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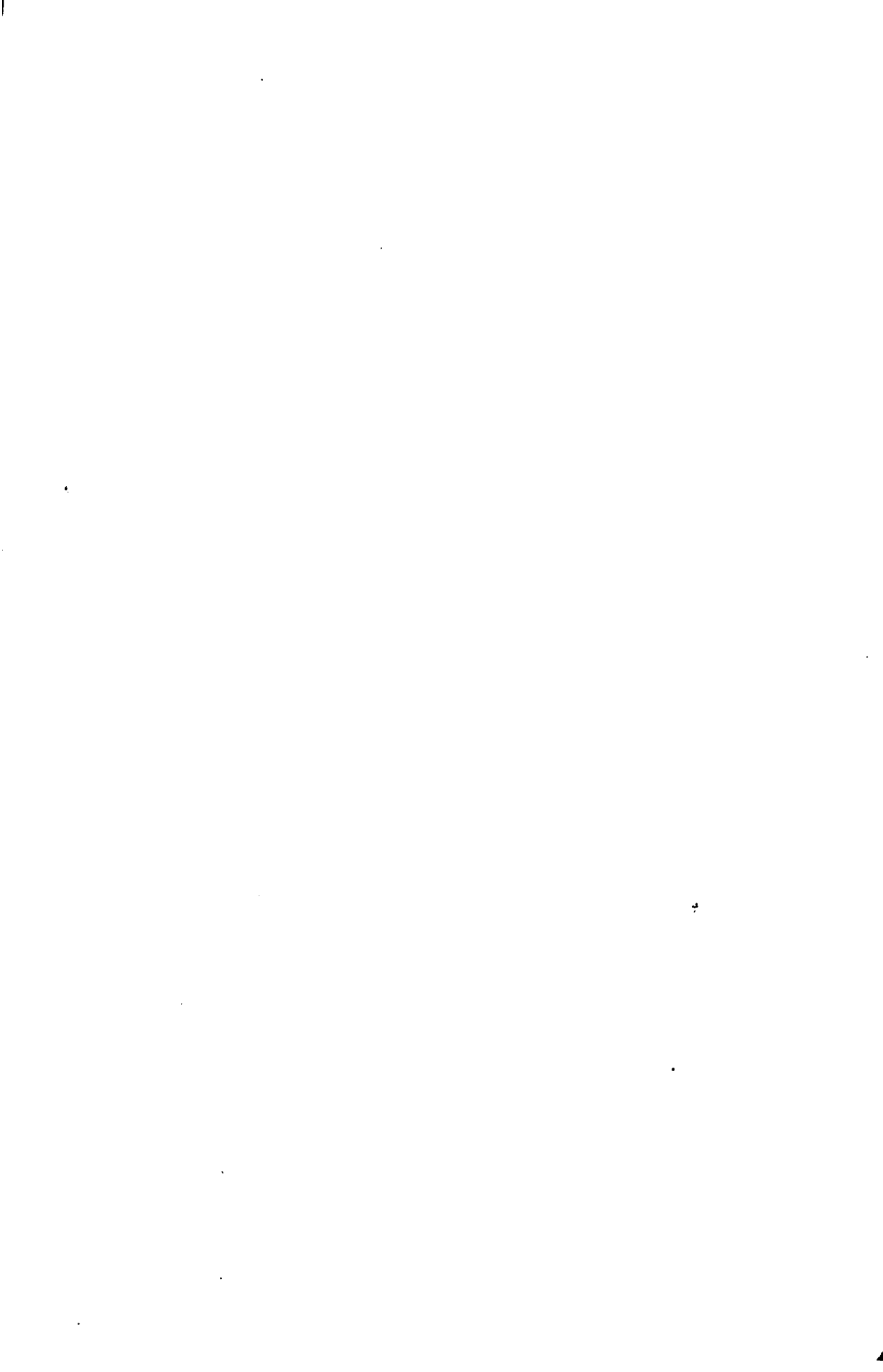
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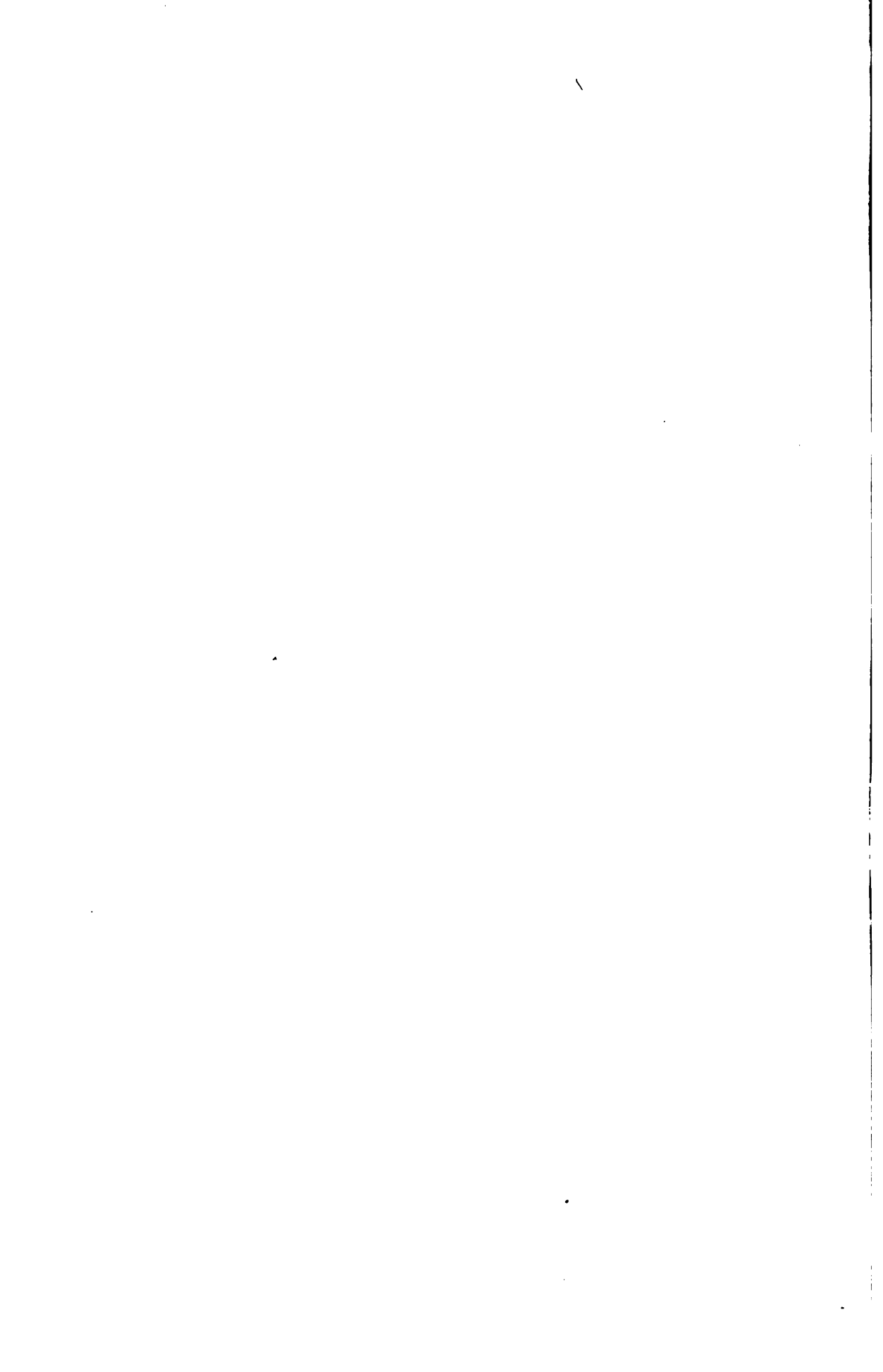
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THE HISTORY OF THE UNITED STATES

OF AMERICA

BY JOHN B. HENNINGSEN

OF THE UNIVERSITY OF CHICAGO

1888

THE HISTORY OF THE UNITED STATES OF AMERICA, FROM THE FIRST SETTLEMENTS TO THE PRESENT TIME. BY JOHN B. HENNINGSEN, OF THE UNIVERSITY OF CHICAGO. VOL. I. THE DISCOVERY AND EARLY SETTLEMENTS. PART I. THE DISCOVERY AND EARLY SETTLEMENTS. CHAPTER I. THE DISCOVERY OF AMERICA. In the year 1492, Christopher Columbus, an Italian navigator, discovered the continent of America. He sailed from Spain in August, and after a long and hazardous voyage, he reached the island of San Salvador on the coast of the continent. This discovery opened up a new world to the Europeans, and led to the great age of exploration.

CHAPTER II

THE EARLY SETTLEMENTS. The first permanent European settlement in America was founded by Spanish explorers in 1492. The settlement was named San Salvador, and was located on the island of San Salvador in the West Indies. This settlement was the first of many that were founded by Spanish explorers in the Americas. The Spanish explorers were followed by other European nations, including the French, Dutch, and English. Each of these nations established settlements in different parts of the continent, and the competition for land and resources led to conflicts between them. The English settlement at Jamestown in 1607 was the first permanent English settlement in America. It was founded by a group of men sent by the Virginia Company to establish a colony in the New World. The settlement was located on the James River in Virginia, and it was the first of many English colonies that were founded in the Americas. The English colonies were established in different parts of the continent, and they grew and expanded over time. The English colonies were the most numerous and the most powerful of the European colonies in America. They were the first to establish a system of self-government, and they were the first to declare their independence from Great Britain in 1776. The American Revolution was a result of the growing tensions between the English colonies and Great Britain, and it led to the birth of the United States of America.

THE
AMERICAN EPHEMERIS

AND
NAUTICAL ALMANAC.

FOR THE YEAR

1 8 6 1 .

PUBLISHED BY AUTHORITY OF THE SECRETARY OF THE NAVY.

BUREAU OF ORDNANCE AND HYDROGRAPHY,
WASHINGTON.

1858.

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P R E F A C E .

THE preparation of the American Ephemeris and Nautical Almanac was begun in the latter part of the year 1849, in accordance with an act of Congress, approved on the 3d of March of that year. An account of this preparation, its details, the values of the constants adopted, and the means employed in various parts of the work to secure additional accuracy, or greater convenience, will be found in the Preface and Appendix of the first volume, for the year 1855. The form and arrangement of the Ephemeris, and the plan for prosecuting the work, then devised and adopted by Lieut. Charles Henry Davis, the Superintendent, with the co-operation of Prof. Benjamin Peirce, have been retained, with slight modification, in the succeeding volumes.

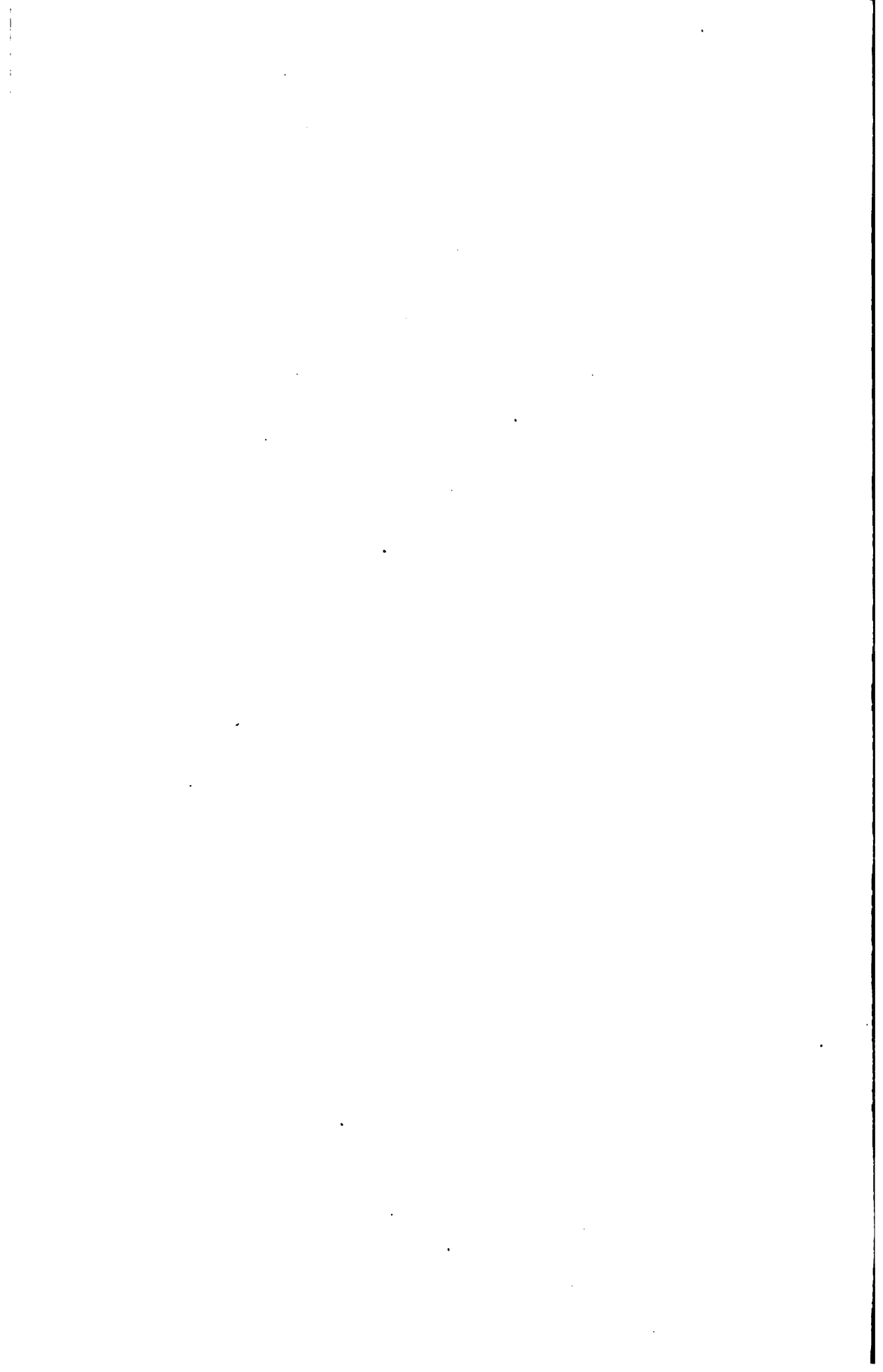
The contents of the volume for the year 1861 are the same generally as those of the volume for the year 1860. A change has been made in the Heliocentric Coördinates of the Principal Planets, to facilitate the computation of special perturbations. In this volume, they are referred to the mean equinox and ecliptic of the 2400,000th day of the Julian Period, instead of to the true equinox and equator of date, as heretofore.

A Supplement has been added, containing the latest elements of the Asteroids, and Ephemerides of thirty-three of them for 1859, and the Heliocentric Coördinates of Mars, Jupiter, and Saturn from the 2400,000th day of the Julian Period to the beginning of the year 1861.

The Table of Geographical Positions of the Principal Observatories has been revised and improved by Dr. Gould.

JOSEPH WINLOCK,

Prof. Math. U. S. Navy, Superintendent.



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EPHEMERIS FOR THE MERIDIAN OF WASHINGTON.

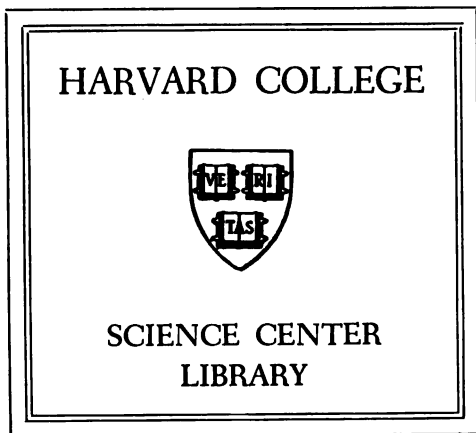
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SYMBOLS AND ABBREVIATIONS.

SIGNS OF THE PLANETS, &c.

<p>☉ The Sun. ☾ The Moon. ☿ Mercury. ♀ Venus. ⊕ or ♂ The Earth.</p>		<p>♂ Mars. ♃ Jupiter. ♄ Saturn. ♅ Uranus. ♆ Neptune.</p>
---	--	--

SIGNS OF THE ZODIAC.

<p>Spring signs. { 1. ♈ Aries. 2. ♉ Taurus. 3. ♊ Gemini. Summer signs. { 4. ♋ Cancer. 5. ♌ Leo. 6. ♍ Virgo.</p>		<p>Autumn signs. { 7. ♎ Libra. 8. ♏ Scorpio. 9. ♐ Sagittarius. Winter signs. { 10. ♑ Capricornus. 11. ♒ Aquarius. 12. ♓ Pisces.</p>
--	--	--

ASPECTS.

♌	Conjunction, or having the same Longitude or Right Ascension.	
☐	Quadrature, or differing 90° in	" " "
♁	Opposition, or differing 180° in	" " "

ABBREVIATIONS.

<p>♊ Ascending Node. ♋ Descending Node. N. North. S. South. E. East. W. West. ° Degrees.</p>		<p>' Minutes of Arc. " Seconds of Arc. h. Hours. m. Minutes of Time. s. Seconds of Time.</p>
--	--	--

ASTRONOMICAL EPHEMERIS

FOR THE USE OF

NAVIGATORS.

AT GREENWICH APPARENT NOON.

THE SUN'S														
Day of the Week.	Day of the Month.	Apparent Right Ascension.			Diff. for 1 hour.	Apparent Declination.			Diff. for 1 hour.	Semi-diameter.	Sidereal Time of the Semi-diameter passing the Meridian.	Equation of Time, to be added to Apparent Time.	Diff. for 1 hour.	
		^h	^m	^s	^s	[°]	[']	["]	["]	[']	^s	^m	^s	
Tues.	1	18	48	27.62	11.033	S. 22	59	26.1	12.76	16	18.42	71.08	3 58.14	1.176
Wed.	2	18	52	52.33	11.019	22	54	6.0	13.91	16	18.41	71.02	4 26.23	1.163
Thur.	3	18	57	16.69	11.004	22	48	18.3	15.05	16	18.39	70.97	4 53.95	1.148
Fri.	4	19	1	40.68	10.988	22	42	3.3	16.18	16	18.37	70.92	5 21.31	1.131
Sat.	5	19	6	4.27	10.971	22	35	21.3	17.30	16	18.35	70.86	5 48.27	1.114
Sun.	6	19	10	27.42	10.952	22	28	12.4	18.42	16	18.31	70.79	6 14.79	1.096
Mon.	7	19	14	50.11	10.932	22	20	36.7	19.52	16	18.27	70.72	6 40.84	1.076
Tues.	8	19	19	12.31	10.911	22	12	34.7	20.62	16	18.23	70.65	7 6.40	1.054
Wed.	9	19	23	33.98	10.889	22	4	6.5	21.70	16	18.19	70.58	7 31.45	1.032
Thur.	10	19	27	55.10	10.866	21	55	12.3	22.78	16	18.15	70.51	7 55.95	1.009
Fri.	11	19	32	15.64	10.841	21	45	52.5	23.84	16	18.10	70.43	8 19.86	0.984
Sat.	12	19	36	35.56	10.815	21	36	7.4	24.88	16	18.04	70.35	8 43.16	0.958
Sun.	13	19	40	54.85	10.788	21	25	57.2	25.92	16	17.98	70.26	9 5.83	0.931
Mon.	14	19	45	13.48	10.760	21	15	22.2	26.95	16	17.92	70.17	9 27.84	0.904
Tues.	15	19	49	31.44	10.731	21	4	22.6	27.96	16	17.85	70.08	9 49.19	0.875
Wed.	16	19	53	48.70	10.701	20	52	59.1	28.96	16	17.78	69.98	10 9.84	0.845
Thur.	17	19	58	5.22	10.671	20	41	11.9	29.94	16	17.70	69.88	10 29.75	0.814
Fri.	18	20	2	21.01	10.640	20	29	1.2	30.91	16	17.62	69.78	10 48.93	0.782
Sat.	19	20	6	36.06	10.609	20	16	27.3	30.87	16	17.54	69.68	11 7.38	0.751
Sun.	20	20	10	50.33	10.577	20	3	30.6	32.81	16	17.45	69.58	11 25.05	0.719
Mon.	21	20	15	3.81	10.544	19	50	11.6	33.74	16	17.35	69.47	11 41.93	0.687
Tues.	22	20	19	16.50	10.510	19	36	30.4	34.65	16	17.25	69.36	11 58.02	0.654
Wed.	23	20	23	28.39	10.477	19	22	27.5	35.55	16	17.15	69.25	12 13.31	0.621
Thur.	24	20	27	39.48	10.444	19	8	3.4	36.43	16	17.04	69.14	12 27.80	0.588
Fri.	25	20	31	49.76	10.410	18	53	18.5	37.29	16	16.92	69.03	12 41.48	0.555
Sat.	26	20	35	59.25	10.377	18	38	12.9	38.15	16	16.79	68.92	12 54.39	0.522
Sun.	27	20	40	7.94	10.343	18	22	46.9	38.99	16	16.66	68.81	13 6.49	0.488
Mon.	28	20	44	15.80	10.309	18	7	1.0	39.81	16	16.53	68.70	13 17.76	0.453
Tues.	29	20	48	22.84	10.276	17	50	55.6	40.61	16	16.40	68.58	13 28.22	0.419
Wed.	30	20	52	29.07	10.242	17	34	31.1	41.40	16	16.25	68.46	13 37.86	0.386
Thur.	31	20	56	34.50	10.208	17	17	47.8	42.18	16	16.09	68.35	13 46.72	0.352
Fri.	32	21	0	39.12	10.175	S. 17	0	46.1	42.94	16	15.93	68.24	13 54.75	0.318

NOTE. — Mean Time of the Semidiameter passing may be found by subtracting 0s.13 from the Sidereal Time.

AT GREENWICH MEAN NOON.

		THE SUN'S					Equation of Time, to be subtracted from Mean Time.		Sidereal Time.						
Day of the Week	Day of the Month.	Apparent Right Ascension.			Diff. for 1 hour.	Apparent Declination.			Diff. for 1 hour.	Diff. for 1 hour.					
		h	m	s	"	S.	°	'	"						
Tues.	1	18	48	26.88	11.033	S. 22	59	27.0	12.76	3	58.06	1.176	18	44	28.82
Wed.	2	18	52	51.51	11.019	22	54	7.0	13.91	4	26.14	1.163	18	48	25.37
Thur.	3	18	57	15.79	11.004	22	48	19.5	15.05	4	53.86	1.148	18	52	21.93
Fri.	4	19	1	39.70	10.988	22	42	4.7	16.18	5	21.21	1.131	18	56	18.49
Sat.	5	19	6	3.21	10.971	22	35	22.9	17.30	5	48.16	1.114	19	0	15.05
Sun.	6	19	10	26.28	10.952	22	28	14.2	18.42	6	14.68	1.096	19	4	11.60
Mon.	7	19	14	48.89	10.932	22	20	38.8	19.52	6	40.73	1.076	19	8	8.16
Tues.	8	19	19	11.01	10.911	22	12	37.1	20.62	7	6.29	1.054	19	12	4.72
Wed.	9	19	23	32.61	10.889	22	4	9.2	21.70	7	31.33	1.032	19	16	1.28
Thur.	10	19	27	53.66	10.866	21	55	15.3	22.78	7	55.82	1.009	19	19	57.84
Fri.	11	19	32	14.13	10.841	21	45	55.8	23.84	8	19.74	0.984	19	23	54.39
Sat.	12	19	36	33.98	10.815	21	36	11.0	24.88	8	43.03	0.958	19	27	50.95
Sun.	13	19	40	53.21	10.788	21	26	1.1	25.92	9	5.70	0.931	19	31	47.51
Mon.	14	19	45	11.78	10.760	21	15	26.4	26.95	9	27.71	0.904	19	35	44.07
Tues.	15	19	49	29.68	10.731	21	4	27.2	27.96	9	49.05	0.875	19	39	40.63
Wed.	16	19	53	46.88	10.701	20	53	4.0	28.96	10	9.70	0.845	19	43	37.18
Thur.	17	19	58	3.35	10.671	20	41	17.1	29.94	10	29.61	0.814	19	47	33.74
Fri.	18	20	2	19.09	10.640	20	29	6.7	30.91	10	48.79	0.782	19	51	30.30
Sat.	19	20	6	34.09	10.609	20	16	33.1	31.87	11	7.24	0.751	19	55	26.85
Sun.	20	20	10	48.32	10.577	20	3	36.8	32.81	11	24.91	0.719	19	59	23.41
Mon.	21	20	15	1.76	10.544	19	50	18.2	33.74	11	41.79	0.687	20	3	19.97
Tues.	22	20	19	14.41	10.510	19	36	37.4	34.65	11	57.88	0.654	20	7	16.53
Wed.	23	20	23	26.26	10.477	19	22	34.8	35.55	12	13.18	0.621	20	11	13.08
Thur.	24	20	27	37.31	10.443	19	8	11.0	36.43	12	27.67	0.588	20	15	9.64
Fri.	25	20	31	47.56	10.410	18	53	26.4	37.29	12	41.36	0.555	20	19	6.20
Sat.	26	20	35	57.02	10.377	18	38	21.1	38.15	12	54.27	0.522	20	23	2.75
Sun.	27	20	40	5.68	10.343	18	22	55.4	38.99	13	6.37	0.488	20	26	59.31
Mon.	28	20	44	13.52	10.309	18	7	9.8	39.81	13	17.65	0.453	20	30	55.87
Tues.	29	20	48	20.54	10.276	17	51	4.7	40.61	13	28.12	0.419	20	34	52.42
Wed.	30	20	52	26.75	10.242	17	34	40.5	41.40	13	37.77	0.386	20	38	48.98
Thur.	31	20	56	32.16	10.208	17	17	57.5	42.18	13	46.63	0.352	20	42	45.53
Fri.	32	21	0	36.76	10.175	S. 17	0	56.1	42.94	13	54.67	0.318	20	46	42.09

NOTE. — The Semidiameter for Mean Noon may be assumed the same as that for Apparent Noon.

AT GREENWICH MEAN NOON.

THE SUN'S										
Day of the Month.	Day of the Year.	True LONGITUDE.				DISE. for 1 hour.	LATITUDE.	Logarithm of the Radius Vector of the Earth.	Diff. for 1 hour.	Mean Time of Sidereal Ob.
		λ		λ'						
		λ	λ'							
1	1	281 ^o 8 33.9	8 17.6	152.89	-0.67	9.9926474	1.5	5 14 39.50		
2	2	282 9 43.3	9 26.7	152.89	0.76	.9926524	2.5	5 10 43.58		
3	3	283 10 52.9	10 36.1	152.90	0.82	.9926600	3.5	5 6 47.67		
4	4	284 12 2.7	11 45.7	152.90	0.84	.9926699	4.5	5 2 51.76		
5	5	285 13 12.5	12 55.4	152.91	0.84	.9926819	5.4	4 58 55.84		
6	6	286 14 22.5	14 5.2	152.91	0.80	.9926960	6.3	4 54 59.93		
7	7	287 15 32.5	15 15.0	152.91	0.78	.9927120	7.1	4 51 4.02		
8	8	288 16 42.6	16 24.9	152.91	0.64	.9927299	7.8	4 47 8.11		
9	9	289 17 52.5	17 34.6	152.90	0.53	.9927495	8.5	4 43 12.20		
10	10	290 19 2.2	18 44.2	152.90	0.41	.9927709	9.2	4 39 16.28		
11	11	291 20 11.6	19 53.4	152.89	0.27	.9927939	9.9	4 35 20.37		
12	12	292 21 20.5	21 2.1	152.87	0.14	.9928186	10.5	4 31 24.46		
13	13	293 22 26.9	22 10.3	152.85	-0.01	.9928450	11.2	4 27 28.55		
14	14	294 23 36.8	23 18.0	152.82	+0.10	.9928731	11.9	4 23 32.64		
15	15	295 24 44.1	24 25.2	152.79	0.20	.9929027	12.7	4 19 36.72		
16	16	296 25 50.6	25 31.5	152.75	0.27	.9929340	13.4	4 15 40.81		
17	17	297 26 56.2	26 36.9	152.71	0.31	.9929672	14.2	4 11 44.90		
18	18	298 28 0.9	27 41.4	152.67	0.32	.9930025	15.1	4 7 48.99		
19	19	299 29 4.6	28 45.0	152.63	0.30	.9930398	16.0	4 3 53.08		
20	20	300 30 7.3	29 47.6	152.59	0.26	.9930794	17.0	3 59 57.17		
21	21	301 31 9.0	30 49.1	152.55	0.19	.9931214	18.0	3 56 1.26		
22	22	302 32 9.7	31 49.6	152.51	+0.10	.9931658	19.0	3 52 5.35		
23	23	303 33 9.3	32 49.0	152.47	-0.02	.9932127	20.1	3 48 9.44		
24	24	304 34 7.9	33 47.5	152.43	0.15	.9932622	21.1	3 44 13.53		
25	25	305 35 5.6	34 45.1	152.39	0.28	.9933143	22.2	3 40 17.61		
26	26	306 36 2.3	35 41.6	152.35	0.42	.9933690	23.3	3 36 21.70		
27	27	307 36 56.1	36 37.2	152.31	0.55	.9934263	24.3	3 32 25.79		
28	28	308 37 53.0	37 31.9	152.27	0.66	.9934863	25.4	3 28 29.88		
29	29	309 38 47.0	38 25.8	152.33	0.74	.9935489	26.4	3 24 33.97		
30	30	310 39 40.1	39 18.8	152.30	0.79	.9936139	27.5	3 20 38.06		
31	31	311 40 32.4	40 10.9	152.17	0.81	.9936810	28.4	3 16 42.15		
32	32	312 41 23.9	41 2.2	152.14	-0.81	9.9937502	29.2	3 12 46.24		

Note. — λ corresponds to the true equinox of the date, λ' to the mean equinox of January 0d.

GREENWICH MEAN TIME.									
THE MOON'S									
Day of the Month.	SEMI-DIAMETER.		HORIZONTAL PARALLAX.				MERIDIAN PASSAGE.		AGE.
	Noon.	Midnight.	Noon.	Diff. for 1 hour.	Midnight.	Diff. for 1 hour.		Diff. for 1 hour.	
				"		"	^h ^m	^m	
1	16' 9.3	16' 10.2	59' 10.9	+0.32	59' 13.9	+0.21	16 17.5	2.03	20.0
2	16 10.7	16 10.7	59 15.5	+0.09	59 15.7	-0.01	17 6.2	2.05	21.0
3	16 10.3	16 9.7	59 14.7	-0.12	59 12.5	0.21	17 55.9	2.11	22.0
4	16 8.9	16 7.7	59 9.8	0.31	59 5.1	0.39	18 47.7	2.21	23.0
5	16 6.3	16 4.6	58 59.8	0.48	58 53.5	0.57	19 42.2	2.32	24.0
6	16 2.6	16 0.3	58 46.2	0.66	58 37.8	0.75	20 39.3	2.42	25.0
7	15 57.7	15 54.8	58 28.3	0.84	58 17.6	0.94	21 38.2	2.45	26.0
8	15 51.6	15 48.1	58 5.8	1.03	57 52.9	1.12	22 37.1	2.41	27.0
9	15 44.3	15 40.2	57 38.9	1.20	57 24.0	1.28	23 33.8	2.29	28.0
10	15 35.9	15 31.4	57 8.2	1.34	56 51.8	1.38	6		29.0
11	15 26.8	15 22.1	56 34.9	1.41	56 17.8	1.42	0 27.1	2.14	0.4
12	15 17.5	15 12.9	56 0.7	1.41	55 43.9	1.37	1 16.5	1.98	1.4
13	15 8.5	15 4.3	55 27.6	1.31	55 12.2	1.22	2 2.1	1.85	2.4
14	15 0.5	14 57.0	54 58.1	1.11	54 45.4	0.98	2 45.0	1.75	3.4
15	14 54.0	14 51.5	54 34.4	0.83	54 25.3	0.66	3 25.9	1.69	4.4
16	14 49.6	14 48.4	54 18.3	0.48	54 13.6	-0.28	4 6.1	1.68	5.4
17	14 47.7	14 47.8	54 11.3	-0.08	54 11.6	+0.13	4 46.5	1.71	6.4
18	14 48.6	14 50.1	54 14.5	+0.35	54 20.0	0.57	5 28.1	1.78	7.4
19	14 52.3	14 55.3	54 28.2	0.79	54 39.0	1.01	6 12.0	1.89	8.4
20	14 58.9	15 3.2	54 52.3	1.21	55 8.0	1.40	6 58.9	2.02	9.4
21	15 8.0	15 13.4	55 25.9	1.57	55 45.7	1.73	7 49.3	2.17	10.4
22	15 19.3	15 25.6	56 7.3	1.85	56 30.3	1.94	8 43.0	2.29	11.4
23	15 32.1	15 38.7	56 54.2	2.00	57 18.5	2.02	9 39.1	2.36	12.4
24	15 45.3	15 51.8	57 42.8	2.00	58 6.6	1.93	10 36.3	2.37	13.4
25	15 58.0	16 3.8	58 29.3	1.82	58 50.5	1.67	11 32.8	2.32	14.4
26	16 9.0	16 13.5	59 9.6	1.49	59 26.3	1.27	12 27.5	2.24	15.4
27	16 17.3	16 20.3	59 40.2	1.02	59 51.1	0.76	13 20.3	2.17	16.4
28	16 22.4	16 23.6	59 58.8	+0.50	60 3.2	+0.23	14 11.4	2.12	17.4
29	16 23.9	16 23.4	60 4.4	-0.02	60 2.6	-0.26	15 1.8	2.10	18.4
30	16 22.2	16 20.3	59 58.1	0.48	59 51.1	0.67	15 52.4	2.14	19.4
31	16 17.8	16 14.8	59 41.9	0.84	59 30.9	0.97	16 44.4	2.21	20.4
32	16 11.4	16 7.7	59 18.5	-1.08	59 4.9	-1.15	17 38.4	2.29	21.4

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
TUESDAY 1.					THURSDAY 3.				
0	10 ^h 29 ^m 58.87 ^s	2.1407	N. 5° 27' 24.5"	15.178	0	12 ^h 12 ^m 16.97 ^s	2.1512	S. 6° 49' 41.4"	15.000
1	10 32 7.25	2.1392	5 12 13.0	15.205	1	12 14 26.10	2.1533	7 4 40.3	14.982
2	10 34 15.55	2.1377	4 56 59.8	15.232	2	12 16 35.36	2.1555	7 19 36.8	14.923
3	10 36 23.77	2.1363	4 41 45.1	15.258	3	12 18 44.75	2.1577	7 34 30.8	14.861
4	10 38 31.91	2.1350	4 26 28.8	15.283	4	12 20 54.28	2.1600	7 49 22.4	14.838
5	10 40 39.97	2.1338	4 11 11.0	15.307	5	12 23 3.95	2.1624	8 4 11.4	14.795
6	10 42 47.95	2.1326	3 55 51.8	15.330	6	12 25 13.77	2.1648	8 18 57.8	14.750
7	10 44 55.87	2.1314	3 40 31.3	15.351	7	12 27 23.73	2.1673	8 33 41.5	14.704
8	10 47 3.72	2.1303	3 25 9.6	15.370	8	12 29 33.84	2.1699	8 48 22.4	14.657
9	10 49 11.51	2.1293	3 9 46.8	15.388	9	12 31 44.11	2.1725	9 3 0.4	14.608
10	10 51 19.25	2.1284	2 54 23.0	15.405	10	12 33 54.54	2.1752	9 17 35.4	14.558
11	10 53 26.93	2.1276	2 38 58.2	15.421	11	12 36 5.14	2.1780	9 32 7.3	14.506
12	10 55 34.56	2.1269	2 23 32.4	15.436	12	12 38 15.91	2.1809	9 46 36.1	14.453
13	10 57 42.15	2.1263	2 8 5.8	15.447	13	12 40 26.85	2.1838	10 1 1.7	14.399
14	10 59 49.71	2.1257	1 52 38.6	15.457	14	12 42 37.96	2.1868	10 15 23.9	14.343
15	11 1 57.23	2.1252	1 37 10.9	15.466	15	12 44 49.26	2.1898	10 29 42.7	14.285
16	11 4 4.72	2.1247	1 21 42.7	15.474	16	12 47 0.74	2.1929	10 43 58.0	14.225
17	11 6 12.19	2.1243	1 6 14.0	15.481	17	12 49 12.41	2.1960	10 58 9.7	14.165
18	11 8 19.64	2.1240	0 50 44.9	15.486	18	12 51 24.27	2.1992	11 12 17.7	14.103
19	11 10 27.07	2.1238	0 35 15.5	15.490	19	12 53 36.32	2.2025	11 26 22.0	14.040
20	11 12 34.49	2.1237	0 19 45.9	15.493	20	12 55 48.57	2.2059	11 40 22.5	13.976
21	11 14 41.91	2.1237	N. 0 4 16.2	15.495	21	12 58 1.03	2.2093	11 54 19.1	13.910
22	11 16 49.33	2.1237	S. 0 11 13.5	15.496	22	13 0 13.69	2.2127	12 8 11.7	13.842
23	11 18 56.75	2.1238	S. 0 26 43.2	15.498	23	13 2 26.56	2.2162	S. 12 22 0.2	13.773
WEDNESDAY 2.					FRIDAY 4.				
0	11 21 4.18	2.1240	S. 0 42 12.7	15.490	0	13 4 39.64	2.2197	S. 12 35 44.4	13.702
1	11 23 11.62	2.1242	0 57 42.0	15.485	1	13 6 52.93	2.2233	12 49 24.4	13.631
2	11 25 19.08	2.1245	1 13 11.0	15.479	2	13 9 6.44	2.2270	13 3 0.1	13.559
3	11 27 26.56	2.1249	1 28 39.6	15.472	3	13 11 20.18	2.2308	13 16 31.4	13.485
4	11 29 34.07	2.1253	1 44 7.7	15.463	4	13 13 34.15	2.2346	13 29 58.3	13.409
5	11 31 41.61	2.1258	1 59 35.2	15.453	5	13 15 48.35	2.2384	13 43 20.6	13.332
6	11 33 49.18	2.1264	2 15 2.1	15.443	6	13 18 2.78	2.2423	13 56 38.2	13.253
7	11 35 56.80	2.1271	2 30 28.3	15.430	7	13 20 17.44	2.2463	14 9 51.0	13.173
8	11 38 4.46	2.1279	2 45 53.7	15.416	8	13 22 32.34	2.2503	14 22 58.8	13.091
9	11 40 12.17	2.1288	3 1 18.2	15.400	9	13 24 47.48	2.2543	14 36 1.7	13.008
10	11 42 19.93	2.1298	3 16 41.7	15.383	10	13 27 2.86	2.2583	14 48 59.7	12.924
11	11 44 27.76	2.1309	3 32 4.2	15.365	11	13 29 18.48	2.2624	15 1 52.6	12.839
12	11 46 35.65	2.1320	3 47 25.5	15.345	12	13 31 34.34	2.2665	15 14 40.3	12.753
13	11 48 43.61	2.1332	4 2 45.6	15.324	13	13 33 50.46	2.2706	15 27 22.7	12.663
14	11 50 51.64	2.1345	4 18 4.4	15.301	14	13 36 6.83	2.2748	15 39 59.8	12.573
15	11 52 59.75	2.1358	4 33 21.7	15.277	15	13 38 23.45	2.2790	15 52 31.5	12.481
16	11 55 7.94	2.1373	4 48 37.6	15.253	16	13 40 40.32	2.2833	16 4 57.6	12.388
17	11 57 16.22	2.1387	5 3 51.9	15.228	17	13 42 57.45	2.2876	16 17 18.1	12.295
18	11 59 24.59	2.1403	5 19 4.6	15.198	18	13 45 14.84	2.2919	16 29 33.0	12.200
19	12 1 33.06	2.1419	5 34 15.6	15.168	19	13 47 32.49	2.2963	16 41 42.1	12.103
20	12 3 41.62	2.1436	5 49 24.7	15.137	20	13 49 50.41	2.3007	16 53 45.3	12.005
21	12 5 50.29	2.1454	6 4 31.9	15.103	21	13 52 8.59	2.3051	17 5 42.6	11.905
22	12 7 59.07	2.1473	6 19 37.1	15.070	22	13 54 27.03	2.3095	17 17 33.9	11.804
23	12 10 7.96	2.1492	6 34 40.3	15.036	23	13 56 45.73	2.3139	17 29 19.1	11.702
24	12 12 16.97	2.1512	S. 6 49 41.4	15.000	24	13 59 4.70	2.3183	S. 17 40 58.1	11.600

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
SATURDAY 5.					MONDAY 7.				
0	h m s	"	S. 17° 40' 58.1"	11.598	0	h m s	"	S. 24° 33' 52.3"	5.174
1	13 59 4.70	2.3183	17 52 30.8	11.493	1	15 55 17.04	2.5073	24 38 58.0	5.016
2	14 1 23.94	2.3273	18 3 57.2	11.387	2	15 57 47.55	2.5097	24 43 54.2	4.837
3	14 3 43.45	2.3316	18 15 17.2	11.279	3	16 0 18.20	2.5120	24 48 40.8	4.637
4	14 6 3.23	2.3363	18 26 30.6	11.169	4	16 2 48.99	2.5142	24 53 17.8	4.437
5	14 8 23.28	2.3409	18 37 37.4	11.058	5	16 5 19.91	2.5163	24 57 45.3	4.277
6	14 10 43.60	2.3454	18 48 37.6	10.946	6	16 7 50.95	2.5183	25 2 3.2	4.066
7	14 13 4.19	2.3500	18 59 31.0	10.833	7	16 10 22.11	2.5202	25 6 11.4	3.895
8	14 15 25.05	2.3545	19 10 17.5	10.718	8	16 12 53.38	2.5220	25 10 9.9	3.733
9	14 17 46.19	2.3590	19 20 57.1	10.602	9	16 15 24.75	2.5236	25 13 58.7	3.578
10	14 20 7.60	2.3635	19 31 29.7	10.485	10	16 17 56.21	2.5250	25 17 37.7	3.427
11	14 22 29.28	2.3680	19 41 55.3	10.367	11	16 20 27.76	2.5264	25 21 6.9	3.280
12	14 24 51.23	2.3680	19 52 13.8	10.248	12	16 22 59.39	2.5277	25 24 26.3	3.138
13	14 27 13.45	2.3725	20 2 25.1	10.127	13	16 25 31.10	2.5289	25 27 35.9	3.000
14	14 29 35.94	2.3770	20 12 29.0	10.004	14	16 28 2.88	2.5300	25 30 35.6	2.867
15	14 31 58.70	2.3815	20 22 25.5	9.880	15	16 30 34.72	2.5310	25 33 25.4	2.731
16	14 34 21.72	2.3860	20 32 14.5	9.755	16	16 33 6.61	2.5318	25 36 5.4	2.597
17	14 36 45.01	2.3904	20 41 56.0	9.629	17	16 35 38.54	2.5325	25 38 35.5	2.422
18	14 39 8.57	2.3948	20 51 29.9	9.503	18	16 38 10.51	2.5331	25 40 55.7	2.257
19	14 41 32.39	2.3992	21 0 56.2	9.378	19	16 40 42.51	2.5335	25 43 6.0	2.092
20	14 43 56.47	2.4036	21 10 14.7	9.253	20	16 43 14.53	2.5338	25 45 6.4	1.926
21	14 46 20.82	2.4079	21 19 25.4	9.129	21	16 45 46.56	2.5339	25 48 56.9	1.760
22	14 48 45.43	2.4123	21 28 28.1	8.990	22	16 48 18.59	2.5338	25 48 37.5	1.594
23	14 51 10.29	2.4165	S. 21° 37' 22.9"	8.847	23	16 50 50.62	2.5337	S. 25° 50' 8.1"	1.428
24	14 53 35.41	2.4207				16 53 22.64	2.5335		
SUNDAY 6.					TUESDAY 8.				
0	14 56 0.78	2.4249	S. 21° 46' 9.6"	8.712	0	16 55 54.65	2.5332	S. 25° 51' 28.7"	1.262
1	14 58 26.40	2.4291	21 54 48.2	8.573	1	16 58 26.63	2.5339	25 52 39.4	1.097
2	15 0 52.27	2.4332	22 3 18.6	8.430	2	17 0 58.59	2.5334	25 53 40.2	0.932
3	15 3 18.39	2.4373	22 11 40.8	8.291	3	17 3 30.51	2.5317	25 54 31.1	0.767
4	15 5 44.75	2.4413	22 19 54.7	8.152	4	17 6 2.38	2.5308	25 55 12.1	0.601
5	15 8 11.35	2.4453	22 28 0.2	8.012	5	17 6 2.38	2.5297	25 55 43.2	0.435
6	15 10 38.19	2.4493	22 35 57.3	7.881	6	17 8 34.20	2.5285	25 56 4.4	0.270
7	15 13 5.26	2.4530	22 43 45.9	7.738	7	17 11 5.95	2.5273	25 56 15.6	0.105
8	15 15 32.56	2.4568	22 51 25.8	7.594	8	17 13 37.63	2.5260	25 56 17.0	0.069
9	15 18 0.08	2.4606	22 58 57.1	7.450	9	17 16 9.23	2.5248	25 56 8.5	0.223
10	15 20 27.82	2.4641	23 6 19.8	7.305	10	17 18 40.74	2.5239	25 55 50.2	0.387
11	15 22 55.78	2.4677	23 13 33.7	7.159	11	17 21 12.16	2.5229	25 55 22.1	0.550
12	15 25 23.95	2.4712	23 20 38.8	7.012	12	17 23 43.48	2.5211	25 54 44.2	0.713
13	15 27 52.33	2.4747	23 27 35.0	6.863	13	17 26 14.69	2.5192	25 53 56.5	0.876
14	15 30 20.92	2.4781	23 34 22.3	6.713	14	17 28 45.78	2.5173	25 52 59.0	1.038
15	15 32 49.71	2.4814	23 41 0.6	6.563	15	17 31 16.74	2.5150	25 51 51.9	1.199
16	15 35 18.70	2.4846	23 47 29.9	6.413	16	17 33 47.57	2.5127	25 50 35.1	1.360
17	15 37 47.88	2.4877	23 53 50.1	6.261	17	17 36 18.26	2.5109	25 49 8.7	1.521
18	15 40 17.25	2.4908	24 0 1.2	6.108	18	17 38 48.80	2.5078	25 47 32.6	1.681
19	15 42 46.80	2.4938	24 6 3.0	5.954	19	17 41 19.18	2.5061	25 45 46.9	1.841
20	15 45 16.51	2.4967	24 11 55.5	5.799	20	17 43 49.40	2.5028	25 43 51.6	2.000
21	15 47 46.40	2.4996	24 17 38.7	5.643	21	17 46 19.45	2.4994	25 41 46.8	2.158
22	15 50 16.46	2.5022	24 23 12.6	5.487	22	17 48 49.33	2.4964	25 39 32.6	2.316
23	15 52 46.68	2.5048	24 28 37.1	5.331	23	17 51 19.03	2.4932	25 37 8.9	2.474
24	15 55 17.04	2.5073	S. 24° 33' 52.3"	5.174	24	17 53 48.53	2.4900	S. 25° 34' 35.7"	2.631

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
WEDNESDAY 9.					FRIDAY 11.				
0	17 56 17.83	2.4867	S. 25° 34' 35.7"	2.831	0	19 50 5.91	2.9281	S. 20° 46' 58.1"	8.902
1	17 58 46.92	2.4892	25 31 53.1	2.786	1	19 52 19.65	2.9288	20 38 1.0	8.902
2	18 1 15.80	2.4797	25 29 1.3	2.940	2	19 54 33.01	2.9196	20 28 57.8	8.101
3	18 3 44.47	2.4700	25 26 0.3	3.093	3	19 56 45.99	2.9102	20 19 48.7	8.190
4	18 6 12.92	2.4723	25 22 50.1	3.246	4	19 58 58.59	2.9008	20 10 33.8	8.286
5	18 8 41.13	2.4682	25 19 30.7	3.399	5	20 1 10.81	2.9006	20 1 13.2	8.380
6	18 11 9.10	2.4641	25 16 2.1	3.551	6	20 3 22.65	2.1942	19 51 47.1	8.482
7	18 13 36.82	2.4600	25 12 24.5	3.701	7	20 5 34.12	2.1980	19 42 15.4	8.573
8	18 16 4.30	2.4558	25 8 37.9	3.850	8	20 7 45.21	2.1917	19 32 38.2	8.663
9	18 18 31.52	2.4518	25 4 42.3	3.999	9	20 9 55.93	2.1754	19 22 55.6	8.753
10	18 20 58.48	2.4471	25 0 37.9	4.147	10	20 12 6.27	2.1692	19 13 7.7	8.841
11	18 23 25.17	2.4426	24 56 24.6	4.294	11	20 14 16.24	2.1630	19 3 14.6	8.930
12	18 25 51.59	2.4380	24 52 2.5	4.440	12	20 16 25.83	2.1567	18 53 16.3	10.014
13	18 28 17.73	2.4333	24 47 31.7	4.586	13	20 18 35.05	2.1506	18 43 12.9	10.096
14	18 30 43.59	2.4285	24 42 52.2	4.730	14	20 20 43.90	2.1444	18 33 4.5	10.180
15	18 33 9.16	2.4236	24 38 4.1	4.871	15	20 22 52.38	2.1382	18 22 51.3	10.260
16	18 35 34.43	2.4187	24 33 7.6	5.012	16	20 25 0.50	2.1320	18 12 33.3	10.339
17	18 37 59.40	2.4137	24 28 2.6	5.153	17	20 27 8.25	2.1258	18 -2 10.5	10.418
18	18 40 24.07	2.4086	24 22 49.2	5.293	18	20 29 15.64	2.1195	17 51 43.0	10.496
19	18 42 48.44	2.4035	24 17 27.4	5.432	19	20 31 22.67	2.1132	17 41 10.9	10.573
20	18 45 12.50	2.3983	24 11 57.3	5.570	20	20 33 29.34	2.1068	17 30 34.2	10.649
21	18 47 36.24	2.3930	24 6 19.0	5.708	21	20 35 35.65	2.1002	17 19 53.1	10.721
22	18 49 59.66	2.3876	24 0 32.6	5.840	22	20 37 41.60	2.0932	17 9 7.6	10.788
23	18 52 22.75	2.3822	S. 23° 54' 38.2"	5.973	23	20 39 47.19	2.0862	S. 16° 58' 17.9"	10.853
THURSDAY 10.					SATURDAY 12.				
0	18 54 45.51	2.3767	S. 23° 48' 35.8"	6.106	0	20 41 52.42	2.0843	S. 16° 47' 24.0"	10.922
1	18 57 7.94	2.3711	23 42 25.5	6.236	1	20 43 57.30	2.0785	16 36 26.0	11.000
2	18 59 30.04	2.3655	23 36 7.3	6.367	2	20 46 1.84	2.0727	16 25 23.9	11.077
3	19 1 51.80	2.3598	23 29 41.4	6.496	3	20 48 6.03	2.0670	16 14 17.8	11.153
4	19 4 13.21	2.3540	23 23 7.8	6.624	4	20 50 9.87	2.0612	16 3 7.7	11.196
5	19 6 34.27	2.3482	23 16 26.6	6.750	5	20 52 13.37	2.0554	15 51 53.8	11.281
6	19 8 54.99	2.3424	23 9 37.8	6.875	6	20 54 16.53	2.0496	15 40 36.2	11.363
7	19 11 15.36	2.3366	23 2 41.5	6.999	7	20 56 19.35	2.0438	15 29 14.9	11.383
8	19 13 35.37	2.3307	22 55 37.8	7.122	8	20 58 21.84	2.0380	15 17 50.1	11.443
9	19 15 55.03	2.3248	22 48 26.8	7.243	9	20 0 24.00	2.0322	15 6 21.7	11.502
10	19 18 14.33	2.3189	22 41 8.6	7.363	10	21 2 25.83	2.0278	14 54 49.8	11.560
11	19 20 33.27	2.3127	22 33 43.2	7.482	11	21 4 27.33	2.0234	14 43 14.5	11.616
12	19 22 51.85	2.3066	22 26 10.7	7.600	12	21 6 28.51	2.0170	14 31 35.8	11.671
13	19 25 10.06	2.3005	22 18 31.2	7.716	13	21 8 29.37	2.0117	14 19 53.9	11.726
14	19 27 27.91	2.2944	22 10 44.8	7.830	14	21 10 29.91	2.0065	14 8 8.8	11.777
15	19 29 45.39	2.2883	22 2 51.6	7.943	15	21 12 30.14	2.0012	13 56 20.6	11.826
16	19 32 2.50	2.2822	21 54 51.7	8.053	16	21 14 30.06	1.9961	13 44 29.3	11.878
17	19 34 19.24	2.2760	21 46 45.1	8.164	17	21 16 29.67	1.9909	13 32 35.1	11.927
18	19 36 35.61	2.2698	21 38 31.8	8.274	18	21 18 28.97	1.9858	13 20 38.0	11.976
19	19 38 51.60	2.2636	21 30 12.0	8.383	19	21 20 27.97	1.9808	13 8 38.0	12.023
20	19 41 7.21	2.2573	21 21 45.8	8.490	20	21 22 26.68	1.9758	12 56 35.1	12.069
21	19 43 22.44	2.2509	21 13 13.2	8.596	21	21 24 25.10	1.9710	12 44 29.5	12.114
22	19 45 37.30	2.2446	21 4 34.3	8.699	22	21 26 23.22	1.9662	12 32 21.4	12.167
23	19 47 51.79	2.2383	20 55 49.2	8.801	23	21 28 21.04	1.9614	12 20 10.7	12.190
24	19 50 5.91	2.2321	S. 20° 46' 58.1"	8.902	24	21 30 18.58	1.9567	S. 12° 7' 57.5"	12.240

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
SUNDAY 13.					TUESDAY 15.				
0	21 30 18.58	1.9067	S. 18° 7' 57.5"	12.240	0	22 59 59.13	1.8083	S. 1° 51' 3.1"	13.128
1	21 32 15.84	1.9021	11 55 41.8	12.260	1	23 1 47.41	1.8088	1 37 55.4	13.127
2	21 34 12.82	1.9475	11 43 23.7	12.280	2	23 3 35.59	1.8023	1 24 47.8	13.125
3	21 36 9.53	1.9430	11 31 3.2	12.300	3	23 5 23.68	1.8009	1 11 40.4	13.122
4	21 38 5.97	1.9385	11 18 40.5	12.306	4	23 7 11.69	1.7996	0 58 33.2	13.118
5	21 40 2.14	1.9340	11 6 15.6	12.432	5	23 8 59.63	1.7984	0 45 26.2	13.114
6	21 41 58.05	1.9296	10 53 48.6	12.467	6	23 10 47.50	1.7973	0 32 19.5	13.109
7	21 43 53.70	1.9253	10 41 19.5	12.501	7	23 12 35.20	1.7962	0 19 13.1	13.103
8	21 45 49.09	1.9211	10 28 48.4	12.534	8	23 14 23.03	1.7952	S. 0 6 7.1	13.097
9	21 47 44.23	1.9169	10 16 15.3	12.566	9	23 16 10.70	1.7942	N. 0 6 58.5	13.090
10	21 49 39.12	1.9128	10 3 40.4	12.597	10	23 17 58.32	1.7933	0 20 3.7	13.082
11	21 51 33.76	1.9087	9 51 3.6	12.627	11	23 19 45.89	1.7925	0 33 8.5	13.074
12	21 53 28.16	1.9047	9 38 25.0	12.656	12	23 21 33.42	1.7918	0 46 12.7	13.065
13	21 55 22.32	1.9008	9 25 44.7	12.685	13	23 23 20.91	1.7912	0 59 16.3	13.055
14	21 57 16.25	1.8970	9 13 2.7	12.713	14	23 25 8.26	1.7906	1 12 19.3	13.045
15	21 59 9.95	1.8932	9 0 19.1	12.740	15	23 26 55.77	1.7900	1 25 21.7	13.034
16	22 1 3.43	1.8895	8 47 34.0	12.765	16	23 28 43.14	1.7895	1 38 23.4	13.022
17	22 2 56.68	1.8858	8 34 47.4	12.789	17	23 30 30.49	1.7891	1 51 24.4	13.010
18	22 4 49.71	1.8821	8 21 59.3	12.812	18	23 32 17.82	1.7888	2 4 24.7	12.997
19	22 6 42.53	1.8785	8 9 9.8	12.835	19	23 34 5.13	1.7885	2 17 24.1	12.983
20	22 8 35.14	1.8750	7 56 19.0	12.857	20	23 35 52.43	1.7883	2 30 22.7	12.968
21	22 10 27.54	1.8716	7 43 27.0	12.878	21	23 37 39.72	1.7881	2 43 20.4	12.954
22	22 12 19.74	1.8682	7 30 33.7	12.898	22	23 39 27.00	1.7880	2 56 17.2	12.939
23	22 14 11.74	1.8651	S. 7 17 39.2	12.917	23	23 41 14.28	1.7880	N. 3 9 13.1	12.923
MONDAY 14.					WEDNESDAY 16.				
0	22 16 3.55	1.8619	S. 7 4 43.6	12.935	0	23 43 1.56	1.7880	N. 3 22 8.0	12.907
1	22 17 55.17	1.8586	6 51 46.9	12.953	1	23 44 48.85	1.7881	3 35 1.8	12.890
2	22 19 46.60	1.8557	6 38 49.2	12.970	2	23 46 36.15	1.7883	3 47 54.6	12.872
3	22 21 37.85	1.8537	6 25 50.5	12.985	3	23 48 23.46	1.7886	4 0 46.3	12.853
4	22 23 28.92	1.8496	6 12 51.0	12.999	4	23 50 10.80	1.7890	4 13 36.9	12.833
5	22 25 19.82	1.8470	5 59 50.6	13.012	5	23 51 58.16	1.7895	4 26 26.3	12.813
6	22 27 10.55	1.8442	5 46 49.4	13.025	6	23 53 45.55	1.7900	4 39 14.4	12.792
7	22 29 1.11	1.8414	5 33 47.4	13.038	7	23 55 32.97	1.7906	4 52 1.2	12.770
8	22 30 51.51	1.8397	5 20 44.7	13.050	8	23 57 20.43	1.7913	5 4 46.7	12.748
9	22 32 41.75	1.8381	5 7 41.3	13.061	9	23 59 7.93	1.7920	5 17 30.9	12.725
10	22 34 31.83	1.8356	4 54 37.3	13.071	10	0 0 55.47	1.7927	5 30 13.7	12.702
11	22 36 21.76	1.8310	4 41 32.8	13.080	11	0 2 43.05	1.7935	5 42 55.1	12.678
12	22 38 11.55	1.8266	4 28 27.7	13.088	12	0 4 30.68	1.7943	5 55 35.1	12.653
13	22 40 1.20	1.8223	4 15 22.1	13.096	13	0 6 18.37	1.7953	6 8 13.6	12.628
14	22 41 50.71	1.8241	4 2 16.1	13.103	14	0 8 6.12	1.7963	6 20 50.5	12.602
15	22 43 40.09	1.8219	3 49 9.8	13.109	15	0 9 53.94	1.7974	6 33 25.9	12.576
16	22 45 29.33	1.8198	3 36 3.1	13.114	16	0 11 41.82	1.7985	6 45 59.7	12.550
17	22 47 18.45	1.8177	3 22 56.1	13.118	17	0 13 29.77	1.7996	6 58 31.9	12.523
18	22 49 7.45	1.8157	3 9 48.9	13.122	18	0 15 17.80	1.8011	7 11 2.4	12.495
19	22 50 56.33	1.8138	2 56 41.5	13.125	19	0 17 5.91	1.8025	7 23 31.1	12.465
20	22 52 45.10	1.8120	2 43 33.9	13.127	20	0 18 54.11	1.8039	7 35 58.1	12.435
21	22 54 33.76	1.8102	2 30 26.3	13.128	21	0 20 42.40	1.8055	7 48 23.3	12.405
22	22 56 22.31	1.8085	2 17 18.6	13.128	22	0 22 30.78	1.8070	8 0 46.7	12.375
23	22 58 10.76	1.8069	2 4 10.9	13.128	23	0 24 19.24	1.8086	8 13 8.2	12.344
24	22 59 59.13	1.8053	S. 1 51 3.1	13.128	24	0 26 7.80	1.8102	N. 8 25 27.9	12.312

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
THURSDAY 17.					SATURDAY 19.				
0	0 26 7.80	1.8109	N. 8° 25' 27.9	12.312	0	1 56 10.89	1.9645	N. 17° 26' 34.4	9.366
1	0 27 56.46	1.8120	8 37 45.6	12.279	1	1 58 8.90	1.9691	17 36 29.9	9.390
2	0 29 45.24	1.8139	8 50 1.3	12.245	2	2 0 7.19	1.9738	17 46 21.3	9.391
3	0 31 34.14	1.8158	9 2 15.0	12.211	3	2 2 5.76	1.9785	17 56 8.5	9.381
4	0 33 23.15	1.8178	9 14 26.6	12.177	4	2 4 4.61	1.9832	18 5 51.4	9.380
5	0 35 12.28	1.8198	9 26 36.1	12.142	5	2 6 3.74	1.9879	18 15 30.1	9.369
6	0 37 1.53	1.8219	9 38 43.5	12.106	6	2 8 3.16	1.9927	18 25 4.5	9.358
7	0 38 50.90	1.8241	9 50 48.7	12.069	7	2 10 2.87	1.9975	18 34 34.7	9.346
8	0 40 40.41	1.8263	10 2 51.7	12.032	8	2 12 2.88	2.0024	18 44 0.5	9.333
9	0 42 30.06	1.8286	10 14 52.4	11.994	9	2 14 3.18	2.0073	18 53 21.8	9.318
10	0 44 19.84	1.8309	10 26 50.8	11.955	10	2 16 3.77	2.0123	19 2 38.6	9.302
11	0 46 9.76	1.8333	10 38 46.9	11.915	11	2 18 4.66	2.0173	19 11 50.8	9.285
12	0 47 59.83	1.8357	10 50 40.6	11.875	12	2 20 5.85	2.0223	19 20 58.4	9.268
13	0 49 50.05	1.8382	11 2 31.9	11.834	13	2 22 7.34	2.0273	19 30 1.3	9.250
14	0 51 40.43	1.8408	11 14 20.7	11.793	14	2 24 9.14	2.0324	19 38 59.5	9.232
15	0 53 30.96	1.8435	11 26 7.0	11.751	15	2 26 11.25	2.0376	19 47 53.0	9.213
16	0 55 21.65	1.8462	11 37 50.8	11.709	16	2 28 13.67	2.0428	19 56 41.6	9.194
17	0 57 12.51	1.8490	11 49 32.0	11.665	17	2 30 16.40	2.0480	20 5 25.3	9.175
18	0 59 3.54	1.8519	12 1 10.6	11.622	18	2 32 19.44	2.0533	20 14 4.0	9.155
19	1 0 54.74	1.8548	12 12 46.6	11.579	19	2 34 22.80	2.0587	20 22 37.7	9.135
20	1 2 46.12	1.8578	12 24 19.9	11.533	20	2 36 26.48	2.0640	20 31 6.4	9.115
21	1 4 37.68	1.8609	12 35 50.4	11.486	21	2 38 30.48	2.0693	20 39 30.0	9.095
22	1 6 29.43	1.8640	12 47 18.1	11.438	22	2 40 34.80	2.0746	20 47 48.4	9.075
23	1 8 21.37	1.8673	N. 12° 58' 42.9	11.390	23	2 42 39.43	2.0799	N. 20° 56' 1.5	9.055
FRIDAY 18.					SUNDAY 20.				
0	1 10 13.49	1.8704	N. 13° 10' 4.9	11.342	0	2 44 44.38	2.0853	N. 21° 4' 9.3	8.997
1	1 12 5.81	1.8737	13 21 24.0	11.293	1	2 46 49.66	2.0907	21 12 11.8	8.977
2	1 13 58.33	1.8770	13 32 40.1	11.245	2	2 48 55.27	2.0961	21 20 8.9	8.957
3	1 15 51.05	1.8804	13 43 53.2	11.193	3	2 51 1.20	2.1016	21 28 0.5	8.936
4	1 17 43.98	1.8838	13 55 3.3	11.142	4	2 53 7.46	2.1070	21 35 46.6	8.915
5	1 19 37.12	1.8873	14 6 10.3	11.090	5	2 55 14.05	2.1125	21 43 27.1	8.894
6	1 21 30.47	1.8909	14 17 14.1	11.037	6	2 57 20.97	2.1180	21 51 2.0	8.873
7	1 23 24.03	1.8945	14 28 14.7	10.983	7	2 59 28.22	2.1236	21 58 31.2	8.852
8	1 25 17.81	1.8982	14 39 12.1	10.929	8	3 1 35.81	2.1292	22 5 54.6	8.831
9	1 27 11.81	1.9019	14 50 6.2	10.874	9	3 3 43.73	2.1348	22 13 12.2	8.810
10	1 29 6.04	1.9057	15 0 57.0	10.818	10	3 5 51.99	2.1404	22 20 23.9	8.789
11	1 31 0.50	1.9096	15 11 44.5	10.762	11	3 8 0.58	2.1460	22 27 29.7	8.768
12	1 32 55.20	1.9136	15 22 28.6	10.706	12	3 10 9.51	2.1516	22 34 29.5	8.747
13	1 34 50.14	1.9176	15 33 9.2	10.649	13	3 12 18.77	2.1570	22 41 23.2	8.726
14	1 36 45.31	1.9216	15 43 46.3	10.590	14	3 14 28.36	2.1625	22 48 10.8	8.705
15	1 38 40.72	1.9256	15 54 19.8	10.530	15	3 16 38.28	2.1681	22 54 52.2	8.684
16	1 40 36.38	1.9297	16 4 49.8	10.470	16	3 18 48.54	2.1737	23 1 27.4	8.663
17	1 42 32.29	1.9338	16 15 16.2	10.409	17	3 20 59.13	2.1793	23 7 56.3	8.642
18	1 44 28.45	1.9381	16 25 38.9	10.347	18	3 23 10.06	2.1848	23 14 18.8	8.621
19	1 46 24.87	1.9424	16 35 57.8	10.283	19	3 25 21.32	2.1903	23 20 34.8	8.600
20	1 48 21.54	1.9468	16 46 12.8	10.219	20	3 27 32.91	2.1958	23 26 44.3	8.579
21	1 50 18.48	1.9512	16 56 24.0	10.155	21	3 29 44.83	2.2014	23 32 47.3	8.558
22	1 52 15.68	1.9556	17 6 31.4	10.090	22	3 31 57.08	2.2070	23 38 43.6	8.537
23	1 54 13.15	1.9600	17 16 34.9	10.025	23	3 34 9.67	2.2126	23 44 33.4	8.516
24	1 56 10.89	1.9645	N. 17° 26' 34.4	9.958	24	3 36 22.59	2.2180	N. 23° 50' 16.5	8.495

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
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MONDAY 21.

h	m	s	"	N. 23°	50'	16.5"	"
0	3	36	22.59	2.2180	23	50	16.5
1	3	38	35.84	2.2286	23	55	52.8
2	3	40	49.42	2.2390	24	1	22.1
3	3	43	3.32	2.2344	24	6	44.5
4	3	45	17.55	2.2398	24	11	59.9
5	3	47	32.10	2.2462	24	17	8.3
6	3	49	46.97	2.2606	24	22	9.6
7	3	52	2.16	2.2560	24	27	3.8
8	3	54	17.67	2.2612	24	31	50.8
9	3	56	33.50	2.2666	24	36	30.5
10	3	58	49.65	2.2717	24	41	2.8
11	4	1	6.11	2.2769	24	45	27.8
12	4	3	22.88	2.2831	24	49	45.3
13	4	5	39.96	2.2872	24	53	55.3
14	4	7	57.34	2.2923	24	57	57.7
15	4	10	15.03	2.2975	25	1	52.5
16	4	12	33.02	2.3028	25	5	39.6
17	4	14	51.31	2.3072	25	9	19.0
18	4	17	9.89	2.3121	25	12	50.6
19	4	19	28.76	2.3169	25	16	14.4
20	4	21	47.92	2.3217	25	19	30.2
21	4	24	7.37	2.3266	25	22	38.0
22	4	26	27.10	2.3312	25	25	37.8
23	4	28	47.10	2.3368	N. 25	28	29.7

WEDNESDAY 23.

h	m	s	"	N. 25°	54'	4.5"	"
0	5	28	24.89	2.4260	25	54	4.5
1	5	30	50.53	2.4266	25	53	10.7
2	5	33	16.31	2.4306	25	52	7.7
3	5	35	42.23	2.4330	25	50	55.5
4	5	38	8.27	2.4351	25	49	34.1
5	5	40	34.44	2.4372	25	48	3.5
6	5	43	0.73	2.4392	25	46	23.6
7	5	45	27.14	2.4410	25	44	34.4
8	5	47	53.65	2.4437	25	42	35.9
9	5	50	20.26	2.4443	25	40	28.1
10	5	52	46.96	2.4468	25	38	11.0
11	5	55	13.76	2.4473	25	35	44.5
12	5	57	40.65	2.4487	25	33	8.8
13	6	0	7.62	2.4499	25	30	23.7
14	6	2	34.65	2.4509	25	27	29.2
15	6	5	1.73	2.4518	25	24	25.3
16	6	7	28.86	2.4526	25	21	12.0
17	6	9	56.04	2.4534	25	17	49.3
18	6	12	23.28	2.4542	25	14	17.3
19	6	14	50.56	2.4549	25	10	35.9
20	6	17	17.87	2.4554	25	6	45.1
21	6	19	45.21	2.4566	25	2	44.9
22	6	22	12.56	2.4580	24	58	35.3
23	6	24	39.92	2.4592	N. 24	54	16.3

TUESDAY 22.

h	m	s	"	N. 25°	31'	13.5"	"
0	4	31	7.38	2.3403	25	31	13.5
1	4	33	27.93	2.3447	25	33	49.1
2	4	35	48.74	2.3491	25	36	16.4
3	4	38	9.82	2.3535	25	38	35.4
4	4	40	31.16	2.3578	25	40	46.1
5	4	42	52.75	2.3620	25	42	48.4
6	4	45	14.59	2.3660	25	44	42.3
7	4	47	36.67	2.3700	25	46	27.8
8	4	49	59.00	2.3739	25	48	4.8
9	4	52	21.56	2.3778	25	49	33.2
10	4	54	44.35	2.3817	25	50	53.0
11	4	57	7.37	2.3855	25	52	4.1
12	4	59	30.62	2.3892	25	53	6.6
13	5	1	54.09	2.3928	25	54	0.4
14	5	4	17.77	2.3963	25	54	45.4
15	5	6	41.65	2.3997	25	55	21.5
16	5	9	5.72	2.4029	25	55	48.8
17	5	11	29.99	2.4061	25	56	7.2
18	5	13	54.45	2.4092	25	56	16.7
19	5	16	19.10	2.4122	25	56	17.3
20	5	18	43.92	2.4151	25	56	8.9
21	5	21	8.91	2.4179	25	55	51.4
22	5	23	34.07	2.4207	25	55	24.8
23	5	25	59.40	2.4234	25	54	49.2
24	5	28	24.89	2.4260	N. 25	54	4.5

THURSDAY 24.

h	m	s	"	N. 24°	49'	48.0"	"
0	6	27	7.29	2.4592	24	49	48.0
1	6	29	34.66	2.4631	24	45	10.3
2	6	32	2.02	2.4669	24	40	23.3
3	6	34	29.38	2.4586	24	35	26.9
4	6	36	56.72	2.4556	24	30	21.2
5	6	39	24.04	2.4560	24	25	6.2
6	6	41	51.33	2.4544	24	19	41.9
7	6	44	18.58	2.4537	24	14	8.4
8	6	46	45.78	2.4530	24	8	25.7
9	6	49	12.93	2.4523	24	2	33.7
10	6	51	40.04	2.4514	23	56	32.5
11	6	54	7.10	2.4505	23	50	22.1
12	6	56	34.10	2.4496	23	44	2.6
13	6	59	1.03	2.4483	23	37	34.0
14	7	1	27.88	2.4470	23	30	56.2
15	7	3	54.65	2.4455	23	24	9.4
16	7	6	21.23	2.4440	23	17	13.5
17	7	8	47.92	2.4425	23	10	8.6
18	7	11	14.43	2.4409	23	2	54.8
19	7	13	40.84	2.4392	22	55	32.1
20	7	16	7.14	2.4375	22	48	0.5
21	7	18	33.33	2.4357	22	40	20.1
22	7	20	59.41	2.4337	22	32	30.9
23	7	23	25.37	2.4317	22	24	32.9
24	7	25	51.22	2.4297	N. 22	16	26.2

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
FRIDAY 25.					SUNDAY 27.				
0	7 ^h 25 ^m 51.22 ^s	2.4297	N. 23° 16' 26.2"	8.183	0	9 ^h 19 ^m 14.56 ^s	2.2871	N. 13° 16' 47.9"	13.312
1	7 28 16.94	2.4277	22 8 10.9	8.327	1	9 21 31.69	2.2846	13 2 56.7	13.396
2	7 30 42.53	2.4255	21 59 47.0	8.470	2	9 23 48.64	2.2810	12 49 0.5	13.977
3	7 33 7.99	2.4232	21 51 14.4	8.613	3	9 26 5.41	2.2760	12 34 59.4	14.087
4	7 35 33.31	2.4208	21 42 33.3	8.755	4	9 28 22.00	2.2700	12 20 53.6	14.185
5	7 37 58.49	2.4184	21 33 43.8	8.895	5	9 30 38.41	2.2731	12 6 43.1	14.218
6	7 40 23.52	2.4160	21 24 45.9	9.034	6	9 32 54.64	2.2682	11 52 28.0	14.289
7	7 42 48.40	2.4135	21 15 39.7	9.172	7	9 35 10.70	2.2633	11 38 8.4	14.363
8	7 45 12.13	2.4109	21 6 25.2	9.310	8	9 37 26.59	2.2584	11 23 44.4	14.435
9	7 47 37.71	2.4083	20 57 2.4	9.447	9	9 39 42.31	2.2537	11 9 16.1	14.508
10	7 50 2.13	2.4056	20 47 31.4	9.583	10	9 41 57.86	2.2478	10 54 43.6	14.573
11	7 52 26.38	2.4029	20 37 52.4	9.717	11	9 44 13.25	2.2422	10 40 7.1	14.640
12	7 54 50.47	2.4002	20 28 5.4	9.850	12	9 46 28.48	2.2365	10 25 26.7	14.706
13	7 57 14.39	2.3974	20 18 10.4	9.983	13	9 48 43.55	2.2308	10 10 42.4	14.770
14	7 59 38.15	2.3946	20 8 7.4	10.115	14	9 50 58.45	2.2242	9 55 54.3	14.832
15	8 2 1.74	2.3917	19 57 56.5	10.245	15	9 53 13.20	2.2178	9 41 2.5	14.893
16	8 4 25.15	2.3887	19 47 37.8	10.375	16	9 55 27.80	2.2112	9 26 7.2	14.952
17	8 6 48.38	2.3857	19 37 11.4	10.503	17	9 57 42.25	2.2047	9 11 8.4	15.009
18	8 8 11.43	2.3827	19 26 37.4	10.630	18	9 59 56.55	2.2073	8 56 6.1	15.065
19	8 11 34.31	2.3797	19 15 55.8	10.756	19	10 2 10.71	2.2048	8 41 0.6	15.119
20	8 13 57.01	2.3767	19 5 6.7	10.880	20	10 4 24.73	2.2023	8 25 52.0	15.171
21	8 16 19.52	2.3737	18 54 10.2	11.003	21	10 6 38.61	2.2002	8 10 40.2	15.222
22	8 18 41.84	2.3706	18 43 6.3	11.125	22	10 8 52.36	2.2000	7 55 25.4	15.271
23	8 21 3.97	2.3675	N. 18° 31' 55.2"	11.245	23	10 11 5.98	2.2000	N. 7° 40' 7.7"	15.318
SATURDAY 26.					MONDAY 28.				
0	8 23 25.91	2.3644	N. 18° 20' 36.9"	11.364	0	10 13 19.47	2.2007	N. 7° 24' 47.2"	15.363
1	8 25 47.66	2.3610	18 9 11.5	11.482	1	10 15 32.83	2.2017	7 9 24.0	15.407
2	8 28 9.22	2.3575	17 57 39.0	11.599	2	10 17 46.07	2.2017	6 53 58.2	15.449
3	8 30 30.59	2.3547	17 45 59.5	11.715	3	10 19 59.19	2.2018	6 38 30.0	15.489
4	8 32 51.78	2.3515	17 34 13.1	11.829	4	10 22 12.20	2.2010	6 22 50.5	15.527
5	8 35 12.77	2.3482	17 22 19.9	11.942	5	10 24 25.10	2.2012	6 7 26.7	15.564
6	8 37 33.56	2.3448	17 10 20.0	12.054	6	10 26 37.89	2.2012	5 51 51.7	15.600
7	8 39 54.16	2.3417	16 58 13.4	12.164	7	10 28 50.57	2.2010	5 36 14.6	15.634
8	8 42 14.57	2.3385	16 46 0.3	12.272	8	10 31 3.15	2.2009	5 20 35.5	15.667
9	8 44 34.78	2.3352	16 33 40.7	12.379	9	10 33 15.63	2.2073	5 4 54.5	15.698
10	8 46 54.79	2.3319	16 21 14.7	12.485	10	10 35 28.02	2.2068	4 49 11.7	15.727
11	8 49 14.60	2.3285	16 8 42.3	12.590	11	10 37 40.32	2.2043	4 33 27.2	15.754
12	8 51 34.22	2.3253	15 56 3.7	12.693	12	10 39 52.53	2.2029	4 17 41.2	15.779
13	8 53 53.64	2.3220	15 43 19.0	12.795	13	10 42 4.66	2.2015	4 1 53.7	15.803
14	8 56 12.87	2.3188	15 30 28.2	12.896	14	10 44 16.71	2.2003	3 46 4.8	15.825
15	8 58 31.90	2.3155	15 17 31.5	12.995	15	10 46 28.68	2.1990	3 30 14.6	15.845
16	9 0 50.74	2.3123	15 4 28.9	13.092	16	10 48 40.58	2.1979	3 14 23.3	15.864
17	9 3 9.39	2.3092	14 51 20.5	13.187	17	10 50 52.42	2.1968	2 58 30.9	15.881
18	9 5 27.84	2.3060	14 38 6.4	13.280	18	10 53 4.20	2.1968	2 42 37.5	15.896
19	9 7 46.10	2.3028	14 24 46.8	13.372	19	10 55 15.92	2.1949	2 26 43.3	15.910
20	9 10 4.17	2.2997	14 11 21.7	13.463	20	10 57 27.58	2.1940	2 10 48.3	15.922
21	9 12 22.05	2.2965	13 57 51.1	13.553	21	10 59 39.19	2.1932	1 54 52.6	15.933
22	9 14 39.74	2.2933	13 44 15.2	13.641	22	11 1 50.75	2.1924	1 38 56.3	15.942
23	9 16 57.24	2.2902	13 30 34.1	13.727	23	11 4 2.27	2.1917	1 22 59.6	15.949
24	9 19 14.56	2.2871	N. 13° 16' 47.9"	13.812	24	11 6 13.74	2.1911	N. 1° 7' 2.5"	15.954

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
TUESDAY 29.					THURSDAY 31.				
0	11 6 13.74	2.1911	N. 1° 7' 2.5"	16.964	0	12 51 59.05	2.2406	S. 11° 14' 23.4"	14.337
1	11 8 25.18	2.1905	0 51 5.1	16.966	1	12 54 13.57	2.2422	11 28 41.5	14.366
2	11 10 36.59	2.1900	0 35 7.5	16.960	2	12 56 28.24	2.2446	11 42 55.3	14.193
3	11 12 47.98	2.1896	0 19 9.9	16.960	3	12 58 43.07	2.2486	11 57 4.6	14.118
4	11 14 59.35	2.1892	N. 0 3 12.3	16.959	4	13 0 58.06	2.2512	12 11 9.4	14.042
5	11 17 10.70	2.1891	S. 0 12 45.3	16.957	5	13 3 13.21	2.2539	12 25 9.6	13.966
6	11 19 22.03	2.1890	0 28 42.7	16.953	6	13 5 28.53	2.2567	12 39 5.1	13.897
7	11 21 33.35	2.1887	0 44 39.7	16.947	7	13 7 44.02	2.2596	12 52 56.0	13.806
8	11 23 44.66	2.1886	1 0 36.2	16.939	8	13 9 59.69	2.2626	13 6 42.1	13.727
9	11 25 55.97	2.1886	1 16 32.2	16.939	9	13 12 15.53	2.2656	13 20 23.3	13.644
10	11 28 7.28	2.1886	1 32 27.6	16.919	10	13 14 31.55	2.2686	13 33 59.4	13.559
11	11 30 18.60	2.1887	1 48 22.4	16.907	11	13 16 47.75	2.2716	13 47 30.4	13.473
12	11 32 29.93	2.1889	2 4 16.4	16.893	12	13 19 4.13	2.2745	14 0 56.2	13.386
13	11 34 41.27	2.1892	2 20 9.5	16.877	13	13 21 20.69	2.2776	14 14 16.8	13.299
14	11 36 52.63	2.1896	2 36 1.5	16.859	14	13 23 37.44	2.2807	14 27 32.1	13.210
15	11 39 4.01	2.1899	2 51 52.5	16.840	15	13 25 54.38	2.2838	14 40 41.9	13.119
16	11 41 15.42	2.1904	3 7 42.3	16.819	16	13 28 11.51	2.2870	14 53 46.2	13.026
17	11 43 26.86	2.1910	3 23 30.8	16.797	17	13 30 28.83	2.2902	15 6 44.9	12.932
18	11 45 38.34	2.1917	3 39 17.9	16.773	18	13 32 46.34	2.2935	15 19 37.9	12.837
19	11 47 49.86	2.1924	3 55 3.6	16.748	19	13 35 4.05	2.2968	15 32 25.3	12.741
20	11 50 1.43	2.1932	4 10 47.7	16.721	20	13 37 21.96	2.3002	15 45 6.9	12.643
21	11 52 13.05	2.1940	4 26 30.1	16.693	21	13 39 40.07	2.3036	15 57 42.5	12.543
22	11 54 24.71	2.1948	4 42 10.8	16.663	22	13 41 58.38	2.3069	16 10 12.1	12.443
23	11 56 36.43	2.1956	S. 4 57 49.6	16.631	23	13 44 16.89	2.3102	S. 16 22 35.7	12.342
WEDNESDAY 30.					FRIDAY, FEBRUARY 1.				
0	11 58 48.21	2.1963	S. 5 13 26.4	16.597	0	13 46 35.61	2.3137	S. 16 34 53.1	12.239
1	12 1 0.05	2.1979	5 29 1.1	16.562					
2	12 3 11.96	2.1991	5 44 33.7	16.526					
3	12 5 23.95	2.2004	6 0 4.2	16.489					
4	12 7 36.01	2.2017	6 15 32.4	16.449					
5	12 9 48.15	2.2031	6 30 58.1	16.408					
6	12 12 0.38	2.2045	6 46 21.3	16.365					
7	12 14 12.69	2.2060	7 1 41.8	16.320					
8	12 16 25.09	2.2075	7 16 59.6	16.274					
9	12 18 37.59	2.2091	7 32 14.6	16.227					
10	12 20 50.19	2.2108	7 47 26.8	16.178					
11	12 23 2.89	2.2126	8 2 36.0	16.128					
12	12 25 15.70	2.2143	8 17 42.1	16.076					
13	12 27 28.62	2.2162	8 32 45.0	16.023					
14	12 29 41.65	2.2182	8 47 44.7	14.968					
15	12 31 54.80	2.2202	9 2 41.1	14.912					
16	12 34 8.07	2.2222	9 17 34.1	14.854					
17	12 36 21.47	2.2242	9 32 23.6	14.794					
18	12 38 35.00	2.2262	9 47 9.5	14.733					
19	12 40 48.66	2.2282	10 1 51.6	14.670					
20	12 43 2.46	2.2311	10 16 29.8	14.606					
21	12 45 16.40	2.2334	10 31 4.1	14.539					
22	12 47 30.47	2.2357	10 45 34.5	14.473					
23	12 49 44.68	2.2381	11 0 1.0	14.406					
24	12 51 59.05	2.2406	S. 11 14 23.4	14.337					

PHASES OF THE MOON.

