of Bright Space.	REMARKS.
	Tenth-metres.			
	6700 ±	..	..	Beginning of the spectrum at the red end.
	6580 } ±	..	..	A narrow band.
	6560 }			
			1	
I.	6450	..	..	Shaded edge.
	6161	9	..	Very sharp edge.
			3	
II.	5936	..	..	As distinct as the edge towards the blue.
	5825	7	..	Not by any means so sharp an edge as usual.
			7	
IV.	5661	..	..	Very faint band, only seen occasionally. As far as can be
	5608	..	..	judged the blue edge is sharp and the red shaded.
			8	
	5488	..	..	Approximate limit of red edge.
V.	5460	..	..	Limit of blackest part of band.
	5445	5	..	Sharp edge towards blue.
			10	This space very bright.
	5222	..	..	Approximate limit towards red.
VI.	5188	..	..	Limit of blackest part of band.
	5169	10	..	Very black.
			10	
VII.	5042	..	..	Approximate limit towards red.
	4963	10	..	Very black.
			9	
	4857	..	..	The spectrum becomes much fainter from about this point.
VIII.	4783	..	..	Approximate limit on the red side.
	4759	6	..	Sharp edge towards blue.
			..	Bands IX. and X. could not be measured.
	3940 ±		..	Spectrum ends about here.

The brightest part of the spectrum was that between the blue edge of Band V. and the red edge of Band VIII. The two dark bands in this space, VI. and VII., are the darkest in the spectrum. They differ in character, VI. being very dark for a short space and then shading off very rapidly, VII. shading off very gradually and regularly. The breadth of the blackest portion of VI. is about equal to the distance from b_1 to b_4. VII. is several times as broad, and is easily seen half-way between the blue edges of VI. and VII.

VIII. resembles VII. in character, but is much fainter; and V. resembles VI., but is slightly narrower and very much fainter.

II. is the only exception to the rule that the bands end towards the blue in a very sharp black edge, and gradually shade away from that edge towards the red.

II. is of nearly the same intensity throughout; its maximum of darkness being near the centre of the band. The red edge of II. is almost as sharp as the blue, which last is by no means so sharp in this band as in all the other bands. IX. and X. are all but invisible, and Band I. can only be seen with difficulty. Band I. is very sharp and black at the blue edge, continues equally black for some little distance, and then shades off slowly. Band III. of β Pegasi, the faintest band in that star, could not be detected.

Beyond Band VIII. to the violet, the whole spectrum begins to change, becoming slowly, gradually, and regularly fainter. Beyond Band II. in the other direction, the spectrum becomes very faint much more quickly.

Position-circle 95° for the measures of the breadths of the bands.

α HERCULIS, NEAR MAXIMUM.

1877, July 2d. 10½h.—14h. Single-prism Spectroscope. Position-circle 96°. Micrometer B.

Observer, M.

No. of Band.	Wave-length, 1st Measure.	Wave-length, 2nd Measure.	Wave-length, 3rd Measure.	Intensity.	REMARKS.
	Tenth-Metres.	Tenth-Metres.	Tenth-Metres.		
	6750	..	..	..	Beginning of the spectrum at the red end.
	6600±	..	..	..	A band suspected.
I.	6312	..	..	..	
	6152	..	6152	10	In this band neither edge is very sharp. The intensity seems affected by atmospheric influence, at times seeming darker than at others. On the whole it seems fainter than usual, while Band I. is certainly darker than usual, and the others also appear to be darker than usual.
	6032	..	..	..	
II.	5870	5870	5844	..	
	..	..	5824	5	
IV.	5706	..	..	..	
	5620	5620	..	2	This band is very faint. Its breadth, however, is considerable.
V.	5480	..	..	..	
	5456	5456	..	6	
VI.	5223	..	..	..	
	5169	5169	..	10	
VII.	5054	..	..	..	
	4956	4954	4958	10	Seems to be broader than usual.
VIII.	4803	..	..	..	
	4771	..	4771	4	
IX.	4567	..	4567	..	
	4000±	..	..	..	Spectrum ends here. Band X. was not visible.

α HERCULIS, NEAR MINIMUM.

Examination of the component stars of the pair.

1877, June 4d. Single-prism Spectroscope. Position-circle 26°.

Observer, M.

A very narrow slit was used, and the light of only one star admitted at a time, the spectroscope being placed first on one star and then on the other, by turning the slow-motion-rod in R.A. In consequence of the narrowness of the slit, and of the light cloud which was constantly passing, the spectra, especially that of the small star, were but faint; so that only the brightest portion, the yellow and green, from D to F, could be examined. The four principal bands in this space, II., V., VI., and VII., were seen to be common to both stars, and to occupy exactly the same position in each. The only difference perceptible between the two spectra was that the dark bands in the smaller star seemed somewhat fainter than in the larger.

Position-circle 95°.

The spectrum of the larger star showed a decided change since May 7. Bands IV. and V. and also VIII., and the spectrum beyond it to the violet, were much fainter than on that occasion.

A careful determination was made of the wave-lengths of the sharp edges of Bands V. and VI., with the following result:—

	Tenth-metres.
Band V.	5448
Band VI.	5169

1877, June 5d. 9½h. to 13¾h. Half-prism Spectroscope, one prism train. Position-circle 26°.

Observer, M.

The sky being constantly covered with haze or light cloud, the only point ascertained was that the spectra of the two stars were evidently the same, certainly as far as Bands V., VI., and VII., are concerned. On a thoroughly good night some differential measures of the position of the bands in the two stars might be made. A slight displacement towards the blue was suspected of the bands in the larger star as compared with those in the other; but the character of the evening was not nearly good enough for so delicate an observation.

COMET *b*, 1877. (WINNECKE'S.)

1877, May 15^d. $8\frac{1}{2}^h$. — 13^h.

Single-prism Spectroscope and Experimental "Half-prism" Spectroscope.

Observers, W C and M.

With the single-prism spectroscope the spectrum of the coma was found to consist of three bands, in the neighbourhood of the three principal bands in the spectrum of an alcohol vacuum tube (second spectrum of carbon), wave-lengths 4834, 5198, and 5610, whilst that from the nucleus appeared to be continuous. Under the much higher dispersion of the "half-prism" spectroscope (20° from A to H), the spectrum of the nucleus no longer appeared to be continuous. The wave-length of the brightest comet band was determined by six indirect comparisons with the carbon band 5198, as follows:— The comet band was brought up to coincidence with the fixed bright line of reference (formed by the direct image of the slit) by turning the half-prism by means of its micrometer-screw. The displacement of the carbon band with reference to the reference-line, was then estimated in terms of the distance between the two carbon-bands at 5198 and 4834.

Comet-band.

Displacement.		Wave-length inferred.	Observer.
		Tenth-metres.	
$\frac{1}{10}$ of (5198 − 4834)	towards blue	5162	W C.
$\frac{1}{10}$ −	„ towards blue	5155	W C.
$\frac{1}{10}$ +	„ towards blue	5169	W C.
Coincident		5198	M.
$\frac{1}{10}$	„ towards blue	5162	M.
$\frac{1}{100}$	„ towards blue	5194	M.
Mean		5173 ±	5 tenth-metres

β LYRÆ.

1877, July 20^d. $9\frac{1}{4}^h$. — $11\frac{3}{4}^h$.

The second minimum (3·9 magnitude) occurred July 20^d. 2^h.

Single-prism Spectroscope. Micrometer B.

Observer, M.

The star showed no trace of bright lines, and the dark lines were very faint and difficult to measure. The spectrum showed very little red or violet. It increased very rapidly in brightness from its commencement up to half-way between D and *b*. From this point to *b* it was very bright, but after *b* it grew gradually fainter towards F, and shortly after F died rapidly away.

Wave-length.	REMARKS.
Tenth-metres.	
6250 ±	Spectrum begins.
5950 ±	Dark line ?
5892	D lines. Rather broader than in Sun, and shaded at the edges.
5783	Dark line.
5470 ±	Dark line ?
4855	Dark line.
4700 ±	Dark line ?
4580 ±	Dark line.
4200 ±	Spectrum ends.

1877, August 23d. $11\frac{1}{2}$h. to $12\frac{3}{4}$h.

ECLIPSE OF MOON.

Single-prism Spectroscope.

Observers, W C and M.

The spectrum was observed during totality and also during the partial phase, when the portion of the Moon's disk still in the umbra was repeatedly compared with the part which had emerged. During totality a strong absorption band was seen in the yellow, and the red and blue ends of the spectrum were completely cut off, whilst the orange was greatly reduced in intensity. The yellow and green were comparatively bright, and in fact appeared at a first glance to constitute the whole visible spectrum. The wave-length of the more refrangible edge of the strong absorption band was found, from a mean of 9 measures, to be 5624 ± 5, and at about 11h. it extended to wave-length 5900, *i.e.*, as far as D. As the end of the total phase approached (12h. 4m.) the band became narrower, its breadth being only twice the interval of the D lines at 11h. 45m., and at 12h. 20m., during the partial phase, it was reduced to a mere line on the eclipsed portion. This band is coincident with the strong band δ of the atmospheric spectrum (as given by Brewster and Gladstone), which is peculiarly characteristic of the spectrum of light which has passed through a thick stratum of air. The red end of the spectrum was cut off by a dark band commencing about half-way from D to C, in which a black line was suspected. About the middle of totality a dark band, commencing at 5080 ± (near band ι of the Brewster-Gladstone spectrum) cut off all the rest of the spectrum, but later on, at 11h. 30m., the spectrum was visible as far as about 4930 (the position of band κ in the atmospheric spectrum). After the end of totality the red and blue ends of the spectrum from the eclipsed portion became visible beyond these limits. The appearance of the spectrum of the part clear of the umbra, though still in the penumbra, was totally different, even when reduced to the same degree of faintness by closing the slit. In this case the spectrum faded out as a whole from beyond D to near G in the violet.

The part of the Moon examined when the band δ was darkest was the region of Mare Nectaris and Mare Fœcunditatis, and the band could be seen only on the darkest part of the Moon when Kepler was just emerging from the umbra, growing rapidly fainter as the spectroscope was moved away towards the bright part.

The light by which the eclipsed Moon is visible would thus appear to have passed through a great thickness of the earth's atmosphere, giving rise to the peculiar copper colour.

1877, August 23d. 13h.—14h.

MARS.

Compared with the spectrum of the Moon.

Single-prism Spectroscope.

Altitude of Mars 26°. Altitude of Moon 24°.

Observer, M.

Three bands were seen in the spectrum of Mars between D and C, *i.e.*, in the red part of the spectrum, all of them being very faint and ill-defined at the edges.

Line or Band.	Wave-length.	Breadth.	Character in spectrum of Mars.	Character in spectrum of Moon.
	Tenth-metres.	Tenth-metres.		
D	5892	..		
Unrecognised	6019	16	Very faint band.	Only suspected.
α of the telluric spectrum.	6287	16	Very faint band.	Not seen.
C	6558	24	Varied in character slightly from time to time in both spectra, being sometimes sharper than at others. It evidently owed its apparent breadth to the presence of atmospheric lines near it, which could not be isolated by so small a dispersion.	About two thirds as broad as in spectrum of Mars, shaded at the edges but black in the centre, by no means so sharp as it usually is in the solar spectrum, but sharper than in that of Mars, and decidedly fainter.
B	6852	44		Not seen.

The four lines B, C, α, and D, are with δ the most distinctive of the bands in the spectrum of a low sun, due to the influence of our own atmosphere.

1877, September 12^{d}. 11$\frac{1}{2}^{h}$. — 13^{h}.

Position-circle 90°. Slit parallel to equator.

Observer, M.

Different portions of the disk of the planet gave spectra differing in brightness and apparent length, but the lines and bands showed no change except in the case of the group round C, which seemed darker in the centre of the disk (the south edge of Dawes Continent), and less so on the north limb. The breadth of this band was from 40 to 50 tenth-metres. Bands B and α were also seen, but no difference was detected in their appearance from whatever part of the disk obtained. But being fainter than C, a slight difference was less likely to be detected. The spectrum of Dawes' Ocean was much fainter than that of the general disk, especially in the red and yellow. The bright polar spot showed a very bright spectrum from D to F, whilst that from the north limb seemed to be rather less bright, but to be visible further into the red.

No further differences were noted with the position-circle at 0°, nor with the slit parallel to the equator of the planet.

The part of the disk where the C line seemed darkest (Dawes' Continent, where it borders on Dawes' Ocean) when examined at 13^{h}. 25^{m}. with a power of 310 on the Great Equatoreal, presented a remarkable appearance. Though ordinarily one of the sharpest markings on the planet, (and presenting on September 7, when it was viewed in nearly the same aspect, a specially distinct appearance), it was now fringed by a thick cluster of minute points, darker than the body of the "Continent" itself, but much brighter than the adjoining "Ocean."

1877, September 21^{d}. 7$\frac{3}{4}^{h}$. — 13^{h}.

Position-circle 0°. Slit perpendicular to equator.

Observer, M.

Band or Line.	Wave-length.	REMARKS.
	Tenth-metres.	
δ Blue edge	5640	The δ band of the Brewster-Gladstone spectrum. Broad but not very dark.
δ Red edge	5661	
D Blue edge	5889	D lines, and atmospheric lines near them. Broader than sodium lines as given by a flame, and shaded at the edges.
D Red edge	5907	
Unrecognised	6022	A very faint band.
α Centre	6287	A broad band, fairly dark.
C Blue edge	6537	Fully twice as broad as the D group. Very dark.
C Red edge	6587	

These five bands seemed darkest some 5″ or 6″ within the limb of the planet.

No other bands or lines, except the Fraunhofer lines, could be seen.

There was a slight amount of mist low down, and the planet seemed unsteady and watery.

No other local differences could be detected in the spectrum, either with the slit in the primary focus of the telescope, or with the image of the planet enlarged two and a half diameters by an eye-piece.

1877, September 26^{d}. 8^{h}. 0^{m}. to 9^{h}. 38^{m}.

Position-circle 0°·0. Slit perpendicular to equator.

Altitude of Mars 24°. Altitude of Moon 23°.

Observer, M.

Band or Line.	Wave-length.	Breadth.	Character in spectrum of Mars.	Character in spectrum of Moon.
	Tenth-metres.	Tenth-metres.		
δ Blue edge	5639	78	Very faint band.	Not seen.
δ Red edge	5717			Not seen.
D	5892	10		Measured as 5892 tenth-metres. Hardly so broad as in Mars.
α	6298	..	Rather dark.	Faint. Measured as 6299 tenth-metres.
	6511	..	Very faint.	Not seen.
C	6560	29	Very dark.	Much narrower than in Mars. Measured as 6553 tenth-metres.
	6695	..	Dark.	Not seen.
B	6895	..		Not seen.

The only local difference observed in the bands in the spectrum of Mars, was that they all appeared to be darkest at about 3″ or 4″ within the limb. The b lines and other Fraunhofer lines were about equally distinct from all parts of the disk. The red end of the spectrum in Mars was not visible so far as in the Moon, and seemed faintest at the limb. The violet end extended as far or nearly as far as in the Moon, and was of about equal intensity from all parts of the planet's disk.

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.

1874—1877.

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 1874.

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.		Spots.		Faculæ.	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.		Spots.		Faculæ.
				Longitude.	Latitude.	Area of UMBRA for each Spot (and for Day).	Area of WHOLE for each Spot (and for Day).	Area for each Group (and for Day).					Longitude.	Latitude.	Area of UMBRA for each Spot (and for Day).	Area of WHOLE for each Spot (and for Day).	Area for each Group (and for Day).
1874.			° ′	° ′	° ′				1874.			° ′	° ′	° ′			
105d·974	82	0·388	61. 12	113. 24	+ 5. 47	0	153		120d·978	83	0·167	186. 8	296. 6	−13. 22	31	168	
Apr. 17						(0)	(153)			84	0·617	288. 20	331. 10	+ 8. 3	0	30	
										85	0·778	92. 3	244. 3	− 4. 1	0	120	
105·995	82	0·388	61. 17	113. 6	+ 5. 45	0	73		May 2						(31)	(318)	
Apr. 17						(0)	(73)										
									121·020	83	0·166	188. 25	295. 54	−13. 15	59	188	
107·006	82	0·210	26. 43	114. 15	+ 5. 36	0	60			84	0·627	287. 49	331. 24	+ 7. 57	0	28	
Apr. 18						(0)	(60)			85	0·776	91. 42	243. 41	− 3. 45	21	144	
									May 2						(80)	(360)	
116·014	83	0·903	101. 57	296. 0	−12. 39	0	201										
Apr. 27						(0)	(201)		123·071	83	0·500	248. 37	295. 52	−13. 40	25	164	
										85	0·330	93. 48	248. 10	− 4. 41	28	314	
116·097	83	0·895	101. 22	295. 59	−12. 6	0	141		May 4						(53)	(478)	
Apr. 27						(0)	(141)										
									123·990	83	0·660	253. 14	295. 36	−13. 38	16	133	
117·043	83	0·765	102. 42	297. 26	−12. 25	40	203			85	0·128	102. 38	248. 3	− 5. 6	31	277	
Apr. 28						(40)	(203)		May 5						(47)	(410)	
117·105	83	0·767	102. 32	296. 25	−12. 19	42	239		124·932	83	0·797	255. 59	295. 8	−13. 12	21	188	
Apr. 28						(42)	(239)			85	0·083	245. 34	247. 4	− 5. 22	11	324	
										86	0·951	82. 0	171. 32	+ 6. 30	0	248	
118·112	83	0·603	105. 33	296. 33	−12. 38	27	187		May 6						(32)	(760)	
Apr. 29						(27)	(187)										
									125·953	83	0·914	257. 3	295. 12	−13. 10	37	195	
118·214	83	0·584	105. 59	296. 37	−12. 37	38	190			85	0·334	264. 18	248. 40	− 5. 2	40	266	
Apr. 29						(38)	(190)			86	0·855	79. 49	171. 31	+ 6. 55	51	348	
										87	0·958	96. 36	155. 55	− 7. 16	116	1015	
119·070	83	0·427	112. 6	296. 25	−12. 55	38	197		May 7						(244)	(1824)	
	84	0·284	317. 2	331. 29	+ 7. 58	0	22										
Apr. 30						(38)	(219)		126·076	83	0·925	255. 53	295. 13	−14. 18	31	180	
										85	0·353	263. 13	248. 11	− 5. 28	38	261	
119·083	83	0·429	112. 10	296. 8	−12. 59	41	213			86	0·841	78. 22	171. 35	+ 7. 55	92	585	
	84	0·284	316. 28	331. 25	+ 7. 52	0	25			87	0·948	95. 43	156. 12	− 6. 28	70	892	
Apr. 30						(41)	(238)		May 7						(231)	(1918)	
120·032	83	0·251	129. 56	296. 14	−13. 6	37	185		127·052	85	0·558	264. 45	248. 32	− 5. 35	42	258	
	84	0·453	295. 37	331. 48	+ 7. 39	0	44			86	0·700	75. 49	171. 42	+ 7. 31	98	494	
	85	0·891	92. 7	244. 38	− 3. 41	0	50			87	0·859	95. 50	155. 35	− 6. 39	39	1075	
May 1						(37)	(279)		May 8						(179)	(1827)	
120·046	83	0·247	129. 58	296. 14	−12. 58	27	196		127·983	85	0·720	266. 4	248. 22	− 4. 59	26	223	
	84	0·457	295. 34	331. 50	+ 7. 44	0	23			86	0·541	70. 59	171. 31	+ 7. 28	67	363	
	85	0·894	92. 3	244. 5	− 3. 37	0	33			87	0·739	96. 54	154. 57	− 7. 11	128	833	
										88	0·787	299. 24	249. 20	+20. 34	0	59	
May 1						(27)	(252)		May 9						(221)	(1478)	

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 82. Single spot which breaks up into two on April 18.

Group 83. Single spot. Is partly hidden by the wire on the second photograph on May 7 (126·076). It is conjectured that the first photograph on April 28 (117·043) may have been dated one hour too early.

Group 84. Small scattered group.

Group 85. A large spot with several small ones near it. The first photograph on May 1 (120·032), the second on May 2 (121·020), and that on May 6, are faint and badly defined.

Group 86. Two large spots. The photograph on May 6 is too little exposed.

Group 87. A large group of many spots.

Group 88. A group of three small spots widely separated.

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).
1874.			° ′	° ′	° ′			
128d·010	85	0·722	265. 45	248. 11	— 5. 13	43	242	
	86	0·532	70. 55	171. 46	+ 7. 18	61	393	
	87	0·730	96. 26	155. 20	— 6. 48	132	870	
	88	0·786	299. 17	248. 56	+20. 26	0	76	
May 9						(236)	(1581)	
130·019	85	0·959	265. 29	248. 59	— 5. 9	0	96	1149 *s f*
	86	0·181	15. 10	172. 47	+ 7. 9	7	197	
	87	0·333	104. 11	156. 35	— 7. 22	59	416	
	88	0·953	294. 4	244. 56	+21. 52	0	47	
May 11						(66)	(756)	(1149)
130·033	85	0·957	265. 24	248. 22	— 5. 14	0	104	
	86	0·179	15. 33	172. 33	+ 7. 2	0	194	
	87	0·326	103. 42	156. 47	— 7. 8	45	438	
	88	0·953	294. 11	244. 43	+21. 58	0	40	
May 11						(45)	(776)	
134·927	87	0·733	263. 18	157. 30	— 6. 29	36	257	
	89	0·932	104. 7	42. 9	−13. 59	0	103	
May 16						(36)	(360)	
134·949	87	0·731	262. 54	157. 1	— 6. 46	32	212	
	89	0·925	103. 0	42. 55	−12. 53	0	54	
May 16						(32)	(266)	
136·934	87	0·966	263. 25	158. 59	— 6. 54	0	96	
	89	0·657	108. 15	44. 19	−13. 26	0	27	
May 18						(0)	(123)	
136·948	87	0·968	263. 51	159. 16	— 6. 29	0	87	
	89	0·656	108. 14	44. 13	−13. 25	0	27	
May 18						(0)	(114)	
138·922	89	0·299	134. 12	45. 2	−13. 47	0	33	
	89*	0·435	125. 35	36. 12	−16. 19	25	274	
May 20						(25)	(307)	
138·967	89	0·291	134. 20	44. 51	−13. 30	0	23	
	89*	0·432	125. 11	35. 41	−16. 5	68	327	
May 20						(68)	(350)	
140·031	89	0·210	187. 56	44. 46	−13. 40	0	26	
	89*	0·295	148. 34	33. 53	−16. 12	0	153	
May 21						(0)	(179)	
1874.			° ′	° ′	° ′			
140d·087	89	0·212	192. 7	44. 57	−13. 38	0	34	
	89*	0·284	150. 28	34. 0	−15. 56	10	231	
May 21						(10)	(265)	
141·004	89	0·334	231. 5	45. 38	−13. 36	0	13	
	89*	0·262	196. 14	34. 33	−16. 6	14	334	
May 22						(14)	(347)	
141·025	89	0·338	230. 56	45. 31	−13. 47	0	18	
	89*	0·267	197. 34	34. 43	−16. 16	22	195	
May 22						(22)	(213)	
144·928	89*	0·874	253. 25	38. 10	−14. 59	5	53	1176 *s f*
	90	0·875	76. 28	278. 20	+11. 13	60	398	702 *n f*
May 26						(65)	(451)	(1878)
144·956	89*	0·877	253. 35	38. 10	−14. 53	0	34	1176 *s f*
	90	0·874	76. 15	278. 8	+11. 23	58	369	764 *n f*
May 26						(58)	(403)	(1940)
148·944	90	0·224	28. 2	279. 2	+10. 42	37	260	
May 30						(37)	(260)	
148·999	90	0·222	24. 58	278. 58	+10. 55	53	258	
May 30						(53)	(258)	
150·963	90	0·413	300. 33	279. 38	+11. 41	32	189	
	91	0·892	97. 58	195. 44	— 7. 16	36	112	
June 1						(68)	(301)	
150·999	90	0·411	300. 27	279. 4	+11. 36	31	215	
	91	0·898	98. 1	194. 29	— 7. 22	29	109	
June 1						(60)	(324)	
152·021	90	0·597	289. 35	279. 16	+11. 16	35	227	
	91	0·763	98. 27	195. 10	— 6. 36	34	159	
June 2						(69)	(386)	
152·033	90	0·602	289. 4	279. 32	+11. 4	33	224	
	91	0·756	98. 25	195. 37	— 6. 32	41	172	
		0·945	82. 40					818
June 2						(74)	(396)	(818)
153·961	90	0·879	282. 46	279. 24	+11. 9	46	235	
	91	0·412	107. 16	195. 29	— 7. 3	31	146	
June 4						(77)	(381)	

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 85. A large spot with several small ones near it. The first photograph on May 1 (120·032), the second on May 2 (121·020), and that on May 6, are faint and badly defined.

Group 86. Two large spots. The photograph on May 6 is much under-exposed.

Group 87. A large group of many spots.

Group 88. A group of three small spots widely separated.

Group 89. Two or three small spots. The second photograph on May 16 (134·949) shows only part of the group. Partly hidden by the wire on the first photograph on May 20 (138·922).

Group 89*. Two large spots of irregular shape. The second photograph on May 20 (138·967) is faint, and the spot is partly hidden by the wire on the second photograph on May 21 (140·087).

Group 90. One large spot of very irregular shape. On the first photograph on May 30 (148·944) it is partly hidden by the wire. It is near the limb on June 5, and only part of it is visible on the second photograph. The first photograph is too little exposed, and scarcely shows the group at all.

Group 91. One well-defined spot of regular shape.

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).
1874.			° ′	° ′	° ′			
153d·970	90	0·877	282. 13	279. 6	+10. 39	30	196	
	91	0·413	107. 12	195. 18	− 7. 2	23	138	
June 4						(53)	(334)	
154·692	90	0·962	282. 40	279. 9	+12. 21	0	272	
	91	0·196	127. 20	196. 30	− 6. 44	12	130	
June 5						(12)	(402)	
154·969	90	0·970	281. 16	280. 52	+10. 56	0	154	
	91	0·208	128. 16	195. 57	− 7. 18	12	124	
June 5						(12)	(278)	
161·034	92	0·215	164. 12	121. 43	−11. 6	0	50	
June 11						(0)	(50)	
161·914	92	0·255	213. 42	121. 44	−11. 18	0	28	
June 12						(0)	(28)	
161·920	92	0·255	213. 24	121. 35	−11. 21	0	32	
June 12						(0)	(32)	
162·905	92	0·398	237. 55	120. 23	−11. 11	19	102	
	93	0·499	285. 49	129. 17	+ 8. 42	0	24	
June 13						(19)	(126)	
162·913	92	0·393	237. 56	120. 0	−11. 1	22	114	
	93	0·501	285. 51	129. 19	+ 8. 44	0	27	
June 13						(22)	(141)	
165·030	92	0·789	256. 6	123. 6	−10. 5	0	29	
	94	0·869	76. 55	12. 33	+11. 58	0	130	
June 15						(0)	(159)	
165·074	92	0·790	255. 46	122. 33	−10. 22	0	29	
	92*	0·390	237. 26	91. 6	−10. 52	0	29	
	94	0·869	76. 39	11. 59	+12. 12	0	122	
June 15						(0)	(180)	
169·019	92*	0·971	259. 44	94. 49	− 9. 31	0	250	
	94	0·217	42. 13	10. 56	+10. 56	40	509	
June 19						(40)	(759)	
169·035	94	0·205	39. 8	11. 41	+10. 51	14	326	
June 19						(14)	(560)	
172·097	94	0·573	285. 4	12. 44	+10. 16	56	540	
June 22						(56)	(540)	
1874.			° ′	° ′	° ′			
172d·119	94	0·581	285. 20	12. 59	+10. 32	52	556	
June 22						(52)	(556)	
172·969	94	0·736	282. 16	13. 57	+10. 29	52	589	
June 23						(52)	(589)	
173·926	94	0·882	280. 46	16. 3	+10. 34	33	495	
	95	0·979	69. 15	236. 25	+20. 47	0	58	
June 24						(33)	(553)	
173·989	94	0·894	279. 57	16. 45	+ 9. 55	34	467	
	95	0·970	68. 32	238. 6	+21. 22	0	66	
June 24						(34)	(533)	
175·007	94	0·974	279. 42	17. 3	+10. 0	70	430	
	95	0·931	66. 52	232. 36	+22. 22	0	117	
June 25						(70)	(547)	
175·017	94	0·976	279. 53	17. 25	+10. 10	70	426	3638*f*
	95	0·927	66. 56	233. 7	+22. 14	0	108	
	96	0·459	124. 54	277. 24	−12. 55	0	47	
June 25						(70)	(581)	(3638)
177·056	95	0·772	66. 13	224. 34	+19. 52	40	443	
June 27						(40)	(443)	
177·091	95	0·760	67. 26	224. 57	+18. 43	43	302	
	96	0·277	133. 42	260. 58	− 8. 22	0	17	
June 27						(43)	(319)	
178·911	95	0·466	58. 47	224. 1	+16. 32	26	231	
	96	0·324	226. 40	262. 16	−10. 1	26	410	
June 29						(52)	(641)	
178·920	95	0·474	58. 46	223. 23	+16. 47	62	406	
	96	0·329	226. 28	262. 20	−10. 16	62	428	
June 29						(124)	(834)	
179·896								354
	95	0·305	36. 44	224. 30	+17. 1	19	345	
	96	0·503	243. 20	262. 31	−10. 20	94	711	
	97	0·771	104. 15	186. 30	− 8. 57	0	12	
June 30						(113)	(1068)	(354)

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

Group 90. One large spot of very irregular shape. On the first photograph on May 30 (148·944) it is partly hidden by the wire. It is near the limb on June 5, and only part of it is visible on the second photograph. The first photograph is too little exposed, and scarcely shows the group at all. Group 91. One well-defined spot of regular shape. Group 92. Two faint spots. Group 92*. Two spots. This group is not measurable on the first photograph on June 15 (165·030) nor on the second on June 19 (169·035), both of which are faint. Group 93. One small spot. Group 94. One spot, which greatly increases in size on June 19, and breaks up into several fragments. The first photograph on June 22 (172·097) and that on June 23 (172·969) are too little exposed. The spot is partly hidden by the wire on the first photograph on June 19 (169·019).