☾ Last Quarter, . . . 3 13 54.9
 ● New Moon, . . . 10 15 27.4
 ☽ First Quarter, . . . 18 16 0.0
 ○ Full Moon, . . . 26 5 5.7

☾ Perigee, 2 8.0
 ☾ Apogee, 17 5.6
 ☾ Perigee, 28 22.8

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Star's Name and Position.	Noon.	P. L. of Dist.	IIIh.	P. L. of Dist.	VIh.	P. L. of Dist.	IXh.	P. L. of Dist.
1	Pollux W.	46 55 48	2344	48 40 44	2340	50 25 45	2337	52 10 50	2334
	Spica E.	44 43 3	2307	42 57 13	2307	41 11 24	2307	39 25 35	2309
	Antares E.	90 22 3	2393	88 35 53	2393	86 49 42	2391	85 3 29	2391
	Venus E.	92 26 12	2706	90 49 40	2704	89 13 6	2704	87 36 31	2703
	SUN E.	123 53 57	2617	122 15 25	2616	120 36 52	2615	118 58 18	2614
2	Pollux W.	60 57 12	2325	62 42 35	2324	64 27 59	2324	66 13 24	2324
	Jupiter W.	25 34 40	2320	27 20 11	2314	29 5 50	2310	30 51 35	2306
	Regulus W.	23 55 44	2326	25 40 51	2320	27 26 7	2326	29 11 29	2322
	Spica E.	30 36 56	2317	28 51 21	2320	27 5 51	2325	25 20 28	2321
	Antares E.	76 12 15	2299	74 26 0	2299	72 39 45	2299	70 53 31	2291
	Venus E.	79 33 22	2701	77 56 43	2701	76 20 5	2701	74 43 27	2703
	SUN E.	110 45 12	2612	109 6 34	2613	107 27 57	2613	105 49 20	2614
3	Pollux W.	75 0 29	2325	76 45 52	2326	78 31 14	2327	80 16 34	2328
	Jupiter W.	39 41 22	2328	41 27 25	2327	43 13 29	2327	44 59 33	2328
	Regulus W.	37 59 11	2315	39 44 48	2314	41 30 25	2316	43 16 1	2316
	Saturn W.	27 2 34	2323	28 46 35	2374	30 30 47	2367	32 15 9	2362
	Antares E.	62 2 38	2296	60 16 32	2297	58 30 28	2298	56 44 26	2300
	Venus E.	66 40 36	2708	65 4 7	2710	63 27 41	2712	61 51 17	2714
	SUN E.	97 36 31	2618	95 58 1	2621	94 19 34	2622	92 41 9	2624
4	Pollux W.	89 2 44	2327	90 47 50	2329	92 32 52	2343	94 17 51	2344
	Jupiter W.	53 49 41	2303	55 35 38	2303	57 21 33	2305	59 7 25	2307
	Regulus W.	52 3 48	2323	53 49 16	2323	55 34 42	2325	57 20 5	2327
	Saturn W.	40 58 34	2346	42 43 26	2346	44 28 18	2346	46 13 11	2346
	Antares E.	47 54 55	2310	46 9 10	2313	44 23 28	2314	42 37 49	2317
	Venus E.	53 50 4	2727	52 14 0	2730	50 38 0	2733	49 2 4	2737
	SUN E.	84 29 40	2634	82 51 31	2636	81 13 25	2638	79 35 22	2641
5	Jupiter W.	67 56 4	2317	69 41 38	2320	71 27 8	2323	73 12 34	2326
	Regulus W.	66 6 13	2329	67 51 16	2343	69 36 15	2345	71 21 9	2348
	Saturn W.	54 57 26	2360	56 42 12	2363	58 26 56	2364	60 11 37	2366
	Antares E.	33 50 34	2331	32 5 20	2334	30 20 10	2337	28 35 4	2341
	Venus E.	41 3 41	2756	39 28 18	2763	37 53 2	2769	36 17 53	2774
	SUN E.	71 26 4	2655	69 48 24	2659	68 10 49	2663	66 33 19	2666
6	Jupiter W.	81 58 34	2342	83 43 31	2347	85 28 22	2350	87 13 8	2355
	Regulus W.	80 4 31	2366	81 48 55	2369	83 33 14	2373	85 17 27	2378
	Saturn W.	68 54 8	2371	70 38 25	2374	72 22 37	2378	74 6 43	2383
	Spica W.	26 5 43	2391	27 49 31	2391	29 33 18	2393	31 17 3	2394
	SUN E.	58 27 1	2666	56 50 2	2669	55 13 8	2664	53 36 20	2669
7	Jupiter W.	95 55 19	2379	97 39 24	2384	99 23 22	2389	101 7 12	2396
	Regulus W.	93 56 52	2402	95 40 24	2406	97 23 48	2413	99 7 4	2419
	Saturn W.	82 45 45	2404	84 29 14	2410	86 12 35	2415	87 55 49	2421
	Spica W.	39 54 58	2410	41 38 18	2416	43 21 32	2419	45 4 40	2424
	SUN E.	45 34 0	2726	43 57 53	2731	42 21 54	2738	40 46 4	2743
8	Saturn W.	96 29 49	2452	98 12 10	2459	99 54 21	2467	101 36 21	2474
	Spica W.	53 38 24	2453	55 20 44	2460	57 2 54	2466	58 44 55	2473
	SUN E.	32 48 58	2777	31 14 0	2785	29 39 12	2792	28 4 34	2801
13	SUN W.	27 44 18	2314	29 10 10	2327	30 35 47	2339	32 1 10	2361
	α Arietis E.	74 31 25	2392	72 58 18	2374	71 25 26	2366	69 52 49	2397

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Star's Name and Position.	Midnight.	P. L. of Dist.	XVh.	P. L. of Dist.	XVIIIh.	P. L. of Dist.	XXIh.	P. L. of Dist.
1	Pollux W.	53° 56' 0"	2331	55° 41' 14"	2329	57° 26' 31"	2328	59° 11' 50"	2326
	Spica E.	37 39 48	2309	35 54 2	2311	34 8 18	2312	32 22 36	2313
	Antares E.	83 17 16	2389	81 31 1	2390	79 44 46	2389	77 58 30	2389
	Venus E.	85 59 55	2702	84 23 18	2701	82 46 40	2701	81 10 1	2701
	SUN E.	117 19 42	2613	115 41 5	2613	114 2 28	2613	112 23 50	2612
2	Pollux W.	67 58 49	2328	69 44 15	2324	71 29 40	2324	73 15 5	2324
	Jupiter W.	32 37 26	2303	34 23 21	2301	36 9 19	2299	37 55 20	2298
	Regulus W.	30 56 56	2320	32 42 27	2318	34 28 0	2317	36 13 35	2316
	Spica E.	23 35 14	2338	21 50 10	2347	20 5 19	2356	18 20 44	2372
	Antares E.	69 7 18	2291	67 21 6	2292	65 34 55	2294	63 48 46	2294
	Venus E.	73 6 50	2703	71 30 14	2704	69 53 40	2703	68 17 7	2707
	SUN E.	104 10 44	2615	102 32 9	2615	100 53 35	2616	99 15 2	2618
3	Pollux W.	82 1 53	2329	83 47 10	2331	85 32 24	2333	87 17 35	2335
	Jupiter W.	46 45 36	2298	48 31 39	2298	50 17 41	2299	52 3 42	2300
	Regulus W.	45 1 37	2317	46 47 12	2317	48 32 46	2319	50 18 18	2320
	Saturn W.	33 59 39	2357	35 44 16	2353	37 28 58	2350	39 13 44	2348
	Antares E.	54 58 27	2302	53 12 30	2303	51 26 35	2303	49 40 43	2308
	Venus E.	60 14 56	2716	58 38 38	2719	57 2 23	2722	55 26 12	2724
	SUN E.	91 2 46	2626	89 24 26	2627	87 46 8	2629	86 7 53	2631
4	Pollux W.	96 2 46	2347	97 47 37	2349	99 32 25	2353	101 17 8	2356
	Jupiter W.	60 53 15	2309	62 39 2	2311	64 24 46	2313	66 10 27	2315
	Regulus W.	59 5 25	2329	60 50 42	2331	62 35 56	2334	64 21 6	2336
	Saturn W.	47 58 4	2346	49 42 57	2347	51 27 48	2348	53 12 38	2349
	Antares E.	40 52 14	2320	39 6 43	2322	37 21 16	2325	35 35 53	2326
	Venus E.	47 26 13	2741	45 50 27	2744	44 14 46	2748	42 39 10	2753
	SUN E.	77 57 23	2644	76 19 28	2646	74 41 36	2649	73 3 48	2652
5	Jupiter W.	74 57 55	2329	76 43 12	2333	78 28 24	2336	80 13 32	2339
	Regulus W.	73 5 59	2351	74 50 44	2354	76 35 25	2357	78 20 1	2362
	Saturn W.	61 56 15	2358	63 40 50	2362	65 25 20	2364	67 9 46	2367
	Antares E.	26 50 4	2344	25 5 9	2348	23 20 20	2353	21 35 37	2357
	Venus E.	34 42 51	2781	33 7 58	2786	31 33 15	2796	29 58 42	2805
	SUN E.	64 55 54	2669	63 18 33	2673	61 41 17	2677	60 4 6	2681
6	Jupiter W.	88 57 47	2359	90 42 20	2364	92 26 47	2368	94 11 7	2374
	Regulus W.	87 1 33	2382	88 45 33	2387	90 29 26	2391	92 13 13	2397
	Saturn W.	75 50 44	2386	77 34 39	2391	79 18 27	2395	81 2 9	2399
	Spica W.	33 0 46	2396	34 44 26	2400	36 28 1	2403	38 11 32	2406
	SUN E.	51 59 39	2704	50 23 4	2709	48 46 36	2713	47 10 14	2719
	7	Jupiter W.	102 50 53	2401	104 34 26	2408	106 17 50	2414	108 1 5	2420
Regulus W.		100 50 12	2425	102 33 11	2431	104 16 1	2438	105 58 42	2445
Saturn W.		89 38 54	2426	91 21 51	2433	93 4 39	2438	94 47 19	2445
Spica W.		46 47 41	2429	48 30 34	2435	50 13 19	2441	51 55 56	2447
SUN E.		39 10 21	2750	37 34 47	2756	35 59 22	2763	34 24 5	2770
8	Saturn W.	103 18 11	2432	104 59 50	2439	106 41 18	2446	108 22 34	2457
	Spica W.	60 26 46	2480	62 8 27	2487	63 49 58	2495	65 31 18	2503
	SUN E.	26 30 7	2808	24 55 50	2817	23 21 44	2825	21 47 49	2834
13	SUN W.	33 26 19	2363	34 51 14	2374	36 15 56	2386	37 40 24	2396
	α Arietis E.	68 20 26	2909	66 48 18	2919	65 16 23	2930	63 44 42	2941

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Star's Name and Position.	Noon.	P. L. of Dif.	IIIh.	P. L. of Dif.	VIh.	P. L. of Dif.	IXh.	P. L. of Dif.
14	SUN W.	39° 4' 40"	3307	40° 28' 43"	3319	41° 52' 33"	3329	43° 16' 11"	3339
	α Arietis E.	62 13 15	3361	60 42 1	3392	59 11 0	3372	57 40 12	3361
	Aldebaran E.	94 49 7	3368	93 18 39	3397	91 48 23	3307	90 18 19	3316
15	SUN W.	50 11 32	3386	51 34 5	3393	52 56 29	3401	54 18 44	3409
	α Arietis E.	50 9 15	3380	48 39 39	3398	47 10 13	3047	45 40 58	3056
	Aldebaran E.	82 50 46	3360	81 21 47	3398	79 52 58	3076	78 24 19	3083
16	SUN W.	61 8 0	3440	62 29 31	3445	63 50 57	3450	65 12 17	3454
	Fomalhaut W.	36 1 54	4476	37 6 7	4386	38 11 42	4303	39 18 32	4230
	α Arietis E.	38 17 14	3094	36 48 57	3192	35 20 50	3110	33 52 52	3117
	Aldebaran E.	71 3 13	3116	69 35 23	3132	68 7 40	3128	66 40 4	3133
17	SUN W.	71 58 2	3466	73 19 4	3468	74 40 4	3468	76 1 4	3467
	Fomalhaut W.	45 7 57	3055	46 20 21	3014	47 33 27	3075	48 47 12	3040
	Aldebaran E.	59 23 29	3154	57 56 25	3166	56 29 25	3161	55 2 29	3163
	Pollux E.	101 14 0	3106	99 45 58	3106	98 17 56	3107	96 49 55	3106
18	SUN W.	82 46 19	3460	84 7 28	3456	85 28 41	3453	86 49 58	3447
	Fomalhaut W.	55 4 18	3094	56 21 11	3071	57 38 29	3048	58 56 12	3026
	α Pegasi W.	32 8 15	3323	33 26 25	3378	34 45 23	3338	36 5 5	3301
	Aldebaran E.	47 48 38	3177	46 22 1	3178	44 55 26	3181	43 28 54	3183
	Pollux E.	89 29 32	3090	88 1 21	3096	86 33 6	3092	85 4 47	3068
19	SUN W.	93 37 52	3417	94 59 49	3410	96 21 54	3402	97 44 8	3393
	Fomalhaut W.	65 30 25	3397	66 50 19	3369	68 10 33	3493	69 31 6	3475
	α Pegasi W.	42 52 47	3367	44 15 53	3332	45 39 27	3310	47 3 27	3288
	Mars W.	23 37 2	3397	24 59 22	3379	26 22 3	3361	27 45 4	3345
	Aldebaran E.	36 17 8	3308	34 51 2	3309	33 25 4	3317	31 59 15	3325
	Pollux E.	77 41 48	3062	76 12 52	3066	74 43 48	3048	73 14 35	3041
	Jupiter E.	111 29 41	3004	109 59 33	2997	108 29 16	2989	106 58 49	2981
20	SUN W.	104 37 58	3343	106 1 20	3332	107 24 55	3319	108 48 44	3306
	Fomalhaut W.	76 18 32	3394	77 40 55	3379	79 3 36	3363	80 26 35	3347
	α Pegasi W.	54 9 34	3188	55 35 57	3170	57 2 42	3152	58 29 49	3133
	Mars W.	34 44 37	3379	36 9 23	3355	37 34 27	3341	38 59 48	3326
	Pollux E.	65 46 3	3096	64 15 48	3089	62 45 21	2978	61 14 41	2967
	Jupiter E.	99 23 53	2984	97 52 17	2924	96 20 28	2912	94 48 24	2901
	Regulus E.	102 38 11	2973	101 7 24	2962	99 36 23	2960	98 5 7	2939
21	SUN W.	115 51 36	3238	117 17 0	3234	118 42 41	3209	120 8 40	3193
	Fomalhaut W.	87 25 51	3375	88 50 32	3390	90 15 30	3247	91 40 44	3232
	α Pegasi W.	65 50 52	3044	67 20 10	3077	68 49 49	3099	70 19 50	2992
	Mars W.	46 11 4	3148	47 38 15	3138	49 5 45	3116	50 33 35	3101
	Pollux E.	53 37 56	2912	52 5 52	2901	50 33 34	2889	49 1 1	2876
	Jupiter E.	87 4 17	2838	85 30 38	2825	83 56 42	2811	82 22 28	2796
	Regulus E.	90 25 3	2876	88 52 13	2862	87 19 5	2848	85 45 40	2834
	Saturn E.	100 57 35	2869	99 24 37	2856	97 51 21	2842	96 17 47	2826
22	α Pegasi W.	77 55 23	2905	79 27 35	2867	81 0 10	2870	82 33 7	2853
	Mars W.	57 57 45	3016	59 27 38	2909	60 57 52	2961	62 28 28	2964
	Pollux E.	41 14 24	2818	39 40 20	2807	38 6 1	2797	36 31 29	2787
	Jupiter E.	74 26 32	2722	72 50 22	2707	71 13 51	2692	69 37 0	2675
	Regulus E.	77 53 50	2760	76 18 29	2744	74 42 47	2729	73 6 45	2712
	Saturn E.	88 25 14	2762	86 49 43	2737	85 13 52	2721	83 37 40	2705

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Star's Name and Position.	Midnight.	P. L. of Dist.	XV ^h .	P. L. of Dist.	XVIII ^h .	P. L. of Dist.	XXI ^h .	P. L. of Dist.
14	SUN W.	44° 39' 37"	3049	46° 2' 52"	3086	47° 25' 54"	3068	48° 48' 49"	3077
	α Arietis E.	56 9 36	3069	54 39 13	3001	53 9 2	3011	51 39 3	3030
	Aldebaran E.	88 48 26	3086	87 18 44	3084	85 49 14	3043	84 19 55	3063
15	SUN W.	55 40 50	3416	57 2 48	3423	58 24 39	3429	59 46 23	3435
	α Arietis E.	44 11 54	3064	42 43 0	3071	41 14 15	3079	39 45 40	3087
	Aldebaran E.	76 55 49	3061	75 27 28	3097	73 59 15	3164	72 31 10	3110
16	SUN W.	66 38 33	3487	67 54 45	3461	69 15 53	3463	70 36 58	3464
	Fomalhaut W.	40 26 30	4163	41 35 31	4106	42 45 28	4060	43 56 18	4001
	α Arietis E.	32 25 3	3126	30 57 24	3123	29 29 53	3140	28 2 32	3149
	Aldebaran E.	65 12 34	3128	63 45 10	3143	62 17 51	3147	60 50 38	3160
17	SUN W.	77 22 5	3487	78 43 6	3465	80 4 9	3464	81 25 13	3463
	Fomalhaut W.	50 1 33	3097	51 16 28	3778	52 31 55	3747	53 47 52	3730
	Aldebaran E.	53 35 36	3167	52 8 47	3189	50 42 1	3172	49 15 18	3174
	Pollux E.	95 21 53	3105	93 53 50	3105	92 25 46	3108	90 57 40	3101
18	SUN W.	88 11 21	3443	89 32 49	3436	90 54 23	3432	92 16 3	3424
	Fomalhaut W.	60 14 18	3095	61 32 47	3584	62 51 39	3565	64 10 52	3546
	α Pegasi W.	37 25 28	3498	38 46 28	3487	40 8 3	3408	41 30 10	3382
	Aldebaran E.	42 2 25	3187	40 36 0	3189	39 9 38	3193	37 43 20	3198
	Pollux E.	83 36 23	3088	82 7 53	3079	80 39 18	3074	79 10 37	3068
19	SUN W.	99 6 32	3065	100 29 6	3374	101 51 52	3365	103 14 49	3354
	Fomalhaut W.	70 51 58	3496	72 13 9	3441	73 34 39	3426	74 56 27	3410
	α Pegasi W.	48 27 52	3367	49 52 42	3347	51 17 56	3296	52 43 34	3268
	Mars W.	29 8 23	3330	30 32 0	3314	31 55 55	3299	33 20 8	3285
	Aldebaran E.	30 33 36	3237	29 8 11	3263	27 43 4	3270	26 18 18	3294
	Pollux E.	71 45 13	3088	70 15 41	3025	68 45 59	3017	67 16 7	3007
	Jupiter E.	105 28 13	3073	103 57 26	3063	102 26 27	3064	100 55 16	3044
20	SUN W.	110 12 48	3094	111 37 6	3081	113 1 40	3067	114 26 30	3053
	Fomalhaut W.	81 49 52	3323	83 13 27	3318	84 37 18	3303	86 1 26	3288
	α Pegasi W.	59 57 18	3116	61 25 9	3097	62 53 22	3080	64 21 56	3063
	Mars W.	40 25 27	3219	41 51 24	3196	43 17 39	3180	44 44 12	3164
	Pollux E.	59 43 47	3067	58 12 40	3048	56 41 19	3035	55 9 45	3024
	Jupiter E.	93 16 6	3069	91 43 33	3078	90 10 44	3064	88 37 39	3051
	Regulus E.	96 33 37	3027	95 1 52	3016	93 29 52	3003	91 57 36	2989
21	SUN W.	121 34 58	3178	123 1 34	3161	124 28 30	3145	125 55 45	3129
	Fomalhaut W.	93 6 15	3219	94 32 2	3206	95 58 4	3194	97 24 20	3182
	α Pegasi W.	71 50 13	3075	73 20 57	3067	74 52 4	3059	76 23 33	3052
	Mars W.	52 1 44	3064	53 30 13	3067	54 59 3	3051	56 28 13	3043
	Pollux E.	47 28 12	2965	45 55 8	2943	44 21 49	2941	42 48 14	2929
	Jupiter E.	80 47 55	3782	79 13 4	3767	77 37 53	3752	76 2 22	3738
	Regulus E.	84 11 56	3030	82 37 54	3006	81 3 32	2990	79 28 51	2975
	Saturn E.	94 43 55	3013	93 9 44	2998	91 35 14	2983	90 0 24	2968
22	α Pegasi W.	84 6 26	2936	85 40 7	2920	87 14 9	2903	88 48 33	2886
	Mars W.	63 59 26	2946	65 30 46	2929	67 2 28	2911	68 34 33	2898
	Pollux E.	34 56 44	2779	33 21 48	2770	31 46 41	2768	30 11 24	2766
	Jupiter E.	67 59 47	3060	66 22 13	3044	64 44 18	3028	63 6 1	3012
	Regulus E.	71 30 21	3006	69 53 36	2981	68 16 30	2964	66 39 2	2948
	Saturn E.	82 1 7	2989	80 24 13	2973	78 46 57	2957	77 9 20	2941

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Star's Name and Position.	Noon.	P. L. of Dist.	III ^h .	P. L. of Dist.	VI ^h .	P. L. of Dist.	IX ^h .	P. L. of Dist.
23	α Pegasi W.	90° 23' 19"	2770	91° 58' 26"	2758	93° 33' 55"	2738	95° 9' 45"	2723
	Mars W.	70 7 1	2676	71 39 51	2666	73 13 4	2640	74 46 40	2622
	α Arietis W.	47 24 10	2649	49 1 58	2633	50 40 10	2614	52 18 46	2597
	Jupiter E.	61 27 22	2606	59 48 21	2580	58 8 59	2564	56 29 15	2548
	Regulus E.	65 1 12	2632	63 23 1	2616	61 44 27	2599	60 5 31	2584
	Saturn E.	75 31 21	2626	73 53 1	2609	72 14 18	2593	70 35 13	2577
24	Mars W.	82 40 23	2735	84 16 16	2719	85 52 31	2702	87 29 8	2686
	α Arietis W.	60 37 41	2611	62 18 39	2604	64 0 0	2479	65 41 43	2462
	Aldebaran W.	29 6 56	2726	30 43 1	2699	32 19 56	2654	33 57 38	2631
	Jupiter E.	48 5 8	2471	46 23 14	2456	44 40 59	2442	42 58 24	2429
	Regulus E.	51 45 24	2604	50 4 17	2489	48 22 49	2475	46 41 0	2460
	Saturn E.	62 14 24	2499	60 33 9	2485	58 51 34	2470	57 9 39	2455
	Spica E.	105 47 46	2499	104 6 31	2482	102 24 53	2467	100 42 53	2452
	Mars W.	95 37 35	2609	97 16 18	2594	98 55 21	2580	100 34 44	2566
25	α Arietis W.	74 15 50	2287	75 59 44	2272	77 43 58	2259	79 28 31	2246
	Aldebaran W.	42 16 4	2493	43 57 27	2471	45 39 21	2451	47 21 43	2432
	Saturn E.	48 35 8	2690	46 51 19	2678	45 7 13	2667	43 22 51	2657
	Spica E.	92 7 32	2278	90 23 25	2264	88 38 58	2250	86 54 11	2237
	α Arietis W.	88 15 55	2285	90 2 16	2275	91 48 52	2265	93 35 43	2256
26	Aldebaran W.	55 59 53	2650	57 44 39	2637	59 29 45	2624	61 15 10	2612
	Saturn E.	34 37 44	2620	32 52 14	2616	31 6 38	2614	29 20 59	2612
	Spica E.	78 5 45	2278	76 19 13	2267	74 32 25	2257	72 45 22	2247
	Aldebaran W.	70 6 18	2262	71 53 14	2244	73 40 21	2247	75 27 39	2239
27	Pollux W.	28 10 26	2231	29 55 55	2201	31 41 53	2255	33 28 15	2270
	Spica E.	63 46 51	2206	61 58 35	2201	60 10 9	2196	58 21 34	2190
	Aldebaran W.	84 26 19	2216	86 14 22	2214	88 2 28	2212	89 50 37	2211
28	Pollux W.	42 24 37	2221	44 12 33	2214	46 0 39	2209	47 48 53	2206
	Spica E.	49 17 2	2173	47 27 54	2173	45 38 44	2170	43 49 32	2170
	Antares E.	94 56 50	2161	93 7 23	2169	91 17 53	2157	89 28 21	2156
	Pollux W.	56 51 13	2196	58 39 48	2196	60 28 22	2196	62 16 55	2196
29	Jupiter W.	24 8 23	2170	25 57 36	2167	27 46 53	2165	29 36 14	2163
	Spica E.	34 43 41	2178	32 54 41	2182	31 5 46	2187	29 16 59	2192
	Antares E.	80 20 24	2157	78 30 51	2156	76 41 20	2160	74 51 52	2163
	Pollux W.	71 18 55	2211	73 7 6	2216	74 55 10	2220	76 43 7	2226
	Jupiter W.	38 43 16	2166	40 32 35	2169	42 21 49	2172	44 10 57	2177
30	Regulus W.	34 17 10	2206	36 5 30	2208	37 53 46	2211	39 41 57	2215
	Saturn W.	24 41 27	2274	26 28 5	2266	28 14 54	2260	30 1 52	2256
	Antares E.	65 45 44	2181	63 56 48	2186	62 8 0	2191	60 19 19	2197
	Venus E.	103 38 12	2267	101 58 32	2272	100 18 59	2278	98 39 34	2283
	SUN E.	128 40 34	2496	126 59 15	2492	125 18 4	2497	123 37 0	2493
	Pollux W.	85 40 46	2256	87 27 50	2264	89 14 43	2271	91 1 25	2279
	Jupiter W.	53 14 51	2204	55 3 12	2210	56 51 24	2217	58 39 26	2224
	Regulus W.	48 41 7	2242	50 28 32	2249	52 15 47	2256	54 2 52	2262
31	Saturn W.	38 57 22	2269	40 44 22	2262	42 31 17	2266	44 18 6	2271
	Antares E.	51 18 10	2239	49 30 25	2236	47 42 51	2244	45 55 29	2251
	Venus E.	90 24 38	2218	88 46 8	2226	87 7 49	2235	85 29 41	2243
	SUN E.	115 13 54	2247	113 33 46	2255	111 53 49	2263	110 14 3	2271

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Star's Name and Position.	Midnight.	P. L. of Dist.	XVh.	P. L. of Dist.	XVIIIh.	P. L. of Dist.	XXIh.	P. L. of Dist.
23	α Pegasi W.	96° 45' 55"	2707	98° 22' 25"	2692	99° 59' 16"	2678	101° 36' 26"	2663
	Mars W.	76 20 39	2606	77 55 1	2787	79 29 46	2770	81 4 53	2763
	α Arietis W.	58 57 45	2680	55 37 8	2692	57 16 55	2646	58 57 6	2627
	Jupiter E.	54 49 9	2633	53 8 41	2617	51 27 52	2602	49 46 41	2486
	Regulus E.	58 26 14	2668	56 46 35	2651	55 6 33	2636	53 26 9	2620
	Saturn E.	68 55 47	2661	67 15 59	2645	65 35 49	2630	63 55 17	2616
24	Mars W.	89 6 7	2670	90 43 27	2664	92 21 9	2638	93 59 12	2624
	α Arietis W.	67 23 49	2447	69 6 17	2482	70 49 6	2417	72 32 17	2401
	Aldebaran W.	35 36 4	2692	37 15 10	2666	38 54 53	2639	40 35 12	2616
	Jupiter E.	41 15 29	2416	39 32 15	2401	37 48 42	2386	36 4 50	2376
	Regulus E.	44 58 51	2446	43 16 22	2432	41 33 33	2418	39 50 24	2405
	Saturn E.	55 27 23	2441	53 44 47	2429	52 1 53	2416	50 18 40	2402
	Spica E.	99 0 32	2436	97 17 49	2421	95 34 44	2406	93 51 18	2392
25	Mars W.	102 14 26	2653	103 54 26	2640	105 34 43	2627	107 15 18	2616
	α Arietis W.	81 13 23	2633	82 58 34	2620	84 44 4	2609	86 29 51	2597
	Aldebaran W.	49 4 32	2414	50 47 47	2397	52 31 26	2381	54 15 28	2366
	Saturn E.	41 38 14	2348	39 53 24	2329	38 8 21	2321	36 23 7	2326
	Spica E.	85 9 6	2324	83 23 42	2312	81 38 0	2300	79 52 1	2289
26	α Arietis W.	95 22 49	2346	97 10 8	2326	98 57 39	2320	100 45 22	2323
	Aldebaran W.	63 0 52	2300	64 46 51	2289	66 33 6	2280	68 19 35	2270
	Saturn E.	27 35 19	2316	25 49 42	2320	24 4 12	2328	22 18 53	2337
	Spica E.	70 58 5	2339	69 10 35	2320	67 22 52	2323	65 34 57	2314
27	Aldebaran W.	77 15 8	2323	79 2 46	2329	80 50 31	2326	82 38 22	2320
	Pollux W.	35 14 58	2353	37 2 0	2346	38 49 19	2337	40 36 52	2329
	Spica E.	56 32 51	2186	54 44 2	2182	52 55 7	2178	51 6 7	2176
28	Aldebaran W.	91 38 48	2310	93 27 0	2310	95 15 12	2310	97 3 24	2312
	Pollux W.	49 37 13	2392	51 25 38	2199	53 14 7	2197	55 2 39	2196
	Spica E.	42 0 19	2170	40 11 6	2171	38 21 55	2172	36 32 46	2176
	Antares E.	87 38 47	2166	85 49 11	2166	83 59 35	2166	82 9 59	2166
29	Pollux W.	64 5 26	2300	65 53 54	2302	67 42 18	2304	69 30 39	2306
	Jupiter W.	31 25 38	2162	33 15 3	2161	35 4 29	2162	36 53 54	2164
	Spica E.	27 28 20	2199	25 39 51	2306	23 51 35	2318	22 3 34	2329
	Antares E.	73 2 28	2166	71 13 9	2169	69 23 55	2172	67 34 46	2177
30	Pollux W.	78 30 56	2321	80 18 37	2327	82 6 9	2343	83 53 32	2349
	Jupiter W.	45 59 59	2182	47 48 54	2187	49 37 41	2192	51 26 20	2196
	Regulus W.	41 30 2	2320	43 18 0	2325	45 5 51	2331	46 53 33	2336
	Saturn W.	31 48 56	2354	33 36 3	2353	35 23 11	2364	37 10 18	2366
	Antares E.	58 30 47	2392	56 42 23	2399	54 54 9	2316	53 6 5	2322
	Venus E.	97 0 16	2690	95 21 7	2697	93 42 8	2694	92 3 18	2611
	SUN E.	121 56 5	2619	120 15 18	2626	118 34 40	2633	116 54 12	2640
31	Pollux W.	92 47 56	2326	94 34 16	2324	96 20 24	2303	98 6 19	2311
	Jupiter W.	60 27 17	2331	62 14 58	2339	64 2 28	2346	65 49 47	2356
	Regulus W.	55 49 47	2370	57 36 31	2377	59 23 4	2386	61 9 26	2392
	Saturn W.	46 4 48	2376	47 51 23	2382	49 37 49	2386	51 24 6	2396
	Antares E.	44 8 18	2359	42 21 18	2367	40 34 30	2376	38 47 54	2383
	Venus E.	83 51 44	2661	82 13 58	2660	80 36 24	2660	78 59 2	2678
	SUN E.	108 34 28	2660	106 55 5	2666	105 15 53	2666	103 36 52	2665

AT GREENWICH APPARENT NOON.

Day of the Week.	Day of the Month.	THE SUN'S					Sideral Time of the Semi-diameter passing the Meridian.	Equation of Time, to be added to Apparent Time.	Diff. for 1 hour.
		Apparent Right Ascension.	Diff. for 1 hour.	Apparent Declination.	Diff. for 1 hour.	Semi-diameter.			
Fri.	1	21 ^h 0 ^m 39.12 ^s	10.175	S. 17° 0' 46.1"	42.94	16 15.93	68.24	13 54.75	0.318
Sat.	2	21 4 42.93	10.142	16 43 26.4	43.68	16 15.77	68.13	14 1.98	0.284
Sun.	3	21 8 45.94	10.108	16 25 49.2	44.40	16 15.61	68.01	14 8.41	0.251
Mon.	4	21 12 48.14	10.075	16 7 54.7	45.10	16 15.45	67.89	14 14.04	0.218
Tues.	5	21 16 49.54	10.041	15 49 43.5	45.79	16 15.28	67.77	14 18.89	0.184
Wed.	6	21 20 50.13	10.008	15 31 16.1	46.46	16 15.10	67.65	14 22.90	0.151
Thur.	7	21 24 49.94	9.975	15 12 32.8	47.11	16 14.92	67.54	15 26.14	0.118
Fri.	8	21 28 48.96	9.942	14 53 34.0	47.75	16 14.75	67.43	14 28.60	0.085
Sat.	9	21 32 47.18	9.910	14 34 20.2	48.37	16 14.56	67.32	14 30.25	0.052
Sun.	10	21 36 44.62	9.877	14 14 51.7	48.97	16 14.37	67.21	14 31.14	0.020
Mon.	11	21 40 41.27	9.844	13 55 9.2	49.56	16 14.18	67.10	14 31.23	0.012
Tues.	12	21 44 37.15	9.813	13 35 12.9	50.12	16 13.99	66.99	14 30.56	0.044
Wed.	13	21 48 32.27	9.781	13 15 3.4	50.66	16 13.80	66.88	14 29.12	0.075
Thur.	14	21 52 26.62	9.750	12 54 41.2	51.18	16 13.61	66.77	14 26.93	0.106
Fri.	15	21 56 20.22	9.719	12 34 6.5	51.69	16 13.41	66.66	14 24.00	0.137
Sat.	16	22 0 13.07	9.688	12 13 19.8	52.18	16 13.21	66.56	14 20.31	0.168
Sun.	17	22 4 5.18	9.657	11 52 21.6	52.65	16 13.00	66.46	14 15.88	0.198
Mon.	18	22 7 56.58	9.628	11 31 12.4	53.11	16 12.79	66.36	14 10.73	0.237
Tues.	19	22 11 47.30	9.600	11 9 52.5	53.55	16 12.58	66.26	14 4.91	0.266
Wed.	20	22 15 37.35	9.572	10 48 22.2	53.97	16 12.36	66.17	13 58.42	0.284
Thur.	21	22 19 26.73	9.544	10 26 42.0	54.37	16 12.14	66.08	13 51.26	0.312
Fri.	22	22 23 15.43	9.517	10 4 52.4	54.76	16 11.92	65.99	13 43.42	0.339
Sat.	23	22 27 3.49	9.490	9 42 53.8	55.13	16 11.70	65.90	13 34.95	0.366
Sun.	24	22 30 50.92	9.464	9 20 46.3	55.49	16 11.47	65.81	13 25.86	0.392
Mon.	25	22 34 37.73	9.439	8 58 30.3	55.84	16 11.23	65.73	13 16.14	0.416
Tues.	26	22 38 23.97	9.416	8 36 6.3	56.16	16 10.99	65.65	13 5.86	0.439
Wed.	27	22 42 9.66	9.394	8 13 34.7	56.47	16 10.75	65.57	12 55.03	0.461
Thur.	28	22 45 54.83	9.373	7 50 55.8	56.77	16 10.51	65.49	12 43.68	0.483
Fri.	29	22 49 39.49	9.352	S. 7 28 10.1	57.05	16 10.26	65.41	12 31.82	0.504

NOTE. — Mean Time of the Semi-diameter passing may be found by subtracting 0s.18 from the Sideral Time.

AT GREENWICH MEAN NOON.

THE SUN'S								
Day of the Week.	Day of the Month.	THE SUN'S				Equation of Time, to be subtracted from Mean Time.	Diff. for 1 hour.	Sidereal Time.
		Apparent Right Ascension.	D.M. for 1 hour.	Apparent Declination.	D.M. for 1 hour.			
Fri.	1	21 ^h 0 ^m 36.76 ^s	10.175	S. 17° 0' 56.1"	42.94	13 54.67	0.318	20 46 42.09
Sat.	2	21 4 40.56	10.149	16 43 36.7	43.68	14 1.91	0.284	20 50 38.65
Sun.	3	21 8 43.56	10.108	16 25 59.7	44.40	14 8.35	0.251	20 54 35.21
Mon.	4	21 12 45.75	10.075	16 8 5.4	45.10	14 13.99	0.218	20 58 31.76
Tues.	5	21 16 47.14	10.041	15 49 54.4	45.79	14 18.83	0.184	21 2 28.31
Wed.	6	21 20 47.73	10.008	15 31 27.2	46.46	14 22.86	0.151	21 6 24.87
Thur.	7	21 24 47.54	9.975	15 12 44.1	47.11	14 26.11	0.118	21 10 21.43
Fri.	8	21 28 46.56	9.943	14 53 45.5	47.75	14 28.58	0.085	21 14 17.98
Sat.	9	21 32 44.78	9.910	14 34 31.9	48.37	14 30.24	0.052	21 18 14.54
Sun.	10	21 36 42.22	9.877	14 15 3.6	48.97	14 31.13	0.020	21 22 11.09
Mon.	11	21 40 38.88	9.844	13 55 21.2	49.56	14 31.23	0.012	21 26 7.65
Tues.	12	21 44 34.77	9.813	13 35 25.0	50.12	14 30.57	0.044	21 30 4.20
Wed.	13	21 48 29.90	9.781	13 15 15.6	50.66	14 29.14	0.075	21 34 0.76
Thur.	14	21 52 24.27	9.750	12 54 53.5	51.18	14 26.96	0.106	21 37 57.31
Fri.	15	21 56 17.89	9.719	12 34 18.9	51.69	14 24.03	0.137	21 41 53.86
Sat.	16	22 0 10.76	9.688	12 13 32.3	52.18	14 20.34	0.168	21 45 50.42
Sun.	17	22 4 2.89	9.657	11 52 34.2	52.65	14 15.92	0.198	21 49 46.97
Mon.	18	22 7 54.31	9.628	11 31 25.0	53.11	14 10.78	0.227	21 53 43.53
Tues.	19	22 11 45.05	9.600	11 10 5.1	53.55	14 4.97	0.256	21 57 40.08
Wed.	20	22 15 35.12	9.572	10 48 34.8	53.97	13 58.48	0.284	22 1 36.64
Thur.	21	22 19 24.52	9.544	10 26 54.6	54.37	13 51.33	0.312	22 5 33.19
Fri.	22	22 23 13.25	9.517	10 5 5.0	54.76	13 43.50	0.339	22 9 29.75
Sat.	23	22 27 1.34	9.490	9 43 6.3	55.13	13 35.04	0.366	22 13 26.30
Sun.	24	22 30 48.80	9.464	9 20 58.7	55.49	13 25.95	0.392	22 17 22.85
Mon.	25	22 34 35.64	9.439	8 58 42.6	55.84	13 16.23	0.416	22 21 19.41
Tues.	26	22 38 21.91	9.416	8 36 18.5	56.16	13 5.95	0.439	22 25 15.96
Wed.	27	22 42 7.63	9.394	8 13 46.8	56.47	12 55.12	0.461	22 29 12.51
Thur.	28	22 45 52.84	9.373	7 51 7.8	56.77	12 43.77	0.483	22 33 9.07
Fri.	29	22 49 37.54	9.352	S. 7 28 22.0	57.05	12 31.92	0.504	22 37 5.62

Note. — The Semidiameter for Mean Noon may be assumed the same as that for Apparent Noon.

AT GREENWICH MEAN NOON.

		THE SUN'S					Logarithm of the Radius Vector of the Earth.	Diff. for 1 hour.	Mean Time of Sidereal Ob.
Day of the Month.	Day of the Year.	True LONGITUDE.		Diff. for 1 hour.	LATITUDE.				
		λ	λ'						
1	32	312° 41' 23.9"	41' 2.2"	152.14	-0.81	9.9937502	29.2	3 12 46.24	
2	33	313 42 14.5	41 52.7	152.10	0.78	.9938216	30.0	3 8 50.33	
3	34	314 43 4.2	42 42.3	152.06	0.72	.9938949	30.8	3 4 54.42	
4	35	315 43 58.1	43 31.1	152.02	0.63	.9939700	31.6	3 0 58.51	
5	36	316 44 41.0	44 18.8	151.98	0.53	.9940468	32.3	2 57 2.60	
6	37	317 45 27.8	45 5.4	151.94	0.41	.9941251	32.8	2 53 6.69	
7	38	318 46 13.5	45 51.0	151.89	0.28	.9942047	33.3	2 49 10.78	
8	39	319 46 58.1	46 35.5	151.84	0.14	.9942854	33.8	2 45 14.87	
9	40	320 47 41.5	47 18.8	151.78	-0.01	.9943671	34.3	2 41 18.96	
10	41	321 48 23.5	48 0.6	151.72	+0.11	.9944500	34.7	2 37 23.05	
11	42	322 49 4.2	48 41.1	151.66	0.22	.9945340	35.1	2 33 27.14	
12	43	323 49 43.3	49 20.1	151.59	0.30	.9946191	35.6	2 29 31.23	
13	44	324 50 20.7	49 57.4	151.52	0.35	.9947053	36.1	2 25 35.32	
14	45	325 50 56.5	50 33.1	151.45	0.37	.9947926	36.6	2 21 39.42	
15	46	326 51 30.5	51 6.9	151.38	0.36	.9948811	37.2	2 17 43.51	
16	47	327 52 2.7	51 39.0	151.31	0.31	.9949710	37.7	2 13 47.60	
17	48	328 52 33.1	52 9.3	151.23	0.24	.9950622	38.3	2 9 51.69	
18	49	329 53 1.6	52 37.7	151.15	0.15	.9951549	38.9	2 5 55.78	
19	50	330 53 23.2	53 4.2	151.07	+0.05	.9952491	39.5	2 1 59.88	
20	51	331 53 52.9	53 28.7	150.99	-0.08	.9953449	40.2	1 58 3.97	
21	52	332 54 15.7	53 51.4	150.91	0.21	.9954425	41.0	1 54 8.06	
22	53	333 54 36.6	54 12.2	150.83	0.34	.9955420	41.8	1 50 12.15	
23	54	334 54 55.5	54 31.0	150.75	0.46	.9956433	42.6	1 46 16.24	
24	55	335 55 12.7	54 48.1	150.68	0.56	.9957464	43.3	1 42 20.34	
25	56	336 55 28.3	55 3.6	150.61	0.65	.9958513	44.1	1 38 24.43	
26	57	337 55 42.1	55 17.3	150.54	0.71	.9959581	44.8	1 34 28.52	
27	58	338 55 54.3	55 29.4	150.47	0.75	.9960667	45.5	1 30 32.61	
28	59	339 56 4.8	55 39.8	150.40	0.75	.9961769	46.2	1 26 36.70	
29	60	340 56 13.7	55 48.6	150.34	-0.72	9.9962886	46.8	1 22 40.80	

NOTE. — λ corresponds to the true equinox of the date, λ' to the mean equinox of January 0d.

GREENWICH MEAN TIME.

THE MOON'S

Day of the Month.

	SEMIDIAMETER.		HORIZONTAL PARALLAX.				MERIDIAN PASSAGE.		AGE.
	Noon.	Midnight.	Noon.	Diff. for 1 hour.	Midnight.	Diff. for 1 hour.		Diff. for 1 hour.	
							h m	m	
1	16' 11.4	16' 7.7	59' 18.5	-1.08	59' 4.9	-1.15	17 38.4	2.29	21.4
2	16 3.8	15 59.7	58 50.6	1.21	58 35.7	1.25	18 34.5	2.37	22.4
3	15 55.6	15 51.4	58 20.5	1.27	58 5.1	1.28	19 32.2	2.41	23.4
4	15 47.2	15 43.0	57 49.7	1.28	57 34.3	1.28	20 30.1	2.38	24.4
5	15 38.8	15 34.7	57 19.0	1.27	57 3.8	1.26	21 26.5	2.29	25.4
6	15 30.6	15 26.6	56 48.8	1.25	56 34.0	1.23	22 20.0	2.16	26.4
7	15 22.6	15 18.7	56 19.3	1.21	56 4.9	1.19	23 10.0	2.01	27.4
8	15 14.8	15 11.1	55 50.8	1.16	55 37.0	1.13	23 56.6	1.88	28.4
9	15 7.5	15 4.0	55 23.7	1.09	55 10.9	1.04	♄		29.4
10	15 0.6	14 57.5	54 58.7	0.98	54 47.3	0.91	0 40.3	1.78	0.7
11	14 54.7	14 52.2	54 36.9	0.82	54 27.7	0.72	1 21.9	1.71	1.7
12	14 50.0	14 48.2	54 19.7	0.60	54 13.2	0.47	2 2.4	1.69	2.7
13	14 46.9	14 46.1	54 8.3	-0.32	54 5.2	-0.16	2 42.8	1.70	3.7
14	14 45.8	14 46.1	54 4.2	+0.01	54 5.4	+0.20	3 23.8	1.74	4.7
15	14 47.1	14 48.7	54 8.9	0.39	54 14.7	0.59	4 6.5	1.81	5.7
16	14 50.9	14 53.9	54 23.0	0.79	54 33.8	1.00	4 51.6	1.94	6.7
17	14 57.5	15 1.8	54 47.1	1.21	55 3.0	1.43	5 39.6	2.06	7.7
18	15 6.8	15 12.4	55 21.3	1.62	55 41.9	1.81	6 30.7	2.18	8.7
19	15 18.6	15 25.3	56 4.7	1.97	56 29.3	2.12	7 24.4	2.27	9.7
20	15 32.4	15 39.9	56 55.5	2.23	57 22.9	2.31	8 19.9	2.32	10.7
21	15 47.6	15 55.3	57 51.0	2.34	58 19.2	2.32	9 15.9	2.32	11.7
22	16 2.8	16 10.0	58 46.8	2.25	59 13.3	2.13	10 11.2	2.28	12.7
23	16 16.7	16 22.8	59 38.0	1.95	60 0.3	1.72	11 5.2	2.22	13.7
24	16 28.0	16 32.2	60 19.5	1.44	60 35.1	1.12	11 58.0	2.19	14.7
25	16 35.3	16 37.3	60 46.6	0.77	60 53.8	+0.40	12 50.1	2.17	15.7
26	16 38.1	16 37.6	60 56.6	+0.03	60 54.9	-0.33	13 42.4	2.20	16.7
27	16 36.0	16 33.3	60 48.9		60 39.1	0.97	14 35.8	2.26	17.7
28	16 29.7	16 25.3	60 25.8	-0.66	60 9.6	1.46	15 31.0	2.35	18.7
29	16 20.2	16 14.6	59 50.9	1.23 -1.63	59 30.4	-1.75	16 23.2	2.43	19.7

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Dif. for 1 m.	Declination.	Dif. for 1 m.	Hour.	Right Ascension.	Dif. for 1 m.	Declination.	Dif. for 1 m.
FRIDAY 1.					SUNDAY 3.				
0	13 46 35.61	2.3137	S. 16° 34' 53.1"	12.229	0	15 41 32.51	2.4633	S. 24° 1' 13.3"	5.309
1	13 48 54.54	2.3171	16 47 4.3	12.135	1	15 44 0.50	2.4673	24 7 6.8	5.315
2	13 51 13.66	2.3206	16 59 9.2	12.029	2	15 46 28.61	2.4693	24 12 51.2	5.363
3	13 53 32.99	2.3239	17 11 7.7	11.923	3	15 48 56.83	2.4713	24 18 26.4	5.510
4	13 55 52.53	2.3273	17 22 59.7	11.813	4	15 51 25.16	2.4730	24 23 52.3	5.366
5	13 58 12.28	2.3308	17 34 45.2	11.708	5	15 53 53.60	2.4747	24 29 9.0	5.302
6	14 0 32.24	2.3343	17 46 24.1	11.593	6	15 56 22.14	2.4764	24 34 16.4	5.047
7	14 2 52.41	2.3379	17 57 56.3	11.481	7	15 58 50.78	2.4780	24 39 14.5	4.691
8	14 5 12.80	2.3415	18 9 21.8	11.368	8	16 1 19.51	2.4796	24 44 3.3	4.735
9	14 7 33.40	2.3451	18 20 40.4	11.253	9	16 3 48.33	2.4809	24 48 42.7	4.679
10	14 9 54.21	2.3487	18 31 52.1	11.137	10	16 6 17.23	2.4822	24 53 12.7	4.423
11	14 12 15.24	2.3523	18 43 56.8	11.020	11	16 8 46.21	2.4835	24 57 33.3	4.265
12	14 14 36.48	2.3557	18 53 54.5	10.903	12	16 11 15.26	2.4847	25 1 44.5	4.108
13	14 16 57.93	2.3592	19 4 45.1	10.783	13	16 13 44.37	2.4857	25 5 46.3	3.951
14	14 19 19.59	2.3627	19 15 28.5	10.663	14	16 16 13.54	2.4866	25 9 36.5	3.793
15	14 21 41.46	2.3662	19 26 4.6	10.543	15	16 18 42.76	2.4874	25 13 21.2	3.634
16	14 24 3.55	2.3698	19 36 33.4	10.419	16	16 21 12.03	2.4881	25 16 54.4	3.475
17	14 26 25.85	2.3733	19 46 54.8	10.295	17	16 23 41.34	2.4887	25 20 18.1	3.316
18	14 28 48.36	2.3768	19 57 8.7	10.170	18	16 26 10.68	2.4892	25 23 32.2	3.156
19	14 31 11.07	2.3802	20 7 15.1	10.044	19	16 28 40.05	2.4897	25 26 36.8	2.997
20	14 33 33.99	2.3836	20 17 13.9	9.918	20	16 31 9.44	2.4900	25 29 31.8	2.838
21	14 35 57.11	2.3870	20 27 5.1	9.790	21	16 33 38.85	2.4903	25 32 17.2	2.679
22	14 38 20.44	2.3905	20 36 48.6	9.660	22	16 36 8.27	2.4903	25 34 53.1	2.519
23	14 40 43.97	2.3939	S. 20° 46' 24.3"	9.530	23	16 38 37.69	2.4904	S. 25° 37' 19.4"	2.360
SATURDAY 2.					MONDAY 4.				
0	14 43 7.71	2.3973	S. 20° 55' 52.1"	9.398	0	16 41 7.11	2.4903	S. 25° 39' 36.1"	2.199
1	14 45 31.65	2.4007	21 5 12.0	9.265	1	16 43 36.52	2.4901	25 41 43.2	2.039
2	14 47 55.79	2.4040	21 14 23.9	9.131	2	16 46 5.92	2.4898	25 43 40.7	1.880
3	14 50 20.13	2.4073	21 23 27.7	8.997	3	16 48 35.99	2.4893	25 45 28.7	1.720
4	14 52 44.66	2.4106	21 32 23.4	8.862	4	16 51 4.63	2.4887	25 47 7.1	1.560
5	14 55 9.39	2.4137	21 41 11.0	8.726	5	16 53 33.93	2.4880	25 48 35.9	1.400
6	14 57 34.31	2.4169	21 49 50.4	8.589	6	16 56 3.19	2.4873	25 49 55.1	1.240
7	14 59 59.42	2.4201	21 58 21.4	8.449	7	16 58 32.41	2.4865	25 51 4.7	1.080
8	15 2 24.72	2.4232	22 6 44.1	8.309	8	17 1 1.57	2.4855	25 52 4.8	0.921
9	15 4 50.21	2.4263	22 14 58.4	8.169	9	17 3 30.67	2.4845	25 52 55.3	0.762
10	15 7 15.88	2.4293	22 23 4.3	8.028	10	17 5 59.70	2.4833	25 53 36.3	0.603
11	15 9 41.73	2.4323	22 31 1.8	7.887	11	17 8 28.66	2.4820	25 54 7.7	0.444
12	15 12 7.75	2.4351	22 38 50.8	7.745	12	17 10 57.53	2.4806	25 54 29.6	0.287
13	15 14 33.94	2.4379	22 46 31.2	7.601	13	17 13 26.32	2.4791	25 54 42.0	0.129
14	15 17 0.30	2.4407	22 54 2.9	7.456	14	17 15 55.01	2.4775	25 54 45.0	0.029
15	15 19 26.84	2.4435	23 1 25.8	7.310	15	17 18 23.61	2.4768	25 54 38.5	0.187
16	15 21 53.54	2.4462	23 8 40.0	7.164	16	17 20 52.10	2.4740	25 54 22.5	0.345
17	15 24 20.40	2.4488	23 15 45.4	7.017	17	17 23 20.48	2.4730	25 53 57.1	0.502
18	15 26 47.41	2.4514	23 22 41.9	6.870	18	17 25 48.74	2.4699	25 53 22.3	0.658
19	15 29 14.57	2.4539	23 29 29.6	6.722	19	17 28 16.87	2.4676	25 52 38.1	0.814
20	15 31 41.88	2.4563	23 36 8.4	6.573	20	17 30 44.87	2.4656	25 51 44.6	0.969
21	15 34 9.33	2.4587	23 42 38.2	6.423	21	17 33 12.73	2.4633	25 50 41.8	1.124
22	15 36 36.92	2.4610	23 48 59.0	6.273	22	17 35 40.45	2.4608	25 49 29.6	1.279
23	15 39 4.65	2.4632	23 55 10.7	6.121	23	17 38 8.02	2.4582	25 48 8.2	1.433
24	15 41 32.51	2.4653	S. 24° 1' 13.3"	5.969	24	17 40 35.43	2.4555	S. 25° 46' 37.6"	1.587

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
TUESDAY 6.					THURSDAY 7.				
0	17 40 35.43	2.4495	S. 25° 46' 37.6"	1.667	0	19 33 49.28	2.2322	S. 21° 48' 10.9"	7.976
1	17 43 2.68	2.4497	25 44 57.8	1.740	1	19 36 3.46	2.2325	21 40 9.1	8.063
2	17 45 29.76	2.4498	25 43 8.8	1.803	2	19 38 17.30	2.2329	21 32 0.8	8.190
3	17 47 56.66	2.4499	25 41 10.6	1.845	3	19 40 30.81	2.2333	21 23 46.2	8.295
4	17 50 23.38	2.4499	25 39 3.3	1.974	4	19 42 43.98	2.2167	21 15 25.4	8.398
5	17 52 49.91	2.4497	25 36 46.9	2.248	5	19 44 56.81	2.2110	21 6 58.4	8.500
6	17 55 16.25	2.4475	25 34 21.6	2.497	6	19 47 9.30	2.2064	20 58 25.3	8.602
7	17 57 42.40	2.4462	25 31 47.3	2.645	7	19 49 21.45	2.1998	20 49 46.1	8.703
8	18 0 8.35	2.4398	25 29 4.1	2.793	8	19 51 33.27	2.1942	20 41 0.9	8.802
9	18 2 34.09	2.4373	25 26 12.0	2.941	9	19 53 44.75	2.1885	20 32 9.8	8.900
10	18 4 59.62	2.4397	25 23 11.0	3.088	10	19 55 55.88	2.1828	20 23 12.9	9.006
11	18 7 24.92	2.4300	25 20 1.3	3.234	11	19 58 6.67	2.1771	20 14 10.3	9.090
12	18 9 50.00	2.4182	25 16 42.8	3.380	12	20 0 17.13	2.1715	20 5 2.1	9.184
13	18 12 14.85	2.4128	25 13 15.6	3.525	13	20 2 27.25	2.1660	19 55 48.3	9.277
14	18 14 39.47	2.4023	25 9 39.7	3.669	14	20 4 37.03	2.1608	19 46 28.9	9.369
15	18 17 3.85	2.4043	25 5 55.2	3.813	15	20 6 46.48	2.1547	19 37 4.0	9.460
16	18 19 27.99	2.4008	25 2 2.1	3.955	16	20 8 55.59	2.1491	19 27 33.7	9.549
17	18 21 51.88	2.3962	24 58 0.5	4.097	17	20 11 4.36	2.1435	19 17 58.1	9.637
18	18 24 15.52	2.3919	24 53 50.4	4.238	18	20 13 12.80	2.1379	19 8 17.3	9.722
19	18 26 38.90	2.3776	24 49 31.9	4.377	19	20 15 20.90	2.1323	18 58 31.3	9.806
20	18 29 2.02	2.3632	24 45 5.1	4.515	20	20 17 28.67	2.1267	18 48 40.2	9.889
21	18 31 24.87	2.3487	24 40 30.0	4.652	21	20 19 36.10	2.1212	18 38 44.1	9.976
22	18 33 47.45	2.3342	24 35 46.7	4.789	22	20 21 43.20	2.1157	18 28 43.0	10.066
23	18 36 9.76	2.3204	S. 24° 30' 55.2"	4.925	23	20 23 49.97	2.1102	S. 18° 18' 37.1"	10.136
WEDNESDAY 6.					FRIDAY 8.				
0	18 38 31.79	2.3048	S. 24° 25' 55.6"	5.060	0	20 25 56.41	2.1047	S. 18° 8' 26.4"	10.217
1	18 40 53.54	2.2892	24 20 47.9	5.194	1	20 28 2.52	2.0993	17 58 11.0	10.295
2	18 43 15.01	2.2855	24 15 32.2	5.327	2	20 30 8.31	2.0939	17 47 50.9	10.373
3	18 45 36.19	2.2807	24 10 8.6	5.459	3	20 32 13.78	2.0885	17 37 26.1	10.450
4	18 47 57.08	2.2697	24 4 37.0	5.590	4	20 34 18.92	2.0831	17 26 56.8	10.525
5	18 50 17.67	2.2497	23 58 57.6	5.720	5	20 36 23.74	2.0777	17 16 23.1	10.600
6	18 52 37.96	2.2387	23 53 10.5	5.849	6	20 38 28.24	2.0734	17 5 45.0	10.671
7	18 54 57.95	2.2296	23 47 15.7	5.977	7	20 40 32.42	2.0671	16 55 2.6	10.742
8	18 57 17.63	2.2245	23 41 13.3	6.103	8	20 42 36.29	2.0619	16 44 16.0	10.812
9	18 59 37.00	2.2203	23 35 3.3	6.226	9	20 44 39.85	2.0567	16 33 25.2	10.881
10	19 1 56.06	2.2162	23 28 45.8	6.343	10	20 46 43.09	2.0515	16 22 30.3	10.949
11	19 4 14.81	2.2100	23 22 20.9	6.477	11	20 48 46.02	2.0463	16 11 31.3	11.016
12	19 6 33.26	2.2048	23 15 48.6	6.599	12	20 50 48.64	2.0413	16 0 28.4	11.081
13	19 8 51.99	2.2005	23 9 9.0	6.730	13	20 52 50.96	2.0362	15 49 21.6	11.145
14	19 11 9.19	2.2041	23 2 22.2	6.840	14	20 54 52.98	2.0312	15 38 11.0	11.208
15	19 13 26.67	2.2067	22 55 28.2	6.969	15	20 56 54.70	2.0262	15 26 56.7	11.270
16	19 15 43.83	2.2083	22 48 27.0	7.077	16	20 58 56.11	2.0212	15 15 38.6	11.332
17	19 18 0.66	2.2079	22 41 18.8	7.193	17	21 0 57.22	2.0162	15 4 16.9	11.392
18	19 20 17.17	2.2075	22 34 3.7	7.308	18	21 2 58.04	2.0113	14 52 51.6	11.450
19	19 22 33.85	2.2070	22 26 41.7	7.423	19	21 4 58.58	2.0065	14 41 22.8	11.507
20	19 24 49.30	2.2055	22 19 12.9	7.537	20	21 6 58.83	2.0017	14 29 50.7	11.563
21	19 27 4.72	2.2050	22 11 37.3	7.649	21	21 8 58.79	1.9970	14 18 15.2	11.618
22	19 29 19.91	2.2045	22 3 55.0	7.760	22	21 10 58.47	1.9923	14 6 36.4	11.673
23	19 31 34.76	2.2040	21 56 6.2	7.868	23	21 12 57.86	1.9876	13 54 54.3	11.727
24	19 33 49.28	2.2035	S. 21° 48' 10.9"	7.975	24	21 14 56.97	1.9830	S. 13° 43' 9.1"	11.779

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
SATURDAY 9.					MONDAY 11.				
0	21 14 56.97	1.9830	S. 13° 43' 9.1"	11.779	0	22 45 48.47	1.8247	S. 3° 37' 9.7"	13.100
1	21 16 55.81	1.9785	13 31 20.8	11.830	1	22 47 37.89	1.8229	3 24 3.0	13.114
2	21 18 54.38	1.9740	13 19 29.5	11.880	2	22 49 27.20	1.8210	3 10 56.0	13.119
3	21 20 52.68	1.9695	13 7 35.2	11.929	3	22 51 16.40	1.8192	2 57 48.7	13.123
4	21 22 50.71	1.9651	12 55 38.1	11.976	4	22 53 5.50	1.8175	2 44 41.2	13.126
5	21 24 48.48	1.9607	12 43 38.2	12.022	5	22 54 54.50	1.8159	2 31 38.5	13.126
6	21 26 45.99	1.9563	12 31 35.5	12.068	6	22 56 43.40	1.8143	2 18 25.7	13.130
7	21 28 43.24	1.9520	12 19 30.0	12.113	7	22 58 32.21	1.8128	2 5 17.8	13.132
8	21 30 40.23	1.9478	12 7 21.9	12.157	8	23 0 20.93	1.8114	1 52 9.8	13.133
9	21 32 36.97	1.9436	11 55 11.2	12.199	9	23 2 9.57	1.8101	1 39 1.8	13.133
10	21 34 33.46	1.9395	11 42 58.0	12.240	10	23 3 58.13	1.8088	1 25 53.9	13.130
11	21 36 29.71	1.9354	11 30 42.4	12.280	11	23 5 46.61	1.8075	1 12 46.1	13.128
12	21 38 25.71	1.9313	11 18 24.5	12.318	12	23 7 35.02	1.8063	0 59 38.5	13.126
13	21 40 21.47	1.9273	11 6 4.3	12.356	13	23 9 23.36	1.8052	0 46 31.1	13.122
14	21 42 17.00	1.9234	10 53 41.8	12.394	14	23 11 11.63	1.8041	0 33 23.9	13.118
15	21 44 12.30	1.9196	10 41 16.9	12.432	15	23 12 59.84	1.8030	0 20 17.0	13.113
16	21 46 7.36	1.9159	10 28 49.8	12.468	16	23 14 47.99	1.8020	S. 0 7 10.4	13.107
17	21 48 2.20	1.9122	10 16 20.6	12.502	17	23 16 36.09	1.8013	N. 0 5 55.8	13.100
18	21 49 56.82	1.9085	10 3 49.4	12.535	18	23 18 24.14	1.8004	0 19 1.5	13.093
19	21 51 51.21	1.9048	9 51 16.3	12.567	19	23 20 12.14	1.7996	0 32 6.8	13.086
20	21 53 45.38	1.9012	9 38 41.3	12.598	20	23 22 0.09	1.7989	0 45 11.7	13.077
21	21 55 39.34	1.8977	9 26 4.5	12.629	21	23 23 48.00	1.7983	0 58 16.0	13.067
22	21 57 33.09	1.8942	9 13 25.9	12.659	22	23 25 35.88	1.7978	1 11 19.7	13.057
23	21 59 26.64	1.8908	S. 9 0 45.5	12.687	23	23 27 23.73	1.7973	N. 1 24 22.8	13.046
SUNDAY 10.					TUESDAY 12.				
0	22 1 19.99	1.8875	S. 8 48 3.4	12.715	0	23 29 11.55	1.7968	N. 1 37 25.2	13.034
1	22 3 13.14	1.8842	8 35 19.7	12.742	1	23 30 59.34	1.7964	1 50 26.9	13.021
2	22 5 6.09	1.8810	8 22 34.4	12.768	2	23 32 47.11	1.7961	2 3 27.8	13.008
3	22 6 58.85	1.8778	8 9 47.6	12.793	3	23 34 34.86	1.7958	2 16 27.8	12.994
4	22 8 51.41	1.8746	7 56 59.3	12.817	4	23 36 22.60	1.7956	2 29 27.0	12.979
5	22 10 43.79	1.8716	7 44 9.6	12.840	5	23 38 10.33	1.7954	2 42 25.2	12.963
6	22 12 35.99	1.8685	7 31 18.5	12.862	6	23 39 58.05	1.7953	2 55 22.5	12.947
7	22 14 28.01	1.8656	7 18 26.2	12.882	7	23 41 45.77	1.7953	3 8 18.9	12.931
8	22 16 19.86	1.8627	7 5 32.7	12.902	8	23 43 33.48	1.7952	3 21 14.3	12.914
9	22 18 11.53	1.8598	6 52 38.0	12.921	9	23 45 21.20	1.7953	3 34 8.6	12.897
10	22 20 3.03	1.8570	6 39 42.1	12.940	10	23 47 8.93	1.7955	3 47 1.8	12.879
11	22 21 54.37	1.8543	6 26 45.1	12.958	11	23 48 56.67	1.7957	3 59 53.8	12.860
12	22 23 45.55	1.8517	6 13 47.1	12.975	12	23 50 44.42	1.7960	4 12 44.6	12.839
13	22 25 36.57	1.8492	6 0 48.1	12.991	13	23 52 32.19	1.7963	4 25 34.2	12.817
14	22 27 27.44	1.8467	5 47 48.2	13.006	14	23 54 19.99	1.7967	4 38 22.6	12.795
15	22 29 18.16	1.8442	5 34 47.4	13.020	15	23 56 7.81	1.7973	4 51 9.6	12.773
16	22 31 8.73	1.8417	5 21 45.8	13.033	16	23 57 55.66	1.7977	5 3 55.2	12.749
17	22 32 59.16	1.8393	5 8 43.4	13.045	17	23 59 43.54	1.7983	5 16 39.4	12.726
18	22 34 49.45	1.8370	4 55 40.3	13.056	18	0 1 31.46	1.7990	5 29 22.9	12.701
19	22 36 39.61	1.8348	4 42 36.6	13.067	19	0 3 19.42	1.7997	5 42 3.5	12.676
20	22 38 29.63	1.8326	4 29 32.3	13.077	20	0 5 7.43	1.8005	5 54 43.3	12.650
21	22 40 19.52	1.8305	4 16 27.4	13.086	21	0 6 55.49	1.8013	6 7 21.5	12.623
22	22 42 9.29	1.8285	4 3 21.9	13.094	22	0 8 43.59	1.8021	6 19 58.1	12.597
23	22 43 58.94	1.8266	3 50 16.0	13.102	23	0 10 31.74	1.8030	6 32 33.2	12.570
24	22 45 48.47	1.8247	S. 3 37 9.7	13.109	24	0 12 19.95	1.8040	N. 6 45 6.6	12.542

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Dif. for 1 m.	Declination.	Dif. for 1 m.	Hour.	Right Ascension.	Dif. for 1 m.	Declination.	Dif. for 1 m.
WEDNESDAY 13.					FRIDAY 15.				
0	h m s	"	N. ° ' "	"	0	h m s	"	N. ° ' "	"
1	0 12 19.95	1.8040	6 45 6.6	12.542	1	1 41 10.43	1.9185	16 11 21.6	10.369
2	0 14 8.23	1.8051	6 57 38.3	12.513	2	1 43 5.65	1.9222	16 11 41.9	10.307
3	0 15 56.57	1.8062	7 10 8.1	12.463	3	1 45 1.09	1.9266	16 21 58.4	10.243
4	0 17 44.98	1.8074	7 22 36.1	12.462	4	1 46 56.75	1.9295	16 32 11.0	10.179
5	0 19 33.46	1.8087	7 35 2.2	12.421	5	1 48 52.64	1.9333	16 42 19.7	10.113
6	0 21 22.02	1.8100	7 47 26.4	12.389	6	1 50 48.77	1.9372	16 52 24.5	10.047
7	0 23 10.66	1.8114	7 59 48.7	12.357	7	1 52 45.13	1.9412	17 2 25.3	9.980
8	0 24 59.39	1.8128	8 12 9.1	12.324	8	1 54 41.72	1.9452	17 12 22.0	9.912
9	0 26 48.20	1.8142	8 24 27.6	12.291	9	1 56 38.55	1.9492	17 22 14.7	9.844
10	0 28 37.10	1.8157	8 36 44.0	12.257	10	1 58 35.62	1.9532	17 32 3.3	9.776
11	0 30 26.10	1.8173	8 48 58.3	12.222	11	2 0 32.93	1.9572	17 41 47.8	9.707
12	0 32 15.19	1.8189	9 1 10.4	12.185	12	2 2 30.48	1.9612	17 51 28.1	9.637
13	0 34 4.38	1.8207	9 13 20.3	12.148	13	2 4 28.28	1.9653	18 1 4.1	9.565
14	0 35 53.67	1.8223	9 25 28.1	12.110	14	2 6 26.33	1.9695	18 10 35.8	9.493
15	0 37 43.07	1.8243	9 37 33.6	12.072	15	2 8 24.63	1.9737	18 20 3.2	9.420
16	0 39 32.58	1.8262	9 49 36.8	12.033	16	2 10 23.18	1.9779	18 29 26.2	9.347
17	0 41 22.21	1.8282	10 1 37.6	11.993	17	2 12 21.98	1.9822	18 38 44.8	9.273
18	0 43 11.96	1.8302	10 13 36.0	11.953	18	2 14 21.04	1.9865	18 47 58.9	9.198
19	0 45 1.83	1.8322	10 25 32.0	11.913	19	2 16 20.36	1.9908	18 57 8.4	9.121
20	0 46 51.82	1.8342	10 37 25.6	11.872	20	2 18 19.94	1.9952	19 6 13.3	9.044
21	0 48 41.94	1.8363	10 49 16.7	11.830	21	2 20 19.79	1.9996	19 15 13.6	8.966
22	0 50 32.19	1.8384	11 1 5.3	11.787	22	2 22 19.90	2.0040	19 24 9.2	8.888
23	0 52 22.58	1.8406	11 12 51.2	11.743	23	2 24 20.28	2.0085	19 33 0.1	8.809
24	0 54 13.10	1.8428	N.11 24 34.5	11.699	24	2 26 20.93	2.0130	N.19 41 46.2	8.729
THURSDAY 14.					SATURDAY 16.				
0	0 56 3.76	1.8455	N.11 36 15.1	11.655	0	2 28 21.85	2.0176	N.19 50 27.5	8.649
1	0 57 54.57	1.8480	11 47 53.0	11.610	1	2 30 23.04	2.0222	19 59 3.9	8.567
2	0 59 45.53	1.8505	11 59 28.2	11.564	2	2 32 24.51	2.0268	20 7 35.4	8.484
3	1 1 36.64	1.8531	12 11 0.6	11.517	3	2 34 26.26	2.0315	20 16 1.9	8.400
4	1 3 27.90	1.8557	12 22 30.2	11.470	4	2 36 28.29	2.0361	20 24 23.3	8.315
5	1 5 19.32	1.8583	12 33 56.9	11.422	5	2 38 30.59	2.0407	20 32 39.6	8.230
6	1 7 10.90	1.8610	12 45 20.7	11.372	6	2 40 33.17	2.0453	20 40 50.8	8.144
7	1 9 2.64	1.8637	12 56 41.5	11.322	7	2 42 36.03	2.0500	20 48 56.9	8.058
8	1 10 54.55	1.8665	13 7 59.4	11.272	8	2 44 39.18	2.0548	20 56 57.7	7.970
9	1 12 46.63	1.8696	13 19 14.2	11.222	9	2 46 42.61	2.0596	21 4 53.2	7.882
10	1 14 38.88	1.8725	13 30 25.9	11.170	10	2 48 46.33	2.0643	21 12 43.4	7.792
11	1 16 31.32	1.8755	13 41 34.5	11.117	11	2 50 50.33	2.0691	21 20 28.2	7.702
12	1 18 23.94	1.8786	13 52 39.9	11.064	12	2 52 54.62	2.0739	21 28 7.5	7.611
13	1 20 16.74	1.8815	14 3 42.1	11.010	13	2 54 59.20	2.0787	21 35 41.3	7.519
14	1 22 9.72	1.8846	14 14 41.0	10.955	14	2 57 4.07	2.0835	21 43 9.6	7.426
15	1 24 2.89	1.8878	14 25 36.6	10.900	15	2 59 9.23	2.0883	21 50 32.4	7.333
16	1 25 56.25	1.8910	14 36 28.9	10.844	16	3 1 14.68	2.0932	21 57 49.5	7.239
17	1 27 49.81	1.8943	14 47 17.8	10.787	17	3 3 20.42	2.0982	22 5 0.9	7.144
18	1 29 43.57	1.8976	14 58 3.3	10.730	18	3 5 26.46	2.1031	22 12 6.6	7.047
19	1 31 37.53	1.9010	15 8 45.3	10.673	19	3 7 32.80	2.1080	22 19 6.4	6.949
20	1 33 31.69	1.9044	15 19 23.8	10.613	20	3 9 39.43	2.1129	22 26 0.3	6.851
21	1 35 26.06	1.9078	15 29 58.7	10.552	21	3 11 46.35	2.1178	22 32 48.3	6.752
22	1 37 20.64	1.9113	15 40 30.0	10.492	22	3 13 53.57	2.1228	22 39 30.4	6.652
23	1 39 15.43	1.9149	15 50 57.7	10.431	23	3 16 1.09	2.1278	22 46 6.5	6.551
24	1 41 10.43	1.9185	N.16 1 21.6	10.369	24	3 18 8.90	2.1327	N.22 52 36.6	6.450

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
SUNDAY 17.					TUESDAY 19.				
0	3 18 8.90	2.1827	N.22 52 36.6	0.450	0	5 5 52.60	2.2426	N.25 48 56.3	0.200
1	3 20 17.00	2.1876	22 59 0.5	0.248	1	5 8 13.26	2.2466	25 49 27.5	0.450
2	3 22 25.40	2.1925	23 5 18.3	0.244	2	5 10 34.11	2.2490	25 49 50.2	0.200
3	3 24 34.10	2.1974	23 11 29.8	0.140	3	5 12 55.14	2.2521	25 50 4.4	0.187
4	3 26 43.09	2.1923	23 17 35.0	0.035	4	5 15 16.26	2.2551	25 50 10.1	0.024
5	3 28 52.37	2.1872	23 23 33.9	5.929	5	5 17 37.76	2.2580	25 50 7.3	0.119
6	3 31 1.95	2.1821	23 29 26.4	5.823	6	5 19 59.33	2.2609	25 49 55.9	0.202
7	3 33 11.83	2.1770	23 35 12.5	5.715	7	5 22 21.07	2.2637	25 49 35.9	0.405
8	3 35 22.00	2.1718	23 40 52.1	5.607	8	5 24 42.98	2.2666	25 49 7.3	0.545
9	3 37 32.46	2.1667	23 46 25.2	5.497	9	5 27 5.05	2.2692	25 48 30.1	0.892
10	3 39 43.21	2.1616	23 51 51.7	5.386	10	5 29 27.27	2.2717	25 47 44.2	0.937
11	3 41 54.26	2.1565	23 57 11.5	5.275	11	5 31 49.65	2.2741	25 46 49.5	0.958
12	3 44 5.60	2.1513	24 2 24.6	5.163	12	5 34 12.17	2.2765	25 45 46.0	1.120
13	3 46 17.23	2.1461	24 7 31.0	5.050	13	5 36 34.83	2.2788	25 44 33.8	1.277
14	3 48 29.15	2.2009	24 12 30.6	4.936	14	5 38 57.63	2.2810	25 43 12.8	1.428
15	3 50 41.35	2.2057	24 17 23.3	4.821	15	5 41 20.56	2.2832	25 41 43.0	1.570
16	3 52 53.84	2.2105	24 22 9.1	4.705	16	5 43 43.63	2.2853	25 40 4.4	1.717
17	3 55 6.61	2.2153	24 26 47.9	4.589	17	5 46 6.82	2.2875	25 38 16.9	1.865
18	3 57 19.67	2.2200	24 31 19.7	4.472	18	5 48 30.12	2.2896	25 36 20.6	2.012
19	3 59 33.01	2.2247	24 35 44.5	4.354	19	5 50 53.54	2.2912	25 34 15.4	2.160
20	4 1 46.63	2.2294	24 40 2.2	4.236	20	5 53 17.06	2.2929	25 32 1.3	2.308
21	4 4 0.53	2.2340	24 44 12.8	4.117	21	5 55 40.68	2.2945	25 29 38.3	2.456
22	4 6 14.70	2.2386	24 48 16.2	3.997	22	5 58 4.41	2.2962	25 27 6.3	2.603
23	4 8 29.15	2.2432	N.24 52 12.3	3.876	23	6 0 28.23	2.2977	N.25 24 25.3	2.751
MONDAY 18.					WEDNESDAY 20.				
0	4 10 43.88	2.2477	N.24 56 1.1	3.752	0	6 2 52.14	2.2991	N.25 21 35.4	2.907
1	4 12 58.88	2.2523	24 59 42.5	3.629	1	6 5 16.13	2.3005	25 18 36.5	3.057
2	4 15 14.14	2.2568	25 3 16.5	3.505	2	6 7 40.20	2.3018	25 15 28.6	3.207
3	4 17 29.67	2.2613	25 6 43.0	3.380	3	6 10 4.35	2.3030	25 12 11.7	3.357
4	4 19 45.47	2.2658	25 10 2.1	3.255	4	6 12 28.57	2.3041	25 8 45.8	3.507
5	4 22 1.53	2.2698	25 13 13.6	3.129	5	6 14 52.85	2.3051	25 5 10.9	3.657
6	4 24 17.85	2.2741	25 16 17.5	3.002	6	6 17 17.19	2.3060	25 1 27.0	3.807
7	4 26 34.43	2.2783	25 19 13.7	2.874	7	6 19 41.58	2.3069	24 57 34.1	3.957
8	4 28 51.26	2.2825	25 22 2.2	2.745	8	6 22 6.02	2.3076	24 53 32.1	4.105
9	4 31 8.34	2.2867	25 24 43.0	2.615	9	6 24 30.50	2.3083	24 49 21.1	4.253
10	4 33 25.67	2.2909	25 27 16.0	2.485	10	6 26 55.02	2.3089	24 45 1.1	4.401
11	4 35 43.25	2.2950	25 29 41.2	2.355	11	6 29 19.57	2.3094	24 40 32.0	4.549
12	4 38 1.07	2.2990	25 31 58.5	2.223	12	6 31 44.15	2.3098	24 35 53.9	4.710
13	4 40 19.13	2.3030	25 34 7.9	2.090	13	6 34 8.75	2.3102	24 31 6.8	4.860
14	4 42 37.43	2.3069	25 36 9.3	1.957	14	6 36 33.37	2.3105	24 26 10.7	5.010
15	4 44 55.96	2.3107	25 38 2.7	1.823	15	6 38 58.01	2.3107	24 21 5.6	5.160
16	4 47 14.72	2.3145	25 39 43.0	1.689	16	6 41 22.66	2.3109	24 15 51.5	5.310
17	4 49 33.70	2.3182	25 41 25.2	1.554	17	6 43 47.32	2.3110	24 10 28.4	5.460
18	4 51 52.90	2.3219	25 42 54.3	1.418	18	6 46 11.98	2.3110	24 4 56.3	5.610
19	4 54 12.32	2.3255	25 44 15.3	1.282	19	6 48 36.64	2.3109	23 59 15.2	5.760
20	4 56 31.96	2.3290	25 45 28.1	1.145	20	6 51 1.29	2.3107	23 53 25.1	5.910
21	4 58 51.81	2.3325	25 46 32.6	1.007	21	6 53 25.93	2.3105	23 47 26.1	6.060
22	5 1 11.87	2.3359	25 47 28.8	0.869	22	6 55 50.55	2.3102	23 41 18.1	6.207
23	5 3 32.14	2.3393	25 48 16.7	0.730	23	6 58 15.14	2.3098	23 35 1.2	6.355
24	5 5 52.60	2.3426	N.25 48 56.3	0.590	24	7 0 39.71	2.3093	N.23 28 35.4	6.504

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
THURSDAY 21.					SATURDAY 23.				
0	7 0 39.71	2.4008	N.23 28 35.4	6.804	0	8 54 44.26	2.3306	N.15 37 15.6	12.802
1	7 3 4.25	2.4087	23 22 0.7	6.803	1	8 57 4.02	2.3284	15 24 24.3	12.808
2	7 5 28.75	2.4081	23 15 17.2	6.799	2	8 59 23.66	2.3263	15 11 26.7	12.813
3	7 7 53.21	2.4074	23 8 24.9	6.845	3	9 1 43.17	2.3242	14 58 22.7	12.817
4	7 10 17.63	2.4067	23 1 23.9	7.891	4	9 4 2.56	2.3221	14 45 12.5	12.819
5	7 12 42.01	2.4060	22 54 14.1	7.837	5	9 6 21.82	2.3200	14 31 56.2	12.819
6	7 15 6.34	2.4053	22 46 55.5	7.883	6	9 8 40.95	2.3178	14 18 34.0	12.818
7	7 17 30.62	2.4045	22 39 28.1	7.829	7	9 10 59.95	2.3156	14 5 6.0	12.815
8	7 19 54.84	2.4038	22 31 52.0	7.874	8	9 13 18.82	2.3134	13 51 32.2	12.811
9	7 22 18.99	2.4031	22 24 7.2	7.818	9	9 15 37.56	2.3114	13 37 52.7	12.796
10	7 24 43.08	2.4024	22 16 13.8	7.863	10	9 17 56.18	2.3094	13 24 7.5	12.800
11	7 27 7.10	2.3998	22 8 11.8	8.105	11	9 20 14.69	2.3075	13 10 16.6	12.808
12	7 29 31.05	2.3993	22 0 1.2	8.247	12	9 22 33.08	2.3056	12 56 20.2	12.804
13	7 31 54.92	2.3973	21 51 42.1	8.389	13	9 24 51.35	2.3036	12 42 18.5	14.873
14	7 34 18.71	2.3960	21 43 14.5	8.630	14	9 27 9.50	2.3016	12 28 11.5	14.100
15	7 36 42.42	2.3946	21 34 38.5	8.670	15	9 29 27.53	2.2996	12 13 59.3	14.345
16	7 39 6.05	2.3933	21 25 54.1	8.810	16	9 31 45.44	2.2977	11 59 42.1	14.829
17	7 41 29.59	2.3917	21 17 1.3	8.950	17	9 34 3.24	2.2956	11 45 19.8	14.413
18	7 43 53.04	2.3901	21 8 0.1	9.089	18	9 36 20.93	2.2940	11 30 52.6	14.493
19	7 46 16.40	2.3886	20 58 50.6	9.227	19	9 38 38.52	2.2923	11 16 20.6	14.873
20	7 48 39.66	2.3869	20 49 32.9	9.365	20	9 40 56.00	2.2906	11 1 43.9	14.600
21	7 51 2.82	2.3854	20 40 7.0	9.499	21	9 43 13.37	2.2887	10 47 2.6	14.797
22	7 53 25.88	2.3834	20 30 33.0	9.634	22	9 45 30.64	2.2870	10 32 16.7	14.802
23	7 55 48.83	2.3817	N.20 20 50.9	9.768	23	9 47 47.81	2.2853	N.10 17 26.3	14.875
FRIDAY 22.					SUNDAY 24.				
0	7 58 11.68	2.3800	N.20 11 0.8	9.902	0	9 50 4.88	2.2837	N.10 2 31.5	14.947
1	8 0 34.42	2.3782	20 1 2.7	10.035	1	9 52 21.85	2.2820	9 47 32.5	15.017
2	8 2 57.05	2.3763	19 50 56.6	10.167	2	9 54 38.72	2.2804	9 32 29.4	15.065
3	8 5 19.57	2.3744	19 40 42.6	10.299	3	9 56 55.50	2.2789	9 17 22.3	15.151
4	8 7 41.97	2.3725	19 30 20.7	10.430	4	9 59 12.20	2.2774	9 2 11.3	15.215
5	8 10 4.26	2.3706	19 19 51.0	10.560	5	10 1 28.81	2.2760	8 46 56.5	15.278
6	8 12 26.43	2.3687	19 9 13.6	10.687	6	10 3 45.33	2.2747	8 31 37.9	15.340
7	8 14 48.49	2.3667	18 58 28.7	10.814	7	10 6 1.77	2.2733	8 16 15.6	15.400
8	8 17 10.43	2.3647	18 47 36.2	10.939	8	10 8 18.13	2.2720	8 0 49.8	15.458
9	8 19 32.25	2.3627	18 36 36.1	11.063	9	10 10 34.41	2.2706	7 45 20.6	15.514
10	8 21 53.94	2.3606	18 25 28.5	11.187	10	10 12 50.62	2.2692	7 29 48.1	15.568
11	8 24 15.51	2.3586	18 14 13.5	11.310	11	10 15 6.76	2.2678	7 14 12.4	15.620
12	8 26 36.95	2.3564	18 2 51.2	11.432	12	10 17 22.83	2.2663	6 58 33.5	15.671
13	8 28 58.27	2.3543	17 51 21.6	11.553	13	10 19 38.83	2.2649	6 42 51.6	15.721
14	8 31 19.46	2.3522	17 39 44.8	11.673	14	10 21 54.77	2.2633	6 27 6.8	15.769
15	8 33 40.52	2.3500	17 28 0.8	11.792	15	10 24 10.65	2.2618	6 11 19.2	15.816
16	8 36 1.45	2.3478	17 16 9.8	11.909	16	10 26 26.47	2.2603	5 55 29.0	15.860
17	8 38 22.25	2.3457	17 4 11.8	12.025	17	10 28 42.24	2.2586	5 39 36.2	15.901
18	8 40 42.92	2.3436	16 52 6.9	12.140	18	10 30 57.96	2.2567	5 23 40.9	15.941
19	8 43 3.47	2.3415	16 39 55.1	12.254	19	10 33 13.64	2.2549	5 7 43.2	15.979
20	8 45 23.89	2.3393	16 27 36.4	12.367	20	10 35 29.27	2.2532	4 51 43.3	16.015
21	8 47 44.18	2.3372	16 15 11.0	12.478	21	10 37 44.86	2.2515	4 35 41.3	16.050
22	8 50 4.34	2.3350	16 2 39.0	12.587	22	10 40 0.41	2.2499	4 19 37.2	16.083
23	8 52 24.37	2.3328	15 50 0.5	12.695	23	10 42 15.93	2.2484	4 3 31.1	16.115
24	8 54 44.26	2.3306	N.15 37 15.6	12.802	24	10 44 31.42	2.2479	N. 3 47 23.2	16.145

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
MONDAY 25.					WEDNESDAY 27.				
0	10 44 31.42	2.2579	N. 3° 47' 23.2"	16.145	0	12 33 28.76	2.3047	S. 9° 5' 52.6"	15.382
1	10 46 46.88	2.2576	3 31 13.6	16.173	1	12 35 47.11	2.3070	9 21 11.9	15.390
2	10 49 2.32	2.2573	3 15 2.4	16.199	2	12 38 5.60	2.3093	9 36 27.4	15.397
3	10 51 17.74	2.2569	2 58 49.8	16.223	3	12 40 24.22	2.3117	9 51 39.2	15.403
4	10 53 33.14	2.2567	2 42 35.8	16.243	4	12 42 42.99	2.3142	10 6 47.0	15.408
5	10 55 48.53	2.2565	2 26 20.5	16.263	5	12 45 1.91	2.3167	10 21 50.7	15.413
6	10 58 3.91	2.2563	2 10 4.1	16.282	6	12 47 20.99	2.3193	10 36 50.1	15.418
7	11 0 19.28	2.2562	1 53 46.6	16.299	7	12 49 40.23	2.3218	10 51 45.2	15.423
8	11 2 34.65	2.2562	1 37 28.2	16.313	8	12 51 59.63	2.3246	11 6 35.9	15.428
9	11 4 50.02	2.2563	1 21 9.0	16.325	9	12 54 19.18	2.3275	11 21 22.1	15.433
10	11 7 5.39	2.2563	1 4 49.1	16.336	10	12 56 38.89	2.3300	11 36 3.7	15.438
11	11 9 20.77	2.2565	0 48 28.6	16.345	11	12 58 58.77	2.3327	11 50 40.6	15.443
12	11 11 36.16	2.2567	0 32 7.6	16.353	12	13 1 18.82	2.3355	12 5 12.6	15.448
13	11 13 51.57	2.2570	N. 0 15 46.2	16.359	13	13 3 39.04	2.3383	12 19 39.7	15.453
14	11 16 7.00	2.2573	S. 0 0 35.4	16.363	14	13 5 59.43	2.3412	12 34 1.8	15.458
15	11 18 22.45	2.2577	0 16 57.2	16.363	15	13 8 19.98	2.3440	12 48 18.8	15.463
16	11 20 37.93	2.2582	0 33 19.0	16.362	16	13 10 40.70	2.3469	13 2 30.5	15.468
17	11 22 53.44	2.2588	0 49 40.7	16.360	17	13 13 1.60	2.3497	13 16 36.9	15.473
18	11 25 8.99	2.2594	1 6 2.1	16.356	18	13 15 22.68	2.3525	13 30 37.9	15.478
19	11 27 24.57	2.2590	1 22 23.3	16.350	19	13 17 43.95	2.3550	13 44 33.4	15.483
20	11 29 40.19	2.2596	1 38 44.1	16.343	20	13 20 5.40	2.3579	13 58 23.2	15.488
21	11 31 55.85	2.2593	1 55 4.3	16.333	21	13 22 27.03	2.3600	14 12 7.3	15.493
22	11 34 11.56	2.2592	2 11 23.8	16.320	22	13 24 48.84	2.3620	14 25 45.6	15.498
23	11 36 27.32	2.2593	S. 2 27 42.6	16.306	23	13 27 10.84	2.3661	S. 14 39 18.0	15.490
TUESDAY 26.					THURSDAY 28.				
0	11 38 43.14	2.2643	S. 2 44 0.5	16.290	0	13 29 33.02	2.3713	S. 14 52 44.4	15.390
1	11 40 59.02	2.2652	3 0 17.4	16.273	1	13 31 55.38	2.3743	15 6 4.7	15.396
2	11 43 14.96	2.2663	3 16 33.2	16.253	2	13 34 17.94	2.3776	15 19 18.8	15.401
3	11 45 30.97	2.2673	3 32 47.8	16.233	3	13 36 40.69	2.3807	15 32 26.6	15.407
4	11 47 47.05	2.2685	3 49 1.0	16.209	4	13 39 3.63	2.3838	15 45 27.9	15.413
5	11 50 3.20	2.2698	4 5 12.8	16.184	5	13 41 26.76	2.3870	15 58 22.7	15.418
6	11 52 19.43	2.2711	4 21 23.0	16.157	6	13 43 50.08	2.3902	16 11 11.0	15.423
7	11 54 35.74	2.2725	4 37 31.6	16.129	7	13 46 13.59	2.3933	16 23 52.8	15.428
8	11 56 52.14	2.2740	4 53 38.4	16.099	8	13 48 37.29	2.3964	16 36 27.9	15.433
9	11 59 8.63	2.2756	5 9 43.3	16.067	9	13 51 1.18	2.3997	16 48 56.1	15.438
10	12 1 25.21	2.2773	5 25 46.2	16.032	10	13 53 25.26	2.4029	17 1 17.4	15.443
11	12 3 41.89	2.2788	5 41 46.9	15.995	11	13 55 49.54	2.4061	17 13 31.6	15.448
12	12 5 58.66	2.2804	5 57 45.4	15.957	12	13 58 14.01	2.4093	17 25 38.7	15.453
13	12 8 15.54	2.2821	6 13 41.6	15.917	13	14 0 38.67	2.4125	17 37 38.7	15.458
14	12 10 32.52	2.2838	6 29 35.3	15.875	14	14 3 3.52	2.4157	17 49 31.4	15.463
15	12 12 49.60	2.2856	6 45 26.4	15.831	15	14 5 28.56	2.4189	18 1 16.8	15.468
16	12 15 6.79	2.2875	7 1 14.8	15.785	16	14 7 53.79	2.4220	18 12 54.8	15.473
17	12 17 24.10	2.2895	7 17 0.4	15.737	17	14 10 19.21	2.4252	18 24 25.3	15.478
18	12 19 41.53	2.2915	7 32 43.1	15.687	18	14 12 44.82	2.4283	18 35 48.3	15.483
19	12 21 59.08	2.2935	7 48 22.9	15.636	19	14 15 10.62	2.4314	18 47 3.7	15.488
20	12 24 16.75	2.2956	8 3 59.5	15.583	20	14 17 36.60	2.4345	18 58 11.4	15.493
21	12 26 34.55	2.2978	8 19 32.9	15.528	21	14 20 2.76	2.4376	19 9 11.2	15.498
22	12 28 52.48	2.3000	8 35 3.0	15.473	22	14 22 29.11	2.4407	19 20 3.1	15.503
23	12 31 10.55	2.3023	8 50 29.6	15.413	23	14 24 55.64	2.4437	19 30 47.1	15.508
24	12 33 28.76	2.3047	S. 9 5 52.6	15.352	24	14 27 22.36	2.4468	S. 19 41 23.1	15.500

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

PHASES OF THE MOON.

	d	h	m
☾ Last Quarter,	1	21	59.9
● New Moon,	9	8	4.6
☽ First Quarter,	17	12	19.6
○ Full Moon,	24	16	43.4

	d	h
☾ Apogee,	13	23.4
☾ Perigee,	26	1.5

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Star's Name and Position.	Noon.	P. L. of Dist.	III ^h .	P. L. of Dist.	VI ^h .	P. L. of Dist.	IX ^h .	P. L. of Dist.
1	Pollux W.	99° 52' 2 ^d	2330	101° 37' 32 ^d	2328	108° 22' 50 ^d	2327	105° 7' 55 ^d	2347
	Jupiter W.	67 36 55	2323	69 23 50	2370	71 10 33	2370	72 57 4	2327
	Regulus W.	62 55 37	2301	64 41 36	2309	66 27 23	2317	68 12 57	2326
	Saturn W.	53 10 13	2301	54 56 11	2309	56 41 58	2316	58 27 35	2324
	Antares E.	37 1 31	2322	35 15 20	2300	33 29 21	2309	31 43 35	2318
	Venus E.	77 21 52	2327	75 44 54	2326	74 8 9	2705	72 31 36	2715
	α Aquilæ E.	91 48' 11	2323	90 14 51	2321	88 41 42	2370	87 8 45	2321
SUN E.	101 58 3	2313	100 19 26	2324	98 41 3	2323	97 2 53	2343	
2	Jupiter W.	81 46 32	2330	83 31 48	2330	85 16 51	2348	87 1 41	2357
	Regulus W.	76 57 43	2320	78 42 2	2378	80 26 8	2327	82 10 2	2326
	Saturn W.	67 12 49	2323	68 57 17	2373	70 41 32	2320	72 25 36	2329
	Spica W.	23 0 4	2403	24 43 35	2407	26 27 0	2411	28 10 19	2417
	Antares E.	22 58 1	2324	21 13 34	2373	19 29 21	2323	17 45 22	2324
	Venus E.	64 32 3	2723	62 56 47	2773	61 21 43	2723	59 46 53	2723
	α Aquilæ E.	79 27 47	2343	77 56 29	2325	76 25 32	2323	74 54 58	2301
SUN E.	88 55 13	2320	87 18 20	2720	85 41 40	2710	84 5 13	2719	
3	Jupiter W.	95 42 38	2401	97 26 11	2410	99 9 31	2419	100 52 38	2426
	Regulus W.	90 46 17	2441	92 28 53	2450	94 11 17	2450	95 53 28	2426
	Saturn W.	81 2 49	2423	82 45 38	2441	84 28 15	2449	86 10 40	2452
	Spica W.	36 44 39	2451	38 27 1	2450	40 9 12	2427	41 51 12	2475
	Venus E.	51 55 58	2343	50 22 25	2322	48 49 5	2322	47 15 58	2373
	α Aquilæ E.	67 28 31	3117	66 0 42	3144	64 33 26	3173	63 6 45	3204
	SUN E.	76 6 11	2720	74 31 2	2779	72 56 6	2726	71 21 23	2726
4	Jupiter W.	109 25 5	2473	111 6 57	2422	112 48 36	2421	114 31 2	2429
	Regulus W.	104 21 12	2513	106 2 7	2322	107 42 50	2320	109 23 21	2540
	Saturn W.	94 39 37	2323	96 20 47	2311	98 1 45	2320	99 42 31	2329
	Spica W.	50 18 22	2516	51 59 13	2324	53 39 53	2323	55 20 22	2540
	Venus E.	39 33 33	2321	38 1 41	2321	36 30 2	2341	34 58 35	2350
	α Aquilæ E.	56 3 25	2323	54 41 4	2443	53 19 36	2424	51 59 5	2549
	SUN E.	63 30 57	2347	61 57 30	2326	60 24 15	2326	58 51 13	2376
5	Saturn W.	108 3 14	2373	109 42 46	2323	111 22 6	2321	113 1 13	2320
	Spica W.	63 39 52	2323	65 19 11	2321	66 58 19	2329	68 37 16	2327
	Antares W.	17 53 55	2373	19 33 20	2326	21 12 34	2326	22 51 36	2323
	Venus E.	27 24 21	2323	25 54 6	2326	24 24 3	2317	22 54 11	2327
	SUN E.	51 9 6	2324	49 37 17	2324	48 5 41	2343	46 34 17	2323
6	Spica W.	76 49 9	2349	78 26 58	2327	80 4 36	2325	81 42 3	2374
	Antares W.	31 4 4	2343	32 42 0	2322	34 19 45	2320	35 57 19	2323
	SUN E.	39 0 16	2301	37 30 4	2310	36 0 4	2321	34 30 17	2321
11	SUN W.	19 5 36	2324	20 28 11	2326	21 50 41	2323	23 13 5	2323
	Mars E.	44 22 48	2326	42 57 45	2325	41 32 53	2374	40 8 11	2323
	α Arietis E.	54 5 33	2326	52 35 15	2324	51 5 7	2313	49 35 10	2321
	Aldebaran E.	86 44 32	2327	85 14 53	2324	83 45 23	2341	82 16 1	2342
12	SUN W.	30 3 46	2423	31 25 36	2423	32 47 21	2423	34 9 1	2423
	Mars E.	33 7 28	2323	31 43 54	2343	30 20 31	2323	28 57 21	2325
	α Arietis E.	42 7 52	2320	40 38 54	2323	39 10 5	2377	37 41 27	2326
	Aldebaran E.	74 51 25	2323	73 22 55	2321	71 54 34	2326	70 26 20	2123
	Pollux E.	116 50 44	2329	115 21 44	2324	113 52 50	2323	112 24 2	2373

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Star's Name and Position.	Midnight.	P. L. of Dist.	XVh.	P. L. of Dist.	XVIIIh.	P. L. of Dist.	XXIh.	P. L. of Dist.
1	Pollux W.	106° 52' 46"	2266	106° 37' 24"	2266	110° 21' 48"	2275	112° 5' 58"	2284
	Jupiter W.	74 43 23	2266	76 29 29	2264	78 15 22	2213	80 1 3	2221
	Regulus W.	69 58 19	2234	71 43 29	2343	73 28 26	2351	75 13 11	2360
	Saturn W.	60 13 0	2231	61 58 14	2230	63 43 17	2246	65 28 9	2266
	Antares E.	29 58 2	2237	28 12 42	2236	26 27 35	2245	24 42 41	2255
	Venus E.	70 55 16	2726	69 19 9	2724	67 43 14	2744	66 7 32	2753
	α Aquilæ E.	85 36 2	2692	84 3 33	2695	82 31 20	2618	80 59 24	2623
SUN E.	95 24 56	2662	93 47 11	2660	92 9 38	2671	90 32 19	2681	
2	Jupiter W.	88 46 18	2266	90 30 42	2275	92 14 53	2283	93 58 52	2292
	Regulus W.	83 53 43	2406	85 37 11	2414	87 20 26	2423	89 3 28	2432
	Saturn W.	74 9 27	2297	75 53 6	2406	77 36 33	2415	79 19 47	2423
	Spica W.	29 53 30	2424	31 36 31	2420	33 19 23	2426	35 2 6	2443
	Antares E.	16 1 38	2404	14 18 9	2415	12 34 56	2426	10 51 59	2438
	Venus E.	58 12 16	2693	56 37 52	2613	55 3 41	2623	53 29 43	2633
	α Aquilæ E.	73 24 47	2623	71 55 1	2643	70 25 42	2667	68 56 52	2691
SUN E.	82 28 58	2729	80 52 56	2729	79 17 8	2749	77 41 33	2759	
3	Jupiter W.	102 35 33	2427	104 18 15	2446	106 0 44	2465	107 43 1	2484
	Regulus W.	97 35 26	2477	99 17 11	2486	100 58 44	2495	102 40 4	2504
	Saturn W.	87 52 52	2467	89 34 52	2476	91 16 39	2485	92 58 14	2493
	Spica W.	43 33 1	2468	45 14 38	2491	46 56 4	2499	48 37 19	2507
	Venus E.	45 43 4	2692	44 10 22	2692	42 37 53	2692	41 5 37	2612
	α Aquilæ E.	61 40 41	2228	60 15 17	2273	58 50 34	2312	57 26 36	2352
	SUN E.	69 46 52	2696	68 12 34	2618	66 38 29	2628	65 4 37	2637
4	Jupiter W.	116 11 16	2609	117 55 17	2617	119 36 6	2626	121 16 43	2635
	Regulus W.	111 3 39	2649	112 43 44	2657	114 23 38	2666	116 3 19	2675
	Saturn W.	101 23 4	2638	103 3 25	2646	104 43 34	2656	106 23 30	2664
	Spica W.	57 0 39	2648	58 40 45	2657	60 20 39	2666	62 0 21	2674
	Venus E.	33 27 20	2690	31 56 17	2699	30 25 26	2690	28 54 48	2699
	α Aquilæ E.	50 39 35	2698	49 21 9	2672	48 3 52	2742	46 47 49	2817
	SUN E.	57 18 23	2665	55 45 45	2695	54 13 20	2695	52 41 7	2614
5	Saturn W.	114 40 8	2610	116 18 50	2618	117 57 20	2627	119 35 36	2637
	Spica W.	70 16 1	2615	71 54 35	2624	73 32 58	2632	75 11 9	2640
	Antares W.	24 30 28	2610	26 9 9	2619	27 47 38	2626	29 25 57	2635
	Venus E.	21 24 32	2696	19 55 4	2646	18 25 48	2666	16 56 45	2665
	SUN E.	45 3 4	2692	43 32 4	2672	42 1 16	2691	40 30 40	2691
6	Spica W.	83 19 18	2692	84 56 22	2690	86 33 15	2696	88 9 57	2707
	Antares W.	37 34 42	2676	39 11 54	2686	40 48 54	2692	42 25 44	2701
	SUN E.	33 0 43	2642	31 31 22	2662	30 2 13	2662	28 33 17	2673
11	SUN W.	24 35 24	2402	25 57 38	2407	27 19 47	2412	28 41 50	2418
	Mars E.	38 43 40	2324	37 19 21	2302	35 55 12	2312	34 31 14	2322
	α Arietis E.	48 5 23	2629	46 35 46	2696	45 6 18	2644	43 37 0	2692
	Aldebaran E.	80 46 49	2665	79 17 46	2668	77 48 51	2669	76 20 4	2676
12	SUN W.	35 30 37	2441	36 52 7	2446	38 13 31	2451	39 34 50	2454
	Mars E.	27 34 24	2377	26 11 41	2389	24 49 12	2402	23 26 58	2416
	α Arietis E.	36 12 59	2696	34 44 41	2101	33 16 33	2110	31 48 36	2119
	Aldebaran E.	68 58 14	2109	67 30 15	2115	66 2 24	2121	64 34 40	2127
	Pollux E.	110 55 20	2678	109 26 43	2692	107 58 11	2696	106 29 44	2699

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13	SUN	W.	40 56' 5"	3458	42 17' 16"	3482	43 38' 23"	3465	44 59' 26"	3486
	Aldebaran	E.	63 7 3	3183	61 39 33	3138	60 12 9	3143	58 44 52	3149
	Pollux	E.	105 1 21	3023	103 33 2	3086	102 4 47	3099	100 36 36	3101
14	SUN	W.	51 44 3	3477	53 4 53	3478	54 25 42	3477	55 46 32	3477
	Aldebaran	E.	51 30 1	3173	50 3 20	3178	48 36 45	3183	47 10 16	3186
	Pollux	E.	93 16 21	3119	91 48 23	3110	90 20 26	3111	88 52 30	3111
15	SUN	W.	62 30 52	3471	63 51 49	3467	65 12 50	3463	66 33 55	3469
	Aldebaran	E.	39 59 22	3216	38 33 31	3223	37 7 49	3230	35 42 15	3239
	Pollux	E.	81 32 42	3165	80 4 39	3103	78 36 33	3101	77 8 24	3086
	Jupiter	E.	111 58 3	3089	110 28 37	3036	106 59 9	3033	107 29 37	3029
Regulus	E.	118 29 20	3067	117 0 54	3063	115 32 24	3061	114 3 51	3077	
16	SUN	W.	73 20 35	3436	74 42 12	3427	76 3 58	3419	77 25 53	3410
	Pollux	E.	69 46 35	3077	68 17 57	3071	66 49 12	3066	65 20 19	3060
	Jupiter	E.	100 0 38	3005	98 30 31	2999	97 0 17	3003	95 29 55	2986
	Regulus	E.	106 39 47	3052	105 10 39	3046	103 41 23	3039	102 11 58	3032
	Saturn	E.	115 21 26	3039	113 52 2	3032	112 22 29	3026	110 52 48	3018
17	SUN	W.	84 17 51	3366	85 40 47	3354	87 3 56	3343	88 27 18	3332
	Mars	W.	23 35 3	3322	24 58 49	3302	26 22 58	3264	27 47 28	3266
	α Arietis	W.	18 8 22	3187	19 35 47	3107	21 3 48	3081	22 32 21	3066
	Pollux	E.	57 53 51	3023	56 24 5	3013	54 54 8	3006	53 24 1	2986
	Jupiter	E.	87 55 41	2943	86 24 16	2933	84 52 39	2924	83 20 50	2913
	Regulus	E.	94 42 32	3089	93 12 5	3079	91 41 26	3069	90 10 34	3056
	Saturn	E.	103 21 52	3073	101 51 6	3064	100 20 8	3054	98 48 57	3042
18	SUN	W.	95 27 41	3365	96 52 33	3351	98 17 42	3336	99 43 8	3321
	Mars	W.	34 55 9	3180	36 21 42	3163	37 48 36	3146	39 15 51	3126
	α Arietis	W.	30 2 16	2960	31 33 31	2933	33 5 9	2914	34 37 10	2896
	Pollux	E.	45 50 28	2946	44 19 8	2937	42 47 36	2927	41 15 51	2916
	Jupiter	E.	75 38 7	2882	74 4 47	2840	72 31 11	2827	70 57 18	2813
	Regulus	E.	82 32 38	2998	81 0 16	2964	79 27 37	2970	77 54 40	2956
	Saturn	E.	91 9 22	3081	89 36 39	3066	88 3 39	3056	86 30 22	3041
19	SUN	W.	106 55 1	3186	108 22 24	3121	109 50 8	3104	111 18 13	3085
	Mars	W.	46 37 25	3039	48 6 50	3020	49 36 38	3001	51 6 49	2992
	α Arietis	W.	42 23 2	2905	43 57 23	2786	45 32 7	2769	47 7 15	2750
	Pollux	E.	33 33 58	2870	32 1 1	2863	30 27 55	2856	28 54 42	2864
	Jupiter	E.	63 3 12	2786	61 27 22	2732	59 51 12	2707	58 14 41	2691
	Regulus	E.	70 5 13	2780	68 30 19	2765	66 55 5	2748	65 19 29	2732
	Saturn	E.	78 39 14	2766	77 4 1	2749	75 28 26	2733	73 52 30	2717
20	SUN	W.	118 44 20	3091	120 14 44	3072	121 45 32	3053	123 16 44	3034
	Mars	W.	58 43 46	2885	60 16 24	2866	61 49 27	2846	63 22 55	2826
	α Arietis	W.	55 9 6	2657	56 46 44	2636	58 24 47	2619	60 3 16	2600
	Aldebaran	W.	23 56 3	2699	25 26 55	2612	26 58 58	2603	28 32 5	2618
	Jupiter	E.	50 6 33	2605	48 27 46	2569	46 48 36	2573	45 9 2	2556
	Regulus	E.	57 15 52	2646	55 37 58	2626	53 59 41	2610	52 20 59	2592
	Saturn	E.	65 47 18	2632	64 9 6	2614	62 30 30	2597	60 51 31	2580
	Spica	E.	111 18 37	2641	109 40 38	2623	106 2 14	2604	106 23 25	2586
21	Mars	W.	71 16 49	2735	72 52 55	2705	74 29 28	2686	76 6 27	2666
	α Arietis	W.	68 22 15	2604	70 3 23	2486	71 44 57	2466	73 26 58	2446

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13	SUN W.	46° 20' 26"	2471	47° 41' 23"	2473	49° 2' 18"	2474	50° 23' 11"	2475
	Aldebaran E.	57 17 42	2154	55 50 38	2159	54 23 40	2163	52 56 47	2169
	Pollux E.	99 8 28	2103	97 40 23	2106	96 12 19	2108	94 44 19	2110
14	SUN W.	57 7 22	2476	58 28 13	2476	59 49 5	2474	61 9 58	2473
	Aldebaran E.	45 43 53	2193	44 17 36	2193	42 51 25	2204	41 25 20	2209
	Pollux E.	87 24 34	2110	85 56 37	2110	84 28 40	2110	83 0 42	2108
15	SUN W.	67 55 5	2484	69 16 20	2480	70 37 40	2448	71 59 5	2441
	Aldebaran E.	34 16 52	2246	32 51 40	2239	31 26 41	2273	30 1 57	2288
	Pollux E.	75 40 12	2094	74 11 55	2091	72 43 34	2086	71 15 7	2092
	Jupiter E.	106 0 0	2026	104 30 18	2021	103 0 31	2016	101 30 38	2010
	Regulus E.	112 35 13	2073	111 6 30	2089	109 37 42	2064	108 8 48	2066
16	SUN W.	78 47 58	2492	80 10 12	2394	81 32 35	2386	82 55 8	2377
	Pollux E.	63 51 19	2062	62 22 10	2046	60 52 53	2038	59 23 27	2030
	Jupiter E.	93 59 25	2078	92 28 45	2070	90 57 55	2063	89 26 54	2052
	Regulus E.	100 42 25	2024	99 12 42	2018	97 42 49	2008	96 12 46	2009
	Saturn E.	109 22 58	2010	107 52 58	2001	106 22 47	2003	104 52 25	2004
17	SUN W.	89 50 53	2319	91 14 42	2306	92 38 46	2294	94 3 5	2279
	Mars W.	29 12 19	2248	30 37 31	2231	32 3 3	2214	33 28 56	2197
	α Arietis W.	24 1 25	2022	25 30 58	2009	27 0 59	1999	28 31 25	2000
	Pollux E.	51 53 42	2006	50 23 12	2077	48 52 30	2066	47 21 35	2067
	Jupiter E.	81 48 47	2001	80 16 30	2000	78 43 58	2078	77 11 11	2066
	Regulus E.	88 39 28	2046	87 8 8	2026	85 36 34	2023	84 4 44	2010
	Saturn E.	97 17 32	2021	95 45 52	2020	94 13 58	2007	92 41 48	2004
18	SUN W.	101 8 52	2306	102 34 55	2129	104 1 17	2173	105 27 59	2186
	Mars W.	40 43 27	2110	42 11 24	2092	43 39 43	2078	45 8 23	2067
	α Arietis W.	36 9 34	2078	37 42 21	2000	39 15 31	2043	40 49 5	2024
	Pollux E.	39 43 53	2006	38 11 42	2007	36 39 19	2007	35 6 44	2079
	Jupiter E.	69 23 7	2709	67 48 38	2726	66 13 50	2709	64 38 42	2723
	Regulus E.	76 21 25	2042	74 47 51	2027	73 13 58	2013	71 39 46	2006
	Saturn E.	84 56 47	2026	83 22 53	2011	81 48 40	2006	80 14 7	2081
	19	SUN W.	112 46 41	2097	114 15 31	2048	115 44 44	2030	117 14 20	2010
Mars W.		52 37 24	2063	54 8 23	2044	55 39 46	2024	57 11 34	2006
α Arietis W.		48 42 48	2722	50 18 45	2718	51 55 7	2696	53 31 54	2676
Pollux E.		27 21 24	2062	25 48 4	2063	24 14 45	2007	22 41 31	2006
Jupiter E.		56 37 49	2076	55 0 35	2097	53 22 58	2040	51 44 57	2023
Regulus E.		63 43 31	2716	62 7 11	2009	60 30 28	2001	58 53 22	2003
Saturn E.		72 16 13	2700	70 39 33	2004	69 2 31	2006	67 25 6	2049
20		SUN W.	124 48 20	2014	126 20 21	2004	127 52 47	2076	129 25 38	2004
	Mars W.	64 56 49	2006	66 31 9	2706	68 5 56	2706	69 41 9	2745
	α Arietis W.	61 42 11	2061	63 21 32	2061	65 1 20	2048	66 41 34	2023
	Aldebaran W.	30 6 10	2776	31 41 9	2729	33 16 59	2702	34 53 36	2009
	Jupiter E.	43 29 5	2036	41 48 44	2020	40 7 59	2003	38 26 50	2406
	Regulus E.	50 41 53	2074	49 2 23	2000	47 22 28	2038	45 42 8	2020
	Saturn E.	59 12 8	2002	57 32 21	2046	55 52 10	2027	54 11 34	2010
	Spica E.	104 44 11	2007	103 4 31	2049	101 24 25	2030	99 43 53	2011
21	Mars W.	77 43 53	2046	79 21 45	2026	81 0 4	2007	82 38 49	2009
	α Arietis W.	75 9 25	2439	76 52 19	2410	78 35 39	2391	80 19 26	2374

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21	Aldebaran W.	36° 30' 58"	2688	36° 9' 2"	2608	39° 47' 46"	2660	41° 27' 8"	2688
	Jupiter E.	36 45 17	2470	35 3 21	2483	33 21 2	2488	31 38 21	2423
	Regulus E.	44 1 23	2692	42 20 13	2480	40 38 39	2468	38 56 41	2461
	Saturn E.	52 30 35	2493	50 49 12	2476	49 7 25	2460	47 25 15	2443
	Spica E.	98 2 55	2492	96 21 31	2474	94 39 41	2466	92 57 24	2436
22	Mars W.	84 17 59	2569	85 57 36	2561	87 37 38	2583	89 18 5	2616
	α Arietis W.	82 3 38	2346	83 48 16	2338	85 33 20	2321	87 18 49	2304
	Aldebaran W.	49 52 57	2431	51 35 47	2410	53 19 8	2389	55 2 59	2366
	Regulus E.	30 21 0	2373	28 36 46	2369	26 52 12	2346	25 7 20	2336
	Saturn E.	38 48 45	2368	37 4 24	2356	35 19 45	2344	33 34 49	2333
	Spica E.	84 19 29	2346	82 34 37	2328	80 49 19	2311	79 3 36	2296
23	Mars W.	97 46 24	2432	99 29 13	2417	101 12 23	2403	102 55 54	2386
	α Arietis W.	96 12 15	2226	98 0 5	2210	99 48 17	2197	101 36 49	2184
	Aldebaran W.	63 49 21	2376	65 35 56	2359	67 22 56	2348	69 10 19	2329
	Pollux W.	22 2 22	2405	23 45 49	2365	25 30 14	2330	27 15 30	2298
	Spica E.	70 9 2	2216	68 20 59	2202	66 32 34	2188	64 43 48	2174
	Antares E.	115 51 19	2210	114 3 6	2196	112 14 31	2180	110 25 34	2167
24	α Arietis W.	110 44 15	2126	112 34 35	2116	114 25 10	2107	116 15 58	2099
	Aldebaran W.	78 12 31	2163	80 1 54	2153	81 51 33	2142	83 41 28	2133
	Pollux W.	36 11 43	2186	38 0 31	2170	39 49 44	2165	41 39 19	2141
	Spica E.	55 35 12	2116	53 44 38	2107	51 53 49	2098	50 2 46	2089
	Antares E.	101 15 59	2107	99 25 11	2098	97 34 8	2088	95 42 50	2079
25	Aldebaran W.	92 54 10	2099	94 45 11	2084	96 36 19	2080	98 27 33	2067
	Pollux W.	50 51 50	2091	52 43 3	2084	54 34 27	2077	56 26 1	2073
	Jupiter W.	21 34 49	2064	23 26 43	2064	25 18 53	2044	27 11 18	2035
	Spica E.	40 44 44	2080	38 52 43	2086	37 0 36	2053	35 8 25	2042
	Antares E.	86 23 15	2044	84 30 50	2040	82 38 18	2036	80 45 40	2023
26	Aldebaran W.	107 44 22	2066	109 35 42	2068	111 26 59	2092	113 18 11	2096
	Pollux W.	65 45 18	2061	67 37 18	2061	69 29 18	2061	71 21 17	2063
	Jupiter W.	36 36 1	2014	38 29 13	2013	40 22 27	2014	42 15 40	2014
	Regulus W.	28 43 13	2059	30 35 15	2067	32 27 21	2065	34 19 29	2065
	Saturn W.	21 13 36	2147	23 3 23	2138	24 53 39	2114	26 44 17	2108
	Antares E.	71 21 34	2027	69 28 42	2028	67 35 51	2020	65 43 3	2022
	α Aquilæ E.	121 22 22	2822	119 48 23	2793	118 13 46	2768	116 38 36	2746
27	Pollux W.	80 40 10	2082	82 31 37	2068	84 22 55	2085	86 14 2	2101
	Jupiter W.	51 40 57	2032	53 33 42	2037	55 26 19	2043	57 18 46	2050
	Regulus W.	43 39 43	2069	45 31 30	2074	47 23 9	2079	49 14 40	2086
	Saturn W.	36 0 18	2065	37 51 40	2066	39 43 0	2060	41 34 15	2064
	Antares E.	56 20 17	2083	54 28 6	2080	52 36 5	2066	50 44 14	2074
	α Aquilæ E.	108 36 50	2879	106 59 42	2873	105 22 25	2868	103 45 2	2866
28	Pollux W.	95 26 37	2147	97 16 25	2187	99 5 57	2168	100 55 13	2180
	Jupiter W.	66 38 6	2092	68 29 18	2102	70 20 14	2113	72 10 53	2126
	Regulus W.	58 29 21	2128	60 19 37	2138	62 9 38	2148	63 59 24	2159
	Saturn W.	50 48 32	2126	52 38 51	2135	54 28 57	2144	56 18 49	2154
	Antares E.	41 28 8	2118	39 37 37	2120	37 47 23	2140	35 57 25	2151
	α Aquilæ E.	95 38 13	2681	94 1 7	2689	92 24 12	2688	90 47 29	2708
	SUN E.	133 30 10	2441	131 47 33	2460	130 5 9	2461	128 23 1	2473

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21	Aldebaran W.	43° 7' 8"	2637	44° 47' 44"	2603	46° 28' 55"	2478	48° 10' 39"	2454
	Jupiter E.	29 55 19	2409	28 11 57	2396	26 28 15	2381	24 44 13	2367
	Regulus E.	37 14 19	2484	35 31 33	2418	33 48 24	2403	32 4 53	2387
	Saturn E.	45 42 41	2437	43 59 45	2411	42 16 26	2396	40 32 46	2382
	Spica E.	91 14 41	2418	89 31 32	2406	87 47 57	2383	86 3 56	2364
22	Mars W.	90 58 57	2498	92 40 13	2481	94 21 53	2464	96 3 57	2448
	α Arietis W.	89 4 42	2287	90 51 0	2271	92 37 42	2256	94 24 47	2240
	Aldebaran W.	56 47 20	2246	58 32 10	2229	60 17 27	2211	62 3 11	2203
	Regulus E.	23 22 13	2337	21 36 53	2330	19 51 22	2316	18 5 46	2317
	Saturn E.	31 49 37	2234	30 4 12	2217	28 18 37	2211	26 32 54	2206
	Spica E.	77 17 29	2278	75 30 57	2262	73 44 2	2248	71 56 43	2231
23	Mars W.	104 39 46	2375	106 23 57	2362	108 8 27	2349	109 53 15	2337
	α Arietis W.	103 25 41	2170	105 14 53	2160	107 4 23	2147	108 54 11	2136
	Aldebaran W.	70 58 4	2214	72 46 11	2200	74 34 39	2187	76 23 26	2176
	Pollux W.	29 1 32	2270	30 48 15	2247	32 35 33	2236	34 23 23	2206
	Spica E.	62 54 42	2162	61 5 17	2149	59 15 33	2137	57 25 31	2126
	Antares E.	108 36 17	2164	106 46 40	2141	104 56 44	2130	103 6 30	2118
24	α Arietis W.	118 6 59	2092	119 58 11	2085	121 49 33	2079	123 41 5	2073
	Aldebaran W.	85 31 37	2134	87 21 59	2116	89 12 33	2110	91 3 17	2104
	Pollux W.	43 29 15	2129	45 19 30	2118	47 10 2	2108	49 0 49	2099
	Spica E.	48 11 30	2092	46 20 3	2075	44 28 26	2069	42 36 39	2064
	Antares E.	93 51 18	2071	91 59 34	2063	90 7 38	2066	88 15 31	2050
25	Aldebaran W.	100 18 52	2086	102 10 14	2085	104 1 37	2086	105 53 0	2086
	Pollux W.	58 17 42	2066	60 9 30	2065	62 1 23	2063	63 53 19	2061
	Jupiter W.	29 3 57	2028	30 56 48	2023	32 49 47	2019	34 42 52	2016
	Spica E.	33 16 11	2092	31 23 57	2092	29 31 44	2084	27 39 34	2067
	Antares E.	78 52 57	2030	77 0 10	2028	75 7 20	2026	73 14 27	2026
26	Aldebaran W.	115 9 17	2161	117 0 15	2167	118 51 3	2115	120 41 40	2128
	Pollux W.	73 13 13	2066	75 5 5	2069	76 56 53	2072	78 48 35	2077
	Jupiter W.	44 8 52	2016	46 2 1	2019	47 55 6	2023	49 48 5	2027
	Regulus W.	36 11 38	2066	38 3 45	2069	39 55 49	2061	41 47 49	2064
	Saturn W.	28 35 12	2095	30 26 19	2099	32 17 35	2086	34 8 55	2086
	Antares E.	63 50 18	2035	61 57 38	2029	60 5 4	2043	58 12 37	2048
	α Aquilæ E.	115 2 57	2737	113 26 53	2711	111 50 28	2698	110 13 46	2698
27	Pollux W.	88 4 59	2169	89 55 44	2118	91 46 16	2127	93 36 34	2137
	Jupiter W.	59 11 3	2067	61 3 8	2066	62 55 0	2073	64 46 40	2083
	Regulus W.	51 6 0	2094	52 57 9	2101	54 48 6	2110	56 38 50	2118
	Saturn W.	43 25 24	2096	45 16 26	2104	47 7 19	2111	48 58 1	2118
	Antares E.	48 52 35	2092	47 . 1 8	2090	45 9 54	2099	43 18 54	2109
	α Aquilæ E.	102 7 37	2686	100 30 11	2667	98 52 47	2670	97 15 27	2675
28	Pollux W.	102 44 11	2192	104 32 51	2204	106 21 12	2216	108 9 15	2230
	Jupiter W.	74 1 14	2136	75 51 18	2147	77 41 5	2159	79 30 35	2170
	Regulus W.	65 48 53	2170	67 38 5	2182	69 27 0	2194	71 15 37	2206
	Saturn W.	58 8 26	2164	59 57 48	2175	61 46 53	2186	63 35 41	2196
	Antares E.	34 7 44	2163	32 18 21	2179	30 29 16	2188	28 40 30	2200
	α Aquilæ E.	89 11 0	2730	87 34 47	2723	85 58 51	2748	84 23 15	2765
	SUN E.	126 41 9	2486	124 59 34	2496	123 18 15	2609	121 37 14	2623

AT GREENWICH APPARENT NOON.

THE SUN'S																
Day of the Week.	Day of the Month.	Apparent Right Ascension.			Diff. for 1 hour.	Apparent Declination.			Diff. for 1 hour.	Semi-diameter.	Sideral Time of the Semi-diameter passing the Meridian.	Equation of Time, to be added to Apparent Time.	Diff. for 1 hour.			
		h	m	s		°	'	"						"	'	"
Fri.	1	22	49	39.49	9.352	S.	7	28	10.1	57.05	16	10.26	65.41	12	31.82	0.504
Sat.	2	22	53	23.67	9.332		7	5	17.8	57.31	16	10.01	65.34	12	19.47	0.524
Sun.	3	22	57	7.39	9.312		6	42	19.4	57.55	16	9.75	65.27	12	6.67	0.543
Mon.	4	23	0	50.65	9.295		6	19	15.5	57.78	16	9.49	65.20	11	53.42	0.561
Tues.	5	23	4	33.47	9.278		5	56	6.2	58.00	16	9.23	65.13	11	39.72	0.579
Wed.	6	23	8	15.89	9.261		5	32	51.8	58.20	16	8.97	65.07	11	25.62	0.595
Thur.	7	23	11	57.91	9.244		5	9	32.9	58.38	16	8.71	65.01	11	11.13	0.611
Fri.	8	23	15	39.53	9.228		4	46	9.9	58.55	16	8.45	64.95	10	56.23	0.627
Sat.	9	23	19	20.80	9.214		4	22	43.1	58.70	16	8.19	64.90	10	40.99	0.642
Sun.	10	23	23	1.74	9.200		3	59	12.9	58.83	16	7.92	64.85	10	25.42	0.656
Mon.	11	23	26	42.35	9.187		3	35	39.9	58.94	16	7.65	64.80	10	9.52	0.669
Tues.	12	23	30	22.66	9.174		3	12	4.3	59.04	16	7.39	64.76	9	53.30	0.681
Wed.	13	23	34	2.66	9.162		2	48	26.7	59.12	16	7.13	64.72	9	36.79	0.693
Thur.	14	23	37	42.38	9.151		2	24	47.4	59.18	16	6.86	64.68	9	20.01	0.705
Fri.	15	23	41	21.85	9.141		2	1	6.8	59.22	16	6.59	64.64	9	2.97	0.715
Sat.	16	23	45	1.07	9.131		1	37	25.3	59.25	16	6.32	64.61	8	45.70	0.724
Sun.	17	23	48	40.07	9.122		1	13	43.1	59.27	16	6.06	64.58	8	28.19	0.732
Mon.	18	23	52	18.86	9.114		0	50	0.8	59.27	16	5.79	64.56	8	10.47	0.740
Tues.	19	23	55	57.46	9.107		0	26	18.6	59.25	16	5.52	64.54	7	52.57	0.748
Wed.	20	23	59	35.90	9.101	S.	0	2	36.9	59.22	16	5.25	64.52	7	34.52	0.755
Thur.	21	0	3	14.20	9.095	N.	0	21	3.9	59.18	16	4.99	64.50	7	16.32	0.761
Fri.	22	0	6	52.38	9.090		0	44	48.4	59.13	16	4.72	64.49	6	58.00	0.765
Sat.	23	0	10	30.45	9.086		1	8	21.4	59.07	16	4.45	64.48	6	39.57	0.769
Sun.	24	0	14	8.44	9.084		1	31	57.5	58.98	16	4.18	64.47	6	21.06	0.772
Mon.	25	0	17	46.39	9.082		1	55	31.3	58.87	16	3.90	64.46	6	2.51	0.774
Tues.	26	0	21	24.32	9.082		2	19	2.4	58.75	16	3.62	64.46	5	43.94	0.775
Wed.	27	0	25	2.24	9.082		2	42	30.7	58.63	16	3.34	64.46	5	25.35	0.774
Thur.	28	0	28	40.17	9.083		3	5	56.0	58.49	16	3.06	64.46	5	6.77	0.773
Fri.	29	0	32	18.14	9.085		3	29	17.8	58.34	16	2.78	64.47	4	48.24	0.771
Sat.	30	0	35	56.18	9.088		3	52	35.7	58.17	16	2.50	64.48	4	29.78	0.768
Sun.	31	0	39	34.32	9.093		4	15	49.4	57.99	16	2.21	64.49	4	11.41	0.764
Mon.	32	0	43	12.55	9.097	N.	4	38	58.5	57.79	16	1.92	64.51	3	53.14	0.759

NOTE. — Mean Time of the Semidiameter passing may be found by subtracting 0s.18 from the Sideral Time.

AT GREENWICH MEAN NOON.

Day of the Week.	Day of the Month.	THE SUN'S				Equation of Time, to be subtracted from Mean Time.	Diff. for 1 hour.	Sidereal Time.
		Apparent Right Ascension.	Diff. for 1 hour.	Apparent Declination.	Diff. for 1 hour.			
		h m s	"	° ' "	"	m s	"	h m s
Fri.	1	22 49 37.54	9.359	S. 7° 28' 22.0"	57.05	12 31.92	0.504	22 37 5.62
Sat.	2	22 53 21.75	9.332	7 5 29.6	57.31	12 19.57	0.524	22 41 2.18
Sun.	3	22 57 5.50	9.312	6 42 31.1	57.55	12 6.77	0.543	22 44 58.73
Mon.	4	23 0 48.80	9.295	6 19 27.0	57.78	11 53.52	0.561	22 48 55.28
Tues.	5	23 4 31.66	9.278	5 56 17.5	58.00	11 39.82	0.579	22 52 51.84
Wed.	6	23 8 14.12	9.261	5 33 2.9	58.20	11 25.73	0.595	22 56 48.39
Thur.	7	23 11 56.18	9.244	5 9 43.8	58.38	11 11.24	0.611	23 0 44.94
Fri.	8	23 15 37.84	9.228	4 46 20.6	58.55	10 56.34	0.627	23 4 41.50
Sat.	9	23 19 19.15	9.214	4 22 53.6	58.70	10 41.10	0.642	23 8 38.05
Sun.	10	23 23 0.13	9.200	3 59 23.2	58.83	10 25.53	0.656	23 12 34.60
Mon.	11	23 26 40.78	9.187	3 35 49.9	58.94	10 19.62	0.669	23 16 31.16
Tues.	12	23 30 21.13	9.174	3 12 14.1	59.04	9 53.42	0.681	23 20 27.71
Wed.	13	23 34 1.17	9.162	2 48 36.2	59.12	9 36.91	0.693	23 24 24.26
Thur.	14	23 37 40.94	9.151	2 24 56.6	59.18	9 20.13	0.705	23 28 20.81
Fri.	15	23 41 20.46	9.141	2 1 15.7	59.22	9 3.09	0.715	23 32 17.37
Sat.	16	23 44 59.73	9.131	1 37 33.9	59.25	8 45.81	0.724	23 36 13.92
Sun.	17	23 48 38.77	9.122	1 13 51.5	59.27	8 28.30	0.732	23 40 10.47
Mon.	18	23 52 17.61	9.114	0 50 8.9	59.27	8 10.58	0.740	23 44 7.03
Tues.	19	23 55 56.26	9.107	0 26 26.4	59.25	7 52.68	0.748	23 48 3.58
Wed.	20	23 59 34.75	9.101	S. 0 2 44.4	59.22	7 34.62	0.755	23 52 0.13
Thur.	21	0 3 13.10	9.095	N. 0 20 56.7	59.18	7 16.41	0.761	23 55 56.69
Fri.	22	0 6 51.33	9.090	0 44 36.5	59.13	6 58.09	0.765	23 59 53.24
Sat.	23	0 10 29.45	9.086	1 8 14.8	59.07	6 39.66	0.769	0 3 49.79
Sun.	24	0 14 7.49	9.084	1 31 51.2	58.98	6 21.14	0.772	0 7 46.35
Mon.	25	0 17 45.48	9.082	1 55 25.3	58.87	6 2.59	0.774	0 11 42.89
Tues.	26	0 21 23.46	9.082	2 18 56.8	58.75	5 44.01	0.775	0 15 39.45
Wed.	27	0 25 1.42	9.082	2 42 25.5	58.63	5 25.42	0.774	0 19 36.00
Thur.	28	0 28 39.40	9.083	3 5 51.1	58.49	5 6.84	0.773	0 23 32.56
Fri.	29	0 32 17.42	9.085	3 29 13.2	58.34	4 48.31	0.771	0 27 29.11
Sat.	30	0 35 55.50	9.088	3 52 31.4	58.17	4 29.84	0.768	0 31 25.66
Sun.	31	0 39 33.68	9.093	4 15 45.4	57.99	4 11.46	0.764	0 35 22.22
Mon.	32	0 43 11.96	9.097	N. 4 38 54.8	57.79	3 53.19	0.759	0 39 18.77

NOTE. — The Semidiameter for Mean Noon may be assumed the same as that for Apparent Noon.

AT GREENWICH MEAN NOON.											
THE SUN'S											
Day of the Month.	Day of the Year.	True LONGITUDE.						Logarithm of the Radius Vector of the Earth.	Diff. for 1 hour.	Mean Time of Sidereal Ob.	
		λ		Diff. for 1 hour.	LATITUDE.	Logarithm of the Radius Vector of the Earth.	Diff. for 1 hour.				Mean Time of Sidereal Ob.
		λ^o	λ'								
1	60	340	56	13.7	55	48.6	150.34	-0.72	9.9962886	46.8	1 22 40.80
2	61	341	56	21.0	55	55.7	150.28	0.66	.9964017	47.3	1 18 44.89
3	62	342	56	26.7	56	1.3	150.21	0.57	.9965160	47.8	1 14 48.98
4	63	343	56	30.9	56	5.4	150.14	0.47	.9966314	48.2	1 10 53.07
5	64	344	56	33.5	56	7.9	150.07	0.35	.9967478	48.6	1 6 57.16
6	65	345	56	34.4	56	8.7	150.00	0.22	.9968649	48.9	1 3 1.26
7	66	346	56	33.7	56	7.9	149.93	-0.09	.9969825	49.1	0 59 5.35
8	67	347	56	31.3	56	5.4	149.86	+0.04	.9971006	49.2	0 55 9.44
9	68	348	56	27.2	56	1.2	149.79	0.17	.9972191	49.3	0 51 13.53
10	69	349	56	21.3	55	55.2	149.71	0.28	.9973379	49.4	0 47 17.62
11	70	350	56	13.5	55	47.3	149.63	0.37	.9974568	49.5	0 43 21.72
12	71	351	56	3.7	55	37.4	149.55	0.44	.9975758	49.6	0 39 25.81
13	72	352	55	51.8	55	25.4	149.46	0.46	.9976948	49.6	0 35 29.90
14	73	353	55	37.8	55	11.3	149.37	0.45	.9978139	49.7	0 31 33.99
15	74	354	55	21.7	54	55.1	149.28	0.42	.9979332	49.7	0 27 38.09
16	75	355	55	3.4	54	36.7	149.19	0.36	.9980526	49.8	0 23 42.19
17	76	356	54	42.8	54	16.0	149.09	0.27	.9981722	49.9	0 19 46.28
18	77	357	54	19.9	53	53.0	148.99	0.17	.9982920	50.0	0 15 50.37
19	78	358	53	54.7	53	27.7	148.89	+0.06	.9984123	50.2	0 11 54.46
20	79	359	53	27.2	53	0.1	148.80	-0.06	.9985331	50.4	0 7 58.55
21	80	0	52	57.4	52	30.2	148.71	0.19	.9986544	50.6	0 4 2.65
22	81	1	52	25.3	51	58.0	148.62	0.32	.9987762	50.9	0 0 8.74
23	82	2	51	51.0	51	23.6	148.53	0.42	.9988988	51.3	23 52 14.93
24	83	3	51	14.4	50	46.9	148.44	0.51	.9990222	51.6	23 48 19.02
25	84	4	50	35.6	50	8.0	148.35	0.58	.9991464	51.9	23 44 23.11
26	85	5	49	54.8	49	27.1	148.26	0.63	.9992718	52.2	23 40 27.20
27	86	6	49	12.0	48	44.2	148.18	0.64	.9993970	52.5	23 36 31.29
28	87	7	48	27.1	47	59.2	148.10	0.61	.9995234	52.7	23 32 35.38
29	88	8	47	40.3	47	12.3	148.02	0.56	.9996504	52.9	23 28 39.47
30	89	9	46	51.6	46	23.5	147.94	0.48	.9997779	53.2	23 24 43.57
31	90	10	46	1.1	45	32.9	147.86	0.38	9.9999058	53.4	23 20 47.66
32	91	11	45	8.8	44	40.5	147.79	-0.26	0.0000339	53.4	23 16 51.75

NOTE. — λ corresponds to the true equinox of the date, λ' to the mean equinox of January 0d.

GREENWICH MEAN TIME.

THE MOON'S

Day of the Month.

	SEMI-DIAMETER		HORIZONTAL PARALLAX.				MERIDIAN PASSAGE.		AGE.
	Noon.	Midnight.	Noon.	Diff. for 1 hour.	Midnight.	Diff. for 1 hour.		Diff. for 1 hour.	
							^h ^m	^m	^d
1	16' 20.2	16' 14.6	59' 50.9	-1.63	59' 30.4	-1.75	16 28.2	2.42	19.7
2	16 8.7	16 2.6	59 8.8	1.85	58 46.3	1.89	17 26.9	2.45	20.7
3	15 56.5	15 50.3	58 23.5	1.90	58 0.8	1.87	18 25.5	2.42	21.7
4	15 44.2	15 38.3	57 38.6	1.83	57 17.1	1.76	19 22.5	2.32	22.7
5	15 32.7	15 27.3	56 56.4	1.68	56 36.8	1.59	20 16.5	2.18	23.7
6	15 22.3	15 17.6	56 18.2	1.50	56 0.8	1.40	21 7.0	2.03	24.7
7	15 13.2	15 9.1	55 44.5	1.31	55 29.4	1.21	21 54.0	1.89	25.7
8	15 5.3	15 1.8	55 15.5	1.11	55 2.7	1.02	22 38.1	1.79	26.7
9	14 58.6	14 55.7	54 51.0	0.93	54 40.4	0.83	23 20.0	1.71	27.7
10	14 53.1	14 50.8	54 31.0	0.74	54 22.6	0.65	6		28.7
11	14 48.9	14 47.2	54 15.3	0.56	54 9.2	0.46	0 0.6	1.68	29.7
12	14 45.9	14 44.8	54 4.3	0.36	54 0.6	0.25	0 40.9	1.69	0.9
13	14 44.2	14 44.0	53 58.3	-0.12	53 57.5	-0.00	1 21.7	1.72	1.9
14	14 44.2	14 44.9	53 58.2	+0.13	54 0.7	+0.28	2 3.7	1.79	2.9
15	14 46.1	14 47.8	54 5.1	0.44	54 11.4	0.61	2 47.8	1.89	3.9
16	14 50.0	14 52.8	54 19.7	0.78	54 30.2	0.96	3 34.4	1.99	4.9
17	14 56.3	15 0.4	54 42.8	1.15	54 57.7	1.34	4 23.6	2.10	5.9
18	15 5.1	15 10.4	55 14.9	1.52	55 34.3	1.71	5 15.2	2.19	6.9
19	15 16.2	15 22.6	55 55.8	1.88	56 19.4	2.05	6 8.5	2.24	7.9
20	15 29.6	15 37.0	56 44.9	2.20	57 12.0	2.32	7 2.5	2.25	8.9
21	15 44.7	15 52.6	57 40.4	2.41	58 9.5	2.45	7 56.4	2.23	9.9
22	16 0.6	16 8.7	58 39.0	2.45	59 8.1	2.40	8 49.5	2.19	10.9
23	16 16.3	16 23.3	59 36.2	2.28	60 2.4	2.10	9 41.8	2.17	11.9
24	16 29.8	16 35.4	60 26.2	1.86	60 46.8	1.56	10 33.8	2.18	12.9
25	16 39.9	16 43.3	61 3.4	1.21	61 15.6	+0.82	11 26.1	2.21	13.9
26	16 45.3	16 45.9	61 23.0	+0.41	61 25.4	-0.02	12 19.9	2.23	14.9
27	16 45.2	16 43.1	61 22.7	-0.44	61 15.0	0.84	13 15.9	2.39	15.9
28	16 39.8	16 35.3	61 2.7	1.21	60 46.3	1.53	14 14.5	2.49	16.9
29	16 29.8	16 23.6	60 26.2	1.80	60 3.3	2.02	15 15.0	2.54	17.9
30	16 16.8	16 9.5	59 38.2	2.17	59 11.5	2.27	16 15.9	2.52	18.9
31	16 2.0	15 54.5	58 44.0	2.31	58 16.3	2.31	17 15.5	2.42	19.9
32	15 47.0	15 39.7	57 48.8	-2.26	57 22.1	-2.18	18 11.8	2.27	20.9

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
FRIDAY 1.					SUNDAY 3.				
0	14 27 22.36	2.4466	S. 19° 41' 23.1"	10.585	0	16 27 14.63	2.5168	S. 25° 15' 5.2"	3.186
1	14 29 49.26	2.4495	19 51 51.3	10.369	1	16 29 45.74	2.5192	25 18 8.5	2.973
2	14 32 16.32	2.4525	20 2 11.1	10.261	2	16 32 16.81	2.5174	25 21 2.1	2.810
3	14 34 43.56	2.4555	20 12 22.7	10.192	3	16 34 47.83	2.5166	25 23 45.8	2.648
4	14 37 10.98	2.4584	20 22 25.9	9.956	4	16 37 18.80	2.5187	25 26 19.8	2.485
5	14 39 38.57	2.4612	20 32 20.8	9.945	5	16 39 49.71	2.5146	25 28 43.9	2.330
6	14 42 6.32	2.4639	20 42 7.2	9.703	6	16 42 20.55	2.5133	25 30 58.3	2.158
7	14 44 34.24	2.4667	20 51 45.1	9.561	7	16 44 51.31	2.5121	25 33 2.8	1.995
8	14 47 2.32	2.4693	21 1 14.5	9.418	8	16 47 22.00	2.5107	25 34 57.6	1.833
9	14 49 30.56	2.4720	21 10 35.2	9.273	9	16 49 52.60	2.5093	25 36 42.6	1.668
10	14 51 58.96	2.4747	21 19 47.3	9.130	10	16 52 23.11	2.5077	25 38 17.8	1.505
11	14 54 27.52	2.4773	21 28 50.7	8.983	11	16 54 53.52	2.5060	25 39 43.3	1.345
12	14 56 56.23	2.4797	21 37 45.3	8.835	12	16 57 23.83	2.5042	25 40 59.1	1.183
13	14 59 25.08	2.4821	21 46 31.0	8.686	13	16 59 54.02	2.5023	25 42 5.2	1.021
14	15 1 54.08	2.4845	21 55 7.9	8.540	14	17 2 24.10	2.5008	25 43 1.6	0.860
15	15 4 23.22	2.4868	22 3 35.8	8.390	15	17 4 54.05	2.4991	25 43 48.4	0.700
16	15 6 52.50	2.4891	22 11 54.7	8.240	16	17 7 23.87	2.4966	25 44 25.5	0.540
17	15 9 21.91	2.4918	22 20 4.6	8.090	17	17 9 53.55	2.4956	25 44 53.1	0.380
18	15 11 51.45	2.4933	22 28 5.4	7.936	18	17 12 23.10	2.4911	25 45 11.1	0.221
19	15 14 21.11	2.4953	22 35 57.0	7.785	19	17 14 52.49	2.4866	25 45 19.6	0.061
20	15 16 50.89	2.4973	22 43 39.5	7.631	20	17 17 21.73	2.4860	25 45 18.5	0.006
21	15 19 20.79	2.4993	22 51 12.8	7.478	21	17 19 50.81	2.4838	25 45 7.9	0.255
22	15 21 50.80	2.5011	22 58 36.8	7.323	22	17 22 19.72	2.4806	25 44 47.9	0.411
23	15 24 20.92	2.5029	S. 23° 5' 51.5"	7.166	23	17 24 48.47	2.4776	S. 25° 44' 18.4"	0.571
SATURDAY 2.					MONDAY 4.				
0	15 26 51.15	2.5047	S. 23° 12' 56.8"	7.011	0	17 27 17.03	2.4745	S. 25° 43' 39.6"	0.726
1	15 29 21.48	2.5062	23 19 52.8	6.855	1	17 29 45.41	2.4713	25 42 51.4	0.561
2	15 31 51.90	2.5077	23 26 39.3	6.696	2	17 32 13.59	2.4691	25 41 53.9	1.085
3	15 34 22.41	2.5092	23 33 16.4	6.540	3	17 34 41.58	2.4649	25 40 47.1	1.190
4	15 36 53.01	2.5106	23 39 44.0	6.381	4	17 37 9.38	2.4616	25 39 31.1	1.343
5	15 39 23.69	2.5119	23 46 2.1	6.221	5	17 39 36.97	2.4561	25 38 5.8	1.496
6	15 41 54.44	2.5132	23 52 10.6	6.063	6	17 42 4.34	2.4544	25 36 31.3	1.648
7	15 44 25.27	2.5143	23 58 9.5	5.901	7	17 44 31.50	2.4506	25 34 47.8	1.800
8	15 46 56.16	2.5153	24 3 58.8	5.741	8	17 46 58.44	2.4471	25 32 55.4	1.960
9	15 49 27.11	2.5163	24 9 38.5	5.581	9	17 49 25.15	2.4433	25 30 53.8	2.101
10	15 51 58.12	2.5173	24 15 8.5	5.420	10	17 51 51.63	2.4394	25 28 43.2	2.261
11	15 54 29.17	2.5179	24 20 28.9	5.258	11	17 54 17.88	2.4366	25 26 23.7	2.366
12	15 57 0.27	2.5186	24 25 30.5	5.096	12	17 56 43.88	2.4312	25 23 55.3	2.546
13	15 59 31.40	2.5192	24 30 40.4	4.935	13	17 59 9.63	2.4271	25 21 18.0	2.693
14	16 2 2.57	2.5197	24 35 31.6	4.773	14	18 1 35.13	2.4229	25 18 32.0	2.833
15	16 4 33.76	2.5200	24 40 13.0	4.610	15	18 4 0.38	2.4187	25 15 37.2	2.965
16	16 7 4.97	2.5203	24 44 44.7	4.448	16	18 6 25.37	2.4143	25 12 33.8	3.120
17	16 9 36.19	2.5206	24 49 6.6	4.283	17	18 8 50.09	2.4099	25 9 21.7	3.273
18	16 12 7.43	2.5206	24 53 18.7	4.120	18	18 11 14.54	2.4053	25 6 1.0	3.415
19	16 14 38.66	2.5205	24 57 21.0	3.962	19	18 13 38.72	2.4007	25 2 31.8	3.556
20	16 17 9.89	2.5204	25 1 13.5	3.793	20	18 16 2.63	2.3960	24 58 54.2	3.696
21	16 19 41.11	2.5202	25 4 56.2	3.630	21	18 18 26.25	2.3913	24 55 8.1	3.836
22	16 22 12.31	2.5198	25 8 20.0	3.465	22	18 20 49.59	2.3866	24 51 13.7	3.975
23	16 24 43.48	2.5193	25 11 52.0	3.301	23	18 23 12.64	2.3819	24 47 11.0	4.113
24	16 27 14.63	2.5186	S. 25° 15' 5.2"	3.138	24	18 25 35.40	2.3769	S. 24° 43' 0.0"	4.250

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
TUESDAY 5.					THURSDAY 7.				
0	18 25 35.40	2.3700	S. 24° 43' 0.0"	4.280	0	20 13 24.19	2.1110	S. 19° 1' 42.1"	9.588
1	18 27 57.86	2.3719	24 38 40.9	4.286	1	20 15 30.68	2.1065	18 52 7.3	9.620
2	18 30 20.03	2.3699	24 34 13.6	4.291	2	20 17 36.85	2.1001	18 42 27.6	9.701
3	18 32 41.89	2.3618	24 29 38.3	4.295	3	20 19 42.69	2.0947	18 32 43.0	9.781
4	18 35 3.45	2.3567	24 24 54.9	4.298	4	20 21 48.21	2.0898	18 22 53.7	9.861
5	18 37 24.70	2.3516	24 20 03.7	4.299	5	20 23 53.40	2.0849	18 12 59.6	9.940
6	18 39 45.64	2.3464	24 15 4.5	4.301	6	20 25 58.27	2.0798	18 3 0.9	10.016
7	18 42 6.27	2.3413	24 9 57.5	4.300	7	20 28 2.83	2.0749	17 52 57.6	10.091
8	18 44 26.59	2.3360	24 4 42.8	4.306	8	20 30 7.06	2.0699	17 42 49.8	10.166
9	18 46 46.59	2.3308	23 59 20.4	4.306	9	20 32 10.98	2.0647	17 32 37.5	10.241
10	18 49 6.26	2.3252	23 53 50.4	4.308	10	20 34 14.58	2.0595	17 22 20.8	10.318
11	18 51 25.61	2.3198	23 48 12.8	4.308	11	20 36 17.88	2.0543	17 11 59.8	10.395
12	18 53 44.64	2.3144	23 42 27.7	4.313	12	20 38 20.86	2.0491	17 1 34.6	10.466
13	18 56 3.34	2.3089	23 36 35.2	4.316	13	20 40 23.54	2.0431	16 51 5.2	10.538
14	18 58 21.71	2.3034	23 30 35.3	4.316	14	20 42 25.91	2.0371	16 40 31.7	10.601
15	19 0 39.75	2.2979	23 24 28.2	4.318	15	20 44 27.99	2.0321	16 29 54.1	10.660
16	19 2 57.46	2.2923	23 18 13.8	4.326	16	20 46 29.76	2.0270	16 19 12.5	10.725
17	19 5 14.83	2.2867	23 11 52.2	4.318	17	20 48 31.23	2.0221	16 18 27.0	10.790
18	19 7 31.87	2.2812	23 5 23.6	4.326	18	20 50 32.41	2.0173	16 17 37.6	10.865
19	19 9 48.57	2.2756	22 58 47.9	4.321	19	20 52 33.30	2.0124	16 6 44.4	10.916
20	19 12 4.93	2.2698	22 52 5.3	4.326	20	20 54 33.90	2.0076	15 55 47.5	10.978
21	19 14 20.95	2.2643	22 45 15.8	4.321	21	20 56 34.21	2.0028	15 24 46.9	11.040
22	19 16 36.63	2.2586	22 38 19.4	4.326	22	20 58 34.24	1.9981	15 13 42.7	11.100
23	19 18 51.97	2.2528	S. 22° 31' 16.3"	7.106	23	21 0 33.96	1.9934	S. 15° 2' 34.9"	11.158
WEDNESDAY 6.					FRIDAY 8.				
0	19 21 6.97	2.2479	S. 22° 24' 6.5"	7.218	0	21 2 33.45	1.9886	S. 14° 51' 23.6"	11.216
1	19 23 21.63	2.2414	22 16 50.1	7.229	1	21 4 32.64	1.9842	14 40 8.9	11.273
2	19 25 35.94	2.2357	22 9 27.1	7.236	2	21 6 31.56	1.9797	14 28 50.8	11.328
3	19 27 49.91	2.2300	22 1 57.6	7.245	3	21 8 30.21	1.9752	14 17 29.4	11.383
4	19 30 3.54	2.2242	21 54 21.7	7.261	4	21 10 28.59	1.9708	14 6 4.8	11.436
5	19 32 16.82	2.2185	21 46 39.4	7.266	5	21 12 26.71	1.9664	13 54 37.0	11.490
6	19 34 29.76	2.2128	21 38 50.9	7.269	6	21 14 24.56	1.9621	13 43 6.0	11.541
7	19 36 42.35	2.2070	21 30 56.2	7.263	7	21 16 22.16	1.9578	13 31 31.9	11.593
8	19 38 54.60	2.2013	21 22 55.3	7.265	8	21 18 19.50	1.9536	13 19 54.8	11.643
9	19 41 6.51	2.1956	21 14 48.4	7.265	9	21 20 16.58	1.9493	13 8 14.7	11.691
10	19 43 18.07	2.1898	21 6 35.5	7.265	10	21 22 13.42	1.9450	12 56 31.8	11.738
11	19 45 29.29	2.1841	20 58 16.6	7.263	11	21 24 10.01	1.9413	12 44 46.0	11.785
12	19 47 40.16	2.1783	20 49 51.9	7.260	12	21 26 6.26	1.9373	12 32 57.5	11.831
13	19 49 50.69	2.1727	20 41 21.4	7.267	13	21 28 2.47	1.9333	12 21 6.2	11.876
14	19 52 0.88	2.1670	20 32 45.1	7.262	14	21 29 58.24	1.9292	12 9 12.3	11.920
15	19 54 10.73	2.1613	20 24 3.2	7.266	15	21 31 53.97	1.9253	11 57 15.7	11.963
16	19 56 20.24	2.1557	20 15 15.6	7.268	16	21 33 49.38	1.9216	11 45 16.6	12.006
17	19 58 29.41	2.1500	20 6 22.5	7.269	17	21 35 44.56	1.9178	11 33 15.0	12.046
18	20 0 38.24	2.1443	19 57 24.0	7.269	18	21 37 39.51	1.9140	11 21 11.0	12.088
19	20 2 46.73	2.1387	19 48 20.0	7.270	19	21 39 34.24	1.9103	11 9 4.6	12.133
20	20 4 54.89	2.1332	19 39 10.8	7.268	20	21 41 28.75	1.9067	10 56 55.9	12.183
21	20 7 2.71	2.1276	19 29 56.3	7.263	21	21 43 23.05	1.9032	10 44 44.9	12.201
22	20 9 10.20	2.1221	19 20 36.7	7.270	22	21 45 17.14	1.8997	10 32 31.7	12.238
23	20 11 17.36	2.1166	19 11 11.9	7.266	23	21 47 11.02	1.8963	10 20 16.3	12.278
24	20 13 24.19	2.1110	S. 19° 1' 42.1"	9.588	24	21 49 4.69	1.8928	S. 10° 7' 58.9"	12.305