Group 95. A very scattered group composed principally of five spots. It undergoes a very rapid change in form and in size during the whole of its course. On the first photograph on June 29 (178·911) it is partly hidden by the wire.

Group 96. Single spot. It is seen on the first photograph on June 25 (175·007), but that photograph being too much exposed, the spot cannot be satisfactorily measured. On the first photograph on June 27 (177·056) it is hidden by the wire. On June 29 it has expanded into a long straggling group of small spots. The group undergoes very rapid change in form and size during the whole of its course. Group 97. One small faint spot. It is partly hidden by the wire on the first photograph on July 2 (181·958). It breaks up into a cluster of very small spots on July 2.

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).
1874.			° ′	° ′	° ′			
179d·921								274
	95	0·301	35. 31	224. 38	+17. 3	34	364	
	96	0·500	243. 6	261. 57	−10. 22	105	754	
	97	0·761	103. 52	186. 58	− 8. 30	0	31	
June 30						(139)	(1149)	(274)
181·958	95	0·392	308. 24	226. 49	+17. 5	23	171	
	96	0·824	255. 37	262. 4	− 9. 54	16	662	
	97	0·374	123. 52	189. 54	− 8. 56	1	29	
	99	0·932	97. 25	140. 6	− 5. 42	2	89	
July 2						(42)	(951)	
181·970		0·919	282. 30					442
	95	0·396	309. 26	226. 38	+17. 33	39	200	
	96	0·827	255. 46	262. 15	− 9. 50	115	555	2233 *c*
	97	0·399	120. 49	187. 48	− 8. 44	1	56	
	98	0·864	77. 31	148. 30	+12. 23	0	14	660 *nf*
	99	0·945	96. 28	137. 44	− 5. 1	33	151	424 *c*
July 2						(188)	(976)	(3759)
183·022	95	0·583	295. 50	227. 17	+17. 26	0	51	
	96	0·953	258. 48	265. 19	− 9. 36	13	106	
	97	0·210	163. 29	190. 37	− 8. 15	0	68	
	98	0·705	74. 22	150. 1	+13. 19	21	256	
	99	0·822	96. 38	139. 24	− 3. 31	40	195	
July 3						(74)	(676)	
183·035	95	0·580	295. 10	227. 3	+17. 1	0	32	
	96	0·945	258. 31	263. 37	− 9. 41	0	228	1268 *c*
	97	0·218	164. 22	190. 30	− 8. 45	0	89	
	98	0·701	75. 26	150. 3	+12. 32	23	189	
	99	0·820	98. 3	139. 34	− 4. 39	25	261	
July 3						(48)	(799)	(1268)
183·903	95	0·722	291. 13	227. 8	+17. 33	20	97	
	96	0·979	260. 11	259. 42	− 8. 52	0	59	513 *c*
	97	0·265	216. 24	191. 32	− 8. 53	0	11	
	98	0·529	73. 48	151. 21	+11. 23	20	351	
	99	0·700	101. 58	139. 5	− 5. 50	90	717	
	100	0·990	101. 45	101. 41	−11. 6	0	532	
July 4						(130)	(1767)	(513)
185·987	95	0·949	287. 5	226. 26	+17. 20	0	42	
	98	0·145	22. 39	151. 35	+11. 17	146	902	
	99	0·322	117. 53	138. 18	− 5. 8	86	504	
	100	0·824	105. 16	101. 5	−10. 22	87	603	
	101	0·453	82. 50	128. 3	+ 6. 29	7	57	
July 6						(326)	(2108)	
1874.			° ′	° ′	° ′			
186d·105	95	0·962	286. 11	227. 32	+16. 33	0	83	2456 *nf*
	98	0·145	17. 26	150. 44	+11. 34	201	1129	
	99	0·292	119. 32	138. 34	− 4. 43	90	378	
	100	0·805	105. 5	101. 23	− 9. 49	130	636	2130 *f*
	101	0·417	81. 37	128. 50	+ 6. 48	21	112	
July 6						(442)	(2338)	(4586)
186·947								519
	98	0·196	310. 31	150. 49	+10. 59	108	1028	
	99	0·164	155. 24	138. 13	− 4. 49	45	320	
	100	0·687	109. 59	101. 14	−10. 43	79	528	
	101	0·250	77. 30	127. 58	+ 6. 43	0	17	
July 7						(232)	(1893)	(519)
186·960		0·956	290. 50					420
	98	0·208	308. 8	151. 30	+11. 2	199	1427	
	99	0·165	154. 53	137. 56	− 4. 50	47	294	
	100	0·685	110. 12	101. 14	−10. 49	86	530	1346 *f*
	101	0·250	77. 58	127. 46	+ 6. 36	0	28	
July 7						(332)	(2279)	(1766)
188·003		0·957	274. 50					182
		0·886	257. 0					693
	98	0·431	287. 25	152. 48	+10. 53	168	1341	
	99	0·230	229. 3	138. 9	− 4. 50	53	342	
	100	0·504	117. 24	101. 15	− 9. 56	109	503	
	101	0·139	278. 12	136. 3	+ 4. 57	0	10	
July 8						(330)	(2196)	(875)
188·023		0·952	275. 10					219
		0·889	256. 0					571
	98	0·433	287. 1	152. 42	+10. 45	128	1261	
	99	0·233	229. 44	138. 7	− 4. 50	56	315	
	100	0·499	118. 25	101. 31	−10. 14	96	525	
	101	0·142	277. 2	135. 59	+ 4. 48	0	27	
July 8						(280)	(2128)	(790)
189·022		0·963	257. 30					239
	98	0·634	283. 13	153. 30	+11. 23	157	1241	
	99	0·442	249. 19	139. 5	− 5. 21	19	199	
	100	0·334	138. 31	101. 42	−10. 34	73	419	
	101	0·375	272. 6	136. 38	+ 4. 27	0	11	
		0·921	76. 0					277
July 9						(249)	(1870)	(516)

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

Group 95. A very scattered group, composed principally of five spots. It undergoes a very rapid change in form and in size during the whole of its course. On the first photograph on June 29 (178·911) it is partly hidden by the wire.

Group 96. Single spot. It is seen on the first photograph on June 25 (175·007), but that photograph being much too long exposed, the spot cannot be satisfactorily measured. On the first photograph on June 27 (177·056) it is hidden by the wire. On June 29 it has expanded into a long straggling group of small spots. The group undergoes very rapid change in form and size during the whole of its course.

Group 97. One small faint spot. It is partly hidden by the wire on the first photograph on July 2 (181·958). It breaks up into a cluster of very small spots on July 2.

Group 98. Two spots. They are small on July 2 but much larger on the following days. They are not seen on the first photograph on July 2 (181·958). On the first photograph on July 6 (185·987) they are partly hidden by the wire.

Group 99. At first a single well-defined spot. On July 3 and 4 a row of small spots forms immediately behind it.

Group 100. One large regular spot. A large and brilliant bridge formed across it on July 15, causing an apparent discrepancy between the area as shown on the first and second photographs. On the second photograph on July 16 (196·033) it is very close to the limb, hence the apparent discrepancy in longitude.

Group 101. Two spots, the first being very small. They greatly decrease in size on July 7, and on July 8 one disappears altogether. The spots 98 to 101 seem to suffer continual changes.

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).
			° ′	° ′	° ′			
1874.								
189^{d}·047		0·969	257. 50					302
	98	0·639	283. 7	153. 34	+11. 22	200	1325	
	99	0·452	250. 8	139. 29	− 5. 14	30	226	
	100	0·329	138. 45	101. 39	−10. 24	93	434	
	101	0·383	272. 9	136. 48	+ 4. 48	0	8	
								318
July 9						(323)	(1993)	(620)
189·997	98	0·780	281. 27	152. 49	+11. 27	120	808	
	99	0·629	256. 21	139. 29	− 5. 19	23	114	
	100	0·247	179. 57	101. 45	−10. 11	40	422	
	102	0·807	74. 45	48. 23	+14. 40	0	29	
July 10						(183)	(1373)	
190·005	98	0·778	281. 37	152. 29	+11. 34	140	908	
	99	0·625	256. 36	139. 5	− 5. 5	16	111	
	100	0·248	180. 16	101. 42	−10. 15	54	425	
	102	0·807	75. 3	48. 13	+14. 25	0	28	
July 10						(210)	(1472)	
193·042	98*a*	0·974	275. 7	138. 33	+ 5. 58	0	126	998*f*
	99	0·979	263. 23	138. 56	− 5. 33	0	75	297*f*
	100	0·685	248. 31	101. 50	−11. 11	144	516	
	102	0·303	58. 36	46. 30	+13. 14	27	122	
July 13						(171)	(839)	(1295)
193·056	98*a*	0·975	275. 25	138. 37	+ 6. 15	0	109	
	99	0·981	263. 31	139. 21	− 5. 28	0	68	
	100	0·684	248. 58	101. 41	−10. 52	49	441	
	102	0·302	57. 24	46. 11	+13. 31	0	78	
July 13						(49)	(696)	
194·006	100	0·828	253. 32	102. 28	−10. 57	44	188	
	102	0·170	13. 49	46. 19	+13. 53	0	41	
	103	0·974	71. 45	331. 18	+18. 46	0	76	
July 14						(44)	(305)	
194·017	100	0·828	253. 42	102. 23	−10. 48	64	283	
	102	0·178	14. 55	45. 52	+14. 17	0	52	
	103	0·975	71. 50	330. 53	+18. 41	0	97	
July 14						(64)	(432)	
194·938	100	0·921	257. 36	101. 58	− 9. 32	214	517	1153*f*
	102	0·225	316. 13	45. 34	+13. 47	42	150	
	103	0·911	72. 48	330. 46	+17. 31	49	133	526*f*
	104	0·454	68. 39	10. 43	+13. 34	0	60	
July 15						(305)	(860)	(1679)
1874.								
194^{d}·948	100	0·924	256. 54	102. 12	−10. 15	88	372	1170*f*
	102	0·236	314. 13	46. 15	+13. 54	34	132	
	103	0·906	72. 59	331. 21	+17. 19	61	148	599*f*
	104	0·450	68. 39	10. 51	+13. 29	0	45	
July 15						(183)	(697)	(1769)
196·015	100	0·988	258. 45	101. 56	−10. 19	0	529	1749*f*
	102	0·522	287. 28	52. 42	+12. 58	35	202	
	103	0·789	69. 58	330. 52	+18. 35	29	170	1352*f*
	104*	0·600	85. 20	345. 16	+ 6. 30	0	93	
	104	0·267	50. 17	9. 56	+14. 19	0	17	
July 16						(64)	(1011)	(3101)
196·033	100	0·993	258. 32	103. 44	−10. 46	0	545	1749*f*
	102	0·532	286. 10	53. 18	+12. 27	20	167	
	103	0·782	70. 10	331. 18	+18. 19	42	178	1352*f*
	104*	0·598	86. 12	345. 11	+ 5. 59	0	61	
	104	0·271	49. 54	9. 35	+14. 32	0	16	
July 16						(62)	(967)	(3101)
197·010	102	0·759	279. 42	58. 17	+10. 25	39	263	
	103	0·645	66. 38	330. 30	+18. 29	23	154	
	104*	0·384	84. 22	346. 27	+ 6. 31	32	338	
July 17						(94)	(755)	
197·022	102	0·756	279. 48	57. 51	+10. 29	42	252	
	103	0·642	66. 18	330. 37	+18. 38	35	173	
	104*	0·388	84. 29	346. 2	+ 6. 29	39	318	
July 17						(116)	(743)	
198·003	102	0·877	279. 23	57. 14	+10. 32	29	129	1071*p*
	103	0·477	59. 29	330. 16	+18. 18	22	136	
	104*	0·167	79. 30	346. 20	+ 6. 28	101	429	
July 18						(152)	(694)	(1071)
198·019	102	0·881	279. 18	57. 32	+10. 28	38	206	1186*p*
	103	0·477	59. 36	330. 3	+18. 16	22	118	
	104*	0·165	82. 54	346. 11	+ 5. 55	61	443	
July 18						(121)	(767)	(1186)
200·006	103	0·231	358. 36	329. 39	+18. 16	25	80	
	104*	0·320	275. 35	347. 55	+ 6. 30	154	829	
July 20						(179)	(909)	

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 98. Two spots. They are small on July 2, but much larger on the following days. They are not seen on the first photograph on July 2 (181·958). On the first photograph on July 6 (185·987) they are partly hidden by the wire. Group 99. At first a single well-defined spot. On July 3 and 4, a row of small spots forms immediately behind it.

Group 100. One large regular spot. A large and brilliant bridge formed across it on July 15, causing an apparent discrepancy between the area as shown on the first and second photographs. On the second photograph on July 16 (196·033) it is very close to the limb, hence the apparent discrepancy in longitude.

Group 101. Two spots, the first being very small. They greatly decrease in size on July 7, and on July 8 one disappears altogether. The spots 98 to 101 seem to suffer continual changes.

Group 102. On July 10 one small spot. On July 13 it has become two of much larger size. On July 13 it is partly hidden by the wire. These two spots become more and more widely separated, increase in size, and break up into several portions as the group crosses the Sun.

Group 103. One large regular spot. On the second photograph on July 16 (196·033) the group is partly hidden by the wire.

Group 104. At first one faint spot, which breaks up into two or three on July 16.

Group 104*. A very faint close cluster of small spots. The second photograph on July 17 (197·022) is somewhat out of focus, and the measures are consequently rough. The group has partly passed round the limb on July 25. The first photograph (204·941) being too little exposed, shows less than the second.

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).
1874.			° ′	° ′	° ′			
200d.019		0·868	283. 10					1603
	103	0·234	358. 52	329. 26	+18. 27	19	74	
	104*	0·317	275. 56	347. 34	+ 6. 36	121	674	
		0·910	70. 20					1670
		0·877	100. 0					1168
July 20						(140)	(748)	(4441)
201·003		0·875	281. 0					1074
	103	0·316	317. 41	329. 1	+18. 23	15	54	
	104*	0·526	273. 16	347. 51	+ 6. 1	172	714	
		0·827	69. 10					614
		0·825	108. 50					924
July 21						(187)	(768)	(2612)
202·986	103	0·640	293. 16	328. 7	+18. 44	5	22	
	104*	0·853	274. 35	348. 32	+ 6. 38	127	999	
	105	0·969	86. 2	214. 7	+ 5. 8	25	176	
July 23						(157)	(1197)	
203·007	103	0·650	293. 6	328. 38	+18. 50	10	37	
	104*	0·849	274. 9	347. 48	+ 6. 18	168	1151	625 *n p*
	105	0·971	85. 58	213. 21	+ 5. 11	78	286	713 *n p*
July 23						(256)	(1474)	(1338)
204·065	103	0·805	288. 55	328. 46	+18. 20	0	24	
	104*	0·957	274. 25	348. 54	+ 5. 47	158	993	499 *n*
	105	0·872	86. 57	214. 54	+ 5. 16	49	261	292 *c*
July 24						(207)	(1278)	(791)
204·941	104*	0·980	275. 11	342. 44	+ 6. 9	0	78	
	105	0·753	88. 31	215. 10	+ 4. 41	55	273	
July 25						(55)	(351)	
204·979	104*	0·990	274. 18	345. 34	+ 5. 1	0	63	753 *n f*
	105	0·746	88. 12	215. 17	+ 4. 57	57	325	426 *f*
July 25						(57)	(388)	(1179)
209·946	105	0·316	277. 19	216. 12	+ 7. 48	46	269	
	106*a*	0·551	79. 40	164. 31	+10. 30	0	116	
	106*b*	0·688	78. 52	154. 25	+11. 50	66	349	
	105*c*	0·751	88. 15	149. 8	+ 5. 8	13	115	
July 30						(125)	(849)	
209·958		0·935	259. 30					337
								673
	105	0·314	276. 37	215. 56	+ 7. 33	63	282	
	106*a*	0·555	79. 35	164. 6	+10. 34	6	118	} 200 *n f*
	106*b*	0·687	78. 40	154. 21	+11. 58	62	344	
	106*c*	0·751	88. 12	148. 58	+ 5. 11	42	224	
July 30						(173)	(968)	(1210)
1874.								
210d.902		0·946	294. 20					586
	105	0·525	275. 26	216. 53	+ 7. 49	39	228	
	106*a*	0·372	75. 24	163. 47	+10. 49	7	92	
	106*b*	0·514	76. 18	154. 37	+12. 1	52	307	
	106*c*	0·578	89. 13	149. 51	+ 5. 14	55	208	
	107	0·952	81. 1	112. 34	+10. 19	39	184	513 *f*
July 31						(192)	(1019)	(1099)
210·938		0·955	294. 10					586
	105	0·528	275. 37	216. 37	+ 7. 56	48	236	
	106*a*	0·371	74. 45	163. 26	+11. 3	0	80	
	106*b*	0·515	75. 52	154. 7	+12. 15	50	316	
	106*c*	0·580	88. 49	149. 14	+ 5. 28	53	238	
	107	0·955	80. 32	111. 30	+10. 46	48	194	618 *f*
July 31						(199)	(1064)	(1204)
213·926	105	0·951	275. 54	217. 31	+ 7. 29	21	148	532 *f*
	106*b*	0·200	309. 19	154. 17	+13. 14	44	284	
	106*c*	0·049	283. 30	147. 55	+ 6. 43	50	234	
	107	0·552	79. 50	111. 46	+10. 39	38	316	
	108	0·687	128. 11	110. 13	−20. 7	53	214	
	109	0·698	112. 52	104. 24	−11. 7	25	78	
		0·967	79. 40					301
Aug. 3						(231)	(1274)	(833)
213·942	105	0·951	275. 42	217. 18	+ 7. 18	65	157	480 *f*
	106*b*	0·202	308. 47	154. 14	+13. 14	43	227	
	106*c*	0·050	275. 59	147. 49	+ 6. 22	40	239	
	107	0·549	79. 43	111. 46	+10. 42	43	309	
	108	0·688	128. 51	110. 12	−20. 33	31	173	
	109	0·696	112. 45	104. 18	−11. 0	25	66	
		0·970	79. 20					297
Aug. 3						(247)	(1171)	(777)
216·918		0·906	248. 30					185
	106*b*	0·756	282. 20	154. 50	+13. 24	43	205	} 1121 *p*
	106*d*	0·720	273. 54	151. 49	+ 7. 9	39	218	
	106*c*	0·649	270. 41	146. 8	+ 5. 13	9	89	
	107	0·149	307. 58	112. 29	+11. 28	43	175	
	108	0·460	191. 23	111. 10	−20. 27	53	197	
	109	0·308	176. 12	104. 27	−11. 33	17	78	
		0·885	108. 10					183
		0·928	77. 30					732
Aug. 6						(204)	(962)	(2221)

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 103. One large regular spot.

Group 104*. A very faint close cluster of small spots. The second photograph on July 17 (197·022) is somewhat out of focus, and the measures are consequently rough. The group has partly passed round the limb on July 25. The first photograph (204·941), being too little exposed, shows less than the second.

Group 105. One regular spot.

Group 106*b*. One regular spot. On the second photograph on August 3 (213·942) it is partly hidden by the wire.

Group 106*c*. A line of small spots.

Group 107. One large spot, and two or three small fragments near it. It gradually diminishes in size.

Group 108. A long line of small spots, partly hidden by the wire on the second photograph on August 6 (216·956). It is seen much foreshortened on August 10, being very close to the limb, and is therefore difficult to measure.

Group 104. At first one faint spot, which breaks up into two or three on July 16.

Group 106*a*. A long line of small spots, which disappear on July 31.

Group 106*d*. One regular spot, and two or three small ones close to it.

Group 109. One small 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).
1874.			° ′	° ′	° ′			
216d·956		0·897	246. 50					135
	106*b*	0·758	282. 11	154. 30	+13. 18	31	208	900 *p*
	106*d*	0·730	274. 9	152. 9	+ 7. 18	36	196	
	106*e*	0·657	270. 58	146. 14	+ 5. 22	0	102	
	107	0·157	305. 17	112. 37	+11. 23	32	193	
	108	0·455	191. 37	110. 43	−20. 7	40	168	
	109	0·303	176. 40	104. 7	−11. 16	22	68	
		0·898	106. 50					247
		0·936	76. 40					1025
Aug. 6						(161)	(935)	(2307)
218·936	106*e*	0·987	273. 39	159. 51	+ 4. 38	0	37	1484 *f*
	106*b*	0·966	282. 18	154. 47	+13. 30	10	239	
	106*d*	0·957	275. 32	152. 26	+ 7. 8	37	406	
	107	0·560	281. 29	112. 53	+11. 41	21	146	
	108	0·684	230. 19	113. 2	−20. 35	59	308	247 *p*
	109	0·516	234. 25	104. 13	−11. 40	15	49	
		0·872	115. 20					174
	110	0·989	88. 42	357. 32	+ 2. 15	67	536	2986 *n*
Aug. 8						(209)	(1721)	(4891)
218·966	106*e*	0·987	273. 34	159. 32	+ 4. 33	0	43	1394 *f*
	106*b*	0·968	282. 19	154. 52	+13. 30	40	218	
	106*d*	0·959	275. 7	152. 24	+ 6. 43	41	368	
	107	0·566	281. 14	112. 55	+11. 36	30	160	
	108	0·682	230. 42	112. 40	−20. 16	83	326	276 *p*
	109	0·521	234. 33	104. 8	−11. 47	13	62	
		0·910	113. 0					143
	110	0·991	88. 43	356. 19	+ 2. 9	92	499	2635 *n*
Aug. 8						(299)	(1676)	(4448)
220·931	107	0·864	280. 8	112. 47	+12. 0	40	177	643 *nf*
	108	0·930	245. 0	116. 25	−20. 22	18	188	1129 *f*
	109	0·814	250. 49	104. 5	−11. 29	14	45	337 *n*
	110	0·821	91. 57	357. 37	+ 2. 8	103	502	1773 *nf*
	111	0·987	110. 10	334. 58	−18. 37	80	900	775 *c*
Aug. 10						(255)	(1812)	(4657)
221·952	107	0·961	280. 43	113. 47	+12. 5	28	159	775 *f*
	108	0·963	246. 50					971
	109	0·926	254. 39	104. 32	−11. 31	0	50	432 *nf*
	110	0·662	94. 9	357. 55	+ 2. 12	94	527	702 *nf*
	111	0·939	111. 39	332. 56	−17. 42	121	1131	1135 *c*
Aug. 11						(243)	(1867)	(4015)
1874.			° ′	° ′	° ′			
222d·074	107	0·970	280. 9	114. 10	+11. 25	32	86	819 *f*
	108	0·957	245. 0					993
	109	0·936	254. 20	104. 28	−12. 8	0	40	348 *nf*
	110	0·641	93. 36	357. 49	+ 2. 45	95	544	725 *nf*
	111	0·932	112. 3	332. 33	−17. 47	218	1357	1000 *c*
Aug. 11						(345)	(2027)	(3885)
222·927	110	0·480	97. 29	357. 52	+ 2. 15	104	497	
	111	0·838	116. 35	334. 23	−17. 58	104	1055	1056 *s*
		0·904	74. 0					754
Aug. 12						(208)	(1552)	(1810)
222·951		0·941	255. 50					684
	110	0·478	97. 3	357. 40	+ 2. 28	99	453	
	111	0·849	116. 34	332. 57	−18. 22	167	1109	1138 *s*
		0·912	72. 40					391
Aug. 12						(266)	(1562)	(2213)
224·991		0·919	281. 50					355
	110	0·078	172. 17	358. 19	+ 2. 17	67	417	
	111	0·578	133. 30	332. 58	−17. 21	137	1153	
Aug. 14						(204)	(1570)	(355)
225·010		0·922	281. 30					222
	110	0·074	175. 25	358. 19	+ 2. 30	93	422	
	111	0·570	134. 14	333. 26	−17. 18	190	1147	
Aug. 14						(283)	(1569)	(222)
225·932	110	0·214	249. 10	357. 57	+ 2. 16	76	463	
	111	0·472	151. 31	332. 51	−17. 52	124	912	
	112	0·849	248. 30	40. 50	−14. 14	10	96	
		0·935	99. 20					373
Aug. 15						(210)	(1471)	(373)
227·977	110	0·630	265. 3	358. 12	+ 2. 13	72	459	
	111	0·471	208. 10	332. 54	−17. 47	127	685	
Aug. 17						(199)	(1144)	
229·998	110	0·918	268. 28	359. 6	+ 1. 22	16	383	
	111	0·734	238. 19	333. 29	−17. 26	44	430	
	114	0·628	120. 21	259. 8	−12. 43	0	11	
	115	0·909	111. 13	231. 9	−15. 59	40	260	
	116	0·958	85. 47	219. 8	+ 6. 1	0	75	
Aug. 19						(100)	(1159)	
230·088	110	0·922	268. 0	358. 26	+ 0. 52	0	398	
	111	0·750	237. 6	333. 8	−18. 52	122	551	
	114	0·613	121. 36	259. 19	−12. 52	0	23	
	115	0·896	111. 19	231. 43	−15. 36	49	276	
	116					0	80	
Aug. 19						(171)	(1328)	

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 106*b*. One regular spot. On the second photograph on August 3 (213·942) it is partly hidden by the wire.
Group 106*d*. One regular spot and two or three small ones close to it.
Group 107. One large spot and two or three small fragments near it. It gradually diminishes in size. The smaller fragments do not appear until the second photograph on July 31 (210·938).
Group 108. A long line of small spots, partly hidden by the wire on the second photograph on August 6 (216·956). It is seen much foreshortened on August 10, being very close to the limb, and is therefore difficult to measure.
Group 110. A large regular spot. Partly hidden by the wire on August 14.
Group 111. Three spots, one very large. Partly hidden by the wire on August 12. The faculæ on the first photograph on August 22 (232·912) are too faint for measurement.
Group 112. A few very small spots in a close cluster.
Group 114. A scattered group of small spots.
Group 115. Two spots close together. On the first photograph on August 25 (235·946) they are partly hidden by the wire.
Group 116. One small spot. The spot cannot be measured on the second photograph on August 19 (230·088) which is too little exposed, and can only be measured with difficulty on the first photograph on August 22 (232·912) which is also too little exposed.