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
SATURDAY 9.					MONDAY 11.				
0	21 49 4.69	1.8926	S. 10 7 58.9	12.306	0	23 17 7.71	1.7992	N. 0 6 18.9	12.973
1	21 50 58.16	1.8926	9 55 39.4	12.341	1	23 18 55.58	1.7977	0 19 17.1	12.988
2	21 52 51.43	1.8928	9 43 17.9	12.375	2	23 20 43.43	1.7972	0 32 15.0	12.991
3	21 54 44.51	1.8931	9 30 54.4	12.408	3	23 22 31.24	1.7967	0 45 12.5	12.993
4	21 56 37.40	1.8799	9 18 29.1	12.438	4	23 24 19.03	1.7968	0 58 9.5	12.946
5	21 58 30.10	1.8799	9 6 1.9	12.468	5	23 26 6.80	1.7968	1 11 6.1	12.988
6	22 0 22.62	1.8797	8 53 32.9	12.497	6	23 27 54.55	1.7967	1 24 2.1	12.928
7	22 2 14.95	1.8707	8 41 2.2	12.525	7	23 29 42.29	1.7966	1 36 57.5	12.918
8	22 4 7.11	1.8679	8 28 29.9	12.551	8	23 31 30.01	1.7968	1 49 52.3	12.908
9	22 5 59.10	1.8660	8 15 55.9	12.580	9	23 33 17.73	1.7969	2 2 46.4	12.906
10	22 7 50.91	1.8622	8 3 20.3	12.605	10	23 35 5.44	1.7969	2 15 39.8	12.903
11	22 9 42.56	1.8604	7 50 43.2	12.630	11	23 36 53.15	1.7969	2 28 32.4	12.971
12	22 11 34.04	1.8587	7 38 4.7	12.655	12	23 38 40.87	1.7968	2 41 24.3	12.968
13	22 13 25.36	1.8541	7 25 24.7	12.678	13	23 40 28.59	1.7964	2 54 15.3	12.948
14	22 15 16.53	1.8515	7 12 43.4	12.698	14	23 42 16.32	1.7966	3 7 5.4	12.928
15	22 17 7.54	1.8499	7 0 0.8	12.720	15	23 44 4.07	1.7969	3 19 54.5	12.919
16	22 18 58.40	1.8466	6 47 16.9	12.741	16	23 45 51.83	1.7969	3 32 42.7	12.796
17	22 20 49.12	1.8441	6 34 31.8	12.761	17	23 47 39.61	1.7965	3 45 29.9	12.775
18	22 22 39.69	1.8417	6 21 45.6	12.780	18	23 49 27.41	1.7969	3 58 16.0	12.769
19	22 24 30.12	1.8394	6 8 58.2	12.798	19	23 51 15.24	1.7974	4 11 1.0	12.749
20	22 26 20.42	1.8373	5 56 9.8	12.815	20	23 53 3.10	1.7979	4 23 44.8	12.739
21	22 28 10.58	1.8349	5 43 20.4	12.831	21	23 54 50.99	1.7965	4 36 27.4	12.709
22	22 30 0.62	1.8329	5 30 30.0	12.848	22	23 56 38.92	1.7971	4 49 8.8	12.689
23	22 31 50.53	1.8308	S. 5 17 38.7	12.861	23	23 58 26.89	1.7968	N. 5 1 48.9	12.688
SUNDAY 10.					TUESDAY 12.				
0	22 33 40.32	1.8288	S. 5 4 46.6	12.875	0	0 0 14.90	1.8006	N. 5 14 27.7	12.981
1	22 35 29.99	1.8268	4 51 53.6	12.888	1	0 2 2.96	1.8014	5 27 5.1	12.911
2	22 37 19.54	1.8249	4 38 59.9	12.900	2	0 3 51.07	1.8022	5 39 41.1	12.888
3	22 39 8.96	1.8232	4 26 5.5	12.911	3	0 5 39.23	1.8031	5 52 15.6	12.863
4	22 40 58.32	1.8214	4 13 10.4	12.923	4	0 7 27.44	1.8040	6 4 48.6	12.838
5	22 42 47.55	1.8197	4 0 14.7	12.933	5	0 9 15.71	1.8051	6 17 20.1	12.811
6	22 44 36.68	1.8180	3 47 18.4	12.941	6	0 11 4.05	1.8062	6 29 50.0	12.785
7	22 46 25.71	1.8164	3 34 21.6	12.950	7	0 12 52.45	1.8073	6 42 18.2	12.748
8	22 48 14.65	1.8149	3 21 24.3	12.958	8	0 14 40.92	1.8084	6 54 44.8	12.709
9	22 50 3.50	1.8134	3 8 26.6	12.965	9	0 16 29.46	1.8097	7 7 9.7	12.669
10	22 51 52.26	1.8119	2 55 28.5	12.971	10	0 18 18.08	1.8109	7 19 32.8	12.629
11	22 53 40.98	1.8106	2 42 30.0	12.976	11	0 20 6.77	1.8126	7 31 54.1	12.589
12	22 55 29.53	1.8098	2 29 31.3	12.980	12	0 21 55.55	1.8137	7 44 13.5	12.548
13	22 57 18.05	1.8091	2 16 32.3	12.983	13	0 23 44.41	1.8151	7 56 31.1	12.506
14	22 59 6.50	1.8089	2 13 33.2	12.986	14	0 25 33.36	1.8166	8 8 46.7	12.463
15	23 0 54.88	1.8096	2 0 33.8	12.990	15	0 27 22.40	1.8181	8 21 0.3	12.419
16	23 2 43.19	1.8047	1 37 34.4	12.990	16	0 29 11.54	1.8197	8 33 11.9	12.375
17	23 4 31.44	1.8007	1 24 35.0	12.990	17	0 31 0.77	1.8213	8 45 21.5	12.341
18	23 6 19.63	1.8027	1 11 35.5	12.991	18	0 32 50.10	1.8230	8 57 28.9	12.306
19	23 8 7.76	1.8016	0 58 36.1	12.990	19	0 34 39.53	1.8246	9 9 34.2	12.270
20	23 9 55.84	1.8009	0 45 36.7	12.988	20	0 36 29.07	1.8263	9 21 37.3	12.233
21	23 11 43.87	1.8002	0 32 37.5	12.985	21	0 38 18.72	1.8284	9 33 38.1	11.996
22	23 13 31.86	1.7994	0 19 38.5	12.981	22	0 40 8.48	1.8306	9 45 36.7	11.966
23	23 15 19.80	1.7986	S. 0 6 39.7	12.978	23	0 41 58.36	1.8323	9 57 32.9	11.916
24	23 17 7.71	1.7992	N. 0 6 18.9	12.973	24	0 43 48.35	1.8341	N.10 9 26.8	11.878

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
WEDNESDAY 13.					FRIDAY 15.				
0	0 43 48.35	1.8341	N.10 9 26.8	11.978	0	2 15 0.20	1.9810	N.18 39 31.0	9.083
1	0 45 38.47	1.8392	10 21 18.2	11.826	1	2 16 59.28	1.9849	18 48 33.9	9.090
2	0 47 28.71	1.8438	10 33 7.2	11.706	2	2 18 58.49	1.9898	18 57 32.1	9.093
3	0 49 19.07	1.8486	10 44 53.7	11.763	3	2 20 57.94	1.9927	19 6 25.7	9.093
4	0 51 9.57	1.8437	10 56 37.6	11.710	4	2 22 57.62	1.9967	19 15 14.5	9.776
5	0 53 0.20	1.8440	11 8 18.9	11.686	5	2 24 57.54	2.0007	19 23 58.6	9.693
6	0 54 50.96	1.8473	11 19 57.6	11.623	6	2 26 57.71	2.0047	19 32 37.8	9.615
7	0 56 41.86	1.8498	11 31 33.6	11.578	7	2 28 58.11	2.0087	19 41 12.2	9.531
8	0 58 32.91	1.8520	11 43 6.9	11.551	8	2 30 58.76	2.0126	19 49 41.6	9.445
9	1 0 24.10	1.8544	11 54 37.4	11.485	9	2 32 59.65	2.0166	19 58 6.9	9.365
10	1 2 15.44	1.8568	12 6 5.1	11.426	10	2 35 0.79	2.0210	20 6 25.4	9.288
11	1 4 6.92	1.8593	12 17 29.9	11.309	11	2 37 2.17	2.0251	20 14 39.8	9.196
12	1 5 58.56	1.8619	12 28 51.9	11.241	12	2 39 3.80	2.0292	20 22 49.0	9.111
13	1 7 50.35	1.8645	12 40 10.9	11.201	13	2 41 5.68	2.0334	20 30 53.1	9.028
14	1 9 42.30	1.8672	12 51 26.9	11.241	14	2 43 7.81	2.0376	20 38 51.9	7.986
15	1 11 34.41	1.8699	13 2 39.9	11.191	15	2 45 10.19	2.0418	20 46 45.5	7.946
16	1 13 26.69	1.8727	13 13 49.8	11.140	16	2 47 12.82	2.0459	20 54 33.8	7.761
17	1 15 19.13	1.8754	13 24 56.8	11.088	17	2 49 15.70	2.0501	21 2 16.8	7.671
18	1 17 11.74	1.8782	13 36 0.2	11.033	18	2 51 18.83	2.0543	21 9 54.4	7.580
19	1 19 4.52	1.8812	13 47 0.6	10.980	19	2 53 22.21	2.0586	21 17 26.5	7.491
20	1 20 57.48	1.8841	13 57 57.7	10.926	20	2 55 25.85	2.0627	21 24 53.2	7.396
21	1 22 50.61	1.8871	14 8 51.5	10.870	21	2 57 29.74	2.0669	21 32 14.3	7.306
22	1 24 43.93	1.8901	14 19 42.0	10.813	22	2 59 33.88	2.0712	21 39 29.9	7.211
23	1 26 37.42	1.8931	N.14 30 29.1	10.756	23	3 1 38.28	2.0754	N.21 46 39.8	7.116
THURSDAY 14.					SATURDAY 16.				
0	1 28 31.10	1.8962	N.14 41 12.8	10.700	0	3 3 42.93	2.0797	N.21 53 44.0	7.028
1	1 30 24.97	1.8993	14 51 53.0	10.646	1	3 5 47.84	2.0839	22 0 42.5	6.936
2	1 32 19.02	1.9024	15 2 29.6	10.591	2	3 7 53.00	2.0881	22 7 35.2	6.836
3	1 34 13.26	1.9057	15 13 2.7	10.533	3	3 9 58.41	2.0923	22 14 22.1	6.736
4	1 36 7.70	1.9090	15 23 32.2	10.486	4	3 12 4.08	2.0965	22 21 3.2	6.636
5	1 38 2.33	1.9122	15 33 57.9	10.400	5	3 14 10.00	2.1008	22 27 38.3	6.535
6	1 39 57.16	1.9156	15 44 20.0	10.366	6	3 16 16.18	2.1052	22 34 7.4	6.435
7	1 41 52.19	1.9189	15 54 38.3	10.375	7	3 18 22.62	2.1096	22 40 30.6	6.333
8	1 43 47.42	1.9223	16 4 52.9	10.310	8	3 20 29.30	2.1139	22 46 47.7	6.236
9	1 45 42.86	1.9257	16 15 3.6	10.146	9	3 22 36.24	2.1177	22 52 58.7	6.130
10	1 47 38.50	1.9291	16 25 10.4	10.078	10	3 24 43.43	2.1220	22 59 3.5	6.020
11	1 49 34.35	1.9326	16 35 13.2	10.010	11	3 26 50.88	2.1262	23 5 2.2	5.925
12	1 51 30.41	1.9361	16 45 12.1	9.943	12	3 28 58.57	2.1306	23 10 54.6	5.830
13	1 53 26.68	1.9397	16 55 7.0	9.963	13	3 31 6.52	2.1346	23 16 40.7	5.715
14	1 55 23.17	1.9433	17 4 57.8	9.910	14	3 33 14.71	2.1387	23 22 20.5	5.611
15	1 57 19.88	1.9469	17 14 44.4	9.743	15	3 35 23.16	2.1428	23 27 54.0	5.503
16	1 59 16.80	1.9506	17 24 26.9	9.673	16	3 37 31.85	2.1469	23 33 21.0	5.395
17	2 1 13.95	1.9543	17 34 5.2	9.601	17	3 39 40.79	2.1511	23 38 41.5	5.286
18	2 3 11.32	1.9580	17 43 39.2	9.561	18	3 41 49.98	2.1552	23 43 55.5	5.178
19	2 5 8.91	1.9618	17 53 8.9	9.468	19	3 43 59.41	2.1593	23 49 2.9	5.070
20	2 7 6.73	1.9656	18 2 34.2	9.395	20	3 46 9.09	2.1633	23 54 3.8	4.962
21	2 9 4.78	1.9693	18 11 55.1	9.311	21	3 48 19.01	2.1673	23 58 58.0	4.846
22	2 11 3.05	1.9732	18 21 11.6	9.236	22	3 50 29.17	2.1713	24 3 45.5	4.738
23	2 13 1.56	1.9771	18 30 23.6	9.160	23	3 52 39.57	2.1753	24 8 26.3	4.624
24	2 15 0.20	1.9810	N.18 39 31.0	9.083	24	3 54 50.21	2.1793	N.24 13 0.3	4.510

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
SUNDAY 17.					TUESDAY 19.				
0	3 54 50.21	2.1798	N.24 13 0.3	4.516	0	5 43 15.94	2.3189	N.25 26 58.7	1.680
1	3 57 1.09	2.1832	24 17 27.5	4.386	1	5 45 35.12	2.3204	25 25 16.7	1.788
2	3 59 12.20	2.1871	24 21 47.9	4.261	2	5 47 54.39	2.3219	25 23 26.4	1.907
3	4 1 23.54	2.1910	24 26 1.3	4.165	3	5 50 13.75	2.3233	25 21 27.8	2.046
4	4 3 35.12	2.1949	24 30 7.8	4.080	4	5 52 33.19	2.3247	25 19 20.9	2.186
5	4 5 46.93	2.1987	24 34 7.3	3.985	5	5 54 52.71	2.3260	25 17 5.6	2.326
6	4 7 58.96	2.2024	24 37 59.8	3.816	6	5 57 12.30	2.3271	25 14 41.9	2.464
7	4 10 11.22	2.2062	24 41 45.2	3.666	7	5 59 31.96	2.3282	25 12 9.9	2.602
8	4 12 23.71	2.2100	24 45 23.5	3.579	8	6 1 51.68	2.3293	25 9 29.5	2.743
9	4 14 36.42	2.2137	24 48 54.7	3.460	9	6 4 11.47	2.3303	25 6 40.7	2.882
10	4 16 49.35	2.2173	24 52 18.7	3.340	10	6 6 31.31	2.3311	25 3 43.5	3.023
11	4 19 2.50	2.2209	24 55 35.5	3.219	11	6 8 51.20	2.3320	25 0 37.9	3.163
12	4 21 15.86	2.2244	24 58 45.0	3.097	12	6 11 11.15	2.3328	24 57 23.9	3.303
13	4 23 29.43	2.2280	25 1 47.2	2.976	13	6 13 31.14	2.3336	24 54 1.5	3.444
14	4 25 43.22	2.2315	25 4 42.1	2.853	14	6 15 51.18	2.3343	24 50 30.6	3.584
15	4 27 57.21	2.2349	25 7 29.5	2.727	15	6 18 11.25	2.3348	24 46 51.4	3.724
16	4 30 11.41	2.2383	25 10 9.6	2.606	16	6 20 31.36	2.3354	24 43 3.7	3.865
17	4 32 25.81	2.2417	25 12 42.1	2.480	17	6 22 51.50	2.3360	24 39 7.5	4.006
18	4 34 40.42	2.2451	25 15 7.2	2.356	18	6 25 11.66	2.3365	24 35 2.9	4.146
19	4 36 55.22	2.2485	25 17 24.7	2.229	19	6 27 31.85	2.3367	24 30 49.9	4.286
20	4 39 10.21	2.2518	25 19 34.7	2.103	20	6 29 52.06	2.3370	24 26 28.5	4.426
21	4 41 25.40	2.2547	25 21 37.1	1.975	21	6 32 12.29	2.3373	24 21 58.7	4.565
22	4 43 40.77	2.2578	25 23 31.8	1.848	22	6 34 32.53	2.3374	24 17 20.4	4.704
23	4 45 56.33	2.2608	N.25 25 18.9	1.720	23	6 36 52.78	2.3370	N.24 12 33.8	4.847
MONDAY 18.					WEDNESDAY 20.				
0	4 48 12.07	2.2638	N.25 26 58.3	1.591	0	6 39 13.03	2.3375	N.24 7 38.7	4.988
1	4 50 27.99	2.2668	25 28 29.9	1.462	1	6 41 33.28	2.3375	24 2 35.2	5.129
2	4 52 44.09	2.2697	25 29 53.8	1.333	2	6 43 53.53	2.3375	23 57 23.2	5.268
3	4 55 0.36	2.2726	25 31 9.9	1.203	3	6 46 13.78	2.3375	23 52 3.0	5.408
4	4 57 16.80	2.2754	25 32 18.2	1.072	4	6 48 34.03	2.3373	23 46 34.7	5.546
5	4 59 33.41	2.2782	25 33 18.6	0.942	5	6 50 54.26	2.3371	23 40 57.8	5.685
6	5 1 50.18	2.2809	25 34 11.1	0.809	6	6 53 14.48	2.3368	23 35 12.5	5.823
7	5 4 7.12	2.2836	25 34 55.7	0.676	7	6 55 34.68	2.3365	23 29 18.9	5.962
8	5 6 24.21	2.2861	25 35 32.3	0.544	8	6 57 54.86	2.3362	23 23 17.0	6.101
9	5 8 41.45	2.2886	25 36 1.0	0.411	9	7 0 15.02	2.3357	23 17 6.7	6.240
10	5 10 58.84	2.2911	25 36 21.7	0.278	10	7 2 35.15	2.3353	23 10 48.2	6.377
11	5 13 16.38	2.2935	25 36 34.4	0.144	11	7 4 55.25	2.3348	23 4 21.4	6.515
12	5 15 34.06	2.2959	25 36 39.0	0.009	12	7 7 15.32	2.3343	22 57 46.4	6.653
13	5 17 51.88	2.2981	25 36 35.5	0.125	13	7 9 35.35	2.3338	22 51 3.1	6.790
14	5 20 9.83	2.3003	25 36 24.0	0.260	14	7 11 55.35	2.3329	22 44 11.6	6.926
15	5 22 27.92	2.3025	25 36 4.3	0.395	15	7 14 15.30	2.3323	22 37 11.9	7.063
16	5 24 46.13	2.3046	25 35 36.5	0.531	16	7 16 35.21	2.3315	22 30 4.0	7.199
17	5 27 4.47	2.3066	25 35 0.5	0.667	17	7 18 55.08	2.3307	22 22 48.0	7.335
18	5 29 22.92	2.3085	25 34 16.4	0.804	18	7 21 14.90	2.3298	22 15 23.8	7.470
19	5 31 41.49	2.3104	25 33 24.0	0.941	19	7 23 34.66	2.3289	22 7 51.6	7.604
20	5 34 0.17	2.3122	25 32 23.5	1.077	20	7 25 54.38	2.3280	22 0 11.3	7.738
21	5 36 18.96	2.3140	25 31 14.7	1.215	21	7 28 14.04	2.3272	21 52 23.0	7.872
22	5 38 37.85	2.3157	25 29 57.7	1.352	22	7 30 33.64	2.3263	21 44 26.6	8.006
23	5 40 56.85	2.3174	25 28 32.4	1.490	23	7 32 53.19	2.3253	21 36 22.3	8.139
24	5 43 15.94	2.3189	N.25 26 58.7	1.628	24	7 35 12.67	2.3243	N.21 28 10.0	8.270

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
THURSDAY 21.					SATURDAY 23.				
0	7 35 12.67	2.2343	N.21° 26' 10.0"	8.370	0	9 25 17.95	2.2685	N.12° 31' 55.7"	13.725
1	7 37 32.09	2.2321	21 19 49.8	8.403	1	9 27 33.73	2.2626	12 18 9.4	13.815
2	7 39 51.44	2.2300	21 11 21.6	8.535	2	9 29 49.46	2.2617	12 4 17.8	13.902
3	7 42 10.73	2.2300	21 2 45.6	8.665	3	9 32 5.13	2.2606	11 50 21.1	13.988
4	7 44 29.95	2.2198	20 54 1.8	8.795	4	9 34 20.76	2.2600	11 36 19.2	14.073
5	7 46 49.10	2.2166	20 45 10.2	8.924	5	9 36 36.33	2.2591	11 22 12.3	14.158
6	7 49 8.18	2.2174	20 36 10.8	9.054	6	9 38 51.85	2.2583	11 8 0.4	14.239
7	7 51 27.19	2.2192	20 27 3.7	9.182	7	9 41 7.33	2.2577	10 53 43.6	14.319
8	7 53 46.12	2.2149	20 17 48.9	9.310	8	9 43 22.77	2.2570	10 39 22.1	14.398
9	7 56 4.98	2.2137	20 8 26.4	9.438	9	9 45 28.17	2.2568	10 24 55.8	14.475
10	7 58 23.76	2.2132	19 58 56.3	9.564	10	9 47 53.52	2.2567	10 10 25.0	14.551
11	8 0 42.46	2.2111	19 49 18.7	9.690	11	9 50 8.85	2.2562	9 55 49.6	14.627
12	8 3 1.09	2.2098	19 39 33.5	9.815	12	9 52 24.14	2.2545	9 41 9.8	14.700
13	8 5 19.63	2.2094	19 29 40.8	9.940	13	9 54 39.40	2.2541	9 26 25.6	14.772
14	8 7 38.10	2.2071	19 19 40.7	10.064	14	9 56 54.63	2.2537	9 11 37.1	14.843
15	8 9 56.48	2.2056	19 9 33.2	10.187	15	9 59 9.84	2.2530	8 56 44.4	14.913
16	8 12 14.79	2.2045	18 59 18.4	10.308	16	10 1 25.03	2.2530	8 41 47.5	14.981
17	8 14 33.02	2.2031	18 48 56.2	10.430	17	10 3 40.20	2.2527	8 26 46.6	15.047
18	8 16 51.16	2.2017	18 38 26.8	10.550	18	10 5 55.35	2.2524	8 11 41.8	15.111
19	8 19 9.22	2.2003	18 27 50.1	10.670	19	10 8 10.49	2.2522	7 56 33.2	15.175
20	8 21 27.20	2.2000	18 17 6.3	10.787	20	10 10 25.62	2.2521	7 41 20.8	15.237
21	8 23 45.09	2.2075	18 6 15.4	10.907	21	10 12 40.74	2.2520	7 26 4.7	15.297
22	8 26 2.90	2.2022	17 55 17.4	11.025	22	10 14 55.86	2.2520	7 10 45.1	15.355
23	8 28 20.63	2.2045	N.17° 44' 12.3"	11.142	23	10 17 10.98	2.2520	N. 6° 55' 22.0"	15.412
FRIDAY 22.					SUNDAY 24.				
0	8 30 38.27	2.2038	N.17° 33' 0.3"	11.260	0	10 19 26.10	2.2621	N. 6° 39' 55.4"	15.470
1	8 32 55.83	2.2019	17 21 41.4	11.373	1	10 21 41.23	2.2622	6 24 25.5	15.524
2	8 35 13.30	2.2006	17 10 15.7	11.485	2	10 23 56.36	2.2622	6 8 52.5	15.575
3	8 37 30.69	2.2002	16 58 43.1	11.599	3	10 26 11.51	2.2626	5 53 16.4	15.627
4	8 39 48.00	2.2078	16 47 3.8	11.710	4	10 28 26.67	2.2626	5 37 37.2	15.677
5	8 42 5.23	2.2064	16 35 17.8	11.822	5	10 30 41.85	2.2622	5 21 55.1	15.725
6	8 44 22.37	2.2060	16 23 25.1	11.932	6	10 32 57.06	2.2627	5 6 10.2	15.771
7	8 46 39.43	2.2037	16 11 25.9	12.040	7	10 35 12.29	2.2641	4 50 22.5	15.815
8	8 48 56.41	2.2023	15 59 20.2	12.149	8	10 37 27.55	2.2645	4 34 32.3	15.857
9	8 51 13.31	2.2010	15 47 8.0	12.255	9	10 39 42.84	2.2662	4 18 39.6	15.898
10	8 53 30.13	2.2007	15 34 49.5	12.361	10	10 41 58.17	2.2668	4 2 44.5	15.937
11	8 55 46.87	2.2004	15 22 24.6	12.467	11	10 44 13.53	2.2664	3 46 47.1	15.975
12	8 58 3.54	2.2072	15 9 53.4	12.570	12	10 46 28.94	2.2672	3 30 47.5	16.010
13	9 0 20.13	2.2066	14 57 16.1	12.673	13	10 48 44.39	2.2680	3 14 45.9	16.043
14	9 2 36.64	2.2046	14 44 32.6	12.775	14	10 50 59.90	2.2680	2 58 42.4	16.074
15	9 4 53.08	2.2024	14 31 43.1	12.875	15	10 53 15.46	2.2688	2 42 37.0	16.104
16	9 7 9.45	2.2022	14 18 47.5	12.975	16	10 55 31.07	2.2687	2 26 29.9	16.131
17	9 9 25.74	2.2010	14 5 46.0	13.073	17	10 57 46.75	2.2618	2 10 21.2	16.158
18	9 11 41.97	2.2000	13 52 36.7	13.170	18	11 0 2.49	2.2626	1 54 10.9	16.182
19	9 13 58.13	2.2006	13 39 25.6	13.266	19	11 2 18.29	2.2640	1 37 59.3	16.206
20	9 16 14.22	2.2077	13 26 6.7	13.361	20	11 4 34.17	2.2662	1 21 46.3	16.225
21	9 18 30.25	2.2066	13 12 42.2	13.455	21	11 6 50.12	2.2665	1 5 32.1	16.245
22	9 20 46.21	2.2055	12 59 12.2	13.548	22	11 9 6.15	2.2678	0 49 16.8	16.262
23	9 23 2.11	2.2045	12 45 36.7	13.637	23	11 11 22.26	2.2692	0 33 0.6	16.277
24	9 25 17.95	2.2035	N.12° 31' 55.7"	13.725	24	11 13 38.46	2.2707	N. 0° 16' 43.5"	16.291

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
MONDAY 25.					WEDNESDAY 27.				
0	11 13 38.46	2.2707	N. 0 16 43.5	16.291	0	13 5 25.37	2.4064	S. 12 23 30.5	14.806
1	11 15 54.75	2.2732	N. 0 0 25.6	16.293	1	13 7 49.87	2.4102	12 38 4.5	14.822
2	11 18 11.13	2.2737	S. 0 15 52.9	16.212	2	13 10 14.60	2.4142	12 52 33.3	14.837
3	11 20 27.60	2.2754	0 32 11.9	16.220	3	13 12 39.57	2.4182	13 6 56.9	14.847
4	11 22 44.18	2.2772	0 48 31.4	16.225	4	13 15 4.78	2.4231	13 21 15.0	14.856
5	11 25 0.86	2.2789	1 4 51.2	16.231	5	13 17 30.22	2.4280	13 35 27.7	14.864
6	11 27 17.65	2.2807	1 21 11.2	16.233	6	13 19 55.90	2.4300	13 49 34.7	14.869
7	11 29 34.55	2.2826	1 37 31.2	16.233	7	13 22 21.82	2.4340	14 3 36.0	13.872
8	11 31 51.56	2.2845	1 53 51.2	16.231	8	13 24 47.98	2.4380	14 17 31.4	13.874
9	11 34 8.69	2.2865	2 10 11.0	16.235	9	13 27 14.38	2.4420	14 31 20.9	13.874
10	11 36 25.94	2.2886	2 26 30.6	16.240	10	13 29 41.02	2.4460	14 45 4.3	13.871
11	11 38 43.32	2.2907	2 42 49.7	16.242	11	13 32 7.90	2.4499	14 58 41.5	13.867
12	11 41 0.83	2.2929	2 59 8.3	16.245	12	13 34 35.01	2.4539	15 12 12.4	13.861
13	11 43 18.47	2.2952	3 15 26.3	16.243	13	13 37 2.37	2.4579	15 25 36.9	13.854
14	11 45 36.25	2.2975	3 31 43.5	16.240	14	13 39 29.96	2.4619	15 38 54.9	13.845
15	11 47 54.17	2.2999	3 47 59.9	16.244	15	13 41 57.80	2.4659	15 52 6.3	13.833
16	11 50 12.24	2.3023	4 4 15.2	16.246	16	13 44 25.87	2.4698	16 5 10.9	13.820
17	11 52 30.45	2.3048	4 20 29.5	16.247	17	13 46 54.18	2.4738	16 18 8.7	12.805
18	11 54 48.82	2.3074	4 36 42.5	16.245	18	13 49 22.74	2.4779	16 30 59.5	12.788
19	11 57 7.34	2.3099	4 52 54.2	16.181	19	13 51 51.53	2.4818	16 43 43.3	12.670
20	11 59 26.01	2.3126	5 9 4.4	16.185	20	13 54 20.55	2.4857	16 56 19.9	12.549
21	12 1 44.85	2.3153	5 25 13.0	16.188	21	13 56 49.81	2.4897	17 8 49.2	12.425
22	12 4 3.85	2.3181	5 41 19.8	16.098	22	13 59 19.31	2.4936	17 21 11.1	12.303
23	12 6 23.02	2.3209	S. 5 57 24.8	16.006	23	14 1 49.04	2.4974	S. 17 33 25.6	12.178
TUESDAY 26.					THURSDAY 28.				
0	12 8 42.36	2.3238	S. 6 13 27.8	16.002	0	14 4 19.00	2.5012	S. 17 45 32.5	12.050
1	12 11 1.88	2.3268	6 29 28.7	15.906	1	14 6 49.19	2.5051	17 57 31.7	11.921
2	12 13 21.57	2.3298	6 45 27.4	15.800	2	14 9 19.61	2.5089	18 9 23.1	11.791
3	12 15 41.45	2.3328	7 1 23.8	15.818	3	14 11 50.26	2.5127	18 21 6.7	11.660
4	12 18 1.51	2.3359	7 17 17.7	15.876	4	14 14 21.13	2.5165	18 32 42.3	11.525
5	12 20 21.76	2.3391	7 33 9.0	15.832	5	14 16 52.22	2.5201	18 44 9.8	11.390
6	12 22 42.20	2.3423	7 48 57.6	15.787	6	14 19 23.54	2.5238	18 55 29.2	11.256
7	12 25 2.83	2.3454	8 4 43.4	15.738	7	14 21 55.07	2.5273	19 6 40.4	11.116
8	12 27 23.65	2.3487	8 20 36.3	15.688	8	14 24 26.82	2.5309	19 17 43.2	10.976
9	12 29 44.67	2.3520	8 36 6.1	15.636	9	14 26 58.78	2.5344	19 28 37.6	10.835
10	12 32 5.89	2.3554	8 51 42.7	15.582	10	14 29 30.95	2.5378	19 39 23.5	10.693
11	12 34 27.32	2.3588	9 7 16.0	15.525	11	14 32 3.32	2.5412	19 50 0.8	10.549
12	12 36 48.95	2.3622	9 22 45.8	15.467	12	14 34 35.89	2.5445	20 0 29.4	10.404
13	12 39 10.79	2.3657	9 38 12.1	15.406	13	14 37 8.66	2.5478	20 10 49.3	10.257
14	12 41 32.84	2.3692	9 53 34.6	15.344	14	14 39 41.63	2.5511	20 21 0.3	10.109
15	12 43 55.10	2.3727	10 8 53.4	15.280	15	14 42 14.79	2.5543	20 31 2.4	9.960
16	12 46 17.57	2.3763	10 24 8.2	15.213	16	14 44 48.13	2.5575	20 40 55.5	9.809
17	12 48 40.26	2.3801	10 39 19.0	15.145	17	14 47 21.66	2.5608	20 50 39.5	9.656
18	12 51 3.18	2.3838	10 54 25.6	15.074	18	14 49 55.37	2.5643	21 0 14.3	9.502
19	12 53 26.32	2.3874	11 9 27.9	15.000	19	14 52 29.25	2.5677	21 9 39.9	9.346
20	12 55 49.67	2.3911	11 24 25.7	14.924	20	14 55 3.30	2.5699	21 18 56.3	9.188
21	12 58 13.25	2.3949	11 39 19.0	14.848	21	14 57 37.52	2.5717	21 28 3.3	9.027
22	13 0 37.06	2.3987	11 54 7.6	14.770	22	15 0 11.90	2.5743	21 37 0.8	8.863
23	13 3 1.10	2.4026	12 8 51.5	14.690	23	15 2 46.43	2.5768	21 45 48.9	8.691
24	13 5 25.37	2.4064	S. 12 23 30.5	14.608	24	15 5 21.12	2.5793	S. 21 54 27.4	8.521

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Dist. for 1 m.	Declination.	Dist. for 1 m.	Hour.	Right Ascension.	Dist. for 1 m.	Declination.	Dist. for 1 m.
FRIDAY 29.					SUNDAY 31.				
0	15 5 21.12	2.5798	8.21 54 27.4	6.861	0	17 9 56.99	2.5686	S. 25 30 10.9	0.364
1	15 7 55.95	2.5817	22 2 56.3	6.400	1	17 12 30.84	2.5824	25 30 27.7	0.196
2	15 10 30.92	2.5840	22 11 15.5	6.330	2	17 15 4.48	2.5880	25 30 34.5	0.030
3	15 13 6.03	2.5862	22 19 25.0	6.077	3	17 17 37.92	2.5855	25 30 31.3	0.136
4	15 15 41.26	2.5883	22 27 24.8	7.914	4	17 20 11.14	2.5818	25 30 18.1	0.303
5	15 18 16.62	2.5908	22 35 14.7	7.750	5	17 22 44.14	2.5481	25 29 55.0	0.467
6	15 20 52.09	2.5923	22 42 54.8	7.685	6	17 25 16.91	2.5443	25 29 22.0	0.631
7	15 23 27.68	2.5940	22 50 24.9	7.419	7	17 27 49.44	2.5402	25 28 39.2	0.795
8	15 26 3.37	2.5957	22 57 45.1	7.352	8	17 30 21.73	2.5361	25 27 46.6	0.957
9	15 28 39.16	2.5973	23 4 55.2	7.084	9	17 32 53.77	2.5319	25 26 44.3	1.120
10	15 31 15.05	2.5988	23 11 55.2	6.815	10	17 35 25.56	2.5277	25 25 32.2	1.280
11	15 33 51.02	2.6003	23 18 45.1	6.747	11	17 37 57.09	2.5233	25 24 10.5	1.441
12	15 36 27.07	2.6018	23 25 24.9	6.677	12	17 40 28.35	2.5188	25 22 39.2	1.600
13	15 39 3.20	2.6037	23 31 54.4	6.407	13	17 42 59.34	2.5143	25 20 58.4	1.759
14	15 41 39.39	2.6057	23 38 13.8	6.237	14	17 45 30.05	2.5095	25 19 8.1	1.916
15	15 44 15.64	2.6068	23 44 22.9	6.066	15	17 48 0.48	2.5047	25 17 8.4	2.073
16	15 46 51.94	2.6084	23 50 21.8	5.896	16	17 50 30.62	2.4998	25 14 59.4	2.227
17	15 49 28.29	2.6093	23 56 10.3	5.723	17	17 53 0.46	2.4948	25 12 41.1	2.383
18	15 52 4.68	2.6098	24 1 48.5	5.550	18	17 55 30.00	2.4898	25 10 13.5	2.535
19	15 54 41.10	2.6073	24 7 16.3	5.377	19	17 57 59.24	2.4847	25 7 36.8	2.687
20	15 57 17.54	2.6075	24 12 33.8	5.204	20	18 0 28.17	2.4796	25 4 51.0	2.839
21	15 59 54.00	2.6077	24 17 40.8	5.030	21	18 2 56.78	2.4745	25 1 56.1	2.989
22	16 2 30.47	2.6078	24 22 37.4	4.856	22	18 5 25.08	2.4693	24 58 52.3	3.138
23	16 5 6.94	2.6078	8.24 27 23.6	4.683	23	18 7 53.05	2.4643	S. 24 55 39.5	3.286
SATURDAY 30.					MONDAY, APRIL 1.				
0	16 7 43.40	2.6076	S. 24 31 59.3	4.508	0	18 10 20.69	2.4579	S. 24 53 17.9	3.433
1	16 10 19.85	2.6073	24 36 24.6	4.336					
2	16 12 56.28	2.6069	24 40 39.5	4.160					
3	16 15 32.68	2.6064	24 44 43.9	3.985					
4	16 18 9.05	2.6057	24 48 37.8	3.815					
5	16 20 45.37	2.6049	24 52 21.3	3.637					
6	16 23 21.64	2.6040	24 55 54.3	3.461					
7	16 25 57.85	2.6030	24 59 16.9	3.289					
8	16 28 34.00	2.6018	25 2 29.0	3.114					
9	16 31 10.07	2.6006	25 5 30.6	2.940					
10	16 33 46.06	2.5991	25 8 21.8	2.766					
11	16 36 21.96	2.5975	25 11 2.6	2.593					
12	16 38 57.76	2.5958	25 13 33.0	2.420					
13	16 41 33.46	2.5940	25 15 53.0	2.245					
14	16 44 9.04	2.5920	25 18 2.5	2.071					
15	16 46 44.50	2.5899	25 20 1.6	1.899					
16	16 49 19.83	2.5877	25 21 50.4	1.737					
17	16 51 55.03	2.5854	25 23 28.9	1.565					
18	16 54 30.08	2.5829	25 24 57.0	1.393					
19	16 57 4.98	2.5804	25 26 14.8	1.211					
20	16 59 39.73	2.5778	25 27 22.4	1.041					
21	17 2 14.31	2.5749	25 28 19.8	0.871					
22	17 4 48.72	2.5720	25 29 7.0	0.701					
23	17 7 22.95	2.5689	25 29 44.0	0.532					
24	17 9 56.99	2.5658	S. 25 30 10.9	0.364					

PHASES OF THE MOON.

- ☾ Last Quarter, d 3 h 7 m 16.4
- New Moon, 11 1 36.9
- ☽ First Quarter, 19 5 32.0
- Full Moon, 26 2 15.4

- ☾ Apogee, d 13 h 12.0
- ☾ Perigee, 26 11.9

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Star's Name and Position.	Noon.	P. L. of Dist.	III ^h .	P. L. of Dist.	VI ^h .	P. L. of Dist.	IX ^h .	P. L. of Dist.
1	Jupiter W.	81° 19' 48"	3183	83° 8' 41"	3196	84° 57' 14"	3210	86° 45' 27"	3223
	Regulus W.	73 3 55	2218	74 51 55	2231	76 39 36	2245	78 26 57	2258
	Saturn W.	65 24 11	2210	67 12 24	2228	69 0 18	2235	70 47 54	2247
	Spica W.	19 7 36	2264	20 54 29	2269	22 41 14	2276	24 27 49	2285
	α Aquilæ E.	82 48 2	2783	81 13 12	2800	79 38 44	2819	78 4 41	2841
	SUN E.	119 56 31	2635	118 16 7	2640	116 36 2	2653	114 56 16	2577
2	Jupiter W.	95 41 28	2293	97 27 38	2307	99 13 28	2321	100 58 57	2335
	Regulus W.	87 18 41	2327	89 4 1	2343	90 49 0	2356	92 33 38	2370
	Saturn W.	79 41 1	2316	81 26 39	2329	83 11 56	2344	84 56 52	2357
	Spica W.	33 17 10	2339	35 2 13	2352	36 46 57	2365	38 31 22	2378
	α Aquilæ E.	70 21 51	2908	68 50 58	2927	67 20 42	2939	65 51 5	2952
	SUN E.	106 42 24	2651	105 4 38	2656	103 27 13	2681	101 50 8	2697
3	Saturn W.	93 36 27	2429	95 19 21	2443	97 1 55	2457	98 44 9	2473
	Spica W.	47 8 44	2445	48 51 15	2459	50 33 26	2473	52 15 18	2486
	α Aquilæ E.	58 33 56	2259	57 8 57	2306	55 44 53	2325	54 21 46	2349
	SUN E.	93 49 53	2774	92 14 51	2789	90 40 9	2805	89 5 48	2820
4	Spica W.	60 39 54	2653	62 19 54	2668	63 59 36	2679	65 39 0	2692
	Antares W.	14 54 57	2653	16 34 56	2666	18 14 38	2677	19 54 4	2690
	α Aquilæ E.	47 42 34	2739	46 26 28	2821	45 11 48	2811	43 58 39	4008
	SUN E.	81 18 54	2684	79 46 28	2909	78 14 21	2924	76 42 33	2938
5	Spica W.	73 51 40	2654	75 29 22	2666	77 6 48	2677	78 43 59	2689
	Antares W.	28 7 5	2650	29 44 52	2661	31 22 24	2673	32 59 40	2684
	α Aquilæ E.	38 19 29	4656	37 17 52	4630	36 18 40	4625	35 22 4	4623
	SUN E.	69 7 56	3007	67 37 52	3021	66 8 5	3034	64 38 34	3047
6	Spica W.	86 46 8	2743	88 21 51	2753	89 57 20	2764	91 32 35	2773
	Antares W.	41 2 18	2738	42 38 7	2748	44 13 43	2759	45 49 5	2769
	SUN E.	57 14 53	3109	55 46 54	3120	54 19 9	3132	52 51 38	3144
7	Antares W.	53 42 46	2815	55 16 54	2824	56 50 51	2833	58 24 36	2842
	SUN E.	45 37 33	3200	44 11 24	3211	42 45 28	3223	41 19 45	3232
8	Antares W.	66 10 42	2881	67 43 25	2888	69 15 59	2896	70 48 23	2903
	SUN E.	34 14 22	3288	32 49 57	3300	31 25 45	3312	30 1 47	3324
13	SUN W.	21 40 44	3545	23 0 18	3540	24 19 58	3534	25 39 45	3527
	Aldebaran E.	54 44 42	3155	53 17 39	3158	51 50 40	3163	50 23 47	3169
	Pollux E.	96 36 0	3104	95 7 55	3105	93 39 51	3106	92 11 49	3106
14	SUN W.	32 20 2	3507	33 40 18	3505	35 0 37	3501	36 21 0	3498
	Aldebaran E.	43 11 0	3197	41 44 47	3204	40 18 42	3210	38 52 45	3219
	Pollux E.	84 51 58	3110	83 24 1	3110	81 56 4	3110	80 28 7	3110
	Jupiter E.	112 13 43	3057	110 44 41	3057	109 15 39	3057	107 46 37	3056
15	SUN W.	43 3 50	3480	44 24 37	3478	45 45 28	3471	47 6 24	3467
	Aldebaran E.	31 45 43	3273	30 21 0	3289	28 56 36	3305	27 32 34	3320
	Pollux E.	73 8 5	3104	71 40 0	3101	70 11 52	3098	68 43 40	3095
	Jupiter E.	100 21 0	3047	98 51 46	3044	97 22 28	3042	95 53 7	3039
16	SUN W.	53 52 29	3438	55 14 2	3432	56 35 42	3425	57 57 30	3418
	Pollux E.	61 21 49	3079	59 53 14	3074	58 24 33	3070	56 55 47	3065

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Star's Name and Position.	Midnight.	P. L. of Dist.	XVh.	P. L. of Dist.	XVIIIh.	P. L. of Dist.	XXIh.	P. L. of Dist.
1	Jupiter W.	88° 33' 20"	2287	90° 20' 53"	2281	92° 8' 5"	2264	93° 54' 57"	2279
	Regulus W.	80 13 58	2272	82 0 39	2265	83 47 0	2259	85 33 1	2213
	Saturn W.	72 35 11	2260	74 22 9	2274	76 8 46	2268	77 55 3	2201
	Spica W.	26 14 11	2294	28 0 20	2204	29 46 13	2215	31 31 50	2227
	α Aquilæ E.	76 31 6	2268	74 58 0	2267	73 25 24	2212	71 53 20	2229
	SUN E.	113 16 50	2292	111 37 44	2206	109 58 57	2221	108 20 30	2226
2	Jupiter W.	102 44 5	2250	104 28 52	2264	106 13 18	2279	107 57 23	2263
	Regulus W.	94 17 56	2284	96 1 53	2299	97 45 29	2412	99 28 45	2426
	Saturn W.	86 41 28	2272	88 25 43	2266	90 9 38	2400	91 53 13	2416
	Spica W.	40 15 29	2291	41 59 17	2405	43 42 45	2418	45 25 54	2421
	α Aquilæ E.	64 22 9	2097	62 53 56	2124	61 26 28	2173	59 59 47	2215
	SUN E.	100 13 24	2712	98 37 1	2728	97 0 58	2743	95 25 15	2750
3	Saturn W.	100 26 2	2486	102 7 35	2499	103 48 49	2512	105 29 44	2227
	Spica W.	53 56 51	2499	55 38 5	2512	57 19 0	2527	58 59 36	2240
	α Aquilæ E.	52 59 40	2466	51 38 38	2527	50 18 44	2522	49 0 1	2268
	SUN E.	87 31 46	2235	85 58 4	2250	84 24 41	2266	82 51 38	2290
4	Spica W.	67 18 6	2204	68 56 55	2217	70 35 27	2229	72 13 42	2242
	Antares W.	21 33 13	2201	23 12 6	2214	24 50 42	2226	26 29 2	2238
	α Aquilæ E.	42 47 7	4114	41 37 19	4220	40 29 21	4258	39 23 22	4499
	SUN E.	75 11 2	2262	73 39 49	2266	72 8 54	2291	70 38 17	2292
5	Spica W.	80 20 54	2700	81 57 34	2710	83 34 0	2722	85 10 11	2722
	Antares W.	34 36 41	2695	36 13 27	2707	37 49 58	2717	39 26 15	2728
	α Aquilæ E.	34 28 14	5487	33 37 21	5766	32 49 38	6064	32 5 17	6446
	SUN E.	63 9 19	2060	61 40 20	2072	60 11 36	2084	58 43 7	2096
6	Spica W.	93 7 38	2782	94 42 28	2798	96 17 5	2802	97 51 30	2812
	Antares W.	47 24 14	2779	48 59 10	2788	50 33 54	2797	52 8 26	2806
	SUN E.	51 24 22	2156	49 57 20	2167	48 30 31	2178	47 3 55	2189
7	Antares W.	59 58 10	2260	61 31 33	2268	63 4 46	2266	64 37 49	2272
	SUN E.	39 54 15	2242	38 28 57	2254	37 3 52	2265	35 39 0	2277
8	Antares W.	72 20 38	2210	73 52 44	2217	75 24 41	2224	76 56 30	2230
	SUN E.	28 38 3	2227	27 14 34	2231	25 51 21	2235	24 28 24	2278
13	SUN W.	26 59 39	2222	28 19 38	2218	29 39 42	2215	30 59 50	2211
	Aldebaran E.	48 57 1	2175	47 30 22	2180	46 3 49	2184	44 37 21	2190
	Pollux E.	90 43 49	2109	89 15 50	2110	87 47 52	2110	86 19 55	2110
14	SUN W.	37 41 26	2492	39 1 56	2491	40 22 30	2488	41 43 8	2484
	Aldebaran E.	37 26 58	2227	36 1 21	2226	34 35 55	2247	33 10 42	2259
	Pollux E.	79 0 9	2109	77 32 10	2108	76 4 10	2106	74 36 8	2105
	Jupiter E.	106 17 33	2055	104 48 28	2053	103 19 21	2052	101 50 12	2049
15	SUN W.	48 27 25	2462	49 48 32	2456	51 9 45	2451	52 31 4	2446
	Aldebaran E.	26 8 57	2227	24 45 51	2228	23 23 21	2426	22 1 34	2472
	Pollux E.	67 15 25	2092	65 47 7	2090	64 18 45	2087	62 50 19	2082
	Jupiter E.	94 23 42	2022	92 54 13	2020	91 24 38	2026	89 54 58	2022
16	SUN W.	59 19 26	2410	60 41 31	2401	62 3 46	2392	63 26 10	2386
	Pollux E.	55 26 55	2060	53 57 57	2055	52 28 52	2050	50 59 41	2042

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Star's Name and Position.	Noon.	P. L. of Dist.	III ^h .	P. L. of Dist.	VI ^h .	P. L. of Dist.	IX ^h .	P. L. of Dist.
16	Jupiter E.	88° 25' 13	3013	86° 55' 22	3013	85° 25' 24	3006	83° 55' 19	3000
	Regulus E.	98 11 12	3047	96 41 57	3043	95 12 36	3036	93 43 8	3030
	Saturn E.	104 44 14	3033	103 14 45	3029	101 45 8	3023	100 15 23	3016
17	SUN W.	64 48 44	3375	66 11 29	3368	67 34 25	3356	68 57 32	3345
	Pollux E.	49 30 22	3038	48 0 56	3033	46 31 23	3026	45 1 42	3020
	Jupiter E.	76 22 50	3064	74 51 52	3056	73 20 44	3047	71 49 25	3038
	Regulus E.	86 13 41	3023	84 48 19	3014	83 19 46	3007	81 42 2	3001
Saturn E.	92 44 28	3079	91 13 49	3070	89 42 59	3061	88 11 57	3052	
18	SUN W.	75 56 23	3228	77 20 51	3223	78 45 35	3209	80 10 34	3204
	Mars W.	24 26 9	3120	25 52 19	3113	27 18 50	3104	28 45 42	3100
	Pollux E.	37 31 24	3039	36 0 58	3034	34 30 25	3029	32 59 46	3026
	Jupiter E.	64 9 46	3037	62 37 10	3033	61 4 19	3023	59 31 13	3020
	Regulus E.	74 5 15	3019	72 33 13	3011	71 0 55	3000	69 28 22	3000
Saturn E.	80 33 43	3030	79 1 28	3028	77 28 49	3016	75 56 0	3013	
19	SUN W.	87 19 46	3170	88 46 31	3163	90 13 36	3158	91 41 0	3150
	Mars W.	36 5 21	3030	37 34 20	3023	39 3 40	3023	40 33 22	3027
	Aldebaran W.	19 49 48	3023	21 14 43	3102	22 41 7	3122	24 8 50	3025
	Jupiter E.	51 41 41	3736	50 6 54	3723	48 31 49	3707	46 56 25	3743
	Regulus E.	61 41 27	3039	60 7 11	3704	58 32 35	3779	56 57 40	3764
Saturn E.	68 7 46	3737	66 33 14	3723	64 58 23	3708	63 23 13	3754	
20	SUN W.	99 3 19	3021	100 32 53	3013	102 9 50	3008	103 33 11	3074
	Mars W.	48 7 29	3013	49 39 29	3008	51 11 53	3076	52 44 42	3067
	Aldebaran W.	31 42 41	3066	33 15 56	3023	34 49 54	3793	36 24 33	3761
	Jupiter E.	38 54 26	3008	37 17 0	3051	35 39 14	3034	34 1 7	3030
	Regulus E.	48 57 58	3034	47 20 57	3008	45 43 34	3051	44 5 48	3036
	Saturn E.	55 22 28	3075	53 45 16	3030	52 7 43	3044	50 29 43	3020
	Spica E.	102 59 54	3075	101 22 41	3068	99 45 5	3040	98 7 5	3023
21	SUN W.	111 11 1	3070	112 43 50	3066	114 17 5	3036	115 50 46	3017
	Mars W.	60 35 10	3787	62 10 34	3757	63 46 25	3716	65 22 43	3696
	Aldebaran W.	44 27 9	3029	46 5 25	3004	47 44 15	3000	49 23 37	3056
	Regulus E.	35 51 15	3050	34 11 11	3033	32 30 44	3017	30 49 54	3003
	Saturn E.	42 14 42	3047	40 34 34	3033	38 54 6	3017	37 13 17	3003
	Spica E.	89 50 52	3030	88 10 21	3011	86 29 23	3022	84 47 59	3473
22	SUN W.	123 45 40	3718	125 21 58	3086	126 58 41	3070	128 35 50	3049
	Mars W.	73 31 3	3004	75 10 6	3074	76 49 36	3056	78 29 33	3036
	Aldebaran W.	57 48 30	3443	59 31 3	3423	61 14 6	3401	62 57 40	3380
	Pollux W.	16 24 41	3749	18 0 16	3006	19 37 41	3006	21 16 41	3036
	Saturn E.	28 44 18	3443	27 1 43	3436	25 18 59	3423	23 36 10	3433
	Spica E.	76 14 15	3078	74 30 8	3059	72 45 35	3040	71 0 34	3323
	Saturn E.	107 49 52	3027	106 2 4	3008	104 13 50	3102	102 25 10	3176
23	Mars W.	86 56 6	3440	88 38 44	3423	90 21 48	3409	92 5 18	3387
	Aldebaran W.	71 42 52	3223	73 29 18	3204	75 16 11	3246	77 3 30	3229
	Pollux W.	29 48 29	3044	31 32 24	3016	32 19 1	3008	35 5 17	3004
	Spica E.	62 8 51	3223	60 21 12	3216	58 33 8	3199	56 44 39	3183
	Antares E.	107 49 52	3027	106 2 4	3008	104 13 50	3102	102 25 10	3176
24	Mars W.	100 48 47	3007	102 34 37	3023	104 20 48	3079	106 7 19	3006
	Aldebaran W.	86 6 16	3130	87 55 59	3127	89 46 2	3124	91 36 25	3111
	Pollux W.	44 5 7	3100	45 54 35	3148	47 44 29	3126	49 34 48	3111

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Star's Name and Position.	Midnight.	P. L. of Dist.	XV ^h .	P. L. of Dist.	XVIII ^h .	P. L. of Dist.	XXI ^h .	P. L. of Dist.
16	Jupiter E.	82° 25' 6"	2998	80° 54' 45"	2997	79° 24' 16"	2998	77° 53' 36"	2973
	Regulus E.	92 13 32	2993	90 43 48	2916	89 13 55	2009	87 43 53	2001
	Saturn E.	98 45 30	2998	97 15 28	2001	95 45 17	2994	94 14 57	2987
17	Sun W.	70 20 52	2984	71 44 24	2923	73 8 10	2911	74 32 9	2886
	Pollux E.	43 31 54	2914	42 1 59	2907	40 31 55	2001	39 1 43	2995
	Jupiter E.	70 17 54	2998	68 46 11	2919	67 14 16	2909	65 42 8	2896
	Regulus E.	80 11 6	2986	78 39 58	2946	77 8 37	2945	75 37 3	2924
18	Saturn E.	86 40 44	2943	85 9 19	2923	83 37 41	2921	82 5 49	2910
	Sun W.	81 35 50	2921	83 1 22	2916	84 27 12	2901	85 53 20	2186
	Mars W.	30 12 56	2189	31 40 31	2111	33 8 27	2095	34 36 43	2077
	Pollux E.	31 29 3	2973	29 58 16	2971	28 27 27	2971	26 56 38	2973
	Jupiter E.	57 57 52	2929	56 24 15	2936	54 50 21	2913	53 16 10	2799
	Regulus E.	67 55 33	2984	66 22 28	2929	64 49 5	2937	63 15 25	2923
19	Saturn E.	74 22 54	2961	72 42 32	2926	71 15 54	2925	69 41 59	2911
	Sun W.	93 8 45	2198	94 36 51	2088	96 5 18	2098	97 34 7	2049
	Mars W.	42 3 26	2989	43 33 52	2971	45 4 41	2953	46 35 53	2934
	Aldebaran W.	25 37 43	2014	27 7 38	2969	28 38 29	2929	30 10 11	2891
	Jupiter E.	45 20 42	2735	43 44 39	2713	42 8 13	2697	40 31 31	2681
	Regulus E.	55 22 25	2749	53 46 50	2733	52 10 54	2717	50 34 37	2701
20	Saturn E.	61 47 45	2739	60 11 57	2733	58 35 48	2708	56 59 19	2692
	Sun W.	105 3 56	2985	106 35 5	2925	108 6 39	2916	109 38 37	2886
	Mars W.	54 17 56	2937	55 51 36	2918	57 25 41	2798	59 0 12	2777
	Aldebaran W.	37 59 52	2733	39 35 48	2706	41 12 20	2699	42 49 27	2654
	Jupiter E.	32 22 39	2994	30 43 50	2969	29 4 40	2974	27 25 10	2929
	Regulus E.	42 27 40	2919	40 49 9	2999	39 10 14	2983	37 30 56	2966
	Saturn E.	48 51 31	2913	47 12 52	2906	45 33 51	2999	43 54 28	2963
21	Spica E.	96 28 40	2904	94 49 51	2926	93 10 37	2967	91 30 57	2949
	Sun W.	117 24 52	2797	118 59 24	2776	120 34 23	2759	122 9 48	2736
	Mars W.	66 59 28	2976	68 36 40	2946	70 14 20	2935	71 52 28	2915
	Aldebaran W.	51 3 32	2933	52 43 59	2910	54 24 58	2489	56 6 28	2465
	Regulus E.	29 8 43	2496	27 27 10	2471	25 45 16	2457	24 3 2	2443
	Saturn E.	35 32 7	2499	33 50 37	2476	32 8 48	2463	30 26 41	2450
22	Spica E.	83 6 8	2456	81 23 51	2436	79 41 6	2416	77 57 54	2397
	Sun W.	130 13 25	2949	131 51 25	2929	133 29 50	2904	135 8 40	2888
	Mars W.	80 9 58	2916	81 50 50	2496	83 32 9	2477	85 13 54	2466
	Aldebaran W.	64 41 44	2949	66 26 18	2929	68 11 21	2919	69 56 53	2900
	Pollux W.	22 57 1	2499	24 38 29	2447	26 20 57	2499	28 4 19	2375
	Saturn E.	21 53 23	2436	20 10 41	2446	18 28 14	2465	16 46 11	2490
	Spica E.	69 15 7	2904	67 29 13	2926	65 42 52	2967	63 56 4	2250
23	Mars W.	93 49 12	2970	95 33 30	2933	97 18 13	2937	99 3 19	2922
	Aldebaran W.	78 51 14	2913	80 39 23	2196	82 27 57	2180	84 16 55	2165
	Pollux W.	36 52 9	2941	38 39 36	2916	40 27 36	2198	42 16 7	2178
	Spica E.	54 55 46	2167	53 6 29	2183	51 16 50	2187	49 26 48	2124
	Antares E.	100 36 5	2199	98 46 36	2144	96 56 44	2128	95 6 28	2114
24	Mars W.	107 54 8	2934	109 41 15	2943	111 28 40	2931	113 16 21	2921
	Aldebaran W.	93 27 7	2100	95 18 6	2099	97 9 22	2079	99 0 54	2069
	Pollux W.	51 25 30	2996	53 16 35	2923	55 8 0	2970	56 59 45	2969

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Star's Name and Position.	Noon.	P. L. of Dist.	IIIh.	P. L. of Dist.	VIh.	P. L. of Dist.	IXh.	P. L. of Dist.
24	Jupiter W.	17° 17' 58"	2103	19° 7' 23"	2136	20° 57' 27"	2113	22° 48' 7"	2091
	Spica E.	47 36 25	2110	45 45 41	2097	43 54 37	2065	42 3 14	2073
	Antares E.	93 15 50	2100	91 24 51	2086	89 33 30	2072	87 41 48	2061
25	Pollux W.	58 51 47	2048	60 44 6	2030	62 36 40	2030	64 29 28	2021
	Jupiter W.	32 8 22	2018	34 1 28	2007	35 54 52	1997	37 48 31	1989
	Regulus W.	21 50 24	2068	23 42 20	2048	25 34 40	2034	27 27 21	2028
	Saturn W.	16 27 40	2216	18 15 41	2171	20 4 52	2132	21 55 2	2101
	Spica E.	32 42 18	2036	30 49 28	2023	28 56 29	2016	27 3 23	2015
	Antares E.	78 18 55	2009	76 25 34	2000	74 32 0	1992	72 38 13	1988
26	Pollux W.	73 56 10	1994	75 49 53	1992	77 43 40	1990	79 37 30	1988
	Jupiter W.	47 19 35	1990	49 14 12	1986	51 8 53	1986	53 3 37	1985
	Regulus W.	36 54 38	1984	38 48 38	1980	40 42 44	1977	42 36 54	1975
	Saturn W.	31 15 13	2014	33 8 25	2005	35 1 51	1998	36 55 28	1993
	Antares E.	63 7 3	1963	61 12 30	1961	59 17 54	1960	57 23 16	1959
27	Pollux W.	89 6 32	1998	91 0 10	2003	92 53 41	2007	94 47 4	2012
	Jupiter W.	62 37 12	1993	64 31 46	1986	66 26 14	1971	68 20 34	1977
	Regulus W.	52 7 57	1990	54 2 3	1984	55 56 2	1989	57 49 54	1984
	Saturn W.	46 24 57	1966	48 18 53	1969	50 12 45	1992	52 6 32	1996
	Antares E.	47 50 20	1999	45 55 57	1974	44 1 41	1979	42 7 33	1984
	α Aquilæ E.	101 9 55	2040	99 29 37	2003	97 49 16	2038	96 8 55	2040
28	Jupiter W.	77 49 33	2016	79 42 42	2026	81 35 35	2087	83 28 12	2048
	Regulus W.	67 16 47	2082	69 9 32	2041	71 2 2	2062	72 54 16	2063
	Saturn W.	61 33 22	2080	63 26 10	2089	65 18 43	2049	67 11 1	2090
	Spica W.	13 24 42	2118	15 15 14	2109	17 6 0	2106	18 56 52	2106
	Antares E.	32 39 36	2085	30 46 41	2086	28 54 3	2047	27 1 42	2050
	α Aquilæ E.	87 48 37	2074	86 9 7	2080	84 29 55	2001	82 51 2	2017
29	Jupiter W.	92 46 37	2113	94 37 17	2126	96 27 34	2142	98 17 29	2167
	Regulus W.	82 10 49	2137	84 1 7	2141	85 51 4	2155	87 40 39	2171
	Saturn W.	76 28 6	2132	78 18 32	2126	80 8 37	2151	81 58 19	2165
	Spica W.	28 9 42	2148	29 59 36	2165	31 49 12	2187	33 38 29	2180
	α Aquilæ E.	74 42 42	2121	73 6 30	2147	71 30 53	2175	69 55 53	2096
	Fomalhaut E.	99 27 32	2038	97 47 11	2048	96 7 5	2061	94 27 16	2074
	SUN E.	138 34 22	2486	136 52 6	2409	135 10 9	2482	133 26 31	2497
30	Jupiter W.	107 21 8	2289	109 8 37	2266	110 55 41	2374	112 42 19	2391
	Regulus W.	96 42 39	2261	98 29 50	2269	100 16 35	2286	102 2 55	2303
	Saturn W.	91 1 3	2246	92 48 23	2262	94 35 18	2280	96 21 47	2297
	Spica W.	42 39 38	2286	44 26 43	2271	46 13 25	2287	47 59 43	2304
	α Aquilæ E.	62 11 30	2266	60 41 2	2081	59 11 28	2077	57 42 50	2126
	Fomalhaut E.	86 13 9	2086	84 35 29	2076	82 58 15	2096	81 21 28	2116
	α Pegasi E.	107 8 43	2405	105 25 15	2419	103 42 8	2434	101 59 22	2449
	SUN E.	125 5 41	2677	123 26 15	2506	121 47 13	2612	120 8 35	2630
31	Saturn W.	105 7 48	2387	106 51 42	2406	108 35 10	2433	110 18 12	2441
	Spica W.	56 44 59	2291	58 28 47	2408	60 12 10	2436	61 55 8	2442
	α Aquilæ E.	50 35 51	2429	49 14 7	2503	47 53 46	2563	46 34 53	2599
	Fomalhaut E.	73 25 3	2637	71 51 23	2664	70 18 18	2692	68 45 49	2621
	α Pegasi E.	93 31 5	2632	91 50 36	2680	90 10 32	2687	88 30 52	2686
	SUN E.	112 1 35	2722	110 25 25	2741	108 49 40	2760	107 14 20	2779

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Star's Name and Position.	Midnight.	P. L. of Dist.	XVh.	P. L. of Dist.	XVIIIh.	P. L. of Dist.	XXIh.	P. L. of Dist.
24	Jupiter W.	24° 39' 20"	2078	26° 31' 1"	2087	28° 23' 6"	2043	30° 15' 34"	2080
	Spica E.	40 11 33	2083	38 19 36	2083	36 27 23	2044	34 34 57	2085
	Antares E.	85 49 48	2049	83 57 30	2087	82 4 54	2027	80 12 2	2017
25	Pollux W.	66 22 29	2014	68 15 41	2008	70 9 3	2003	72 2 33	1998
	Jupiter W.	39 42 23	1981	41 36 27	1975	43 30 41	1969	45 25 4	1964
	Regulus W.	29 20 20	2013	31 13 36	2008	33 7 5	1995	35 0 46	1989
	Saturn W.	23 45 59	2075	25 37 36	2055	27 29 44	2039	29 22 18	2025
	Spica E.	25 10 12	2014	23 16 59	2014	21 23 46	2017	19 30 38	2023
	Antares E.	70 44 16	1979	68 50 9	1974	66 55 54	1969	65 1 31	1966
26	Pollux W.	81 31 21	1969	83 25 12	1990	85 19 2	1992	87 12 49	1994
	Jupiter W.	54 58 22	1956	56 53 7	1955	58 47 52	1957	60 42 34	1960
	Regulus W.	44 31 7	1975	46 25 21	1976	48 19 35	1976	50 13 47	1977
	Saturn W.	38 49 14	1969	40 43 6	1986	42 37 2	1985	44 30 59	1985
	Antares E.	55 28 37	1969	53 33 58	1961	51 39 22	1963	49 44 49	1965
	27	Pollux W.	96 40 17	2020	98 33 20	2028	100 26 11	2085	102 18 49	2045
Jupiter W.		70 14 44	1984	72 8 44	1991	74 2 33	1998	75 56 10	2007
Regulus W.		59 43 38	2000	61 37 12	2007	63 30 36	2014	65 23 48	2023
Saturn W.		54 0 13	2001	55 53 46	2007	57 47 9	2014	59 40 21	2021
Antares E.		40 13 34	1991	38 19 45	1999	36 26 9	2007	34 32 46	2016
α Aquilæ E.		94 28 37	2043	92 48 23	2048	91 8 17	2055	89 28 21	2064
28		Jupiter W.	85 20 31	2080	87 12 32	2073	89 4 14	2085	90 55 36	2089
	Regulus W.	74 46 12	2075	76 37 50	2088	78 29 10	2099	80 20 10	2113
	Saturn W.	69 3 2	2071	70 54 46	2063	72 46 12	2065	74 37 19	2108
	Spica W.	20 47 44	2109	22 38 30	2115	24 29 7	2123	26 19 32	2133
	Antares E.	25 9 40	2073	23 17 57	2085	21 26 34	2099	19 35 33	2114
	α Aquilæ E.	81 12 30	2086	79 34 22	2084	77 56 40	2075	76 19 26	2087
	29	Jupiter W.	100 7 1	2178	101 56 9	2188	103 44 54	2205	105 33 14	2233
Regulus W.		89 29 50	2186	91 18 38	2203	93 7 3	2218	94 55 3	2235
Saturn W.		83 47 39	2180	85 36 36	2196	87 25 9	2213	89 13 18	2230
Spica W.		35 27 26	2184	37 16 2	2208	39 4 17	2224	40 52 9	2239
α Aquilæ E.		68 21 33	2088	66 47 54	2073	65 14 59	2098	63 42 50	2046
Fomalhaut E.		92 47 45	2086	91 8 34	2093	89 29 43	2019	87 51 14	2037
SUN E.		131 47 14	2013	130 6 18	2037	128 25 43	2043	126 45 30	2061
30		Jupiter W.	114 28 32	2300	116 14 19	2327	117 59 39	2345	119 44 33	2364
	Regulus W.	103 48 50	2321	105 34 19	2338	107 19 23	2357	109 4 0	2375
	Saturn W.	98 7 51	2315	99 53 29	2333	101 38 41	2350	103 23 28	2368
	Spica W.	49 45 36	2321	51 31 5	2339	53 16 8	2355	55 0 46	2373
	α Aquilæ E.	56 15 12	3179	54 48 38	3206	53 23 11	3226	51 58 54	3350
	Fomalhaut E.	79 45 10	2788	78 9 21	2793	76 34 3	2798	74 59 17	2811
	α Pegasi E.	100 16 57	2465	98 34 54	2481	96 53 14	2498	95 11 58	2515
	SUN E.	118 30 21	2049	116 52 32	2087	115 15 8	2085	113 38 9	2704
	31	Saturn W.	112 0 48	2480	113 42 58	2477	115 24 43	2496	117 6 2	2514
Spica E.		63 37 41	2461	65 19 49	2478	67 1 33	2496	68 42 52	2513
α Aquilæ E.		45 17 33	3764	44 1 53	3805	42 47 58	3975	41 35 54	4100
Fomalhaut E.		67 13 57	2981	65 42 43	2992	64 12 8	3014	62 42 13	3048
α Pegasi E.		86 51 36	2603	85 12 45	2631	83 34 19	2640	81 56 18	2650
SUN E.		105 39 25	2798	104 4 54	2817	102 30 48	2836	100 57 7	2854

AT GREENWICH APPARENT NOON.

THE SUN'S															
Day of the Week.	Day of the Month.	Apparent Right Ascension.			Diff. for 1 hour.	Apparent Declination.			Semi-diameter.	Sidereal Time of the Semi-diameter passing the Meridian.	Equation of Time, to be added to subtracted from Apparent Time.	Diff. for 1 hour.			
		h	m	s		°	'	"					"		
Mon.	1	0	43	12.55	9.097	N. 4	38	58.5	57.79	16	1.92	64.51	3	53.14	0.759
Tues.	2	0	46	50.91	9.103	5	2	2.6	57.58	16	1.63	64.58	3	35.00	0.754
Wed.	3	0	50	29.43	9.110	5	25	1.6	57.35	16	1.35	64.55	3	17.01	0.747
Thur.	4	0	54	8.12	9.118	5	47	55.0	57.11	16	1.07	64.57	2	59.20	0.739
Fri.	5	0	57	46.99	9.126	6	10	42.6	56.86	16	0.79	64.59	2	41.58	0.731
Sat.	6	1	1	26.06	9.134	6	33	23.8	56.59	16	0.51	64.63	2	24.13	0.723
Sun.	7	1	5	5.35	9.143	6	55	58.3	56.30	16	0.23	64.65	2	6.91	0.713
Mon.	8	1	8	44.88	9.153	7	18	25.7	56.00	15	59.95	64.68	1	49.93	0.703
Tues.	9	1	12	24.66	9.164	7	40	45.7	55.68	15	59.68	64.72	1	33.19	0.692
Wed.	10	1	16	4.71	9.175	8	2	58.1	55.36	15	59.41	64.76	1	16.74	0.681
Thur.	11	1	19	45.03	9.187	8	25	2.3	55.01	15	59.14	64.80	1	0.56	0.669
Fri.	12	1	23	25.64	9.199	8	46	58.0	54.65	15	58.87	64.85	0	44.66	0.657
Sat.	13	1	27	6.54	9.212	9	8	45.0	54.37	15	58.60	64.90	0	29.05	0.644
Sun.	14	1	30	47.76	9.226	9	30	22.7	53.88	15	58.34	64.95	0	13.75	0.630
Mon.	15	1	34	29.31	9.240	9	51	50.9	53.47	15	58.08	65.00	0	1.21	0.616
Tues.	16	1	38	11.19	9.254	10	13	9.2	53.06	15	57.82	65.05	0	15.84	0.601
Wed.	17	1	41	53.43	9.270	10	34	17.3	52.63	15	57.56	65.11	0	30.12	0.586
Thur.	18	1	45	36.05	9.286	10	55	14.9	52.18	15	57.30	65.17	0	44.02	0.570
Fri.	19	1	49	19.06	9.302	11	16	1.7	51.72	15	57.04	65.23	0	57.53	0.554
Sat.	20	1	53	2.46	9.318	11	36	37.3	51.25	15	56.79	65.29	1	10.64	0.538
Sun.	21	1	56	46.28	9.336	11	57	1.4	50.77	15	56.54	65.35	1	23.35	0.521
Mon.	22	2	0	30.52	9.354	12	17	13.7	50.27	15	56.29	65.41	1	35.62	0.503
Tues.	23	2	4	15.20	9.372	12	37	13.9	49.76	15	56.04	65.48	1	47.46	0.484
Wed.	24	2	8	0.34	9.392	12	57	1.9	49.24	15	55.79	65.55	1	58.85	0.464
Thur.	25	2	11	45.96	9.412	13	16	37.2	48.70	15	55.54	65.62	2	9.75	0.444
Fri.	26	2	15	32.06	9.432	13	35	59.5	48.15	15	55.29	65.69	2	20.17	0.423
Sat.	27	2	19	18.66	9.453	13	55	8.4	47.59	15	55.04	65.76	2	30.09	0.402
Sun.	28	2	23	5.78	9.475	14	14	3.7	47.02	15	54.80	65.83	2	39.50	0.380
Mon.	29	2	26	53.44	9.498	14	32	45.1	46.43	15	54.56	65.91	2	48.37	0.358
Tues.	30	2	30	41.64	9.521	14	51	12.2	45.83	15	54.32	65.99	2	56.71	0.336
Wed.	31	2	34	30.39	9.544	N. 15	9	24.7	45.21	15	54.08	66.07	3	4.50	0.313

NOTE. — Mean Time of the Semi-diameter passing may be found by subtracting 0.13 from the Sidereal Time.

AT GREENWICH MEAN NOON.

THE SUN'S									
Day of the Week.	Day of the Month.	THE SUN'S				Equation of Time, to be subtracted from		Diff. for 1 hour.	Sidereal Time.
		Apparent Right Ascension.	Diff. for 1 hour.	Apparent Declination.	Dist. for 1 hour.	added to Mean Time.			
		h m s	s	° ' "	"	m s	s	h m s	
Mon.	1	0 43 11.96	9.087	N. 4 38' 54.8"	57.79	3 53.19	0.759	0 39 18.77	
Tues.	2	0 46 50.37	9.103	5 1 59.2	57.58	3 35.05	0.754	0 43 15.32	
Wed.	3	0 50 28.94	9.110	5 24 58.5	57.35	3 17.06	0.747	0 47 11.88	
Thur.	4	0 54 7.67	9.118	5 47 52.2	57.11	2 59.24	0.739	0 51 8.43	
Fri.	5	0 57 46.59	9.126	6 10 40.0	56.86	2 41.61	0.731	0 55 4.98	
Sat.	6	1 1 25.70	9.134	6 33 21.5	56.59	2 24.16	0.722	0 59 1.54	
Sun.	7	1 5 5.08	9.143	6 55 56.3	56.30	2 6.94	0.713	1 2 58.09	
Mon.	8	1 8 44.60	9.153	7 18 24.0	56.00	1 49.96	0.703	1 6 54.64	
Tues.	9	1 12 24.42	9.164	7 40 44.3	55.68	1 33.22	0.692	1 10 51.20	
Wed.	10	1 16 4.51	9.175	8 2 56.9	55.36	1 16.76	0.681	1 14 47.75	
Thur.	11	1 19 44.87	9.187	8 25 1.4	55.01	1 0.57	0.669	1 18 44.20	
Fri.	12	1 23 25.52	9.199	8 46 57.4	54.65	0 44.66	0.656	1 22 40.86	
Sat.	13	1 27 6.46	9.212	9 8 44.6	54.27	0 29.05	0.643	1 26 37.41	
Sun.	14	1 30 47.72	9.226	9 30 22.5	53.88	0 13.75	0.630	1 30 33.97	
Mon.	15	1 34 29.31	9.240	9 51 50.9	53.47	0 1.21	0.616	1 34 30.52	
Tues.	16	1 38 11.23	9.254	10 18 9.4	53.06	0 15.84	0.601	1 38 27.07	
Wed.	17	1 41 53.51	9.270	10 34 17.7	52.63	0 30.12	0.586	1 42 23.63	
Thur.	18	1 45 36.17	9.286	10 55 15.5	52.18	0 44.01	0.570	1 46 20.18	
Fri.	19	1 49 19.21	9.302	11 16 2.5	51.72	0 57.53	0.554	1 50 16.74	
Sat.	20	1 53 2.64	9.318	11 36 38.3	51.25	1 10.65	0.538	1 54 13.29	
Sun.	21	1 56 46.49	9.336	11 57 2.6	50.77	1 23.38	0.521	1 58 9.85	
Mon.	22	2 0 30.77	9.354	12 17 15.1	50.27	1 35.63	0.503	2 2 6.40	
Tues.	23	2 4 15.48	9.372	12 37 15.5	49.76	1 47.47	0.484	2 6 2.95	
Wed.	24	2 8 0.65	9.392	12 57 3.6	49.24	1 58.86	0.464	2 9 59.51	
Thur.	25	2 11 46.30	9.412	13 16 39.0	48.70	2 9.76	0.444	2 13 56.06	
Fri.	26	2 15 32.43	9.432	13 36 1.4	48.15	2 20.19	0.423	2 17 52.62	
Sat.	27	2 19 19.06	9.453	13 55 10.4	47.59	2 30.11	0.402	2 21 49.17	
Sun.	28	2 23 6.21	9.475	14 14 5.8	47.02	2 39.52	0.380	2 25 45.73	
Mon.	29	2 26 53.89	9.498	14 32 47.3	46.43	2 48.39	0.358	2 29 42.28	
Tues.	30	2 30 42.11	9.521	14 51 14.5	45.83	2 56.72	0.336	2 33 38.84	
Wed.	31	2 34 30.88	9.544	N.15 9 27.1	45.21	3 4.51	0.313	2 37 35.39	

Note.—The Equilibrium for Mean Noon may be assumed the same as that for Apparent Noon.

AT GREENWICH MEAN NOON.

		THE SUN'S				Logarithm of the Radius Vector of the Earth.	Diff. for 1 hour.	Mean Time of Sidereal Oh
Day of the Month.	Day of the Year.	True LONGITUDE.		Diff. for 1 hour.	LATITUDE.			
		λ	λ'					
1	91	11° 45' 8.8"	44° 40.5'	147.79	-0.26"	0.0000339	53.4	23 16 51.75
2	92	12 44 14.8	43 46.4	147.72	-0.12	.0001620	53.3	23 12 55.84
3	93	13 43 19.0	42 50.5	147.65	+0.02	.0002899	53.2	23 8 59.94
4	94	14 42 21.4	41 52.8	147.57	0.15	.0004178	53.1	23 5 4.04
5	95	15 41 22.1	40 53.4	147.49	0.28	.0005453	53.0	23 1 8.13
6	96	16 40 21.0	39 52.2	147.42	0.39	.0006721	52.7	22 57 12.22
7	97	17 39 18.0	38 49.1	147.34	0.49	.0007983	52.4	22 53 16.31
8	98	18 38 13.1	37 44.1	147.26	0.56	.0009236	52.0	22 49 20.40
9	99	19 37 6.3	36 37.2	147.18	0.59	.0010480	51.6	22 45 24.50
10	100	20 35 57.6	35 28.4	147.10	0.60	.0011714	51.2	22 41 28.59
11	101	21 34 46.9	34 17.6	147.01	0.57	.0012938	50.8	22 37 32.68
12	102	22 33 34.0	33 4.6	146.92	0.52	.0014153	50.4	22 33 36.77
13	103	23 32 19.1	31 49.6	146.83	0.44	.0015357	50.0	22 29 40.86
14	104	24 31 2.0	30 32.4	146.74	0.34	.0016551	49.6	22 25 44.96
15	105	25 29 42.7	29 12.9	146.65	0.22	.0017736	49.2	22 21 49.05
16	106	26 28 21.1	27 51.2	146.55	+0.10	.0018913	48.9	22 17 53.14
17	107	27 26 57.3	26 27.3	146.46	-0.03	.0020082	48.6	22 13 57.23
18	108	28 25 31.2	25 1.1	146.37	0.16	.0021244	48.4	22 10 1.32
19	109	29 24 2.9	23 32.7	146.28	0.26	.0022401	48.1	22 6 5.42
20	110	30 22 32.5	22 2.1	146.19	0.35	.0023554	47.9	22 2 9.51
21	111	31 21 0.1	20 29.6	146.10	0.44	.0024703	47.8	21 58 13.60
22	112	32 19 25.6	18 55.0	146.02	0.49	.0025848	47.6	21 54 17.69
23	113	33 17 49.1	17 18.4	145.94	0.50	.0026990	47.5	21 50 21.78
24	114	34 16 10.7	15 39.9	145.86	0.48	.0028129	47.3	21 46 25.88
25	115	35 14 30.4	13 59.4	145.78	0.42	.0029265	47.2	21 42 29.97
26	116	36 12 48.3	12 17.2	145.71	0.34	.0030398	47.1	21 38 34.06
27	117	37 11 4.4	10 33.2	145.64	0.25	.0031527	47.0	21 34 38.15
28	118	38 9 18.9	8 47.6	145.57	0.15	.0032651	46.8	21 30 42.24
29	119	39 7 31.9	7 0.4	145.51	-0.02	.0033771	46.5	21 26 46.33
30	120	40 5 43.4	5 11.7	145.45	+0.12	.0034884	46.2	21 22 50.42
31	121	41 3 53.4	3 21.6	145.39	+0.26	0.0035987	45.7	21 18 54.51

NOTE. — λ corresponds to the true equinox of the date, λ' to the mean equinox of January 0d.

GREENWICH MEAN TIME.

THE MOON'S

Day of the Month.