Group 106*c*. A line of small spots.
Group 106*e*. One small spot.
Group 109. One small 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.		Spots.		Faculæ.	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.		Spots.		Faculæ.
				Longitude.	Latitude.	Area of UMBRA for each Spot (and for Day).	Area of WHOLE for each Spot (and for Day).	Area for each Group (and for Day).					Longitude.	Latitude.	Area of UMBRA for each Spot (and for Day).	Area of WHOLE for each Spot (and for Day).	Area for each Group (and for Day).
1874.			° ′	° ′	° ′				1874.			° ′	° ′	° ′			
231d·063	110	0·993	269. 43	1. 36	+ 0. 34	0	347	843 *nf*	235d·958	114	0·754	254. 57	260. 55	− 6. 27	0	22	328 *np*
	111	0·847	243. 51	331. 26	−17. 45	86	694	1759 *c*		115	0·471	218. 1	231. 23	−14. 56	42	217	
	114	0·415	138. 59	262. 35	−11. 30	31	191			117	0·862	81. 27	153. 57	+10. 56	11	51	997 *sf*
	115	0·794	114. 58	230. 41	−14. 56	47	328	355 *c*			0·987	109. 40					422
	116	0·859	86. 29	219. 12	+ 6. 35	0	27	803 *nf*	Aug. 25						(53)	(290)	(1747)
Aug. 20						(164)	(1587)	(3760)									
									236·925	115	0·607	233. 19	231. 21	−15. 4	43	230	
231·994		0·906	287. 0					223		117	0·734	82. 15	153. 41	+10. 31	18	58	
	111	0·937	248. 4	332. 0	−17. 42	58	347	1463 *c*	Aug. 26						(61)	(288)	
	114	0·298	172. 58	264. 15	−10. 10	25	119										
	115	0·658	122. 41	231. 31	−15. 4	51	295		236·933		0·891	256. 0					1191
	116	0·725	87. 58	219. 47	+ 6. 16	19	76				0·843	288. 50					225
Aug. 21						(153)	(837	(1686)		115	0·607	232. 47	231. 4	−15. 19	49	229	
										117	0·741	82. 33	153. 1	+10. 17	16	56	
232·078		0·913	287. 10					283			0·941	112. 20					672
	111	0·940	247. 49	331. 20	−18. 3	57	264	1138 *c*			0·979	91. 50					184
	114	0·296	175. 15	263. 52	−10. 7	12	122		Aug. 26						(65)	(285)	(2272)
	115	0·648	122. 53	231. 10	−14. 47	46	227										
	116	0·717	87. 29	219. 20	+ 6. 40	30	79		237·967		0·967	256. 10					998
Aug. 21						(145)	(692)	(1421)			0·944	289. 20					212
										115	0·758	242. 50	231. 35	−15. 8	43	219	
232·912	111	0·986	248. 26	331. 3	−19. 47	0	100			117	0·545	80. 17	154. 23	+11. 15	0	22	
	114	0·326	204. 54	262. 13	−10. 11	0	76				0·897	118. 30					1367
	115	0·538	135. 35	231. 15	−16. 5	46	272				0·924	87. 50					360
	116	0·571	90. 32	219. 23	+ 5. 27	25	60		Aug. 27						(43)	(241)	(2937)
Aug. 22						(71)	(508)										
									238·008		0·963	256. 50					1248
233·038	111	0·992	247. 54	331. 49	−20. 45	0	58	1215 *f*			0·935	291. 10					251
	114	0·343	212. 18	263. 14	− 9. 53	0	87			115	0·755	243. 2	230. 51	−14. 53	45	215	
	115	0·508	136. 29	231. 25	−15. 0	47	272			117	0·549	80. 10	153. 33	+11. 21	0	25	
	116	0·541	89. 22	219. 44	+ 6. 15	14	29				0·889	116. 50					1044
Aug. 22						(61)	(446)	(1215)			0·940	87. 40					475
									Aug. 27						(45)	(240)	(3018)
234·914	114	0·620	247. 0	262. 51	− 8. 13	0	73										
	115	0·381	188. 53	231. 16	−14. 58	57	266		238·923	115	0·865	248. 27	230. 50	−14. 34	32	227	
	117	0·962	81. 0	152. 57	+10. 34	0	55	861 *sp*		117	0·367	77. 26	153. 29	+11. 14	0	26	
Aug. 24						(57)	(394)	(861)	Aug. 28						(32)	(253)	
235·090	114	0·654	248. 29	263. 13	− 8. 16	0	86		238·945	115	0·870	248. 35	231. 10	−14. 38	24	208	510 *c*
	115	0·393	193. 50	231. 1	−15. 18	48	240			117	0·357	77. 23	153. 51	+11. 10	6	32	
	117	0·944	80. 9	153. 58	+11. 36	0	33	867 *sp*			0·920	113. 30					1588
Aug. 24						(48)	(359)	(867)			0·881	81. 0					419
									Aug. 28						(30)	(240)	(2517)
235·946	114	0·750	254. 58	260. 45	− 6. 21	0	22	389 *np*									
	115	0·470	217. 5	231. 9	−15. 10	27	184		240·005	115	0·960	251. 56	231. 11	−15. 2	37	156	
	117	0·866	81. 50	153. 40	+10. 36	27	63	916 *sf*		117	0·144	57. 0	153. 28	+11. 37	0	17	
		0·991	110. 20					347		118	0·289	146. 24	151. 17	− 6. 47	0	51	
Aug. 25						(54)	(269)	(1652)	Aug. 29						(37)	(224)	

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 110. A large regular spot. Partly hidden by the wire on August 14.

Group 111. Three spots, one very large. Partly hidden by the wire on August 12. The faculæ on the first photograph on August 22 (232·912) are too faint for measurement.

Group 112. A few very small spots on a close cluster.

Group 113. This seems to be a defect in the photographic film, not a Sun spot.

Group 114. A scattered group of small spots.

Group 115. Two spots close together. On the first photograph on August 25 (235·946) they are partly hidden by the wire.

Group 116. One small spot. The spot cannot be measured on the second photograph on August 19 (230·088) which is insufficiently exposed, and can only be measured with difficulty on the first photograph on August 22 (232·912) which is also too little exposed.

Group 117. One small spot. The first photograph on August 24 (234·914) is badly defined, and the first on August 26 (236·925) is too little exposed. It seems probable that the labels of the two photographs on August 27 have been interchanged.

Group 118. A scattered group of faint spots. The second photograph on August 31 (241·994) is too little exposed. The second photograph on September 4 (246·073) and the first on September 5 (246·896) are very badly defined.

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).
1874.			° ′	° ′	° ′			
240d·025	115	0·965	251. 42	232. 0	−15. 29	27	179	363 *c*
		0·868	277. 0					293
	117	0·135	54. 53	153. 49	+11. 34	17	41	
	118	0·285	148. 51	151. 45	− 6. 57	8	110	
		0·903	115. 20					1008
		0·887	85. 50					98
Aug. 29						(52)	(330)	(1762)
241·972	117	0·337	284. 34	153. 54	+11. 40	0	7	
	118	0·403	231. 39	153. 3	− 7. 35	0	72	
Aug. 31						(0)	(79)	
241·994	117	0·342	285. 31	153. 51	+12. 2	0	9	
	118	0·408	230. 44	152. 28	− 8. 4	0	57	
Aug. 31						(0)	(66)	
242·956	118	0·585	245. 39	153. 57	− 7. 50	9	93	
		0·954	108. 50					831
Sept. 1						(9)	(93)	(831)
243·907		0·874	275. 20					869
	118	0·732	253. 27	153. 47	− 6. 54	14	144	
		0·907	111. 0					1187
		0·943	74. 50					721
Sept. 2						(14)	(144)	(2777)
243·929		0·916	278. 20					500
	118	0·739	253. 12	154. 0	− 7. 15	14	109	
		0·906	111. 10					1161
		0·945	74. 40					452
Sept. 2						(14)	(109)	(2113)
246·066		0·942	277. 20					589
	118	0·963	259. 22	153. 13	− 8. 8	110	641	805 *c*
		0·878	241. 40					722
	119	0·978	89. 2	2. 36	+ 2. 29	0	60	154 *c*
		0·934	72. 30					298
Sept. 4						(110)	(701)	(2568)
246·073	118	0·964	259. 8	153. 14	− 8. 24	0	237	
	119	0·979	88. 47	2. 7	+ 2. 41	0	53	
Sept. 4						(0)	(290)	
246·896	118	0·990	262. 12	150. 9	− 6. 36	0	287	
		0·844	241. 30					1314
	119	0·924	92. 8	2. 18	+ 0. 51	0	29	
Sept. 5						(0)	(316)	(1314)

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).
1874.			° ′	° ′	° ′			
246d·910	118	0·994	261. 56	151. 50	− 7. 7	111	351	
		0·872	241. 30					1338
	119	0·920	91. 47	2. 39	+ 1. 15	0	36	1922 *s f*
Sept. 5						(111)	(387)	(3260)
251·101	119	0·206	117. 3	3. 27	+ 1. 47	0	37	
	120	0·891	270. 14	76. 58	+ 3. 31	0	27	275 *n f*
	121	0·596	233. 21	43. 27	−14. 29	0	39	
Sept. 9						(0)	(103)	(275)
251·117	119	0·206	117. 54	3. 19	+ 1. 37	0	30	
	120	0·893	269. 57	76. 57	+ 3. 14	0	30	266 *n f*
	121	0·603	233. 15	43. 38	−14. 49	13	64	
Sept. 9						(13)	(124)	(266)
251·924	120	0·945	272. 52	74. 16	+ 5. 5	0	75	380 *n f*
	121	0·712	242. 21	43. 28	−13. 46	11	91	
Sept. 10						(11)	(166)	(380)
251·953	121	0·712	242. 28	43. 5	−13. 42	5	78	
Sept. 10						(5)	(78)	
253·926		0·875	290. 40					911
	119*	0·689	273. 7	20. 27	+ 7. 23	22	124	
	121	0·937	252. 11	43. 14	−13. 52	26	385	
		0·892	103. 40					432
Sept. 12						(48)	(509)	(1343)
253·942		0·866	290. 20					425
	119*	0·692	272. 50	20. 27	+ 7. 10	32	134	
	121	0·935	252. 5	42. 39	−13. 52	40	391	1240 *c*
		0·858	106. 0					695
Sept. 12						(72)	(525)	(2360)
255·934	119†	0·962	275. 27	24. 43	+ 7. 12	34	124	1767 *s f*
		0·599	223. 20					2405
		0·939	80. 20					141
		0·730	90. 30					534
		0·785	117. 50					303
Sept. 14						(34)	(124)	(5150)
255·994	119†	0·964	274. 59	24. 23	+ 6. 42	23	104	
		0·943	79. 50					141
		0·741	90. 40					534
		0·781	117. 40					303
Sept. 14						(23)	(104)	(978)

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 Faculæ 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 115. Two spots close together. On the first photograph on August 25 (235·946) they are partly hidden by the wire.

Group 117. One small spot. The first photograph on August 24 (234·914) is badly defined, and the first on August 26 (236·925) is too little exposed. It seems probable that the labels of the two photographs on August 27 have been interchanged.

Group 118. A scattered group of faint spots. The second photograph on August 31 (241·994) is too little exposed. The second photograph on September 4 (246·073) and the first on September 5 (246·896) are very badly defined.

Group 119. One spot.

Group 119*. A long row of small spots.

Group 119†. One small spot.

Group 120. One small spot. The second photograph on September 10 (251·953) is out of focus and does not show this group.

Group 121. A group of small spots forming a circle. The first photograph on September 9 (251·101) is badly defined.

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).
1874.			° ′	° ′	° ′			
256d·957		0·940	276. 50					899
	122	0·934	107. 23	230. 32	−13. 22	0	51	
		0·889	80. 50					486
Sept. 15						(0)	(51)	(1385)
256·977		0·925	278. 30					1075
	122	0·933	107. 12	230. 21	−13. 10	0	45	
		0·886	80. 50					548
Sept. 15						(0)	(45)	(1623)
260·950		0·883	288. 50					107
	122	0·417	142. 22	229. 36	−12. 52	0	14	
		0·896	85. 20					490
Sept. 19						(0)	(14)	(597)
263·906	122	0·528	231. 20	229. 51	−12. 51	0	13	
	123	0·381	49. 58	186. 51	+20. 48	13	41	
	124	0·747	109. 30	159. 34	− 9. 32	62	326	
Sept. 22						(75)	(380)	
263·997								268
		0·897	250. 30					152
	122	0·542	232. 28	229. 48	−12. 56	0	12	
	123	0·365	46. 30	187. 18	+21. 13	18	88	
	124	0·730	108. 57	159. 37	− 8. 41	89	438	330 *s f*
		0·881	75. 30					202
Sept. 22						(107)	(538)	(952)
265·902								247
		0·913	245. 40					149
	123	0·292	328. 47	187. 54	+21. 15	12	52	
	124	0·418	130. 31	159. 55	− 9. 8	74	432	
								60
		0·911	116. 0					412
Sept. 24						(86)	(484)	(868)
265·926								237
		0·909	245. 0					270
	123	0·297	326. 59	188. 15	+21. 10	10	50	
	124	0·415	130. 34	159. 46	− 9. 2	68	396	
								79
		0·916	117. 50					328
Sept. 24						(78)	(446)	(914)

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).
1874.			° ′	° ′	° ′			
266d·917		0·927	290. 40					417
		0·903	244. 50					164
	123	0·450	305. 12	188. 9	+21. 19	15	53	
	124	0·285	161. 9	159. 41	− 8. 44	77	419	
	125	0·978	87. 57	87. 0	+ 3. 27	0	37	280 *c*
Sept. 25						(92)	(509)	(861)
266·933								387
		0·900	243. 50					219
	123	0·452	305. 6	188. 29	+21. 21	6	33	
	124	0·282	161. 40	160. 5	− 8. 36	75	411	
	125	0·981	87. 37	86. 18	+ 3. 41	0	67	409 *c*
Sept. 25						(81)	(511)	(1115)
267·966		0·875	284. 0					393
	123	0·631	296. 4	188. 46	+21. 32	11	33	
	124	0·303	209. 53	160. 7	− 8. 24	63	394	
	125	0·900	88. 55	87. 13	+ 3. 58	26	72	659 *f*
Sept. 26						(100)	(499)	(1052)
268·085								190
	123	0·648	293. 59	188. 51	+20. 35	6	32	
	124	0·319	213. 5	159. 54	− 8. 42	74	366	
	125	0·888	88. 25	87. 6	+ 4. 34	5	37	431 *f*
Sept. 26						(85)	(435)	(621)
269·969	123							323 *s*
	124	0·625	247. 39	160. 31	− 8. 13	69	384	
	125	0·610	92. 46	87. 28	+ 3. 42	0	17	
	127	0·983	105. 13	47. 50	−13. 31	124	963	1290 *p*
Sept. 28						(193)	(1364)	(1613)
270·048	123	0·901	289. 19	188. 39	+20. 18	0	18	253 *s*
	124	0·633	247. 41	160. 3	− 8. 26	64	382	
	125	0·597	92. 37	87. 20	+ 3. 52	0	14	
	127	0·981	104. 48	47. 18	−13. 2	171	1040	1172 *p*
Sept. 28						(235)	(1454)	(1425)
270·998								869
	124	0·783	253. 47	160. 27	− 8. 15	40	312	
	125	0·404	96. 27	87. 36	+ 3. 34	0	10	
	126	0·801	108. 50	60. 54	−10. 42	0	33	
	127	0·942	106. 35	43. 25	−13. 7	93	1419	1966 *f*
		0·937	70. 50					448
Sept. 29						(133)	(1774)	(3283)

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

Group 122. One small regular spot.

Group 123. A small spot and a very small marking at a little distance. Entirely hidden by the wire on September 28 (269·966) and partly on September 26 (267·966). The group of faculæ on the first photograph on September 29 (270·998) is too faint to be measured.

Group 124. One large regular spot. Partly hidden by the wire on September 22 and 26. Two groups of faculæ on September 24, one on the second photograph on September 25 (266·933), and one on the second on September 26 (268·085) are too faint for their positions to be measured.

Group 125. One small regular spot. The second photograph on September 25 (266·933) is ill-defined and faint. The spot is entirely hidden by the wire on the second photograph on September 30 (271·986).

Group 126. One small spot and two very small specks near. It is partly hidden by the wire on the first photograph on September 29 (270·998). On the second photograph on October 1 (272·974) the groups of faculæ are seen, but are too faint for measurement.

Group 127. A close cluster composed of many spots. On September 29 (270·998) it is partly hidden by the wire, and also on September 30 (271·986), and again on October 1 (272·974) and October 5 (277·005). The photograph on September 30 (271·986) was taken through cloud, and is consequently very faint.

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).
1874.			° ′	° ′	° ′			
271d·033		0·923	280. 20					1034
	124	0·778	253. 39	159. 41	— 8. 14	72	369	662 *p*
	125	0·400	95. 50	87. 30	+ 3. 51	0	20	
	126	0·799	108. 21	60. 41	—10. 17	19	84	456 *c*
	127	0·930	107. 3	45. 12	—13. 7	117	1378	2535 *f*
		0·919	78. 50					791
Sept. 29						(208)	(1851)	(5478)
271·966	124	0·894	257. 30	160. 11	— 8. 1	64	328	
	125	0·192	107. 6	88. 2	+ 3. 20	0	10	
	126	0·656	116. 19	61. 51	—11. 32	12	71	
	127	0·849	110. 38	43. 58	—13. 34	108	847	
Sept. 30						(184)	(1256)	
271·986	124	0·897	257. 18	160. 14	— 8. 16	45	242	
	126	0·652	116. 16	61. 51	—11. 23	17	68	
	127	0·844	110. 48	44. 15	—13. 33	66	888	
Sept. 30						(128)	(1198)	
272·948	124	0·974	259. 57	161. 3	— 8. 10	74	304	1755 *s f*
	126	0·498	128. 2	62. 6	—11. 45	14	51	
	127	0·719	116. 23	44. 17	—13. 39	204	1156	1020 *s f*
		0·941	83. 20					533
Oct. 1						(292)	(1511)	(3308)
272·974	124	0·974	259. 46	160. 40	— 8. 21	63	258	1256
	126	0·492	128. 19	62. 10	—11. 37	4	24	
	127	0·720	116. 12	43. 48	—13. 33	113	1146	
Oct. 1						(180)	(1428)	(1256)
274·936		0·877	246. 10					311
	126	0·317	183. 10	60. 25	—11. 51	0	25	
	127	0·429	141. 35	43. 34	—13. 18	203	1449	
		0·865	103. 40					247
		0·907	76. 20					184
Oct. 3						(203)	(1474)	(742)
274·972		0·881	251. 10					337
	126	0·315	183. 52	60. 9	—11. 43	2	30	
	127	0·422	142. 39	43. 44	—13. 14	187	1402	
		0·922	71. 30					1166
Oct. 3						(189)	(1432)	(1503)
276·948		0·897	237. 0					324
	127	0·389	210. 4	44. 21	—13. 19	137	1057	
		0·862	56. 30					223
		0·895	112. 50					1438
Oct. 5						(137)	(1057)	(1985)
1874.			° ′	° ′	° ′			
277d·005		0·885	235. 0					379
		0·839	269. 50					332
	127	0·384	210. 17	43. 31	—13. 2	178	1031	
		0·888	112. 10					1550
Oct. 5						(178)	(1031)	(2261)
279·998	127	0·811	249. 49	43. 37	—12. 22	94	737	1702 *p*
	128	0·434	284. 7	17. 58	+11. 40	0	17	
Oct. 8						(94)	(754)	(1702)
280·018	127	0·813	249. 50	43. 33	—12. 24	102	730	
	128	0·445	283. 27	18. 26	+11. 30	0	12	
Oct. 8						(102)	(742)	
281·877	127	0·969	256. 50	41. 38	—11. 6	13	294	2014 *s*
	128	0·766	282. 9	17. 54	+13. 11	8	100	
	129	0·405	196. 25	334. 40	—16. 43	42	201	
Oct. 10						(63)	(595)	(2014)
281·941	127	0·976	255. 56	42. 25	—12. 15	77	375	2081 *s*
	128	0·776	281. 12	18. 1	+12. 31	8	106	
	129	0·409	198. 18	334. 39	—16. 44	51	266	
Oct. 10						(136)	(747)	(2081)
284·969	129	0·804	244. 39	336. 3	—16. 17	45	142	
Oct. 13						(45)	(142)	
285·013	129	0·808	244. 48	335. 54	—16. 19	30	147	
Oct. 13						(30)	(147)	
287·015	129	0·984	252. 19	337. 20	—16. 12	0	83	
	130	0·647	82. 19	219. 41	+ 9. 19	3	59	
	131	0·955	82. 5	186. 55	+ 9. 15	54	179	
Oct. 15						(57)	(321)	
287·060	129	0·988	252. 8	338. 5	—16. 36	0	70	1187 *f*
	130	0·638	82. 0	219. 47	+ 9. 29	18	82	
	131	0·950	81. 52	187. 15	+ 9. 30	59	162	522 *f*
Oct. 15						(77)	(314)	(1709)
291·024	130	0·226	284. 59	219. 53	+ 8. 35	0	15	
	131	0·325	79. 30	188. 25	+ 8. 29	26	121	
	132	0·745	105. 35	160. 57	— 7. 49	25	132	
Oct. 19						(51)	(268)	
291·052	130	0·225	285. 47	219. 25	+ 8. 45	0	37	
	131	0·323	78. 52	188. 12	+ 8. 40	14	122	
	132	0·740	105. 24	160. 58	— 7. 35	18	137	
Oct. 19						(32)	(296)	

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 124. One large regular spot. Partly hidden by the wire on September 22 and 26. Two groups of faculæ on September 24, one on the first photograph on September 25 (266·933) and one on the second on September 26 (268·085) are too faint for their positions to be measured.

Group 125. One small regular spot. The second photograph on September 25 (266·933) is ill-defined and faint. The spot is entirely hidden by the wire on the second photograph on September 30 (271·986).

Group 126. One small spot and two very small specks near. It is partly hidden by the wire on the first photograph on September 29 (270·998). On the second photograph on October 1 (272·974) the groups of faculæ are seen, but are too faint for measurement.

Group 127. A close cluster composed of many spots. On September 29 (270·998) it is partly hidden by the wire, and also on September 30 (271·986) and again on October 1 (272·974) and October 5 (277·005). The photograph on September 30 (271·986) was taken through cloud, and is consequently very faint.

Group 128. At first one very small spot, but on October 10 it has extended into a row of several small fragments.

Group 129. Three spots arranged in a line.

Group 130. Two small spots. The smaller of these grows gradually fainter, and disappears on October 20. It is hidden by the wire on October 19.

Group 131. One spot. Both photographs on October 23 were taken through cloud. The first photograph (249·995) is much spoiled by the cloud.

Group 132. Single 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).
1874.			° ′	° ′	° ′			
292d·003	130	0·394	280. 35	217. 15	+ 9. 1	13	52	
	131	0·113	59. 19	188. 39	+ 8. 34	11	80	
	132	0·579	111. 0	161. 22	− 7. 29	22	79	
Oct. 20						(46)	(211)	
294·051	130	0·765	276. 26	217. 16	+ 8. 13	0	16	677 *f*
	131	0·382	279. 50	189. 32	+ 8. 28	15	50	
	132	0·245	154. 43	161. 14	− 7. 39	23	122	
	133	0·800	114. 48	118. 18	−16. 14	0	21	610 *c*
		0·961	101. 40					1040
Oct. 22						(38)	(209)	(2327)
294·995	131	0·576	276. 34	189. 57	+ 7. 54	0	13	
	132	0·260	205. 14	161. 13	− 8. 33	27	87	
Oct. 23						(27)	(100)	
295·032		0·890	276. 50					326
	131	0·583	277. 7	189. 55	+ 8. 14	0	27	
	132	0·257	207. 52	161. 15	− 8. 5	23	92	
Oct. 23						(23)	(119)	(326)
300·019		0·910	297. 50					305
		0·950	260. 0					768
		0·804	117. 10					1537
		0·928	77. 40					2165
Oct. 28								(4775)
300·042		0·925	293. 30					358
		0·951	259. 20					646
		0·796	116. 20					1438
		0·903	71. 0					1835
Oct. 28								(4277)
306·052	134	0·638	121. 30	334. 38	−16. 9	82	446	
Nov. 3						(82)	(446)	
306·988		0·819	248. 10					1428
	134	0·498	132. 58	334. 26	−16. 12	95	518	
Nov. 4						(95)	(518)	(1428)
307·968		0·873	246. 0					806
	134	0·380	155. 17	334. 14	−16. 25	96	471	
Nov. 5						(96)	(471)	(806)
308·017	134	0·375	156. 16	334. 6	−16. 18	83	500	
Nov. 5						(83)	(500)	

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).
1874.			° ′	° ′	° ′			
309d·059	134	0·356	189. 46	332. 58	−16. 51	46	393	
Nov. 6						(46)	(393)	
309·091	134	0·354	193. 43	333. 56	−16. 25	80	522	
Nov. 6						(80)	(522)	
309·958	134	0·437	221. 4	334. 48	−15. 48	96	568	
Nov. 7						(96)	(568)	
309·979		0·860	286. 30					334
	134	0·433	221. 25	334. 27	−15. 31	92	546	
Nov. 7						(92)	(546)	(334)
312·082	134	0·737	246. 29	333. 39	−14. 42	156	820	
Nov. 9						(156)	(820)	
313·971	134	0·948	254. 35	334. 26	−13. 32	18	451	
Nov. 11						(18)	(451)	
314·916	134	0·984	252. 53	330. 16	−16. 14	0	134	408 *c*
	135	0·958	84. 21	178. 50	+ 6. 16	0	71	1895 *np*
Nov. 12						(0)	(205)	(2303)
314·936	134	0·985	253. 20	330. 26	−15. 50	0	113	596 *c*
	135	0·962	84. 31	177. 45	+ 6. 5	0	103	2188 *np*
Nov. 12						(0)	(216)	(2784)
315·958	135	0·851	83. 44	180. 11	+ 6. 49	25	137	685 *nf*
Nov. 13						(25)	(137)	(685)
315·986	135	0·850	83. 50	179. 56	+ 6. 44	44	160	842 *nf*
Nov. 13						(44)	(160)	(842)
319·012		0·868	253. 40					505
	135	0·277	70. 51	182. 55	+ 7. 34	68	368	
Nov. 16						(68)	(368)	(505)
320·074	135					55	234	
Nov. 17						(55)	(234)	
322·942	135	0·651	278. 56	186. 35	+ 7. 18	84	546	610 *p*
	136	0·963	85. 56	72. 8	+ 4. 28	20	138	425 *c*
	137	0·998	74. 30	59. 50	+15. 36	0	228	
Nov. 20						(104)	(912)	(1035)
323·042	135	0·660	279. 3	185. 57	+ 7. 27	91	528	568 *p*
	136	0·956	86. 9	72. 14	+ 4. 16	29	100	595 *c*
	137	0·995	74. 34	60. 39	+15. 33	0	266	
Nov. 20						(120)	(894)	(1163)

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 130. Two small spots. The smaller of these grows gradually fainter and disappears on October 20. It is hidden by the wire on October 19.

Group 131. One spot. Both photographs on October 23 were taken through cloud. The first photograph (249·995) is much spoiled by the cloud.

Group 132. Single spot.

Group 133. Single spot.

Group 134. Two rather large spots. The first and larger spot throws off several fragments on November 7. The definition on November 6 (309·059) is very indifferent, and the group is partly hidden by the wire.

Group 135. One spot. A second small spot appears on the second photograph on November 12 (314·936). It entirely changes its character on the following days, and on November 16 has changed into a very long irregular line of small spots. The photograph on November 17 is too faint to be measured. On November 23 the greater portion of the group has disappeared round the limb.

Group 136. One spot. On November 23 several very small markings appear close behind it. These disappear again on November 27.

Group 137. The spot is seen as a notch in the limb on November 20. Only part of it has advanced far enough on the limb to be measured on the first photograph on that day (322·942).

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.)
1874.			° ′	° ′	° ′			
325^{d}·950		0·859	259. 20					83
	135	0·990	277. 2	188. 23	+ 7. 12	0	328	1106 *f*
	136	0·541	86. 15	74. 6	+ 3. 24	20	71	
	137	0·754	71. 17	59. 12	+15. 4	41	290	655 *f*
		0·937	108. 30					632
Nov. 23						(61)	(689)	(2476)
325·968		0·861	259. 20					137
	135	0·992	276. 56	189. 5	+ 7. 5	37	324	1027 *f*
	136	0·539	86. 2	74. 0	+ 3. 30	20	132	
	137	0·752	71. 11	59. 8	+15. 6	41	278	643 *f*
		0·942	109. 50					986
Nov. 23						(98)	(734)	(2793)
327·015	136	0·310	83. 26	74. 47	+ 3. 26	13	69	
	137	0·588	66. 45	58. 53	+14. 36	24	251	
Nov. 24						(37)	(320)	
329·959	136	0·373	274. 40	75. 37	+ 2. 46	4	21	
	137	0·249	342. 28	58. 18	+14. 47	38	197	
		0·961	105. 40					593
Nov. 27						(42)	(218)	(593)
330·069	136	0·395	274. 18	75. 31	+ 2. 43	0	21	
	137	0·252	337. 7	58. 11	+14. 28	35	213	
		0·958	105. 10					662
Nov. 27						(35)	(234)	(662)
336·945		0·951	247. 30					510
Dec. 4								(510)
339·936	138	0·160	237. 44	290. 9	− 5. 2	9	127	
Dec. 7						(9)	(127)	
339·958	138	0·164	239. 22	290. 12	− 4. 55	19	94	
		0·959	85. 20					178
Dec. 7						(19)	(94)	(178)
343·949	138	0·872	263. 43	289. 53	− 5. 47	0	40	499 *n p*
	139	0·293	319. 56	240. 36	+12. 15	0	17	
	140*a*	0·625	76. 53	191. 48	+ 7. 36	13	43	
	b	0·630	79. 36	191. 8	+ 5. 59	0	12	
	c	0·707	84. 14	184. 54	+ 3. 35	20	69	
	d	0·788	83. 23	177. 57	+ 4. 47	15	72	
Dec. 11						(48)	(253)	(499)
1874.			° ′	° ′	° ′			
344^{d}·005	138	0·880	263. 52	290. 7	− 5. 42	0	32	425 *n p*
	139	0·301	318. 32	240. 30	+12. 19	0	18	
	140*a*	0·612	76. 31	192. 2	+ 7. 39	17	53	349 *n f*
	b	0·615	79. 54	191. 28	+ 5. 38	0	6	
	c	0·698	83. 57	184. 54	+ 3. 43	23	121	
	d	0·776	83. 4	178. 21	+ 4. 56	28	88	
Dec. 11						(68)	(318)	(774)
346·964	140*a*	0·158	339. 33	192. 58	+ 7. 24	16	58	
	c	0·112	32. 9	186. 22	+ 4. 22	12	110	
	d	0·247	63. 29	177. 1	+ 5. 16	0	30	
	e	0·243	30. 37	182. 34	+10. 57	0	22	
	f	0·307	48. 16	176. 22	+10. 42	17	61	
Dec. 14						(45)	(281)	
347·032	140*a*	0·157	333. 45	192. 53	+ 6. 59	5	67	
	c	0·100	27. 38	186. 14	+ 4. 0	17	69	
	d	0·225	62. 33	177. 23	+ 4. 53	0	31	
	e	0·227	27. 48	182. 44	+10. 28	0	28	
	f	0·287	46. 36	176. 42	+10. 16	17	59	
Dec. 14						(39)	(254)	
350·079	140*a*	0·715	281. 26	193. 30	+ 7. 6	0	56	
	c	0·624	277. 12	186. 56	+ 3. 20	8	57	
	d	0·561	284. 47	181. 45	+ 6. 59	0	6	
	e	0·617	288. 12	185. 7	+ 9. 54	0	42	
	f	0·501	292. 36	176. 38	+ 9. 47	0	39	
Dec. 17						(8)	(200)	
350·087	140*a*	0·716	281. 48	193. 26	+ 7. 22	7	82	
	c	0·625	277. 26	186. 52	+ 3. 29	11	57	
	d	0·562	285. 14	181. 39	+ 7. 15	0	3	
	e	0·619	288. 49	185. 3	+10. 19	0	38	
	f	0·503	292. 49	176. 36	+ 9. 55	0	13	
Dec. 17						(18)	(193)	
351·008	140*a*	0·851	278. 35	196. 9	+ 6. 26	0	58	
	c	0·775	275. 19	188. 54	+ 3. 6	0	20	
	e	0·765	284. 6	187. 9	+ 9. 40	0	28	
	f	0·670	286. 1	179. 6	+ 9. 26	0	22	
Dec. 18						(0)	(128)	
351·018	140*a*	0·852	279. 4	196. 5	+ 6. 52	0	43	
	c	0·776	275. 25	188. 53	+ 3. 12	0	26	
	e	0·770	284. 36	187. 22	+10. 8	0	33	
	f	0·674	286. 23	179. 6	+ 9. 43	0	20	
Dec. 18						(0)	(122)	

The photographs taken on the following days show no spots:—April 20, 21, 22, and 23; June 8 and 9; October 26, 27, 28, and 29; December 3 and 4.

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 135. One spot. A second small spot appears on the second photograph on November 12 (314·936). It entirely changes its character on the following days, and on November 16 has changed into a very long irregular line of small spots. The photograph on November 17 is too faint to be measured. On November 23 the greater portion of the group has disappeared round the limb.

Group 136. One spot. On November 23 several very small markings appear close behind it. These disappear again on November 27.

Group 137. The spot is seen as a notch in the limb on November 20. Only part of it has advanced far enough on the limb to be measured on the first photograph on that day (322·942).

Group 138. A line of very small spots.

Group. 139. A group of very small spots.

Group 140. A very scattered group composed at first of four spots, *a*, *b*, *c*, and *d*. Spot *a* breaks up on December 14 into several little spots, and two fresh spots appear, *e* and *f*. Spot *d* disappears on December 14 and spot *b* on December 18.

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 1875.

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).
1875.			° ′	° ′	° ′			
1d·018	141	0·563	250. 27	331. 45	−13. 29	30	220	
Jan. 2						(30)	(220)	
1·036	141	0·571	250. 39	332. 7	−13. 41	33	209	
Jan. 2						(33)	(209)	
4·036	141	0·952	256. 50	331. 21	−13. 40	25	118	
Jan. 5						(25)	(118)	
4·063	141	0·953	256. 29	331. 13	−14. 0	37	162	1670 *s f*
		0·930	82. 0					437
Jan. 5						(37)	(162)	(2107)
4·986		0·993	249. 20					391
		0·945	297. 0					235
		0·906	81. 20					416
Jan. 6								(1042)
14·995	142	0·552	98. 20	81. 23	− 8. 38	0	28	
Jan. 16						(0)	(28)	
15·091		0·945	278. 30					944
		0·821	257. 10					697
	142	0·541	99. 30	80. 55	− 9. 12	12	55	
Jan. 16						(12)	(55)	(1641)
20·984		0·913	259. 0					159
	142*	0·623	287. 48	72. 25	+ 6. 37	117	541	427 *n p*
	143	0·293	357. 54	36. 31	+11. 34	17	55	
		0·890	108. 0					1242
Jan. 22						(134)	(596)	(1828)
21·075		0·904	257. 0					118
	142*	0·635	286. 7	72. 21	+ 5. 51	120	576	391 *n p*
	143	0·284	353. 21	36. 36	+10. 55	16	102	
		0·867	107. 30					1440
Jan. 22						(136)	(678)	(1949)
24·046	142*	0·969	277. 24	70. 20	+ 5. 42	0	61	942 *c*
	143	0·703	292. 8	37. 1	+11. 6	0	43	
Jan. 25						(0)	(104)	(942)
24·061	142*	0·971	277. 1	70. 34	+ 5. 23	0	53	709 *c*
	143	0·711	291. 27	37. 34	+10. 52	0	34	
Jan. 25						(0)	(87)	(709)
1875.			° ′	° ′	° ′			
26d·125		0·925	286. 0					486
		0·916	72. 20					524
Jan. 27								(1010)
29·052		0·892	294. 20					225
		0·880	251. 10					651
		0·919	84. 0					403
Jan. 30								(1279)
30·020		0·975	285. 40					427
		0·869	72. 10					1012
Jan. 31								(1439)
31·960		0·891	295. 0					305
		0·894	251. 10					901
	144	0·951	68. 48	182. 52	+17. 54	44	155	2204 *s p*
Feb. 2						(44)	(155)	(3410)
31·975		[Too faint to be measured.]						246
		0·903	250. 50					526
	144	0·949	68. 35	183. 8	+18. 1	42	199	1901 *s p*
Feb. 2						(42)	(199)	(2673)
33·946		0·859	253. 10					172
	144	0·597	45. 47	198. 29	+18. 52	17	104	
Feb. 4						(17)	(104)	(172)
34·023	144	0·589	45. 9	198. 9	+18. 46	16	78	
Feb. 4						(16)	(78)	
47·940	145	0·988	70. 44	322. 54	+17. 42	121	431	
Feb. 18						(121)	(431)	
47·955		0·789	293. 0					545
		0·840	111. 50					211
	145	0·989	70. 19	322. 25	+18. 10	147	524	166 *n p*
Feb. 18						(147)	(524)	(922)
50·999	145	0·736	57. 11	320. 16	+18. 6	169	738	
	146	0·626	99. 23	321. 49	−11. 23	72	384	
Feb. 21						(241)	(1122)	
51·034	145	0·728	56. 46	320. 34	+18. 2	166	711	
	146	0·619	100. 1	321. 54	−11. 46	52	381	
Feb. 21						(218)	(1092)	

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 141. Single spot. The photographs on January 2, and the first photograph on January 5 (4·036) are too little exposed. The faculæ cannot be measured in consequence.
Group 142. A group of two or three very small spots. The first photograph on January 16 (14·995) is too little exposed.
Group 142*. Two large spots close together, and a few small markings round them. The first photograph on January 22 (20·984), though the definition is very fine, is almost too faint for measurement.
Group 143. A small spot, surrounded by a few very small and scattered markings. It becomes slightly more condensed on January 25.
Group 144. Single spot. The second photograph on February 4 (34·023) is under-exposed.
Group 145. A very large spot, with two or three small ones near it. No faculæ are seen on the first photograph on February 18 (47·940).
Group 146. One large spot, surrounded by many small ones.

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.		Spots.		Faculæ.	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.		Spots.		Faculæ.
				Longitude.	Latitude.	Area of UMBRA for each Spot (and for Day).	Area of WHOLE for each Spot (and for Day).	Area for each Group (and for Day).					Longitude.	Latitude.	Area of UMBRA for each Spot (and for Day).	Area of WHOLE for each Spot (and for Day).	Area for each Group (and for Day).
1875.			° ′	° ′	° ′				1875.			° ′	° ′	° ′			
51d·950	145	0·611	47. 18	320. 5	+18. 7	168	658		68·096	148	0·979	287. 33	210. 51	+15. 27	27	263	983 *f*
	146	0·445	101. 2	321. 50	−11. 16	47	261			149*	0·925	94. 42	67. 27	− 7. 5	21	199	903 *s f*
	147	0·989	83. 14	267. 45	+ 5. 33	0	163		Mar. 10						(48)	(462)	(1886)
Feb. 22						(215)	(1082)										
									69·086		0·906	282. 10					536
52·103	145	0·590	44. 58	320. 13	+18. 11	124	658			149*	0·819	93. 21	67. 11	− 6. 53	35	199	831 *s*
	146	0·410	101. 34	322. 4	−11. 13	49	284			150	0·971	91. 47	46. 11	− 3. 28	34	208	
	147	0·982	82. 52	268. 8	+ 5. 34	0	168		Mar. 11						(69)	(407)	(1367)
Feb. 22						(173)	(1110)										
									69·108		0·910	283. 0					641
										149*	0·818	93. 44	66. 58	− 7. 12	27	226	747 *s*
52·996	145	0·489	28. 56	320. 1	+18. 19	136	679			150	0·971	92. 5	45. 53	− 3. 45	62	239	
	146	0·223	107. 0	321. 54	−10. 42	63	359		Mar. 11						(89)	(465)	(1388)
	147	0·946	81. 21	264. 36	+ 5. 44	19	156	423 *n*									
Feb. 23						(218)	(1194)	(423)	72·144	149*	0·262	93. 14	66. 52	− 7. 45	0	14	
										150	0·584	87. 0	46. 28	− 4. 5	28	169	
55·015	145	0·475	334. 51	320. 1	+18. 20	145	693		Mar. 14						(28)	(183)	
	146	0·228	249. 52	320. 21	−11. 30	64	249										
	147	0·682	74. 46	266. 37	+ 4. 54	22	119	355 *n f*	73·067	150	0·394	83. 39	46. 56	− 4. 5	25	173	
Feb. 25						(231)	(1061)	(355)	Mar. 15						(25)	(173)	
55·046	145	0·475	334. 10	319. 55	+18. 12	116	698		73·100	150	0·393	82. 57	46. 36	− 3. 48	24	159	
	146	0·235	249. 30	320. 19	−11. 42	42	181		Mar. 15						(24)	(159)	
	147	0·671	74. 29	267. 5	+ 4. 51	21	97										
Feb. 25						(179)	(976)		76·056	150*a*	0·403	262. 37	54. 19	− 9. 25	23	76	
										150*b*	0·290	281. 39	46. 59	− 3. 25	9	28	
56·058	145	}				145	714				0·908	101. 0					608
	146	} Photograph missing.				16	144			151	0·952	69. 8	322. 1	+17. 20	91	381	337 *f*
	147	}				0	27		Mar. 18						(123)	(485)	(945)
Feb. 26		}				(161)	(885)										
									76·083		0·897	285. 30					435
62·946	147	0·934	276. 58	271. 23	+ 3. 49	0	31	584 *n*		150*a*	0·417	262. 42	54. 51	− 9. 27	19	94	
	148	0·411	348. 28	208. 12	+16. 25	18	90			150*b*	0·298	280. 37	47. 9	− 3. 36	3	23	
Mar. 5						(18)	(121)	(584)			0·910	103. 20					428
										151	0·958	69. 11	320. 27	+17. 34	90	387	346 *f*
67·035	148	0·890	292. 49	208. 3	+16. 29	47	266	955 *s p*	Mar. 18						(112)	(504)	(1209)
		0·866	72. 30					386									
	149	0·962	254. 26	224. 46	−16. 54	0	179	94 *n p*	80·924								227
Mar. 9						(47)	(445)	(1435)		150*	0·683	256. 51	9. 25	−13. 59	97	459	
										151	0·433	12. 52	320. 32	+18. 1	69	340	
67·058	148	0·895	292. 42	208. 25	+16. 35	55	295	1451 *s p*									224
		0·861	71. 40					356	Mar. 23						(166)	(799)	(451)
	149	0·966	254. 17	225. 23	−17. 0	0	179	114 *n p*									
Mar. 9						(55)	(474)	(1921)	80·946		0·911	264. 20					232
										150*	0·691	256. 38	9. 44	−14. 11	124	458	
67·959	148	0·975	287. 41	211. 32	+15. 22	27	230			151	0·435	11. 52	320. 38	+18. 14	74	346	
	149*	0·937	94. 20	67. 22	− 6. 34	19	165	468 *s f*			0·829	77. 30					328
Mar. 10						(46)	(395)	(468)	Mar. 23						(198)	(804)	(560)

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 Faculæ 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 145. A very large spot, with two or three small ones near it. No faculæ are seen on the first photograph on February 18 (47·940).

Group 146. One large spot, surrounded by many small ones.

Group 147. Two small spots. The preceding spot alone has appeared on February 22. The following and smaller spot decreases in size as the group crosses the disk, until on March 5 only the preceding spot is left.

Group 148. Several small spots ranged in a straight line.

Group 149. One spot.

Group 149*. One spot regular in shape.

Group 150. Single spot; breaks up on March 18 into several spots, some of which are widely scattered.

Group 150*. Two large spots, one of which had disappeared behind the limb before the second photograph on March 26 (84·116) was taken.

Group 151. One large spot. It is conjectured that the second photograph on March 27 (84·956) may have been dated one hour too early. The spot is partly hidden by the wire on the second photograph on March 18 (76·083).

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.		Spots.		Faculæ.	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.		Spots.		Faculæ.
				Longitude.	Latitude.	Area of UMBRA for each Spot (and for Day).	Area of WHOLE for each Spot (and for Day).	Area for each Group (and for Day).					Longitude.	Latitude.	Area of UMBRA for each Spot (and for Day).	Area of WHOLE for each Spot (and for Day).	Area for each Group (and for Day).
1875.			° ′	° ′	° ′				1875.			° ′	° ′	° ′			
82d.921	150*	0.929	257. 6	9. 2	−14. 28	93	494	847 *c*	90d.969	152	0.881	278. 45	254. 29	+ 4. 35	15	101	551 *f*
	151	0.540	321. 4	320. 53	+18. 24	77	328			152*	0.211	221. 48	202. 12	−15. 20	36	185	
		0.926	105. 0					273	Apr. 2						(51)	(286)	(551)
Mar. 25						(170)	(822)	(1120)	93.060		0.812	295. 10					349
										152*	0.619	252. 36	203. 55	−15. 36	0	55	
82.974	150*	0.932	256. 44	8. 51	−14. 48	110	488	910 *c*		153	0.834	102. 5	109. 28	−13. 30	0	10	199 *n*
	151	0.543	321. 0	320. 20	+18. 31	55	322		Apr. 4						(0)	(65)	(548)
		0.915	106. 0					200	93.074		0.856	295. 30					201
Mar. 25						(165)	(810)	(1110)		152*	0.611	252. 52	203. 9	−15. 21	0	54	
										153	0.835	102. 1	109. 9	−13. 27	0	12	367 *n*
84.099	150*	0.987	257. 3	6. 20	−13. 49	0	207	149 *c*			0.912	78. 0					341
	151	0.690	306. 18	320. 15	+18. 36	71	330		Apr. 4						(0)	(66)	(909)
		0.953	71. 40					436	94.007		0.921	286. 50					449
Mar. 26						(71)	(537)	(585)		153*	0.263	20. 41	148. 22	+ 8. 1	0	16	
									Apr. 5						(0)	(16)	(449)
84.116	150*	0.985	257. 1	5. 23	−13. 55	0	222	192 *c*									
	151	0.689	306. 12	320. 0	+18. 30	48	315		94.912		0.912	285. 50					400
		0.949	71. 10					702		153*	0.265	337. 42	147. 36	+ 8. 2	3	53	
Mar. 26						(48)	(537)	(894)	Apr. 6						(3)	(53)	(400)
84.899	151	0.788	300. 24	319. 39	+18. 50	39	293		94.942		0.919	285. 40					410
		0.901	71. 20					535		153*	0.264	334. 0	148. 4	+ 7. 34	0	48	
Mar. 27						(39)	(293)	(535)	Apr. 6						(0)	(48)	(410)
84.956	151	0.801	299. 33	320. 21	+18. 43	43	282		96.986								519
		0.903	68. 50					578		153*	0.578	292. 40	146. 52	+ 7. 47	0	18	
Mar. 27						(43)	(282)	(578)	Apr. 8						(0)	(18)	(519)
86.023	151	0.905	294. 53	319. 14	+19. 8	101	597		97.058								332
		0.876	301. 0					601		153*	0.616	291. 7	148. 48	+ 7. 55	0	16	
	152	0.228	40. 17	250. 38	+ 3. 24	0	44		Apr. 8						(0)	(16)	(332)
		0.925	77. 50					1471									
Mar. 28						(101)	(641)	(2072)	102.030	153*	0.812	281. 17	100. 48	+ 5. 45	0	34	
										154	0.393	49. 17	30. 21	+ 9. 26	22	104	
86.036	151	0.909	294. 42	319. 39	+19. 8	81	451			155	0.623	105. 27	9. 48	−13. 58	72	505	
		0.873	296. 50					551	Apr. 13						(94)	(643)	
	152	0.223	40. 55	250. 33	+ 3. 5	0	27										
		0.922	78. 50					915	102.100	153†	0.823	280. 58	101. 1	+ 5. 43	0	44	287 *np*
Mar. 28						(81)	(478)	(1466)		154	0.376	47. 49	30. 37	+ 9. 10	25	95	
										155	0.606	106. 8	10. 11	−14. 11	91	459	
90.087	152*	0.181	153. 39	200. 42	−15. 42	20	115		Apr. 13						(116)	(598)	(287)
Apr. 1						(20)	(115)										
									103.031	153†	0.915	278. 37	99. 47	+ 5. 34	0	54	737 *n*
90.951	152	0.878	278. 40	254. 23	+ 4. 27	41	143	504 *f*		154	0.263	12. 37	31. 19	+ 9. 17	34	110	
	152*	0.206	219. 53	201. 56	−15. 23	30	203			155	0.437	110. 45	9. 49	−13. 54	93	494	
Apr. 2						(71)	(346)	(504)	Apr. 14						(127)	(658)	(737)

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 150*. Two large spots, one of which had disappeared behind the limb before the second photograph on March 26 (84·116) was taken.

Group 151. One large spot. It is conjectured that the second photograph on March 27 (84·956) may have been dated one hour too early. The spot is partly hidden by the wire on the second photograph on March 18 (76·083).

Group 152. One spot. It cannot be measured on the photograph on April 1.

Group 152*. A number of small spots in a straight line. Partly hidden by the wire on the second photograph on April 4 (93·074).

Group 153. One very small spot.

Group 153*. One very small spot. It is partly hidden by the wire on the second photograph on April 6 (94·942). The photographs on April 8 are scarcely measureable.

Group 153†. Two very small spots. The first photograph on April 13 (102·030) is too faint for the faculæ to be measured.

Group 154. One spot, regular in shape. Breaks up into two on April 16; but on April 18 only one spot remains.

Group 155. Two large spots very close together. The faculæ at 72° are spoilt by a defect in the film on the first photograph on April 19 (107·907).

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).
1875.			° ′	° ′	° ′			
104d·987	154	0·439	304. 8	30. 18	+ 9. 12	41	168	
	155	0·156	189. 34	10. 19	−14. 11	76	324	
		0·875	59. 10					823
Apr. 16						(117)	(492)	(823)
105·098	154	0·458	302. 21	30. 19	+ 9. 11	38	169	
	155	0·166	198. 14	10. 24	−14. 23	74	348	
		0·847	62. 0					823
Apr. 16						(112)	(517)	(823)
105·933	154	0·610	292. 58	30. 52	+ 9. 22	19	154	
	155	0·277	236. 43	10. 3	−13. 51	59	326	
		0·805	52. 40					794
		0·919	76. 20					428
Apr. 17						(78)	(480)	(1222)
106·007	154	0·619	292. 59	30. 30	+ 9. 38	25	142	
	155	0·293	238. 14	10. 8	−13. 57	73	334	
		0·794	51. 30					612
		0·914	76. 0					366
Apr. 17						(98)	(476)	(978)
107·011	154	0·808	284. 54	34. 4	+ 8. 47	19	102	
	155	0·492	251. 17	10. 35	−13. 38	61	294	
		0·780	60. 10					202
Apr. 18						(80)	(396)	(202)
107·023	154	0·803	285. 7	33. 23	+ 8. 50	12	109	250 *nf*
	155	0·489	251. 13	10. 13	−13. 37	66	289	
		0·907	73. 20					191
Apr. 18						(78)	(398)	(441)
107·907	154	0·908	282. 5	33. 55	+ 8. 41	15	79	737 *nf*
	155	0·647	255. 4	10. 5	−13. 32	47	272	
Apr. 19						(62)	(351)	(737)
107·980	154	0·913	281. 52	33. 39	+ 8. 37	10	72	493 *nf*
	155	0·656	255. 24	9. 50	−13. 23	29	232	
		0·936	72. 20					241
Apr. 19						(39)	(304)	(734)
109·039	154	0·988	279. 21	35. 14	+ 8. 23	0	103	544 *nf*
	155	0·814	257. 39	9. 43	−12. 57	51	229	687 *sf*
	156	0·949	75. 4	245. 37	+12. 26	0	30	593 *np*
Apr. 20						(51)	(362)	(1824)
1875.			° ′	° ′	° ′			
109d·122	154	0·991	279. 0	35. 20	+ 8. 11	0	55	456 *nf*
	155	0·823	257. 33	9. 33	−13. 4	42	256	834 *sf*
	156	0·942	75. 7	245. 45	+12. 11	0	29	569 *np*
Apr. 20						(42)	(340)	(1859)
112·988		0·858	70. 10					291
Apr. 24								(291)
113·973		0·924	298. 0					773
	156*	0·925	94. 42	182. 20	− 6. 5	56	259	676 *f*
Apr. 25						(56)	(259)	(1449)
113·988		0·901	301. 20					531
	156*	0·920	94. 48	182. 53	− 6. 12	51	267	736 *f*
Apr. 25						(51)	(267)	(1267)
114·938	156*	0·812	94. 23	183. 2	− 6. 11	36	190	
	157	0·977	80. 3	160. 48	+ 8. 42	0	533	
Apr. 26						(36)	(723)	
115·091	156*	0·801	94. 10	182. 5	− 6. 1	41	177	
	157	0·976	80. 6	159. 6	+ 8. 37	0	570	
Apr. 26						(41)	(747)	
115·977	156*	0·656	94. 6	182. 38	− 6. 0	43	224	
	157	0·914	78. 15	158. 56	+ 8. 51	105	845	1263 *nf*
Apr. 27						(148)	(1069)	(1263)
116·017	156*	0·650	93. 57	182. 34	− 5. 53	55	222	
	157	0·913	78. 3	158. 35	+ 9. 1	94	800	1472 *nf*
Apr. 27						(149)	(1022)	(1472)
117·048	156*	0·455	94. 51	182. 27	− 6. 0	28	178	
	157	0·798	75. 6	158. 16	+ 9. 9	155	951	918 *nf*
Apr. 28						(183)	(1129)	(918)
118·061	156*	0·244	99. 23	182. 7	− 6. 19	33	135	
	157	0·643	69. 35	158. 33	+ 9. 37	139	973	
Apr. 29						(172)	(1108)	
118·102	156*	0·233	98. 54	182. 12	− 6. 7	31	158	
	157	0·637	69. 16	158. 30	+ 9. 40	127	988	
Apr. 29						(158)	(1146)	
118·993	156*	0·044	145. 25	182. 19	− 6. 9	0	36	
	157	0·487	61. 25	158. 8	+ 9. 44	91	835	
Apr. 30						(91)	(871)	

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

Group 154. One spot, regular in shape. Breaks up into two on April 16; but on April 18 only one spot remains.

Group 155. Two large spots very close together. The faculæ at 72° are spoilt by a defect in the film on the first photograph on April 19 (107·907)

Group 156. One small spot.

Group 156*. Two small spots very close together. The first photograph on April 26 (114·938) is very insufficiently exposed.

Group 157. One large spot with several small ones following it. The first photograph on April 26 (114·938) is insufficiently exposed, and only the darkest part of the spot is visible. On May 3 and 4 there were no wires in the Photoheliograph. The photographs on May 5 are too little exposed.

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).
1875.			° ′	° ′	° ′			
119d·005	156*	0·040	144. 51	182. 17	— 5. 57	0	40	
	157	0·484	61. 45	158. 6	+ 9. 31	56	711	
Apr. 30						(56)	(751)	
121·999	156*	0·614	264. 6	181. 47	— 6. 36	19	79	
	157	0·347	310. 8	159. 31	+ 9. 15	99	691	
May 3						(118)	(770)	
122·059	156*	0·620				11	48	
	157	0·354				86	654	
May 3						(97)	(702)	
122·958	156*	0·771				13	56	
	157	0·512				97	577	
May 4						(110)	(633)	
122·997	156*	0·772				0	45	
	157	0·522				87	577	
May 4						(87)	(622)	
123·929	156*	0·893	264. 6	181. 43	— 6. 52	0	27	
	157	0·685	287. 2	159. 50	+ 8. 52	71	620	
May 5						(71)	(647)	
124·035	156*	0·903	264. 17	181. 39	— 6. 41	0	24	
	157	0·702	287. 7	159. 46	+ 9. 17	106	560	
May 5						(106)	(584)	
125·004	157	0·841	283. 3	160. 8	+ 9. 0	89	397	
May 6						(89)	(397)	
127·960		0·914	105. 40					454
May 9								(454)
133·038		0·937	265. 20					241
		0·927	70. 50					295
May 14								(536)
133·111		0·951	265. 30					289
		0·920	70. 30					290
May 14								(579)
134·081		0·818	282. 50					218
		0·865	64. 50					477
May 15								(695)
1875.			° ′	° ′	° ′			
134d·115		0·821	286. 10					186
		0·861	62. 40					477
May 15								(663)
135·977		0·928	287. 30					230
		0·849	233. 30					207
		0·944	75. 30					129
May 17								(566)
140·033		0·963	81. 0					226
May 21								(226)
143·018	158	0·387	41. 11	210. 45	+ 15. 31	0	43	
	159	0·898	80. 10	162. 53	+ 8. 11	0	34	855 *f*
May 24						(0)	(77)	(855)
143·052	158	0·383	40. 58	210. 32	+ 15. 24	0	48	
	159	0·893	80. 26	163. 4	+ 7. 52	0	35	955 *f*
May 24						(0)	(83)	(955)
145·110	159	0·595	74. 32	163. 6	+ 8. 9	0	27	
May 26						(0)	(27)	
151·013	160	0·868	101. 45	60. 42	— 10. 23	0	84	
June 1						(0)	(84)	
151·070	160	0·863	102. 10	60. 34	— 10. 41	6	73	
June 1						(6)	(73)	
151·978		0·849	284. 0					656
	160	0·742	103. 32	60. 31	— 10. 11	32	184	607 *n f*
June 2						(32)	(184)	(1263)
152·076		0·857	284. 30					621
	160	0·728	103. 44	60. 26	— 10. 3	33	220	491 *n f*
June 2						(33)	(220)	(1112)
153·070		0·918	284. 40					686
	160	0·559	109. 14	60. 40	— 10. 44	42	493	
June 3						(42)	(493)	(686)
153·134		0·918	283. 0					686
	160	0·546	110. 5	60. 50	— 10. 55	73	499	
June 3						(73)	(499)	(686)
154·014		0·949	284. 40					217
	160	0·381	119. 44	60. 55	— 10. 55	81	489	
June 4						(81)	(489)	(217)

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

Group 156*. Two small spots very close together. The first photograph on April 26 (114·938) is insufficiently exposed.