	SEMI-DIAMETER.		HORIZONTAL PARALLAX.				MERIDIAN PASSAGE.		AGE.
	Noon.	Midnight.	Noon.	Diff. for 1 hour.	Midnight.	Diff. for 1 hour.		Diff. for 1 hour.	
1	15' 47.0	15' 39.7	57' 48.8	-2.26	57' 22.1	-2.18	18 ^h 11.8 ^m	2.27	20.9 ^d
2	15' 32.7	15' 26.1	56' 56.6	2.08	56' 32.4	1.95	19 4.1	2.09	21.9
3	15' 20.0	15' 14.4	56 9.8	1.81	55 49.0	1.66	19 52.3	1.94	22.9
4	15 9.2	15 4.5	55 29.9	1.51	55 12.7	1.36	20 37.1	1.81	23.9
5	15 0.3	14 56.6	54 57.4	1.20	54 43.9	1.05	21 19.4	1.73	24.9
6	14 53.4	14 50.7	54 32.1	0.90	54 22.2	0.75	22 0.1	1.68	25.9
7	14 48.4	14 46.6	54 14.0	0.62	54 7.3	0.50	22 40.3	1.68	26.9
8	14 45.2	14 44.2	54 2.1	0.37	53 58.4	0.25	23 20.8	1.70	27.9
9	14 43.6	14 43.3	53 56.0	-0.14	53 55.0	-0.03	♄		28.9
10	14 43.4	14 43.8	53 55.3	+0.08	53 56.9	+0.19	0 2.4	1.77	0.2
11	14 44.6	14 45.8	53 59.9	0.30	54 4.2	0.42	0 45.9	1.86	1.2
12	14 47.4	14 49.4	54 10.0	0.54	54 17.2	0.67	1 31.7	1.96	2.2
13	14 51.8	14 54.6	54 26.0	0.80	54 36.4	0.94	2 20.1	2.06	3.2
14	14 57.9	15 1.7	54 48.5	1.08	55 2.3	1.23	3 10.6	2.15	4.2
15	15 5.9	15 10.6	55 17.9	1.37	55 35.3	1.52	4 2.8	2.19	5.2
16	15 15.8	15 21.5	55 54.4	1.67	56 15.2	1.81	4 55.5	2.19	6.2
17	15 27.6	15 34.2	56 37.8	1.95	57 1.8	2.06	5 47.9	2.17	7.2
18	15 41.1	15 48.3	57 27.2	2.16	57 53.6	2.24	6 39.5	2.13	8.2
19	15 55.6	16 3.1	58 20.7	2.28	58 48.0	2.28	7 30.2	2.10	9.2
20	16 10.4	16 17.5	59 15.0	2.23	59 41.1	2.12	8 20.4	2.09	10.2
21	16 24.2	16 30.3	60 5.7	1.96	60 27.9	1.74	9 10.9	2.13	11.2
22	16 35.5	16 39.7	60 47.1	1.46	61 2.8	1.14	10 2.9	2.21	12.2
23	16 42.9	16 44.7	61 14.2	+0.77	61 21.0	+0.36	10 57.2	2.33	13.2
24	16 45.2	16 44.4	61 22.9	-0.05	61 19.7	-0.47	11 54.8	2.47	14.2
25	16 42.2	16 38.7	61 11.7	0.88	60 58.9	1.25	12 55.6	2.59	15.2
26	16 34.1	16 28.4	60 41.9	1.59	60 21.1	1.88	13 58.4	2.62	16.2
27	16 21.9	16 14.7	59 57.1	2.11	59 30.9	2.27	15 0.9	2.57	17.2
28	16 7.1	15 59.3	59 2.9	2.38	58 34.0	2.43	16 0.9	2.41	18.2
29	15 51.4	15 43.5	58 4.8	2.43	57 35.9	2.38	16 56.6	2.22	19.2
30	15 35.8	15 28.5	57 7.9	2.30	56 41.0	2.18	17 47.6	2.03	20.2
31	15 21.6	15 15.2	56 15.8	-2.03	55 52.3	-1.87	18 34.4	1.88	21.2

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Dist. for 1 m.	Declination.	Dist. for 1 m.	Hour.	Right Ascension.	Dist. for 1 m.	Declination.	Dist. for 1 m.
MONDAY 1.					WEDNESDAY 3.				
0	18 10 20.69	2.4879	S. 24 52 17.9	2.483	0	20 1 10.40	2.1543	S. 19 41 16.9	2.042
1	18 12 48.00	2.4924	24 48 47.5	2.479	1	20 3 19.47	2.1451	19 39 11.7	2.129
2	18 15 14.98	2.4967	24 45 8.4	2.474	2	20 5 28.17	2.1419	19 23 1.4	2.114
3	18 17 41.61	2.4999	24 41 20.6	2.467	3	20 7 36.50	2.1357	19 13 46.0	2.096
4	18 20 7.89	2.4822	24 37 24.3	2.461	4	20 9 44.45	2.1294	19 4 25.6	2.080
5	18 22 33.83	2.4824	24 33 19.4	2.455	5	20 11 52.03	2.1233	18 55 0.3	2.062
6	18 24 59.42	2.4835	24 29 6.2	2.450	6	20 13 59.25	2.1173	18 45 30.1	2.043
7	18 27 24.65	2.4174	24 24 44.5	2.443	7	20 16 6.10	2.1112	18 35 55.1	2.023
8	18 29 49.51	2.4114	24 20 14.6	2.438	8	20 18 12.59	2.1052	18 26 15.4	2.000
9	18 32 14.02	2.4054	24 15 36.5	2.433	9	20 20 18.72	2.0992	18 16 31.0	2.077
10	18 34 38.16	2.3993	24 10 50.2	2.428	10	20 22 24.49	2.0932	18 6 42.1	2.053
11	18 37 1.94	2.3932	24 5 55.8	2.423	11	20 24 29.91	2.0872	17 56 48.7	2.027
12	18 39 25.35	2.3871	24 0 53.4	2.418	12	20 26 34.97	2.0814	17 46 50.8	2.000
13	18 41 48.39	2.3808	23 55 43.2	2.413	13	20 28 39.68	2.0757	17 36 48.6	2.073
14	18 44 11.05	2.3745	23 50 25.0	2.408	14	20 30 44.05	2.0699	17 26 42.0	2.045
15	18 46 33.33	2.3682	23 44 59.0	2.403	15	20 32 48.07	2.0642	17 16 31.2	2.018
16	18 48 55.23	2.3618	23 39 25.2	2.398	16	20 34 51.75	2.0585	17 6 16.3	2.000
17	18 51 16.75	2.3555	23 33 43.9	2.393	17	20 36 55.09	2.0528	16 55 57.2	2.001
18	18 53 37.89	2.3492	23 27 55.1	2.388	18	20 38 58.09	2.0472	16 45 34.1	2.017
19	18 55 58.65	2.3427	23 21 58.7	2.383	19	20 41 0.76	2.0417	16 35 7.0	2.034
20	18 58 19.02	2.3363	23 15 55.0	2.378	20	20 43 3.10	2.0362	16 24 36.0	2.040
21	19 0 39.00	2.3298	23 9 44.0	2.373	21	20 45 5.11	2.0306	16 14 1.1	2.057
22	19 2 58.59	2.3233	23 3 25.7	2.368	22	20 47 6.80	2.0250	16 3 22.5	2.073
23	19 5 17.80	2.3168	S. 22 57 0.2	2.363	23	20 49 8.17	2.0200	S. 15 52 40.2	2.078
TUESDAY 2.					THURSDAY 4.				
0	19 7 36.61	2.3103	S. 22 50 27.6	2.358	0	20 51 9.22	2.0149	S. 15 41 54.2	2.070
1	19 9 55.03	2.3037	22 43 48.0	2.353	1	20 53 9.96	2.0097	15 31 4.6	2.056
2	19 12 13.06	2.2972	22 37 1.5	2.348	2	20 55 10.39	2.0045	15 20 11.4	2.042
3	19 14 30.69	2.2906	22 30 8.1	2.343	3	20 57 10.50	1.9993	15 9 14.8	2.027
4	19 16 47.93	2.2841	22 23 7.9	2.338	4	20 59 10.30	1.9942	14 58 14.8	2.012
5	19 19 4.78	2.2775	22 16 1.0	2.333	5	21 1 9.81	1.9890	14 47 11.5	2.000
6	19 21 21.23	2.2709	22 8 47.5	2.328	6	21 3 9.02	1.9843	14 36 4.8	2.018
7	19 23 37.29	2.2643	22 1 27.4	2.323	7	21 5 7.93	1.9795	14 24 54.9	2.011
8	19 25 52.95	2.2577	21 54 0.9	2.318	8	21 7 6.56	1.9748	14 13 41.8	2.000
9	19 28 8.22	2.2512	21 46 27.9	2.313	9	21 9 4.90	1.9700	14 2 25.7	2.004
10	19 30 23.09	2.2446	21 38 48.6	2.307	10	21 11 2.95	1.9652	13 51 6.5	2.000
11	19 32 37.57	2.2381	21 31 3.0	2.302	11	21 13 0.72	1.9605	13 39 44.3	2.004
12	19 34 51.66	2.2315	21 23 11.3	2.297	12	21 14 58.22	1.9557	13 28 19.2	2.000
13	19 37 5.36	2.2250	21 15 13.5	2.292	13	21 16 55.44	1.9510	13 16 51.2	2.000
14	19 39 18.66	2.2184	21 7 9.6	2.287	14	21 18 52.39	1.9470	13 5 20.3	2.000
15	19 41 31.57	2.2119	20 58 59.8	2.282	15	21 20 49.08	1.9425	12 53 46.7	2.000
16	19 43 44.10	2.2056	20 50 44.3	2.277	16	21 22 45.50	1.9382	12 42 10.4	2.000
17	19 45 56.24	2.1991	20 42 22.9	2.272	17	21 24 41.06	1.9340	12 30 31.4	2.000
18	19 48 7.99	2.1926	20 33 55.8	2.267	18	21 26 37.57	1.9297	12 18 49.8	2.000
19	19 50 19.35	2.1861	20 25 23.0	2.262	19	21 28 33.23	1.9255	12 7 5.6	2.000
20	19 52 30.22	2.1797	20 16 44.7	2.257	20	21 30 28.64	1.9214	11 55 19.0	2.000
21	19 54 40.91	2.1733	20 8 0.8	2.252	21	21 32 23.80	1.9172	11 43 29.9	2.000
22	19 56 51.12	2.1670	19 59 11.5	2.247	22	21 34 18.72	1.9131	11 31 38.4	2.000
23	19 59 0.95	2.1607	19 50 16.8	2.242	23	21 36 13.41	1.9090	11 19 44.6	2.000
24	20 1 10.40	2.1543	S. 19 41 16.9	2.237	24	21 38 7.87	1.9057	S. 11 7 48.5	2.000

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
FRIDAY 5.					SUNDAY 7.				
0	21 38 7.87	1.9087	S. 11° 7' 48.5"	11.863	0	23 6 22.06	1.7081	S. 1° 6' 26.1"	12.886
1	21 40 2.10	1.9019	10 55 50.9	11.860	1	23 8 9.74	1.7044	0 53 37.7	12.806
2	21 41 56.10	1.8982	10 43 49.7	12.856	2	23 9 57.39	1.7007	0 40 49.3	12.805
3	21 43 49.88	1.8944	10 31 47.1	12.850	3	23 11 44.99	1.7001	0 28 1.0	12.803
4	21 45 43.43	1.8906	10 19 42.5	12.844	4	23 13 32.56	1.7025	0 15 12.8	12.800
5	21 47 36.77	1.8873	10 7 35.8	12.187	5	23 15 20.10	1.7021	S. 0 2 24.8	12.796
6	21 49 29.90	1.8838	9 55 27.9	12.189	6	23 17 7.61	1.7016	N. 0 10 22.9	12.792
7	21 51 22.83	1.8805	9 43 16.7	12.190	7	23 18 55.09	1.7011	0 23 10.4	12.787
8	21 53 15.56	1.8773	9 31 4.8	12.231	8	23 20 42.54	1.7005	0 35 57.6	12.782
9	21 55 8.09	1.8738	9 18 50.1	12.261	9	23 22 29.98	1.7005	0 48 44.4	12.776
10	21 57 0.42	1.8705	9 6 34.1	12.260	10	23 24 17.41	1.7005	1 1 30.8	12.769
11	21 58 52.56	1.8674	8 54 16.4	12.269	11	23 26 4.82	1.7000	1 14 16.7	12.761
12	22 0 44.51	1.8643	8 41 57.0	12.235	12	23 27 52.21	1.7000	1 27 2.9	12.754
13	22 2 36.28	1.8613	8 29 36.0	12.268	13	23 29 39.61	1.7000	1 39 47.1	12.748
14	22 4 27.87	1.8583	8 17 13.4	12.269	14	23 31 27.00	1.7000	1 52 31.4	12.734
15	22 6 19.28	1.8554	8 4 49.3	12.413	15	23 33 14.40	1.7001	2 5 15.1	12.724
16	22 8 10.52	1.8526	7 52 23.8	12.437	16	23 35 1.81	1.7002	2 17 58.2	12.713
17	22 10 1.59	1.8498	7 39 56.8	12.460	17	23 36 49.22	1.7003	2 30 40.6	12.708
18	22 11 52.49	1.8471	7 27 26.5	12.483	18	23 38 36.65	1.7003	2 43 22.2	12.698
19	22 13 43.24	1.8445	7 14 58.8	12.505	19	23 40 24.09	1.7000	2 56 3.1	12.678
20	22 15 33.83	1.8418	7 2 27.9	12.528	20	23 42 11.56	1.7013	3 8 43.1	12.662
21	22 17 24.26	1.8392	6 49 55.7	12.548	21	23 43 59.05	1.7017	3 21 22.3	12.646
22	22 19 14.54	1.8366	6 37 22.3	12.568	22	23 45 46.56	1.7021	3 34 0.6	12.630
23	22 21 4.69	1.8340	S. 6 24 47.8	12.584	23	23 47 34.10	1.7025	N. 3 46 37.9	12.615
SATURDAY 6.					MONDAY 8.				
0	22 22 54.69	1.8312	S. 6 12 12.2	12.601	0	23 49 21.68	1.7000	N. 3 59 14.2	12.599
1	22 24 44.55	1.8289	5 59 35.6	12.619	1	23 51 9.29	1.7000	4 11 49.7	12.580
2	22 26 34.28	1.8277	5 46 57.9	12.636	2	23 52 56.94	1.7045	4 24 24.0	12.562
3	22 28 23.88	1.8266	5 34 19.3	12.651	3	23 54 44.64	1.7064	4 36 57.2	12.544
4	22 30 13.35	1.8255	5 21 39.7	12.666	4	23 56 32.39	1.7083	4 49 29.3	12.524
5	22 32 2.70	1.8244	5 8 59.3	12.680	5	23 58 20.18	1.7070	5 2 0.1	12.508
6	22 33 51.98	1.8233	4 56 18.1	12.693	6	0 0 8.03	1.7060	5 14 29.7	12.492
7	22 35 41.04	1.8222	4 43 36.1	12.705	7	0 1 55.94	1.7050	5 26 58.0	12.480
8	22 37 30.04	1.8212	4 30 53.4	12.717	8	0 3 43.91	1.6000	5 39 25.0	12.466
9	22 39 18.93	1.8201	4 18 10.0	12.729	9	0 5 31.94	1.6011	5 51 50.6	12.451
10	22 41 7.73	1.8194	4 5 25.9	12.739	10	0 7 20.04	1.6022	6 4 14.8	12.398
11	22 42 56.42	1.8186	3 52 41.3	12.748	11	0 9 8.21	1.6034	6 16 37.5	12.368
12	22 44 45.02	1.8182	3 39 56.1	12.756	12	0 10 56.45	1.6045	6 28 58.8	12.341
13	22 46 33.52	1.8176	3 27 10.3	12.763	13	0 12 44.76	1.6056	6 41 18.5	12.318
14	22 48 21.83	1.8169	3 14 24.1	12.773	14	0 14 33.16	1.6073	6 53 36.6	12.297
15	22 50 10.26	1.8160	3 1 37.5	12.780	15	0 16 21.64	1.6087	7 5 53.0	12.269
16	22 51 58.59	1.8150	2 48 50.6	12.786	16	0 18 10.21	1.6100	7 18 7.8	12.264
17	22 53 46.70	1.8138	2 36 3.1	12.791	17	0 19 58.87	1.6117	7 30 20.9	12.268
18	22 55 34.80	1.8121	2 23 15.5	12.794	18	0 21 47.62	1.6130	7 42 32.2	12.273
19	22 57 22.83	1.7900	2 10 27.6	12.799	19	0 23 36.46	1.6145	7 54 41.7	12.248
20	22 59 10.79	1.7890	1 57 39.6	12.802	20	0 25 25.40	1.6166	8 6 49.4	12.212
21	23 0 58.69	1.7879	1 44 51.3	12.806	21	0 27 14.44	1.6180	8 18 55.2	12.090
22	23 2 46.54	1.7870	1 32 3.0	12.808	22	0 29 3.59	1.6200	8 30 59.0	12.047
23	23 4 34.33	1.7860	1 19 14.6	12.808	23	0 30 52.84	1.6215	8 43 0.9	12.014
24	23 6 22.06	1.7861	S. 1 6 26.1	12.808	24	0 32 42.21	1.6237	N. 8 55 0.7	11.989

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Dif. for 1 m.	Declination.	Dif. for 1 m.	Hour.	Right Ascension.	Dif. for 1 m.	Declination.	Dif. for 1 m.
TUESDAY 9.					THURSDAY 11.				
0	0 32 42.21	1.8337	N. 8° 55' 0.7	11.980	0	2 3 14.92	1.9638	N. 17° 36' 23.3	9.444
1	0 34 31.69	1.8357	9 6 58.5	11.945	1	2 5 12.86	1.9676	17 45 47.8	9.372
2	0 36 21.29	1.8376	9 18 54.1	11.909	2	2 7 11.03	1.9713	17 55 8.0	9.300
3	0 38 11.00	1.8396	9 30 47.6	11.873	3	2 9 9.42	1.9752	18 4 23.8	9.228
4	0 40 0.84	1.8417	9 42 38.8	11.836	4	2 11 8.05	1.9790	18 13 35.1	9.180
5	0 41 50.80	1.8438	9 54 27.8	11.797	5	2 13 6.90	1.9828	18 22 41.9	9.076
6	0 43 40.89	1.8459	10 6 14.5	11.759	6	2 15 5.98	1.9867	18 31 44.2	9.000
7	0 45 31.11	1.8480	10 17 58.9	11.720	7	2 17 5.30	1.9905	18 40 41.9	8.922
8	0 47 21.47	1.8404	10 29 40.9	11.680	8	2 19 4.84	1.9943	18 49 35.0	8.845
9	0 49 11.96	1.8427	10 41 20.5	11.639	9	2 21 4.62	1.9980	18 58 23.4	8.768
10	0 51 2.59	1.8451	10 52 57.6	11.597	10	2 23 4.63	2.0017	19 7 7.0	8.692
11	0 52 53.37	1.8476	11 4 32.2	11.554	11	2 25 4.87	2.0055	19 15 45.8	8.608
12	0 54 44.29	1.8499	11 16 4.2	11.511	12	2 27 5.35	2.0100	19 24 19.8	8.526
13	0 56 35.36	1.8524	11 27 33.6	11.468	13	2 29 6.07	2.0139	19 32 48.9	8.444
14	0 58 26.58	1.8549	11 39 0.4	11.424	14	2 31 7.02	2.0178	19 41 13.1	8.361
15	1 0 17.95	1.8576	11 50 24.5	11.378	15	2 33 8.21	2.0219	19 49 32.3	8.277
16	1 2 9.48	1.8603	12 1 45.8	11.332	16	2 35 9.64	2.0260	19 57 46.4	8.192
17	1 4 1.17	1.8632	12 13 4.4	11.285	17	2 37 11.30	2.0300	20 5 55.5	8.108
18	1 5 53.02	1.8666	12 24 20.1	11.238	18	2 39 13.21	2.0339	20 13 59.4	8.021
19	1 7 45.04	1.8699	12 35 33.0	11.190	19	2 41 15.35	2.0378	20 21 58.1	7.935
20	1 9 37.22	1.8731	12 46 43.0	11.143	20	2 43 17.74	2.0419	20 29 51.6	7.847
21	1 11 29.57	1.8763	12 57 50.1	11.095	21	2 45 20.37	2.0460	20 37 39.8	7.759
22	1 13 22.09	1.8797	13 8 54.1	11.041	22	2 47 23.23	2.0497	20 45 22.7	7.667
23	1 15 14.78	1.8797	N. 13 19 55.1	10.990	23	2 49 26.33	2.0537	N. 20 53 0.2	7.569
WEDNESDAY 10.					FRIDAY 12.				
0	1 17 7.65	1.8827	N 13 30 53.0	10.939	0	2 51 29.67	2.0577	N. 21 0 32.3	7.469
1	1 19 0.70	1.8857	13 41 47.7	10.886	1	2 53 33.25	2.0617	21 7 58.9	7.367
2	1 20 53.93	1.8887	13 52 39.1	10.833	2	2 55 37.08	2.0657	21 15 20.0	7.265
3	1 22 47.34	1.8918	14 3 27.3	10.778	3	2 57 41.14	2.0697	21 22 35.6	7.162
4	1 24 40.94	1.8949	14 14 12.1	10.731	4	2 59 45.44	2.0737	21 29 45.5	7.058
5	1 26 34.73	1.8980	14 24 53.7	10.684	5	3 1 49.98	2.0777	21 36 49.8	6.952
6	1 28 28.70	1.9011	14 35 31.8	10.636	6	3 3 54.76	2.0817	21 43 48.3	6.847
7	1 30 22.86	1.9043	14 46 6.6	10.589	7	3 5 59.78	2.0857	21 50 41.1	6.741
8	1 32 17.22	1.9076	14 66 37.8	10.491	8	3 8 5.04	2.0896	21 57 28.1	6.636
9	1 34 11.77	1.9111	15 7 5.5	10.432	9	3 10 10.53	2.0935	22 4 9.2	6.530
10	1 36 6.53	1.9144	15 17 29.6	10.372	10	3 12 16.26	2.0975	22 10 44.5	6.425
11	1 38 1.48	1.9176	15 27 50.1	10.310	11	3 14 22.23	2.1015	22 17 13.8	6.320
12	1 39 56.64	1.9210	15 38 6.7	10.249	12	3 16 28.44	2.1054	22 23 37.2	6.215
13	1 41 52.00	1.9243	15 48 19.8	10.186	13	3 18 34.88	2.1093	22 29 54.5	6.110
14	1 43 47.56	1.9277	15 58 29.1	10.123	14	3 20 41.56	2.1132	22 36 5.8	6.005
15	1 45 43.33	1.9313	16 8 34.5	10.058	15	3 22 48.46	2.1170	22 42 10.9	5.900
16	1 47 39.32	1.9349	16 18 36.1	9.994	16	3 24 55.60	2.1209	22 48 9.9	5.795
17	1 49 35.52	1.9384	16 28 33.8	9.928	17	3 27 2.97	2.1247	22 54 2.7	5.690
18	1 51 31.93	1.9419	16 38 27.5	9.860	18	3 29 10.56	2.1284	22 59 49.2	5.585
19	1 53 28.55	1.9454	16 48 17.1	9.793	19	3 31 18.38	2.1322	23 5 29.5	5.480
20	1 55 25.38	1.9490	16 58 2.7	9.726	20	3 33 26.44	2.1363	23 11 3.4	5.375
21	1 57 22.43	1.9527	17 7 44.1	9.658	21	3 35 34.73	2.1399	23 16 31.0	5.270
22	1 59 19.71	1.9564	17 17 21.4	9.589	22	3 37 43.23	2.1435	23 21 52.1	5.165
23	2 1 17.30	1.9601	17 26 54.5	9.519	23	3 39 51.95	2.1473	23 27 6.8	5.060
24	2 3 14.92	1.9638	N. 17 36 23.3	9.444	24	3 42 0.89	2.1509	N. 23 32 15.0	4.955

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
SATURDAY 13.					MONDAY 15.				
0	h m s	"	N. 23° 32' 15.0"	6.081	0	h m s	"	N. 25° 19' 25.9"	0.798
1	3 42 0.89	2.1808	23 32 15.0	6.081	1	5 28 42.05	2.2744	25 19 25.9	0.798
2	3 44 10.05	2.1845	23 37 16.6	4.971	2	5 30 58.55	2.2766	25 18 34.0	0.800
3	3 46 19.43	2.1892	23 42 11.6	4.961	3	5 33 15.12	2.2767	25 17 34.3	1.061
4	3 48 29.03	2.1918	23 47 0.0	4.750	4	5 35 31.75	2.2778	25 16 26.6	1.194
5	3 50 38.84	2.1953	23 51 41.7	4.689	5	5 37 48.45	2.2788	25 15 11.0	1.326
6	3 52 48.86	2.1988	23 56 16.7	4.626	6	5 40 5.21	2.2797	25 13 47.4	1.469
7	3 54 59.09	2.1792	24 0 44.9	4.413	7	5 42 22.02	2.2805	25 12 15.9	1.591
8	3 57 9.53	2.1787	24 5 6.3	4.300	8	5 44 38.87	2.2818	25 10 36.4	1.726
9	3 59 20.18	2.1792	24 9 20.9	4.185	9	5 46 55.77	2.2820	25 8 48.9	1.859
10	4 1 31.03	2.1834	24 13 28.6	4.070	10	5 49 12.71	2.2827	25 6 53.4	1.993
11	4 3 42.07	2.1867	24 17 29.4	3.955	11	5 51 29.69	2.2833	25 4 50.0	2.128
12	4 5 53.32	2.1891	24 21 23.2	3.838	12	5 53 46.71	2.2839	25 2 38.7	2.260
13	4 8 4.76	2.1923	24 25 10.1	3.723	13	5 56 3.76	2.2843	25 0 19.4	2.391
14	4 10 16.40	2.1955	24 28 50.0	3.606	14	5 58 20.83	2.2847	24 57 52.1	2.521
15	4 12 28.22	2.1986	24 32 22.8	3.487	15	6 0 37.93	2.2851	24 55 16.8	2.656
16	4 14 40.23	2.2017	24 35 48.5	3.369	16	6 2 55.04	2.2853	24 52 33.5	2.788
17	4 16 52.43	2.2048	24 39 7.1	3.250	17	6 5 12.17	2.2856	24 49 42.2	2.921
18	4 19 4.81	2.2078	24 42 18.6	3.131	18	6 7 29.31	2.2858	24 46 42.9	3.056
19	4 21 17.37	2.2108	24 45 22.9	3.010	19	6 9 46.46	2.2859	24 43 35.6	3.190
20	4 23 40.11	2.2137	24 48 19.9	2.890	20	6 12 3.62	2.2860	24 40 20.3	3.320
21	4 25 43.02	2.2166	24 51 9.7	2.769	21	6 14 20.78	2.2860	24 36 57.1	3.453
22	4 27 56.10	2.2194	24 53 52.1	2.646	22	6 16 37.94	2.2860	24 33 25.9	3.586
23	4 30 9.35	2.2222	24 56 27.3	2.524	23	6 18 55.10	2.2860	24 29 46.8	3.718
24	4 32 22.77	2.2250	N. 24 58 55.1	2.402		6 21 12.24	2.2860	N. 24 25 59.7	3.851
SUNDAY 14.					TUESDAY 16.				
0	4 34 36.35	2.2277	N. 25 1 15.6	2.279	0	6 23 20.37	2.2864	N. 24 22 4.6	3.984
1	4 36 50.09	2.2303	25 3 28.6	2.156	1	6 25 46.49	2.2863	24 18 1.6	4.116
2	4 39 3.99	2.2330	25 5 34.2	2.030	2	6 28 3.59	2.2863	24 13 50.7	4.247
3	4 41 18.04	2.2358	25 7 32.3	1.906	3	6 30 20.67	2.2865	24 9 31.9	4.380
4	4 43 32.23	2.2378	25 9 23.0	1.781	4	6 32 37.73	2.2864	24 5 5.1	4.515
5	4 45 46.57	2.2403	25 11 6.1	1.656	5	6 34 54.76	2.2866	24 0 30.4	4.644
6	4 48 1.06	2.2428	25 12 41.7	1.530	6	6 37 11.76	2.2869	23 55 47.8	4.776
7	4 50 15.68	2.2448	25 14 9.7	1.408	7	6 39 28.72	2.2873	23 50 57.4	4.906
8	4 52 30.44	2.2471	25 15 30.1	1.276	8	6 41 45.64	2.2877	23 45 59.0	5.038
9	4 54 45.33	2.2493	25 16 42.9	1.149	9	6 44 2.52	2.2870	23 40 52.8	5.169
10	4 57 0.35	2.2514	25 17 48.0	1.021	10	6 46 19.36	2.2868	23 35 38.7	5.300
11	4 59 15.50	2.2534	25 18 45.5	0.894	11	6 48 36.16	2.2798	23 30 16.8	5.430
12	5 1 30.76	2.2553	25 19 35.3	0.768	12	6 50 52.91	2.2788	23 24 47.1	5.560
13	5 3 46.14	2.2573	25 20 17.4	0.646	13	6 53 9.61	2.2778	23 19 9.6	5.689
14	5 6 1.63	2.2593	25 20 51.7	0.507	14	6 55 26.25	2.2769	23 13 24.4	5.818
15	5 8 17.24	2.2611	25 21 18.3	0.378	15	6 57 42.84	2.2760	23 7 31.4	5.947
16	5 10 32.96	2.2628	25 21 37.1	0.248	16	6 59 59.37	2.2750	23 1 30.7	6.075
17	5 12 48.78	2.2644	25 21 48.1	0.118	17	7 2 15.84	2.2740	22 55 22.3	6.204
18	5 15 4.69	2.2660	25 21 51.3	0.011	18	7 4 32.25	2.2730	22 49 6.2	6.331
19	5 17 20.70	2.2676	25 21 46.7	0.140	19	7 6 48.60	2.2718	22 42 42.5	6.459
20	5 19 36.80	2.2691	25 21 34.3	0.272	20	7 9 4.87	2.2706	22 36 11.1	6.586
21	5 21 52.99	2.2705	25 21 14.0	0.408	21	7 11 21.07	2.2694	22 29 32.1	6.710
22	5 24 9.26	2.2719	25 20 45.9	0.546	22	7 13 37.20	2.2683	22 22 45.5	6.840
23	5 26 25.62	2.2733	25 20 9.8	0.686	23	7 15 53.27	2.2672	22 15 51.3	6.966
24	5 28 42.05	2.2744	N. 25 19 25.9	0.798	24	7 18 9.27	2.2660	N. 22 8 49.5	7.091

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Dist. for 1 m.	Declination.	Dist. for 1 m.	Hour.	Right Ascension.	Dist. for 1 m.	Declination.	Dist. for 1 m.
WEDNESDAY 17.					FRIDAY 19.				
0	7 18 9.27	2.2669	N.22° 8' 49.5"	7.001	0	9 5 13.45	2.1970	N.14° 14' 39.1"	12.297
1	7 20 25.18	2.2668	22 1 40.2	7.217	1	9 7 25.27	2.1969	14 2 12.5	12.488
2	7 22 41.02	2.2667	21 54 23.4	7.241	2	9 9 36.96	2.1968	13 49 40.5	12.678
3	7 24 56.77	2.2666	21 46 59.2	7.466	3	9 11 48.62	2.1968	13 37 3.1	12.867
4	7 27 12.44	2.2665	21 39 27.6	7.698	4	9 14 0.22	2.1969	13 24 20.4	12.755
5	7 29 28.03	2.2663	21 31 48.6	7.713	5	9 16 11.77	2.1969	13 11 32.4	12.843
6	7 31 43.54	2.2678	21 24 2.1	7.686	6	9 18 23.26	2.1911	12 58 39.2	12.930
7	7 33 58.96	2.2663	21 16 8.4	7.666	7	9 20 34.70	2.1968	12 45 40.8	12.015
8	7 36 14.30	2.2549	21 8 7.3	8.079	8	9 22 46.09	2.1968	12 32 37.3	12.100
9	7 38 29.55	2.2634	20 59 58.9	8.200	9	9 24 57.44	2.1967	12 19 28.8	12.183
10	7 40 44.71	2.2619	20 51 43.3	8.320	10	9 27 8.74	2.1968	12 6 15.3	12.266
11	7 42 59.78	2.2608	20 43 20.4	8.440	11	9 29 20.00	2.1973	11 52 56.9	12.347
12	7 45 14.76	2.2499	20 34 50.4	8.560	12	9 31 31.22	2.1967	11 39 33.6	12.427
13	7 47 29.65	2.2478	20 26 13.2	8.678	13	9 33 42.41	2.1962	11 26 5.6	12.506
14	7 49 44.44	2.2458	20 17 28.9	8.797	14	9 35 53.56	2.1968	11 12 32.8	12.585
15	7 51 59.15	2.2443	20 8 37.5	8.915	15	9 38 4.68	2.1962	10 58 55.3	12.662
16	7 54 13.76	2.2428	19 59 39.0	9.032	16	9 40 15.78	2.1948	10 45 13.3	12.737
17	7 56 28.28	2.2413	19 50 33.5	9.149	17	9 42 26.85	2.1943	10 31 26.8	12.812
18	7 58 42.70	2.2398	19 41 21.1	9.266	18	9 44 37.90	2.1940	10 17 35.8	12.886
19	8 0 57.03	2.2381	19 32 1.7	9.380	19	9 46 48.93	2.1967	10 3 40.5	12.966
20	8 3 11.27	2.2365	19 22 35.5	9.494	20	9 48 59.95	2.1968	9 49 40.8	13.030
21	8 5 25.41	2.2349	19 13 2.4	9.608	21	9 51 10.95	2.1968	9 35 36.9	13.100
22	8 7 39.46	2.2334	19 3 22.5	9.721	22	9 53 21.95	2.1968	9 21 28.8	13.168
23	8 9 53.42	2.2318	N.18° 53' 35.8"	9.834	23	9 55 32.95	2.1968	N. 9 7 16.6	13.237
THURSDAY 18.					SATURDAY 20.				
0	8 12 7.28	2.2303	N.18° 43' 42.4"	9.948	0	9 57 43.94	2.1962	N. 8 53 0.3	13.304
1	8 14 21.04	2.2286	18 33 42.3	10.067	1	9 59 54.93	2.1962	8 38 40.1	13.370
2	8 16 34.71	2.2271	18 23 35.5	10.186	2	10 2 5.93	2.1962	8 24 15.9	13.435
3	8 18 48.29	2.2256	18 13 22.1	10.377	3	10 4 16.93	2.1966	8 9 47.9	13.497
4	8 21 1.78	2.2240	18 3 2.2	10.386	4	10 6 27.95	2.1966	7 55 16.2	13.559
5	8 23 15.17	2.2225	17 52 35.8	10.494	5	10 8 38.99	2.1941	7 40 40.8	13.619
6	8 25 28.48	2.2210	17 42 2.9	10.601	6	10 10 50.04	2.1944	7 26 1.9	13.678
7	8 27 41.69	2.2194	17 31 23.6	10.708	7	10 13 1.12	2.1948	7 11 19.4	13.738
8	8 29 54.81	2.2179	17 20 37.9	10.814	8	10 15 12.22	2.1962	6 56 33.5	13.792
9	8 32 7.84	2.2164	17 9 45.9	10.919	9	10 17 23.35	2.1966	6 41 44.2	13.849
10	8 34 20.78	2.2149	16 58 47.6	11.024	10	10 19 34.52	2.1964	6 26 51.6	13.902
11	8 36 33.64	2.2133	16 47 43.0	11.127	11	10 21 45.72	2.1971	6 11 55.9	13.955
12	8 38 46.41	2.2118	16 36 32.3	11.230	12	10 23 56.97	2.1976	5 56 57.0	14.007
13	8 40 59.10	2.2102	16 25 15.4	11.331	13	10 26 8.26	2.1968	5 41 55.0	14.067
14	8 43 11.70	2.2088	16 13 52.5	11.432	14	10 28 19.60	2.1968	5 26 50.1	14.105
15	8 45 24.32	2.2073	16 2 23.5	11.533	15	10 30 31.00	2.1964	5 11 42.3	14.143
16	8 47 36.66	2.2057	15 50 48.5	11.633	16	10 32 42.45	2.1913	4 56 31.7	14.180
17	8 49 49.02	2.2043	15 39 7.6	11.733	17	10 34 53.96	2.1924	4 41 18.4	14.244
18	8 52 1.30	2.2028	15 27 20.8	11.833	18	10 37 5.54	2.1966	4 26 2.4	14.297
19	8 54 13.51	2.2013	15 15 28.1	11.933	19	10 39 17.18	2.1947	4 10 43.9	14.350
20	8 56 25.64	2.2010	15 3 29.7	12.033	20	10 41 28.90	2.1968	3 55 22.9	14.378
21	8 58 37.70	2.2006	14 51 25.5	12.133	21	10 43 40.69	2.1973	3 39 59.5	14.406
22	9 0 49.68	2.1998	14 39 15.7	12.233	22	10 45 52.56	2.1966	3 24 33.9	14.445
23	9 3 1.60	2.1981	14 27 0.2	12.333	23	10 48 4.52	2.2001	3 9 6.0	14.481
24	9 5 13.45	2.1970	N.14° 14' 39.1"	12.397	24	10 50 16.57	2.2016	N. 2 53 36.1	14.515

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
SUNDAY 21.					TUESDAY 23.				
0	10 50 16.57	2.2916	N. 9° 53' 36.1"	15.515	0	12 30 0.17	2.2529	S. 9° 39' 14.9"	15.151
1	10 52 28.71	2.2923	2 38 4.1	15.548	1	12 41 21.55	2.2587	9 54 22.4	15.007
2	10 54 40.95	2.2948	2 22 30.3	15.679	2	12 43 43.21	2.2633	10 9 26.6	15.041
3	10 56 53.29	2.2966	2 6 54.6	15.810	3	12 46 5.14	2.2679	10 24 27.4	14.983
4	10 59 5.73	2.2983	1 51 17.1	15.933	4	12 48 27.36	2.2727	10 39 24.6	14.923
5	11 1 18.28	2.2102	1 35 38.0	15.955	5	12 50 49.87	2.2777	10 54 18.1	14.860
6	11 3 30.95	2.2121	1 19 57.3	15.980	6	12 53 12.68	2.2825	11 9 7.8	14.795
7	11 5 43.73	2.2140	1 4 15.1	15.714	7	12 55 35.77	2.2873	11 23 53.5	14.738
8	11 7 56.63	2.2161	0 48 31.5	15.735	8	12 57 59.16	2.2922	11 38 35.2	14.680
9	11 10 9.66	2.2183	0 32 46.7	15.756	9	13 0 22.65	2.2972	11 53 12.7	14.620
10	11 12 22.82	2.2205	0 17 0.7	15.775	10	13 2 46.84	2.3022	12 7 45.9	14.515
11	11 14 36.12	2.2228	N. 0 1 13.7	15.791	11	13 5 11.12	2.3073	12 22 14.6	14.440
12	11 16 49.55	2.2251	S. 0 14 34.2	15.807	12	13 7 35.71	2.3124	12 36 38.8	14.364
13	11 19 3.13	2.2275	0 30 23.1	15.821	13	13 10 0.61	2.3175	12 50 58.3	14.286
14	11 21 16.85	2.2300	0 46 12.8	15.833	14	13 12 25.81	2.3226	13 5 13.0	14.203
15	11 23 30.73	2.2327	1 2 3.1	15.843	15	13 14 51.32	2.3277	13 19 22.7	14.120
16	11 25 44.77	2.2353	1 17 54.0	15.852	16	13 17 17.14	2.3329	13 33 27.4	14.035
17	11 27 58.97	2.2380	1 33 45.4	15.859	17	13 19 43.27	2.3381	13 47 26.9	13.947
18	11 30 13.33	2.2408	1 49 37.1	15.865	18	13 22 9.71	2.3432	14 1 21.1	13.858
19	11 32 27.86	2.2435	2 5 29.2	15.869	19	13 24 36.46	2.3484	14 15 9.9	13.766
20	11 34 42.55	2.2464	2 21 21.4	15.870	20	13 27 3.52	2.3537	14 28 53.1	13.673
21	11 36 57.43	2.2494	2 37 13.6	15.870	21	13 29 30.90	2.3590	14 42 30.6	13.579
22	11 39 12.49	2.2525	2 53 5.8	15.869	22	13 31 58.59	2.3643	14 56 2.3	13.479
23	11 41 27.73	2.2556	S. 3 8 57.8	15.863	23	13 34 26.59	2.3696	S. 15 9 28.1	13.379
MONDAY 22.					WEDNESDAY 24.				
0	11 43 43.16	2.2588	S. 3 24 49.6	15.850	0	13 36 54.91	2.3749	S. 15 22 47.8	13.278
1	11 45 58.79	2.2621	3 40 41.0	15.822	1	13 39 23.54	2.3798	15 36 1.3	13.173
2	11 48 14.61	2.2654	3 56 31.9	15.843	2	13 41 52.49	2.3847	15 49 8.5	13.066
3	11 50 30.63	2.2687	4 12 22.2	15.862	3	13 44 21.75	2.3896	16 2 9.3	12.958
4	11 52 46.85	2.2721	4 28 11.8	15.880	4	13 46 51.32	2.3945	16 15 3.5	12.847
5	11 55 3.28	2.2757	4 44 0.6	15.905	5	13 49 21.21	2.3997	16 27 51.0	12.736
6	11 57 19.93	2.2793	4 59 48.5	15.739	6	13 51 51.40	2.4049	16 40 31.8	12.621
7	11 59 36.79	2.2829	5 15 35.3	15.770	7	13 54 21.91	2.4111	16 53 5.6	12.506
8	12 1 53.87	2.2865	5 31 20.9	15.799	8	13 56 52.73	2.4163	17 5 32.5	12.388
9	12 4 11.17	2.2902	5 47 5.3	15.797	9	13 59 23.68	2.4214	17 17 52.2	12.268
10	12 6 28.70	2.2940	6 2 48.2	15.793	10	14 1 55.30	2.4265	17 30 4.7	12.146
11	12 8 46.47	2.2982	6 18 29.6	15.675	11	14 4 27.04	2.4316	17 42 9.8	12.022
12	12 11 4.48	2.3023	6 34 9.3	15.647	12	14 6 59.08	2.4366	17 54 7.4	11.896
13	12 13 22.74	2.3063	6 49 47.3	15.617	13	14 9 31.43	2.4416	18 5 57.4	11.769
14	12 15 41.23	2.3101	7 5 28.4	15.585	14	14 12 4.07	2.4465	18 17 39.7	11.640
15	12 17 59.95	2.3141	7 20 57.5	15.550	15	14 14 37.01	2.4515	18 29 14.2	11.509
16	12 20 18.92	2.3183	7 36 29.5	15.515	16	14 17 10.25	2.4564	18 40 40.8	11.376
17	12 22 38.15	2.3227	7 51 59.3	15.478	17	14 19 43.78	2.4613	18 51 59.3	11.240
18	12 24 57.65	2.3271	8 7 26.7	15.438	18	14 22 17.60	2.4661	19 3 9.7	11.104
19	12 27 17.40	2.3314	8 22 51.7	15.398	19	14 24 51.71	2.4709	19 14 11.8	10.965
20	12 29 37.42	2.3358	8 38 14.0	15.350	20	14 27 26.10	2.4756	19 25 5.5	10.825
21	12 31 57.70	2.3403	8 53 33.6	15.303	21	14 30 0.77	2.4801	19 35 50.8	10.683
22	12 34 18.26	2.3448	9 8 50.4	15.256	22	14 32 35.71	2.4847	19 46 27.5	10.539
23	12 36 39.06	2.3493	9 24 4.2	15.204	23	14 35 10.93	2.4892	19 56 55.5	10.394
24	12 39 0.17	2.3539	S. 9 39 14.9	15.151	24	14 37 46.41	2.4938	S. 20 7 14.8	10.247

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Dif. for 1 m.	Declination.	Dif. for 1 m.	Hour.	Right Ascension.	Dif. for 1 m.	Declination.	Dif. for 1 m.
THURSDAY 25.					SATURDAY 27.				
0	14 37 46.41	2.6996	S. 20° 7' 14.8"	10.947	0	16 45 21.85	2.6714	S. 25° 6' 53.9"	1.966
1	14 40 22.16	2.6990	20 17 25.2	10.999	1	16 48 2.07	2.6693	25 8 45.7	1.773
2	14 42 58.17	2.6983	20 27 26.7	9.949	2	16 50 42.17	2.6672	25 10 26.7	1.591
3	14 45 34.43	2.6964	20 37 19.1	9.797	3	16 53 22.14	2.6650	25 11 56.8	1.411
4	14 48 10.94	2.6106	20 47 2.4	9.646	4	16 56 1.97	2.6628	25 13 16.1	1.230
5	14 50 47.70	2.6147	20 56 36.5	9.490	5	16 58 41.65	2.6600	25 14 24.5	1.049
6	14 53 24.70	2.6186	21 6 1.2	9.333	6	17 1 21.17	2.6572	25 15 22.0	0.900
7	14 56 1.93	2.6223	21 15 16.5	9.175	7	17 4 0.52	2.6543	25 16 8.8	0.690
8	14 58 39.38	2.6261	21 24 22.3	9.017	8	17 6 39.69	2.6513	25 16 44.8	0.510
9	15 1 17.06	2.6298	21 33 18.6	8.857	9	17 9 18.68	2.6482	25 17 10.1	0.331
10	15 3 54.96	2.6334	21 42 5.2	8.696	10	17 11 57.47	2.6448	25 17 24.6	0.153
11	15 6 33.07	2.6368	21 50 42.1	8.532	11	17 14 36.05	2.6413	25 17 28.5	0.022
12	15 9 11.38	2.6402	21 59 9.1	8.368	12	17 17 14.42	2.6377	25 17 21.9	0.196
13	15 11 49.89	2.6434	22 7 26.3	8.203	13	17 19 52.57	2.6339	25 17 4.7	0.374
14	15 14 28.59	2.6466	22 15 33.5	8.036	14	17 22 30.49	2.6301	25 16 37.0	0.649
15	15 17 7.48	2.6497	22 23 30.7	7.869	15	17 25 8.18	2.6261	25 15 58.8	0.732
16	15 19 46.55	2.6528	22 31 17.8	7.700	16	17 27 45.62	2.6219	25 15 10.2	0.596
17	15 22 25.79	2.6553	22 38 54.7	7.530	17	17 30 22.81	2.6176	25 14 11.2	1.095
18	15 25 5.19	2.6579	22 46 21.4	7.369	18	17 32 59.74	2.6132	25 13 2.0	1.299
19	15 27 44.74	2.6604	22 53 37.8	7.196	19	17 35 36.39	2.6086	25 11 42.5	1.410
20	15 30 24.44	2.6628	23 0 43.8	7.014	20	17 38 12.76	2.6038	25 10 12.8	1.660
21	15 33 4.28	2.6652	23 7 39.5	6.840	21	17 40 48.65	2.6001	25 8 32.9	1.748
22	15 35 44.26	2.6673	23 14 24.7	6.665	22	17 43 24.65	2.5962	25 6 43.0	1.915
23	15 38 24.36	2.6693	S. 23° 20' 59.4"	6.490	23	17 46 0.15	2.5901	S. 25° 4' 43.1"	2.081
FRIDAY 26.					SUNDAY 28.				
0	15 41 4.57	2.6711	S. 23° 27' 23.5"	6.314	0	17 48 35.34	2.5889	S. 25° 2' 33.2"	2.247
1	15 43 44.89	2.6726	23 33 37.1	6.137	1	17 51 10.22	2.5796	25 0 13.4	2.411
2	15 46 25.31	2.6744	23 39 40.0	5.960	2	17 53 44.77	2.5731	24 57 43.8	2.572
3	15 49 5.82	2.6766	23 45 32.2	5.780	3	17 56 18.99	2.5677	24 55 4.5	2.736
4	15 51 46.41	2.6772	23 51 13.7	5.601	4	17 58 52.89	2.5621	24 52 15.5	2.906
5	15 54 27.08	2.6783	23 56 44.4	5.421	5	18 1 26.44	2.5563	24 49 16.9	2.086
6	15 57 7.81	2.6798	24 2 4.3	5.241	6	18 3 59.65	2.5505	24 46 8.7	2.315
7	15 59 48.60	2.6802	24 7 13.4	5.060	7	18 6 32.51	2.5448	24 42 51.1	2.370
8	16 2 29.44	2.6810	24 12 11.6	4.879	8	18 9 5.00	2.5385	24 39 24.2	2.526
9	16 5 10.32	2.6816	24 16 58.9	4.697	9	18 11 37.13	2.5324	24 35 47.9	2.681
10	16 7 51.23	2.6820	24 21 35.3	4.515	10	18 14 8.89	2.5263	24 32 2.4	2.835
11	16 10 32.16	2.6822	24 26 0.8	4.334	11	18 16 40.28	2.5201	24 28 7.7	2.986
12	16 13 13.09	2.6823	24 30 15.4	4.151	12	18 19 11.30	2.5138	24 24 4.0	4.136
13	16 15 54.03	2.6823	24 34 19.0	3.970	13	18 21 41.93	2.5073	24 19 51.3	4.283
14	16 18 34.96	2.6821	24 38 11.6	3.785	14	18 24 12.17	2.5007	24 15 29.7	4.434
15	16 21 15.88	2.6818	24 41 53.3	3.603	15	18 26 42.02	2.4942	24 10 59.2	4.580
16	16 23 56.78	2.6813	24 45 24.0	3.419	16	18 29 11.47	2.4875	24 6 20.0	4.736
17	16 26 37.64	2.6806	24 48 43.6	3.235	17	18 31 40.52	2.4807	24 1 32.1	4.889
18	16 29 18.46	2.6798	24 51 52.3	3.053	18	18 34 9.16	2.4740	23 56 35.7	5.010
19	16 31 59.22	2.6789	24 54 50.0	2.870	19	18 36 37.40	2.4672	23 51 30.8	5.151
20	16 34 39.91	2.6778	24 57 36.8	2.687	20	18 39 5.22	2.4603	23 46 17.5	5.299
21	16 37 20.53	2.6762	25 0 12.5	2.503	21	18 41 32.63	2.4532	23 40 55.9	5.429
22	16 40 1.06	2.6748	25 2 37.2	2.320	22	18 43 59.62	2.4464	23 35 26.0	5.565
23	16 42 41.50	2.6733	25 4 51.0	2.139	23	18 46 26.19	2.4393	23 29 48.1	5.709
24	16 45 21.85	2.6714	S. 25° 6' 53.9"	1.965	24	18 48 52.33	2.4321	S. 23° 24' 2.0"	5.834

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
MONDAY 29.					TUESDAY 30.				
0	18 48 52.33	2.4231	S. 23° 24' 2.0	5.334	0	19 45 8.24	2.2567	S. 20° 29' 10.0	8.595
1	18 51 18.04	2.4260	23 18 8.0	5.365	1	19 47 23.37	2.2465	20 20 31.4	8.591
2	18 53 43.33	2.4178	23 12 6.0	6.066	2	19 49 38.06	2.2412	20 11 47.0	8.787
3	18 56 8.18	2.4106	23 5 56.4	6.236	3	19 51 52.31	2.2340	20 2 56.9	8.881
4	18 58 32.60	2.4034	22 59 38.8	6.365	4	19 54 6.14	2.2267	19 54 1.2	8.973
5	19 0 56.59	2.3962	22 53 13.7	6.480	5	19 56 19.51	2.2188	19 45 0.1	9.064
6	19 3 20.14	2.3893	22 46 41.1	6.605	6	19 58 32.46	2.2122	19 35 53.5	9.155
7	19 5 43.24	2.3814	22 40 1.1	6.728	7	20 0 44.96	2.2051	19 26 41.5	9.243
8	19 8 5.91	2.3742	22 33 13.7	6.850	8	20 2 57.07	2.1980	19 17 24.3	9.330
9	19 10 28.14	2.3668	22 26 19.0	6.970	9	20 5 8.74	2.1909	19 8 1.9	9.415
10	19 12 49.92	2.3593	22 19 17.2	7.089	10	20 7 19.96	2.1838	18 58 34.5	9.499
11	19 15 11.26	2.3520	22 12 8.3	7.205	11	20 9 30.80	2.1767	18 49 2.0	9.583
12	19 17 32.16	2.3445	22 4 52.5	7.321	12	20 11 41.19	2.1697	18 39 24.5	9.665
13	19 19 52.61	2.3372	21 57 29.7	7.435	13	20 13 51.16	2.1627	18 29 42.2	9.744
14	19 22 12.62	2.3298	21 50 0.2	7.547	14	20 16 0.72	2.1559	18 19 55.2	9.823
15	19 24 32.18	2.3223	21 42 24.0	7.659	15	20 18 9.87	2.1491	18 10 3.4	9.900
16	19 26 51.30	2.3149	21 34 41.1	7.769	16	20 20 18.61	2.1423	18 0 7.1	9.976
17	19 29 9.97	2.3075	21 26 51.7	7.877	17	20 22 26.94	2.1355	17 50 6.2	10.051
18	19 31 28.20	2.3001	21 18 55.8	7.984	18	20 24 34.87	2.1286	17 40 0.9	10.125
19	19 33 45.98	2.2927	21 10 53.6	8.089	19	20 26 42.40	2.1222	17 29 51.2	10.197
20	19 36 3.32	2.2853	21 2 45.1	8.192	20	20 28 49.54	2.1167	17 19 37.2	10.268
21	19 38 20.22	2.2779	20 54 30.4	8.295	21	20 30 56.28	2.1090	17 9 19.0	10.338
22	19 40 36.67	2.2705	20 46 9.6	8.396	22	20 33 2.63	2.1026	16 58 56.6	10.405
23	19 42 52.68	2.2631	20 37 42.8	8.495	23	20 35 8.60	2.0963	16 48 30.2	10.474
24	19 45 8.24	2.2557	S. 20° 29' 10.0	8.595	24	20 37 14.18	2.0898	S. 16° 37' 59.7	10.541

PHASES OF THE MOON.

☾ Last Quarter,	d	h	m
● New Moon,	1	18	24.1
☽ First Quarter,	9	18	55.7
○ Full Moon,	17	18	45.5
	24	10	23.6

☾ Apogee,	d	h
☾ Perigee,	9	15.3
	23	22.5

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Star's Name and Position.	Noon.	P. L. of Dist.	III ^h .	P. L. of Dist.	VI ^h .	P. L. of Dist.	IX ^h .	P. L. of Dist.
1	Spica W.	70° 23' 47"	2686	72° 4' 18"	2647	73° 44' 26"	2664	75° 24' 10"	2681
	Antares W.	24 40 29	2629	26 21 2	2646	28 1 12	2663	29 40 59	2679
	Fomalhaut E.	61 13 0	2668	59 44 30	2120	58 16 45	2158	56 49 46	2196
	α Pegasi E.	80 18 43	2678	78 41 33	2697	77 4 49	2716	75 28 30	2735
	SUN E.	99 23 49	2673	97 50 55	2691	96 18 25	2909	94 46 18	2637
2	Spica W.	83 37 13	2682	85 14 44	2677	86 51 55	2692	88 28 45	2707
	Antares W.	37 54 21	2686	39 31 57	2674	41 9 12	2689	42 46 7	2704
	Fomalhaut E.	49 47 33	2434	48 25 55	2490	47 5 20	2560	45 45 51	2613
	α Pegasi E.	67 33 19	2633	65 59 34	2653	64 26 15	2673	62 53 22	2694
	SUN E.	87 11 22	2615	85 41 28	2693	84 11 55	2649	82 42 43	2665
3	Spica W.	96 28 5	2778	96 3 2	2791	99 37 42	2804	101 12 5	2817
	Antares W.	50 45 53	2774	52 20 55	2798	53 55 41	2799	55 30 10	2813
	Fomalhaut E.	39 27 17	4091	38 15 58	4126	37 6 21	4241	35 58 34	4370
	α Pegasi E.	55 15 34	2691	53 45 22	2694	52 15 39	2647	50 46 24	2671
	SUN E.	75 21 33	2143	73 54 15	2157	72 27 14	2171	71 0 30	2186
4	Antares W.	63 18 37	2670	64 51 34	2680	66 24 18	2691	67 56 49	2691
	α Pegasi E.	43 27 50	2206	42 1 48	2227	40 36 23	2271	39 11 38	2309
	SUN E.	63 50 53	2280	62 25 43	2263	61 0 48	2275	59 36 7	2296
5	Antares W.	75 36 21	2646	77 7 42	2654	78 38 53	2692	80 9 54	2696
	α Aquilæ W.	34 30 24	2433	35 21 55	2424	36 15 36	2404	37 11 18	2382
	SUN E.	52 35 49	2326	51 12 22	2345	49 49 6	2358	48 26 1	2367
6	Antares W.	87 42 48	2691	89 12 59	2697	90 43 3	2613	92 13 0	2618
	α Aquilæ W.	42 14 41	4440	43 19 26	4366	44 25 18	4300	45 32 11	4239
	SUN E.	41 33 13	2411	40 11 9	2420	38 49 15	2428	37 27 30	2437
7	α Aquilæ W.	51 19 10	4011	52 30 39	2676	53 42 42	2644	54 55 17	2615
	SUN E.	30 41 13	2481	29 20 28	2491	27 59 54	2602	26 39 32	2612
12	SUN W.	24 29 23	2507	25 49 39	2496	27 10 8	2486	28 30 49	2473
	Pollux E.	64 19 52	2693	62 51 21	2679	61 22 46	2677	59 54 8	2674
	Jupiter E.	90 14 37	2680	88 45 26	2646	87 16 10	2643	85 46 50	2639
	Regulus E.	101 9 50	2661	99 40 40	2647	98 11 26	2643	96 42 7	2639
	Saturn E.	106 12 6	2649	104 42 54	2645	103 13 37	2642	101 44 16	2637
13	SUN W.	35 17 9	2424	36 38 58	2415	38 0 57	2407	39 23 6	2396
	Pollux E.	52 30 6	2699	51 1 6	2666	49 32 2	2652	48 2 54	2649
	Jupiter E.	78 18 50	2615	76 48 56	2609	75 18 55	2604	73 48 47	2599
	Regulus E.	89 14 9	2614	87 44 14	2609	86 14 13	2604	84 44 5	2597
	Saturn E.	94 16 7	2614	92 46 11	2607	91 16 7	2601	89 45 56	2596
14	SUN W.	46 16 28	2621	47 39 41	2641	49 3 5	2622	50 26 40	2621
	Pollux E.	40 36 15	2684	39 6 45	2623	37 37 12	2620	36 7 37	2620
	Jupiter E.	66 16 18	2666	64 45 23	2666	63 14 18	2661	61 43 4	2643
	Regulus E.	77 11 26	2664	75 40 28	2666	74 9 20	2649	72 38 3	2640
	Saturn E.	82 13 5	2662	80 42 5	2656	79 10 56	2647	77 39 37	2639
15	SUN W.	57 27 38	2667	58 52 28	2655	60 17 32	2643	61 42 50	2621
	Aldebaran W.	16 50 18	2625	18 10 15	2408	19 32 28	2311	20 56 27	2229
	Pollux E.	28 39 41	2637	27 10 14	2644	25 40 56	2653	24 11 51	2699
	Jupiter E.	54 4 19	2691	52 32 1	2691	50 59 30	2681	49 26 47	2672

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Star's Name and Position.	Midnight.	P. L. of Dist.	XVh.	P. L. of Dist.	XVIIIh.	P. L. of Dist.	XXIh.	P. L. of Dist.
1	Spica W.	77° 3' 31"	2607	78° 42' 30"	2614	80° 21' 6"	2620	81° 59' 20"	2646
	Antares W.	31 20 23	2606	32 59 25	2611	34 38 5	2626	36 16 24	2643
	Fomalhaut E.	55 23 35	2641	53 58 14	2626	52 33 45	2632	51 10 11	2631
	α Pegasi E.	73 52 37	2764	72 17 9	2774	70 42 7	2758	69 7 30	2613
	SUN E.	93 14 34	2646	91 43 13	2663	90 12 14	2661	88 41 37	2666
2	Spica W.	90 5 15	2723	91 41 26	2726	93 17 18	2750	94 52 51	2765
	Antares W.	44 22 42	2718	45 58 58	2723	47 34 55	2747	49 10 33	2760
	Fomalhaut E.	44 27 31	2623	43 10 25	2768	41 54 37	2626	40 40 12	2624
	α Pegasi E.	61 20 55	2614	59 48 54	2625	58 17 20	2657	56 46 13	2679
	SUN E.	81 13 51	2661	79 45 18	2666	78 17 4	2612	76 49 9	2628
3	Spica W.	102 46 11	2620	104 20 1	2641	105 53 36	2652	107 26 56	2665
	Antares W.	57 4 22	2626	58 38 18	2626	60 11 59	2646	61 45 25	2650
	Fomalhaut E.	34 52 46	4612	33 49 5	4671	32 47 41	4650	31 48 46	5061
	α Pegasi E.	49 17 39	2606	47 49 24	2621	46 21 40	2648	44 54 28	2676
	SUN E.	69 34 3	2696	68 7 52	2612	66 41 57	2625	65 16 18	2627
4	Antares W.	69 29 7	2610	71 1 13	2620	72 33 7	2626	74 4 49	2627
	α Pegasi E.	37 47 36	2647	36 24 19	2629	35 1 50	2428	33 40 13	2486
	SUN E.	58 11 36	2626	56 47 22	2607	55 23 19	2616	53 59 28	2626
5	Antares W.	81 40 46	2676	83 11 29	2623	84 42 3	2629	86 12 29	2626
	α Aquilæ W.	38 8 51	4626	39 8 6	4714	40 8 54	4612	41 11 8	4622
	SUN E.	47 3 7	2677	45 40 24	2626	44 17 51	2628	42 55 27	2402
6	Antares W.	93 42 50	2623	95 12 34	2629	96 42 12	2632	98 11 45	2626
	α Aquilæ W.	46 40 0	4126	47 48 40	4126	48 58 7	4096	50 8 18	4048
	SUN E.	36 5 55	2446	34 44 30	2464	33 23 14	2463	32 2 8	2472
7	α Aquilæ W.	56 8 22	2629	57 21 54	2664	58 35 50	2641	59 50 10	2619
	SUN E.	25 19 22	2626	23 59 27	2641	22 39 48	2656	21 20 26	2672
12	SUN W.	29 51 43	2463	31 12 48	2454	32 34 4	2444	33 55 31	2424
	Pollux E.	58 25 27	2671	56 56 42	2620	55 27 54	2626	53 59 2	2622
	Jupiter E.	84 17 25	2624	82 47 55	2620	81 18 19	2626	79 48 88	2620
	Regulus E.	95 12 43	2624	93 43 13	2620	92 13 38	2626	90 43 57	2620
	Saturn E.	100 14 49	2623	98 45 17	2629	97 15 40	2624	95 45 57	2618
13	SUN W.	40 45 25	2626	42 7 55	2679	43 30 35	2670	44 53 26	2620
	Pollux E.	46 33 42	2646	45 4 26	2643	43 35 6	2629	42 5 42	2627
	Jupiter E.	79 18 33	2626	70 48 12	2626	69 17 42	2620	67 47 4	2673
	Regulus E.	83 13 49	2623	81 43 26	2626	80 12 55	2676	78 42 15	2671
	Saturn E.	88 15 38	2629	86 45 12	2623	85 14 38	2677	83 43 56	2629
14	SUN W.	51 50 27	2611	53 14 26	2620	54 38 37	2629	56 3 1	2678
	Pollux E.	34 38 1	2629	33 8 24	2620	31 38 48	2620	30 9 13	2623
	Jupiter E.	60 11 40	2626	58 40 6	2627	57 8 21	2616	55 36 25	2610
	Regulus E.	71 6 35	2623	69 34 57	2623	68 3 7	2614	66 31 6	2625
	Saturn E.	76 8 8	2621	74 36 29	2623	73 4 39	2614	71 32 38	2626
15	SUN W.	63 8 23	2619	64 34 10	2626	66 0 13	2626	67 26 31	2678
	Aldebaran W.	22 21 50	2611	23 48 22	2623	25 15 52	2621	26 44 13	2622
	Pollux E.	22 43 4	2626	21 14 40	2614	19 46 47	2648	18 19 36	2628
	Jupiter E.	47 53 52	2623	46 20 44	2621	44 47 22	2641	43 13 47	2629

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Star's Name and Position.	Noon.	P. L. of DM.	III ^h	P. L. of DM.	VI ^h	P. L. of DM.	IX ^h	P. L. of DM.
15	Regulus E.	64° 58' 54"	2896	63° 26' 30"	2888	61° 53' 53"	2876	60° 21' 3"	2866
	Saturn E.	70 0 25	2896	68 28 1	2887	66 55 25	2876	65 22 36	2866
16	SUN W.	68 53 6	2168	70 19 57	2151	71 47 5	2137	73 14 30	2128
	Aldebaran W.	28 13 21	2017	29 43 13	2085	31 13 45	2064	32 44 56	2025
	Mars W.	26 36 29	2043	28 5 49	2028	29 35 27	2014	31 5 23	2006
	Jupiter E.	41 39 57	2818	40 5 53	2808	38 31 35	2796	36 57 2	2785
	Regulus E.	52 33 29	2810	50 59 14	2798	49 24 44	2786	47 49 58	2773
	Saturn E.	57 35 13	2813	56 1 2	2801	54 26 36	2790	52 51 55	2779
	Spica E.	106 35 31	2801	105 1 4	2788	103 26 21	2775	101 51 21	2768
17	SUN W.	80 36 6	2046	82 5 22	2029	83 34 59	2013	85 4 56	2006
	Aldebaran W.	40 29 22	2802	42 3 47	2780	43 38 41	2769	45 14 3	2758
	Mars W.	38 39 48	2921	40 11 40	2905	41 43 53	2898	43 16 27	2871
	Jupiter E.	29 0 40	2731	27 24 41	2721	25 48 29	2711	24 12 4	2702
	Regulus E.	39 52 0	2710	38 15 34	2697	36 38 50	2684	35 1 48	2671
	Saturn E.	44 54 37	2719	43 18 22	2706	41 41 50	2694	40 5 2	2682
	Spica E.	93 51 53	2692	92 15 3	2678	90 37 53	2662	89 0 22	2647
18	SUN W.	92 40 1	2909	94 12 8	2891	95 44 38	2873	97 17 31	2865
	Aldebaran W.	53 17 41	2637	54 55 46	2618	56 34 17	2608	58 13 15	2578
	Mars W.	51 4 44	2766	52 39 30	2768	54 14 40	2760	55 50 14	2722
	Regulus E.	26 52 23	2610	25 13 42	2600	23 34 47	2591	21 55 39	2585
	Saturn E.	31 57 11	2629	30 18 55	2620	28 40 27	2612	27 1 49	2607
	Spica E.	80 47 32	2667	79 7 52	2651	77 27 49	2634	75 47 23	2617
19	SUN W.	105 7 51	2763	106 43 8	2744	108 18 49	2726	109 54 55	2707
	Aldebaran W.	66 34 43	2483	68 16 20	2465	69 58 23	2445	71 40 53	2427
	Mars W.	63 54 3	2640	65 32 3	2622	67 10 28	2604	68 49 18	2586
	Pollux W.	24 53 0	2601	26 31 53	2586	28 11 34	2573	29 52 1	2562
	Spica E.	67 19 20	2432	65 36 31	2415	63 53 17	2397	62 9 38	2380
	Antares E.	112 59 45	2426	111 16 47	2408	109 33 24	2391	107 49 36	2374
20	SUN W.	118 1 31	2617	119 40 3	2599	121 18 59	2582	122 58 19	2565
	Aldebaran W.	80 19 56	2336	82 5 3	2319	83 50 35	2302	85 36 32	2286
	Mars W.	77 9 47	2494	78 51 9	2476	80 32 56	2459	82 15 7	2441
	Pollux W.	38 24 29	2388	40 8 49	2346	41 53 42	2324	43 39 7	2308
	Spica E.	53 25 12	2293	51 39 5	2279	49 52 34	2262	48 5 39	2246
	Antares E.	99 4 23	2287	97 18 5	2270	95 31 21	2258	93 44 12	2237
21	Aldebaran W.	94 32 13	2207	96 20 30	2192	98 9 9	2179	99 58 8	2166
	Mars W.	90 52 7	2359	92 36 42	2344	94 21 38	2328	96 6 56	2314
	Pollux W.	52 33 31	2208	54 21 46	2192	56 10 26	2175	57 59 31	2169
	Jupiter W.	26 12 54	2206	28 1 13	2187	29 50 0	2169	31 39 14	2163
	Regulus W.	15 36 24	2274	17 23 1	2241	19 10 28	2210	20 58 40	2183
	Spica E.	39 5 21	2172	37 16 12	2169	35 26 43	2147	33 36 55	2134
	Antares E.	84 42 32	2159	82 53 2	2144	81 3 10	2130	79 12 56	2116
22	Mars W.	104 58 31	2249	106 45 46	2237	108 33 18	2227	110 21 5	2217
	Pollux W.	67 10 34	2090	69 1 48	2079	70 53 19	2068	72 45 7	2059
	Jupiter W.	40 51 23	2061	42 42 52	2068	44 34 40	2067	46 26 45	2047
	Regulus W.	30 8 22	2083	31 59 40	2073	33 51 20	2061	35 43 20	2049
	Saturn W.	25 41 1	2149	27 30 46	2126	29 21 5	2106	31 11 55	2088
	Antares E.	69 56 42	2064	68 4 32	2043	66 12 5	2038	64 19 22	2024

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Star's Name and Position.	Midnight.	P. L. of Dist.	XVh.	P. L. of Dist.	XVIIIh.	P. L. of Dist.	XXIh.	P. L. of Dist.
15	Regulus E.	58° 48' 0"	2825	57° 14' 44"	2845	55° 41' 14"	2833	54° 7' 29"	2821
	Saturn E.	63 49 34	2856	62 16 19	2846	60 42 51	2836	59 9 9	2825
16	SUN W.	74 42 12	3108	76 10 12	3092	77 38 31	3077	79 7 9	3061
	Aldebaran W.	34 16 43	2898	35 49 5	2872	37 22 0	2848	38 55 26	2825
	Mars W.	32 35 38	2984	34 6 11	2908	35 37 4	2953	37 8 16	2937
	Jupiter E.	35 22 15	2774	33 47 13	2763	32 11 56	2759	30 36 25	2741
	Regulus E.	46 14 55	2761	44 39 36	2749	43 4 1	2736	41 28 9	2723
	Saturn E.	51 16 59	2767	49 41 48	2754	48 6 20	2742	46 30 36	2731
	Spica E.	100 16 4	2749	98 40 29	2735	97 4 36	7721	95 28 24	2707
17	SUN W.	86 35 14	2979	88 5 53	2992	89 36 54	2945	91 8 16	2927
	Aldebaran W.	46 49 52	2718	48 26 8	2697	50 2 52	2677	51 40 3	2657
	Mars W.	44 49 23	2655	46 22 40	2626	47 56 19	2621	49 30 20	2603
	Jupiter E.	22 35 27	2694	20 58 39	2688	19 21 43	2663	17 44 40	2678
	Regulus E.	33 24 29	2658	31 46 53	2645	30 8 59	2633	28 30 49	2621
	Saturn E.	38 27 58	2671	36 50 39	2659	35 13 4	2648	33 35 14	2638
	Spica E.	87 22 31	2632	85 44 19	2615	84 5 45	2600	82 26 50	2683
18	SUN W.	98 50 47	2837	100 24 27	2818	101 58 31	2800	103 32 59	2782
	Aldebaran W.	59 52 40	2559	61 32 31	2540	63 12 49	2521	64 53 33	2502
	Mars W.	57 26 11	2714	59 2 32	2695	60 39 18	2678	62 16 28	2659
	Regulus E.	20 16 23	2681	18 37 2	2661	16 57 41	2585	15 18 26	2593
	Saturn E.	25 23 4	2604	23 44 15	2605	22 5 27	2610	20 26 45	2618
	Spica E.	74 6 34	2500	72 25 21	2484	70 43 45	2467	69 1 45	2449
19	SUN W.	111 31 25	2689	113 8 20	2671	114 45 39	2652	116 23 23	2635
	Aldebaran W.	73 23 49	2409	75 7 11	2390	76 51 0	2372	78 35 15	2354
	Mars W.	70 28 33	2567	72 8 13	2548	73 48 19	2530	75 28 50	2512
	Pollux W.	31 33 11	2473	33 15 3	2445	34 57 34	2418	36 40 43	2392
	Spica E.	60 25 34	2383	58 41 6	2346	56 56 13	2328	55 10 55	2311
	Antares E.	106 5 24	2357	104 20 47	2339	102 35 44	2322	100 50 16	2304
20	SUN W.	124 38 2	2548	126 18 8	2533	127 58 36	2516	129 39 27	2500
	Aldebaran W.	87 22 53	2269	89 9 38	2253	90 56 47	2237	92 44 19	2223
	Mars W.	83 57 43	2424	85 40 43	2408	87 24 7	2391	89 7 55	2374
	Pollux W.	45 25 2	2283	47 11 27	2268	48 58 21	2245	50 45 42	2226
	Spica E.	46 18 20	2221	44 30 39	2216	42 42 35	2201	40 54 9	2186
	Antares E.	91 56 39	2221	90 8 43	2205	88 20 23	2189	86 31 39	2174
21	Aldebaran W.	101 47 27	2183	103 37 5	2141	105 27 2	2129	107 17 17	2118
	Mars W.	97 52 35	2300	99 38 34	2286	101 24 54	2273	103 11 33	2260
	Pollux W.	59 49 0	2144	61 38 52	2130	63 29 5	2116	65 19 39	2108
	Jupiter W.	33 28 53	2136	35 18 57	2121	37 9 24	2107	39 0 13	2098
	Regulus W.	22 47 33	2160	24 37 1	2139	26 27 0	2130	28 17 28	2108
	Spica E.	31 46 48	2123	29 56 24	2113	28 5 45	2103	26 14 51	2086
	Antares E.	77 22 21	2103	75 31 26	2089	73 40 10	2077	71 48 35	2065
22	Mars W.	112 9 7	2208	113 57 23	2200	115 45 51	2193	117 34 31	2184
	Pollux W.	74 37 11	2048	76 29 30	2040	78 22 2	2032	80 14 46	2025
	Jupiter W.	48 19 6	2087	50 11 42	2028	52 4 32	2020	53 57 35	2013
	Regulus W.	37 35 38	2088	39 28 13	2028	41 21 4	2019	43 14 9	2010
	Saturn W.	33 3 12	2073	34 54 53	2059	36 46 56	2046	38 39 18	2035
	Antares E.	62 26 25	2015	60 33 14	2007	58 39 51	2000	56 46 16	1993

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Star's Name and Position.	Noon.	P. L. of Dist.	III ^h .	P. L. of Dist.	VI ^h .	P. L. of Dist.	IX ^h .	P. L. of Dist.
23	Pollux W.	82° 7' 42"	2019	84° 0' 47"	2023	85° 54' 1"	2008	87° 47' 23"	2008
	Jupiter W.	55 50 49	2007	57 44 13	2001	59 37 46	1996	61 31 26	1992
	Regulus W.	45 7 28	2008	47 0 58	1996	48 54 38	1991	50 48 28	1987
	Saturn W.	40 31 57	2026	42 24 51	2017	44 17 58	2010	46 11 17	2004
	Antares E.	54 52 30	1987	52 58 35	1983	51 4 32	1977	49 10 22	1974
	α Aquilæ E.	107 19 27	2581	105 40 6	2588	104 0 23	2561	102 20 20	2536
24	Pollux W.	97 15 12	1996	99 8 49	2000	101 2 24	2001	102 55 56	2008
	Jupiter W.	71 0 58	1984	72 54 53	1986	74 48 56	1987	76 42 51	1989
	Regulus W.	60 18 47	1977	62 12 58	1977	64 7 9	1979	66 1 17	1981
	Saturn W.	55 39 43	1986	57 33 36	1993	59 27 29	1999	61 21 21	1991
	Antares E.	39 38 30	1986	37 44 5	1980	35 49 42	1971	33 55 22	1974
	α Aquilæ E.	93 56 48	2607	92 15 45	2607	90 34 42	2588	88 53 40	2613
25	Jupiter W.	86 11 5	2014	88 4 18	2021	89 57 19	2020	91 50 8	2028
	Regulus W.	75 30 40	2004	77 24 8	2011	79 17 25	2019	81 10 30	2026
	Saturn W.	70 49 33	2013	72 42 49	2019	74 35 54	2026	76 28 47	2033
	Spica W.	21 31 16	2028	23 23 59	2028	25 16 38	2028	27 9 11	2044
	α Aquilæ E.	80 30 31	2566	78 50 35	2570	77 10 59	2586	75 31 45	2604
	Fomalhaut E.	105 32 59	2441	103 50 22	2440	102 7 47	2443	100 25 14	2446
26	Jupiter W.	101 10 25	2002	103 1 36	2106	104 52 27	2116	106 42 58	2128
	Regulus W.	90 32 12	2061	92 23 41	2098	94 14 51	2107	96 5 40	2120
	Saturn W.	85 49 35	2068	87 40 53	2100	89 31 52	2113	91 22 31	2126
	Spica W.	36 29 21	2097	38 20 40	2098	40 11 42	2111	42 2 25	2122
	α Aquilæ E.	67 22 50	2720	65 46 50	2708	64 11 33	2797	62 37 1	2824
	Fomalhaut E.	91 54 25	2468	90 12 55	2506	88 31 42	2614	86 50 48	2620
α Pegasi E.	113 2 40	2244	111 15 18	2293	109 28 8	2291	107 41 11	2270	
27	Saturn W.	100 30 15	2204	102 18 36	2220	104 6 33	2238	105 54 4	2266
	Spica W.	51 10 52	2196	52 59 26	2212	54 47 36	2229	56 35 21	2246
	α Aquilæ E.	54 57 41	2071	53 28 56	2120	52 1 23	2168	50 35 6	2203
	Fomalhaut E.	78 32 12	2626	76 53 52	2649	75 16 3	2673	73 38 46	2690
	α Pegasi E.	98 50 37	2236	97 5 30	2251	95 20 45	2267	93 36 23	2284
	SUN E.	143 56 52	2630	142 16 20	2646	140 26 9	2661	138 56 20	2676
28	Spica W.	65 27 44	2234	67 12 54	2223	68 57 38	2271	70 41 55	2289
	Antares W.	19 46 6	2237	21 31 11	2246	23 15 51	2273	25 0 5	2290
	α Aquilæ E.	43 46 2	2709	42 29 25	2626	41 14 49	2662	40 2 22	2693
	Fomalhaut E.	65 41 29	2648	64 8 3	2682	62 35 21	2618	61 3 25	2645
	α Pegasi E.	85 0 46	2475	83 18 57	2494	81 37 36	2615	79 56 43	2626
	SUN E.	130 42 56	2664	129 5 28	2684	127 28 26	2702	125 51 49	2721
29	Spica W.	79 16 33	2465	80 58 8	2608	82 39 17	2622	84 20 0	2640
	Antares W.	33 34 49	2482	35 16 27	2601	36 57 39	2620	38 38 25	2626
	Fomalhaut E.	53 36 21	2177	52 9 44	2229	50 44 9	2263	49 19 38	2343
	α Pegasi E.	71 39 32	2643	70 1 34	2666	68 24 7	2697	66 47 10	2711
	SUN E.	117 55 9	2620	116 21 7	2630	114 47 30	2660	113 14 19	2690
	30	Spica W.	92 37 13	2682	94 15 25	2649	95 53 14	2668	97 30 39	2684
Antares W.		46 55 56	2629	48 34 12	2646	50 12 5	2663	51 49 34	2681
Fomalhaut E.		42 35 21	2706	41 18 40	2706	40 3 34	2695	38 56 9	2694
α Pegasi E.		58 50 18	2681	57 16 31	2697	55 43 17	2682	54 10 36	2670
SUN E.		105 34 42	2677	104 4 0	2686	102 33 41	2614	101 3 45	2622

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Star's Name and Position.	Midnight.	P. L. of Dist.	XVh.	P. L. of Dist.	XVIIIh.	P. L. of Dist.	XXIh.	P. L. of Dist.
23	Pollux W.	89° 40' 50"	2001	91° 34' 22"	2000	93° 27' 57"	1998	95° 21' 34"	1996
	Jupiter W.	63 25 13	1989	65 19 4	1986	67 13 0	1985	69 6 58	1984
	Regulus W.	52 42 21	1983	54 36 22	1981	56 30 27	1978	58 24 36	1977
	Saturn W.	48 4 45	1989	49 58 21	1984	51 52 4	1991	53 45 52	1989
	Antares E.	47 16 6	1971	45 21 46	1968	43 27 22	1967	41 32 56	1967
	α Aquilæ E.	100 40 0	2328	98 59 26	2320	97 18 41	2314	95 37 47	2310
24	Pollux W.	104 49 23	2009	106 42 44	2014	108 35 57	2019	110 29 1	2026
	Jupiter W.	78 36 43	1992	80 30 30	1986	82 24 10	2001	84 17 42	2007
	Regulus W.	67 55 22	1984	69 49 22	1987	71 43 16	1993	73 37 2	1998
	Saturn W.	63 15 10	1983	65 8 55	1986	67 2 35	2001	68 56 8	2006
	Antares E.	32 1 7	1978	30 6 58	1982	28 12 56	1988	26 19 3	1995
	α Aquilæ E.	87 12 43	2317	85 31 53	2324	83 51 13	2333	82 10 45	2343
25	Jupiter W.	93 42 43	2048	95 35 3	2066	97 27 7	2068	99 18 55	2080
	Regulus W.	83 3 21	2037	84 55 58	2046	86 48 20	2057	88 40 25	2069
	Saturn W.	78 21 27	2044	80 13 53	2068	82 6 4	2064	83 57 58	2075
	Spica W.	29 1 36	2061	30 53 51	2088	32 45 55	2066	34 37 46	2077
	α Aquilæ E.	73 52 56	2026	72 14 35	2048	70 36 45	2078	68 59 29	2701
	Fomalhaut E.	96 42 45	2451	97 0 23	2466	95 18 11	2467	93 36 11	2477
	26	Jupiter W.	108 33 7	2147	110 22 54	2168	112 12 18	2178	114 1 18	2194
Regulus W.		97 56 8	2126	99 46 14	2149	101 35 58	2166	103 25 19	2181
Saturn W.		93 12 48	2141	95 2 44	2156	96 52 18	2171	98 41 29	2188
Spica W.		43 52 49	2126	45 42 53	2151	47 32 35	2168	49 21 55	2180
α Aquilæ E.		61 3 17	2074	59 30 25	2019	57 58 30	2066	56 27 34	2016
Fomalhaut E.		85 10 16	2346	83 30 7	2364	81 50 22	2368	80 11 3	2368
α Pegasi E.		105 54 28	2323	104 8 2	2324	102 21 54	2307	100 36 5	2322
27	Saturn W.	107 41 8	2274	109 27 46	2292	111 13 57	2311	112 59 41	2331
	Spica W.	58 22 41	2262	60 9 36	2280	61 56 5	2296	63 42 8	2316
	α Aquilæ E.	49 10 11	2338	47 46 43	2419	46 24 48	2507	45 4 32	2604
	Fomalhaut E.	72 2 3	2728	70 25 56	2753	68 50 27	2784	67 15 38	2815
	α Pegasi E.	91 52 25	2401	90 8 52	2419	88 25 44	2437	86 43 2	2456
	SUN E.	137 16 52	2693	135 37 47	2610	133 59 6	2628	132 20 49	2646
	28	Spica W.	72 25 45	2408	74 9 8	2428	75 52 3	2447	77 34 31	2466
Antares W.		26 43 54	2408	28 27 17	2426	30 10 14	2445	31 52 45	2464
α Aquilæ E.		38 52 14	4349	37 44 34	4422	36 39 33	4615	35 37 21	4681
Fomalhaut E.		59 32 16	2996	58 1 57	3087	56 32 30	3081	55 3 57	3128
α Pegasi E.		78 16 19	2556	76 36 23	2577	74 56 57	2599	73 18 0	2620
SUN E.		124 15 37	2741	122 39 51	2760	121 4 31	2780	119 29 37	2800
29		Spica W.	86 0 17	2559	87 40 9	2577	89 19 35	2596	90 58 36	2613
	Antares W.	40 18 46	2556	41 58 41	2574	43 38 11	2593	45 17 16	2611
	Fomalhaut E.	47 56 15	3405	46 34 4	3471	45 13 8	3544	43 53 32	3622
	α Pegasi E.	65 10 45	2785	63 34 51	2768	61 59 28	2782	60 24 37	2807
	SUN E.	111 41 34	2899	110 9 14	2919	108 37 19	2938	107 5 48	2956
	30	Spica W.	99 7 41	2701	100 44 20	2718	102 20 36	2738	103 56 29	2762
Antares W.		53 26 39	2906	55 3 21	2715	56 39 41	2731	58 15 40	2747
Fomalhaut E.		37 38 33	4124	36 28 54	4255	35 21 20	4401	34 16 0	4564
α Pegasi E.		52 38 30	2937	51 6 58	2955	49 36 1	2993	48 5 40	3023
SUN E.		99 34 12	3050	98 5 1	3069	96 36 13	3087	95 7 47	3108

AT GREENWICH APPARENT NOON.