Group 157. One large spot with several small ones following it. The first photograph on April 26 (114·938) is insufficiently exposed, and only the darkest part of the spot is visible. On May 3 and 4 there were no wires in the Photoheliograph. The photographs on May 5 are too little exposed.

Group 158. Two small spots. Group 159. One small spot. Group 160. Two spots. This group greatly increases in size on June 3 and following days.

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).
1875.			° ′	° ′	° ′			
154d·050	160	0·378	118. 56	60. 27	−10. 33	63	467	
June 4						(63)	(467)	
155·134	160	0·193	156. 41	61. 16	−10. 6	97	520	
June 5						(97)	(520)	
158·002	160	0·580	252. 26	61. 43	− 9. 42	64	527	
June 8						(64)	(527)	
158·061	160	0·592	252. 43	61. 48	− 9. 45	50	477	
June 8						(50)	(477)	
160·064	160	0·886	258. 11	61. 58	−10. 8	60	433	701 *s f*
June 10						(60)	(433)	(701)
161·052	160	0·965	258. 51	61. 29	−10. 32	100	463	568 *c*
June 11						(100)	(463)	(568)
161·067	160	0·966	259. 15	61. 34	−10. 10	74	450	595 *c*
June 11						(74)	(450)	(595)
166·006	161	0·573	80. 54	247. 13	+ 6. 19	15	119	
June 16						(15)	(119)	
166·026	161	0·559	80. 59	247. 57	+ 6. 9	30	239	
		0·843	103. 50					234
June 16						(30)	(239)	(234)
166·948	161	0·386	76. 28	247. 12	+ 6. 32	83	541	
June 17						(83)	(541)	
166·965	161	0·376	76. 3	247. 38	+ 6. 35	91	549	
June 17						(91)	(549)	
168·936	161	0·111	321. 33	246. 58	+ 6. 41	128	727	
		0·926	81. 30					173
June 19						(128)	(727)	(173)
169·020	161	0·121	314. 53	246. 41	+ 6. 36	116	716	
		0·881	81. 50					255
June 19						(116)	(716)	(255)
170·144	161	0·366	283. 22	247. 56	+ 6. 34	98	527	
June 20						(98)	(527)	
171·979	161	0·706	277. 11	247. 21	+ 6. 30	80	442	
	162	0·193	202. 35	206. 58	− 8. 11	35	216	
June 22						(115)	(658)	
1875.			° ′	° ′	° ′			
172d·015	161	0·704	276. 22	246. 43	+ 5. 56	64	437	
	162	0·203	203. 56	206. 58	− 8. 35	27	196	
June 22						(91)	(633)	
173·030	161	0·854	275. 26	247. 16	+ 5. 46	103	333	955 *c*
	162	0·334	239. 30	205. 36	− 7. 38	105	551	
June 23						(208)	(884)	(955)
173·967	161	0·940	275. 37	246. 18	+ 6. 4	13	152	448 *c*
	162	0·521	251. 26	206. 9	− 7. 31	174	795	
June 24						(187)	(947)	(448)
173·998	161	0·943	275. 9	246. 25	+ 5. 37	0	161	532 *c*
	162	0·527	250. 54	206. 3	− 7. 54	194	755	
June 24						(194)	(916)	(532)
175·023	162	0·698	257. 28	205. 35	− 6. 55	163	811	
June 25						(163)	(811)	
175·081	162	0·710	257. 22	205. 45	− 7. 10	199	901	
June 25						(199)	(901)	
176·019	162	0·846	259. 6	206. 10	− 7. 48	123	826	
June 26						(123)	(826)	
177·031	162	0·941	261. 8	205. 15	− 7. 24	106	611	717 *c*
	163	0·961	102. 51	63. 4	−11. 33	28	170	329 *p*
June 27						(134)	(781)	(1046)
179·001	163	0·750	107. 12	63. 7	−10. 50	18	111	
	164	0·482	285. 23	137. 47	+ 9. 50	10	51	
June 29						(28)	(162)	
182·918	163	0·261	148. 14	49. 57	− 9. 31	19	86	
	164	0·923	281. 33	125. 13	+11. 55	11	121	273 *s p*
July 3						(30)	(207)	(273)
182·934	163	0·258	148. 21	49. 52	− 9. 23	23	117	
	164	0·924	281. 23	125. 11	+11. 46	25	157	256 *s p*
July 3						(48)	(274)	(256)
185·885	163	0·553	247. 9	49. 35	− 9. 16	10	41	
July 6						(10)	(41)	
185·901	163	0·559	247. 33	49. 50	− 9. 12	15	39	
July 6						(15)	(39)	

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 160. Two spots. This group greatly increases in size on June 3 and following days.

Group 161. Three or four small spots close together. The first photograph on June 16 (166·006), and the first on June 22 (171·979) are insufficiently exposed.

Group 162. Single spot. Greatly increases in size and breaks up into several spots on June 23.

Group 163. One spot at first, which breaks up into two on July 3.

Group 164. One small spot regular in shape. It has broken up into several spots on July 3. The second photograph on July 3 (182·934) is too little exposed and the definition poor.

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.		Spots.		Faculæ.	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.		Spots.		Faculæ.
				Longitude.	Latitude.	Area of UMBRA for each Spot (and for Day).	Area of WHOLE for each Spot (and for Day).	Area for each Group (and for Day).					Longitude.	Latitude.	Area of UMBRA for each Spot (and for Day).	Area of WHOLE for each Spot (and for Day).	Area for each Group (and for Day).
1875.			° ′	° ′	° ′				1875.				° ′	° ′			
186d·902	163	0·723	253. 27	49. 35	− 9. 13	6	40		207d·941		0·958	254. 50					152
July 7						(6)	(40)			166	0·669	82. 39	44. 46	+ 9. 5	41	167	
											0·923	105. 10					178
186·955	163	0·734	253. 4	49. 44	− 9. 42	12	35		July 28						(41)	(167)	(330)
July 7						(12)	(35)										
									207·959		0·968	254. 30					152
190·034	164*	0·525	66. 23	293. 54	+15. 35	39	135			166	0·669	83. 26	44. 32	+ 8. 34	22	174	
		0·949	80. 40					847			0·911	103. 50					190
July 10						(39)	(135)	(847)	July 28						(22)	(174)	(342)
190·073	164*	0·519	66. 9	293. 49	+15. 35	32	152										
		0·944	80. 20					805	208·961		0·939	257. 30					167
July 10						(32)	(152)	(805)		166	0·483	83. 58	43. 27	+ 7. 54	36	241	
									July 29						(36)	(241)	(167)
197·993		0·965	287. 10					217									
July 18								(217)	208·983		0·943	258. 10					200
										166	0·496	83. 47	43. 19	+ 8. 1	26	176	
199·979		0·898	281. 0					581	July 29						(26)	(176)	(200)
July 20								(581)									
									210·086	166	0·228	76. 23	45. 34	+ 8. 42	29	158	
203·979		0·947	257. 0					228	July 30						(29)	(158)	
	165	0·571	58. 46	107. 39	+21. 42	0	10										
		0·966	106. 50					125	210·101	166	0·211	78. 3	46. 17	+ 8. 9	23	176	
July 24						(0)	(10)	(353)	July 30						(23)	(176)	
203·999		0·948	258. 0					390	210·983	166	0·065	337. 30	48. 1	+ 9. 17	14	173	
	165	0·573	58. 42	107. 16	+21. 47	0	14		July 31						(14)	(173)	
		0·953	102. 0					320									
July 24						(0)	(14)	(710)	211·035	166	0·069	321. 0	48. 24	+ 8. 54	25	138	
									July 31						(25)	(138)	
204·936		0·885	277. 20					334									
	165	0·435	47. 18	106. 28	+22. 9	0	20										
		0·905	104. 30					168	212·972	166a	0·581	276. 7	55. 51	+ 8. 25	44	272	
July 25						(0)	(20)	(502)		166b	0·368	276. 30	41. 51	+ 7. 57	33	218	
											0·797	78. 0					123
204·954		0·889	277. 30					320	Aug. 2						(77)	(490)	(123)
	165	0·438	47. 12	106. 5	+22. 18	0	23										
		0·895	100. 30					244	214·001	166a	0·772	275. 53	57. 22	+ 8. 23	36	124	
July 25						(0)	(23)	(564)		166b	0·592	274. 43	43. 2	+ 7. 40	29	145	
									Aug. 3						(65)	(269)	
206·011	166	0·929	83. 47	43. 51	+ 7. 48	23	221	794 *nf*									
July 26						(23)	(221)	(794)	215·979	166a	0·970	277. 21	56. 54	+ 8. 38	0	104	
										166b	0·898	276. 35	44. 44	+ 8. 38	40	113	656 *nf*
206·027	166	0·928	83. 36	43. 46	+ 7. 58	14	122	865 *nf*	Aug. 5						(40)	(217)	(656)
July 26						(14)	(122)	(865)									
									216·004	166a	0·972	277. 0	57. 3	+ 8. 15	0	71	
207·083	166	0·801	84. 17	44. 49	+ 7. 54	0	95			166b	0·905	276. 11	45. 20	+ 8. 13	33	110	631 *nf*
July 27						(0)	(95)		Aug. 5						(33)	(181)	(631)

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

Group 164*. Two spots.

Group 165. One small spot.

Group 166. Several small spots close together. On July 30 (210·086) the group is partly hidden by the wire. The group becomes more and more scattered up to August 2 when it has completely divided into two parts.

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).
1875.			° ′	° ′	° ′			
220d·948		0·836	283. 0					135
Aug. 10								(135)
220·978		0·807	284. 0					191
Aug. 10								(191)
222·088		0·915	286. 40					315
		0·975	84. 20					757
Aug. 11								(1072)
222·110								107
		0·977	84. 0					482
Aug. 11								(589)
224·012		0·914	285. 30					286
		0·845	84. 30					220
Aug. 13								(506)
224·022		0·920	281. 50					345
		0·821	84. 30					578
Aug. 13								(923)
226·912		0·886	284. 30					237
Aug. 16								(237)
226·937		0·900	282. 40					248
Aug. 16								(248)
230·918		0·920	258. 40					110
		0·952	100. 10					148
Aug. 20								(258)
230·949		0·929	256. 30					133
		0·953	101. 40					140
Aug. 20								(273)
231·954	167	0·918	83. 42	62. 19	+ 8. 32	21	118	
	168	0·985	84. 17	48. 52	+ 6. 49	66	384	683
Aug. 21						(87)	(502)	(683)
231·968	167	0·919	83. 41	61. 58	+ 8. 32	23	112	
	168	0·988	84. 6	47. 41	+ 6. 54	52	380	608 *n f*
Aug. 21						(75)	(492)	(608)
233·130		0·886	276. 0					279
	167	0·782	84. 56	62. 7	+ 8. 19	23	90	
	168	0·918	86. 2	46. 55	+ 6. 25	57	293	1577 *n*
Aug. 22						(80)	(383)	(1856)
1875.			° ′	° ′	° ′			
233d·147		0·905	277. 0					375
	167	0·783	85. 9	61. 48	+ 8. 9	28	73	
	168	0·919	86. 13	46. 33	+ 6. 14	42	307	1420 *n*
Aug. 22						(70)	(380)	(1795)
233·951		0·924	276. 30					138
	167	0·652	85. 15	62. 4	+ 8. 25	12	47	
	168	0·828	86. 26	46. 48	+ 6. 54	70	235	981 *n p*
		0·964	102. 40					201
Aug. 23						(82)	(282)	(1320)
234·059		0·964	278. 0					131
	167	0·629	85. 23	62. 23	+ 8. 22	14	53	
	168	0·808	86. 45	47. 26	+ 6. 46	54	271	959 *n p*
		0·960	104. 0					311
Aug. 23						(68)	(324)	(1401)
237·979	167	0·232	279. 28	63. 5	+ 9. 7	0	20	
	168	0·033	94. 29	47. 52	+ 6. 59	28	110	
Aug. 27						(28)	(130)	
238·095	167	0·251	278. 31	62. 44	+ 9. 2	0	26	
	168	0·014	105. 24	47. 28	+ 6. 48	26	146	
Aug. 27						(26)	(172)	
239·967	168	0·405	271. 43	47. 28	+ 7. 15	32	124	
Aug. 29						(32)	(124)	
239·993	168	0·415	271. 47	47. 45	+ 7. 16	34	132	
Aug. 29						(34)	(132)	
240·938	168	0·606	273. 51	48. 8	+ 8. 3	23	123	
	169	0·920	104. 31	306. 1	−10. 18	0	14	341 *c*
Aug. 30						(23)	137	(341)
241·940	168	0·766	274. 15	47. 40	+ 7. 53	12	75	1071 *n p*
		0·838	104. 30					328
Aug. 31						(12)	(75)	(1399)
243·021		0·881	99. 10					928
Sept. 1								(928)
243·031		0·886	97. 10					1005
Sept. 1								(1005)

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

Group 167. One spot.

Group 168. One spot.

Group 169. One small 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).
1875.			° ′	° ′	° ′			
250d·891		0·913	259. 40					291
		0·895	286. 50					220
	170	0·570	135. 35	214. 34	−17. 22	0	15	
		0·900	82. 50					224
Sept. 9						(0)	(15)	(735)
250·936	170	0·562	136. 13	214. 41	−17. 14	0	18	
Sept. 9						(0)	(18)	
255·984	171	0·968	76. 30	95. 25	+14. 50	32	140	694 *p*
Sept. 14						(32)	(140)	(694)
255·995	171	0·962	76. 36	96. 39	+14. 49	44	206	548 *p*
Sept. 14						(44)	(206)	(548)
256·910		0·884	246. 40					149
	171	0·875	76. 36	98. 1	+15. 10	0	60	445 *s*
	172	0·308	93. 17	141. 43	+ 5. 50	0	11	
Sept. 15						(0)	(71)	(594)
257·046		0·897	247. 10					119
	171	0·856	76. 25	98. 35	+15. 18	9	92	346 *s*
	172	0·279	92. 47	141. 46	+ 6. 7	0	10	
Sept. 15						(9)	(102)	(465)
257·917	171	0·741	76. 7	98. 29	+15. 3	0	60	
Sept. 16						(0)	(60)	
257·935	171	0·739	75. 53	98. 26	+15. 13	0	26	641 *s*
Sept. 16						(0)	(26)	(641)
269·044		0·877	280. 0					530
	173	0·702	109. 29	317. 48	− 8. 26	24	114	
		0·986	80. 30					192
Sept. 27						(24)	(114)	(722)
269·048	173	0·704	109. 18	317. 34	− 8. 21	11	107	
Sept. 27						(11)	(107)	
270·956		0·917	280. 0					131
	173	0·365	133. 41	319. 0	− 8. 3	36	190	
	174	0·568	230. 34	1. 15	−15. 5	0	33	
		0·811	81. 0					53
Sept. 29						(36)	(223)	(184)
270·977	173	0·357	135. 20	319. 30	− 8. 8	14	123	
	174	0·573	230. 41	1. 19	−15. 15	0	23	
Sept. 29						(14)	(146)	

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1875.			° ′	° ′	° ′			
271d·963	173	0·254	170. 3	318. 33	− 7. 44	31	119	
	174	0·743	241. 40	3. 41	−15. 42	0	12	
Sept. 30						(31)	(131)	
271·979	173	0·256	172. 4	318. 50	− 7. 55	32	121	
	174	0·748	241. 36	3. 51	−15. 56	0	15	
Sept. 30						(32)	(136)	
273·918	173	0·442	238. 19	317. 26	− 7. 17	0	53	
	174	0·955	251. 58	5. 5	−15. 0	0	20	373 *s f*
	175	0·268	197. 23	299. 54	− 8. 11	18	143	
Oct. 2						(18)	(216)	(373)
273·928	173	0·446	238. 29	317. 35	− 7. 20	0	53	
	174	0·954	252. 6	4. 48	−14. 49	0	20	
	175	0·269	197. 53	299. 56	− 8. 11	36	189	
Oct. 2						(36)	(262)	
277·059	175	0·756	254. 59	300. 59	− 6. 56	30	91	166 *p*
	176	0·746	285. 0	301. 59	+15. 24	0	12	257 *p*
	177	0·377	287. 28	275. 19	+12. 25	6	28	
Oct. 5						(36)	(131)	(423)
277·072	175	0·751	254. 47	300. 20	− 6. 58	24	79	
	176	0·751	285. 20	302. 13	+15. 43	0	19	142 *p*
	177	0·375	287. 18	275. 3	+12. 20	0	26	
Oct. 5						(24)	(124)	(142)
277·894	175	0·858	257. 18	300. 10	− 7. 28	13	84	153 *c*
	176	0·850	284. 3	301. 19	+15. 15	0	11	
	177	0·574	281. 1	277. 45	+11. 30	0	12	
Oct. 6						(13)	(107)	(153)
277·951		0·970	260. 30					299
		0·855	249. 20					118
	175	0·866	257. 34	300. 21	− 7. 25	15	61	281 *c*
	176	0·870	284. 1	302. 51	+15. 18	0	11	328 *n p*
	177	0·587	281. 12	277. 53	+11. 41	0	11	
Oct. 6						(15)	(83)	(1026)
278·929		0·940	257. 40					135
	175	0·954	259. 54	300. 16	− 7. 37	0	28	185 *f*
		0·952	284. 40					265
	177	0·720	281. 5	275. 16	+12. 19	38	125	
Oct. 7						(38)	(153)	(585)

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

Group 170. Two small spots.

Group 171. Three or four very small spots. It is conjectured that the first photograph on September 14 (255·984) may have been dated one hour too late.

Group 172. Two very small spots. Partly hidden by the wire on September 15 (275·046).

Group 173. One spot surrounded by several very much smaller ones.

Group 174. One small spot.

Group 175. Two spots.

Group 176. Two small spots close together. The first photograph on October 6 (277·894) is not sufficiently exposed, and shows only part of the group. Only one group of faculæ can be measured on it.

Group 177. A scattered cluster of very 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).
1875.			° ′	° ′	° ′			
278d·948	175	0·948	259. 43	298. 55	— 7. 37	0	11	240 *f*
								237
	177	0·721	281. 17	275. 5	+12. 28	30	119	(477)
Oct. 7						(30)	(130)	
280·914	177	0·964	280. 18	278. 10	+11. 33	0	18	105 *c*
	178	0·238	243. 25	215. 12	— 0. 3	0	12	
Oct. 9						(0)	(30)	(105)
280·915	177	0·963	280. 28	277. 59	+11. 44	0	21	203 *c*
	178	0·236	243. 52	215. 8	+ 0. 6	0	12	
Oct. 9						(0)	(33)	(203)
281·951	178	0·434	258. 23	214. 19	+ 0. 32	11	41	
Oct. 10						(11)	(41)	
281·963	178	0·441	259. 2	214. 40	+ 0. 41	0	22	
Oct. 10						(0)	(22)	
282·903		0·960	88. 0					461
Oct. 11								(461)
282·954		0·954	88. 30					386
Oct. 11								(386)
292·897		0·842	272. 10					74
	179	0·163	52. 4	37. 25	+11. 19	0	24	
Oct. 21						(0)	(24)	(74)
292·907	179	0·158	50. 14	37. 43	+10. 59	0	19	
Oct. 21						(0)	(19)	
296·970	180	0·913	80. 18	285. 7	+10. 51	88	511	939 *f*
Oct. 25						(88)	(511)	(939)
296·981	180	0·910	80. 22	285. 23	+10. 46	91	498	851 *f*
Oct. 25						(91)	(498)	(851)
297·915	180	0·808	79. 49	285. 53	+11. 2	52	319	
Oct. 26						(52)	(319)	
304·886	180	0·621	281. 57	283. 50	+10. 41	83	305	
Nov. 2						(83)	305	
310·997		0·879	267. 50					241
Nov. 8								(241)

Mean Solar Time.	No. of Group and Letter for Spot.	Distance from Centre in term's 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).
1875.			° ′	° ′	° ′			
317d·908		0·960	250. 20					183
	181	0·922	287. 31	141. 48	+17. 8	0	10	200 *s f*
		0·902	112. 50					265
Nov. 15						(0)	(10)	(648)
317·921		0·960	250. 20					148
	181	0·925	287. 29	142. 8	+17. 8	0	8	200 *s f*
								172
Nov. 15						(0)	(8)	(520)
320·901	182*a*	0·605	104. 52	359. 45	— 7. 3	32	138	
	182*b*	0·685	105. 54	354. 2	— 9. 4	14	57	
		0·937	77. 0					506
Nov. 18						(46)	(195)	(506)
320·919	182*a*	0·602	104. 59	359. 45	— 7. 11	36	133	
	182*b*	0·684	105. 56	353. 53	— 9. 5	15	64	
		0·926	76. 50					578
Nov. 18						(51)	(197)	(578)
321·896	182*a*	0·420	111. 11	358. 30	— 6. 36	29	137	
	182*b*	0·517	112. 7	353. 43	— 9. 18	6	39	
	183	0·705	76. 53	338. 29	+10. 43	0	31	447 *f*
Nov. 19						(35)	(207)	(447)
321·905	182*a*	0·426	111. 31	359. 3	— 6. 58	20	143	
	182*b*	0·498	110. 37	354. 31	— 8. 9	7	44	
	183	0·707	76. 57	338. 10	+10. 42	14	41	592 *f*
Nov. 19						41)	(228)	(592)
323·039	182*a*	0·183	144. 38	1. 26	— 6. 32	37	126	
	182*b*	0·267	129. 54	355. 39	— 7. 50	16	75	
	183	0·485	71. 55	339. 43	+10. 24	13	63	
	184	0·891	100. 20	305. 26	— 8. 14	23	101	
	185	0·992	78. 34	284. 43	+11. 36	0	81	
Nov. 20						(89)	(446)	
324·920	182*a*	0·373	247. 9	2. 52	— 6. 37	22	96	
	182*b*	0·266	234. 48	355. 18	— 7. 2	13	70	
	183	0·168	18. 35	339. 37	+10. 54	5	19	
	184	0·609	105. 30	306. 36	— 7. 53	67	258	
	185	0·841	77. 1	286. 7	+11. 51	20	55	410 *n f*
Nov. 22						(127)	(498)	(410)

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 175. Two spots.

Group 176. Two small spots close together. The first photograph on October 6 (277·894) is very faint and shows only part of the group. Only one group of faculæ can be measured on it.

Group 177. A scattered cluster of very small spots.

Group 178. Two very small spots. On October 10 one of the two spots has disappeared.

Group 180. One large spot.

Group 181. One small spot.

Group 182*a*. Spot followed by three or four very much smaller. On November 19 it is difficult to separate the group into two divisions, and the division has been differently made on the two photographs.

Group 182*b*. One small spot.

Group 183. Cluster of two or three small spots.

Group 183***. Four very small spots.

Group 184. Two large spots with several very small ones between them. A somewhat scattered group. The group breaks up into two on November 23.

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.		Spots.		Faculæ.	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.		Spots.		Faculæ.
				Longitude.	Latitude.	Area of UMBRA for each Spot (and for Day).	Area of WHOLE for each Spot (and for Day).	Area for each Group (and for Day).					Longitude.	Latitude.	Area of UMBRA for each Spot (and for Day).	Area of WHOLE for each Spot (and for Day).	Area for each Group (and for Day).
1875.			° ′	° ′	° ′				1875.			° ′	° ′	° ′			
324d·938	182*a*	0·378	247. 51	3. 0	− 6. 29	21	95		346d·941	186	0·316	342. 22	58. 12	+16. 25	0	15	
	182*b*	0·270	236. 15	355. 29	− 6. 50	19	69			187	0·701	97. 35	8. 25	− 6. 1	0	10	
	183	0·167	16. 48	339. 41	+10. 55	4	16		Dec. 14						(0)	(25)	
	184	0·602	105. 38	306. 51	− 7. 51	58	275										
	185	0·837	77. 2	286. 18	+11. 42	17	57	329 *nf*	346·956	186	0·312	339. 55	58. 41	+15. 55	0	6	
Nov. 22						(119)	(512)	(329)		187	0·702	97. 29	8. 9	− 5. 58	0	10	
									Dec. 14						(0)	(16)	
325·998	182*a*	0·585	256. 1	3. 12	− 6. 44	28	97		349·986	188	0·279	111. 12	357. 19	− 7. 7	15	61	
	182*b*	0·478	251. 23	355. 32	− 7. 16	6	39			189	0·773	103. 33	322. 39	−11. 18	54	360	280 *f*
	183	0·265	303. 52	341. 21	+10. 3	0	10		Dec. 17						(69)	(421)	(280)
	184*a*	0·349	117. 50	310. 28	− 7. 45	44	181										
	184*b*	0·442	112. 42	304. 19	− 8. 16	19	88		350·007	188	0·276	111. 42	357. 15	− 7. 10	28	79	
	185	0·686	74. 49	286. 13	+11. 32	11	62			189	0·775	103. 45	322. 12	−11. 29	53	372	268 *f*
Nov. 23						(108)	(477)		Dec. 17						(81)	(451)	(268)
									356·044	188	0·914	263. 58	358. 29	− 6. 23	0	32	184 *c*
328·063	182	0·893	263. 8	3. 59	− 5. 28	29	149	132 *sf*		189	0·510	253. 26	322. 14	−10. 12	34	161	
	183*	0·261	333. 36	308. 9	+14. 50	0	22		Dec. 23						(34)	(193)	(184)
	184*a*	0·217	226. 5	310. 19	− 7. 14	36	191										
	184*b*	0·172	202. 48	305. 8	− 7. 40	9	42		356·056	188	0·916	264. 7	358. 37	− 6. 14	0	21	
	185	0·311	55. 30	286. 13	+11. 27	15	41			189	0·514	253. 33	322. 21	−10. 11	26	161	
Nov. 25						(89)	(445)	(132)	Dec. 23						(26)	(182)	
									357·031		0·983	263. 10					184
328·081	182	0·897	263. 15	4. 17	− 5. 25	28	149	188 *sf*		189	0·707	257. 23	323. 57	−10. 29	17	84	
	183*	0·271	332. 25	308. 29	+15. 12	0	19		Dec. 24						(17)	(84)	(184)
	184*a*	0·220	227. 37	310. 25	− 7. 7	24	181										
	184*b*	0·175	203. 27	305. 3	− 7. 48	11	64		357·049		0·985	263. 20					126
	185	0·309	56. 24	285. 56	+11. 8	15	38			189	0·704	257. 5	323. 27	−10. 40	18	83	
Nov. 25						(78)	(451)	(188)	Dec. 24						(18)	(83)	(126)

The photographs taken on the following days show no Spots:—January 6, 27, 28, 30, and 31; February 15 and 16; April 24; May 9, 10, 11, 12, 13, 14, 15, 17, 19, 21, 22, and 23; June 15; July 18 and 20; August 10, 11, 13, 16, and 20; September 1, 4, 6, 7, and 13; October 11, 12, 13, 17, and 18; November 6, 8, 10, and 12.

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 182*a*. Spot followed by three or four very much smaller. On November 19 it is difficult to separate the group into two divisions, and the division has been differently made on the two photographs.

Group 182*b*. One small spot.

Group 183. Cluster of two or three small spots.

Group 183*. Four very small spots.

Group 184. Two large spots, with several very small ones between them. A somewhat scattered group. The group breaks up into two on November 23.

Group 185. Single spot.

Group 186. One small spot.

Group 187. One small spot.

Group 188. Group of three or four spots ranged in a line.

Group 189. One large spot. On the first photograph on December 24 (357·031) it is partly hidden by the wire.

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 1876.

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).
1876.			° ′	° ′	° ′			
3^{d}·981	190	0·651	93. 27	81. 44	— 5. 2	0	16	
Jan. 5						(0)	(16)	
3·992	190	0·647	93. 44	81. 52	— 5. 13	0	15	
Jan. 5						(0)	(15)	
17·019	191	0·435	309. 22	330. 30	+11. 14	4	21	
	192	0·945	99. 34	239. 17	—10. 40	50	265	384 *sf*
Jan. 18						(54)	(286)	(384)
17·033	191	0·437	309. 7	330. 31	+11. 14	8	30	
	192	0·945	99. 36	239. 8	—10. 42	48	266	392 *sf*
Jan. 18						(56)	(296)	(392)
18·033	191	0·591	298. 49	329. 28	+12. 10	42	162	
	192	0·857	99. 54	238. 29	—11. 6	105	658	428 *sf*
Jan. 19						(147)	(820)	(428)
20·972	191	0·945	284. 24	327. 27	+11. 42	6	291	
	192	0·337	109. 54	239. 43	—11. 39	53	266	
	193	0·536	104. 24	226. 33	—12. 12	0	12	
Jan. 22						(59)	(569)	
22·003	192	0·145	142. 30	239. 46	—12. 0	45	247	
	193	0·331	113. 2	226. 49	—12. 36	0	9	
	194	0·553	251. 37	277. 37	—14. 36	2	125	
Jan. 23						(47)	(381)	
22·038	192	0·142	144. 51	239. 41	—12. 5	45	257	
	193	0·323	114. 22	226. 58	—12. 51	0	16	
	194	0·561	251. 48	277. 43	—14. 38	23	138	
Jan. 23						(68)	(411)	
22·952	192	0·170	226. 29	239. 40	—12. 11	56	243	
	194	0·702	253. 48	276. 36	—15. 16	75	344	
Jan. 24						(131)	(587)	
22·963	192	0·170	227. 17	239. 35	—12. 5	48	240	
	194	0·700	253. 35	276. 14	—15. 23	90	332	
Jan. 24						(138)	(572)	
22·983	192	0·174	228. 20	239. 37	—12. 6	39	248	
	194	0·706	254. 17	276. 33	—14. 58	68	285	
Jan. 24						(107)	(533)	
24·005	192	0·374	251. 14	239. 41	—12. 8	38	231	
	194	0·855	255. 57	277. 33	—14. 54	75	354	
Jan. 25						(113)	(585)	

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).
1876.			° ′	° ′	° ′			
24^{d}·017		0·874	289. 30	276. 20	—14. 0			145
	192	0·379	250. 27	239. 46	—12. 30	53	263	
	194	0·856	255. 30	277. 22	—15. 17	66	315	860 *f*
Jan. 25						(119)	(578)	(1005)
25·996	192	0·735	257. 2	239. 35	—13. 26	20	110	
	194	0·980	253. 46	271. 49	—17. 2	0	96	
Jan. 27						(20)	(206)	
27·938	192	0·954	257. 25	239. 56	—13. 45	0	60	607 *f*
	195	0·980	96. 35	87. 54	— 7. 38	0	57	
Jan. 29						(0)	(117)	(607)
27·952	192	0·953	257. 7	239. 37	—14. 3	0	75	626 *f*
	195	0·979	96. 44	87. 59	— 7. 48	0	66	
Jan. 29						(0)	(141)	(626)
29·947	195	0·786	95. 14	88. 22	— 7. 52	10	33	196 *f*
Jan. 31						(10)	(33)	(196)
29·956	195	0·785	95. 15	88. 20	— 7. 52	9	37	361 *f*
Jan. 31						(9)	(37)	(361)
31·986	195	0·430	95. 43	88. 1	— 8. 4	8	31	
Feb. 2						(8)	(31)	
32·015	195	0·419	95. 36	88. 21	— 7. 59	4	22	
Feb. 2						(4)	(22)	
32·042	195	0·415	95. 52	88. 15	— 8. 5	2	21	
Feb. 2						(2)	(21)	
33·931	195	0·038	189. 16	88. 15	— 8. 29	0	6	
Feb. 4						(0)	(6)	
33·982	195	0·041	206. 22	88. 16	— 8. 25	2	6	
Feb. 4						(2)	(6)	
39·939	196	0·991	100. 41	285. 36	—11. 27	14	384	
Feb. 10						(14)	(384)	
39·950	196	0·990	100. 54	285. 54	—11. 42	14	370	
Feb. 10						(14)	(370)	
41·946	196					133	710	868 *f*
Feb. 12						(133)	(710)	(868)

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 190. Scattered group of very faint small spots.

Group 191. Scattered group, but with two principal spots.

Group 192. Single large spot, but several smaller spots are seen on January 19. The Faculæ are very faint on both photographs on January 25, quite too faint to be measured on the first photograph (24·005).

Group 193. Scattered group of small spots.

Group 194. Scattered group of small spots. A change of shape is seen on January 24.

Group 195. Single spot.

Group 196. Single large spot. There were no wires in the Photoheliograph on February 12 and 13.

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).
1876.			° ′	° ′	° ′			
42d·012	196					154	804	741 *f*
Feb. 12						(154)	(804)	(741)
43·054	196					150	739	
Feb. 13						(150)	(739)	
43·063	196					154	651	
Feb. 13						(154)	(651)	
44·045		0·916	283. 50	19. 0	+ 9. 40			79
	196	0·498	104. 0	285. 8	−12. 53	151	695	
		0·960	100. 10	240. 10	−11. 40			281
Feb. 14						(151)	(695)	(360)
44·056		0·914	283. 40	18. 30	+ 9. 30			114
	196	0·496	104. 15	285. 11	−12. 59	154	713	
		0·959	99. 10	240. 30	−10. 40			175
Feb. 14						(154)	(713)	(289)
44·091	196	0·489	104. 21	285. 10	−12. 57	143	676	
		0·957	99. 10	240. 20	−10. 40			417
Feb. 14						(143)	(676)	(417)
47·910		0·958	284. 40	334. 50	+11. 50			113
	196	0·395	251. 14	286. 22	−13. 45	103	511	
Feb. 18						(103)	(511)	(113)
47·918	196	0·398	251. 35	286. 29	−13. 40	109	521	
Feb. 18						(109)	(521)	
49·025	196	0·606	256. 19	286. 18	−13. 52	110	531	
Feb. 19						(110)	(531)	
49·032	196	0·608	256. 30	286. 23	−13. 46	112	548	
Feb. 19						(112)	(548)	
49·040	196	0·614	256. 41	286. 44	−13. 43	118	545	
Feb. 19						(118)	(545)	
51·915	196	0·961	257. 18	285. 57	−14. 8	104	377	999 *sf*
Feb. 22						(104)	(377)	(999)
51·945	196	0·961	257. 1	285. 37	−14. 25	63	302	999 *sf*
Feb. 22						(63)	(302)	(999)
51·958	196	0·962	257. 2	285. 32	−14. 23	68	316	1022 *sf*
Feb. 22						(68)	(316)	(1022)
1876.			° ′	° ′	° ′			
51d·967	196	0·963	257. 7	285. 43	−14. 17	59	339	855 *sf*
Feb. 22						(59)	(339)	(855)
53·937		0·848	258. 40	243. 0	−13. 20			89
		0·946	75. 0	115. 50	+11. 40			169
Feb. 24								(258)
53·950		0·825	258. 20	240. 20	−13. 40			167
		0·964	73. 40	112. 20	+13. 30			35
Feb. 24								(202)
53·973		0·834	259. 0	241. 0	−13. 10			154
Feb. 24								(154)
55·925		0·979	284. 20	234. 20	+12. 20			137
		0·959	259. 10	232. 40	−12. 20			113
	197	0·702	67. 50	117. 9	+ 9. 55	17	97	
		0·963	92. 20	83. 50	− 4. 20			801
Feb. 26						(17)	(97)	(1051)
58·027	197	0·363	39. 2	117. 12	+ 9. 16	11	68	
Feb. 28						(11)	(68)	
58·088		0·869	285. 40	187. 40	+ 9. 50			59
	197	0·358	38. 1	116. 55	+ 9. 15	22	62	
		0·794	91. 40	77. 0	− 5. 40			253
Feb. 28						(22)	(62)	(312)
59·093	197	0·289	2. 7	115. 54	+ 9. 28	9	80	
Feb. 29						(9)	(80)	
61·095	198	0·155	76. 51	81. 27	− 5. 9	2	16	
Mar. 2						(2)	(16)	
62·910		0·830	285. 30	120. 0	+ 8. 40			252
Mar. 4								(252)
62·919		0·828	285. 30	119. 40	+ 8. 30			236
Mar. 4								(236)
64·893		0·985	279. 40	118. 40	+ 8. 10			184
	198*	0·662	289. 22	78. 56	+ 7. 1	13	42	
		0·934	73. 20	333. 50	+12. 50			278
Mar. 6						(13)	(42)	(462)

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 196. Single large spot. There were no wires in the Photoheliograph on February 12 and 13.

Group 197. Somewhat scattered group of very small spots.

Group 198. Single small spot.

Group 198*. A few very small spots, not far apart, some of which disappear on March 7.

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).
			° ′	° ′	° ′			
1876.								
64d·928		0·984	279. 0	117. 50	+ 7. 30			265
	198*	0·670	289. 17	79. 4	+ 7. 10	18	36	
		0·933	73. 0	333. 40	+13. 0			388
Mar. 6						(18)	(36)	(653)
65·910		0·865	265. 30	87. 0	− 7. 30			765
	198*	0·820	284. 9	79. 49	+ 7. 14	7	26	
		0·842	69. 10	333. 0	+13. 10			201
Mar. 7						(7)	(26)	(966)
67·003		0·937	264. 50	82. 10	− 7. 20			365
	198*	0·925	279. 53	78. 32	+ 6. 15			189
		0·984	100. 20	291. 40	−11. 30			31
Mar. 8								(585)
67·893		0·981	265. 40	79. 50	− 5. 40			191
	199	0·967	99. 23	284. 33	−10. 53	6	102	450 *sp*
Mar. 9						(6)	(102)	(641)
67·923		0·984	265. 10	80. 10	− 6. 0			230
	199	0·965	99. 22	284. 36	−10. 54	21	103	700 *sp*
Mar. 9						(21)	(103)	(930)
67·959		0·986	265. 10	80. 30	− 5. 50			310
	199	0·962	99. 20	284. 52	−10. 55	18	96	530 *sp*
Mar. 9						(18)	(96)	(840)
69·039	199	0·873	99. 3	284. 9	−11. 23	22	84	197 *sp*
		0·978	85. 10	268. 20	+ 3. 10			156
Mar. 10						(22)	(84)	(353)
69·051	199	0·870	99. 3	284. 18	−11. 24	14	88	306 *sp*
		0·976	85. 0	268. 40	+ 3. 10			185
Mar. 10						(14)	(88)	(491)
69·945	199	0·749	98. 51	284. 44	−11. 22	12	62	272 *sf*
		0·912	82. 20	268. 50	+ 3. 50			163
Mar. 11						(12)	(62)	(435)
70·011	199	0·739	99. 14	284. 43	−11. 39	15	70	268 *sf*
		0·903	82. 30	269. 10	+ 3. 40			178
Mar. 11						(15)	(70)	(446)
72·115	199	0·352	104. 39	284. 40	−11. 48	14	57	
	200	0·923	70. 5	241. 3	+15. 15	49	238	529 *sf*
		0·926	99. 0	236. 30	−11. 0			65
Mar. 13						(63)	(295)	(594)
1876.								
72d·151	199	0·346	105. 38	284. 38	−12. 4	22	59	
	200	0·918	70. 16	241. 17	+14. 54	41	191	511 *sf*
		0·926	99. 40	236. 0	−11. 40			92
Mar. 13						(63)	(250)	(603)
73·060	199	0·157	121. 43	284. 40	−11. 47	17	57	
	200	0·827	64. 56	241. 26	+16. 3	49	176	524 *sf*
	201	0·960	93. 10	218. 30	− 5. 0			138
Mar. 14						(66)	(233)	(662)
74·036	199	0·121	233. 37	285. 17	−11. 10	9	40	
	200	0·701	59. 20	241. 4	+15. 23	35	116	
	201	0·906	93. 19	214. 25	− 6. 1	0	8	808 *np*
Mar. 15						(44)	(164)	(808)
74·094	199	0·128	235. 13	284. 57	−11. 14	10	33	
	200	0·691	59. 20	241. 0	+15. 1	45	129	
	201	0·899	93. 41	214. 33	− 6. 25	0	7	704 *np*
Mar. 15						(55)	(169)	(704)
74·939	199	0·299	251. 11	284. 29	−12. 18	0	17	
	200	0·583	50. 11	240. 8	+15. 35	51	161	
	201	0·789	91. 44	215. 30	− 5. 43	7	39	
Mar. 16						(58)	(217)	
74·956	199	0·304	250. 53	284. 32	−12. 28	4	16	
	200	0·588	50. 32	239. 30	+15. 38	53	208	
	201	0·789	91. 33	215. 18	− 5. 35	9	47	
Mar. 16						(66)	(271)	
75·967	199	0·510	257. 4	284. 37	−12. 37	0	12	
	200	0·467	36. 53	237. 20	+15. 6	30	187	
	201	0·636	91. 9	214. 33	− 6. 11	51	227	
	202	0·819	101. 8	198. 45	−13. 8	1	22	
Mar. 17						(82)	(448)	
75·980	199	0·513	257. 26	284. 42	−12. 28	0	13	
	200	0·459	34. 46	238. 18	+15. 17	9	120	
	201	0·633	91. 37	214. 36	− 6. 29	62	212	
	202	0·817	101. 11	198. 47	−13. 11	0	14	
Mar. 17						(71)	(359)	

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 198*. A few very small spots, not far apart, some of which disappear on March 7.

Group 199. Single spot.

Group 200. Scattered group. A great change is seen on March 17.

Group 201. Small group, principally consisting of one spot, the smaller spots disappearing on March 20.

Group 202. Single 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.		Spots.		Faculæ.
				Longitude.	Latitude.	Area of UMBRA for each Spot (and for Day).	Area of WHOLE for each Spot (and for Day).	Area for each Group (and for Day).
1876.			° ′	° ′	° ′			
76d·997	199	0·693	258. 58	284. 37	−12. 42	0	12	
	200	0·375	358. 14	241. 16	+14. 53	9	50	
	201	0·432	89. 32	214. 57	− 6. 9	50	126	
	202	0·632	102. 10	201. 23	−13. 7	0	10	
	203	0·928	96. 49	171. 59	− 8. 56	0	129	
Mar. 18						(59)	(327)	
77·025	199	0·696	258. 42	284. 29	−12. 53	0	6	
	200	0·378	357. 8	241. 20	+15. 4	22	62	
	201	0·425	89. 29	215. 1	− 6. 8	36	137	
	202	0·627	102. 9	201. 23	−13. 3	0	9	
	203	0·924	96. 46	172. 12	− 8. 55	5	112	
Mar. 18						(63)	(326)	
78·188	200	0·446	324. 38	240. 16	+14. 31	2	57	
	201	0·170	89. 9	215. 3	− 6. 44	41	122	
	203	0·792	97. 27	172. 9	−10. 9	48	229	270 *sf*
Mar. 19						(91)	(408)	(270)
78·967	201	0·098	277. 18	220. 11	− 6. 13	14	46	
	203	0·644	95. 26	174. 20	− 8. 49	36	128	
	204	0·951	72. 49	145. 25	+13. 55	61	274	
Mar. 20						(111)	(448)	
79·003	201	0·108	274. 50	220. 17	− 6. 24	18	50	
	203	0·640	95. 56	174. 8	− 9. 8	44	145	
	204	0·953	73. 2	144. 29	+13. 48	66	275	
Mar. 20						(128)	(470)	
80·994		0·832	294. 40	239. 30	+16. 10			376
	201	0·533	268. 54	220. 9	− 6. 25	5	14	
	203	0·227	94. 58	174. 44	− 7. 49	9	68	
	204	0·674	58. 31	151. 35	+15. 0	118	457	277 *sf*
	205	0·874	76. 55	128. 50	+ 7. 54	4	22	228 *f*
Mar. 22						(136)	(561)	(881)
81·039		0·815	294. 50	237. 20	+15. 30			386
	201	0·542	268. 44	220. 11	− 6. 28	7	12	
	203	0·212	96. 21	175. 3	− 8. 4	19	57	
	204	0·660	58. 29	151. 53	+14. 33	162	501	323 *sf*
	205	0·870	77. 8	128. 40	+ 7. 37	13	26	209 *f*
Mar. 22						(201)	(596)	(918)
1876.			° ′	° ′	° ′			
81d·047		0·816	294. 40	237. 20	+15. 40			337
	201	0·539	269. 2	219. 51	− 6. 19	3	17	
	203	0·211	94. 7	174. 58	− 7. 36	12	62	
	204	0·655	56. 51	152. 36	+15. 17	167	547	261 *sf*
	205	0·868	76. 42	128. 51	+ 7. 56	8	24	247 *f*
Mar. 22						(190)	(650)	(845)
81·055		0·823	293. 50	238. 10	+15. 10			467
	201	0·545	269. 1	220. 10	− 6. 19	3	22	
	203	0·212	95. 51	174. 50	− 7. 58	9	66	
	204	0·654	57. 47	152. 19	+14. 43	179	584	335 *sf*
	205	0·866	76. 52	128. 57	+ 7. 44	7	22	228 *f*
Mar. 22						(198)	(694)	(1030)
82·908		0·969	287. 20	235. 30	+14. 50			1261
	201	0·844	265. 54	220. 26	− 7. 6	0	14	191 *nf*
	204	0·397	21. 4	154. 11	+14. 55	87	485	
	205	0·592	66. 23	129. 34	+ 7. 59	7	28	
		0·938	94. 40	92. 40	− 6. 50			244
Mar. 24						(94)	(527)	(1696)
82·967		0·966	286. 30	234. 20	+14. 0			796
	201	0·852	265. 54	220. 32	− 7. 3	0	15	194 *nf*
	204	0·394	20. 41	153. 37	+14. 48	85	452	
	205	0·579	65. 25	129. 52	+ 8. 8	7	30	
		0·924	94. 20	94. 0	− 6. 30			262
Mar. 24						(92)	(497)	(1252)
82·994		0·964	286. 30	233. 30	+13. 50			438
	201	0·852	266. 2	220. 11	− 6. 56	0	13	204 *nf*
	204	0·389	19. 32	153. 48	+14. 40	94	470	
	205	0·578	65. 50	129. 28	+ 7. 53	9	29	
		0·921	94. 50	94. 10	− 7. 10			286
Mar. 24						(103)	(512)	(928)
83·909	201	0·907	266. 10	214. 50	− 6. 20			253
	204	0·380	348. 7	154. 4	+14. 59	96	450	
	205	0·415	52. 6	130. 12	+ 8. 20	8	19	
		0·838	93. 10	92. 20	− 6. 20			295
Mar. 25						(104)	(469)	(548)
83·918	201	0·912	265. 30	215. 20	− 6. 50			314
	204	0·376	348. 34	153. 43	+14. 47	63	433	
	205	0·413	52. 5	130. 11	+ 8. 15	7	15	
		0·871	95. 10	88. 30	− 7. 50			282
Mar. 25						(70)	(448)	(596)

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

Group 199. Single spot.

Group 200. Scattered group. A great change is seen on March 17.

Group 201. Small group, principally consisting of one spot, the smaller spots disappearing on March 20.

Group 202. Single spot.

Group 203. Scattered group.

Group 204. Scattered group, consisting principally of two large spots. The first photograph on March 29 (88·076) is too little exposed. The third on March 30 (89·048) is too much exposed, so that the Umbra of the spot, which is very near the limb, cannot be distinguished.

Group 205. Single small 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).
1876.			° ′	° ′	° ′			
88d·076		0·968	258. 0	170. 5o	−13. 10			234
	204	0·940	288. 53	161. 27	+15. 13	77	273	283 *nf*
	205	0·817	291. 52	145. 35	+13. 37	0	14	
Mar. 29						(77)	(287)	(517)
88·091		0·961	258. 3o	169. 0	−13. 0			260
	204	0·931	289. 7	159. 42	+15. 5	52	248	306 *nf*
	205	0·814	291. 44	145. 5	+13. 25	6	20	
Mar. 29						(58)	(268)	(566)
88·099		0·964	258. 10	169. 3o	−13. 10			332
	204	0·936	288. 56	160. 26	+15. 7	84	25o	345 *nf*
	205	0·817	291. 59	145. 13	+13. 43	0	19	
Mar. 29						(84)	(269)	(677)
88·915	204	0·981	286. 24	159. 46	+14. 38	71	237	380 *nf*
	205	0·902	287. 52	144. 57	+13. 0	0	7	
Mar. 3o						(71)	(244)	(380)
88·935	204	0·982	286. 25	159. 44	+14. 41	47	188	446 *nf*
	205	0·905	287. 45	145. 7	+13. 0	0	16	
Mar. 3o						(47)	(204)	(446)
89·048	204	0·985	286. 3o	159. 13	+14. 56	0	141	309 *nf*
	205	0·911	287. 40	144. 29	+13. 8	0	18	
Mar. 3o						(0)	(159)	(309)
89·990	205	0·961	287. 0	140. 3o	+14. 20			235
Mar. 31								(235)
90·002	205	0·956	287. 0	139. 20	+14. 10			212
Mar. 31								(212)
91·956		0·811	266. 20	97. 40	− 6. 40			242
Apr. 2								(242)
92·922		0·897	265. 0	94. 3o	− 7. 10			160
Apr. 3								(160)
92·948		0·922	264. 40	97. 40	− 7. 20			176
Apr. 3								(176)
93·907	206	0·852	102. 32	318. 49	−13. 55	0	4	63 *np*
Apr. 4						(0)	(4)	(63)
93·917	206	0·856	102. 47	318. 14	−14. 8	0	4	79 *np*
Apr. 4						(0)	(4)	(79)

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).
1876.			° ′	° ′	° ′			
96d·906	207	0·839	68. 5o	284. 20	+14. 0			90
Apr. 7								(90)
98·023	207	0·649	60. 11	287. 53	+13. 57	0	11	
	208	0·944	73. 5o	254. 5o	+13. 0			190
Apr. 8						(0)	(11)	(190)
98·030	207	0·650	60. 8	287. 44	+14. 1	0	27	
	208	0·937	73. 5o	256. 0	+12. 5o			190
Apr. 8						(0)	(27)	(190)
99·052	207	0·487	46. 7	288. 3o	+14. 10	0	12	
	208	0·797	69. 34	259. 59	+12. 20	0	7	
		0·945	70. 10	241. 5o	+16. 40			529
Apr. 9						(0)	(19)	(529)
99·058	207	0·482	46. 48	288. 25	+13. 43	0	6	
	208	0·793	69. 52	260. 10	+12. 1	0	7	
		0·944	70. 3o	241. 5o	+16. 10			439
Apr. 9						(0)	(13)	(439)
100·916	208	0·526	57. 36	258. 11	+11. 13	0	3o	
		0·787	63. 5o	237. 5o	+16. 20			415
		0·920	97. 5o	217. 5o	− 9. 20			123
Apr. 11						(0)	(3o)	(538)
100·990	208	0·507	55. 41	258. 51	+11. 23	0	3o	
		0·769	63. 3o	238. 3o	+16. 10			364
		0·908	98. 0	218. 3o	− 9. 3o			123
Apr. 11						(0)	(3o)	(487)
104·101		0·776	292. 3o	290. 20	+13. 40			83
	208*	0·361	94. 15	221. 48	− 6. 38	14	41	
		0·928	101. 3o	174. 3o	−12. 40			606
Apr. 14						(14)	(41)	(689)
104·120		0·783	292. 10	290. 5o	+13. 3o			97
	208*	0·361	93. 40	221. 34	− 6. 25	9	5o	
		0·922	102. 10	175. 10	−13. 20			649
Apr. 14						(9)	(5o)	(746)
104·961	208*	0·175	94. 33	221. 33	− 6. 7	9	26	
		0·850	101. 5o	173. 10	−12. 5o			455
		0·976	70. 5o	157. 0	+17. 20			152
Apr. 15						(9)	(26)	(607)

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 Faculæ 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 204. Scattered group, consisting principally of two large spots. The first photograph on March 29 (88·076) is too little exposed. The third on March 30 (89·048) is too much exposed, so that the Umbra of the spot, which is very near the limb, cannot be distinguished.

Group 205. Single small spot.

Group 206. Single spot, very small indeed.

Group 207. Single spot, very small indeed.

Group 208. Group of small spots.

Group 208*. Group consisting mainly of one small 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.		Spots.		Faculæ.	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.		Spots.		Faculæ.
				Longitude.	Latitude.	Area of UMBRA for each Spot (and for Day).	Area of WHOLE for each Spot (and for Day).	Area for each Group (and for Day).					Longitude.	Latitude.	Area of UMBRA for each Spot (and for Day).	Area of WHOLE for each Spot (and for Day).	Area for each Group (and for Day).
1876.			° ′	° ′	° ′				1876.			° ′	° ′	° ′			
105d.055		0·867	289. 10	287. 40	+13. 40			115	122d.027		0·947	74. 0	296. 40	+13. 50			80
	208*	0·170	94. 46	220. 35	− 6. 7	4	21		May 2								(80)
		0·862	101. 30	170. 40	−12. 40			299									
		0·953	73. 30	160. 20	+13. 50			168	123·001		0·886	71. 50	293. 10	+14. 10			187
Apr. 15						(4)	(21)	(582)	May 3								(187)
106·037		0·953	285. 50	287. 40	+13. 20			122									
		0·831	276. 50	272. 50	+ 2. 40			168	123·027		0·848	72. 30	297. 10	+12. 40			249
	208*	0·022	191. 15	217. 39	− 6. 32	0	8		May 3								(249)
		0·920	68. 10	154. 0	+17. 40			134									
Apr. 16						(0)	(8)	(424)	124·032		0·807	72. 30	288. 0	+11. 40			462
									May 4								(462)
108·021	208†	0·038	340. 42	191. 54	− 3. 5	0	17										
Apr. 18						(0)	(17)		125·908	209	0·967	103. 30	239. 30	−14. 0			344
									May 6								(344)
108·095	208†	0·051	314. 23	192. 17	− 3. 6	0	21										
Apr. 18						(0)	(21)		125·939	209	0·960	103. 20	240. 40	−13. 40			361
									May 6								(361)
109·956		0·938	289. 20	232. 30	+16. 10			180									
		0·847	263. 40	223. 40	− 8. 0			184									
		0·856	93. 0	106. 40	− 5. 10			159	127·082	209	0·841	104. 16	242. 28	−13. 44	67	225	313 *s f*
Apr. 20								(523)	May 7						(67)	(225)	(313)
109·967		0·954	288. 30	235. 30	+16. 0			166	127·095	209	0·837	103. 59	242. 42	−13. 27	67	233	322 *s f*
		0·831	263. 40	221. 50	− 8. 0			148	May 7						(67)	(233)	(322)
		0·878	94. 30	104. 0	− 6. 20			176									
Apr. 20								(490)	127·919	209	0·715	105. 34	243. 22	−13. 16	50	182	280 *s f*
									May 8						(50)	(182)	(280)
113·097		0·823	257. 10	179. 20	−13. 11			233									
Apr. 23								(233)	128·017	209	0·701	105. 52	243. 15	−13. 18	50	170	
									May 8						(50)	(170)	
113·892		0·874	256. 10	174. 30	−14. 20			268									
Apr. 24								(268)	128·955	209	0·541	110. 51	243. 18	−13. 40	26	145	
									May 9						(26)	(145)	
113·916		0·890	256. 40	176. 10	−14. 0			342									
Apr. 24								(342)	129·011	209	0·536	111. 18	242. 57	−13. 48	42	171	
									May 9						(42)	(171)	
115·043		0·906	295. 0	159. 20	+20. 20			123									
		0·946	254. 10	169. 40	−16. 30			391	129·954		0·897	262. 20	325. 0	− 8. 10			91
Apr. 25								(514)		209	0·344	124. 22	244. 22	−13. 57	28	117	
											0·987	76. 40	181. 40	+12. 40			208
115·084		0·909	295. 0	159. 10	+20. 30			82	May 10						(28)	(117)	(299)
		0·942	254. 10	168. 30	−16. 30			265									
Apr. 25								(347)	129·972		0·872	263. 40	321. 40	− 7. 0			137
										209	0·344	124. 22	244. 8	−13. 57	28	107	
120·920		0·874	92. 50	319. 50	− 4. 20			285			0·960	96. 40	187. 20	− 7. 10			208
Apr. 31								(285)	May 10						(28)	(107)	(345)

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 208*. Group consisting mainly of one small spot.