Day of the Week.	Day of the Month.	THE SUN'S					Sideral Time of the Semi-diameter passing the Meridian.	Equation of Time, to be subtracted from Apparent Time.	D.M. for 1 hour.
		Apparent Right Ascension.	Diff. for 1 hour.	Apparent Declination.	Diff. for 1 hour.	Semi-diameter.			
		h m s	"	N. ° ' "	"	"' "	"	m s "	"
Wed.	1	2 34 30.39	9.544	N.15 9 24.7	45.21	15 54.08	66.07	3 4.50	0.313
Thur.	2	2 38 19.70	9.567	15 27 22.3	44.58	15 53.84	66.15	3 11.73	0.289
Fri.	3	2 42 9.58	9.591	15 45 4.7	43.94	15 53.60	66.23	3 18.38	0.265
Sat.	4	2 46 0.03	9.615	16 2 31.5	43.29	15 53.36	66.31	3 24.47	0.241
Sun.	5	2 49 51.06	9.639	16 19 42.5	42.62	15 53.12	66.39	3 29.99	0.217
Mon.	6	2 53 42.66	9.663	16 36 37.4	41.94	15 52.89	66.47	3 34.92	0.193
Tues.	7	2 57 34.85	9.687	16 53 15.8	41.25	15 52.67	66.55	3 39.28	0.169
Wed.	8	3 1 27.62	9.711	17 9 37.4	40.54	15 52.45	66.63	3 43.06	0.145
Thur.	9	3 5 20.96	9.735	17 25 41.8	39.82	15 52.23	66.71	3 46.26	0.121
Fri.	10	3 9 14.88	9.759	17 41 28.7	39.08	15 52.02	66.80	3 48.88	0.097
Sat.	11	3 13 9.37	9.783	17 56 57.7	38.33	15 51.82	66.89	3 50.94	0.073
Sun.	12	3 17 4.43	9.807	18 12 8.7	37.58	15 51.62	66.97	3 52.43	0.050
Mon.	13	3 21 0.08	9.831	18 27 1.4	36.81	15 51.42	67.05	3 53.33	0.027
Tues.	14	3 24 56.29	9.853	18 41 35.5	36.02	15 51.22	67.13	3 53.68	0.004
Wed.	15	3 28 53.05	9.876	18 55 50.7	35.23	15 51.03	67.21	3 53.48	0.020
Thur.	16	3 32 50.35	9.899	19 9 46.6	34.42	15 50.84	67.29	3 52.74	0.043
Fri.	17	3 36 48.20	9.922	19 23 23.0	33.60	15 50.66	67.37	3 51.45	0.066
Sat.	18	3 40 46.60	9.944	19 36 39.6	32.78	15 50.48	67.45	3 49.60	0.088
Sun.	19	3 44 45.55	9.967	19 49 36.4	31.94	15 50.30	67.53	3 47.22	0.110
Mon.	20	3 48 45.03	9.989	20 2 13.0	31.09	15 50.12	67.61	3 44.32	0.132
Tues.	21	3 52 45.03	10.011	20 14 28.9	30.23	15 49.95	67.69	3 40.88	0.154
Wed.	22	3 56 45.56	10.032	20 26 24.2	29.36	15 49.78	67.77	3 36.91	0.176
Thur.	23	4 0 46.60	10.053	20 37 58.6	28.49	15 49.61	67.84	3 32.44	0.198
Fri.	24	4 4 48.15	10.075	20 49 11.8	27.60	15 49.24	67.91	3 27.46	0.219
Sat.	25	4 8 50.22	10.096	21 0 3.7	26.71	15 49.28	67.98	3 21.96	0.239
Sun.	26	4 12 52.79	10.117	21 10 33.9	25.80	15 49.12	68.05	3 15.97	0.260
Mon.	27	4 16 55.86	10.137	21 20 42.2	24.88	15 48.96	68.12	3 9.48	0.281
Tues.	28	4 20 59.42	10.157	21 30 28.5	23.96	15 48.81	68.18	3 2.49	0.301
Wed.	29	4 25 3.46	10.176	21 39 52.6	23.03	15 48.66	68.24	2 55.03	0.321
Thur.	30	4 29 7.96	10.195	21 48 54.3	22.09	15 48.51	68.30	2 47.12	0.339
Fri.	31	4 33 12.90	10.214	21 57 33.3	21.14	15 48.37	68.36	2 38.76	0.357
Sat.	32	4 37 18.27	10.232	N.22 5 49.3	20.18	15 48.23	68.42	2 29.97	0.375

NOTE. — Mean Time of the Semi-diameter passing may be found by subtracting 0s.18 from the Sideral Time.

AT GREENWICH MEAN NOON.

THE SUN'S															
Day of the Week.	Day of the Month.	Apparent Right Ascension.		Diff. for 1 hour.	Apparent Declination.			Diff. for 1 hour.	Equation of Time, to be added to Mean Time.		Diff. for 1 hour.	Sidereal Time.			
		h	m		s	°	'		"	m		s	h	m	s
Wed.	1	2	34	30.88	9.544	N.15	9	27.1	45.21	3	4.51	0.313	2	37	35.89
Thur.	2	2	38	20.21	9.567	15	27	24.8	44.58	3	11.74	0.289	2	41	31.95
Fri.	3	2	42	10.11	9.591	15	45	7.2	43.94	3	18.39	0.265	2	45	28.50
Sat.	4	2	46	0.58	9.615	16	2	34.0	43.29	3	24.48	0.241	2	49	25.06
Sun.	5	2	49	51.62	9.639	16	19	45.0	42.62	3	30.00	0.217	2	53	21.62
Mon.	6	2	53	43.24	9.663	16	36	39.9	41.94	3	34.93	0.193	2	57	18.17
Tues.	7	2	57	35.44	9.687	16	53	18.3	41.25	3	39.29	0.169	3	1	14.73
Wed.	8	3	1	28.22	9.711	17	9	39.9	40.54	3	43.06	0.145	3	5	11.28
Thur.	9	3	5	21.57	9.735	17	25	44.3	39.82	3	46.27	0.121	3	9	7.84
Fri.	10	3	9	15.50	9.759	17	41	31.2	39.08	3	48.89	0.097	3	13	4.39
Sat.	11	3	13	10.00	9.783	17	57	0.2	38.33	3	50.95	0.073	3	17	0.95
Sun.	12	3	17	5.07	9.807	18	12	11.2	37.58	3	52.44	0.050	3	20	57.51
Mon.	13	3	21	0.72	9.831	18	27	3.9	36.81	3	53.34	0.027	3	24	54.06
Tues.	14	3	24	56.93	9.853	18	41	37.9	36.02	3	53.68	0.004	3	28	50.61
Wed.	15	3	28	53.69	9.876	18	55	53.0	35.23	3	53.48	0.020	3	32	47.17
Thur.	16	3	32	50.99	9.899	19	9	48.9	34.42	3	52.74	0.043	3	36	43.73
Fri.	17	3	36	48.84	9.922	19	23	25.2	33.60	3	51.45	0.066	3	40	40.29
Sat.	18	3	40	47.24	9.944	19	36	41.7	32.78	3	49.60	0.088	3	44	36.84
Sun.	19	3	44	46.18	9.967	19	49	38.4	31.94	3	47.22	0.110	3	48	33.40
Mon.	20	3	48	45.65	9.989	20	2	14.9	31.09	3	44.81	0.132	3	52	29.96
Tues.	21	3	52	45.65	10.011	20	14	30.8	30.23	3	40.87	0.154	3	56	26.52
Wed.	22	3	56	46.17	10.032	20	26	26.0	29.36	3	36.90	0.176	4	0	23.07
Thur.	23	4	0	47.20	10.053	20	38	0.3	28.49	3	32.43	0.198	4	4	19.63
Fri.	24	4	4	48.74	10.075	20	49	13.4	27.60	3	27.45	0.219	4	8	16.19
Sat.	25	4	8	50.79	10.096	21	0	5.2	26.71	3	21.95	0.239	4	12	12.74
Sun.	26	4	12	53.34	10.117	21	10	35.3	25.80	3	15.96	0.260	4	16	9.30
Mon.	27	4	16	56.39	10.137	21	20	43.5	24.88	3	9.47	0.281	4	20	5.86
Tues.	28	4	20	59.93	10.157	21	30	29.7	23.96	3	2.48	0.301	4	24	2.41
Wed.	29	4	25	3.95	10.176	21	39	53.7	23.03	2	55.02	0.321	4	27	58.97
Thur.	30	4	29	8.43	10.195	21	48	55.3	22.09	2	47.10	0.339	4	31	55.53
Fri.	31	4	33	13.35	10.214	21	57	34.2	21.14	2	38.74	0.357	4	35	52.09
Sat.	32	4	37	18.70	10.232	N.22	5	50.1	20.18	2	29.95	0.375	4	39	48.65

Note. — The Semidiameter for Mean Noon may be assumed the same as that for Apparent Noon.

AT GREENWICH MEAN NOON.									
Day of the Month.	Day of the Year.	THE SUN'S					Logarithm of the Radius Vector of the Earth.	Diff. for 1 hour.	Mean Time of Sidereal Ob.
		True LONGITUDE.		Diff. for 1 hour.	LATITUDE.				
		λ	λ'						
1	121	41° 3' 53.4"	3' 21.6"	145.39	-0.26	0.0035987	45.7	21 18 54.51	
2	122	42 2 1.9	1 30.0	145.33	0.40	.0037060	45.2	21 14 58.60	
3	123	42 60 9.0	59 37.0	145.27	0.51	.0038161	44.7	21 11 2.69	
4	124	43 58 14.7	57 42.5	145.21	0.60	.0039230	44.2	21 7 6.78	
5	125	44 56 19.1	55 46.7	145.15	0.67	.0040285	43.6	21 3 10.87	
6	126	45 54 22.0	53 49.5	145.09	0.72	.0041323	42.9	20 59 14.96	
7	127	46 52 23.4	51 50.8	145.03	0.73	.0042345	42.1	20 55 19.05	
8	128	47 50 23.3	49 50.6	144.97	0.71	.0043348	41.3	20 51 23.14	
9	129	48 48 21.7	47 48.8	144.91	0.65	.0044332	40.5	20 47 27.24	
10	130	49 46 18.6	45 45.5	144.84	0.57	.0045297	39.7	20 43 31.33	
11	131	50 44 13.9	43 40.7	144.77	0.48	.0046242	39.0	20 39 35.42	
12	132	51 42 7.6	41 34.3	144.70	0.38	.0047169	38.2	20 35 39.51	
13	133	52 39 59.7	39 26.2	144.63	0.26	.0048076	37.4	20 31 43.60	
14	134	53 37 50.1	37 16.4	144.56	+0.13	.0048964	36.7	20 27 47.69	
15	135	54 35 38.8	35 4.9	144.49	0.00	.0049836	36.0	20 23 51.78	
16	136	55 33 25.8	32 51.8	144.42	-0.11	.0050691	35.2	20 19 55.87	
17	137	56 31 11.1	30 37.0	144.35	0.20	.0051529	34.6	20 15 59.96	
18	138	57 28 54.7	28 20.4	144.38	0.29	.0052352	34.1	20 12 4.05	
19	139	58 26 36.6	26 2.1	144.31	0.35	.0053162	33.5	20 8 8.13	
20	140	59 24 17.0	23 42.3	144.15	0.36	.0053960	33.0	20 4 12.22	
21	141	60 21 56.0	21 21.2	144.09	0.34	.0054748	32.6	20 0 16.31	
22	142	61 19 33.6	18 58.7	144.03	0.30	.0055525	32.2	19 56 20.40	
23	143	62 17 9.8	16 34.7	143.98	0.23	.0056290	31.7	19 52 24.49	
24	144	63 14 44.7	14 9.4	143.93	0.14	.0057044	31.2	19 48 28.57	
25	145	64 12 18.4	11 42.9	143.88	-0.03	.0057788	30.7	19 44 32.66	
26	146	65 9 51.0	9 15.4	143.84	+0.10	.0058520	30.2	19 40 36.75	
27	147	66 7 22.6	6 46.8	143.80	0.24	.0059241	29.7	19 36 40.84	
28	148	67 4 53.3	4 17.3	143.76	0.38	.0059949	29.2	19 32 44.93	
29	149	68 2 23.2	1 47.0	143.72	0.52	.0060644	28.7	19 28 49.01	
30	150	68 59 52.2	59 15.8	143.69	0.64	.0061326	28.1	19 24 53.10	
31	151	69 57 20.4	56 43.9	143.67	0.73	.0061991	27.3	19 20 57.19	
32	152	70 54 47.9	54 11.2	143.64	+0.79	0.0062637	26.5	19 17 1.28	

NOTE. — λ corresponds to the true equinox of the date, λ' to the mean equinox of January 0d.

GREENWICH MEAN TIME.

THE MOON'S

Day of the Month.	SEMI-DIAMETER.		HORIZONTAL PARALLAX.			MERIDIAN PASSAGE.		AGE.	
	Noon.	Midnight.	Noon.	Diff. for 1 hour.	Midnight.	Diff. for 1 hour.	Diff. for 1 hour.		
							h m		
1	15' 21.6"	15' 15.2"	56' 15.8"	-2.03	55' 52.3"	-1.87	18 34.4	1.88	21.2
2	15 9.4	15 4.2	55 30.9	1.69	55 11.8	1.50	19 17.9	1.76	22.2
3	14 59.6	14 55.6	54 54.8	1.32	54 40.2	1.13	19 59.3	1.70	23.2
4	14 52.2	14 49.5	54 27.8	0.94	54 17.6	0.75	20 39.6	1.67	24.2
5	14 47.3	14 45.7	54 9.7	0.58	54 3.8	0.40	21 19.8	1.69	25.2
6	14 44.6	14 44.1	53 59.9	-0.24	53 58.0	-0.08	22 1.0	1.75	26.2
7	14 44.1	14 44.5	53 57.8	+0.05	53 59.1	+0.17	22 48.9	1.84	27.2
8	14 45.2	14 46.3	54 1.9	0.29	54 6.1	0.41	23 29.2	1.94	28.2
9	14 47.8	14 49.6	54 11.7	0.51	54 18.4	0.61	δ		29.2
10	14 51.8	14 54.3	54 26.4	0.71	54 35.4	0.80	0 17.0	2.04	0.5
11	14 57.1	15 0.1	54 45.5	0.89	54 56.8	0.98	1 7.2	2.13	1.5
12	15 3.5	15 7.1	55 9.1	1.07	55 22.5	1.16	1 59.1	2.19	2.5
13	15 11.1	15 15.3	55 37.0	1.25	55 52.6	1.35	2 51.9	2.20	3.5
14	15 19.9	15 24.7	56 9.3	1.44	56 27.1	1.52	3 44.2	2.15	4.5
15	15 29.8	15 35.2	56 45.9	1.61	57 5.6	1.69	4 35.3	2.10	5.5
16	15 40.8	15 46.6	57 26.3	1.75	57 47.6	1.81	5 25.0	2.05	6.5
17	15 52.6	15 58.6	58 9.5	1.84	58 31.7	1.85	6 13.8	2.02	7.5
18	16 4.6	16 10.5	58 53.7	1.83	59 15.3	1.77	7 2.3	2.03	8.5
19	16 16.1	16 21.4	59 35.9	1.67	59 55.2	1.53	7 51.6	2.09	9.5
20	16 26.1	16 30.1	60 12.4	1.34	60 27.1	1.11	8 43.0	2.20	10.5
21	16 33.3	16 35.5	60 38.8	0.83	60 46.9	+0.52	9 37.5	2.35	11.5
22	16 36.6	16 36.6	60 51.2	+0.18	60 51.3	-0.17	10 35.7	2.50	12.5
23	16 35.5	16 33.2	60 47.1	-0.53	60 38.7	0.88	11 37.3	2.62	13.5
24	16 29.8	16 25.4	60 26.2	1.20	60 10.0	1.51	12 40.8	2.64	14.5
25	16 20.1	16 13.9	59 50.3	1.76	59 27.9	1.98	13 43.4	2.55	15.5
26	16 7.2	16 0.0	59 3.2	2.14	58 36.8	2.25	14 42.6	2.38	16.5
27	15 52.6	15 45.1	58 9.5	2.29	57 42.0	2.29	15 37.4	2.18	17.5
28	15 37.7	15 30.5	57 14.8	2.25	56 48.2	2.17	16 27.3	1.99	18.5
29	15 23.6	15 17.1	56 22.8	2.06	55 59.0	1.91	17 13.2	1.84	19.5
30	15 11.1	15 5.7	55 37.0	1.74	55 17.2	1.56	17 56.1	1.75	20.5
31	15 0.9	14 56.8	54 59.6	1.37	54 44.4	1.16	18 37.2	1.70	21.5
32	14 53.3	14 50.5	54 31.7	-0.95	54 21.5	-0.74	19 17.7	1.69	22.5

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
WEDNESDAY 1.					FRIDAY 3.				
0	20 37 14.18	2.0886	S. 16° 37' 59.7"	10.441	0	22 11 22.82	1.8093	S. 7° 16' 25.0"	12.487
1	20 39 19.37	2.0883	16 27 25.3	10.006	1	22 13 14.28	1.8061	7 3 55.2	12.406
2	20 41 24.18	2.0770	16 16 47.0	10.870	2	22 15 5.56	1.8030	6 51 24.4	12.622
3	20 43 28.62	2.0708	16 6 4.9	10.732	3	22 16 56.66	1.8002	6 38 52.5	12.639
4	20 45 32.69	2.0647	15 55 19.1	10.794	4	22 18 47.59	1.8473	6 26 19.7	12.655
5	20 47 36.39	2.0585	15 44 29.6	10.864	5	22 20 38.35	1.8445	6 13 45.9	12.672
6	20 49 39.72	2.0525	15 33 36.6	10.913	6	22 22 28.94	1.8419	6 1 11.1	12.687
7	20 51 42.69	2.0465	15 22 40.0	10.972	7	22 24 19.37	1.8391	5 48 35.5	12.691
8	20 53 45.30	2.0405	15 11 40.0	11.028	8	22 26 9.64	1.8365	5 35 59.0	12.614
9	20 55 47.56	2.0347	15 0 36.6	11.083	9	22 27 59.76	1.8341	5 23 21.8	12.637
10	20 57 49.47	2.0290	14 49 30.0	11.137	10	22 29 49.74	1.8317	5 10 43.8	12.633
11	20 59 51.04	2.0232	14 38 20.1	11.192	11	22 31 39.57	1.8292	4 58 5.2	12.649
12	21 1 52.26	2.0175	14 27 7.0	11.244	12	22 33 29.26	1.8270	4 45 25.9	12.660
13	21 3 53.14	2.0119	14 15 50.8	11.295	13	22 35 18.82	1.8249	4 32 46.0	12.669
14	21 5 53.69	2.0064	14 4 31.6	11.345	14	22 37 8.25	1.8227	4 20 5.6	12.678
15	21 7 53.91	2.0009	13 53 9.4	11.395	15	22 38 57.55	1.8206	4 7 24.6	12.687
16	21 9 53.80	1.9955	13 41 44.2	11.443	16	22 40 46.73	1.8187	3 54 43.2	12.694
17	21 11 53.37	1.9901	13 30 16.2	11.490	17	22 42 35.80	1.8168	3 42 1.3	12.701
18	21 13 52.62	1.9849	13 18 45.4	11.537	18	22 44 24.75	1.8149	3 29 19.1	12.707
19	21 15 51.56	1.9797	13 7 11.8	11.582	19	22 46 13.59	1.8131	3 16 36.5	12.713
20	21 17 50.19	1.9745	12 55 35.6	11.625	20	22 48 2.33	1.8115	3 3 53.6	12.718
21	21 19 48.51	1.9695	12 43 56.8	11.668	21	22 49 50.97	1.8098	2 51 10.4	12.723
22	21 21 46.53	1.9645	12 32 15.4	11.711	22	22 51 39.51	1.8082	2 38 27.0	12.728
23	21 23 44.25	1.9595	S. 12° 20' 31.5"	11.752	23	22 53 27.96	1.8068	S. 2° 25' 43.4"	12.733
THURSDAY 2.					SATURDAY 4.				
0	21 25 41.67	1.9545	S. 12° 8' 45.1"	11.792	0	22 55 16.33	1.8054	S. 2° 12' 59.6"	12.731
1	21 27 38.81	1.9499	11 56 56.4	11.831	1	22 57 4.61	1.8040	2 0 15.7	12.733
2	21 29 35.66	1.9451	11 45 5.4	11.861	2	22 58 52.82	1.8028	1 47 31.8	12.732
3	21 31 32.23	1.9405	11 33 12.1	11.897	3	23 0 40.95	1.8016	1 34 47.9	12.733
4	21 33 28.53	1.9360	11 21 16.6	11.933	4	23 2 29.01	1.8004	1 22 3.9	12.731
5	21 35 24.55	1.9314	11 9 18.9	11.978	5	23 4 17.00	1.7993	1 9 20.1	12.730
6	21 37 20.30	1.9270	10 57 19.2	12.012	6	23 6 4.93	1.7983	0 56 36.3	12.728
7	21 39 15.79	1.9226	10 45 17.4	12.047	7	23 7 52.80	1.7974	0 43 52.7	12.726
8	21 41 11.02	1.9184	10 33 13.6	12.079	8	23 9 40.62	1.7965	0 31 9.2	12.723
9	21 43 6.00	1.9141	10 21 7.9	12.111	9	23 11 28.38	1.7956	0 18 26.0	12.717
10	21 45 0.72	1.9100	10 9 0.3	12.142	10	23 13 16.10	1.7949	S. 0° 5' 43.1"	12.713
11	21 46 55.20	1.9060	9 56 50.9	12.172	11	23 15 3.77	1.7942	N. 0° 6' 59.6"	12.708
12	21 48 49.43	1.9018	9 44 39.7	12.201	12	23 16 51.41	1.7936	0 19 41.9	12.703
13	21 50 43.42	1.8979	9 32 26.8	12.229	13	23 18 39.01	1.7930	0 32 23.9	12.697
14	21 52 37.18	1.8940	9 20 12.2	12.257	14	23 20 26.58	1.7925	0 45 5.5	12.690
15	21 54 30.70	1.8902	9 7 55.9	12.284	15	23 22 14.12	1.7920	0 57 46.6	12.681
16	21 56 24.01	1.8864	8 55 38.1	12.308	16	23 24 1.63	1.7916	1 10 27.2	12.672
17	21 58 17.09	1.8829	8 43 18.8	12.331	17	23 25 49.12	1.7914	1 23 07.3	12.663
18	22 0 9.96	1.8798	8 30 58.0	12.359	18	23 27 36.60	1.7911	1 35 46.8	12.654
19	22 2 2.61	1.8770	8 18 35.7	12.382	19	23 29 24.06	1.7910	1 48 25.8	12.643
20	22 3 55.05	1.8733	8 6 12.1	12.404	20	23 31 11.52	1.7908	2 1 4.0	12.633
21	22 5 47.29	1.8699	7 53 47.2	12.426	21	23 32 58.97	1.7908	2 13 41.6	12.620
22	22 7 39.33	1.8656	7 41 21.0	12.447	22	23 34 46.42	1.7908	2 26 18.4	12.607
23	22 9 31.17	1.8623	7 28 53.6	12.467	23	23 36 33.87	1.7909	2 38 54.5	12.595
24	22 11 22.82	1.8592	S. 7° 16' 25.0"	12.487	24	23 38 21.33	1.7910	N. 2° 51' 29.8"	12.581

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
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SUNDAY 5.

0.	h	m	s	"	N.	°	'	"	"
0.	23	38	21.33	1.7910	N.	2	51	29.8	12.561
1	23	40	8.79	1.7911		3	4	4.2	12.566
2	23	41	56.27	1.7914		3	16	37.7	12.551
3	23	43	43.76	1.7917		3	29	10.3	12.536
4	23	45	31.28	1.7921		3	41	42.0	12.519
5	23	47	18.82	1.7924		3	54	12.6	12.502
6	23	49	6.39	1.7930		4	6	42.2	12.484
7	23	50	53.99	1.7936		4	19	10.7	12.467
8	23	52	41.63	1.7943		4	31	38.2	12.448
9	23	54	29.31	1.7950		4	44	4.5	12.428
10	23	56	17.03	1.7956		4	56	29.6	12.406
11	23	58	4.79	1.7965		5	8	53.5	12.387
12	23	59	52.61	1.7974		5	21	16.1	12.366
13	0	1	40.48	1.7984		5	33	37.4	12.343
14	0	3	28.42	1.7995		5	45	57.3	12.320
15	0	5	16.42	1.8005		5	58	15.8	12.297
16	0	7	4.48	1.8015		6	10	32.9	12.272
17	0	8	52.61	1.8026		6	22	48.5	12.247
18	0	10	40.82	1.8040		6	35	2.6	12.222
19	0	12	29.10	1.8052		6	47	15.1	12.195
20	0	14	17.46	1.8066		6	59	26.0	12.166
21	0	16	5.91	1.8081		7	11	35.3	12.141
22	0	17	54.44	1.8095		7	23	42.9	12.112
23	0	19	43.07	1.8113	N.	7	35	48.8	12.084

TUESDAY 7.

0	h	m	s	"	N.	°	'	"	"
0	1	5	38.13	1.8074	N.	12	26	55.4	11.130
1	1	7	30.26	1.8083		12	38	1.8	11.093
2	1	9	22.57	1.8092		12	49	5.3	11.054
3	1	11	15.05	1.8101		13	0	5.9	10.985
4	1	13	7.71	1.8109		13	11	3.5	10.935
5	1	15	0.55	1.8122		13	21	58.1	10.884
6	1	16	53.58	1.8133		13	32	49.6	10.833
7	1	18	46.79	1.8145		13	43	38.0	10.780
8	1	20	40.20	1.8157		13	54	23.2	10.727
9	1	22	33.80	1.8169		14	5	5.2	10.673
10	1	24	27.59	1.8181		14	15	44.0	10.619
11	1	26	21.58	1.8195		14	26	19.5	10.564
12	1	28	15.77	1.8208		14	36	51.7	10.508
13	1	30	10.16	1.8222		14	47	20.5	10.451
14	1	32	4.76	1.8236		14	57	45.8	10.393
15	1	33	59.56	1.8250		15	8	7.7	10.335
16	1	35	54.57	1.8265		15	18	26.0	10.275
17	1	37	49.79	1.8280		15	28	40.7	10.215
18	1	39	45.22	1.8295		15	38	51.8	10.154
19	1	41	40.87	1.8310		15	48	59.2	10.092
20	1	43	36.73	1.8325		15	59	2.9	10.030
21	1	45	32.81	1.8340		16	9	2.8	9.967
22	1	47	29.11	1.8352		16	18	58.9	9.902
23	1	49	25.64	1.8400	N.	16	28	51.1	9.837

MONDAY 6.

0	h	m	s	"	N.	°	'	"	"
0	0	21	31.80	1.8129	N.	7	47	53.0	12.055
1	0	23	20.62	1.8145		7	59	55.4	12.025
2	0	25	9.55	1.8163		8	11	55.9	11.992
3	0	26	58.58	1.8180		8	23	54.5	11.951
4	0	28	47.71	1.8199		8	35	51.2	11.928
5	0	30	36.96	1.8218		8	47	45.9	11.905
6	0	32	26.33	1.8238		8	59	38.6	11.881
7	0	34	15.82	1.8258		9	11	29.2	11.857
8	0	36	5.43	1.8279		9	23	17.8	11.793
9	0	37	55.17	1.8300		9	35	4.4	11.757
10	0	39	45.03	1.8320		9	46	48.7	11.719
11	0	41	35.02	1.8343		9	58	30.7	11.680
12	0	43	25.15	1.8365		10	10	10.3	11.642
13	0	45	15.41	1.8389		10	21	47.8	11.605
14	0	47	5.82	1.8413		10	33	22.9	11.566
15	0	48	56.36	1.8436		10	44	55.7	11.526
16	0	50	47.04	1.8460		10	56	26.0	11.485
17	0	52	37.88	1.8485		11	7	53.8	11.442
18	0	54	28.86	1.8510		11	19	19.1	11.401
19	0	56	20.00	1.8537		11	30	41.9	11.357
20	0	58	11.30	1.8563		11	42	2.0	11.313
21	1	0	2.76	1.8590		11	53	19.5	11.268
22	1	1	54.38	1.8617		12	4	34.2	11.223
23	1	3	46.17	1.8646		12	15	46.2	11.177
24	1	5	38.13	1.8674	N.	12	26	55.4	11.130

WEDNESDAY 8.

0	h	m	s	"	N.	°	'	"	"
0	1	51	22.39	1.8477	N.	16	38	39.3	9.771
1	1	53	19.37	1.8515		16	48	23.6	9.705
2	1	55	16.57	1.8553		16	58	3.9	9.637
3	1	57	14.01	1.8591		17	7	40.1	9.568
4	1	59	11.67	1.8630		17	17	12.1	9.499
5	2	1	9.57	1.8669		17	26	40.0	9.430
6	2	3	7.70	1.8707		17	36	3.7	9.360
7	2	5	6.06	1.8745		17	45	23.1	9.287
8	2	7	4.66	1.8785		17	54	38.2	9.215
9	2	9	3.50	1.8825		18	3	48.9	9.141
10	2	11	2.58	1.8865		18	12	55.1	9.067
11	2	13	1.90	1.8905		18	21	56.9	8.992
12	2	15	1.46	1.8945		18	30	54.2	8.917
13	2	17	1.26	1.8987		18	39	46.9	8.839
14	2	19	1.31	1.9028		18	48	34.9	8.762
15	2	21	1.60	1.9069		18	57	18.3	8.684
16	2	23	2.14	1.9110		19	5	57.0	8.605
17	2	25	2.92	1.9150		19	14	30.9	8.525
18	2	27	3.95	1.9191		19	23	0.0	8.445
19	2	29	5.22	1.9233		19	31	24.3	8.363
20	2	31	6.75	1.9275		19	39	43.6	8.280
21	2	33	8.53	1.9316		19	47	57.9	8.197
22	2	35	10.55	1.9357		19	56	7.2	8.112
23	2	37	12.82	1.9399		20	4	11.4	8.027
24	2	39	15.34	1.9440	N.	20	12	10.5	7.942

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
THURSDAY 9.					SATURDAY 11.				
0	2 39 15.34	2.0440	N.20 12 10.5	7.942	0	4 21 56.41	2.2235	N.24 39 3.8	2.893
1	2 41 18.11	2.0482	20 20 4.4	7.835	1	4 24 9.91	2.2264	24 41 53.8	2.772
2	2 43 21.13	2.0523	20 27 53.1	7.767	2	4 26 23.58	2.2292	24 44 36.4	2.649
3	2 45 24.40	2.0565	20 35 36.5	7.678	3	4 28 37.42	2.2319	24 47 11.7	2.527
4	2 47 27.92	2.0607	20 43 14.5	7.589	4	4 30 51.41	2.2345	24 49 39.6	2.403
5	2 49 31.69	2.0649	20 50 47.2	7.500	5	4 33 5.56	2.2370	24 52 0.1	2.279
6	2 51 35.71	2.0690	20 58 14.4	7.407	6	4 35 19.86	2.2395	24 54 13.1	2.154
7	2 53 39.97	2.0730	21 5 36.1	7.316	7	4 37 34.30	2.2419	24 56 18.6	2.029
8	2 55 44.49	2.0772	21 12 52.3	7.222	8	4 39 48.89	2.2443	24 58 16.6	1.904
9	2 57 49.25	2.0813	21 20 2.9	7.127	9	4 42 3.62	2.2466	25 0 7.1	1.779
10	2 59 54.27	2.0856	21 27 7.8	7.032	10	4 44 18.49	2.2489	25 1 50.1	1.652
11	3 1 59.53	2.0897	21 34 7.2	6.939	11	4 46 33.49	2.2510	25 3 25.4	1.525
12	3 4 5.04	2.0939	21 41 0.9	6.846	12	4 48 48.61	2.2530	25 4 53.1	1.398
13	3 6 10.80	2.0980	21 47 48.8	6.749	13	4 51 3.86	2.2552	25 6 13.2	1.272
14	3 8 16.80	2.1020	21 54 30.8	6.651	14	4 53 19.23	2.2570	25 7 25.7	1.143
15	3 10 23.05	2.1061	22 1 6.9	6.552	15	4 55 34.71	2.2590	25 8 30.4	1.015
16	3 12 29.54	2.1101	22 7 37.1	6.453	16	4 57 50.31	2.2608	25 9 27.5	0.887
17	3 14 36.27	2.1142	22 14 1.3	6.353	17	5 0 6.01	2.2625	25 10 16.9	0.756
18	3 16 43.25	2.1182	22 20 19.5	6.252	18	5 2 21.82	2.2643	25 10 58.5	0.629
19	3 18 50.46	2.1222	22 26 31.6	6.151	19	5 4 37.73	2.2659	25 11 32.4	0.500
20	3 20 57.92	2.1263	22 32 37.6	6.049	20	5 6 53.73	2.2674	25 11 58.5	0.370
21	3 23 5.62	2.1302	22 38 37.5	5.946	21	5 9 9.82	2.2689	25 12 16.8	0.240
22	3 25 13.55	2.1341	22 44 31.1	5.842	22	5 11 26.00	2.2703	25 12 27.3	0.110
23	3 27 21.72	2.1380	N.22 50 18.5	5.737	23	5 13 42.26	2.2716	N.25 12 30.0	0.020
FRIDAY 10.					SUNDAY 12.				
0	3 29 30.12	2.1419	N.22 55 59.5	5.631	0	5 15 58.60	2.2729	N.25 12 24.9	0.151
1	3 31 38.75	2.1459	23 1 34.2	5.526	1	5 18 15.01	2.2740	25 12 11.9	0.283
2	3 33 47.62	2.1496	23 7 2.6	5.419	2	5 20 31.49	2.2752	25 11 51.1	0.413
3	3 35 56.71	2.1534	23 12 24.5	5.311	3	5 22 48.04	2.2762	25 11 22.4	0.543
4	3 38 6.03	2.1571	23 17 39.9	5.202	4	5 25 4.64	2.2771	25 10 45.9	0.674
5	3 40 15.57	2.1610	23 22 48.8	5.094	5	5 27 21.30	2.2780	25 10 1.5	0.806
6	3 42 25.34	2.1646	23 27 51.2	4.984	6	5 29 38.01	2.2788	25 9 9.2	0.937
7	3 44 35.33	2.1682	23 32 46.9	4.873	7	5 31 54.76	2.2796	25 8 9.0	1.069
8	3 46 45.53	2.1718	23 37 36.0	4.762	8	5 34 11.56	2.2803	25 7 0.9	1.202
9	3 48 55.95	2.1755	23 42 18.4	4.651	9	5 36 28.40	2.2809	25 5 44.8	1.333
10	3 51 6.59	2.1790	23 46 54.1	4.538	10	5 38 45.27	2.2814	25 4 20.9	1.465
11	3 53 17.44	2.1825	23 51 23.0	4.425	11	5 41 2.17	2.2819	25 2 49.0	1.597
12	3 55 28.49	2.1859	23 55 45.1	4.311	12	5 43 19.10	2.2823	25 1 9.3	1.728
13	3 57 39.75	2.1893	24 0 0.3	4.196	13	5 45 36.05	2.2825	24 59 21.6	1.861
14	3 59 51.21	2.1925	24 4 8.6	4.081	14	5 47 53.01	2.2828	24 57 26.0	1.992
15	4 2 2.88	2.1960	24 8 10.0	3.965	15	5 50 9.99	2.2830	24 55 22.5	2.125
16	4 4 14.74	2.1993	24 12 4.4	3.848	16	5 52 26.97	2.2830	24 53 11.0	2.257
17	4 6 26.80	2.2025	24 15 51.8	3.731	17	5 54 43.96	2.2831	24 50 51.6	2.389
18	4 8 39.05	2.2057	24 19 32.1	3.612	18	5 57 0.95	2.2830	24 48 24.3	2.521
19	4 10 51.49	2.2089	24 23 5.3	3.493	19	5 59 17.93	2.2829	24 45 49.1	2.652
20	4 13 4.12	2.2120	24 26 31.4	3.375	20	6 1 34.90	2.2827	24 43 6.0	2.784
21	4 15 16.93	2.2150	24 29 50.3	3.256	21	6 3 51.86	2.2825	24 40 15.0	2.916
22	4 17 29.92	2.2179	24 33 2.1	3.136	22	6 6 8.80	2.2822	24 37 16.1	3.047
23	4 19 43.08	2.2207	24 36 6.6	3.014	23	6 8 25.73	2.2819	24 34 9.3	3.178
24	4 21 56.41	2.2235	N.24 39 3.8	2.893	24	6 10 42.63	2.2814	N.24 30 54.7	3.309

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
MONDAY 13.					WEDNESDAY 15.				
0	6 10 42.63	2.3814	N.24° 30' 54.7	2.309	0	7 58 42.53	2.2044	N.19° 27' 10.7	9.189
1	6 12 59.50	2.3809	24 27 32.2	2.441	1	8 0 54.73	2.2022	19 17 57.9	9.287
2	6 15 16.34	2.3808	24 24 1.8	2.579	2	8 3 6.80	2.2000	19 8 38.7	9.378
3	6 17 33.14	2.3798	24 20 23.6	2.703	3	8 5 18.73	2.1978	18 59 13.1	9.474
4	6 19 49.90	2.3790	24 16 37.5	2.828	4	8 7 30.54	2.1956	18 49 41.2	9.565
5	6 22 6.62	2.3782	24 12 43.6	2.954	5	8 9 42.21	2.1935	18 40 2.9	9.660
6	6 24 23.29	2.3774	24 8 41.8	3.080	6	8 11 53.76	2.1913	18 30 18.4	9.754
7	6 26 39.91	2.3768	24 4 32.4	3.202	7	8 14 5.17	2.1890	18 20 27.6	9.856
8	6 28 56.47	2.3762	24 0 15.1	3.322	8	8 16 16.45	2.1869	18 10 30.7	10.000
9	6 31 12.97	2.3755	23 55 50.1	3.442	9	8 18 27.60	2.1847	18 0 27.6	10.102
10	6 33 29.42	2.3748	23 51 17.3	3.561	10	8 20 38.62	2.1825	17 50 18.5	10.202
11	6 35 45.80	2.3742	23 46 36.8	3.678	11	8 22 49.51	2.1804	17 40 3.3	10.302
12	6 38 2.11	2.3735	23 41 48.7	3.796	12	8 25 0.26	2.1782	17 29 42.2	10.402
13	6 40 18.35	2.3700	23 36 52.9	3.914	13	8 27 10.89	2.1761	17 19 15.1	10.500
14	6 42 34.51	2.3687	23 31 49.4	4.032	14	8 29 21.40	2.1740	17 8 42.2	10.597
15	6 44 50.60	2.3674	23 26 38.3	4.149	15	8 31 31.78	2.1719	16 58 3.4	10.694
16	6 47 6.61	2.3660	23 21 19.5	4.267	16	8 33 42.03	2.1698	16 47 18.8	10.791
17	6 49 22.53	2.3646	23 15 53.1	4.385	17	8 35 52.16	2.1778	16 36 28.5	10.885
18	6 51 38.37	2.3632	23 10 19.2	4.502	18	8 38 2.17	2.1658	16 25 32.6	10.979
19	6 53 54.12	2.3618	23 4 37.7	4.620	19	8 40 12.06	2.1639	16 24 31.0	11.073
20	6 56 9.77	2.3600	22 58 48.7	4.737	20	8 42 21.84	2.1619	16 3 23.8	11.166
21	6 58 25.33	2.3585	22 52 52.3	4.854	21	8 44 31.49	2.1599	15 52 11.1	11.258
22	7 0 40.79	2.3569	22 46 48.2	4.972	22	8 46 41.03	2.1580	15 40 52.9	11.349
23	7 2 56.16	2.3553	N.22° 40' 36.8	5.089	23	8 48 50.45	2.1560	N.15° 29' 29.2	11.439
TUESDAY 14.					THURSDAY 16.				
0	7 5 11.42	2.3538	N.22° 34' 17.9	5.206	0	8 50 59.76	2.1542	N.15° 18' 0.2	11.527
1	7 7 26.58	2.3517	22 27 51.7	5.323	1	8 53 8.96	2.1524	15 6 25.9	11.616
2	7 9 41.63	2.3500	22 21 18.2	5.441	2	8 55 18.05	2.1505	14 54 46.3	11.707
3	7 11 56.58	2.3481	22 14 37.4	5.559	3	8 57 27.03	2.1488	14 43 1.5	11.790
4	7 14 11.41	2.3463	22 7 49.3	5.678	4	8 59 35.91	2.1471	14 31 11.5	11.876
5	7 16 26.13	2.3444	22 0 53.9	5.796	5	9 1 44.69	2.1454	14 19 16.4	11.960
6	7 18 40.74	2.3425	21 53 51.3	5.915	6	9 3 53.36	2.1437	14 7 16.3	12.043
7	7 20 55.23	2.3406	21 46 41.5	6.033	7	9 6 1.94	2.1421	13 55 11.2	12.126
8	7 23 9.60	2.3386	21 39 24.6	6.152	8	9 8 10.42	2.1400	13 43 1.1	12.209
9	7 25 23.85	2.3366	21 32 0.5	6.270	9	9 10 18.81	2.1380	13 30 46.1	12.290
10	7 27 37.98	2.3345	21 24 29.4	6.389	10	9 12 27.11	2.1375	13 18 26.3	12.369
11	7 29 51.99	2.3325	21 16 51.2	6.508	11	9 14 35.32	2.1360	13 6 1.8	12.448
12	7 32 5.88	2.3304	21 9 6.0	6.627	12	9 16 43.44	2.1346	12 53 32.5	12.527
13	7 34 19.64	2.3282	21 1 13.8	6.746	13	9 18 51.48	2.1333	12 40 58.6	12.604
14	7 36 33.28	2.3261	20 53 14.7	6.865	14	9 20 59.44	2.1320	12 28 20.0	12.681
15	7 38 46.79	2.3240	20 45 8.7	6.984	15	9 23 7.32	2.1307	12 15 36.9	12.756
16	7 41 0.17	2.3219	20 36 55.8	7.103	16	9 25 15.13	2.1295	12 2 49.4	12.829
17	7 43 13.42	2.3197	20 28 36.1	7.222	17	9 27 22.86	2.1283	11 49 57.4	12.902
18	7 45 26.54	2.3176	20 20 9.6	7.341	18	9 29 30.53	2.1272	11 37 1.1	12.975
19	7 47 39.54	2.3155	20 11 36.5	7.460	19	9 31 38.13	2.1260	11 24 0.4	13.047
20	7 49 52.40	2.3132	20 2 56.5	7.579	20	9 33 45.66	2.1250	11 10 55.5	13.117
21	7 52 5.13	2.3110	19 54 9.9	7.698	21	9 35 53.13	2.1240	10 57 46.4	13.187
22	7 54 17.73	2.3087	19 45 16.7	7.817	22	9 38 0.55	2.1232	10 44 33.1	13.255
23	7 56 30.20	2.3066	19 36 17.0	7.936	23	9 40 7.92	2.1224	10 31 15.8	13.322
24	7 58 42.53	2.3044	N.19° 27' 10.7	8.055	24	9 42 15.24	2.1215	N.10° 17' 54.5	13.388

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
FRIDAY 17.					SUNDAY 19.				
0	9 42 15.24	2.1216	N. 10 17 54.5	13.388	0	11 24 22.45	2.1608	S. 1 20 11.3	15.238
1	9 44 22.51	2.1207	10 4 29.2	13.454	1	11 26 32.16	2.1623	1 35 25.7	15.242
2	9 46 29.73	2.1201	9 51 0.0	13.518	2	11 28 42.04	2.1630	1 50 40.4	15.247
3	9 48 36.92	2.1195	9 37 27.0	13.582	3	11 30 52.08	2.1787	2 5 55.4	15.252
4	9 50 44.07	2.1188	9 23 50.2	13.644	4	11 33 2.29	2.1715	2 21 10.6	15.256
5	9 52 51.19	2.1184	9 10 9.7	13.705	5	11 35 12.67	2.1745	2 36 26.0	15.258
6	9 54 58.28	2.1179	8 56 25.6	13.765	6	11 37 23.23	2.1775	2 51 41.2	15.265
7	9 57 5.34	2.1175	8 42 37.9	13.824	7	11 39 33.98	2.1806	3 6 56.6	15.264
8	9 59 12.38	2.1171	8 28 46.7	13.882	8	11 41 44.91	2.1837	3 22 11.8	15.261
9	10 1 19.40	2.1169	8 14 52.0	13.939	9	11 43 56.03	2.1870	3 37 26.7	15.246
10	10 3 26.41	2.1166	8 0 54.0	13.994	10	11 46 7.35	2.1903	3 52 41.3	15.240
11	10 5 33.40	2.1165	7 46 52.7	14.049	11	11 48 18.87	2.1936	4 7 55.6	15.232
12	10 7 40.39	2.1165	7 32 48.1	14.103	12	11 50 30.59	2.1970	4 23 9.3	15.222
13	10 9 47.38	2.1165	7 18 40.3	14.156	13	11 52 42.52	2.2005	4 38 22.2	15.211
14	10 11 54.37	2.1165	7 4 29.3	14.207	14	11 54 54.66	2.2041	4 53 34.6	15.198
15	10 14 1.36	2.1166	6 50 15.3	14.257	15	11 57 7.03	2.2079	5 8 46.1	15.184
16	10 16 8.36	2.1167	6 35 58.4	14.307	16	11 59 19.63	2.2117	5 23 56.7	15.168
17	10 18 15.37	2.1170	6 21 38.5	14.355	17	12 1 32.45	2.2156	5 39 6.3	15.151
18	10 20 22.40	2.1173	6 7 15.8	14.402	18	12 3 45.50	2.2194	5 54 14.8	15.131
19	10 22 29.45	2.1171	5 52 50.3	14.447	19	12 5 58.78	2.2234	6 9 21.9	15.110
20	10 24 36.53	2.1180	5 38 22.2	14.492	20	12 8 12.31	2.2275	6 24 27.8	15.087
21	10 26 43.64	2.1187	5 23 51.3	14.536	21	12 10 26.08	2.2315	6 39 32.2	15.068
22	10 28 50.78	2.1192	5 9 17.9	14.577	22	12 12 40.10	2.2356	6 54 35.4	15.047
23	10 30 57.95	2.1199	N. 4 54 42.0	14.618	23	12 14 54.38	2.2400	S. 7 9 36.9	15.010
SATURDAY 18.					MONDAY 20.				
0	10 33 5.17	2.1206	N. 4 40 3.7	14.658	0	12 17 8.91	2.2443	S. 7 24 36.8	14.961
1	10 35 12.43	2.1214	4 25 23.0	14.697	1	12 19 23.70	2.2487	7 39 34.7	14.950
2	10 37 19.74	2.1223	4 10 40.0	14.735	2	12 21 38.76	2.2532	7 54 30.8	14.917
3	10 39 27.11	2.1233	3 55 54.8	14.854	3	12 23 54.09	2.2578	8 9 24.8	14.883
4	10 41 34.54	2.1243	3 41 7.5	14.907	4	12 26 9.70	2.2624	8 24 16.6	14.848
5	10 43 42.03	2.1254	3 26 18.0	14.941	5	12 28 25.58	2.2770	8 39 6.2	14.807
6	10 45 49.59	2.1268	3 11 26.6	14.973	6	12 30 41.75	2.2718	8 53 53.5	14.767
7	10 47 57.22	2.1278	2 56 33.2	14.904	7	12 32 58.20	2.2766	9 8 38.3	14.726
8	10 50 4.93	2.1291	2 41 38.1	14.934	8	12 35 14.94	2.2814	9 23 20.5	14.683
9	10 52 12.72	2.1305	2 26 41.1	14.963	9	12 37 31.97	2.2864	9 38 0.1	14.637
10	10 54 20.60	2.1320	2 11 42.5	14.990	10	12 39 49.31	2.2914	9 52 26.9	14.590
11	10 56 28.56	2.1333	1 56 42.2	15.017	11	12 42 6.94	2.2964	10 7 10.8	14.540
12	10 58 36.62	2.1351	1 41 40.3	15.042	12	12 44 24.88	2.3015	10 21 41.7	14.490
13	11 0 44.78	2.1369	1 26 37.1	15.065	13	12 46 43.12	2.3066	10 36 9.6	14.437
14	11 2 53.05	2.1388	1 11 32.5	15.087	14	12 49 1.68	2.3119	10 50 34.2	14.382
15	11 5 1.42	2.1406	0 56 26.6	15.108	15	12 51 20.55	2.3170	11 4 55.5	14.326
16	11 7 9.91	2.1424	0 41 19.5	15.128	16	12 53 39.73	2.3223	11 19 13.3	14.267
17	11 9 18.51	2.1444	0 26 11.2	15.147	17	12 55 59.23	2.3276	11 33 27.6	14.208
18	11 11 27.24	2.1465	N. 0 11 1.9	15.163	18	12 58 19.05	2.3330	11 47 38.3	14.147
19	11 13 36.09	2.1485	S. 0 4 8.4	15.179	19	13 0 39.20	2.3385	12 1 45.2	14.082
20	11 15 45.08	2.1509	0 19 19.6	15.193	20	13 2 59.68	2.3440	12 15 48.2	14.017
21	11 17 54.20	2.1532	0 34 31.6	15.206	21	13 5 20.49	2.3496	12 29 47.2	13.949
22	11 20 3.47	2.1557	0 49 44.3	15.217	22	13 7 41.64	2.3552	12 43 42.1	13.880
23	11 22 12.89	2.1581	1 4 57.6	15.227	23	13 10 3.12	2.3608	12 57 32.8	13.808
24	11 24 22.45	2.1606	S. 1 20 11.5	15.236	24	13 12 24.94	2.3665	S. 13 11 19.1	13.734

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
TUESDAY 21.					THURSDAY 23.				
0	13 12 24.94	2.3665	S. 13° 11' 19.1"	13.734	0	15 12 40.97	2.6340	S. 22° 9' 23.4"	7.979
1	13 14 47.10	2.3721	13 25 0.9	13.689	1	15 15 19.14	2.6382	22 17 17.3	7.917
2	13 17 9.60	2.3779	13 38 38.2	13.563	2	15 17 57.56	2.6423	22 25 1.5	7.855
3	13 19 32.45	2.3837	13 52 10.8	13.403	3	15 20 36.22	2.6464	22 32 35.9	7.491
4	13 21 55.65	2.3895	14 5 38.6	13.232	4	15 23 15.13	2.6504	22 40 0.4	7.325
5	13 24 19.19	2.3952	14 19 1.4	13.388	5	15 25 54.27	2.6544	22 47 14.9	7.158
6	13 26 43.08	2.4011	14 32 19.2	13.363	6	15 28 33.63	2.6577	22 54 19.4	6.991
7	13 29 7.33	2.4076	14 45 31.8	13.167	7	15 31 13.20	2.6611	23 1 13.8	6.822
8	13 31 31.93	2.4137	14 58 39.2	13.077	8	15 33 52.97	2.6645	23 7 58.0	6.651
9	13 33 56.88	2.4198	15 11 41.1	12.965	9	15 36 32.95	2.6679	23 14 31.9	6.479
10	13 36 22.19	2.4247	15 24 37.6	12.892	10	15 39 13.12	2.6710	23 20 55.5	6.307
11	13 38 47.85	2.4296	15 37 27.9	12.798	11	15 41 53.47	2.6740	23 27 8.8	6.134
12	13 41 13.87	2.4366	15 50 13.3	12.702	12	15 44 34.00	2.6769	23 33 11.6	5.960
13	13 43 40.25	2.4426	16 2 52.5	12.606	13	15 47 14.70	2.6798	23 39 4.0	5.785
14	13 46 6.99	2.4485	16 15 25.7	12.502	14	15 49 55.55	2.6820	23 44 45.7	5.609
15	13 48 34.08	2.4545	16 27 52.8	12.400	15	15 52 36.56	2.6845	23 50 16.9	5.431
16	13 51 1.54	2.4606	16 40 13.7	12.306	16	15 55 17.70	2.6868	23 55 37.4	5.252
17	13 53 29.36	2.4665	16 52 28.2	12.187	17	15 57 58.98	2.6890	24 0 47.2	5.074
18	13 55 57.53	2.4725	17 4 36.2	12.079	18	16 0 40.38	2.6909	24 5 46.3	4.895
19	13 58 26.06	2.4785	17 16 37.7	11.969	19	16 3 21.89	2.6926	24 10 34.6	4.715
20	14 0 54.95	2.4845	17 28 32.5	11.876	20	16 6 3.50	2.6944	24 15 12.1	4.533
21	14 3 24.20	2.4904	17 40 20.5	11.742	21	16 8 45.22	2.6960	24 19 38.6	4.352
22	14 5 53.80	2.4962	17 52 1.6	11.623	22	16 11 27.02	2.6973	24 23 54.3	4.170
23	14 8 23.75	2.5021	S. 18° 3' 35.6"	11.507	23	16 14 8.89	2.6983	S. 24° 27' 59.1"	3.988
WEDNESDAY 22.					FRIDAY 24.				
0	14 10 54.06	2.5080	S. 18° 15' 2.5"	11.369	0	16 16 50.82	2.6998	S. 24° 31' 52.9"	3.805
1	14 13 24.72	2.5139	18 26 22.3	11.262	1	16 19 32.81	2.7008	24 35 35.7	3.622
2	14 15 55.73	2.5198	18 37 34.4	11.140	2	16 22 14.85	2.7009	24 39 7.5	3.438
3	14 18 27.10	2.5256	18 48 39.1	11.016	3	16 24 56.92	2.7013	24 42 28.3	3.255
4	14 20 58.81	2.5314	18 59 36.3	10.889	4	16 27 39.01	2.7015	24 45 38.1	3.071
5	14 23 30.87	2.5370	19 10 25.8	10.760	5	16 30 21.11	2.7017	24 48 36.8	2.887
6	14 26 3.26	2.5427	19 21 7.5	10.628	6	16 33 3.22	2.7018	24 51 24.5	2.702
7	14 28 36.00	2.5484	19 31 41.3	10.494	7	16 35 45.33	2.7017	24 54 1.1	2.518
8	14 31 9.07	2.5540	19 42 7.0	10.359	8	16 38 27.43	2.7014	24 56 26.7	2.333
9	14 33 42.48	2.5595	19 52 24.6	10.224	9	16 41 9.50	2.7008	24 58 41.1	2.148
10	14 36 16.22	2.5640	20 2 33.9	10.086	10	16 43 51.53	2.7000	25 0 44.5	1.964
11	14 38 50.28	2.5704	20 12 34.9	9.947	11	16 46 33.50	2.6990	25 2 36.8	1.779
12	14 41 24.67	2.5768	20 22 27.5	9.805	12	16 49 15.42	2.6981	25 4 18.0	1.594
13	14 43 59.38	2.5811	20 32 11.5	9.661	13	16 51 57.28	2.6969	25 5 48.1	1.409
14	14 46 34.41	2.5864	20 41 46.8	9.516	14	16 54 39.05	2.6954	25 7 7.1	1.225
15	14 49 9.75	2.5915	20 51 13.4	9.370	15	16 57 20.73	2.6928	25 8 15.1	1.041
16	14 51 45.39	2.5965	21 0 31.2	9.223	16	17 0 2.31	2.6921	25 9 12.0	0.857
17	14 54 21.34	2.6016	21 9 40.0	9.072	17	17 2 43.79	2.6902	25 9 57.9	0.674
18	14 56 57.60	2.6064	21 18 39.8	8.920	18	17 5 25.14	2.6880	25 10 32.9	0.492
19	14 59 34.13	2.6112	21 27 30.4	8.767	19	17 8 6.36	2.6858	25 10 56.9	0.309
20	15 2 10.93	2.6160	21 36 11.8	8.613	20	17 10 47.44	2.6835	25 11 10.0	0.127
21	15 4 48.03	2.6205	21 44 43.9	8.457	21	17 13 28.38	2.6809	25 11 12.1	0.055
22	15 7 25.41	2.6252	21 53 6.6	8.309	22	17 16 9.15	2.6780	25 11 3.4	0.296
23	15 10 3.06	2.6298	22 1 19.8	8.140	23	17 18 49.75	2.6750	25 10 43.8	0.416
24	15 12 40.97	2.6340	S. 22° 9' 23.4"	7.979	24	17 21 30.17	2.6721	S. 25° 10' 13.5"	0.595

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Dif. for 1 m.	Declination.	Dif. for 1 m.	Hour.	Right Ascension.	Dif. for 1 m.	Declination.	Dif. for 1 m.
SATURDAY 25.					MONDAY 27.				
0	17 21 30.17	2.6721	S. 25° 10' 13.5"	0.596	0	19 23 42.97	2.3689	S. 21° 34' 16.0"	7.893
1	17 24 10.40	2.6688	25 9 32.3	0.776	1	19 26 5.78	2.3763	21 26 19.5	7.906
2	17 26 50.43	2.6655	25 8 40.4	0.954	2	19 28 28.13	2.3837	21 18 16.1	8.112
3	17 29 30.25	2.6619	25 7 37.8	1.132	3	19 30 50.03	2.3910	21 10 6.0	8.226
4	17 32 9.86	2.6582	25 6 24.6	1.309	4	19 33 11.46	2.3984	21 1 49.1	8.337
5	17 34 49.24	2.6543	25 5 0.7	1.486	5	19 35 32.44	2.4058	20 53 25.6	8.446
6	17 37 28.38	2.6502	25 3 26.3	1.661	6	19 37 52.96	2.4130	20 44 55.6	8.553
7	17 40 7.27	2.6460	25 1 41.4	1.835	7	19 40 13.01	2.4203	20 36 19.2	8.659
8	17 42 45.91	2.6418	24 59 46.1	2.009	8	19 42 32.60	2.4276	20 27 36.5	8.763
9	17 45 24.29	2.6376	24 57 40.3	2.182	9	19 44 51.73	2.4349	20 18 47.6	8.866
10	17 48 2.39	2.6326	24 55 24.3	2.353	10	19 47 10.41	2.4421	20 9 52.6	8.967
11	17 50 40.21	2.6290	24 52 58.0	2.523	11	19 49 28.62	2.4497	20 0 51.5	9.066
12	17 53 17.75	2.6231	24 50 21.6	2.692	12	19 51 46.38	2.4571	19 51 44.5	9.165
13	17 55 54.99	2.6181	24 47 35.0	2.861	13	19 54 3.68	2.4645	19 42 31.7	9.261
14	17 58 31.93	2.6130	24 44 38.3	3.027	14	19 56 20.52	2.4719	19 33 13.2	9.356
15	18 1 8.55	2.6076	24 41 31.7	3.192	15	19 58 36.91	2.4792	19 23 49.0	9.450
16	18 3 44.85	2.6023	24 38 15.2	3.357	16	20 0 52.84	2.4867	19 14 19.2	9.542
17	18 6 20.83	2.5968	24 34 48.8	3.522	17	20 3 8.32	2.4942	19 4 44.0	9.632
18	18 8 56.47	2.5911	24 31 12.6	3.684	18	20 5 23.35	2.4967	18 55 3.4	9.721
19	18 11 31.77	2.5855	24 27 26.7	3.845	19	20 7 37.93	2.5022	18 45 17.5	9.807
20	18 14 6.73	2.5798	24 23 31.2	4.006	20	20 9 52.06	2.5077	18 35 26.5	9.892
21	18 16 41.33	2.5736	24 19 26.1	4.163	21	20 12 5.74	2.5132	18 25 30.4	9.978
22	18 19 15.57	2.5675	24 15 11.6	4.321	22	20 14 18.98	2.5170	18 15 29.2	10.061
23	18 21 49.44	2.5614	S. 24° 10' 47.6"	4.477	23	20 16 31.78	2.5208	S. 18° 5' 23.1"	10.143
SUNDAY 26.					TUESDAY 28.				
0	18 24 22.94	2.5551	S. 24° 6' 14.4"	4.631	0	20 18 44.14	2.5233	S. 17° 55' 12.2"	10.221
1	18 26 56.06	2.5488	24 1 31.9	4.784	1	20 20 56.06	2.5260	17 44 56.6	10.299
2	18 29 28.80	2.5424	23 56 40.3	4.935	2	20 23 7.54	2.5287	17 34 36.3	10.377
3	18 32 1.15	2.5358	23 51 39.7	5.085	3	20 25 18.59	2.5313	17 24 11.4	10.453
4	18 34 33.10	2.5291	23 46 30.1	5.234	4	20 27 29.22	2.5339	17 13 42.1	10.528
5	18 37 4.65	2.5225	23 41 11.6	5.383	5	20 29 39.41	2.5365	17 3 8.3	10.602
6	18 39 35.80	2.5157	23 35 44.3	5.527	6	20 31 49.18	2.5392	16 52 30.3	10.676
7	18 42 6.54	2.5089	23 30 8.3	5.671	7	20 33 58.53	2.5418	16 41 48.1	10.748
8	18 44 36.87	2.5020	23 24 23.8	5.813	8	20 36 7.46	2.5445	16 31 1.7	10.807
9	18 47 6.78	2.4949	23 18 30.7	5.953	9	20 38 15.97	2.5472	16 20 11.3	10.873
10	18 49 36.26	2.4878	23 12 29.2	6.095	10	20 40 24.08	2.5498	16 9 16.9	10.939
11	18 52 5.32	2.4807	23 6 19.3	6.233	11	20 42 31.78	2.5525	15 58 18.6	11.003
12	18 54 33.95	2.4735	23 0 1.2	6.369	12	20 44 39.08	2.5552	15 47 16.5	11.066
13	18 57 2.15	2.4663	22 53 35.0	6.504	13	20 46 45.98	2.5578	15 36 10.7	11.127
14	18 59 29.91	2.4590	22 47 0.7	6.638	14	20 48 52.48	2.5605	15 25 1.2	11.187
15	19 1 57.23	2.4516	22 40 18.4	6.770	15	20 50 58.59	2.5632	15 13 48.2	11.247
16	19 4 24.11	2.4442	22 33 28.3	6.900	16	20 53 4.31	2.5659	15 2 31.6	11.305
17	19 6 50.54	2.4368	22 26 30.4	7.028	17	20 55 9.64	2.5686	14 51 11.6	11.362
18	19 9 16.53	2.4294	22 19 24.9	7.156	18	20 57 14.59	2.5713	14 39 48.2	11.417
19	19 11 42.07	2.4221	22 12 11.8	7.281	19	20 59 19.16	2.5740	14 28 21.6	11.470
20	19 14 7.16	2.4144	22 4 51.2	7.405	20	21 1 23.35	2.5767	14 16 51.8	11.522
21	19 16 31.80	2.4068	21 57 23.2	7.527	21	21 3 27.17	2.5795	14 5 18.9	11.574
22	19 18 55.98	2.3992	21 49 48.0	7.647	22	21 5 30.62	2.5822	13 53 42.9	11.624
23	19 21 19.71	2.3915	21 42 5.5	7.766	23	21 7 33.70	2.5849	13 42 4.0	11.673
24	19 23 42.97	2.3839	S. 21° 34' 16.0"	7.883	24	21 9 36.42	2.5876	S. 13° 30' 22.1"	11.722

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
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WEDNESDAY 29.

0	h	m	s	°	'	"	11.722	
1	21	11	38.79	2.0365	S. 13	30	22.1	11.767
2	21	13	40.80	2.0305	13	6	50.0	11.812
3	21	15	42.46	2.0248	12	54	59.9	11.857
4	21	17	43.78	2.0191	12	43	7.2	11.900
5	21	19	44.76	2.0135	12	31	11.9	11.942
6	21	21	45.40	2.0079	12	19	14.2	11.982
7	21	23	45.71	2.0024	12	7	14.0	12.023
8	21	25	45.69	1.9970	11	55	11.4	12.062
9	21	27	45.35	1.9916	11	43	6.5	12.100
10	21	29	44.69	1.9864	11	30	59.4	12.137
11	21	31	43.72	1.9811	11	18	50.1	12.172
12	21	33	42.43	1.9760	11	6	38.8	12.206
13	21	35	40.84	1.9710	10	54	25.4	12.239
14	21	37	38.95	1.9660	10	42	10.1	12.271
15	21	39	36.76	1.9610	10	29	52.8	12.302
16	21	41	34.28	1.9562	10	17	33.7	12.333
17	21	43	31.51	1.9515	10	5	12.8	12.362
18	21	45	28.46	1.9468	9	52	50.2	12.391
19	21	47	25.13	1.9421	9	40	25.9	12.419
20	21	49	21.52	1.9375	9	27	59.9	12.446
21	21	51	17.64	1.9331	9	15	32.4	12.472
22	21	53	13.50	1.9288	9	3	3.3	12.497
23	21	55	9.10	1.9246	S. 8	50	32.8	12.520

THURSDAY 30.

0	21	57	4.44	1.9203	S. 8	38	0.9	12.543
1	21	58	59.53	1.9160	8	25	27.7	12.564
2	22	0	54.37	1.9120	8	12	53.2	12.586
3	22	2	48.97	1.9080	8	0	17.4	12.606
4	22	4	43.34	1.9041	7	47	40.5	12.624
5	22	6	37.47	1.9002	7	35	2.5	12.642
6	22	8	31.37	1.8964	7	22	23.4	12.661
7	22	10	25.04	1.8927	7	9	43.2	12.677
8	22	12	18.50	1.8891	6	57	2.1	12.693
9	22	14	11.74	1.8855	6	44	20.0	12.708
10	22	16	4.77	1.8820	6	31	37.1	12.723
11	22	17	57.59	1.8787	6	18	53.3	12.736
12	22	19	50.22	1.8755	6	6	8.8	12.748
13	22	21	42.65	1.8722	5	53	23.5	12.760
14	22	23	34.89	1.8690	5	40	37.6	12.771
15	22	25	26.93	1.8659	5	27	51.0	12.783
16	22	27	18.80	1.8629	5	15	3.8	12.791
17	22	29	10.48	1.8599	5	2	16.1	12.799
18	22	31	1.99	1.8571	4	49	27.9	12.807
19	22	32	53.34	1.8544	4	36	39.3	12.814
20	22	34	44.52	1.8516	4	23	50.2	12.821
21	22	36	35.54	1.8490	4	11	0.8	12.827
22	22	38	26.40	1.8463	3	58	11.0	12.833
23	22	40	17.10	1.8438	3	45	21.0	12.838
24	22	42	7.66	1.8415	S. 3	32	30.8	12.838

FRIDAY 31.

0	h	m	s	°	'	"	1.8415	
1	22	43	58.08	1.8391	S. 3	19	40.4	12.843
2	22	45	48.36	1.8368	3	6	49.8	12.843
3	22	47	38.50	1.8346	2	53	59.2	12.844
4	22	49	28.52	1.8326	2	41	8.5	12.845
5	22	51	18.42	1.8306	2	28	17.8	12.844
6	22	53	8.20	1.8286	2	15	27.2	12.843
7	22	54	57.86	1.8266	2	2	36.6	12.842
8	22	56	47.40	1.8248	1	49	46.1	12.840
9	22	58	36.84	1.8231	1	36	55.8	12.837
10	23	0	26.18	1.8215	1	24	5.6	12.834
11	23	2	15.42	1.8199	1	11	15.7	12.830
12	23	4	4.57	1.8184	0	58	26.0	12.826
13	23	5	53.63	1.8169	0	45	36.7	12.819
14	23	7	42.60	1.8156	0	32	47.7	12.813
15	23	9	31.49	1.8142	0	19	59.1	12.807
16	23	11	20.31	1.8130	S. 0	7	10.9	12.799
17	23	13	9.06	1.8119	N. 0	5	36.8	12.791
18	23	14	57.74	1.8107	0	18	24.0	12.782
19	23	16	46.35	1.8096	0	31	10.7	12.771
20	23	18	34.90	1.8087	0	43	56.7	12.760
21	23	20	23.40	1.8079	0	56	42.2	12.749
22	23	22	11.85	1.8070	1	9	27.0	12.737
23	23	24	0.25	1.8064	N. 1	22	11.0	12.737

SATURDAY, JUNE 1.

0	23	25	48.62	1.8058	N. 1	34	54.4	12.716
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PHASES OF THE MOON.

	d	h	m
☾ Last Quarter, . . .	1	7	32.0
● New Moon, . . .	9	11	7.5
☽ First Quarter, . . .	17	4	3.3
☽ Full Moon, . . .	23	18	6.2
☾ Last Quarter, . . .	30	22	25.3

	d	h
☾ Apogee,	6	19.6
☾ Perigee,	22	6.0

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Star's Name and Position.	Noon.	P. L. of DM.	III ^h .	P. L. of DM.	VI ^h .	P. L. of DM.	IX ^h .	P. L. of DM.
1	Antares W.	59° 51' 18"	2763	61° 26' 35"	2779	63° 1' 31"	2794	64° 36' 7"	2806
	α Pegasi E.	46 35 56	2665	45 6 51	2667	43 38 25	2119	42 10 39	2154
	SUN E.	93 39 41	3120	92 11 56	3128	90 44 32	3153	89 17 27	3169
2	Antares W.	72 24 32	2976	73 57 21	2989	75 29 54	2991	77 2 11	2912
	α Aquilæ W.	32 37 37	2610	33 24 51	2675	34 14 43	2670	35 6 59	2191
	α Pegasi E.	35 3 18	2671	33 40 28	2425	32 18 40	2426	30 58 0	2422
	SUN E.	82 6 40	2244	80 41 23	2297	79 16 21	2270	77 51 35	2294
3	Antares W.	84 40 5	2968	86 11 0	2975	87 41 44	2984	89 12 17	2988
	α Aquilæ W.	39 57 41	4663	41 0 35	4480	42 4 45	4401	43 10 5	4220
	SUN E.	70 51 22	2341	69 27 58	2351	68 4 46	2361	66 41 45	2372
4	Antares W.	96 42 32	2029	98 12 9	2034	99 41 39	2040	101 11 2	2045
	α Aquilæ W.	48 51 4	4069	50 1 36	4030	51 12 46	2693	52 24 32	2680
	Fomalhaut W.	28 9 57	2201	28 53 7	2294	29 39 27	2623	30 28 40	2407
	SUN E.	59 49 16	2412	58 27 13	2419	57 5 18	2426	55 43 31	2422
5	α Aquilæ W.	58 30 42	2635	59 45 8	2615	60 59 55	2703	62 15 1	2720
	Fomalhaut W.	35 9 45	4636	36 11 39	4530	37 15 5	4423	38 19 55	4360
	SUN E.	48 56 13	2458	47 35 2	2463	46 13 56	2468	44 52 54	2471
6	α Aquilæ W.	68 34 35	2709	69 51 12	2696	71 8 1	2687	72 25 2	2677
	Fomalhaut W.	44 1 19	4034	45 12 25	2666	46 24 18	2643	47 36 54	2624
	SUN E.	38 8 44	2496	36 48 4	2496	35 27 27	2491	34 6 53	2492
7	α Aquilæ W.	78 52 30	2637	80 10 24	2631	81 26 25	2624	82 46 33	2616
	Fomalhaut W.	53 49 2	2748	55 5 0	2721	56 21 25	2697	57 38 15	2675
	SUN E.	27 24 45	2606	26 4 30	2613	24 44 20	2618	23 24 16	2324
11	SUN W.	17 20 40	2425	18 42 28	2401	20 4 43	2380	21 27 22	2362
	Pollux E.	43 28 13	2018	41 58 23	2016	40 28 30	2015	38 58 36	2014
	Jupiter E.	70 23 19	2982	68 52 44	2977	67 22 2	2970	65 51 12	2964
	Regulus E.	80 5 7	2652	78 33 54	2646	77 2 33	2639	75 31 4	2632
	Saturn E.	84 48 33	2968	83 17 40	2962	81 46 39	2956	80 15 30	2948
12	SUN W.	28 25 24	2288	29 49 49	2276	31 14 29	2264	32 39 23	2253
	Pollux E.	31 29 3	2022	29 59 17	2028	28 29 39	2026	27 0 11	2046
	Jupiter E.	58 14 57	2990	56 43 16	2922	55 11 26	2916	53 39 27	2909
	Regulus E.	67 51 32	2696	66 19 10	2691	64 46 39	2683	63 13 58	2676
	Saturn E.	72 37 34	2914	71 5 33	2907	69 33 23	2900	68 1 4	2892
13	SUN W.	39 47 16	2196	41 13 31	2183	42 40 0	2173	44 6 42	2161
	Jupiter E.	45 57 9	2671	44 24 13	2663	42 51 7	2655	41 17 50	2647
	Regulus E.	55 28 5	2636	53 54 23	2627	52 20 30	2619	50 46 27	2611
	Saturn E.	60 17 4	2655	58 43 47	2646	57 10 19	2638	55 36 41	2630
	Spica E.	109 30 15	2927	107 56 22	2918	106 22 17	2908	104 48 0	2902
14	SUN W.	51 23 38	2104	52 51 43	2091	54 20 3	2080	55 48 37	2069
	Mars W.	18 1 39	2973	19 32 26	2962	21 3 27	2950	22 34 43	2939
	Jupiter E.	33 28 56	2610	31 54 41	2603	30 20 17	2597	28 45 45	2591
	Regulus E.	42 53 24	2768	41 18 14	2760	39 42 53	2751	38 7 21	2742
	Saturn E.	47 45 54	2791	46 11 14	2782	44 36 23	2775	43 1 22	2766
	Spica E.	96 53 28	2761	95 17 56	2741	93 42 10	2730	92 6 10	2719

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Star's Name and Position.	Midnight.	P. L. of DM.	XVh.	P. L. of DM.	XVIIIh.	P. L. of DM.	XXIh.	P. L. of DM.
1	Antares W.	66° 10' 24"	3232	67° 44' 23"	3238	69° 18' 4"	3250	70° 51' 27"	3264
	α Pegasi E.	40 43 35	3198	39 17 17	3223	37 51 46	3275	36 27 5	3331
	SUN E.	87 50 41	3186	86 24 14	3200	84 58 5	3215	83 32 14	3230
2	Antares W.	78 34 14	3224	80 6 2	3235	81 37 36	3246	83 8 57	3256
	α Aquilæ W.	36 1 27	3036	36 57 55	3096	37 56 13	3174	38 56 11	3264
	α Pegasi E.	29 38 33	3226	28 20 27	3111	27 3 52	3006	25 48 58	3019
	SUN E.	76 27 5	3206	75 2 49	3208	73 38 47	3219	72 14 58	3231
3	Antares W.	90 42 39	3001	92 12 51	3009	93 42 53	3015	95 12 47	3023
	α Aquilæ W.	44 16 30	4267	45 23 53	4211	46 32 9	4159	47 41 14	4112
	SUN E.	65 18 56	3390	63 56 17	3398	62 33 47	3397	61 11 27	3406
4	Antares W.	102 40 19	3060	104 9 30	3066	105 38 35	3069	107 7 34	3063
	α Aquilæ W.	53 36 51	3290	54 49 40	3204	56 2 56	3272	57 16 37	3256
	Fomalhaut W.	31 20 30	3211	32 14 43	3040	33 11 7	4909	34 9 31	4784
	SUN E.	54 21 51	3436	53 0 18	3444	51 38 51	3445	50 17 29	3444
5	α Aquilæ W.	63 30 24	3764	64 46 4	3748	66 2 0	3734	67 18 11	3723
	Fomalhaut W.	39 26 2	4373	40 33 20	4204	41 41 42	4143	42 51 3	4086
	SUN E.	43 31 57	3474	42 11 4	3477	40 50 14	3480	39 29 27	3483
6	α Aquilæ W.	73 42 13	3268	74 59 34	3280	76 17 4	3261	77 34 43	3244
	Fomalhaut W.	48 50 10	3266	50 4 4	3283	51 18 32	3202	52 33 32	3773
	SUN E.	32 46 21	3496	31 25 52	3498	30 5 26	3502	28 45 4	3506
7	α Aquilæ W.	84 4 48	3213	85 23 8	3209	86 41 33	3205	88 0 2	3200
	Fomalhaut W.	58 55 28	3266	60 13 3	3285	61 30 59	3217	62 49 15	3200
	SUN E.	22 4 18	3281	20 44 28	3540	19 24 48	3543	18 5 21	3537
11	SUN W.	22 50 22	3245	24 13 41	3239	25 37 19	3214	27 1 14	3201
	Pollux E.	37 28 40	3014	35 58 44	3014	34 28 48	3015	32 58 54	3018
	Jupiter E.	64 20 14	3268	62 49 8	3260	61 17 53	3243	59 46 29	3237
	Regulus E.	73 59 27	3226	72 27 41	3220	70 55 47	3213	69 23 44	3206
	Saturn E.	78 44 12	3243	77 12 46	3235	75 41 11	3227	74 9 27	3220
12	SUN W.	34 4 30	3241	35 29 51	3229	36 55 26	3216	38 21 14	3206
	Pollux E.	25 30 55	3090	24 1 56	3078	22 33 19	3100	21 5 9	3128
	Jupiter E.	52 7 18	3201	50 35 0	3204	49 2 33	3206	47 29 56	3278
	Regulus E.	61 41 8	3268	60 8 8	3269	58 34 57	3243	57 1 36	3244
	Saturn E.	66 28 35	3266	64 55 57	3277	63 23 9	3269	61 50 11	3262
13	SUN W.	45 33 38	3160	47 0 47	3138	48 28 10	3127	49 55 47	3118
	Jupiter E.	39 44 23	3289	38 10 46	3281	36 36 59	3224	35 3 2	3217
	Regulus E.	49 12 13	3202	47 37 48	3193	46 3 11	3185	44 28 23	3176
	Saturn E.	54 2 52	3222	52 28 53	3215	50 54 44	3206	49 20 24	3198
	Spica E.	103 13 30	3789	101 38 48	3780	100 3 54	3770	98 26 47	3761
14	SUN W.	57 17 26	3246	58 46 30	3243	60 15 50	3230	61 45 25	3218
	Mars W.	24 6 13	3227	25 37 58	3216	27 9 58	3208	28 42 13	3201
	Jupiter E.	27 11 5	3785	25 36 18	3781	24 1 25	3776	22 26 26	3773
	Regulus E.	36 31 37	3734	34 55 42	3725	33 19 35	3716	31 43 17	3709
	Saturn E.	41 26 10	3759	39 50 48	3752	38 15 17	3744	36 39 36	3738
	Spica E.	90 29 56	3708	88 53 27	3698	87 16 44	3687	85 39 46	3676

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Star's Name and Position.	Noon.	P. L. of Dist.	IIIh.	P. L. of Dist.	VIh.	P. L. of Dist.	IXh.	P. L. of Dist.
15	SUN W.	63° 15' 16"	2006	64° 45' 23"	2002	66° 15' 48"	2078	67° 46' 26"	2065
	Mars W.	30 14 44	2079	31 47 30	2066	33 20 32	2054	34 53 50	2042
	Regulus E.	30 6 49	2701	28 30 11	2086	26 53 24	2089	25 16 29	2084
	Saturn E.	35 3 46	2783	33 27 48	2736	31 51 43	2722	30 15 32	2716
	Spica E.	84 2 33	2064	82 25 5	2062	80 47 21	2040	79 9 21	2028
16	SUN W.	75 23 58	2007	76 56 21	2003	78 29 2	2069	80 2 1	2064
	Mars W.	42 44 30	2776	44 19 29	2702	45 54 47	2748	47 30 23	2735
	Pollux W.	21 33 6	2013	23 7 17	2706	24 42 27	2729	26 18 29	2084
	Spica E.	70 55 10	2068	69 15 29	2063	67 35 30	2041	65 55 14	2028
17	SUN W.	87 51 39	2781	89 26 32	2706	91 1 45	2761	92 37 17	2786
	Mars W.	55 33 2	2063	57 10 31	2049	58 48 19	2035	60 26 27	2020
	Pollux W.	34 29 1	2009	36 8 52	2037	37 49 14	2016	39 30 5	2006
	Spica E.	57 29 22	2062	55 47 16	2049	54 4 51	2036	52 22 7	2022
	Antares E.	103 7 52	2066	101 25 35	2041	99 42 59	2027	98 0 3	2012
18	SUN W.	100 39 56	2002	102 17 27	2046	103 55 19	2032	105 33 31	2018
	Mars W.	68 42 4	2048	70 22 11	2033	72 2 38	2018	73 43 26	2004
	Pollux W.	48 1 6	2006	49 44 34	2007	51 28 27	2071	53 12 43	2055
	Jupiter W.	19 57 47	2066	21 40 2	2031	23 22 52	2008	25 6 15	2007
	Spica E.	43 43 38	2066	41 59 0	2043	40 14 3	2031	38 28 48	2018
	Antares E.	89 20 25	2044	87 35 29	2031	85 50 14	2017	84 4 39	2004
19	SUN W.	113 49 20	2048	115 29 27	2030	117 9 52	2021	118 50 36	2008
	Mars W.	82 12 18	2035	83 55 3	2023	85 38 6	2009	87 21 28	2006
	Pollux W.	61 59 42	2000	63 46 11	2006	65 38 1	2020	67 20 11	2000
	Jupiter W.	33 50 15	2008	35 36 17	2003	37 22 42	2006	39 9 28	2004
	Regulus W.	24 58 2	2001	26 44 14	2073	28 30 53	2055	30 17 59	2038
	Saturn W.	20 33 9	2008	22 16 33	2073	24 0 47	2043	25 45 45	2016
	Spica E.	29 38 14	2002	27 51 19	2003	26 4 11	2045	24 16 51	2026
	Antares E.	75 11 50	2037	73 24 18	2026	71 36 27	2012	69 48 18	2000
	20	SUN W.	127 18 33	2050	129 0 56	2040	130 43 34	2030	132 26 26	2021
Mars W.		96 2 42	2037	97 47 47	2037	99 33 7	2017	101 18 42	2007
Pollux W.		76 20 42	2179	78 9 41	2100	79 58 56	2169	81 48 26	2149
Jupiter W.		48 8 15	2102	49 56 55	2100	51 45 52	2170	53 35 5	2100
Regulus W.		39 19 15	2108	41 8 31	2106	42 58 5	2146	44 47 56	2124
Saturn W.		34 39 17	2014	36 27 23	2100	38 15 52	2164	40 4 43	2173
Antares E.		60 43 9	2144	58 53 17	2134	57 3 10	2125	55 12 49	2116
α Aquilæ E.		112 27 48	2774	110 52 46	2746	109 17 10	2725	107 41 3	2704
21	Mars W.	110 9 58	2006	111 56 48	2000	113 43 48	2033	115 30 56	2000
	Pollux W.	90 59 21	2100	92 50 6	2108	94 41 1	2098	96 32 4	2092
	Jupiter W.	62 44 41	2118	64 35 12	2118	66 25 53	2106	68 16 43	2100
	Regulus W.	54 0 58	2000	55 52 13	2008	57 43 38	2077	59 35 13	2070
	Saturn W.	49 13 26	2119	51 3 56	2111	52 54 38	2103	54 45 32	2097
	Antares E.	45 57 44	2077	44 6 10	2071	42 14 26	2066	40 22 33	2061
	α Aquilæ E.	99 34 5	2032	97 55 40	2011	96 17 0	2001	94 38 6	2000
22	Jupiter W.	77 32 42	2003	79 24 8	2002	81 15 35	2001	83 7 3	2001
	Regulus W.	68 55 3	2002	70 47 16	2001	72 39 31	2000	74 31 48	2000
	Saturn W.	64 2 10	2076	65 53 47	2073	67 45 27	2072	69 37 9	2072
	Spica W.	15 0 33	2121	16 51 0	2107	18 41 49	2095	20 32 56	2086
	Antares E.	31 1 36	2046	29 9 13	2046	27 16 50	2046	25 24 27	2047

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Star's Name and Position.	Midnight.	P. L. of Dist.	XVh.	P. L. of Dist.	XVIIIh.	P. L. of Dist.	XXIh.	P. L. of Dist.
15	SUN W.	69° 17' 23"	2863	70° 48' 35"	2868	72° 20' 5"	2824	73° 51' 53"	2911
	Mars W.	36 27 24	2828	38 1 15	2815	39 35 23	2803	41 9 48	2789
	Regulus E.	23 39 27	2851	22 2 21	2879	20 25 13	2681	18 48 7	2688
	Saturn E.	28 39 16	2716	27 2 57	2716	25 26 38	2717	23 50 21	2722
	Spica E.	77 31 4	2616	75 52 31	2604	74 13 41	2691	72 34 34	2579
16	SUN W.	81 35 19	2830	83 8 56	2826	84 42 51	2611	86 17 5	2795
	Mars W.	49 6 17	2720	50 42 30	2706	52 19 2	2692	53 55 52	2678
	Pollux W.	27 55 17	2622	29 32 48	2634	31 10 57	2607	32 49 42	2683
	Spica E.	64 14 40	2515	62 33 48	2502	60 52 38	2489	59 11 9	2476
17	SUN W.	94 13 9	2721	95 49 21	2706	97 25 53	2601	99 2 45	2677
	Mars W.	62 4 55	2605	63 43 43	2601	65 22 50	2577	67 2 17	2662
	Pollux W.	41 11 24	2477	42 53 10	2468	44 35 23	2439	46 18 2	2422
	Spica E.	50 39 4	2406	48 55 41	2395	47 11 59	2382	45 27 58	2366
	Antares E.	96 16 47	2209	94 33 11	2205	92 49 15	2273	91 5 0	2268
18	SUN W.	107 12 2	2608	108 50 53	2589	110 30 3	2575	112 9 32	2561
	Mars W.	75 24 33	2490	77 6 0	2476	78 47 47	2463	80 29 53	2449
	Pollux W.	54 57 22	2329	56 42 24	2324	58 27 48	2309	60 13 34	2294
	Jupiter W.	26 50 9	2206	28 34 32	2248	30 19 21	2231	32 4 36	2214
	Spica E.	36 43 15	2206	34 57 24	2206	33 11 17	2284	31 24 54	2272
Antares E.	82 18 45	2200	80 32 31	2277	78 45 57	2263	76 59 3	2260	
19	SUN W.	120 31 38	2490	122 12 57	2464	123 54 33	2473	125 36 25	2461
	Mars W.	89 5 8	2384	90 49 6	2373	92 33 21	2360	94 17 53	2348
	Pollux W.	69 7 40	2237	70 55 28	2214	72 43 35	2202	74 32 0	2190
	Jupiter W.	40 56 35	2241	42 44 2	2238	44 31 48	2215	46 19 53	2204
	Regulus W.	32 5 30	2222	33 53 25	2208	35 41 41	2194	37 30 18	2180
	Saturn W.	27 31 23	2291	29 17 36	2269	31 4 21	2249	32 51 36	2231
	Spica E.	22 29 20	2223	20 41 42	2230	18 53 59	2230	17 6 16	2223
	Antares E.	67 59 51	2168	66 11 6	2177	64 22 4	2166	62 32 45	2156
	20	SUN W.	134 9 31	2412	135 52 48	2404	137 36 17	2397	139 19 56	2390
Mars W.		103 4 32	2298	104 50 35	2289	106 36 51	2281	108 23 19	2273
Pollux W.		83 38 11	2139	85 28 10	2131	87 18 22	2123	89 8 46	2116
Jupiter W.		55 24 33	2161	57 14 15	2141	59 4 11	2133	60 54 20	2125
Regulus W.		46 38 4	2124	48 28 27	2116	50 19 4	2106	52 9 55	2098
Saturn W.		41 53 53	2169	43 43 22	2148	45 33 8	2137	47 23 10	2128
Antares E.		53 22 13	2106	51 31 23	2099	49 40 21	2091	47 49 8	2084
α Aquilæ E.		106 4 28	2084	104 27 26	2066	102 50 0	2049	101 12 12	2035
21		Mars W.	117 18 12	2243	119 5 35	2239	120 53 5	2226	122 40 40	2222
	Pollux W.	98 23 15	2089	100 14 32	2085	102 5 55	2081	103 57 23	2080
	Jupiter W.	70 7 42	2096	71 58 48	2091	73 50 1	2088	75 41 19	2085
	Regulus W.	61 26 58	2096	63 18 50	2091	65 10 49	2087	67 2 54	2086
	Saturn W.	56 36 36	2091	58 27 49	2086	60 19 10	2082	62 10 37	2078
	Antares E.	38 30 33	2066	36 38 26	2053	34 46 14	2050	32 53 57	2047
	α Aquilæ E.	92 59 1	2066	91 19 47	2063	89 40 27	2078	88 1 2	2077
22	Jupiter W.	84 58 32	2061	86 50 0	2063	88 41 25	2065	90 32 47	2068
	Regulus W.	76 24 5	2060	78 16 22	2062	80 8 36	2063	82 0 47	2066
	Saturn W.	71 28 52	2073	73 20 35	2073	75 12 16	2075	77 3 54	2077
	Spica W.	22 24 17	2079	24 15 48	2076	26 7 26	2072	27 59 8	2072
	Antares E.	23 32 6	2048	21 39 48	2053	19 47 36	2067	17 55 30	2062

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Star's Name and Position.	Noon.	P. L. of Dist.	IIIh.	P. L. of Dist.	VIh.	P. L. of Dist.	IXh.	P. L. of Dist.
22	α Aquilæ E.	86° 21' 35"	2677	84° 42' 9"	2679	83° 2' 45"	2663	81° 23' 26"	2666
23	Jupiter W.	92 24 5	2693	94 15 17	2696	96 6 22	2101	97 57 19	2107
	Regulus W.	83 52 54	2669	85 44 56	2663	87 36 52	2698	89 28 40	2673
	Saturn W.	78 55 28	2681	80 46 57	2685	82 38 20	2689	84 29 36	2684
	Spica W.	29 50 51	2673	31 42 33	2673	33 34 13	2677	35 25 48	2680
	α Aquilæ E.	73 9 34	2643	71 31 38	2660	69 54 5	2680	68 16 58	2701
Fomalhaut E.	97 58 16	2476	96 16 32	2460	94 34 51	2468	92 53 14	2467	
24	Jupiter W.	107 9 35	2146	108 59 25	2155	110 49 0	2166	112 38 19	2177
	Regulus W.	98 45 14	2111	100 35 56	2120	102 26 24	2131	104 16 36	2141
	Saturn W.	93 43 32	2123	95 33 42	2141	97 23 38	2152	99 13 18	2163
	Spica W.	44 41 49	2113	46 32 29	2121	48 22 56	2130	50 13 9	2140
	α Aquilæ E.	60 19 48	2623	58 46 27	2601	57 13 57	2623	55 42 22	2601
	Fomalhaut E.	84 27 14	2629	82 46 41	2643	81 6 27	2637	79 26 33	2673
	α Pegasi E.	105 5 56	2253	103 18 48	2260	101 31 49	2268	99 45 2	2277
25	Spica W.	59 20 6	2200	61 8 34	2213	62 56 42	2227	64 44 29	2242
	Antares W.	13 40 13	2211	15 28 24	2223	17 16 17	2236	19 3 51	2249
	α Aquilæ E.	48 20 59	2204	46 56 40	2276	45 33 56	2466	44 12 54	2465
	Fomalhaut E.	71 13 11	2676	60 35 58	2701	67 59 19	2728	66 23 16	2757
	α Pegasi E.	90 54 53	2235	89 9 44	2248	87 24 55	2263	85 40 27	2278
26	Spica W.	73 37 49	2220	75 23 20	2236	77 8 27	2253	78 53 9	2271
	Antares W.	27 56 50	2219	29 42 22	2235	31 27 30	2252	33 12 14	2268
	Fomalhaut E.	58 33 22	2681	57 1 43	2673	55 30 57	2618	54 1 7	2667
	α Pegasi E.	77 3 56	2465	75 21 54	2465	73 40 19	2604	71 59 12	2624
27	Spica W.	87 30 21	2460	89 12 31	2477	90 54 16	2496	92 35 35	2514
	Antares W.	41 49 44	2466	43 31 59	2475	45 13 48	2493	46 55 12	2510
	Fomalhaut E.	46 47 54	2623	45 24 54	2435	44 3 17	2616	42 43 9	2601
	α Pegasi E.	63 40 51	2635	62 2 44	2650	60 25 9	2664	58 48 7	2706
	α Arietis E.	105 58 49	2473	104 16 57	2490	102 35 30	2507	100 54 27	2525
	SUN E.	136 42 44	2786	135 7 56	2803	133 33 32	2822	131 59 33	2841
28	Antares W.	55 15 56	2600	56 54 51	2618	58 33 21	2636	60 11 27	2654
	Fomalhaut E.	36 28 33	4178	35 19 46	4333	34 13 24	4506	33 9 37	4680
	α Pegasi E.	50 51 38	2647	49 18 11	2677	47 45 23	2690	46 13 15	2642
	α Arietis E.	92 35 29	2616	90 56 56	2634	89 18 47	2662	87 41 2	2689
	SUN E.	124 15 41	2626	122 44 8	2641	121 12 58	2673	119 42 12	2692
29	Antares W.	68 16 7	2738	69 51 56	2755	71 27 23	2771	73 2 29	2786
	α Pegasi E.	38 43 41	3135	37 16 14	3182	35 49 43	3231	34 24 11	3285
	α Arietis E.	79 38 8	2755	78 2 41	2771	76 27 35	2788	74 52 51	2804
	SUN E.	112 14 5	2693	110 45 34	3100	109 17 24	3117	107 49 35	3133
30	Antares W.	80 53 2	2680	82 26 12	2673	83 59 5	2667	85 31 41	2660
	α Aquilæ W.	37 18 2	4784	38 18 33	4619	39 20 41	4516	40 24 17	4436
	α Arietis E.	67 4 16	2679	65 31 30	2684	63 59 3	2697	62 26 53	2690
	SUN E.	100 35 26	3213	99 9 31	3237	97 43 54	3242	96 18 34	3256
31	Antares W.	93 10 45	2656	94 41 51	2669	96 12 43	2678	97 43 23	2687
	α Aquilæ W.	45 59 49	4109	47 9 42	4063	48 20 20	4023	49 31 38	3985
	α Arietis E.	54 50 11	2683	53 19 37	2694	51 49 17	2696	50 19 11	2616
	SUN E.	89 15 48	3318	87 51 57	3320	86 28 19	3326	85 4 53	3330

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Star's Name and Position.	Midnight.	P. L. of Dist.	XV ^h .	P. L. of Dist.	XVIII ^h .	P. L. of Dist.	XXI ^h .	P. L. of Dist.
22	α Aquilæ E.	79° 44' 15"	2696	78° 5' 14"	2604	76° 26' 25"	2616	74° 47' 51"	2686
23	Jupiter W.	99 48 8	2113	101 38 47	2120	103 29 15	2128	105 19 31	2186
	Regulus W.	91 20 20	2080	93 11 50	2086	95 3 10	2094	96 54 18	2102
	Saturn W.	86 20 45	2100	88 11 44	2107	90 2 32	2118	91 53 8	2123
	Spica W.	37 17 18	2065	39 8 41	2091	40 59 54	2098	42 50 57	2105
	α Aquilæ E.	66 40 20	2726	65 4 15	2753	63 28 45	2753	61 53 55	2816
	Fomalhaut E.	91 11 42	2492	89 30 18	2499	87 49 4	2508	86 8 2	2618
24	Jupiter W.	114 27 21	2188	116 16 6	2201	118 4 32	2214	119 52 39	2286
	Regulus W.	106 6 32	2153	107 56 11	2165	109 45 31	2178	111 34 32	2191
	Saturn W.	101 2 41	2174	102 51 47	2186	104 40 35	2199	106 29 4	2218
	Spica W.	52 3 7	2151	53 52 48	2163	55 42 12	2174	57 31 18	2186
	α Aquilæ E.	54 11 46	2033	52 42 14	2090	51 13 52	2153	49 46 45	2220
	Fomalhaut E.	77 47 1	2590	76 7 52	2610	74 29 10	2630	72 50 56	2652
	α Pegasi E.	97 58 29	2267	96 12 10	2296	94 26 7	2308	92 40 21	2322
25	Spica W.	66 31 54	2267	68 18 57	2272	70 5 37	2287	71 51 55	2304
	Antares W.	20 51 6	2262	22 38 2	2274	24 24 39	2289	26 10 55	2303
	α Aquilæ E.	42 53 42	2075	41 36 28	2796	40 21 22	2830	39 8 33	4079
	Fomalhaut E.	64 47 52	2783	63 13 8	2821	61 39 7	2855	60 5 51	2882
	α Pegasi E.	83 56 21	2394	82 12 38	2411	80 29 19	2429	78 46 25	2446
26	Spica W.	80 37 26	2388	82 21 18	2406	84 4 44	2424	85 47 45	2441
	Antares W.	34 56 34	2386	36 40 29	2403	38 23 59	2421	40 7 4	2438
	Fomalhaut E.	52 32 17	2118	51 4 29	2172	49 37 46	2221	48 12 13	2294
	α Pegasi E.	70 18 32	2545	68 38 21	2606	66 58 40	2689	65 19 30	2612
27	Spica W.	94 16 29	2533	95 56 57	2551	97 37 0	2569	99 16 38	2587
	Antares W.	48 36 11	2529	50 16 44	2546	51 56 53	2564	53 36 37	2583
	Fomalhaut E.	41 24 36	2095	40 7 44	2799	38 52 41	2813	37 39 84	4089
	α Pegasi E.	57 11 38	2735	55 35 44	2781	54 0 25	2789	52 25 43	2818
	α Arietis E.	99 13 49	2642	97 33 36	2662	95 53 49	2680	94 14 27	2698
	SUN E.	130 25 58	2869	128 52 47	2879	127 20 1	2898	125 47 39	2916
28	Antares W.	61 49 9	2671	63 26 28	2686	65 3 24	2705	66 39 57	2722
	Fomalhaut E.	32 8 37	4917	31 10 36	5166	30 15 48	5449	29 24 28	5780
	α Pegasi E.	44 41 49	2977	43 11 7	3013	41 41 10	3051	40 12 0	3092
	α Arietis E.	86 3 40	2687	84 26 42	2704	82 50 8	2723	81 13 57	2738
	SUN E.	118 11 49	3010	116 41 49	3029	115 12 12	3047	113 42 58	3065
29	Antares W.	74 37 15	2901	76 11 41	2817	77 45 47	2831	79 19 34	2846
	α Pegasi E.	32 59 43	2347	31 36 26	2414	30 14 25	2498	28 53 47	2569
	α Arietis E.	73 18 28	2819	71 44 25	2835	70 10 43	2860	68 37 20	2885
	SUN E.	106 22 6	3160	104 54 57	3167	103 26 8	3183	102 1 38	3198
30	Antares W.	87 4 0	2912	88 36 3	2924	90 7 51	2935	91 39 25	2946
	α Aquilæ W.	41 29 13	4349	42 35 21	4378	43 42 34	4216	44 50 45	4160
	α Arietis E.	60 55 0	2934	59 23 24	2946	57 52 4	2969	56 21 0	2971
	SUN E.	94 53 31	3269	93 28 43	3292	92 4 10	3294	90 39 52	3306
31	Antares W.	99 13 52	2997	100 44 9	3006	102 14 15	3013	103 44 12	3021
	α Aquilæ W.	50 43 32	3951	51 56 0	3921	53 8 58	3894	54 22 24	3869
	α Arietis E.	48 49 18	3036	47 19 38	3087	45 50 11	3047	44 20 56	3056
	SUN E.	83 41 39	3359	82 18 36	3369	80 55 44	3378	79 33 2	3386

AT GREENWICH APPARENT NOON.

THE SUN'S													
Day of the Week.	Day of the Month.	Apparent Right Ascension.			Diff. for 1 hour.	Apparent Declination.			Diff. for 1 hour.	Semi-diameter.	Sidereal Time of the Semi-diameter passing the Meridian.	Equation of Time, to be subtracted from	Diff. for 1 hour.
		h	m	s	"	°	'	"	"	"	m	s	
Sat.	1	4	37	18.27	10.232	N.22	5	49.3	20.18	15 46.23	68.42	2 29.97	0.375
Sun.	2	4	41	24.07	10.249	22	13	42.2	19.22	15 46.09	68.48	2 20.74	0.393
Mon.	3	4	45	30.28	10.266	22	21	11.9	18.25	15 47.96	68.53	2 11.12	0.409
Tues.	4	4	49	36.87	10.281	22	28	18.1	17.27	15 47.83	68.58	2 1.11	0.423
Wed.	5	4	53	43.81	10.295	22	35	0.9	16.29	15 47.71	68.63	1 50.76	0.437
Thur.	6	4	57	51.10	10.309	22	41	20.0	15.30	15 47.60	68.67	1 40.05	0.451
Fri.	7	5	1	58.71	10.322	22	47	15.3	14.30	15 47.49	68.71	1 29.03	0.465
Sat.	8	5	6	6.62	10.334	22	52	46.5	13.29	15 47.38	68.75	1 17.71	0.477
Sun.	9	5	10	14.80	10.344	22	57	53.6	12.28	15 47.27	68.79	1 6.13	0.487
Mon.	10	5	14	23.21	10.353	23	2	36.4	11.27	15 47.18	68.82	0 54.31	0.496
Tues.	11	5	18	31.83	10.362	23	6	54.9	10.26	15 47.09	68.85	0 42.28	0.504
Wed.	12	5	22	40.65	10.369	23	10	48.9	9.24	15 47.00	68.88	0 30.04	0.511
Thur.	13	5	26	49.64	10.376	23	14	18.5	8.22	15 46.92	68.90	0 17.64	0.517
Fri.	14	5	30	58.78	10.382	23	17	23.6	7.20	15 46.84	68.92	0 5.10	0.521
Sat.	15	5	35	8.05	10.387	23	20	4.1	6.17	15 46.77	68.94	0 7.57	0.525
Sun.	16	5	39	17.42	10.390	23	22	19.8	5.14	15 46.71	68.95	0 20.34	0.529
Mon.	17	5	43	26.86	10.392	23	24	10.8	4.11	15 46.65	68.96	0 33.19	0.532
Tues.	18	5	47	36.33	10.394	23	25	37.1	3.08	15 46.59	68.97	0 46.06	0.535
Wed.	19	5	51	45.82	10.394	23	26	38.7	2.05	15 46.53	68.98	0 58.96	0.537
Thur.	20	5	55	55.31	10.394	23	27	15.5	1.02	15 46.48	68.98	1 11.86	0.536
Fri.	21	6	0	4.80	10.394	23	27	27.5	0.02	15 46.43	68.98	1 24.75	0.535
Sat.	22	6	4	14.27	10.392	23	27	14.7	1.05	15 46.38	68.97	1 37.63	0.533
Sun.	23	6	8	23.69	10.389	23	26	37.1	2.08	15 46.34	68.96	1 50.46	0.531
Mon.	24	6	12	33.03	10.386	23	25	34.8	3.11	15 46.30	68.95	2 3.22	0.529
Tues.	25	6	16	42.28	10.381	23	24	7.8	4.14	15 46.27	68.93	2 15.87	0.526
Wed.	26	6	20	51.42	10.376	23	22	16.2	5.17	15 46.24	68.91	2 28.41	0.522
Thur.	27	6	25	0.43	10.371	23	19	59.8	6.19	15 46.21	68.89	2 40.82	0.516
Fri.	28	6	29	9.29	10.364	23	17	18.9	7.21	15 46.18	68.87	2 53.11	0.509
Sat.	29	6	33	17.98	10.357	23	14	13.4	8.24	15 46.16	68.84	3 5.21	0.500
Sun.	30	6	37	26.48	10.348	23	10	43.3	9.26	15 46.15	68.81	3 17.11	0.491
Mon.	31	6	41	34.76	10.338	N.23	6	48.9	10.27	15 46.14	68.78	3 28.80	0.481

NOTE. — Mean Time of the Semidiameter passing may be found by subtracting 0s.13 from the Sidereal Time.

AT GREENWICH MEAN NOON.

THE SUN'S															
Day of the Week.	Day of the Month.	Apparent				Equation of Time, to be added to		Dif. for 1 hour.		Sidereal Time.					
		Right Ascension.			Dif. for 1 hour.	Declination.			Dif. for 1 hour.						
		h	m	s	s	°	'	"	m	s					
Sat.	1	4	37	18.70	10.232	N.22	5	50.1	2	29.95	0.375	4	39	48.65	
Sun.	2	4	41	24.48	10.249	22	13	42.9	2	20.72	0.393	4	43	45.20	
Mon.	3	4	45	30.66	10.266	22	21	12.5	2	11.10	0.409	4	47	41.76	
Tues.	4	4	49	37.22	10.281	22	28	18.7	17.27	2	1.10	0.423	4	51	38.32
Wed.	5	4	53	44.13	10.295	22	35	1.4	16.29	1	50.75	0.437	4	55	34.88
Thur.	6	4	57	51.89	10.309	22	41	20.4	15.30	1	40.04	0.451	4	59	31.43
Fri.	7	5	1	58.97	10.322	22	47	15.6	14.30	1	29.02	0.465	5	3	27.99
Sat.	8	5	6	6.85	10.334	22	52	46.7	13.29	1	17.70	0.477	5	7	24.55
Sun.	9	5	10	14.99	10.344	22	57	53.7	12.23	1	6.12	0.487	5	11	21.11
Mon.	10	5	14	23.37	10.353	23	2	36.5	11.27	0	54.30	0.496	5	15	17.67
Tues.	11	5	18	31.96	10.362	23	6	54.9	10.26	0	42.27	0.504	5	19	14.23
Wed.	12	5	22	40.75	10.369	23	10	48.9	9.24	0	30.03	0.511	5	23	10.78
Thur.	13	5	26	49.70	10.376	23	14	18.5	8.22	0	17.64	0.517	5	27	7.34
Fri.	14	5	30	58.80	10.382	23	17	23.6	7.20	0	5.10	0.521	5	31	3.90
Sat.	15	5	35	8.08	10.387	23	20	4.1	6.17	0	7.57	0.525	5	35	0.46
Sun.	16	5	39	17.36	10.390	23	22	19.8	5.14	0	20.34	0.529	5	38	57.02
Mon.	17	5	43	26.76	10.392	23	24	10.8	4.11	0	33.19	0.532	5	42	53.57
Tues.	18	5	47	36.19	10.394	23	25	37.1	3.08	0	46.06	0.535	5	46	50.13
Wed.	19	5	51	45.65	10.394	23	26	38.7	2.05	0	58.96	0.537	5	50	46.69
Thur.	20	5	55	55.10	10.394	23	27	15.5	1.02	1	11.85	0.536	5	54	43.25
Fri.	21	6	0	4.55	10.394	23	27	27.5	0.00	1	24.74	0.535	5	58	39.81
Sat.	22	6	4	13.99	10.392	23	27	14.7	1.04	1	37.63	0.533	6	2	36.36
Sun.	23	6	8	23.37	10.389	23	26	37.2	2.08	1	50.45	0.531	6	6	32.92
Mon.	24	6	12	32.68	10.386	23	25	34.9	3.11	2	3.20	0.529	6	10	29.48
Tues.	25	6	16	41.89	10.381	23	24	7.9	4.14	2	15.85	0.526	6	14	26.04
Wed.	26	6	20	50.99	10.376	23	22	16.3	5.17	2	28.39	0.522	6	18	22.60
Thur.	27	6	24	59.96	10.371	23	20	0.0	6.19	2	40.80	0.516	6	22	19.16
Fri.	28	6	29	8.79	10.364	23	17	19.2	7.21	2	53.08	0.509	6	26	15.71
Sat.	29	6	33	17.45	10.357	23	14	13.8	8.24	3	5.18	0.500	6	30	12.27
Sun.	30	6	37	25.91	10.348	23	10	43.8	9.26	3	17.08	0.491	6	34	8.83
Mon.	31	6	41	34.16	10.338	N.23	6	49.5	10.27	3	28.77	0.481	6	38	5.39

NOTE. — The Semidiameter for Mean Noon may be assumed the same as that for Apparent Noon.

AT GREENWICH MEAN NOON.

		THE SUN'S					Logarithm of the Radius Vector of the Earth.	Diff. for 1 hour.	Mean Time of Sidereal Oh.
Day of the Month.	Day of the Year.	True LONGITUDE.		Diff. for 1 hour.	LATITUDE.				
		λ	λ'						
1	152	70° 54' 47.9"	54' 11.2"	143.64	+0.79	0.0062637	26.5	19 17 1.28	
2	153	71 52 14.7	51 37.8	143.61	0.84	.0063263	25.7	19 13 5.37	
3	154	72 49 41.0	49 3.9	143.58	0.86	.0063871	24.9	19 9 9.45	
4	155	73 47 6.6	46 29.4	143.55	0.84	.0064459	24.0	19 5 13.54	
5	156	74 44 31.5	43 54.2	143.42	0.80	.0065022	22.9	19 1 17.63	
6	157	75 41 55.6	41 18.1	143.49	0.73	.0065561	21.9	18 57 21.72	
7	158	76 39 18.9	38 41.2	143.46	0.64	.0066075	20.9	18 53 25.81	
8	159	77 36 41.5	36 3.6	143.43	0.53	.0066565	19.8	18 49 29.89	
9	160	78 34 3.3	33 25.2	143.39	0.40	.0067030	18.8	18 45 33.98	
10	161	79 31 24.4	30 46.2	143.35	0.27	.0067470	17.8	18 41 38.07	
11	162	80 28 44.6	28 6.2	143.31	0.14	.0067885	16.8	18 37 42.16	
12	163	81 26 4.0	25 25.4	143.27	+0.01	.0068276	15.8	18 33 46.25	
13	164	82 23 22.6	22 43.8	143.23	-0.10	.0068643	14.8	18 29 50.33	
14	165	83 20 40.3	20 1.3	143.20	0.19	.0068988	13.9	18 25 54.42	
15	166	84 17 57.2	17 18.1	143.17	0.25	.0069312	13.1	18 21 58.51	
16	167	85 15 13.2	14 33.9	143.14	0.27	.0069616	12.3	18 18 2.60	
17	168	86 12 28.4	11 48.9	143.11	0.27	.0069902	11.6	18 14 6.69	
18	169	87 9 42.8	9 3.1	143.08	0.24	.0070171	10.9	18 10 10.77	
19	170	88 6 56.6	6 16.7	143.06	0.18	.0070424	10.2	18 6 14.86	
20	171	89 4 9.9	3 29.8	143.04	-0.09	.0070661	9.5	18 2 18.95	
21	172	90 1 22.6	0 42.3	143.02	+0.02	.0070883	8.9	17 58 23.04	
22	173	90 58 34.9	57 54.4	143.00	0.14	.0071091	8.3	17 54 27.13	
23	174	91 55 46.9	55 6.2	142.99	0.27	.0071284	7.7	17 50 31.21	
24	175	92 52 58.5	52 17.6	142.98	0.41	.0071463	7.2	17 46 35.30	
25	176	93 50 9.9	49 28.8	142.98	0.55	.0071627	6.6	17 42 39.39	
26	177	94 47 21.3	46 40.0	142.98	0.66	.0071776	5.9	17 38 43.48	
27	178	95 44 32.7	43 51.2	142.98	0.76	.0071909	5.3	17 34 47.57	
28	179	96 41 44.2	41 2.5	142.99	0.85	.0072024	4.5	17 30 51.65	
29	180	97 38 55.9	38 14.1	143.00	0.90	.0072122	3.7	17 26 55.74	
30	181	98 36 7.8	35 25.8	143.00	0.91	.0072201	2.9	17 22 59.83	
31	182	99 33 19.8	32 37.6	143.01	+0.90	0.0072258	2.0	17 19 3.92	

NOTE. — λ corresponds to the true equinox of the date, λ' to the mean equinox of January 0d.

GREENWICH MEAN TIME.

THE MOON'S

Day of the Month.	SEMI-DIAMETER.		HORIZONTAL PARALLAX.				MERIDIAN PASSAGE.		AGE.	
	Noon.	Midnight.	Noon.	Diff. for 1 hour.	Midnight.	Diff. for 1 hour.	h	m		
1	14' 53.3	14' 50.5	54' 31.7	-0.95	54' 21.5	-0.74	19	17.7	1.69	22.5
2	14 48.4	14 47.0	54 13.8	0.54	54 8.5	-0.34	19	58.6	1.73	23.5
3	14 46.2	14 46.0	54 5.7	-0.15	54 5.0	+0.03	20	40.8	1.80	24.5
4	14 46.4	14 47.3	54 6.4	+0.30	54 9.8	0.36	21	25.3	1.90	25.5
5	14 48.8	14 50.7	54 15.1	0.51	54 23.1	0.65	22	12.3	2.02	26.5
6	14 53.0	14 55.7	54 30.8	0.77	54 40.6	0.86	23	2.1	2.13	27.5
7	14 58.7	15 1.9	54 51.4	0.94	55 3.3	1.02	23	54.1	2.20	28.5
8	15 5.3	15 9.0	55 15.9	1.08	55 29.2	1.14	6			29.5
9	15 12.8	15 16.7	55 43.2	1.18	55 57.5	1.22	0	47.3	2.22	0.9
10	15 20.7	15 24.8	56 12.3	1.24	56 27.3	1.26	1	40.4	2.20	1.9
11	15 28.9	15 33.1	56 42.6	1.28	56 58.1	1.30	2	32.4	2.14	2.9
12	15 37.4	15 41.7	57 13.8	1.31	57 29.5	1.31	3	22.7	2.06	3.9
13	15 46.0	15 50.3	57 45.2	1.31	58 0.9	1.31	4	11.5	2.01	4.9
14	15 54.5	15 58.7	58 16.5	1.29	58 31.9	1.27	4	59.4	1.99	5.9
15	16 2.8	16 6.7	58 46.9	1.23	59 1.3	1.17	5	47.3	2.01	6.9
16	16 10.4	16 13.8	59 14.9	1.09	59 27.4	1.00	6	36.3	2.08	7.9
17	16 16.9	16 19.5	59 38.6	0.87	59 48.2	0.72	7	27.7	2.21	8.9
18	16 21.5	16 22.9	59 55.7	0.53	60 0.8	+0.32	8	22.6	2.36	9.9
19	16 23.6	16 23.5	60 3.4	+0.10	60 3.1	-0.14	9	21.1	2.50	10.9
20	16 22.6	16 20.9	59 59.9	-0.40	59 53.4	0.67	10	22.4	2.59	11.9
21	16 18.3	16 14.9	59 43.9	0.92	59 31.4	1.16	11	24.9	2.59	12.9
22	16 10.7	16 5.9	59 16.1	1.39	58 58.3	1.58	12	25.9	2.48	13.9
23	16 0.5	15 54.6	58 38.3	1.74	58 16.7	1.87	13	23.3	2.30	14.9
24	15 48.3	15 41.9	57 53.8	1.95	57 30.1	1.99	14	16.2	2.11	15.9
25	15 35.4	15 29.0	57 6.2	1.99	56 42.6	1.95	15	4.8	1.95	16.9
26	15 22.7	15 16.7	56 19.6	1.87	55 57.8	1.77	15	49.8	1.82	17.9
27	15 11.2	15 6.1	55 37.3	1.63	55 18.7	1.48	16	32.4	1.74	18.9
28	15 1.6	14 57.6	55 2.0	1.30	54 47.6	1.11	17	13.6	1.71	19.9
29	14 54.8	14 51.7	54 35.5	0.90	54 25.9	0.69	17	54.6	1.72	20.9
30	14 49.8	14 48.6	54 18.9	0.48	54 14.5	-0.26	18	36.5	1.78	21.9
31	14 48.1	14 48.3	54 12.6	-0.05	54 13.2	+0.16	19	20.0	1.85	22.9

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Dif. for 1 m.	Declination.	Dif. for 1 m.	Hour.	Right Ascension.	Dif. for 1 m.	Declination.	Dif. for 1 m.
SATURDAY 1.					MONDAY 3.				
0	23 25 48.62	1.8066	N. 1° 34' 54.4"	12.716	0	0 53 1.00	1.8523	N. 11° 18' 53.8"	11.375
1	23 27 36.95	1.8061	1 47 37.0	12.703	1	0 54 52.21	1.8548	11 30 15.0	11.331
2	23 29 25.24	1.8046	2 0 18.8	12.689	2	0 56 43.58	1.8574	11 41 33.5	11.287
3	23 31 13.51	1.8043	2 12 59.7	12.674	3	0 58 35.10	1.8599	11 52 49.4	11.242
4	23 33 1.76	1.8040	2 25 39.7	12.659	4	1 0 26.77	1.8625	12 4 2.5	11.198
5	23 34 49.99	1.8037	2 38 18.8	12.643	5	1 2 18.60	1.8652	12 15 12.8	11.148
6	23 36 38.20	1.8034	2 50 56.9	12.627	6	1 4 10.60	1.8680	12 26 20.3	11.101
7	23 38 26.40	1.8031	3 3 34.0	12.610	7	1 6 2.76	1.8707	12 37 24.9	11.053
8	23 40 14.58	1.8030	3 16 10.1	12.592	8	1 7 55.09	1.8738	12 48 26.7	11.005
9	23 42 2.76	1.8030	3 28 45.1	12.574	9	1 9 47.59	1.8765	12 59 25.5	10.956
10	23 43 50.95	1.8031	3 41 19.0	12.556	10	1 11 40.27	1.8795	13 10 21.3	10.904
11	23 45 39.14	1.8032	3 53 51.7	12.536	11	1 13 33.13	1.8824	13 21 14.0	10.853
12	23 47 27.35	1.8034	4 6 23.3	12.513	12	1 15 26.16	1.8854	13 32 3.6	10.802
13	23 49 15.56	1.8036	4 18 53.6	12.485	13	1 17 19.38	1.8885	13 42 50.2	10.750
14	23 51 3.79	1.8040	4 31 22.7	12.474	14	1 19 12.78	1.8915	13 53 33.6	10.697
15	23 52 52.04	1.8043	4 43 50.5	12.452	15	1 21 6.37	1.8947	14 4 13.8	10.643
16	23 54 40.31	1.8047	4 56 16.9	12.430	16	1 23 0.15	1.8980	14 14 50.8	10.589
17	23 56 28.61	1.8053	5 8 42.0	12.407	17	1 24 54.13	1.9013	14 25 24.5	10.534
18	23 58 16.95	1.8059	5 21 5.7	12.382	18	1 26 48.30	1.9045	14 35 54.9	10.478
19	0 0 5.32	1.8065	5 33 27.9	12.356	19	1 28 42.67	1.9079	14 46 21.9	10.421
20	0 1 53.73	1.8071	5 45 48.7	12.333	20	1 30 37.25	1.9113	14 56 45.4	10.363
21	0 3 42.18	1.8080	5 58 7.9	12.307	21	1 32 32.03	1.9147	15 7 5.5	10.305
22	0 5 30.69	1.8086	6 10 25.6	12.282	22	1 34 27.02	1.9183	15 17 22.0	10.246
23	0 7 19.24	1.8096	N. 6° 22' 41.7"	12.255	23	1 36 22.23	1.9218	N. 15° 27' 35.0"	10.186
SUNDAY 2.					TUESDAY 4.				
0	0 9 7.85	1.8106	N. 6° 34' 56.1"	12.227	0	1 38 17.64	1.9253	N. 15° 37' 44.3"	10.126
1	0 10 56.52	1.8116	6 47 8.9	12.198	1	1 40 13.27	1.9290	15 47 50.0	10.064
2	0 12 45.25	1.8128	6 59 19.9	12.169	2	1 42 9.12	1.9325	15 57 52.0	10.002
3	0 14 34.06	1.8140	7 11 29.2	12.140	3	1 44 5.18	1.9362	16 7 50.2	9.939
4	0 16 22.93	1.8151	7 23 36.7	12.110	4	1 46 1.47	1.9400	16 17 44.7	9.876
5	0 18 11.88	1.8165	7 35 42.4	12.079	5	1 47 57.98	1.9437	16 27 35.3	9.812
6	0 20 0.91	1.8178	7 47 46.2	12.048	6	1 49 54.72	1.9475	16 37 22.1	9.747
7	0 21 50.02	1.8191	7 59 48.2	12.017	7	1 51 51.69	1.9514	16 47 4.8	9.680
8	0 23 39.21	1.8205	8 11 48.2	11.984	8	1 53 48.89	1.9552	16 56 43.7	9.612
9	0 25 28.49	1.8221	8 23 46.3	11.951	9	1 55 46.32	1.9591	17 6 18.5	9.546
10	0 27 17.87	1.8238	8 35 42.3	11.917	10	1 57 43.99	1.9631	17 15 49.2	9.477
11	0 29 7.35	1.8254	8 47 36.3	11.882	11	1 59 41.90	1.9671	17 25 15.8	9.408
12	0 30 56.92	1.8270	8 59 28.2	11.847	12	2 1 40.05	1.9710	17 34 38.2	9.338
13	0 32 46.60	1.8289	9 11 18.0	11.812	13	2 3 38.43	1.9750	17 43 56.4	9.267
14	0 34 36.39	1.8307	9 23 5.6	11.775	14	2 5 37.06	1.9792	17 53 10.3	9.196
15	0 36 26.29	1.8325	9 34 51.0	11.738	15	2 7 35.94	1.9833	18 2 19.9	9.123
16	0 38 16.30	1.8344	9 46 34.2	11.700	16	2 9 35.06	1.9874	18 11 25.1	9.050
17	0 40 6.43	1.8365	9 58 15.0	11.662	17	2 11 34.43	1.9915	18 20 25.9	8.976
18	0 41 56.69	1.8386	10 9 53.6	11.623	18	2 13 34.05	1.9956	18 29 22.2	8.902
19	0 43 47.07	1.8407	10 21 29.7	11.582	19	2 15 33.91	1.9997	18 38 14.0	8.825
20	0 45 37.58	1.8430	10 33 3.5	11.543	20	2 17 34.02	2.0040	18 47 1.2	8.747
21	0 47 28.23	1.8452	10 44 34.8	11.502	21	2 19 34.39	2.0082	18 55 43.7	8.670
22	0 49 19.01	1.8475	10 56 3.7	11.460	22	2 21 35.01	2.0124	19 4 21.6	8.592
23	0 51 9.93	1.8499	11 7 30.0	11.417	23	2 23 35.88	2.0166	19 12 54.7	8.513
24	0 53 1.00	1.8523	N. 11° 18' 53.8"	11.375	24	2 25 37.01	2.0210	N. 19° 21' 23.1"	8.432

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
WEDNESDAY 5.					FRIDAY 7.				
0	2 25 37.01	2.0310	N.19° 21' 23.1"	8.493	0	4 7 33.80	2.3908	N.24° 17' 59.5"	2.613
1	2 27 38.40	2.0282	19 29 46.6	8.523	1	4 9 47.12	2.3877	24 21 32.7	2.494
2	2 29 40.04	2.0266	19 38 5.3	8.570	2	4 12 0.65	2.3873	24 24 58.8	2.374
3	2 31 41.94	2.0268	19 46 19.0	8.187	3	4 14 14.39	2.3906	24 28 17.6	2.252
4	2 33 44.10	2.0281	19 54 27.8	8.104	4	4 16 28.33	2.3930	24 31 29.1	2.132
5	2 35 46.52	2.0426	20 2 31.5	8.026	5	4 18 42.46	2.3971	24 34 33.4	2.010
6	2 37 49.20	2.0468	20 10 30.2	7.965	6	4 20 56.79	2.3403	24 37 30.3	2.886
7	2 39 52.14	2.0512	20 18 23.7	7.949	7	4 23 11.30	2.3428	24 40 19.8	2.764
8	2 41 55.35	2.0566	20 26 12.1	7.792	8	4 25 25.99	2.3463	24 43 2.0	2.641
9	2 43 58.82	2.0600	20 33 55.2	7.676	9	4 27 40.86	2.3498	24 45 36.7	2.517
10	2 46 2.55	2.0644	20 41 33.1	7.667	10	4 29 55.91	2.3532	24 48 4.0	2.392
11	2 48 6.54	2.0688	20 49 5.6	7.497	11	4 32 11.14	2.3561	24 50 23.8	2.267
12	2 50 10.79	2.0730	20 56 32.7	7.306	12	4 34 26.53	2.3579	24 52 36.0	2.141
13	2 52 15.31	2.0775	21 3 54.3	7.316	13	4 36 42.09	2.3606	24 54 40.7	2.014
14	2 54 20.09	2.0819	21 11 10.5	7.328	14	4 38 57.81	2.3632	24 56 37.7	1.897
15	2 56 25.14	2.0863	21 18 21.1	7.131	15	4 41 13.68	2.3658	24 58 27.1	1.780
16	2 58 30.45	2.0906	21 25 26.2	7.087	16	4 43 29.71	2.3683	25 0 8.9	1.662
17	3 0 36.02	2.0951	21 32 25.6	6.942	17	4 45 45.88	2.3707	25 1 43.0	1.548
18	3 2 41.86	2.0995	21 39 19.3	6.847	18	4 48 2.20	2.3731	25 3 9.3	1.374
19	3 4 47.96	2.1038	21 46 7.2	6.751	19	4 50 18.66	2.3754	25 4 27.9	1.246
20	3 6 54.32	2.1081	21 52 49.4	6.654	20	4 52 35.25	2.3776	25 5 38.8	1.116
21	3 9 0.94	2.1122	21 59 25.7	6.567	21	4 54 51.97	2.3797	25 6 41.8	0.986
22	3 11 7.83	2.1166	22 5 56.2	6.486	22	4 57 8.82	2.3818	25 7 37.1	0.856
23	3 13 14.97	2.1211	N.22° 12' 20.7"	6.366	23	4 59 25.79	2.3838	N.25° 8' 24.5"	0.734
THURSDAY 6.					SATURDAY 8.				
0	3 15 22.37	2.1256	N.22° 18' 39.9"	6.287	0	5 1 42.88	2.3867	N.25° 9' 4.0"	0.588
1	3 17 30.03	2.1297	22 24 51.6	6.187	1	5 4 0.08	2.3874	25 9 35.7	0.482
2	3 19 37.94	2.1340	22 30 58.0	6.086	2	5 6 17.39	2.3894	25 9 59.4	0.389
3	3 21 46.11	2.1383	22 36 58.2	5.992	3	5 8 34.81	2.3910	25 10 15.2	0.197
4	3 23 54.54	2.1426	22 42 52.2	5.948	4	5 10 52.32	2.3926	25 10 23.1	0.066
5	3 26 3.22	2.1468	22 48 40.0	5.744	5	5 13 9.92	2.3940	25 10 23.0	0.067
6	3 28 12.14	2.1509	22 54 21.5	5.688	6	5 15 27.61	2.3955	25 10 15.0	0.200
7	3 30 21.32	2.1550	22 59 56.6	5.592	7	5 17 45.39	2.3970	25 9 59.0	0.338
8	3 32 30.75	2.1591	23 5 25.4	5.496	8	5 20 3.25	2.3982	25 9 35.0	0.467
9	3 34 40.43	2.1632	23 10 47.7	5.318	9	5 22 21.18	2.3994	25 9 3.0	0.601
10	3 36 50.35	2.1674	23 16 3.6	5.210	10	5 24 39.18	2.3006	25 8 22.9	0.736
11	3 39 0.52	2.1714	23 21 12.9	5.101	11	5 26 57.25	2.3016	25 7 34.8	0.868
12	3 41 10.92	2.1753	23 26 15.7	4.991	12	5 29 15.37	2.3026	25 6 38.7	1.002
13	3 43 21.56	2.1792	23 31 11.8	4.880	13	5 31 33.55	2.3034	25 5 34.5	1.137
14	3 45 32.44	2.1833	23 36 1.3	4.769	14	5 33 51.78	2.3042	25 4 22.2	1.272
15	3 47 43.56	2.1873	23 40 44.1	4.657	15	5 36 10.06	2.3049	25 3 1.9	1.406
16	3 49 54.92	2.1911	23 45 20.1	4.543	16	5 38 28.37	2.3056	25 1 33.5	1.541
17	3 52 6.50	2.1949	23 49 49.3	4.430	17	5 40 46.72	2.3060	24 59 57.0	1.676
18	3 54 18.31	2.1986	23 54 11.6	4.315	18	5 43 5.10	2.3066	24 58 12.5	1.809
19	3 56 30.34	2.2024	23 58 27.1	4.200	19	5 45 23.50	2.3069	24 56 19.9	1.944
20	3 58 42.60	2.2061	24 2 35.6	4.084	20	5 47 41.93	2.3072	24 54 19.2	2.079
21	4 0 55.08	2.2097	24 6 37.2	3.967	21	5 50 0.37	2.3074	24 52 10.4	2.214
22	4 3 7.77	2.2133	24 10 31.7	3.850	22	5 52 18.82	2.3075	24 49 53.5	2.348
23	4 5 20.68	2.2169	24 14 19.2	3.732	23	5 54 37.28	2.3076	24 47 28.6	2.482
24	4 7 33.80	2.2206	N.24° 17' 59.5"	3.613	24	5 56 55.74	2.3076	N.24° 44' 55.6"	2.617

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
SUNDAY 9.					TUESDAY 11.				
0	5 56 55.74	2.3076	N.24 44 55.6	2.617	0	7 46 21.71	2.2312	N.20 9 50.3	6.657
1	5 59 14.20	2.3075	24 42 14.5	2.782	1	7 48 35.51	2.2306	20 1 7.8	6.768
2	6 1 32.65	2.3073	24 39 25.3	2.987	2	7 50 49.15	2.2290	19 52 18.3	6.878
3	6 3 51.08	2.3070	24 36 28.1	3.020	3	7 53 2.63	2.2233	19 43 22.2	6.988
4	6 6 9.49	2.3068	24 33 22.9	3.154	4	7 55 15.95	2.2205	19 34 19.5	7.097
5	6 8 27.88	2.3063	24 30 9.6	3.268	5	7 57 29.11	2.2180	19 25 10.1	7.205
6	6 10 46.25	2.3058	24 26 48.3	3.422	6	7 59 42.11	2.2153	19 15 54.7	7.312
7	6 13 4.58	2.3062	24 23 19.0	3.555	7	8 1 54.95	2.2136	19 6 32.9	7.418
8	6 15 22.88	2.3046	24 19 41.7	3.688	8	8 4 7.63	2.2099	18 57 4.7	7.524
9	6 17 41.14	2.3040	24 15 56.4	3.822	9	8 6 20.14	2.2073	18 47 30.1	7.628
10	6 19 59.36	2.3031	24 12 3.1	3.954	10	8 8 32.50	2.2045	18 37 49.3	7.732
11	6 22 17.52	2.3023	24 8 1.9	4.087	11	8 10 44.68	2.2017	18 28 2.3	7.834
12	6 24 35.64	2.3014	24 3 52.7	4.219	12	8 12 56.71	2.1990	18 18 9.2	7.936
13	6 26 53.69	2.3003	23 59 35.6	4.351	13	8 15 8.57	2.1963	18 8 10.0	8.037
14	6 29 11.68	2.2993	23 55 10.6	4.482	14	8 17 20.27	2.1936	17 58 4.8	8.137
15	6 31 29.61	2.2982	23 50 37.7	4.614	15	8 19 31.81	2.1910	17 47 53.6	8.236
16	6 33 47.47	2.2970	23 45 56.9	4.745	16	8 21 43.19	2.1883	17 37 36.5	8.334
17	6 36 5.25	2.2967	23 41 8.3	4.876	17	8 23 54.41	2.1855	17 27 13.5	8.431
18	6 38 22.96	2.2944	23 36 11.8	5.007	18	8 26 5.46	2.1828	17 16 44.8	8.527
19	6 40 40.58	2.2930	23 31 7.5	5.138	19	8 28 16.35	2.1802	17 6 10.3	8.623
20	6 42 58.12	2.2917	23 25 55.5	5.265	20	8 30 27.09	2.1776	16 55 30.1	8.718
21	6 45 15.57	2.2900	23 20 35.7	5.394	21	8 32 37.67	2.1750	16 44 44.3	8.810
22	6 47 32.92	2.2883	23 15 8.2	5.522	22	8 34 48.09	2.1723	16 33 52.9	8.902
23	6 49 50.18	2.2867	N.23 9 33.0	5.651	23	8 36 58.35	2.1697	N.16 22 56.0	9.000
MONDAY 10.					WEDNESDAY 12.				
0	6 52 7.33	2.2850	N.23 3 50.1	5.778	0	8 39 8.46	2.1671	N.16 11 53.7	11.084
1	6 54 24.38	2.2833	22 57 59.6	5.906	1	8 41 18.41	2.1645	16 0 45.9	11.174
2	6 56 41.33	2.2815	22 52 1.4	6.032	2	8 43 28.21	2.1620	15 49 32.8	11.262
3	6 58 58.17	2.2797	22 45 55.7	6.157	3	8 45 37.86	2.1606	15 38 14.4	11.351
4	7 1 14.89	2.2777	22 39 42.5	6.283	4	8 47 47.34	2.1670	15 26 50.7	11.437
5	7 3 31.50	2.2758	22 33 21.7	6.408	5	8 49 56.69	2.1645	15 15 21.9	11.523
6	7 5 47.99	2.2738	22 26 53.5	6.533	6	8 52 5.89	2.1620	15 3 48.0	11.607
7	7 8 4.36	2.2717	22 20 17.8	6.657	7	8 54 14.94	2.1496	14 52 9.1	11.690
8	7 10 20.60	2.2696	22 13 34.7	6.780	8	8 56 23.84	2.1473	14 40 25.2	11.773
9	7 12 36.72	2.2676	22 6 44.2	6.902	9	8 58 32.61	2.1449	14 28 36.4	11.854
10	7 14 52.71	2.2654	21 59 46.4	7.024	10	9 0 41.23	2.1426	14 16 42.7	11.935
11	7 17 8.57	2.2631	21 52 41.3	7.145	11	9 2 49.72	2.1403	14 4 44.2	12.015
12	7 19 24.29	2.2608	21 45 29.0	7.266	12	9 4 58.07	2.1380	13 52 40.9	12.094
13	7 21 39.87	2.2585	21 38 9.4	7.386	13	9 7 6.28	2.1366	13 40 32.9	12.173
14	7 23 55.31	2.2562	21 30 42.7	7.505	14	9 9 14.37	2.1346	13 28 20.3	12.246
15	7 26 10.62	2.2539	21 23 8.8	7.623	15	9 11 22.32	2.1314	13 16 3.1	12.323
16	7 28 25.78	2.2515	21 15 28.0	7.741	16	9 13 30.14	2.1292	13 3 41.5	12.398
17	7 30 40.80	2.2490	21 7 40.0	7.866	17	9 15 37.83	2.1273	12 51 15.4	12.473
18	7 32 55.67	2.2465	20 59 45.0	7.974	18	9 17 45.41	2.1262	12 38 44.9	12.545
19	7 35 10.39	2.2440	20 51 43.1	8.089	19	9 19 52.86	2.1250	12 26 10.0	12.616
20	7 37 24.96	2.2415	20 43 34.2	8.204	20	9 22 0.19	2.1212	12 13 31.1	12.685
21	7 39 39.38	2.2390	20 35 18.5	8.319	21	9 24 7.41	2.1188	12 0 47.9	12.768
22	7 41 53.65	2.2365	20 26 55.9	8.433	22	9 26 14.51	2.1174	11 48 0.5	12.823
23	7 44 7.76	2.2338	20 18 26.5	8.546	23	9 28 21.50	2.1166	11 35 9.1	12.880
24	7 46 21.71	2.2312	N.20 9 50.3	8.657	24	9 30 28.39	2.1139	N.11 22 13.7	12.936

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
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THURSDAY 13.

Hour.	^h ^m ^s	^s	N. [°]	['] ["]	["]
0	9 30 28.39	2.1139	N. 11	22 13.7	13.266
1	9 32 35.17	2.1131	11	9 14.4	13.021
2	9 34 41.85	2.1105	10	56 11.2	13.065
3	9 36 48.43	2.1089	10	43 4.2	13.148
4	9 38 54.92	2.1074	10	29 53.4	13.211
5	9 41 1.31	2.1057	10	16 38.9	13.272
6	9 43 7.61	2.1043	10	3 20.8	13.331
7	9 45 13.83	2.1029	9	49 59.2	13.389
8	9 47 19.96	2.1015	9	36 34.1	13.447
9	9 49 26.02	2.1003	9	23 5.6	13.503
10	9 51 32.00	2.0990	9	9 33.7	13.556
11	9 53 37.90	2.0977	8	55 58.6	13.612
12	9 55 43.73	2.0965	8	42 20.2	13.665
13	9 57 49.50	2.0955	8	28 38.6	13.717
14	9 59 55.20	2.0945	8	14 54.0	13.768
15	10 2 0.85	2.0936	8	1 6.4	13.818
16	10 4 6.44	2.0927	7	47 15.8	13.867
17	10 6 11.98	2.0920	7	33 22.3	13.915
18	10 8 17.48	2.0912	7	19 26.0	13.962
19	10 10 22.93	2.0905	7	5 26.9	14.007
20	10 12 28.34	2.0898	6	51 25.2	14.051
21	10 14 33.71	2.0892	6	37 20.8	14.095
22	10 16 39.05	2.0886	6	23 13.8	14.137
23	10 18 44.37	2.0881	N. 6	9 4.4	14.177

SATURDAY 15.

Hour.	^h ^m ^s	^s	N. [°]	['] ["]	["]
0	11 11 0.21	2.1003	N. 0	5 3.7	14.818
1	11 13 6.27	2.1017	S. 0	9 45.7	14.828
2	11 15 12.42	2.1032	0	24 35.7	14.837
3	11 17 18.66	2.1048	0	39 26.2	14.845
4	11 19 25.00	2.1065	0	54 17.1	14.851
5	11 21 31.45	2.1084	1	9 8.3	14.856
6	11 23 38.01	2.1102	1	23 59.8	14.860
7	11 25 44.68	2.1120	1	38 51.5	14.862
8	11 27 51.46	2.1140	1	53 43.3	14.863
9	11 29 58.37	2.1162	2	8 35.1	14.862
10	11 32 5.41	2.1188	2	23 26.8	14.861
11	11 34 12.57	2.1205	2	38 18.4	14.858
12	11 36 19.87	2.1229	2	53 9.7	14.853
13	11 38 27.32	2.1263	3	8 0.8	14.848
14	11 40 34.91	2.1276	3	22 51.5	14.841
15	11 42 42.64	2.1300	3	37 41.7	14.832
16	11 44 50.52	2.1326	3	52 31.4	14.823
17	11 46 58.56	2.1364	4	7 20.5	14.812
18	11 49 67.77	2.1382	4	22 8.9	14.800
19	11 51 15.15	2.1410	4	36 56.5	14.786
20	11 53 23.70	2.1459	4	51 43.2	14.770
21	11 55 32.42	2.1469	5	6 28.9	14.758
22	11 57 41.33	2.1500	5	21 13.6	14.736
23	11 59 50.42	2.1531	S. 5	35 57.2	14.716

FRIDAY 14.

Hour.	^h ^m ^s	^s	N. [°]	['] ["]	["]
0	10 20 49.66	2.0890	N. 5	54 52.5	14.217
1	10 22 54.93	2.0877	5	40 38.3	14.256
2	10 25 0.19	2.0875	5	26 21.8	14.293
3	10 27 5.43	2.0873	5	12 3.1	14.330
4	10 29 10.67	2.0872	4	57 42.2	14.365
5	10 31 15.90	2.0871	4	43 19.3	14.399
6	10 33 21.13	2.0873	4	28 54.3	14.433
7	10 35 26.37	2.0874	4	14 27.4	14.463
8	10 37 31.62	2.0875	3	59 58.7	14.493
9	10 39 36.88	2.0878	3	45 28.2	14.523
10	10 41 42.16	2.0881	3	30 55.9	14.552
11	10 43 47.46	2.0885	3	16 22.0	14.578
12	10 45 52.78	2.0889	3	1 46.5	14.604
13	10 47 58.13	2.0894	2	47 9.5	14.629
14	10 50 3.51	2.0900	2	32 31.0	14.653
15	10 52 8.93	2.0907	2	17 51.2	14.674
16	10 54 14.40	2.0915	2	3 10.1	14.695
17	10 56 19.91	2.0923	1	48 27.8	14.715
18	10 58 25.48	2.0932	1	33 44.3	14.734
19	11 0 31.10	2.0941	1	18 59.7	14.751
20	11 2 36.78	2.0952	1	4 14.2	14.766
21	11 4 42.53	2.0963	0	49 27.8	14.781
22	11 6 48.34	2.0975	0	34 40.5	14.795
23	11 8 54.23	2.0989	0	19 52.4	14.807
24	11 11 0.21	2.1003	N. 0	5 3.7	14.818

SUNDAY 16.

Hour.	^h ^m ^s	^s	S. [°]	['] ["]	["]
0	12 1 59.71	2.1564	S. 5	50 39.5	14.695
1	12 4 9.19	2.1596	6	5 20.6	14.672
2	12 6 18.87	2.1630	6	20 0.2	14.648
3	12 8 28.76	2.1665	6	34 38.4	14.624
4	12 10 38.85	2.1700	6	49 15.1	14.599
5	12 12 49.16	2.1736	7	3 50.2	14.570
6	12 14 59.69	2.1773	7	18 23.5	14.541
7	12 17 10.44	2.1810	7	32 55.1	14.510
8	12 19 21.41	2.1847	7	47 24.7	14.477
9	12 21 32.61	2.1886	8	1 52.3	14.443
10	12 23 44.05	2.1926	8	16 17.9	14.408
11	12 25 55.73	2.1967	8	30 41.3	14.371
12	12 28 7.66	2.2008	8	45 2.4	14.332
13	12 30 19.83	2.2049	8	59 21.1	14.292
14	12 32 32.25	2.2091	9	13 37.4	14.251
15	12 34 44.93	2.2135	9	27 51.2	14.207
16	12 36 57.87	2.2179	9	42 2.3	14.163
17	12 39 11.08	2.2223	9	56 10.8	14.117
18	12 41 24.55	2.2269	10	10 16.4	14.069
19	12 43 38.29	2.2313	10	24 19.1	14.020
20	12 45 52.31	2.2360	10	38 18.8	13.969
21	12 48 6.61	2.2406	10	52 15.4	13.916
22	12 50 21.19	2.2453	11	6 8.8	13.862
23	12 52 36.05	2.2500	11	19 58.9	13.807
24	12 54 51.20	2.2550	S. 11	33 45.6	13.750

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
MONDAY 17.					WEDNESDAY 19.				
0	12 ^h 54 ^m 51.20	2.2660	S. 11° 33' 45.6"	13.760	0	14 49 25.32	2.6324	S. 20° 56' 0.5"	9.696
1	12 57 6.65	2.2600	11 47 28.9	13.691	1	14 51 56.89	2.6297	21 4 58.5	9.697
2	12 59 22.40	2.2649	12 1 8.5	13.629	2	14 54 28.77	2.6240	21 13 48.1	9.766
3	13 1 38.44	2.2609	12 14 44.4	13.607	3	14 57 0.97	2.6203	21 22 29.2	9.814
4	13 3 54.79	2.2760	12 28 16.6	13.604	4	14 59 33.48	2.6444	21 31 1.8	9.472
5	13 6 11.45	2.2601	12 41 44.9	13.488	5	15 2 6.30	2.6405	21 39 25.8	9.327
6	13 8 28.41	2.2653	12 55 9.2	13.871	6	15 4 39.42	2.6645	21 47 41.0	9.161
7	13 10 45.69	2.2606	13 9 29.4	13.802	7	15 7 12.84	2.6606	21 55 47.5	9.035
8	13 13 3.28	2.2658	13 21 45.5	13.232	8	15 9 46.56	2.6645	22 3 45.0	7.967
9	13 15 21.19	2.2612	13 34 57.3	13.160	9	15 12 20.58	2.6693	22 11 33.5	7.736
10	13 17 39.43	2.2666	13 48 4.7	13.086	10	15 14 54.88	2.6739	22 19 13.0	7.602
11	13 19 57.99	2.2190	14 1 7.6	13.011	11	15 17 29.45	2.6785	22 26 43.3	7.488
12	13 22 16.87	2.2174	14 14 6.0	12.983	12	15 20 4.30	2.6830	22 34 4.4	7.273
13	13 24 36.08	2.2229	14 26 59.6	12.884	13	15 22 39.42	2.6875	22 41 16.1	7.116
14	13 26 55.62	2.2285	14 39 48.5	12.774	14	15 25 14.81	2.6919	22 48 18.4	6.989
15	13 29 15.50	2.2340	14 52 32.5	12.662	15	15 27 50.45	2.6961	22 55 11.2	6.860
16	13 31 35.71	2.2396	15 5 11.5	12.607	16	15 30 26.35	2.6998	23 1 54.4	6.640
17	13 33 56.26	2.2452	15 17 45.4	12.522	17	15 33 2.49	2.6944	23 8 28.0	6.479
18	13 36 17.14	2.2609	15 20 14.1	12.484	18	15 35 38.88	2.6984	23 14 51.9	6.217
19	13 38 38.37	2.2666	15 32 37.5	12.346	19	15 38 15.50	2.6121	23 21 6.1	6.184
20	13 40 59.94	2.2624	15 54 55.6	12.266	20	15 40 52.34	2.6166	23 27 10.4	5.990
21	13 43 21.86	2.2681	16 7 8.1	12.162	21	15 43 29.40	2.6196	23 33 4.8	5.894
22	13 45 44.12	2.2739	16 19 15.0	12.067	22	15 46 6.68	2.6220	23 38 49.3	5.666
23	13 48 6.73	2.2797	S. 16° 31' 16.2"	11.972	23	15 48 44.16	2.6262	S. 23° 44' 23.8"	5.491
TUESDAY 18.					THURSDAY 20.				
0	13 50 29.69	2.2856	S. 16° 43' 11.5"	11.874	0	15 51 21.83	2.6294	S. 23° 49' 48.2"	5.322
1	13 52 53.00	2.2914	16 55 1.0	11.775	1	15 53 59.69	2.6325	23 55 2.5	5.184
2	13 55 16.66	2.2972	17 6 44.5	11.674	2	15 56 37.74	2.6355	24 0 6.7	4.965
3	13 57 40.67	2.4030	17 18 21.9	11.572	3	15 59 15.96	2.6384	24 5 0.7	4.814
4	14 0 5.03	2.4089	17 29 53.1	11.467	4	16 1 54.35	2.6411	24 9 44.4	4.642
5	14 2 29.74	2.4147	17 41 18.0	11.362	5	16 4 32.90	2.6436	24 14 17.8	4.471
6	14 4 54.80	2.4206	17 52 36.5	11.254	6	16 7 11.59	2.6460	24 18 40.9	4.297
7	14 7 20.22	2.4265	18 3 48.5	11.144	7	16 9 50.42	2.6483	24 22 53.5	4.124
8	14 9 45.99	2.4324	18 14 53.8	11.033	8	16 12 29.39	2.6506	24 26 55.8	3.951
9	14 12 12.11	2.4383	18 25 52.5	10.921	9	16 15 8.48	2.6528	24 30 47.5	3.778
10	14 14 38.58	2.4440	18 36 44.3	10.807	10	16 17 47.69	2.6543	24 34 28.8	3.601
11	14 17 5.40	2.4499	18 47 29.3	10.691	11	16 20 27.00	2.6560	24 37 59.6	3.425
12	14 19 32.57	2.4557	18 58 7.2	10.573	12	16 23 6.41	2.6575	24 41 19.8	3.249
13	14 22 0.09	2.4615	19 8 38.1	10.454	13	16 25 45.91	2.6590	24 44 29.5	3.072
14	14 24 27.95	2.4673	19 19 1.7	10.333	14	16 28 25.49	2.6602	24 47 28.5	2.895
15	14 26 56.16	2.4730	19 29 18.1	10.211	15	16 31 5.14	2.6613	24 50 16.9	2.718
16	14 29 24.72	2.4788	19 39 27.0	10.087	16	16 33 44.85	2.6622	24 52 54.7	2.541
17	14 31 53.62	2.4845	19 49 28.5	9.961	17	16 36 24.61	2.6630	24 55 21.8	2.362
18	14 34 22.86	2.4901	19 59 22.3	9.833	18	16 39 4.41	2.6635	24 57 38.2	2.185
19	14 36 52.44	2.4957	20 9 8.5	9.704	19	16 41 44.24	2.6640	24 59 44.0	2.007
20	14 39 22.35	2.5013	20 18 46.8	9.573	20	16 44 24.09	2.6643	25 1 39.0	1.827
21	14 41 52.60	2.5069	20 28 17.3	9.441	21	16 47 3.95	2.6643	25 3 23.3	1.648
22	14 44 23.18	2.5123	20 37 39.8	9.307	22	16 49 43.81	2.6643	25 4 56.8	1.470
23	14 46 54.08	2.5178	20 46 54.2	9.173	23	16 52 23.66	2.6640	25 6 19.7	1.292
24	14 49 25.32	2.5234	S. 20° 56' 0.5"	9.086	24	16 55 3.50	2.6637	S. 25° 7' 31.8"	1.112

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	DIF. for 1 m.	Declination.	DIF. for 1 m.	Hour.	Right Ascension.	DIF. for 1 m.	Declination.	DIF. for 1 m.
FRIDAY 21.					SUNDAY 23.				
0	16 55 3.50	2.6087	S. 25° 7' 31.8"	1.119	0	18 59 33.32	2.4738	S. 22° 43' 59.2"	6.738
1	16 57 43.31	2.6081	25 8 33.2	0.933	1	19 2 1.55	2.4671	22 37 10.8	6.873
2	17 0 23.08	2.6023	25 9 23.8	0.764	2	19 4 29.38	2.4606	22 30 14.4	7.007
3	17 3 2.79	2.6013	25 10 3.7	0.576	3	19 6 56.81	2.4538	22 23 10.0	7.146
4	17 5 42.43	2.6001	25 10 32.9	0.397	4	19 9 23.84	2.4470	22 15 57.6	7.271
5	17 8 22.01	2.6080	25 10 51.4	0.220	5	19 11 50.46	2.4402	22 8 37.5	7.400
6	17 11 1.51	2.6076	25 10 59.3	0.043	6	19 14 16.67	2.4333	22 1 9.7	7.527
7	17 13 40.93	2.6061	25 10 56.4	0.137	7	19 16 42.46	2.4268	21 53 34.3	7.653
8	17 16 20.25	2.6044	25 10 42.8	0.315	8	19 19 7.83	2.4193	21 45 51.3	7.777
9	17 18 59.46	2.6026	25 10 18.6	0.492	9	19 21 32.78	2.4123	21 38 1.0	7.900
10	17 21 38.55	2.6006	25 9 43.8	0.668	10	19 23 57.31	2.4058	21 30 3.3	8.023
11	17 24 17.52	2.6083	25 8 58.4	0.845	11	19 26 21.42	2.3983	21 21 58.4	8.142
12	17 26 56.35	2.6060	25 8 2.4	1.023	12	19 28 45.11	2.3913	21 13 46.3	8.260
13	17 29 35.04	2.6036	25 6 55.8	1.197	13	19 31 8.37	2.3840	21 5 27.2	8.376
14	17 32 13.58	2.6009	25 5 38.7	1.373	14	19 33 31.20	2.3769	20 57 1.2	8.490
15	17 34 51.95	2.6080	25 4 11.1	1.547	15	19 35 53.60	2.3696	20 48 28.4	8.603
16	17 37 30.15	2.6061	25 2 33.1	1.720	16	19 38 15.56	2.3624	20 39 48.8	8.716
17	17 40 8.17	2.6030	25 0 44.7	1.893	17	19 40 37.09	2.3552	20 31 2.6	8.825
18	17 42 46.00	2.6008	24 58 45.9	2.065	18	19 42 58.19	2.3480	20 22 9.8	8.934
19	17 45 23.63	2.6056	24 56 36.8	2.237	19	19 45 18.86	2.3409	20 13 10.5	9.041
20	17 48 1.06	2.6030	24 54 17.4	2.408	20	19 47 39.11	2.3336	20 4 4.9	9.146
21	17 50 38.27	2.6102	24 51 47.8	2.577	21	19 49 58.91	2.3264	19 54 53.0	9.249
22	17 53 15.25	2.6144	24 49 8.1	2.746	22	19 52 18.28	2.3192	19 45 35.0	9.351
23	17 55 52.00	2.6196	S. 24 46 18.3	2.914	23	19 54 37.23	2.3120	S. 19 36 10.9	9.452
SATURDAY 22.					MONDAY 24.				
0	17 58 28.51	2.6064	S. 24 43 18.4	3.081	0	19 56 55.71	2.3047	S. 19 26 40.8	9.551
1	18 1 4.77	2.6021	24 40 8.5	3.247	1	19 59 13.78	2.2975	19 17 4.8	9.647
2	18 3 40.77	2.6078	24 36 48.7	3.412	2	20 1 31.41	2.2902	19 7 23.1	9.742
3	18 6 16.51	2.6083	24 33 19.0	3.576	3	20 3 48.61	2.2830	18 57 35.7	9.837
4	18 8 51.97	2.6066	24 29 39.6	3.739	4	20 6 5.37	2.2767	18 47 42.6	9.931
5	18 11 27.15	2.6040	24 25 50.3	3.901	5	20 8 21.70	2.2695	18 37 44.0	10.021
6	18 14 2.05	2.6091	24 21 51.4	4.062	6	20 10 37.60	2.2615	18 27 40.1	10.110
7	18 16 36.65	2.6141	24 17 42.9	4.222	7	20 12 53.08	2.2544	18 17 30.8	10.197
8	18 19 10.95	2.6080	24 13 24.8	4.381	8	20 15 8.12	2.2473	18 7 16.4	10.283
9	18 21 44.94	2.6038	24 8 57.2	4.538	9	20 17 22.74	2.2400	17 56 56.8	10.368
10	18 24 18.61	2.6065	24 4 20.2	4.694	10	20 19 36.93	2.2330	17 46 32.2	10.452
11	18 26 51.96	2.6030	23 59 33.9	4.849	11	20 21 50.70	2.2269	17 36 2.6	10.533
12	18 29 24.97	2.6074	23 54 38.3	5.002	12	20 24 4.04	2.2199	17 25 28.2	10.613
13	18 31 57.65	2.6118	23 49 33.5	5.154	13	20 26 16.97	2.2120	17 14 49.1	10.691
14	18 34 29.99	2.6080	23 44 19.7	5.305	14	20 28 29.48	2.2050	17 4 5.3	10.768
15	18 37 1.97	2.6000	23 38 56.9	5.455	15	20 30 41.57	2.1980	16 53 16.9	10.843
16	18 39 33.60	2.6041	23 33 25.1	5.603	16	20 32 53.25	2.1912	16 42 24.1	10.917
17	18 42 4.87	2.6101	23 27 44.5	5.750	17	20 35 4.52	2.1844	16 31 26.8	10.990
18	18 44 35.78	2.6130	23 21 55.1	5.896	18	20 37 15.38	2.1776	16 20 25.3	11.061
19	18 47 6.32	2.6069	23 15 57.0	6.040	19	20 39 25.84	2.1709	16 9 19.5	11.131
20	18 49 36.49	2.6095	23 9 50.3	6.183	20	20 41 35.89	2.1641	15 58 9.6	11.199
21	18 52 6.27	2.6081	23 3 35.1	6.324	21	20 43 45.54	2.1575	15 46 55.6	11.266
22	18 54 35.67	2.6069	22 57 11.4	6.464	22	20 45 54.79	2.1508	15 35 37.7	11.331
23	18 57 4.69	2.6094	22 50 39.4	6.602	23	20 48 3.64	2.1440	15 24 15.9	11.395
24	18 59 33.32	2.6136	S. 22 43 59.2	6.738	24	20 50 12.09	2.1375	S. 15 12 50.3	11.457

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
TUESDAY 25.					THURSDAY 27.				
0	20 50 12.09	2.1375	S. 15° 12' 50.3"	11.457	0	22 26 25.31	1.8976	S. 5° 15' 2.2"	13.022
1	20 52 20.15	2.1311	15 1 21.0	11.518	1	22 28 19.06	1.8943	5 2 0.7	13.029
2	20 54 27.83	2.1247	14 49 48.1	11.577	2	22 30 12.62	1.8910	4 48 58.7	13.036
3	20 56 35.12	2.1183	14 38 11.7	11.636	3	22 32 5.99	1.8880	4 35 56.4	13.041
4	20 58 42.03	2.1120	14 26 31.8	11.692	4	22 33 59.18	1.8849	4 22 53.8	13.046
5	21 0 48.56	2.1057	14 14 48.6	11.748	5	22 35 52.18	1.8819	4 9 50.9	13.050
6	21 2 54.72	2.0995	14 3 2.0	11.803	6	22 37 45.01	1.8790	3 56 47.8	13.053
7	21 5 0.51	2.0933	13 51 12.2	11.856	7	22 39 37.67	1.8761	3 43 44.5	13.057
8	21 7 5.92	2.0871	13 39 19.4	11.907	8	22 41 30.15	1.8733	3 30 41.1	13.059
9	21 9 10.97	2.0811	13 27 23.5	11.957	9	22 43 22.47	1.8707	3 17 37.6	13.058
10	21 11 15.66	2.0751	13 15 24.6	12.005	10	22 45 14.64	1.8681	3 4 34.1	13.056
11	21 13 19.99	2.0692	13 3 22.9	12.052	11	22 47 6.65	1.8656	2 51 30.6	13.057
12	21 15 23.97	2.0634	12 51 18.3	12.100	12	22 48 58.51	1.8631	2 38 27.2	13.056
13	21 17 27.60	2.0576	12 39 10.9	12.146	13	22 50 50.23	1.8607	2 25 23.9	13.053
14	21 19 30.88	2.0518	12 27 0.9	12.188	14	22 52 41.80	1.8584	2 12 20.8	13.050
15	21 21 33.82	2.0461	12 14 48.3	12.231	15	22 54 33.24	1.8562	1 59 17.9	13.047
16	21 23 36.42	2.0405	12 2 33.2	12.272	16	22 56 24.55	1.8540	1 46 15.2	13.043
17	21 25 38.69	2.0350	11 50 15.6	12.312	17	22 58 15.73	1.8519	1 33 12.8	13.037
18	21 27 40.63	2.0296	11 37 55.7	12.352	18	23 0 6.78	1.8499	1 20 10.8	13.030
19	21 29 42.24	2.0244	11 25 33.4	12.390	19	23 1 57.72	1.8480	1 7 9.2	13.023
20	21 31 43.52	2.0197	11 13 8.9	12.427	20	23 3 48.54	1.8460	0 54 8.0	13.016
21	21 33 44.49	2.0156	11 0 42.2	12.463	21	23 5 39.25	1.8442	0 41 7.3	13.008
22	21 35 45.14	2.0082	10 48 13.5	12.497	22	23 7 29.85	1.8426	0 28 7.0	13.000
23	21 37 45.48	2.0081	S. 10° 35' 42.7"	12.529	23	23 9 20.36	1.8410	S. 0° 15' 7.3"	13.000
WEDNESDAY 26.					FRIDAY 28.				
0	21 39 45.52	1.9980	S. 10° 23' 10.0"	12.561	0	23 11 10.77	1.8394	S. 0° 2' 8.2"	13.979
1	21 41 45.25	1.9930	10 10 35.4	12.592	1	23 13 1.09	1.8379	N. 0° 10' 50.2"	13.998
2	21 43 44.68	1.9880	9 57 58.9	12.623	2	23 14 51.32	1.8366	0 23 48.0	13.967
3	21 45 43.82	1.9832	9 45 20.7	12.651	3	23 16 41.47	1.8350	0 36 45.0	13.946
4	21 47 42.67	1.9784	9 32 40.8	12.678	4	23 18 31.53	1.8337	0 49 41.3	13.923
5	21 49 41.23	1.9738	9 19 59.3	12.705	5	23 20 21.52	1.8326	1 2 36.8	13.917
6	21 51 39.51	1.9690	9 7 16.2	12.731	6	23 22 11.44	1.8314	1 15 31.4	13.902
7	21 53 37.51	1.9644	8 54 31.6	12.755	7	23 24 1.29	1.8306	1 28 25.1	13.886
8	21 55 35.24	1.9600	8 41 45.6	12.778	8	23 25 51.08	1.8298	1 41 17.9	13.873
9	21 57 32.71	1.9556	8 28 58.2	12.801	9	23 27 40.81	1.8294	1 54 9.7	13.856
10	21 59 29.91	1.9510	8 16 9.5	12.822	10	23 29 30.49	1.8295	2 7 0.5	13.838
11	22 1 26.84	1.9466	8 3 19.5	12.843	11	23 31 20.12	1.8298	2 19 50.3	13.821
12	22 3 23.51	1.9423	7 50 28.3	12.862	12	23 33 9.70	1.8300	2 32 39.0	13.803
13	22 5 19.94	1.9384	7 37 36.0	12.881	13	23 34 59.24	1.8306	2 45 26.6	13.784
14	22 7 16.12	1.9348	7 24 42.6	12.898	14	23 36 48.75	1.8316	2 58 13.0	13.764
15	22 9 12.06	1.9303	7 11 48.2	12.914	15	23 38 38.22	1.8329	3 10 58.3	13.744
16	22 11 7.76	1.9265	6 58 52.9	12.930	16	23 40 27.66	1.8337	3 23 42.3	13.723
17	22 13 3.23	1.9228	6 45 56.6	12.945	17	23 42 17.07	1.8333	3 36 25.0	13.701
18	22 14 58.47	1.9187	6 32 59.5	12.958	18	23 44 6.46	1.8321	3 49 6.4	13.678
19	22 16 53.48	1.9150	6 20 1.6	12.971	19	23 45 55.85	1.8320	4 1 46.4	13.656
20	22 18 48.27	1.9114	6 7 3.0	12.983	20	23 47 45.23	1.8322	4 14 25.1	13.633
21	22 20 42.85	1.9079	5 54 3.7	12.993	21	23 49 34.60	1.8327	4 27 2.3	13.608
22	22 22 37.21	1.9042	5 41 3.8	13.008	22	23 51 23.96	1.8326	4 39 38.1	13.583
23	22 24 31.36	1.9018	5 28 3.3	13.013	23	23 53 13.31	1.8326	4 52 12.3	13.558
24	22 26 25.31	1.8976	S. 5° 15' 2.2"	13.022	24	23 55 2.66	1.8326	N. 5° 4' 45.1"	13.533

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
SATURDAY 29.					SUNDAY 30.				
0	23 55 2.66	1.8226	N. 5° 4' 45.1"	12.533	0	0 38 58.96	1.8450	N. 9° 56' 30.4"	11.731
1	23 56 52.03	1.8229	5 17 16.3	12.506	1	0 40 49.71	1.8467	10 8 12.4	11.679
2	23 58 41.41	1.8231	5 29 45.8	12.477	2	0 42 40.57	1.8485	10 19 51.9	11.637
3	0 0 30.81	1.8235	5 42 13.6	12.440	3	0 44 31.53	1.8503	10 31 28.9	11.596
4	0 2 20.22	1.8238	5 54 39.8	12.423	4	0 46 22.61	1.8523	10 43 3.3	11.562
5	0 4 9.66	1.8243	6 7 4.2	12.392	5	0 48 13.80	1.8541	10 54 35.1	11.507
6	0 5 59.13	1.8248	6 19 26.9	12.363	6	0 50 5.11	1.8563	11 6 4.2	11.463
7	0 7 48.64	1.8254	6 31 47.8	12.333	7	0 51 56.55	1.8583	11 17 30.7	11.418
8	0 9 38.18	1.8259	6 44 6.8	12.301	8	0 53 48.11	1.8604	11 28 54.4	11.372
9	0 11 27.76	1.8265	6 56 23.9	12.269	9	0 55 39.80	1.8625	11 40 15.4	11.326
10	0 13 17.39	1.8274	7 8 39.1	12.237	10	0 57 31.62	1.8646	11 51 33.5	11.277
11	0 15 7.07	1.8283	7 20 52.3	12.204	11	0 59 23.58	1.8671	12 2 48.7	11.230
12	0 16 56.79	1.8291	7 33 3.6	12.173	12	1 1 15.68	1.8695	12 14 1.1	11.182
13	0 18 46.57	1.8303	7 45 12.9	12.137	13	1 3 7.92	1.8719	12 25 10.5	11.133
14	0 20 36.42	1.8312	7 57 20.1	12.103	14	1 5 0.31	1.8744	12 36 17.0	11.082
15	0 22 26.33	1.8323	8 9 25.2	12.067	15	1 6 52.85	1.8769	12 47 20.4	11.032
16	0 24 16.30	1.8334	8 21 28.1	12.031	16	1 8 45.54	1.8795	12 58 20.8	10.980
17	0 26 6.34	1.8346	8 33 28.9	11.995	17	1 10 38.39	1.8821	13 9 18.0	10.928
18	0 27 56.46	1.8360	8 45 27.5	11.967	18	1 12 31.40	1.8848	13 20 12.2	10.876
19	0 29 46.66	1.8373	8 57 23.8	11.919	19	1 14 24.57	1.8875	13 31 3.2	10.823
20	0 31 36.94	1.8387	9 9 17.8	11.881	20	1 16 17.90	1.8903	13 41 51.0	10.770
21	0 33 27.31	1.8401	9 21 9.5	11.843	21	1 18 11.41	1.8933	13 52 35.6	10.718
22	0 35 17.76	1.8417	9 32 58.9	11.803	22	1 20 5.09	1.8960	14 3 16.8	10.659
23	0 37 8.31	1.8433	9 44 45.9	11.763	23	1 21 58.94	1.8990	14 13 54.7	10.604
24	0 38 58.96	1.8450	N. 9° 56' 30.4"	11.731	24	1 23 52.98	1.9023	N. 14° 24' 29.2"	10.548

PHASES OF THE MOON.