Group 208†. Two very small spots close together.

Group 209. Fairly large spot, with a small one at a little distance, the latter almost disappearing on May 10. The Faculæ on May 13 being very faint can only be measured on the first and denser photograph.

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.		Spots.		Faculæ.
				Longitude.	Latitude.	Area of UMBRA for each Spot (and for Day).	Area of WHOLE for each Spot (and for Day).	Area for each Group (and for Day).
1876.			° ′	° ′	° ′			
130d·947		0·765	289. 20	295. 50	+12. 40			110
	209	0·201	166. 12	245. 22	−14. 1	22	88	
		0·901	101. 0	184. 10	−11. 10			166
		0·926	74. 10	182. 0	+13. 30			137
May 11						(22)	(88)	(413)
130·963		0·790	287. 40	298. 10	+12. 0			137
	209	0·202	167. 2	245. 17	−14. 7	22	93	
		0·894	101. 40	184. 50	−11. 40			116
		0·922	75. 10	182. 20	+12. 30			114
May 11						(22)	(93)	(367)
130·988	209	0·206	169. 53	245. 30	−14. 28	22	88	
		0·887	101. 20	185. 20	−11. 20			258
		0·923	74. 20	182. 0	+13. 20			103
May 11						(22)	(88)	(361)
131·001	209	0·202	169. 1	245. 11	−14. 12	22	88	
		0·887	100. 20	185. 10	−10. 20			258
		0·924	74. 40	181. 30	+13. 0			194
May 11						(22)	(88)	(452)
132·062		0·897	285. 40	295. 30	+12. 40			142
	209	0·292	224. 57	245. 41	−14. 31	27	103	
		0·902	108. 30	169. 50	−17. 50			74
		0·807	70. 30	182. 0	+14. 0			156
May 12						(27)	(103)	(372)
132·089		0·899	285. 40	295. 30	+12. 40			293
	209	0·295	224. 53	245. 26	−14. 39	27	112	
		0·895	105. 40	170. 0	−15. 10			291
May 12						(27)	(112)	(584)
132·939		0·960	285. 40	294. 0	+14. 10			128
	209	0·451	240. 33	245. 42	−15. 8	24	106	
		0·815	110. 30	168. 30	−18. 0			189
May 13						(24)	(106)	(317)
132·963	209	0·452	241. 7	245. 34	−14. 56	19	106	
May 13						(19)	(106)	
135·063	209	0·797	252. 34	245. 31	−15. 14	0	9	180 *s f*
May 15						(0)	(9)	(180)
136·002		0·889	280. 50	243. 0	+ 8. 30			125
	209	0·886	251. 40	242. 50	−17. 20			425
		0·932	96. 30	112. 40	− 6. 50			160
May 16								(710)
1876.			° ′	° ′	° ′			
136d·085		0·888	281. 40	241. 50	+ 9. 20			125
	209	0·889	252. 17	242. 9	−16. 44			406
		0·926	96. 30	112. 30	− 6. 50			98
May 16								(629)
141·021		0·930	257. 40	183. 0	−12. 0			236
May 21								(236)
151·900		0·868	262. 20	30. 50	− 6. 50			122
June 1								(122)
151·927		0·855	263. 20	29. 0	− 5. 50			105
June 1								(105)
155·157		0·860	259. 40	346. 30	− 8. 50			130
		0·896	99. 50	224. 50	− 8. 40			81
June 4								(211)
168·963		0·907	95. 50	40. 10	− 4. 30			368
June 18								(368)
170·105		0·767	96. 30	40. 20	− 3. 50			269
June 19								(269)
170·971		0·768	327. 10	112. 10	−41. 40			233
June 20								(233)
171·940	210	0·932	90. 7	357. 12	+ 0. 38	0	40	783 *f*
June 21						(0)	(40)	(783)
176·932	210*	0·470	247. 36	25. 31	− 7. 56	0	6	
June 26						(0)	(6)	
184·095	211	0·713	250. 33	307. 54	−11. 14	19	57	253 *c*
	212	0·843	100. 6	208. 22	− 6. 37	58	291	677 *f*
July 3						(77)	(348)	(930)
184·103	211	0·715	250. 40	308. 0	−11. 12	13	70	202 *c*
	212	0·842	100. 20	208. 24	− 6. 48	75	307	659 *f*
July 3						(88)	(377)	(861)
187·899	212	0·191	148. 46	208. 47	− 5. 35	18	58	
	213	0·542	95. 12	181. 56	+ 0. 23	0	10	
	214	0·758	80. 32	165. 21	+ 9. 38	0	7	422 *n f*
July 7						(18)	(75)	(422)

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 209. Fairly large spot, with a small one at a little distance, the latter almost disappearing on May 10. The Faculæ on May 13 being very faint can only be measured on the first and denser photograph.

Group 210*. Single small spot.

Group 212. Group consisting mainly of three fairly large spots, of which two disappear on July 7.

Group 214. Single small spot.

Group 210. Single small spot.

Group 211. Group of small spots.

Group 213. Group of 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).
1876.			° ′	° ′	° ′			
187d·914	212	0·186	150. 0	208. 56	− 5. 28	13	71	
	213	0·545	95. 2	181. 32	+ 0. 27	0	10	
	214	0·758	80. 17	165. 10	+ 9. 49	0	14	503 *nf*
July 7						(13)	(95)	(503)
188·963	212	0·287	224. 0	211. 57	− 8. 2	18	46	
	213	0·308	103. 11	183. 1	− 0. 18	12	73	
	214	0·581	78. 46	165. 13	+ 9. 40	3	5	
July 8						(33)	(124)	
191·030	212	0·636	253. 45	210. 49	− 6. 59	6	23	235 *np*
	213	0·175	246. 59	182. 15	+ 0. 9	0	4	
July 10						(6)	(27)	(235)
191·059	212	0·643	253. 24	210. 54	− 7. 20	6	23	247 *np*
	213	0·184	246. 28	182. 19	− 0. 9	0	4	
July 10						(6)	(27)	(247)
192·987	212	0·886	259. 20	208. 20	− 7. 20			604
July 12								(604)
193·005	212	0·891	259. 30	208. 40	− 7. 20			613
July 12								(613)
194·089		0·952	261. 0	203. 40	− 7. 10			479
July 13								(479)
197·988		0·968	279. 0	156. 50	+ 9. 50			188
July 17								(188)
200·091	215	0·835	89. 43	356. 37	+ 2. 58	0	58	
July 19						(0)	(58)	
201·036	215	0·697	91. 2	356. 33	+ 2. 54	6	30	
	216	0·867	101. 11	341. 51	− 7. 4	0	9	463 *nf*
July 20						(6)	(39)	(463)
201·106	215	0·683	91. 57	356. 47	+ 2. 22	6	42	
	216	0·855	102. 14	342. 26	− 7. 43	18	35	284 *nf*
July 20						(24)	(77)	(284)
202·085	215	0·496	94. 21	357. 12	+ 2. 19	0	10	
	216	0·714	105. 44	343. 3	+ 7. 26	0	5	284 *nf*
	217	0·959	102. 17	314. 50	−10. 12	32	113	266 *f*
July 21						(32)	(128)	(550)
1876.			° ′	° ′	° ′			
202d·102	215	0·489	94. 43	357. 29	+ 2. 11	0	5	
	216	0·708	106. 1	343. 22	− 7. 30	0	3	262 *nf*
	217	0·955	102. 33	315. 24	−10. 20	32	129	323 *f*
July 21						(32)	(137)	(585)
202·923	215	0·308	98. 16	357. 59	+ 2. 26	0	9	
	217	0·886	104. 10	315. 10	− 9. 59	18	102	353 *f*
July 22						(18)	(111)	(353)
202·979	215	0·299	98. 59	357. 48	+ 2. 18	0	9	
	217	0·882	104. 7	314. 54	− 9. 50	28	102	428 *f*
July 23						(28)	(111)	(428)
205·985	217	0·436	128. 4	314. 50	−10. 26	24	92	
		0·810	101. 10	282. 20	− 5. 40			278
July 25						(24)	(92)	(278)
206·000	217	0·438	128. 13	314. 34	−10. 30	19	107	
		0·811	100. 40	282. 0	− 5. 20			308
July 25						(19)	(107)	(308)
206·933	217	0·309	154. 45	314. 57	−10. 41	23	82	
July 26						(23)	(82)	
206·958	217	0·305	156. 3	315. 5	−10. 39	14	59	
July 26						(14)	(59)	
207·093	217	0·294	162. 7	315. 15	−10. 40	19	57	
July 26						(19)	(57)	
207·926	217	0·302	199. 26	315. 20	−10. 54	18	46	
July 27						(18)	(46)	
207·940	217	0·304	199. 28	315. 12	−11. 0	14	37	
July 27						(14)	(37)	
214·010		0·826	257. 40	283. 10	− 6. 40			268
Aug. 2								(268)
214·017		0·843	259. 10	285. 1	− 5. 50			252
Aug. 2								(252)
215·050		0·946	261. 10	285. 10	− 6. 20			179
Aug. 3								(179)
218·960		0·865	261. 50	222. 30	− 3. 50			261
	218	0·908	278. 13	229. 11	+10. 6	0	87	
Aug. 7						(0)	(87)	(261)

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

Group 212. Group consisting mainly of three fairly large spots, of which two disappear on July 7.
Group 213. Group of small spots.
Group 214. Single small spot.
Group 215. Single small spot.
Group 216. Single small spot.
Group 217. Single small spot.
Group 218. Single small 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.		Spots.		Faculæ.
				Longitude.	Latitude.	Area of UMBRA for each Spot (and for Day).	Area of WHOLE for each Spot (and for Day).	Area for each Group (and for Day).
1876.			° ′	° ′	° ′			
220d·962		0·952	256. 40	207. 20	−10. 30			164
Aug. 9								(164)
220·999		0·950	256. 50	206. 30	−10. 20			134
Aug. 9								(134)
227·999	219	0·791	105. 53	354. 5	− 8. 8	0	41	
Aug. 16						(0)	(41)	
228·965	219	0·651	109. 32	353. 16	− 7. 9	46	127	
Aug. 17						(46)	(127)	
234·898	220	0·367	139. 50	299. 6	− 9. 23	9	42	
Aug. 23						(9)	(42)	
234·908	220	0·366	140. 34	299. 13	− 9. 30	14	37	
Aug. 23						(14)	(37)	
237·086	220	0·406	227. 5	301. 28	− 9. 13	34	97	
		0·863	103. 40	226. 20	− 8. 0			271
Aug. 25						(34)	(97)	(271)
240·959	220	0·942	256. 41	301. 11	− 9. 56	0	27	503 *p*
Aug. 29						(0)	(27)	(503)
241·003	220	0·943	256. 50	300. 42	− 9. 50	0	27	429 *p*
Aug. 29						(0)	(27)	(429)
242·945	221	0·374	162. 48	200. 6	−13. 40	14	46	
Aug. 31						(14)	(46)	
242·956	221	0·374	161. 27	199. 27	−13. 31	14	41	
Aug. 31						(14)	(41)	
244·092	221	0·389	207. 6	201. 53	−13. 4	19	75	
Sept. 1						(19)	(75)	
244·105	221	0·396	208. 47	201. 45	−13. 8	14	65	
Sept. 1						(14)	(65)	
248·075		0·949	266. 50	210. 0	− 0. 40			158
	221	0·892	250. 52	198. 41	−13. 25	0	9	608 *np*
Sept. 5						(0)	(9)	(766)
248·088		0·946	266. 50	209. 20	−0. 30			145
	221	0·888	250. 59	198. 3	−13. 10	0	9	608 *np*
Sept. 5						(0)	(9)	(753)
249·015	221	0·964	253. 30	198. 20	−13. 50			344
Sept. 6								(344)

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.		Spots.		Faculæ.
				Longitude.	Latitude.	Area of UMBRA for each Spot (and for Day).	Area of WHOLE for each Spot (and for Day).	Area for each Group (and for Day).
1876.			° ′	° ′	° ′			
249d·043	221	0·967	253. 10	198. 30	−14. 10			344
Sept. 6								(344)
260·907	222	0·946	279. 32	41. 16	+11. 17	0	37	161 *p*
	223	0·305	160. 59	323. 42	− 9. 37	35	128	
Sept. 18						(35)	(165)	(161)
260·973	222	0·948	279. 50	40. 48	+11. 34	0	25	136 *p*
	223	0·300	163. 14	323. 35	− 9. 33	31	123	
Sept. 18						(31)	(148)	(136)
264·025		0·940	92. 10	218. 40	+ 0. 20			670
Sept. 21								(670)
264·033		0·943	92. 10	218. 0	+ 0. 20			670
Sept. 21								(670)
264·935		0·870	93. 30	216. 20	+ 0. 30			884
		0·956	109. 20	206. 40	−16. 0			161
Sept. 22								(1045)
264·945		0·865	93. 40	216. 40	+ 0. 20			902
		0·957	109. 30	206. 20	−16. 20			161
Sept. 22								(1063)
264·955		0·862	93. 10	216. 50	+ 0. 50			798
		0·960	109. 50	205. 40	−16. 40			176
Sept. 22								(974)
270·955	224	0·678	107. 2	156. 19	− 6. 20	75	335	
Sept. 28						(75)	(335)	
270·975	224	0·672	107. 13	156. 31	− 6. 18	87	347	
Sept. 28						(87)	(347)	
271·944	224	0·510	114. 36	156. 6	− 6. 18	113	403	
Sept. 29						(113)	(403)	
272·045	224	0·495	115. 48	155. 56	− 6. 25	113	438	
Sept. 29						(113)	(438)	
277·044	224	0·700	256. 59	159. 28	− 4. 22	39	180	
Oct. 4						(39)	(180)	
277·938	224	0·827	260. 9	159. 19	− 4. 27	46	168	349 *sf*
Oct. 5						(46)	(168)	(349)
277·948	224	0·829	260. 20	159. 24	− 4. 20	46	175	357 *sf*
Oct. 5						(46)	(175)	(357)

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

Group 219. Two spots.

Group 220. Only one spot is seen at first, but a second of equal size appears on August 25.

Group 221. Two small spots, one of which breaks into small fragments on September 1, and finally disappears on September 5. The group is partly hidden by the wire on the second photograph on August 31 (242·956).

Group 222. Single spot.

Group 223. Two small spots.

Group 224. Two spots of nearly equal size, of which the preceding spot grows larger and the following spots smaller on October 4 and 5.

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

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.		Spots.		Faculæ.	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.		Spots.		Faculæ.
				Longitude.	Latitude.	Area of UMBRA for each Spot (and for Day).	Area of WHOLE for each Spot (and for Day).	Area for each Group (and for Day).					Longitude.	Latitude.	Area of UMBRA for each Spot (and for Day).	Area of WHOLE for each Spot (and for Day).	Area for each Group (and for Day).
1876.			° ′	° ′	° ′				1876.			° ′	° ′	° ′			
279d·065	224	0·942	263. 22	159. 20	− 4. 3	34	131	405 *s f*	319d·070	228	0·663	91. 10	240. 56	+ 1. 7	17	62	
		0·980	103. 40	13. 20	−12. 0			165		229*a*	0·886	104. 37	221. 24	−11. 41	65	169	303 *s f*
Oct. 6						(34)	(131)	(570)		*b*	0·921	102. 59	216. 26	−10. 54	37	120	
									Nov. 15						(119)	(351)	(303)
284·059	225	0·298	158. 57	17. 43	−10. 9	2	18										
Oct. 11						(2)	(18)		319·971	228	0·493	92. 21	241. 0	+ 0. 57	5	28	
										229*a*	0·782	107. 19	220. 52	−11. 51	39	121	
284·998	225	0·301	198. 50	17. 13	−10. 36	29	99			*b*	0·841	104. 28	214. 37	−10. 45	29	91	
		0·977	94. 0	294. 30	− 2. 30			142	Nov. 16						(73)	(240)	
Oct. 12						(29)	(99)	(142)									
289·937	225	0·961	258. 17	18. 50	− 9. 37	172	718	528 *c*	320·004	228	0·490	92. 28	240. 47	+ 0. 54	5	28	
Oct. 17						(172)	(718)	(528)		229*a*	0·777	107. 40	220. 59	−12. 1	33	140	
										b	0·837	104. 44	214. 39	−10. 53	23	90	
289·948	225	0·960	258. 24	18. 28	− 9. 28	144	732	556 *c*	Nov. 16						(61)	(258)	
Oct. 17						(144)	(732)	(556)									
									320·015	228	0·487	92. 11	240. 50	+ 1. 3	9	33	
290·018	225	0·963	259. 0	18. 19	− 9. 0	115	631	579 *c*		229*a*	0·778	107. 29	220. 43	−11. 54	37	136	
		0·945	90. 50	234. 40	+ 1. 0			150		*b*	0·839	104. 40	214. 18	−10. 52	23	81	
Oct. 17						(115)	(631)	(729)	Nov. 16						(69)	(250)	
291·938	226	0·912	107. 27	216. 48	−13. 29	73	332	612 *f*	322·988	229*a*	0·271	145. 36	221. 42	−10. 50	30	105	
		0·844	91. 40	222. 40	+ 1. 30			136		*b*	0·364	128. 29	213. 50	−11. 5	16	61	
		0·896	91. 20	216. 40	+ 1. 10			68		230	0·954	260. 51	302. 23	− 8. 5	0	26	349 *n f*
Oct. 19						(73)	(332)	(816)	Nov. 19						(46)	(192)	(349)
291·956	226	0·908	107. 37	217. 9	−13. 31	52	290	578 *f*	322·998	229*a*	0·270	145. 40	221. 17	−10. 48	23	98	
		0·838	91. 0	223. 0	+ 2. 10			170		*b*	0·363	128. 14	213. 22	−10. 58	13	56	
		0·897	91. 30	216. 20	+ 1. 0			39		230	0·954	260. 57	302. 18	− 7. 59	0	26	349 *n f*
Oct. 19						(52)	(290)	(787)	Nov. 19						(36)	(180)	(349)
292·013	226	0·901	107. 39	217. 19	−13. 20	62	301	692 *f*	332·997		0·956	102. 50	26. 50	−12. 0			186
		0·781	93. 30	228. 0	+ 0. 40			157	Nov. 29								(186)
		0·888	92. 0	216. 40	+ 0. 40			68									
Oct. 19						(62)	(301)	(917)	339·963		0·915	99. 50	301. 20	− 9. 0			136
									Dec. 6								(136)
313·072	227	0·876	98. 47	301. 3	− 6. 5	0	28	202 *p*									
Nov. 9						(0)	(28)	(202)	347·061		0·799	104. 50	221. 20	−12. 20			287
									Dec. 13								(287)
318·082	228	0·819	90. 4	240. 31	+ 1. 28	34	125	190 *p*									
Nov. 14						(34)	(125)	(190)									
									356·038	231	0·272	36. 47	145. 37	+10. 28	84	707	
318·965	228	0·684	90. 57	240. 41	+ 1. 12	17	68		Dec. 22						(84)	(707)	
	229*a*	0·905	104. 5	220. 15	−11. 34	49	149	260 *s f*									
	b	0·937	102. 34	215. 18	−10. 49	37	132		356·060	231	0·273	37. 8	145. 9	+10. 33	93	627	
Nov. 15						(103)	(349)	(260)	Dec. 22						(93)	(627)	

The photographs of the Sun taken on the following days in the year 1876 show no Spots nor groups of Faculæ sufficiently distinct to be measured :—January 12 ; April 22, 26, 28 ; May 5, 16, 18 to 21, 29, 30 ; June 7, 12, 14, 16, 27 ; July 14, 15 ; August 5, 8, 11, 14, 15, 21 ; September 7, 8, 25 ; October 9, 31 ; November 1, 7, 8, and 28.

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 224. Two spots of nearly equal size, of which the preceding spot grows larger and the following spots smaller on October 4 and 5.
Group 225. Scattered group.
Group 226. One large spot, and two or three small ones.
Group 227. Single spot.
Group 228. Single spot.
Group 229. Two spots of nearly equal size.
Group 230. Single spot.
Group 231. Single spot.

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 1877.

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).
1877.			° ′	° ′	° ′			
14d·085		0·903	285. 30					192
	232	0·247	14. 34	194. 53	+ 8. 58	55	215	
	233	0·800	72. 40	147. 39	+10. 45	75	325	706 *n f*
Jan. 15						(130)	(540)	(898)
21·990	233	0·823	288. 4	147. 8	+11. 27	14	78	
Jan. 23						(14)	(78)	
22·010	233	0·824	288. 23	146. 56	+11. 43	18	98	
Jan. 23						(18)	(98)	
23·036	233	0·926	285. 3	146. 17	+11. 38	17	86	283 *n f*
Jan. 24						(17)	(86)	(283)
25·033	234	0·710	94. 37	9. 0	− 7. 20	0	28	200 *c*
Jan. 26						(0)	(28)	(200)
27·967		0·945	98. 10					299
Jan. 29								(299)
29·023	234*	0·865	94. 30	301. 42	− 6. 56	0	11	218 *p*
Jan. 30						(0)	(11)	(218)
29·045	234*	0·862	94. 22	301. 40	− 7. 25	0	7	162 *p*
Jan. 30						(0)	(7)	(162)
33·057	234*	0·088	113. 33	304. 2	− 8. 19	0	16	
Feb. 3						(0)	(16)	
36·959	234*	0·827	265. 23	313. 21	− 7. 30	0	6	
	235	0·900	75. 34	195. 18	+ 9. 55	28	124	
Feb. 7						(28)	(130)	
38·013	235	0·779	72. 9	194. 53	+ 9. 26	32	165	
Feb. 8						(32)	(165)	
38·033	235	0·776	72. 0	194. 55	+ 9. 28	30	142	
Feb. 8						(30)	(142)	
45·995	235	0·859	284. 59	195. 18	+ 9. 3	28	131	198 *p*
		0·855	80. 10					104
Feb. 16						(28)	(131)	(302)
46·020	235	0·861	284. 44	195. 15	+ 8. 54	28	115	209 *p*
		0·852	80. 50					79
Feb. 16						(28)	(115)	(288)

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).
			° ′	° ′	° ′			
1877.								
47d·019	235	0·954	281. 41	195. 35	+ 8. 53	21	146	315 *n*
Feb. 17						(21)	(146)	(315)
47·047	235	0·954	281. 54	195. 13	+ 9. 5	45	145	116 *n*
Feb. 17						(45)	(145)	(116)
49·059		0·872	289. 30					176
Feb. 19								(176)
57·046	236	0·837	76. 7	297. 58	+ 7. 26	36	133	596 *n f*
Feb. 27						(36)	(133)	(596)
66·100	237	0·526	261. 3	265. 17	−10. 51	0	36	
Mar. 8						(0)	(36)	
66·118	237	0·532	261. 19	265. 24	−10. 44	0	36	
Mar. 8						(0)	(36)	
68·052	237	0·909	262. 36	273. 39	− 9. 43	0	39	223 *f*
Mar. 10						(0)	(39)	(223)
68·065	237	0·910	262. 31	273. 38	− 9. 47	0	41	252 *f*
Mar. 10						(0)	(41)	(252)
74·935	238	0·194	248. 6	127. 33	−11. 5	0	34	
Mar. 17						(0)	(34)	
75·027	238	0·228	251. 14	128. 29	−11. 5	9	43	
Mar. 17						(9)	(43)	
75·886	238	0·417	258. 25	128. 59	−11. 12	45	187	
Mar. 18						(45)	(187)	
75·911	238	0·430	258. 36	129. 30	−11. 14	46	207	
Mar. 18						(46)	(207)	
77·014	238	0·640	261. 0	129. 34	−11. 7	55	290	
Mar. 19						(55)	(290)	
77·110	238	0·656	261. 4	129. 32	−11. 8	22	231	
Mar. 19						(22)	(231)	
79·836	238	0·978	258. 54	131. 15	−12. 15	40	149	337 *n f*
Mar. 22						(40)	(149)	(337)
80·094	238	0·991	259. 48	132. 18	−11. 0	60	197	409 *n f*
Mar. 22						(60)	(197)	(409)

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 232. One regular spot. Group 233. One regular spot. It preserves its form, but decreases in size as it crosses the Sun. Group 234. One small faint spot.

Group 234*. Very small faint spot, that breaks up into several fragments on February 3. On the second photograph on January 30 (29·045) it is spoilt by a particle of dust.

Group 235. A well-defined regular spot which gradually diminishes in size, but does not otherwise change its form.

Group 236. A group of three or four small spots. Group 237. Faint ill-defined spot, which breaks up into several spots on March 10.

Group 238. A scattered group of ill-defined spots, which gradually condenses into two well-defined spots. On March 22, one of the spots has gone off the limb, and the other is only partly visible. The first photograph on March 18 (75·886) is too much exposed; the second (75·911) is insufficiently exposed.

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.		Spots.		Faculæ.	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.		Spots.		Faculæ.
				Longitude.	Latitude.	Area of UMBRA for each Spot (and for Day).	Area of WHOLE for each Spot (and for Day).	Area for each Group (and for Day).					Longitude.	Latitude.	Area of UMBRA for each Spot (and for Day).	Area of WHOLE for each Spot (and for Day).	Area for each Group (and for Day).
1877.			° ′	° ′	° ′				1877.			° ′	° ′	° ′			
80d·907		0·899	69. 40					242	105d·964		0·908	258. 20					159
		0·980	97. 10					422		240	0·610	252. 21	104. 26	−14. 51	70	386	
Mar. 23								(664)	Apr. 17						(70)	(386)	(159)
81·098		0·889	81. 10					231	105·988		0·910	257. 0					262
		0·973	97. 40					360		240	0·618	252. 0	104. 38	−15. 10	69	415	
Mar. 23								(591)	Apr. 17						(69)	(415)	(262)
81·963		0·927	97. 10					706	107·994	240	0·887	256. 12	103. 26	−14. 34	73	316	349 *f*
Mar. 24								(706)	Apr. 19						(73)	(316)	(349)
81·984		0·924	95. 30					753	108·051	240	0·895	256. 32	103. 43	−14. 18	43	288	324 *f*
Mar. 24								(753)	Apr. 19						(43)	(288)	(324)
85·061		0·928	100. 10					446	108·915	240	0·963	256. 29	103. 31	−14. 21	39	209	324 *f*
Mar. 27								(446)		241	0·715	84. 31	343. 27	+ 0. 24	0	43	263 *n*
											0·974	79. 10					96
									Apr. 20						(39)	(252)	(683)
88·927		0·775	294. 50					208									
Mar. 31								(208)	109·025	240	0·968	257. 26	103. 12	−13. 24	72	276	386 *f*
										241	0·694	84. 21	343. 42	+ 0. 18	8	38	375 *n*
93·064		0·946	261. 20					273			0·967	80. 0					133
		0·933	285. 50					237	Apr. 20						(80)	(314)	(894)
		0·951	177. 0					156									
Apr. 4								(666)	111·898	241	0·123	15. 51	347. 18	+ 2. 3	20	92	
										242	0·718	96. 9	303. 21	− 7. 41	23	77	
93·077		0·951	282. 50					256	Apr. 23						(43)	(169)	
		0·909	283. 20					221									
Apr. 4								(477)	111·917	241	0·120	19. 35	346. 40	+ 1. 45	34	181	
										242	0·722	96. 1	302. 45	− 7. 36	19	68	
94·064		0·952	279. 0					354	Apr. 23						(53)	(249)	
Apr. 5								(354)									
94·931	239	0·984	101. 45	132. 47	−12. 37	0	52	186 *c*	112·911	241	0·240	300. 37	347. 43	+ 2. 29	25	72	
Apr. 6						(0)	(52)	(186)		242	0·534	96. 47	303. 39	− 7. 31	13	47	
									Apr. 24						(38)	(119)	
95·069	239	0·980	101. 38	132. 8	−12. 36	16	73	228 *c*									
Apr. 6						(16)	(73)	(228)	112·935	241	0·242	298. 53	347. 42	+ 2. 10	20	66	
										242	0·534	96. 46	303. 20	− 7. 31	8	35	
95·954	239	0·917	101. 24	132. 47	−12. 50	6	31	407 *c*	Apr. 24						(28)	(101)	
Apr. 7						(6	(31)	(407)									
									113·904	241	0·444	285. 8	348. 0	+ 2. 33	22	76	
95·966		0·914	286. 0					124		242	0·304	102. 7	305. 19	− 7. 57	17	53	
	239	0·917	101. 27	132. 37	−12. 53	0	37	483 *c*	Apr. 25						(39)	(129)	
Apr. 7						(0)	(37)	(607)									
									113·929	241	0·449	284. 16	348. 6	+ 2. 15	18	59	
100·909		0·877	267. 0					140		242	0·302	103. 10	305. 12	− 8. 15	14	43	
Apr. 12								(140)	Apr. 25						(32)	(102)	

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 239. One small well-defined spot.

Group 240. A group composed of three spots, of which the smallest gradually disappears.

Group 241. A group of small spots which change greatly on April 23.

Group 242. A group consisting principally of two small spots, of which one disappears on April 27.

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).
			° ′	° ′	° ′			
1877.								
116d·047	241	0·821	277. 26	348. 5o	+ 3. 35	o	22	356 *nf*
	242	0·282	261. 1	310. 36	— 6. 39	13	53	
Apr. 27						(13)	(75)	(356)
116·073	241	0·825	277. 23	348. 53	+ 3. 35	o	24	265 *nf*
	242	0·288	261. 54	310. 39	— 6. 27	13	58	
Apr. 27						(13)	(82)	(265)
119·054	242	0·893	246. 26	317. 58	— 6. 47	11	33	468 *f*
	243	0·827	50. 54	207. 5o	+28. 38	o	25	136 *nf*
Apr. 30						(11)	(58)	(604)
121·922	243	0·569	12. 41	208. 28	+29. 54	13	54	
May 3						(13)	(54)	
121·934	243	0·572	12. 2	208. 40	+30. 12	13	42	
May 3						(13)	(42)	
123·016	243	0·561	350. 56	208. 6	+29. 54	o	32	
	244	0·259	273. 27	217. 12	— 2. 35	12	49	
May 4						(12)	(81)	
123·940	244	0·490	272. 5	219. 16	— 2. 2	9	33	
May 5						(9)	(33)	
123·953	244	0·492	272. 27	219. 14	— 1. 51	12	29	
May 5						(12)	(29)	
125·902	244	0·838	270. 10	220. 51	— 1. 40	4	12	125 *f*
		0·808	311. 3o					233
	245	0·874	104. 23	103. 31	—14. 9	31	159	218 *sf*
May 7						(35)	(171)	(576)
125·926	244	0·838	270. 1	220. 33	— 1. 48	3	10	
		0·789	313. o					224
	245	0·867	104. 39	104. 4	—14. 19	39	142	241 *sf*
May 7						(42)	(152)	(465)
126·899	244	0·942	269. 14	221. 10	— 1. 48	o	15	272 *f*
		0·894	306. 5o					186
	245	0·744	106. 13	103. 42	—14. 7	28	118	
		0·949	80. 10					233
May 8						(28)	(133)	(691)
1877.								
126d·923	244	0·943	269. 3	220. 59	— 1. 58	o	24	131 *f*
		0·888	306. 10					196
	245	0·741	106. 22	103. 38	—14. 12	34	160	215 *sf*
		0·947	80. 10					226
May 8						(34)	(184)	(768)
127·947		0·962	302. 30					221
		0·929	262. 5o					135
	245	0·574	110. 33	103. 35	—14. 8	18	57	
	246	0·823	77. 51	82. 57	+ 8. 9	9	3o	176 *nf*
May 9						(27)	(87)	(532)
127·962		0·961	302. 3o					192
		0·920	265. o					122
	245	0·571	110. 33	103. 35	—14. 5	15	65	
	246	0·822	77. 51	82. 5o	+ 8. 9	13	40	216 *nf*
May 9						(28)	(105)	(530)
128·939	245	0·393	120. 2	103. 3o	—14. 5	19	66	
	246	0·680	74. 21	82. 41	+ 8. 19	3o	106	
May 10						(49)	(172)	
128·999	245	0·382	120. 35	103. 27	—13. 56	18	69	
	246	0·672	73. 51	82. 36	+ 8. 3o	3o	108	
May 10						(48)	(177)	
130·091	245	0·213	155. 49	103. 35	—13. 59	14	61	
	246	0·439	64. 19	85. 15	+ 8. 19	26	139	
May 11						(40)	(200)	
134·033	246	0·522	291. 12	85. 57	+ 8. 46	21	107	
May 15						(21)	(107)	
134·065	246	0·529	291. 12	86. o	+ 8. 55	25	103	
May 15						(25)	(103)	
136·910	246	0·931	280. 14	86. 15	+ 8. 44	o	14	391 *nf*
	247	0·834	76. 36	323. 18	+ 9. 57	21	96	306 *f*
		0·834	97. 3o					112
May 18						(21)	(110)	(809)
136·925	246	0·934	279. 56	86. 31	+ 8. 3o	o	13	373 *nf*
	247	0·834	76. 27	323. 7	+10. 4	31	87	298 *f*
		0·909	97. 5o					170
May 18						(31)	(100)	(841)
142·970	247	0·473	291. 21	324. 42	+ 8. 41	19	89	
May 24						(19)	(89)	

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 241. A group of small spots which change greatly on April 23.

Group 242. A group consisting principally of two small spots, of which one disappears on April 27.

Group 243. A scattered group of small faint spots.

Group 244. A scattered group of small faint spots, condensing on May 5 into a single spot.

Group 245. A single well-defined spot.

Group 246. One small well-defined spot. A second appears on May 10, but soon disappears again.

Group 247. One small spot. A second appears on May 24, and a third on May 26.

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.		Spots.		Faculæ.	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.		Spots.		Faculæ.
				Longitude.	Latitude.	Area of UMBRA for each Spot (and for Day).	Area of WHOLE for each Spot (and for Day).	Area for each Group (and for Day).					Longitude.	Latitude.	Area of UMBRA for each Spot (and for Day).	Area of WHOLE for each Spot (and for Day).	Area for each Group (and for Day).
1877.			° ′	° ′	° ′				1877.			° ′	° ′	° ′			
143d·940	247	0·638	285. 58	323. 46	+ 9. 7	26	92		156d·033	249	0·334	123. 10	109. 3	−10. 16	40	151	
May 25						(26)	(92)		June 6						(40)	(151)	
143·980	247	0·643	285. 47	323. 40	+ 9. 5	31	94		156·907	249	0·207	153. 55	108. 38	−10. 20	36	150	
May 25						(31)	(94)		June 7						(36)	(150)	
144·936	247	0·795	281. 57	324. 1	+ 8. 46	7	65	493 *n*	156·919	249	0·205	153. 46	108. 30	−10. 13	36	138	
	248	0·623	256. 27	310. 1	− 9. 14	13	58		June 7						(36)	(138)	
May 26						(20)	(123)	(493)	157·948	249	0·237	216. 55	108. 25	−10. 25	36	165	
144·946	247	0·800	281. 47	324. 25	+ 8. 42	7	57	423 *n*	June 8						(36)	(165)	
	248	0·628	256. 20	310. 15	− 9. 22	17	47		158·064	249	0·254	222. 8	108. 32	−10. 20	37	154	
May 26						(24)	(104)	(423)	June 8						(37)	(154)	
146·920		0·972	281. 20					200	158·903	249	0·399	241. 54	108. 21	−10. 15	56	250	
		0·908	259. 30					177	June 9						(56)	(250)	
May 28								(377)	158·935	249	0·406	242. 21	108. 24	−10. 16	42	191	
147·883		0·978	260. 50					207	June 9						(42)	(191)	
May 29								(207)	160·962	249	0·758	254. 58	108. 13	−10. 45	32	189	266 *c*
147·936		0·977	260. 50					292	June 11						(32)	(189)	(266)
May 29								(292)	160·975	249	0·761	255. 5	108. 19	−10. 42	33	178	373 *c*
152·993	249	0·851	102. 19	108. 13	−10. 30	10	39	186 *nf*	June 11						(33)	(178)	(373)
		0·957	75. 30					176	163·911		0·818	77. 30					153
June 3						(10)	(39)	(362)			0·920	100. 10					444
153·004	249	0·850	102. 15	108. 10	−10. 26	11	35	134 *nf*	June 14								(597)
		0·960	76. 10					248	163·921		0·814	78. 20					147
June 3						(11)	(35)	(382)			0·906	99. 40					485
153·912		0·898	277. 30					140	June 14								(632)
	249	0·730	104. 18	107. 46	−10. 22	42	260		164·890		0·780	101. 30					343
June 4						(42)	(260)	(140)	June 15								(343)
153·951	249	0·723	104. 17	107. 49	−10. 15	32	215		164·904		0·799	101. 50					177
June 4						(32)	(215)		June 15								(177)
154·921	249	0·557	108. 56	107. 58	−10. 17	43	221		165·912		0·737	83. 50					205
June 5						(43)	(221)		June 16								(205)
154·960	249	0·549	109. 2	108. 1	−10. 11	41	178		174·894		0·944	256. 40					203
June 5						(41)	(178)			250	0·302	150. 32	227. 7	−12. 45	24	59	
155·894	249	0·363	120. 23	108. 51	−10. 20	25	135				0·883	91. 30					160
June 6						(25)	(135)		June 25						(24)	(59)	(363)

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 247. One small spot. A second appears on May 24, and a third on May 26.

Group 248. Two small spots.

Group 249. Two spots, one of them very small.

Group 250. 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.		Spots.		Faculæ.	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.		Spots.		Faculæ.
				Longitude.	Latitude.	Area of UMBRA for each Spot (and for Day).	Area of WHOLE for each Spot (and for Day).	Area for each Group (and for Day).					Longitude.	Latitude.	Area of UMBRA for each Spot (and for Day).	Area of WHOLE for each Spot (and for Day).	Area for each Group (and for Day).
			° ′	° ′	° ′							° ′	° ′	° ′			
1877.									1877.								
174d·961		0·968	257. 40					197	189d·961		0·859	279. 40					208
	250	0·294	154. 53	227. 38	−12. 55	24	81		July 10								(208)
		0·865	91. 10					152									
June 25						(24)	(81)	(349)	191·995		0·928	102. 10					245
									July 12								(245)
177·039		0·899	269. 10					128									
June 27								(128)									
									197·952	253	0·563	237. 10	319. 39	−13. 29	6	16	
177·983	251	0·593	245. 1	228. 8	−12. 7	10	31				0·870	108. 40					258
		0·973	101. 10					197	July 18						(6)	(16)	(258)
June 28						(10)	(31)	(197)									
									197·984	253	0·567	237. 41	319. 38	−13. 23	6	15	
177·996	251	0·586	245. 2	227. 31	−11. 55	9	29				0·869	109. 30					258
		0·978	100. 40					232	July 18						(6)	(15)	(258)
June 28						(9)	(29)	(232)									
									200·012		0·937	282. 50					248
178·949	251	0·749	249. 49	228. 7	−12. 55	34	110	326 *f*			0·859	253. 50					187
		0·936	217. 50					228	July 20								(435)
		0·913	101. 40					286									
June 29						(34)	(110)	(840)	200·026		0·956	284. 10					71
											0·857	253. 20					242
178·968	251	0·749	250. 19	227. 59	−12. 33	30	84	273 *f*	July 20								(313)
		0·937	218. 0					86									
		0·911	101. 30					244	201·004		0·944	278. 30					109
June 29						(30)	(84)	(603)			0·939	255. 0					250
									July 21								(359)
182·932	252	0·626	77. 17	91. 12	+10. 32	8	30										
July 3						(8)	(30)		201·024		0·951	279. 20					80
											0·936	254. 20					271
182·951	252	0·626	77. 5	90. 58	+10. 39	12	32		July 21								(351)
July 3						(12)	(32)										
									209·908		0·880	48. 30					36
183·934		0·786	270. 20					111	July 30								(36)
	252	0·399	73. 12	93. 27	+ 9. 47	6	35										
July 4						(6)	(35)	(111)	209·924		0·877	48. 40					66
									July 30								(66)
183·945		0·791	269. 0					121									
	252	0·400	73. 22	93. 14	+ 9. 44	0	27		210·898		0·799	44. 10					116
July 4						(0)	(27)	(121)	July 31								(116)
184·900	252	0·188	55. 50	94. 21	+ 9. 33	0	27		210·917		0·801	44. 20					65
July 5						(0)	(27)		July 31								(65)
184·913	252	0·191	56. 16	93. 59	+ 9. 34	2	23		213·015	254	0·616	282. 24	129. 17	+12. 21	17	43	
July 5						(2)	(23)		Aug. 2						(17)	(43)	
189·910		0·848	279. 20					171	213·031	254	0·617	282. 28	129. 8	+12. 24	20	50	
July 10								(171)	Aug. 2						(20)	(50)	

The groups of Spots are numbered in the order of their appearance at the E. limb of the Sun. Where 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 250. Two small spots, apparently distinct from 251, which appears later in the same place.

Group 251. A very close pair of well-defined small spots.

Group 252. One very small spot which breaks up into two or three on July 4.

Group 253. One very small spot.

Group 254. Two very small spots, one of which disappears on August 3.

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).
1877.			° ′	° ′	° ′			
213d·997 Aug. 3	254	0·790	280. 40	130. 47	+12. 8	0 (0)	26 (26)	104 *f* (104)
214·009 Aug. 3	254	0·793	280. 39	130. 56	+12. 8	0 (0)	14 (14)	104 *f* (104)
224·956 Aug. 14		0·860	107. 40					144 (144)
225·089 Aug. 14		0·856	108. 50					134 (134)
232·981 Aug. 22	255	0·991	83. 16	104. 39	+ 7. 35	15 (15)	94 (94)	208 *n* (208)
233·030 Aug. 22	255	0·990	82. 45	104. 24	+ 8. 9	38 (38)	138 (138)	460 *n* (460)
233·990 Aug. 23	255	0·942	83. 15	103. 16	+ 8. 42	28 (28)	151 (151)	685 *nf* (685)
234·078 Aug. 23	255	0·935	83. 36	103. 17	+ 8. 28	35 (35)	146 (146)	623 *nf* (623)
234·930 Aug. 24	255	0·849	84. 4	103. 16	+ 8. 46	27 (27)	260 (260)	848 *f* (848)
234·950 Aug. 24	255	0·847	84. 4	103. 13	+ 8. 46	32 (32)	200 (200)	542 *f* (542)
238·971 Aug. 28	255	0·084	69. 30	103. 48	+ 8. 49	12 (12)	38 (38)	
238·984 Aug. 28	255	0·079	71. 4	103. 52	+ 8. 37	18 (18)	43 (43)	
240·061		0·941	267. 50					80
Aug. 29	255	0·179	277. 26	104. 15	+ 8. 24	13 (13)	29 (29)	(80)
240·078		0·942	268. 20					100
Aug. 29	255	0·184	277. 26	104. 19	+ 8. 25	8 (8)	30 (30)	(100)
241·899 Aug. 31	255	0·571	273. 21	104. 38	+ 7. 48	4 (4)	21 (21)	
1877. 241d·912 Aug. 31	255	0·575	273. 34	104. 46	+ 7. 56	3 (3)	17 (17)	
242·952		0·724	275. 30					555
Sept. 1		0·938	100. 0					184 (739)
243·059		0·732	275. 40					520
Sept. 1		0·931	100. 40					220 (740)
245·994 Sept. 4	256	0·926	82. 34	307. 16	+ 9. 36	32 (32)	143 (143)	308 *c* (308)
246·011 Sept. 4	256	0·936	82. 42	305. 25	+ 9. 22	17 (17)	90 (90)	284 *c* (284)
246·891 Sept. 5	256	0·833	83. 15	306. 6	+ 9. 37	50 (50)	220 (220)	356 *c* (356)
247·057 Sept. 5	256	0·811	83. 58	306. 2	+ 9. 7	42 (42)	211 (211)	236 *c* (236)
247·901 Sept. 6	256	0·682	83. 50	307. 9	+ 9. 30	62 (62)	228 (228)	149 (149)
247·970 Sept. 6	256	0·670	84. 39	307. 11	+ 8. 58	40 (40)	198 (198)	
248·892 Sept. 7	256	0·512	84. 20	306. 24	+ 9. 7	45 (45)	249 (249)	
251·005 Sept. 9	256	0·034	39. 15	308. 11	+ 8. 44	37 (37)	158 (158)	
251·035 Sept. 9	256	0·026	30. 59	308. 15	+ 8. 30	35 (35)	158 (158)	
253·899	256	0·607	274. 37	308. 47	+ 8. 32	30	108	
Sept. 12	257	0·790	110. 33	222. 26	−11. 21	23 (53)	85 (193)	250 *sf* (250)
253·911	256	0·606	274. 48	308. 35	+ 8. 39	22	103	
Sept. 12	257	0·787	110. 39	222. 35	−11. 21	15 (37)	64 (167)	171 *sf* (171)

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

Group 254. Two very small spots, one of which disappears on August 3.

Group 255. A good sized spot divided into three portions by bridges. On August 28 it has separated into two small spots, one of which disappears on August 29.

Group 256. Two spots; the following spot, which is small and faint, disappears on September 9; and a violent change takes place in the larger spot on September 4.

Group 257. One small 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).
1877.			° ′	° ′	° ′			
260d·018	257	0·593	240. 4	221. 53	−11. 7	0	18	
	258	0·445	115. 6	166. 42	− 4. 21	0	11	186 *c*
Sept. 18						(0)	(29)	(186)
260·029	257	0·592	240. 5	221. 42	−11. 5	2	12	
	258	0·431	116. 20	167. 37	− 4. 26	0	12	
Sept. 18						(2)	(24)	
262·915		0·941	253. 0					315
	258	0·340	231. 26	167. 28	− 5. 26	1	10	
Sept. 21						(1)	(10)	(315)
263·011		0·950	253. 40					345
	258	0·358	235. 8	168. 2	− 5. 3	1	13	
Sept. 21						(1)	(13)	(345)
265·895		0·835	257. 40					208
Sept. 24								(208)
265·914		0·848	259. 10					282
Sept. 24								(282)
268·088	259	0·901	101. 56	21. 29	− 7. 35	20	85	308 *s f*
Sept. 26						(20)	(85)	(308)
268·995	259	0·793	104. 44	21. 31	− 7. 19	0	26	
Sept. 27						(0)	(26)	
269·006	259	0·785	104. 49	22. 7	− 7. 12	8	33	381 *s f*
Sept. 27						(8)	(33)	(381)
269·911	259	0·651	109. 9	21. 45	− 7. 0	6	35	
Sept. 28						(6)	(35)	
271·015		0·880	281. 10					219
	259	0·453	119. 22	21. 59	− 6. 38	3	8	
		0·914	100. 40					52
Sept. 29						(3)	(8)	(271)
271·027		0·874	280. 40					262
	259	0·459	119. 23	21. 30	− 6. 50	2	9	
		0·927	101. 10					56
Sept. 29						(2)	(9)	(318)
272·915	260	0·458	196. 18	28. 2	−19. 26	3	80	
		0·941	82. 20					196
Oct. 1						(3)	(80)	(196)

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).
1877.			° ′	° ′	° ′			
276d·898		0·840	263. 0					240
Oct. 5								(240)
276·944		0·844	258. 30					244
Oct. 5								(244)
277·899		0·930	259. 30					362
Oct. 6								(362)
277·981		0·942	259. 50					415
Oct. 6								(415)
288·918		0·805	76. 20					95
Oct. 17								(95)
288·930		0·812	77. 0					69
Oct. 17								(69)
295·890		0·839	78. 30					170
Oct. 24								(170)
296·004		0·838	80. 10					143
Oct. 24								(143)
302·013		0·747	257. 30					120
	261	0·421	119. 40	334. 49	− 7. 57	139	605	
	262	0·703	97. 58	312. 25	− 2. 28	20	120	347 *c*
Oct. 30						(159)	(725)	(467)
302·942	261	0·267	141. 58	334. 40	− 7. 55	115	626	
	262	0·529	101. 1	313. 1	− 2. 10	27	127	
Oct. 31						(142)	(753)	
302·954	261	0·269	142. 45	334. 35	− 8. 8	133	698	
	262	0·527	101. 7	312. 59	− 2. 11	23	120	
Oct. 31						(156)	(818)	
303·928	261	0·220	194. 38	334. 22	− 8. 6	109	801	
	262	0·328	109. 10	313. 11	− 2. 14	30	154	
		0·775	81. 20					173
Nov. 1						(139)	(955)	(173)
303·961	261	0·223	197. 10	334. 33	− 8. 7	123	754	
	262	0·316	109. 18	313. 28	− 2. 1	20	124	
		0·788	283. 16					313
Nov. 1						(143)	(878)	(313)
305·976	261	0·538	247. 55	334. 19	− 8. 14	136	562	
	262	0·191	233. 47	313. 2	− 2. 35	20	82	
Nov. 3						(156)	(644)	
305·987	261	0·543	248. 11	334. 31	− 8. 13	103	561	
	262	0·185	234. 33	312. 37	− 2. 13	15	70	
Nov. 3						(118)	(631)	

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

Group 257. One small spot.

Group 258. Two small faint spots. The second photograph on September 18 (260·029) was taken through a cloud. The group is partly hidden by the wire on the second photograph on September 21 (263·011).

Group 259. One small spot.

Group 260. One very small spot.

Group 261. A large well-defined spot surrounded by several small fragments.

Group 262. A somewhat scattered group of small spots.

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

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).
1877.			° ′	° ′	° ′			
306d·987	261	0·712	254. 11	334. 29	— 8. 24	91	505	
	262	0·390	254. 34	312. 50	— 2. 24	8	39	
Nov. 4						(99)	(544)	
306·995	261	0·717	254. 55	334. 54	— 7. 59	111	580	
	262	0·397	254. 40	313. 10	— 2. 29	3	51	
Nov. 4						(114)	(631)	
307·942	261	0·845	257. 42	334. 34	— 8. 18	100	508	358 *c*
	262	0·590	259. 22	313. 35	— 3. 12	0	24	
Nov. 5						(100)	(532)	(358)
310·940		0·959	265. 10					539
Nov. 8								(539)
312·942		0·961	265. 10					405
Nov. 10								(405)
314·905		0·942	80. 40					188
Nov. 12								(188)
314·977		0·945	79. 40					194
Nov. 12								(194)
316·980	263	0·590	111. 0	125. 19	— 9. 23	37	123	
Nov. 14						(37)	(123)	
317·007	263	0·589	111. 8	124. 59	— 9. 59	39	98	
Nov. 14						(39)	(98)	
319·048	263	0·232	155. 14	126. 14	— 9. 41	16	58	
Nov. 16						(16)	(58)	
320·061	263	0·262	214. 35	127. 8	—10. 6	14	24	
Nov. 17						(14)	(24)	
320·111	263	0·267	214. 17	126. 35	—10. 25	15	29	
Nov. 17						(15)	(29)	
324·994		0·962	257. 20					176
		0·891	280. 10					102
	264	0·981	100. 34	335. 21	—10. 1	87	297	439 *c*
Nov. 22						(87)	(297)	(717)

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).
1877.			° ′	° ′	° ′			
325d·021		0·968	257. 10					189
		0·907	281. 10					105
	264	0·979	100. 41	335. 35	—10. 5	85	305	286 *c*
Nov. 22						(85)	(305)	(580)
325·918	264	0·922	101. 54	335. 2	—10. 18	84	371	791 *c*
Nov. 23						(84)	(371)	(791)
325·954	264	0·921	101. 51	334. 43	—10. 15	74	412	427 *c*
Nov. 23						(74)	(412)	(427)
329·044	264	0·461	114. 37	335. 2	— 9. 56	89	447	
Nov. 26						(89)	(447)	
329·059	264	0·466	115. 59	334. 48	—10. 39	101	488	
Nov. 26						(101)	(488)	
330·948	264	0·192	179. 15	334. 50	—10. 3	73	341	
Nov. 28						(73)	(341)	
330·990	264	0·193	181. 40	334. 47	—10. 7	72	344	
Nov. 28						(72)	(344)	
332·907	264	0·466	246. 33	334. 48	—10. 0	74	281	
Nov. 30						(74)	(281)	
332·948	264	0·478	247. 12	335. 7	—10. 1	61	241	
Nov. 30						(61)	(241)	
335·007	264	0·816	257. 20	335. 14	—10. 1	48	217	537 *s*
		0·966	62. 40					68
Dec. 2						(48)	(217)	(605)
335·029	264	0·822	257. 15	335. 34	—10. 10	52	189	390 *s*
		0·964	62. 30					60
Dec. 2						(52)	(189)	(450)
363·956		0·963	255. 10					234
	265	0·929	279. 33	327. 28	+ 7. 38	0	16	195 *f*
Dec. 31						(0)	(16)	(429)
363·976		0·956	256. 0					176
	265	0·958	278. 40	332. 23	+ 7. 21	0	52	189 *f*
Dec. 31						(0)	(52)	(365)

The photographs taken on the following days show no Spots:—January 29; February 19, 20, and 23; March 16, 23, 24, 27, 28, and 31; April 4, 5, 11, and 12; May 28, 29, and 30; June 12, 14, 15, 16, 17, 18, 19, 20, 21, 22, and 27; July 6, 7, 10, 12, 13, 18, 20, 21, 24, 25, 26, 29, 30, and 31; August 9, 12, 14, 16, 17, 18, 20, and 21; September 1, 22, and 24; October 2, 3, 5, 6, 8, 9, 11, 12, 15, 16, 17, 18, 20, and 24; November 8, 10, 12, and 20; December 8, 12, 13, 18, 26, and 28.

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 261. A large well-defined spot surrounded by several small fragments. Group 262. A somewhat scattered group of small spots.

Group 263. Two small spots, the second of which moves more quickly than the first, and grows gradually smaller.

Group 264. A well-defined spot, closely surrounded by several smaller ones.

Group 265. Two small spots, one on each side of a small but compact and very brilliant group of faculæ. On the first photograph on December 31 (363·956) only the following spot is clearly seen, on the second (363·976) only the preceding.

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, AND FOR EACH YEAR,

FROM 1873, JULY 11, TO THE END OF 1877.

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, from 1873, July 11.

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.
1	1873 July 11	237	1308	3773
2	August 6	118	683	4539
3	August 31	78	460	4295
4	September 25	153	798	3036
5	October 21	107	668	1719
6	November 15	37	244	1356
7	December 11	80	583	1456
8	1874 January 5	199	1172	3251
9	January 30	51	318	1688
10	February 25	47	426	436
11	March 22	71	532	282
12	April 16	54	488	60
13	May 12	39	305	248
14	June 6	39	436	513
15	July 2	174	1192	1519
16	July 27	206	1341	1963
17	August 21	34	248	1906
18	September 16	127	904	1645
19	October 11	42	227	794
20	November 6	60	437	773
21	December 1	17	138	255
22	December 26	17	99	1197
23	1875 January 21	21	107	1069
24	February 15	120	653	620
25	March 12	56	321	643
26	April 7	81	547	706
27	May 2	22	138	190
28	May 28	65	420	274
29	June 22	90	485	365
30	July 17	20	129	327
31	August 12	24	128	598
32	September 6	14	96	383
33	October 1	17	98	259
34	October 27	29	130	212
35	November 21	78	377	164
36	December 17	16	96	113
37	1876 January 11	50	302	226
38	February 5	66	348	318
39	March 2	57	248	510
40	March 27	8	40	324
41	April 21	9	38	267
42	May 17	0	0	62

No. of Rotation.	Date of commencement of each Rotation.	Mean Area.		
		Umbræ.	Whole Spots.	Faculæ.
43	1876 June 11	8	41	251
44	July 7	12	51	225
45	August 1	7	28	80
46	August 26	7	34	265
47	September 21	34	136	209
48	October 16	27	147	235
49	November 11	37	130	163
50	December 6	44	334	144
51	1877 January 1	41	186	345
52	January 26	13	64	131
53	February 20	18	92	85
54	March 17	8	41	320
55	April 12	34	157	192
56	May 7	22	95	255
57	June 2	16	73	126
58	June 27	5	18	188
59	July 22	1	5	30
60	August 17	21	102	217
61	September 11	6	33	199
62	October 6	35	187	46
63	November 1	52	239	184
64	November 26	27	115	75
65	December 22	0	5	128

Many of the photographs taken during the ninth and five following rotations, *i.e.*, between 1874, January 30, and 1874, July 2, do not show the Faculæ with sufficient distinctness to allow of their measurement; the mean areas of Faculæ given for these rotations are therefore too small.

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 YEAR, from 1873 to 1877.

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

Year.	Mean of Daily Areas.		
	Umbræ.	Whole Spots.	Faculæ.
1873	116	678	2882
1874	83	583	1095
1875	45	255	475
1876	25	132	226
1877	20	94	168

Many of the photographs taken during the early part of 1874 do not show the Faculæ with sufficient distinctness to allow of their measurement, the mean area of Faculæ given for that year is therefore too small. The mean of daily areas of Faculæ for the half year beginning 1874, July 2, is 1257.