● New Moon,	d	h	m
☽ First Quarter,	15	10	16.3
○ Full Moon,	22	2	23.2
☾ Last Quarter,	29	14	40.7

☾ Apogee,	d	h
☾ Perigee,	19	4.0

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Star's Name and Position.	Noon.	P. L. of Dist.	IIIh.	P. L. of Dist.	VIh.	P. L. of Dist.	IXh.	P. L. of Dist.
1	Antares W.	105° 13' 59"	3026	106° 43' 37"	3034	108° 13' 7"	3041	109° 42' 29"	3047
	α Aquilæ W.	55 36 15	3046	56 50 30	3024	58 5 7	3006	59 20 3	3766
	α Arietis E.	42 51 52	3036	41 23 1	3074	39 54 20	3083	38 25 49	3081
	SUN E.	78 10 30	3393	76 48 6	3400	75 25 50	3403	74 3 42	3414
2	Antares W.	117 7 45	3060	118 36 32	3073	120 5 16	3075	121 33 56	3077
	α Aquilæ W.	65 38 53	3718	66 55 21	3707	68 12 1	3696	69 28 52	3697
	Fomalhaut W.	41 31 10	4150	42 40 15	4108	43 50 14	4050	45 1 4	4084
	α Arietis E.	31 5 56	3186	29 38 30	3147	28 11 16	3158	26 44 14	3170
	SUN E.	67 14 37	3438	65 53 3	3441	64 31 33	3445	63 10 7	3446
3	α Aquilæ W.	75 55 29	3646	77 13 14	3638	78 31 7	3633	79 49 6	3636
	Fomalhaut W.	51 5 43	3819	52 20 26	3789	53 35 40	3763	54 51 21	3737
	α Pegasi W.	28 13 1	3773	29 28 32	3719	30 45 8	3668	32 2 40	3610
	SUN E.	56 23 25	3462	55 2 7	3483	53 40 49	3463	52 19 31	3460
4	α Aquilæ W.	86 20 37	3600	87 39 11	3606	88 57 50	3593	90 16 33	3586
	Fomalhaut W.	61 16 0	3631	62 34 1	3613	63 52 22	3606	65 11 2	3579
	α Pegasi W.	38 41 28	3440	40 2 59	3415	41 24 59	3393	42 47 25	3380
	SUN E.	45 32 33	3440	44 11 2	3437	42 49 27	3434	41 27 49	3431
5	α Aquilæ W.	96 51 2	3576	98 10 3	3576	99 29 5	3573	100 48 9	3573
	Fomalhaut W.	71 48 33	3606	73 8 50	3494	74 29 21	3483	75 50 5	3476
	α Pegasi W.	49 45 23	3279	51 9 59	3263	52 34 54	3249	54 0 5	3235
	SUN E.	34 38 29	3408	33 16 22	3403	31 54 8	3396	30 31 49	3393
10	SUN W.	22 27 20	3073	23 56 2	3063	25 24 58	3061	26 54 8	3060
	Jupiter E.	39 47 56	3797	38 13 24	3793	36 38 45	3785	35 3 57	3779
	Regulus E.	45 55 59	3740	44 20 12	3723	42 44 14	3725	41 8 7	3717
	Saturn E.	51 52 30	3275	50 17 29	3268	48 42 19	3261	47 7 0	3256
	Spica E.	99 56 30	3734	98 20 22	3716	96 44 2	3706	95 7 30	3697
11	SUN W.	34 23 23	2966	35 53 54	2976	37 24 38	2966	38 55 35	2964
	Jupiter E.	27 8 12	3769	25 32 49	3766	23 57 24	3766	22 21 59	3760
	Regulus E.	33 5 16	3687	31 28 18	3681	29 51 13	3676	28 14 1	3673
	Saturn E.	39 8 23	3726	37 32 18	3723	35 56 7	3713	34 19 51	3716
	Spica E.	87 1 53	3633	85 24 10	3644	83 46 15	3635	82 8 8	3636
12	SUN W.	46 33 30	2905	48 5 42	2894	49 38 8	2884	50 10 47	2874
	Mars W.	22 29 12	3795	24 3 46	3785	25 38 34	3776	27 13 34	3766
	Saturn E.	26 18 6	3730	24 41 53	3729	23 5 51	3740	21 30 4	3767
	Spica E.	73 54 33	2683	72 15 14	2674	70 35 43	2664	68 55 59	2656
	Antares E.	119 33 52	2877	117 54 26	2869	116 14 48	2859	114 34 56	2851
13	SUN W.	58 57 11	2826	60 31 5	2816	62 5 13	2806	63 39 34	2796
	Mars W.	35 11 47	3717	36 48 4	3707	38 24 35	3696	40 1 18	3689
	Spica E.	60 34 21	2613	58 53 25	2604	57 12 17	2595	55 30 57	2587
	Antares E.	106 12 34	2806	104 31 28	2486	102 50 9	2487	101 8 38	2477
14	SUN W.	71 34 32	2747	73 10 10	2737	74 46 2	2727	76 22 7	2716
	Mars W.	48 8 8	3640	49 46 9	3630	51 24 23	3621	53 2 50	3611
	Spica E.	47 1 15	2444	45 18 43	2436	43 35 58	2427	41 53 2	2419
	Antares E.	92 37 48	2433	90 54 59	2424	89 11 58	2415	87 28 44	2406
15	SUN W.	84 25 44	2669	86 3 6	2659	87 40 41	2649	89 18 29	2640

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Star's Name and Position.	Midnight.	P. L. of Dist.	XV ^h .	P. L. of Dist.	XVIII ^h .	P. L. of Dist.	XXI ^h .	P. L. of Dist.
1	Antares W.	111° 11' 44"	3063	112° 40' 53"	3066	114° 9' 56"	3061	115° 38' 53"	3065
	α Aquilæ W.	60 35 18	3773	61 50 49	3787	63 6 36	3744	64 22 37	3729
	α Arietis E.	36 57 29	3101	35 29 20	3110	34 1 22	3118	32 33 34	3126
	SUN E.	72 41 41	3430	71 19 47	3436	69 57 59	3430	68 36 16	3433
2	Antares W.	123 2 34	3079	124 31 9	3081	125 59 42	3081	127 28 15	3083
	α Aquilæ W.	70 45 53	3677	72 3 4	3689	73 20 24	3682	74 37 52	3683
	Fomalhaut W.	46 12 40	3061	47 24 58	3030	48 37 57	3065	49 51 32	3050
	α Arietis E.	25 17 26	3180	23 50 53	3188	22 24 36	3210	20 58 39	3238
	SUN E.	61 48 43	3448	60 27 21	3460	59 6 1	3453	57 44 43	3453
3	α Aquilæ W.	81 7 13	3021	82 25 25	3016	83 43 43	3009	85 2 8	3005
	Fomalhaut W.	56 7 29	3713	57 24 2	3691	58 40 59	3669	59 58 19	3649
	α Pegasi W.	33 21 4	3089	34 40 12	3083	36 0 1	3497	37 30 28	3468
	SUN E.	50 58 11	3449	49 36 49	3447	48 15 26	3446	46 54 1	3443
4	α Aquilæ W.	91 35 20	3085	92 54 11	3083	94 13 5	3078	95 32 3	3077
	Fomalhaut W.	66 29 59	3089	67 49 14	3046	69 8 45	3035	70 28 31	3020
	α Pegasi W.	44 10 17	3249	45 33 32	3231	46 57 8	3212	48 21 6	3206
	SUN E.	40 6 7	3436	38 44 20	3433	37 22 28	3417	36 0 31	3413
5	α Aquilæ W.	102 7 13	3073	103 26 17	3075	104 45 19	3076	106 4 21	3077
	Fomalhaut W.	77 11 3	3450	78 32 13	3448	79 53 35	3438	81 15 9	3425
	α Pegasi W.	55 25 33	3231	56 51 17	3208	58 17 17	3193	59 43 34	3181
	SUN E.	29 9 23	3267	27 46 52	3261	26 24 14	3276	25 1 30	3270
10	SUN W.	28 23 32	3029	29 53 9	3018	31 23 0	3007	32 53 5	2996
	Jupiter E.	33 29 1	2773	31 53 58	2766	30 18 48	2764	28 43 33	2760
	Regulus E.	39 31 50	2710	37 55 24	2704	36 18 50	2698	34 42 7	2692
	Saturn E.	45 31 33	2748	43 55 57	2743	42 20 13	2736	40 44 21	2733
	Spica E.	93 30 46	2688	91 53 50	2679	90 16 42	2671	88 39 24	2662
11	SUN W.	40 26 45	2945	41 58 7	2935	43 29 42	2925	45 1 29	2914
	Jupiter E.	20 46 39	2766	19 11 26	2775	17 36 26	2791	16 1 46	2811
	Regulus E.	26 36 45	2673	24 59 27	2670	23 22 7	2671	21 44 48	2674
	Saturn E.	32 43 32	2713	31 7 10	2713	29 30 46	2713	27 54 24	2716
	Spica E.	80 29 49	2616	78 51 18	2609	77 12 35	2600	75 33 40	2591
12	SUN W.	52 43 39	2866	54 16 44	2856	55 50 0	2846	57 23 29	2836
	Mars W.	28 48 47	2766	30 24 13	2746	31 59 52	2737	33 35 43	2737
	Saturn E.	19 54 40	2780	18 19 46	2814	16 45 36	2861	15 12 27	2927
	Spica E.	67 16 4	2648	65 35 57	2639	63 55 37	2629	62 15 5	2621
	Antares E.	112 54 53	2641	111 14 37	2633	109 34 9	2623	107 53 27	2615
13	SUN W.	65 14 8	2786	66 48 55	2776	68 23 54	2766	69 59 7	2756
	Mars W.	41 38 13	2678	43 15 22	2698	44 52 45	2659	46 30 20	2649
	Spica E.	53 49 25	2478	52 7 41	2469	50 25 44	2461	48 43 36	2452
	Antares E.	99 26 53	2466	97 44 55	2460	96 2 46	2450	94 20 23	2443
14	SUN W.	77 58 25	2707	79 34 56	2698	81 11 39	2689	82 48 35	2678
	Mars W.	54 41 30	2601	56 20 23	2598	57 59 28	2583	59 38 46	2574
	Spica E.	40 9 55	2413	38 26 37	2403	36 43 7	2393	34 59 27	2389
	Antares E.	85 45 17	2396	84 1 37	2398	82 17 45	2378	80 33 39	2370
15	SUN W.	90 56 30	2630	92 34 44	2621	94 13 10	2612	95 51 49	2604

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Star's Name and Position.	Noon.	P. L. of Dist.	III ^h .	P. L. of Dist.	VI ^h .	P. L. of Dist.	IX ^h .	P. L. of Dist.
15	Mars W.	61 18 17	2544	62 58 2	2555	64 37 59	2545	66 18 9	2587
	Jupiter W.	26 46 1	2465	28 28 4	2460	30 10 28	2436	31 53 11	2423
	Regulus W.	21 25 24	2426	23 8 8	2419	24 51 15	2404	26 34 44	2389
	Saturn W.	15 56 30	2369	17 33 52	2310	19 13 34	2268	20 52 20	2225
	Spica E.	33 15 37	2383	31 31 38	2376	29 47 29	2371	28 3 12	2364
	Antares E.	78 49 21	2261	77 4 50	2263	75 20 7	2243	73 35 10	2226
16	SUN W.	97 30 39	2584	99 9 42	2585	100 48 57	2577	102 28 24	2568
	Mars W.	74 42 7	2493	76 23 31	2483	78 5 8	2475	79 46 57	2467
	Jupiter W.	40 31 7	2387	42 15 29	2387	44 0 6	2346	45 44 56	2387
	Regulus W.	35 17 27	2322	37 2 54	2312	38 48 36	2302	40 34 32	2298
	Saturn W.	29 22 4	2408	31 5 35	2385	32 49 31	2370	34 33 49	2355
	Antares E.	64 47 18	2292	63 1 7	2284	61 14 44	2277	59 28 11	2266
	α Aquilæ E.	116 1 54	2265	114 30 49	2261	112 59 10	2205	111 26 58	2262
17	SUN W.	110 48 30	2529	112 29 3	2522	114 9 46	2515	115 50 39	2507
	Mars W.	88 18 47	2426	90 1 42	2421	91 44 47	2415	93 28 1	2408
	Jupiter W.	54 32 23	2397	56 18 27	2389	58 4 43	2365	59 51 9	2375
	Regulus W.	49 27 39	2249	51 14 54	2241	53 2 20	2234	54 49 57	2227
	Saturn W.	43 20 0	2298	45 6 3	2289	46 52 19	2279	48 38 49	2271
	Antares E.	50 32 31	2233	48 44 52	2225	46 57 2	2219	45 9 4	2212
	α Aquilæ E.	103 39 18	2192	102 4 39	2177	100 29 41	2163	98 54 25	2153
18	SUN W.	124 17 14	2480	125 58 55	2475	127 40 43	2470	129 22 38	2465
	Mars W.	102 6 17	2381	103 50 19	2376	105 34 28	2372	107 18 43	2368
	Jupiter W.	68 45 39	2246	70 32 58	2242	72 20 23	2228	74 7 54	2223
	Regulus W.	63 50 26	2186	65 38 57	2183	67 27 35	2166	69 16 20	2164
	Saturn W.	57 34 8	2237	59 21 41	2231	61 9 22	2226	62 57 11	2222
	Antares E.	36 7 5	2188	34 18 20	2184	32 29 28	2181	30 40 32	2177
α Aquilæ E.	90 54 51	2112	89 18 28	2108	87 41 59	2107	86 5 28	2106	
19	Mars W.	116 1 8	2266	117 45 46	2255	119 30 26	2254	121 15 7	2253
	Jupiter W.	83 6 48	2220	84 54 46	2219	86 42 45	2218	88 30 46	2218
	Regulus W.	78 21 24	2171	80 10 35	2169	81 59 49	2169	83 49 4	2169
	Saturn W.	71 57 42	2205	73 46 0	2204	75 34 21	2203	77 22 44	2203
	Spica W.	24 21 2	2194	26 9 39	2190	27 58 22	2186	29 47 10	2184
	α Aquilæ E.	78 3 4	2190	76 26 51	2188	74 50 48	2187	73 14 57	2187
	Fomalhaut E.	102 57 32	2209	101 18 49	2201	99 39 56	2206	98 0 55	2201
20	Jupiter W.	97 30 30	2226	99 18 19	2229	101 6 3	2223	102 53 43	2225
	Regulus W.	92 55 8	2174	94 44 15	2177	96 33 17	2180	98 22 14	2184
	Saturn W.	86 24 32	2208	88 12 48	2211	90 0 59	2214	91 49 5	2218
	Spica W.	38 51 57	2179	40 40 56	2181	42 29 52	2182	44 18 46	2186
	α Aquilæ E.	65 20 3	2232	63 46 17	2235	62 13 2	2233	60 40 21	2212
	Fomalhaut E.	89 45 4	2201	88 5 57	2205	86 26 55	2209	84 47 59	2205
	α Pegasi E.	110 45 22	2222	108 59 56	2222	107 14 29	2222	105 29 3	2224
21	Jupiter W.	111 50 22	2264	113 37 14	2271	115 23 56	2279	117 10 26	2288
	Regulus W.	107 25 16	2212	109 13 26	2218	111 1 26	2227	112 49 14	2234
	Saturn W.	100 47 55	2245	102 35 15	2253	104 22 23	2260	105 9 21	2269
	Spica W.	53 21 51	2208	55 10 6	2215	56 58 11	2222	58 46 6	2220
	α Aquilæ E.	53 7 47	2116	51 39 57	2170	50 13 12	2221	48 47 37	2225
	Fomalhaut E.	76 36 0	2257	74 58 22	2272	73 21 4	2268	71 44 8	2265
	α Pegasi E.	96 42 36	2241	94 57 36	2247	93 12 45	2245	91 28 5	2242

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Star's Name and Position.	Midnight.	P. L. of Dist.	XVh.	P. L. of Dist.	XVIIIh.	P. L. of Dist.	XXIh.	P. L. of Dist.
15	Mars W.	67° 58' 31"	2327	69° 39' 6"	2313	71° 19' 54"	2510	73° 0' 54"	2300
	Jupiter W.	33 36 13	2411	35 19 32	2399	37 3 8	2398	38 47 0	2378
	Regulus W.	28 18 35	2373	30 2 49	2359	31 47 23	2346	33 32 16	2333
	Saturn W.	22 32 58	2493	24 14 21	2463	25 56 23	2441	27 38 59	2421
	Spica E.	26 18 46	2361	24 34 15	2357	22 49 38	2354	21 4 57	2354
	Antares E.	71 50 1	2326	70 4 39	2317	68 19 4	2309	66 33 17	2300
16	SUN W.	104 8 3	2500	105 47 54	2551	107 27 56	2544	109 8 8	2537
	Mars W.	81 28 57	2469	83 11 8	2461	84 53 30	2443	86 36 3	2436
	Jupiter W.	47 30 1	2329	49 15 18	2320	51 0 48	2312	52 46 30	2304
	Regulus W.	42 20 42	2263	44 7 7	2274	45 53 45	2255	47 40 36	2257
	Saturn W.	36 18 28	2343	38 3 25	2331	39 48 40	2319	41 34 12	2308
	Antares E.	57 41 25	2261	55 54 28	2253	54 7 20	2245	52 20 1	2239
	α Aquilæ E.	109 54 17	2392	108 21 9	2342	106 47 35	2323	105 13 37	2307
17	SUN W.	117 31 42	2501	119 12 54	2496	120 54 13	2490	122 35 40	2485
	Mars W.	95 11 24	2403	96 54 55	2397	98 38 34	2391	100 22 22	2386
	Jupiter W.	61 37 45	2298	63 24 31	2263	65 11 25	2257	66 58 28	2251
	Regulus W.	56 37 45	2221	58 25 41	2214	60 13 47	2208	62 2 2	2202
	Saturn W.	50 25 31	2263	52 12 25	2256	53 59 29	2249	55 46 44	2243
	Antares E.	43 20 56	2208	41 32 40	2202	39 44 16	2197	37 55 44	2192
	α Aquilæ E.	97 18 54	2741	95 43 9	2733	94 7 13	2726	92 31 6	2719
18	SUN W.	131 4 39	2492	132 46 45	2486	134 28 54	2480	136 11 6	2466
	Mars W.	109 3 4	2365	110 47 29	2362	112 31 59	2350	114 16 32	2357
	Jupiter W.	75 55 32	2230	77 43 15	2227	79 31 2	2225	81 18 53	2222
	Regulus W.	71 5 12	2180	72 54 9	2177	74 43 11	2175	76 32 16	2173
	Saturn W.	64 45 6	2218	66 33 7	2214	68 21 14	2210	70 9 26	2208
	Antares E.	28 51 30	2175	27 2 25	2173	25 13 17	2172	23 24 7	2169
	α Aquilæ E.	84 28 56	2707	82 52 25	2707	81 15 54	2709	79 39 26	2718
19	Mars W.	122 59 49	2354	124 44 30	2355	126 29 9	2357	128 13 46	2359
	Jupiter W.	90 18 45	2219	92 6 44	2220	93 54 42	2223	95 42 37	2223
	Regulus W.	85 38 18	2169	87 27 32	2170	89 16 45	2170	91 5 57	2171
	Saturn W.	79 11 7	2203	80 59 30	2204	82 47 52	2204	84 36 13	2206
	Spica W.	31 36 2	2181	33 24 58	2179	35 13 57	2178	37 2 58	2179
	α Aquilæ E.	71 39 20	2700	70 4 0	2774	68 28 58	2791	66 54 18	2810
	Fomalhaut E.	96 21 48	2689	94 42 38	2688	93 3 26	2688	91 24 14	2689
20	Jupiter W.	104 41 18	2229	106 28 47	2245	108 16 7	2251	110 3 19	2257
	Regulus W.	100 11 5	2186	101 59 50	2194	103 48 27	2199	105 36 56	2205
	Saturn W.	93 37 5	2223	95 24 59	2227	97 12 46	2233	99 0 25	2239
	Spica W.	46 7 35	2189	47 56 19	2193	49 44 57	2196	51 33 27	2202
	α Aquilæ E.	59 8 18	2246	57 36 57	2261	56 6 21	2262	54 36 37	2267
	Fomalhaut E.	83 9 11	2612	81 30 33	2622	79 52 8	2632	78 13 56	2643
	α Pegasi E.	103 43 38	2235	101 58 15	2237	100 12 55	2233	98 27 42	2237
21	Jupiter W.	118 56 43	2226	120 42 48	2307	122 28 38	2315	124 14 15	2327
	Regulus W.	114 36 51	2243	116 24 14	2252	118 11 24	2262	119 58 20	2271
	Saturn W.	107 56 6	2278	109 42 38	2287	111 28 57	2297	113 15 1	2306
	Spica W.	60 33 49	2226	62 21 20	2245	64 8 40	2255	65 55 46	2264
	α Aquilæ E.	47 23 22	2309	46 0 30	2449	44 39 9	2536	43 19 27	2634
	Fomalhaut E.	70 7 36	2725	68 31 29	2746	66 55 50	2768	65 20 42	2794
	α Pegasi E.	89 43 36	2371	87 59 19	2379	86 15 14	2389	84 31 23	2399

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Star's Name and Position.	Noon.	P. L. of Dist.	IIIh.	P. L. of Dist.	VIh.	P. L. of Dist.	IXh.	P. L. of Dist.	
22	Saturn W.	115° 0' 49"	2318	116° 46' 22"	2330	118° 31' 36"	2349	120° 16' 36"	2365	
	Spica W.	67 42 38	2274	69 29 15	2265	71 15 38	2290	73 1 44	2307	
	Antares W.	22 1 50	2376	23 48 26	2265	25 34 48	2296	27 20 54	2307	
	Fomalhaut E.	63 46 6	2320	62 12 4	2249	60 38 40	2281	59 5 57	2215	
	α Pegasi E.	82 47 47	2410	81 4 27	2422	79 21 23	2435	77 38 38	2448	
	α Arietis E.	125 42 20	2222	123 56 9	2201	122 10 11	2211	120 24 28	2222	
23	Spica W.	81 47 57	2309	83 32 16	2292	85 16 16	2296	86 59 56	2410	
	Antares W.	36 7 19	2266	37 51 43	2260	39 35 47	2293	41 19 32	2408	
	Fomalhaut E.	51 34 12	2129	50 6 38	2133	48 40 8	2241	47 14 47	2206	
	α Pegasi E.	69 9 57	2222	67 29 20	2243	65 49 7	2263	64 9 21	2262	
	α Arietis E.	111 39 59	2281	109 55 57	2294	108 12 14	2408	106 28 51	2422	
	24	Spica W.	95 33 7	2486	97 14 41	2200	98 55 54	2217	100 36 44	2222
Antares W.		49 53 9	2481	51 34 49	2497	53 16 7	2212	54 57 4	2227	
Fomalhaut E.		40 28 30	2722	39 12 6	2281	37 57 36	2264	36 45 11	4090	
α Pegasi E.		55 57 25	2291	54 20 33	2716	52 44 15	2742	51 8 31	2767	
α Arietis E.		97 57 2	2426	96 15 43	2211	94 34 45	2227	92 54 9	2242	
25		Spica W.	108 55 25	2212	110 34 2	2222	112 12 17	2245	113 50 11	2261
	Antares W.	63 16 22	2207	64 55 8	2224	66 33 31	2228	68 11 33	2266	
	Fomalhaut E.	31 20 33	2075	30 24 36	2261	29 32 13	2292	28 43 41	2077	
	α Arietis E.	84 36 36	2222	82 58 12	2220	81 20 10	2255	79 42 29	2271	
	26	Antares W.	76 16 23	2722	77 52 19	2746	79 27 55	2763	81 3 11	2779
		α Arietis E.	71 39 30	2760	70 3 57	2766	68 28 45	2792	66 53 54	2798
Aldebaran E.		104 20 10	2722	102 45 20	2727	101 10 48	2212	99 36 36	2227	
SUN E.		130 56 0	2062	129 27 11	2064	127 58 42	2101	126 30 33	2116	
27		Antares W.	88 54 43	2249	90 28 7	2262	92 1 14	2276	93 34 4	2280
		α Aquilæ W.	42 44 52	4182	43 53 34	4122	45 3 14	4068	46 13 47	4020
	α Arietis E.	59 4 33	2271	57 31 37	2266	55 59 0	2200	54 26 41	2212	
	Aldebaran E.	91 50 13	2297	90 17 50	2210	88 45 44	2222	87 13 54	2226	
	SUN E.	119 14 32	2122	117 48 13	2207	116 22 12	2222	114 56 29	2226	
	28	Antares W.	101 14 18	2247	102 45 37	2268	104 16 43	2268	105 47 36	2277
α Aquilæ W.		52 16 50	2242	53 31 3	2222	54 45 42	2292	56 0 45	2761	
Fomalhaut W.		30 43 50	2222	31 36 29	2142	32 31 34	2272	33 28 51	2222	
α Arietis E.		46 49 18	2272	45 18 38	2290	43 48 13	2202	42 18 3	2014	
Aldebaran E.		79 38 39	2296	78 8 21	2007	76 38 17	2212	75 8 26	2027	
SUN E.		107 51 45	2292	106 27 32	2202	105 3 31	2212	103 39 42	2221	
29	Antares W.	113 19 17	2012	114 49 7	2022	116 18 48	2022	117 48 21	2022	
	α Aquilæ W.	62 20 24	2702	63 37 3	2207	64 53 53	2267	66 10 54	2272	
	Fomalhaut W.	38 41 53	4202	39 48 43	4220	40 56 41	4166	42 5 40	4166	
	α Arietis E.	34 50 50	2072	33 22 6	2084	31 53 37	2096	30 25 22	2106	
	Aldebaran E.	67 42 11	2074	66 13 30	2062	64 44 59	2061	63 16 38	2062	
	SUN E.	96 43 30	2276	95 20 46	2262	93 58 10	2291	92 35 42	2297	
30	α Aquilæ W.	72 38 7	2244	73 55 54	2222	75 13 47	2222	76 31 46	2222	
	Fomalhaut W.	48 3 3	2292	49 16 34	2262	50 30 40	2222	51 45 16	2796	
	α Pegasi W.	25 5 47	2241	26 18 25	2266	27 32 30	2794	28 47 49	2722	
	Aldebaran E.	55 57 6	2122	54 29 35	2122	53 2 12	2142	51 34 55	2142	
	SUN E.	85 45 5	2422	84 22 13	2422	83 1 25	2422	81 39 41	2421	

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Star's Name and Position.	Midnight.	P. L. of Dist.	XVh.	P. L. of Dist.	XVIIIh.	P. L. of Dist.	XXIh.	P. L. of Dist.	
22	Saturn W.	122° 1' 16"	2896	123° 45' 37"	2892	125° 29' 38"	2896	127° 13' 13"	2410	
	Spica W.	74 47 34	2819	76 33 6	2831	78 18 21	2842	80 3 19	2266	
	Antares W.	29 6 44	2817	30 52 18	2828	32 37 36	2840	34 22 37	2263	
	Fomalhaut E.	57 33 57	2851	56 2 43	2867	54 32 19	2833	53 2 47	2679	
	α Pegasi E.	75 56 12	2462	74 14 6	2477	72 32 20	2498	70 50 57	2510	
	α Arietis E.	118 39 0	2838	116 53 49	2845	115 8 55	2857	113 24 18	2368	
23	Spica W.	88 43 16	2426	90 26 15	2429	92 8 54	2454	93 51 12	2476	
	Antares W.	43° 2' 56"	2422	44 46 0	2426	46 28 43	2450	48 11 7	2465	
	Fomalhaut E.	45 50 40	2878	44 27 53	2448	43 6 31	2631	41 46 41	2622	
	α Pegasi E.	62 30 1	2601	60 51 8	2623	59 12 43	2644	57 34 48	2668	
	α Arietis E.	104 45 49	2426	103 3 6	2450	101 20 43	2466	99 38 42	2481	
	24	Spica W.	102 17 13	2646	103 57 19	2664	105 37 3	2680	107 16 25	2686
Antares W.		56 37 40	2643	58 17 54	2659	59 57 45	2674	61 37 15	2691	
Fomalhaut E.		35 35 0	4244	34 27 15	4414	33 22 6	4608	32 19 48	4826	
α Pegasi E.		49 33 20	2797	47 58 48	2828	46 24 56	2857	44 51 42	2889	
α Arietis E.		91 13 55	2646	89 34 2	2674	87 54 31	2690	86 15 22	2697	
25		Spica W.	115 27 43	2678	117 4 53	2692	118 41 42	2709	120 18 10	2725
	Antares W.	69 49 13	2671	71 26 32	2687	73 3 30	2702	74 40 7	2718	
	Fomalhaut E.	27 59 16	6829	27 19 14	7063	26 43 50	7119	26 13 20	8510	
	α Arietis E.	78 5 10	2698	76 28 14	2704	74 51 39	2719	73 15 24	2735	
	26	Antares W.	82 38 7	2798	84 12 44	2808	85 47 2	2822	87 21 1	2835
		α Arietis E.	65 19 23	2613	63 45 12	2626	62 11 21	2642	60 37 48	2656
Aldebaran E.		98 2 43	2842	96 29 9	2858	94 55 52	2869	93 22 53	2882	
SUN E.		125 2 43	3182	123 35 12	3148	122 8 0	3163	120 41 7	3178	
27		Antares W.	95 6 37	2801	96 38 55	2812	98 10 57	2824	99 42 45	2836
		α Aquilæ W.	47 25 7	2677	48 37 9	2689	49 49 49	2695	51 3 4	2674
	α Arietis E.	52 54 39	2627	51 22 54	2640	49 51 26	2653	48 20 14	2666	
	Aldebaran E.	85 42 19	2849	84 11 2	2861	82 40 0	2873	81 9 12	2884	
	SUN E.	113 31 2	3247	112 5 49	3261	110 40 52	3275	109 16 11	3288	
	28	Antares W.	107 18 19	2896	108 48 50	2904	110 19 10	2904	111 49 18	2911
α Aquilæ W.		57 16 7	2764	58 31 47	2747	59 47 44	2732	61 3 57	2719	
Fomalhaut W.		34 28 9	4691	35 29 16	4675	36 32 2	4474	37 36 17	4384	
α Arietis E.		40 48 8	2626	39 18 27	2667	37 49 0	2649	36 19 48	2600	
Aldebaran E.		73 38 47	2627	72 9 20	2647	70 40 6	2666	69 11 3	2665	
SUN E.		102 16 6	3241	100 52 42	3250	99 29 28	3258	98 6 24	3267	
29	Antares W.	119 17 46	3043	120 47 5	3080	122 16 16	3054	123 45 22	3069	
	α Aquilæ W.	67 28 4	2670	68 45 23	2663	70 2 50	2655	71 20 25	2649	
	Fomalhaut W.	43 15 34	4063	44 26 21	4007	45 37 54	3963	46 50 10	3926	
	α Arietis E.	28 57 19	3119	27 29 33	3183	26 2 3	3147	24 34 50	3163	
	Aldebaran E.	61 48 27	3106	60 20 24	3113	58 52 30	3119	57 24 44	3126	
	SUN E.	91 13 23	2462	89 51 9	2407	88 29 0	2414	87 6 59	2420	
30	α Aquilæ W.	77 49 50	2623	79 7 59	2620	80 26 12	2615	81 44 30	2610	
	Fomalhaut W.	53 0 22	2770	54 15 55	2746	55 31 53	2723	56 48 16	2702	
	α Pegasi W.	30 4 13	2667	31 21 35	2619	32 39 49	2678	33 58 47	2635	
	Aldebaran E.	50 7 44	3155	48 40 41	3190	47 13 44	3164	45 46 52	3198	
	SUN E.	80 18 0	2428	78 56 21	2424	77 34 43	2434	76 13 5	2426	

AT GREENWICH APPARENT NOON.

Day of the Week.	Day of the Month.	THE SUN'S						Sideral Time of the Semidiameter passing the Meridian.	Equation of Time, to be added to Apparent Time.	Diff. for 1 hour.
		Apparent Right Ascension.	Diff. for 1 hour.	Apparent Declination.	Diff. for 1 hour.	Semidiameter.				
Mon.	1	6 ^h 41 ^m 34.76 ^s	10.338	N.23° 6' 48.9"	10.27	15' 46.14"	68.78	3 ^m 28.80 ^s	0.481	
Tues.	2	6 45 42.80	10.328	23 2 30.2	11.28	15 46.13	68.74	3 40.25	0.470	
Wed.	3	6 49 50.59	10.317	22 57 47.3	12.29	15 46.12	68.70	3 51.46	0.459	
Thur.	4	6 53 58.11	10.305	22 52 40.3	13.29	15 46.12	68.66	4 2.39	0.448	
Fri.	5	6 58 5.31	10.292	22 47 9.4	14.28	15 46.13	68.61	4 13.00	0.435	
Sat.	6	7 2 12.17	10.278	22 41 14.7	15.27	15 46.15	68.56	4 23.27	0.421	
Sun.	7	7 6 18.69	10.263	22 34 56.4	16.25	15 46.17	68.51	4 33.20	0.406	
Mon.	8	7 10 24.83	10.246	22 28 14.5	17.23	15 46.19	68.46	4 42.76	0.390	
Tues.	9	7 14 30.57	10.229	22 21 9.3	18.19	15 46.22	68.40	4 51.92	0.373	
Wed.	10	7 18 35.89	10.211	22 13 40.9	19.15	15 46.26	68.34	5 0.65	0.355	
Thur.	11	7 22 40.77	10.192	22 5 49.6	20.10	15 46.30	68.28	5 8.94	0.337	
Fri.	12	7 26 45.20	10.174	21 57 35.5	21.04	15 46.34	68.22	5 16.80	0.318	
Sat.	13	7 30 49.16	10.154	21 48 58.9	21.98	15 46.39	68.16	5 24.18	0.297	
Sun.	14	7 34 52.62	10.133	21 40 0.2	22.90	15 46.45	68.09	5 31.06	0.276	
Mon.	15	7 38 55.55	10.111	21 30 39.3	23.83	15 46.51	68.02	5 37.42	0.255	
Tues.	16	7 42 57.96	10.089	21 20 56.4	24.73	15 46.58	67.95	5 43.26	0.233	
Wed.	17	7 46 59.85	10.067	21 10 51.9	25.63	15 46.65	67.88	5 48.59	0.211	
Thur.	18	7 51 1.20	10.044	21 0 25.9	26.52	15 46.72	67.80	5 53.37	0.188	
Fri.	19	7 55 1.99	10.021	20 49 38.7	27.40	15 46.80	67.72	5 57.59	0.165	
Sat.	20	7 59 2.21	9.998	20 38 30.3	28.28	15 46.88	67.64	6 1.24	0.142	
Sun.	21	8 3 1.88	9.974	20 27 1.1	29.14	15 47.07	67.56	6 4.34	0.118	
Mon.	22	8 7 0.98	9.950	20 15 11.3	29.98	15 47.16	67.48	6 6.88	0.094	
Tues.	23	8 10 59.52	9.927	20 3 1.3	30.83	15 47.25	67.40	6 8.85	0.070	
Wed.	24	8 14 57.48	9.903	19 50 31.2	31.66	15 47.24	67.32	6 10.25	0.046	
Thur.	25	8 18 54.85	9.879	19 37 41.2	32.49	15 47.34	67.24	6 11.07	0.022	
Fri.	26	8 22 51.65	9.855	19 24 31.5	33.31	15 47.44	67.16	6 11.31	0.002	
Sat.	27	8 26 47.86	9.831	19 11 2.4	34.11	15 47.54	67.07	6 10.98	0.026	
Sun.	28	8 30 43.49	9.807	18 57 14.3	34.90	15 47.64	66.98	6 10.06	0.050	
Mon.	29	8 34 38.55	9.782	18 43 7.4	35.67	15 47.75	66.89	6 8.57	0.075	
Tues.	30	8 38 33.02	9.757	18 28 41.9	36.44	15 47.86	66.81	6 6.49	0.099	
Wed.	31	8 42 26.89	9.733	18 13 58.0	37.20	15 47.98	66.73	6 3.81	0.123	
Thur.	32	8 46 20.17	9.708	N.17 58 56.1	37.95	15 48.10	66.64	6 0.55	0.147	

Nota. — Mean Time of the Semidiameter passing may be found by subtracting 0s.18 from the Sideral Time.

AT GREENWICH MEAN NOON.

THE SUN'S									
Day of the Week.	Day of the Month.	THE SUN'S				Equation of Time, to be subtracted from Mean Time.		Sideral Time.	
		Apparent Right Ascension.	Diff. for 1 hour.	Apparent Declination.	Diff. for 1 hour.	Equation of Time.	Diff. for 1 hour.	Sideral Time.	
Mon.	1	6 ^h 41 ^m 34.16 ^s	10.338	N.23° 6' 49.5"	10.27	3 ^m 28.77 ^s	0.481	6 ^h 38 ^m 5.39 ^s	
Tues.	2	6 45 42.17	10.328	23 2 30.9	11.28	3 40.22	0.470	6 42 1.95	
Wed.	3	6 49 49.93	10.317	22 57 48.1	12.29	3 51.43	0.459	6 45 58.50	
Thur.	4	6 53 57.42	10.305	22 52 41.2	13.29	4 2.36	0.448	6 49 55.06	
Fri.	5	6 58 4.59	10.292	22 47 10.4	14.28	4 12.97	0.435	6 53 51.62	
Sat.	6	7 2 11.42	10.278	22 41 15.8	15.27	4 23.24	0.421	6 57 48.18	
Sun.	7	7 6 17.91	10.263	22 34 57.6	16.25	4 33.17	0.406	7 1 44.74	
Mon.	8	7 10 24.02	10.246	22 28 15.8	17.23	4 42.73	0.390	7 5 41.29	
Tues.	9	7 14 29.74	10.229	22 21 10.8	18.19	4 51.89	0.373	7 9 37.85	
Wed.	10	7 18 35.03	10.211	22 13 42.6	19.15	5 0.62	0.355	7 13 34.41	
Thur.	11	7 22 39.88	10.192	22 5 51.5	20.10	5 8.91	0.337	7 17 30.97	
Fri.	12	7 26 44.29	10.174	21 57 37.5	21.04	5 16.77	0.318	7 21 27.52	
Sat.	13	7 30 48.23	10.154	21 49 1.0	21.98	5 24.15	0.297	7 25 24.08	
Sun.	14	7 34 51.67	10.133	21 40 2.4	22.90	5 31.03	0.276	7 29 20.64	
Mon.	15	7 38 54.59	10.111	21 30 41.6	23.83	5 37.39	0.255	7 33 17.20	
Tues.	16	7 42 56.99	10.089	21 20 58.8	24.73	5 43.23	0.233	7 37 13.76	
Wed.	17	7 46 58.87	10.067	21 10 54.4	25.63	5 48.56	0.211	7 41 10.31	
Thur.	18	7 51 0.21	10.044	21 0 28.5	26.52	5 53.34	0.188	7 45 6.87	
Fri.	19	7 55 0.99	10.021	20 49 41.4	27.40	5 57.56	0.165	7 49 3.43	
Sat.	20	7 59 1.21	9.998	20 38 33.2	28.28	6 1.23	0.142	7 52 59.98	
Sun.	21	8 3 0.88	9.974	20 27 4.1	29.14	6 4.34	0.118	7 56 56.54	
Mon.	22	8 6 59.98	9.950	20 15 14.4	29.98	6 6.88	0.094	8 0 53.10	
Tues.	23	8 10 58.51	9.927	20 3 4.5	30.83	6 8.85	0.070	8 4 49.66	
Wed.	24	8 14 56.46	9.903	19 50 34.5	31.66	6 10.25	0.046	8 8 46.21	
Thur.	25	8 18 53.84	9.879	19 37 44.6	32.49	6 11.07	0.022	8 12 42.77	
Fri.	26	8 22 50.64	9.855	19 24 35.0	33.31	6 11.31	0.002	8 16 39.33	
Sat.	27	8 26 46.86	9.831	19 11 6.0	34.11	6 10.98	0.026	8 20 35.88	
Sun.	28	8 30 42.50	9.807	18 57 17.9	34.90	6 10.06	0.050	8 24 32.44	
Mon.	29	8 34 37.58	9.782	18 43 11.0	35.67	6 8.59	0.075	8 28 28.99	
Tues.	30	8 38 32.05	9.757	18 28 45.6	36.44	6 6.50	0.099	8 32 25.55	
Wed.	31	8 42 25.93	9.733	18 14 1.8	37.20	6 3.82	0.123	8 36 22.11	
Thur.	32	8 46 19.22	9.708	N.17° 58' 59.9"	37.95	6 0.56	0.147	8 40 18.66	

Note. — The Semidiameter for Mean Noon may be assumed the same as that for Apparent Noon.

AT GREENWICH MEAN NOON.

		THE SUN'S					Logarithm of the Radius Vector of the Earth.	Dif. for 1 hour.	Mean Time of Sidereal Oh.
Day of the Month.	Day of the Year.	True LONGITUDE.		Dif. for 1 hour.	LATITUDE.				
		λ	λ'						
1	182	99° 33' 19.8"	32' 37.6"	143.01	+0.90	.0072258	2.0	17 19 3.92	
2	183	100 30 32.0	29 49.6	143.02	0.85	.0072294	1.0	17 15 8.01	
3	184	101 27 44.4	27 1.8	143.03	0.79	.0072307	0.0	17 11 12.09	
4	185	102 24 57.1	24 14.4	143.04	0.70	.0072296	1.0	17 7 16.18	
5	186	103 22 10.1	21 27.2	143.04	0.59	.0072259	2.1	17 3 20.27	
6	187	104 19 23.4	18 40.3	143.05	0.46	.0072196	3.2	16 59 24.36	
7	188	105 16 36.8	15 53.5	143.06	0.33	.0072106	4.3	16 55 28.45	
8	189	106 13 50.5	13 7.1	143.07	0.20	.0071989	5.4	16 51 32.53	
9	190	107 11 4.3	10 20.8	143.08	+0.08	.0071847	6.5	16 47 36.62	
10	191	108 8 18.2	7 34.5	143.08	-0.03	.0071679	7.6	16 43 40.71	
11	192	109 5 32.1	4 48.2	143.08	0.12	.0071486	8.5	16 39 44.80	
12	193	110 2 46.1	2 2.0	143.08	0.17	.0071268	9.5	16 35 48.89	
13	194	110 60 0.2	59 15.9	143.09	0.20	.0071026	10.4	16 31 52.97	
14	195	111 57 14.5	56 30.1	143.10	0.21	.0070764	11.3	16 27 57.06	
15	196	112 54 28.8	53 44.2	143.10	0.20	.0070481	12.2	16 24 1.15	
16	197	113 51 43.3	50 58.5	143.11	0.16	.0070177	13.0	16 20 5.24	
17	198	114 48 58.0	48 13.0	143.12	-0.08	.0069853	13.7	16 16 9.33	
18	199	115 46 13.0	45 27.9	143.13	+0.02	.0069512	14.4	16 12 13.41	
19	200	116 43 28.3	42 43.1	143.14	0.13	.0069156	15.1	16 8 17.50	
20	201	117 40 43.9	39 58.5	143.16	0.26	.0068786	15.7	16 4 21.59	
21	202	118 37 59.9	37 14.3	143.18	0.39	.0068403	16.2	16 0 25.68	
22	203	119 35 16.6	34 30.8	143.21	0.52	.0068006	16.8	15 56 29.77	
23	204	120 32 33.9	31 48.0	143.24	0.63	.0067595	17.4	15 52 33.86	
24	205	121 29 51.9	29 5.9	143.27	0.73	.0067170	18.0	15 48 37.95	
25	206	122 27 10.7	26 24.5	143.31	0.82	.0066732	18.6	15 44 42.04	
26	207	123 24 30.5	23 44.1	143.35	0.87	.0066279	19.2	15 40 46.13	
27	208	124 21 51.2	21 4.6	143.39	0.89	.0065812	19.9	15 36 50.22	
28	209	125 19 12.9	18 26.2	143.43	0.88	.0065330	20.5	15 32 54.31	
29	210	126 16 35.6	15 48.8	143.47	0.84	.0064830	21.2	15 28 58.40	
30	211	127 13 59.5	13 12.5	143.52	0.78	.0064310	22.0	15 25 2.49	
31	212	128 11 24.7	10 37.5	143.57	0.70	.0063772	22.9	15 21 6.58	
32	213	129 8 51.1	8 3.8	143.62	+0.58	.0063214	23.8	15 17 10.67	

NOTE. — λ corresponds to the true equinox of the date, λ' to the mean equinox of January 0d.

GREENWICH MEAN TIME.

THE MOON'S

Day of the Month.

	SEMI-DIAMETER.		HORIZONTAL PARALLAX.				MERIDIAN PASSAGE.		AGM.
	Noon.	Midnight.	Noon.	Diff. for 1 hour.	Midnight.	Diff. for 1 hour.		Diff. for 1 hour.	
				"		"	h m	m	
1	14' 48.1"	14' 48.3"	54' 12.6"	-0.05	54' 13.2"	+0.16	19 20.0	1.85	22.9
2	14 49.1	14 50.6	54 16.3	+0.35	54 21.7	0.54	20 6.0	1.97	23.9
3	14 52.7	14 55.3	54 29.3	0.72	54 39.0	0.88	20 54.7	2.08	24.9
4	14 58.4	15 2.0	54 50.5	1.02	55 3.5	1.14	21 46.0	2.18	25.9
5	15 5.9	15 10.1	55 17.9	1.24	55 33.3	1.32	22 39.1	2.24	26.9
6	15 14.5	15 19.1	55 49.6	1.38	56 6.4	1.41	23 33.0	2.24	27.9
7	15 23.7	15 28.4	56 23.5	1.42	56 40.6	1.42	6		28.9
8	15 33.0	15 37.5	56 57.5	1.39	57 14.0	1.35	0 26.3	2.20	0.4
9	15 41.8	15 45.9	57 29.8	1.29	57 44.9	1.22	1 18.2	2.13	1.4
10	15 49.7	15 53.3	57 59.0	1.14	58 12.2	1.05	2 8.4	2.06	2.4
11	15 56.6	15 59.6	58 24.3	0.96	58 35.2	0.87	2 57.2	2.02	3.4
12	16 2.3	16 4.7	58 45.1	0.77	58 53.8	0.68	3 45.4	2.01	4.4
13	16 6.8	16 8.5	59 1.4	0.58	59 7.8	0.49	4 34.0	2.05	5.4
14	16 9.9	16 11.1	59 13.1	0.39	59 17.3	0.29	5 24.1	2.14	6.4
15	16 11.9	16 12.3	59 20.2	+0.19	59 21.9	+0.08	6 16.7	2.26	7.4
16	16 12.4	16 12.1	59 22.2	-0.04	59 21.0	-0.17	7 12.4	2.39	8.4
17	16 11.3	16 10.1	59 18.2	0.30	59 18.8	0.44	8 11.2	2.49	9.4
18	16 8.4	16 6.2	59 7.7	0.59	58 59.7	0.73	9 11.7	2.53	10.4
19	16 3.6	16 0.5	58 50.0	0.88	58 38.5	1.03	10 12.1	2.48	11.4
20	15 56.9	15 52.8	58 25.3	1.17	58 10.4	1.30	11 10.3	2.35	12.4
21	15 48.4	15 43.6	57 54.1	1.41	57 36.7	1.50	12 4.8	2.19	13.4
22	15 38.6	15 33.4	57 18.3	1.56	56 59.2	1.60	12 55.3	2.02	14.4
23	15 28.2	15 22.9	56 39.8	1.61	56 20.4	1.60	13 42.1	1.89	15.4
24	15 17.7	15 12.7	56 1.4	1.56	55 43.1	1.49	14 26.1	1.79	16.4
25	15 8.0	15 3.7	55 25.8	1.39	55 9.8	1.26	15 8.3	1.74	17.4
26	14 59.8	14 56.4	54 55.4	1.12	54 42.9	0.95	15 49.8	1.73	18.4
27	14 53.5	14 51.3	54 32.5	0.77	54 24.4	0.58	16 31.5	1.76	19.4
28	14 49.7	14 48.8	54 18.6	-0.38	54 15.3	-0.17	17 14.4	1.82	20.4
29	14 48.7	14 49.2	54 14.6	+0.05	54 16.5	+0.27	17 59.2	1.91	21.4
30	14 50.4	14 52.3	54 21.0	0.48	54 28.1	0.69	18 46.4	2.02	22.4
31	14 54.9	14 58.1	54 37.6	0.89	54 49.4	1.07	19 36.2	2.13	23.4
32	15 1.9	15 6.3	55 3.4	+1.25	55 19.4	+1.41	20 28.3	2.21	24.4

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Dif. for 1 m.	Declination.	Dif. for 1 m.	Hour.	Right Ascension.	Dif. for 1 m.	Declination.	Dif. for 1 m.
MONDAY 1.					WEDNESDAY 3.				
0	1 23 52.98	1.9022	N.14° 24' 29.2"	10.548	0	2 59 24.63	2.0897	N.21° 31' 36.0"	6.988
1	1 25 47.20	1.9052	14 35 0.4	10.491	1	3 1 30.15	2.0942	21 38 30.3	6.886
2	1 27 41.60	1.9082	14 45 28.1	10.432	2	3 3 35.93	2.0988	21 45 18.9	6.783
3	1 29 36.19	1.9113	14 55 52.3	10.373	3	3 5 41.98	2.1080	21 52 1.8	6.687
4	1 31 30.96	1.9145	15 6 12.9	10.313	4	3 7 48.29	2.1075	21 58 38.9	6.570
5	1 33 25.93	1.9177	15 16 29.9	10.253	5	3 9 54.87	2.1119	22 5 10.2	6.472
6	1 35 21.09	1.9210	15 26 43.3	10.192	6	3 12 1.72	2.1163	22 11 35.6	6.373
7	1 37 16.45	1.9243	15 36 53.0	10.130	7	3 14 8.83	2.1207	22 17 55.0	6.274
8	1 39 12.01	1.9277	15 46 59.0	10.068	8	3 16 16.20	2.1251	22 24 8.5	6.174
9	1 41 7.78	1.9311	15 57 1.2	10.006	9	3 18 23.84	2.1295	22 30 16.0	6.074
10	1 43 3.75	1.9346	16 6 59.6	9.943	10	3 20 31.74	2.1339	22 36 17.4	5.973
11	1 44 59.93	1.9381	16 16 54.2	9.878	11	3 22 39.90	2.1382	22 42 12.6	5.880
12	1 46 56.32	1.9417	16 26 44.9	9.813	12	3 24 48.33	2.1426	22 48 1.7	5.786
13	1 48 52.98	1.9453	16 36 31.7	9.747	13	3 26 57.02	2.1469	22 53 44.5	5.682
14	1 50 49.75	1.9489	16 46 14.5	9.680	14	3 29 5.97	2.1513	22 59 21.1	5.587
15	1 52 46.79	1.9526	16 55 53.3	9.613	15	3 31 15.17	2.1556	23 4 51.3	5.451
16	1 54 44.06	1.9563	17 5 28.0	9.545	16	3 33 24.63	2.1599	23 10 15.2	5.344
17	1 56 41.55	1.9600	17 14 58.6	9.476	17	3 35 34.35	2.1642	23 15 32.6	5.237
18	1 58 39.26	1.9638	17 24 25.1	9.406	18	3 37 44.33	2.1684	23 20 43.6	5.130
19	2 0 37.20	1.9676	17 33 47.4	9.336	19	3 39 54.56	2.1726	23 25 48.1	5.020
20	2 2 35.38	1.9714	17 43 5.4	9.265	20	3 42 5.04	2.1768	23 30 46.0	4.910
21	2 4 33.78	1.9753	17 52 19.1	9.193	21	3 44 15.77	2.1810	23 35 37.3	4.800
22	2 6 32.42	1.9792	18 1 28.5	9.120	22	3 46 26.76	2.1852	23 40 22.0	4.689
23	2 8 31.30	1.9832	N.18 10 33.5	9.046	23	3 48 38.00	2.1893	N.23 44 59.9	4.576
TUESDAY 2.					THURSDAY 4.				
0	2 10 30.41	1.9872	N.18 19 34.1	8.972	0	3 50 49.48	2.1934	N.23 49 31.1	4.463
1	2 12 29.76	1.9912	18 28 30.2	8.897	1	3 53 1.20	2.1974	23 53 55.5	4.350
2	2 14 29.36	1.9953	18 37 21.8	8.821	2	3 55 13.17	2.2014	23 58 13.1	4.238
3	2 16 29.20	1.9994	18 46 8.8	8.745	3	3 57 25.37	2.2054	24 2 23.8	4.130
4	2 18 29.28	2.0035	18 54 51.2	8.668	4	3 59 37.81	2.2093	24 6 27.5	4.004
5	2 20 29.61	2.0077	19 3 29.0	8.590	5	4 1 50.48	2.2132	24 10 24.3	3.888
6	2 22 30.20	2.0118	19 12 2.0	8.511	6	4 4 3.39	2.2170	24 14 14.1	3.771
7	2 24 31.04	2.0160	19 20 30.3	8.431	7	4 6 16.52	2.2208	24 17 56.8	3.653
8	2 26 32.12	2.0202	19 28 53.7	8.350	8	4 8 29.88	2.2246	24 21 32.4	3.535
9	2 28 33.46	2.0244	19 37 12.3	8.269	9	4 10 43.46	2.2283	24 25 0.8	3.414
10	2 30 35.05	2.0287	19 45 26.0	8.187	10	4 12 57.27	2.2319	24 28 22.1	3.294
11	2 32 36.90	2.0330	19 53 34.8	8.106	11	4 15 11.29	2.2356	24 31 36.2	3.174
12	2 34 39.01	2.0373	20 1 38.6	8.022	12	4 17 25.53	2.2391	24 34 43.0	3.053
13	2 36 41.38	2.0416	20 9 37.4	7.937	13	4 19 39.98	2.2426	24 37 42.5	2.930
14	2 38 44.00	2.0459	20 17 31.0	7.852	14	4 21 54.64	2.2461	24 40 34.6	2.807
15	2 40 46.88	2.0502	20 25 19.5	7.765	15	4 24 9.51	2.2495	24 43 19.4	2.684
16	2 42 50.02	2.0545	20 33 2.7	7.678	16	4 26 24.58	2.2529	24 45 56.7	2.560
17	2 44 53.42	2.0589	20 40 40.7	7.590	17	4 28 39.85	2.2562	24 48 26.6	2.436
18	2 46 57.09	2.0633	20 48 13.5	7.501	18	4 30 55.32	2.2594	24 50 49.0	2.310
19	2 49 1.02	2.0677	20 55 40.9	7.412	19	4 33 10.98	2.2626	24 53 3.8	2.184
20	2 51 5.21	2.0721	21 3 2.9	7.323	20	4 35 26.83	2.2657	24 55 11.1	2.056
21	2 53 9.67	2.0765	21 10 19.4	7.230	21	4 37 42.87	2.2688	24 57 10.8	1.931
22	2 55 14.39	2.0809	21 17 30.5	7.138	22	4 39 59.09	2.2718	24 59 2.8	1.803
23	2 57 19.38	2.0853	21 24 36.1	7.046	23	4 42 15.49	2.2747	25 0 47.2	1.675
24	2 59 24.63	2.0897	N.21 31 36.0	6.953	24	4 44 32.06	2.2776	N.25 2 23.9	1.546

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
FRIDAY 5.					SUNDAY 7.				
0	4 44 32.06	2.3776	N.25° 2' 23.9"	1.446	0	6 35 43.19	2.3244	N.23° 42' 1.7"	4.942
1	4 46 48.80	2.3804	25 3 52.8	1.417	1	6 38 2.63	2.3285	23 37 1.2	5.076
2	4 49 57.71	2.3831	25 5 14.0	1.388	2	6 40 22.01	2.3326	23 31 52.6	5.210
3	4 51 22.78	2.3866	25 6 27.4	1.366	3	6 42 41.32	2.3313	23 26 36.0	5.343
4	4 53 40.01	2.3904	25 7 33.0	1.098	4	6 45 0.57	2.3301	23 21 11.4	5.476
5	4 55 57.39	2.3909	25 8 30.7	0.987	5	6 47 19.74	2.3169	23 15 38.9	5.609
6	4 58 14.92	2.3983	25 9 20.6	0.765	6	6 49 38.84	2.3176	23 9 58.4	5.741
7	5 0 32.59	2.3997	25 10 2.5	0.633	7	6 51 57.85	2.3162	23 4 10.0	5.873
8	5 2 50.40	2.3996	25 10 36.5	0.601	8	6 54 16.78	2.3146	22 58 13.7	6.004
9	5 5 8.35	2.3902	25 11 2.5	0.568	9	6 56 35.62	2.3138	22 52 9.5	6.136
10	5 7 26.43	2.3923	25 11 20.6	0.385	10	6 58 54.37	2.3117	22 45 57.5	6.265
11	5 9 44.63	2.3944	25 11 30.7	0.101	11	7 1 13.02	2.3101	22 39 37.7	6.396
12	5 12 2.96	2.3964	25 11 32.7	0.033	12	7 3 31.58	2.3084	22 33 10.1	6.524
13	5 14 21.40	2.3963	25 11 26.7	0.167	13	7 5 50.03	2.3067	22 26 34.7	6.653
14	5 16 39.96	2.3102	25 11 12.6	0.302	14	7 8 8.38	2.3049	22 19 51.7	6.781
15	5 18 58.63	2.3120	25 10 50.4	0.437	15	7 10 26.62	2.3031	22 13 1.0	6.908
16	5 21 17.40	2.3137	25 10 20.1	0.572	16	7 12 44.75	2.3012	22 6 2.7	7.035
17	5 23 36.27	2.3158	25 9 41.7	0.708	17	7 15 2.76	2.2993	21 58 56.8	7.161
18	5 25 55.23	2.3166	25 8 55.1	0.844	18	7 17 20.66	2.2973	21 51 43.3	7.287
19	5 28 14.28	2.3162	25 8 0.4	0.980	19	7 19 38.44	2.2963	21 44 22.3	7.412
20	5 30 33.41	2.3166	25 6 57.5	1.116	20	7 21 56.09	2.2932	21 36 53.8	7.536
21	5 32 52.62	2.3200	25 5 46.4	1.253	21	7 24 13.61	2.2911	21 29 17.9	7.660
22	5 35 11.91	2.3221	25 4 27.1	1.390	22	7 26 31.01	2.2889	21 21 34.6	7.783
23	5 37 31.27	2.3233	N.25° 2' 59.6"	1.527	23	7 28 48.28	2.2867	N.21° 13' 43.9"	7.906
SATURDAY 6.					MONDAY 8.				
0	5 39 50.69	2.3246	N.25° 1' 23.9"	1.664	0	7 31 5.41	2.2844	N.21° 5' 45.9"	8.028
1	5 42 10.17	2.3261	24 59 40.0	1.801	1	7 33 22.40	2.2821	20 57 40.6	8.148
2	5 44 29.70	2.3280	24 57 47.9	1.938	2	7 35 39.26	2.2798	20 49 28.1	8.268
3	5 46 49.28	2.3298	24 55 47.5	2.074	3	7 37 55.97	2.2774	20 41 8.5	8.387
4	5 49 8.91	2.3276	24 53 38.9	2.211	4	7 40 12.54	2.2750	20 32 41.7	8.506
5	5 51 28.58	2.3261	24 51 22.1	2.348	5	7 42 28.96	2.2725	20 24 7.8	8.628
6	5 53 48.28	2.3266	24 48 57.1	2.485	6	7 44 45.24	2.2700	20 15 26.9	8.740
7	5 56 8.01	2.3290	24 46 23.8	2.623	7	7 47 1.37	2.2675	20 6 39.0	8.856
8	5 58 27.76	2.3294	24 43 42.3	2.760	8	7 49 17.34	2.2650	19 57 44.2	8.971
9	6 0 47.53	2.3297	24 40 52.6	2.898	9	7 51 33.16	2.2624	19 48 42.5	9.085
10	6 3 7.32	2.3299	24 37 54.6	3.035	10	7 53 48.83	2.2598	19 39 34.0	9.199
11	6 5 27.12	2.3300	24 34 48.4	3.173	11	7 56 4.34	2.2573	19 30 18.7	9.310
12	6 7 46.92	2.3300	24 31 34.0	3.309	12	7 58 19.69	2.2548	19 20 56.7	9.423
13	6 10 6.72	2.3300	24 28 11.4	3.446	13	8 0 34.88	2.2519	19 11 28.1	9.533
14	6 12 26.52	2.3299	24 24 40.5	3.583	14	8 2 49.92	2.2493	19 1 52.8	9.643
15	6 14 46.31	2.3297	24 21 1.4	3.720	15	8 5 4.80	2.2466	18 52 10.9	9.752
16	6 17 6.08	2.3294	24 17 14.1	3.857	16	8 7 19.51	2.2439	18 42 22.6	9.860
17	6 19 25.83	2.3290	24 13 18.6	3.993	17	8 9 34.06	2.2412	18 32 27.8	9.966
18	6 21 45.56	2.3286	24 9 14.9	4.130	18	8 11 48.45	2.2385	18 22 26.7	10.072
19	6 24 5.26	2.3280	24 5 3.0	4.266	19	8 14 2.68	2.2358	18 12 19.2	10.177
20	6 26 24.93	2.3274	24 0 43.0	4.402	20	8 16 16.75	2.2331	18 2 5.4	10.281
21	6 28 44.56	2.3268	23 56 14.8	4.538	21	8 18 30.65	2.2303	17 51 45.4	10.384
22	6 31 4.15	2.3261	23 51 38.5	4.673	22	8 20 44.39	2.2276	17 41 19.3	10.486
23	6 33 23.70	2.3253	23 46 54.1	4.807	23	8 22 57.96	2.2248	17 30 47.1	10.587
24	6 35 43.19	2.3244	N.23° 42' 1.7"	4.942	24	8 25 11.37	2.2221	N.17° 20' 8.8"	10.687

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
TUESDAY 9.					THURSDAY 11.				
0	8 ^h 25 ^m 11.37 ^s	2.2321	N. 17° 20' 8.8"	10.697	0	10 ^h 9 ^m 0.49 ^s	2.1164	N. 7° 13' 9.2"	14.182
1	8 27 24.61	2.2189	17 9 24.6	10.786	1	10 11 7.43	2.1123	6 58 58.8	14.186
2	8 29 37.69	2.2166	16 58 34.5	10.884	2	10 13 14.31	2.1141	6 44 45.8	14.287
3	8 31 50.60	2.2189	16 47 38.5	10.981	3	10 15 21.12	2.1180	6 30 30.4	14.377
4	8 34 3.35	2.2110	16 36 36.8	11.077	4	10 17 27.87	2.1190	6 16 12.6	14.316
5	8 36 15.93	2.2088	16 25 29.4	11.171	5	10 19 34.56	2.1111	6 1 52.5	14.338
6	8 38 28.35	2.2066	16 14 16.3	11.264	6	10 21 41.20	2.1103	5 47 30.2	14.389
7	8 40 40.61	2.2080	16 2 57.6	11.367	7	10 23 47.78	2.1094	5 33 5.8	14.434
8	8 42 52.71	2.2008	15 51 33.4	11.449	8	10 25 54.32	2.1086	5 18 39.3	14.488
9	8 45 4.65	2.1976	15 40 3.7	11.589	9	10 28 0.81	2.1079	5 4 10.8	14.491
10	8 47 16.42	2.1949	15 28 28.7	11.628	10	10 30 7.27	2.1073	4 49 40.4	14.522
11	8 49 28.03	2.1928	15 16 48.4	11.716	11	10 32 13.69	2.1067	4 35 8.2	14.562
12	8 51 39.49	2.1896	15 5 2.8	11.803	12	10 34 20.08	2.1062	4 20 34.2	14.561
13	8 53 50.79	2.1870	14 53 12.0	11.889	13	10 36 26.44	2.1066	4 5 58.6	14.606
14	8 56 1.93	2.1844	14 41 16.1	11.974	14	10 38 32.78	2.1064	3 51 21.3	14.634
15	8 58 12.91	2.1818	14 29 15.1	12.068	15	10 40 39.09	2.1061	3 36 42.5	14.669
16	9 0 23.74	2.1792	14 17 9.2	12.141	16	10 42 45.39	2.1049	3 22 2.2	14.683
17	9 2 34.42	2.1767	14 4 58.3	12.223	17	10 44 51.67	2.1047	3 7 20.5	14.706
18	9 4 44.94	2.1743	13 52 42.6	12.302	18	10 46 57.95	2.1046	2 52 37.6	14.732
19	9 6 55.31	2.1717	13 40 22.1	12.381	19	10 49 4.23	2.1046	2 37 53.4	14.746
20	9 9 5.54	2.1692	13 27 56.9	12.449	20	10 51 10.50	2.1046	2 23 8.1	14.784
21	9 11 15.62	2.1668	13 15 27.0	12.536	21	10 53 16.78	2.1047	2 8 21.7	14.781
22	9 13 25.56	2.1644	13 2 52.6	12.612	22	10 55 23.06	2.1049	1 53 34.4	14.797
23	9 15 35.35	2.1620	N. 12° 50' 13.6"	12.687	23	10 57 29.36	2.1061	N. 1° 38' 46.1"	14.812
WEDNESDAY 10.					FRIDAY 12.				
0	9 17 45.00	2.1596	N. 12° 37' 30.2"	12.760	0	10 59 35.67	2.1064	N. 1° 23' 57.0"	14.826
1	9 19 54.51	2.1573	12 24 42.5	12.831	1	11 1 42.00	2.1067	1 9 7.1	14.837
2	9 22 3.88	2.1551	12 11 50.5	12.902	2	11 3 48.36	2.1063	0 54 16.6	14.847
3	9 24 13.12	2.1529	11 58 54.3	12.972	3	11 5 54.75	2.1067	0 39 25.5	14.866
4	9 26 22.23	2.1507	11 45 53.9	13.040	4	11 8 1.17	2.1073	0 24 33.9	14.884
5	9 28 31.20	2.1486	11 32 49.4	13.107	5	11 10 7.62	2.1079	N. 0° 9' 41.8"	14.871
6	9 30 40.05	2.1464	11 19 41.0	13.178	6	11 12 14.12	2.1067	S. 0° 5' 10.6"	14.876
7	9 32 48.77	2.1443	11 6 28.7	13.237	7	11 14 20.67	2.1066	0 20 3.3	14.880
8	9 34 57.37	2.1423	10 53 12.5	13.300	8	11 16 27.26	2.1108	0 34 56.2	14.883
9	9 37 5.85	2.1403	10 39 52.6	13.363	9	11 18 33.91	2.1112	0 49 49.3	14.886
10	9 39 14.21	2.1384	10 26 28.9	13.425	10	11 20 40.61	2.1129	1 4 42.4	14.886
11	9 41 22.46	2.1365	10 13 1.6	13.486	11	11 22 47.38	2.1134	1 19 35.5	14.884
12	9 43 30.59	2.1346	9 59 30.7	13.544	12	11 24 54.22	2.1146	1 34 28.4	14.891
13	9 45 38.61	2.1328	9 45 56.4	13.601	13	11 27 1.13	2.1166	1 49 21.1	14.877
14	9 47 46.53	2.1311	9 32 18.6	13.657	14	11 29 8.11	2.1171	2 4 13.6	14.873
15	9 49 54.35	2.1294	9 18 37.5	13.713	15	11 31 15.18	2.1185	2 19 5.7	14.866
16	9 52 2.06	2.1277	9 4 53.1	13.766	16	11 33 22.33	2.1200	2 33 57.4	14.867
17	9 54 9.67	2.1261	8 51 5.5	13.819	17	11 35 29.57	2.1216	2 48 48.5	14.848
18	9 56 17.19	2.1246	8 37 14.8	13.871	18	11 37 36.90	2.1221	3 3 39.1	14.838
19	9 58 24.62	2.1231	8 23 21.0	13.921	19	11 39 44.33	2.1247	3 18 29.0	14.836
20	10 0 31.96	2.1216	8 9 24.3	13.970	20	11 41 51.86	2.1264	3 33 18.2	14.813
21	10 2 39.21	2.1202	7 55 24.7	14.017	21	11 43 59.49	2.1282	3 48 6.5	14.798
22	10 4 46.38	2.1189	7 41 22.2	14.063	22	11 46 7.24	2.1301	4 2 53.9	14.782
23	10 6 53.47	2.1176	7 27 17.0	14.108	23	11 48 15.10	2.1320	4 17 40.3	14.765
24	10 9 0.49	2.1164	N. 7° 13' 9.2"	14.152	24	11 50 23.08	2.1341	S. 4° 32' 25.7"	14.746

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
SATURDAY 13.					MONDAY 15.				
0	h m s	"	S. ° ' "	"	0	h m s	"	S. ° ' "	"
1	11 50 23.08	2.1341	4 32 25.7	14.746	1	13 36 25.32	2.3067	15 44 10.5	12.184
2	11 52 31.19	2.1363	4 47 9.9	14.725	2	13 38 43.87	2.3116	15 44 10.5	12.095
3	11 54 39.42	2.1383	5 1 52.8	14.705	3	13 41 2.71	2.3164	15 56 13.5	12.004
4	11 56 47.78	2.1405	5 16 34.4	14.682	4	13 43 21.84	2.3213	16 8 11.0	11.913
5	11 58 56.28	2.1428	5 31 14.6	14.656	5	13 45 41.27	2.3262	16 20 3.0	11.818
6	12 1 4.92	2.1462	5 45 53.3	14.622	6	13 48 1.00	2.3312	16 31 49.3	11.723
7	12 3 13.71	2.1477	6 0 30.4	14.605	7	13 50 21.02	2.3362	16 43 29.8	11.627
8	12 5 22.64	2.1503	6 15 5.9	14.577	8	13 52 41.34	2.3412	16 55 4.5	11.529
9	12 7 31.73	2.1528	6 29 39.6	14.547	9	13 55 1.96	2.3462	17 6 33.3	11.429
10	12 9 40.97	2.1554	6 44 11.5	14.515	10	13 57 22.88	2.3512	17 17 56.1	11.328
11	12 11 50.38	2.1581	6 58 41.4	14.482	11	13 59 44.11	2.3562	17 29 12.7	11.226
12	12 13 59.95	2.1609	7 13 9.4	14.449	12	14 2 5.64	2.3612	17 40 23.2	11.123
13	12 16 9.69	2.1638	7 27 35.3	14.414	13	14 4 27.47	2.3664	17 51 27.4	11.017
14	12 18 19.61	2.1667	7 41 59.1	14.377	14	14 6 49.61	2.3715	18 2 25.2	10.910
15	12 20 29.70	2.1697	7 56 20.6	14.339	15	14 9 12.05	2.3766	18 13 16.6	10.802
16	12 22 39.98	2.1728	8 10 39.7	14.299	16	14 11 34.79	2.3816	18 24 1.4	10.692
17	12 24 50.44	2.1760	8 24 56.5	14.258	17	14 13 57.84	2.3867	18 34 39.6	10.581
18	12 27 1.09	2.1793	8 39 10.8	14.217	18	14 16 21.19	2.3918	18 45 11.1	10.468
19	12 29 11.94	2.1825	8 53 22.5	14.174	19	14 18 44.85	2.3968	18 55 35.7	10.354
20	12 31 22.99	2.1858	9 7 31.5	14.130	20	14 21 8.81	2.4018	19 5 53.4	10.238
21	12 33 34.24	2.1893	9 21 37.8	14.081	21	14 23 33.06	2.4068	19 16 4.2	10.121
22	12 35 45.70	2.1927	9 35 41.2	14.033	22	14 25 57.62	2.4118	19 26 7.9	10.003
23	12 37 57.36	2.1962	9 49 41.7	13.984	23	14 28 22.48	2.4169	19 36 4.5	9.883
24	12 40 9.24	2.1998	S. 10 3 39.2	13.933	24	14 30 47.64	2.4219	S. 19 45 53.8	9.761
SUNDAY 14.					TUESDAY 16.				
0	12 42 21.33	2.2025	S. 10 17 33.6	13.881	0	14 33 13.11	2.4269	S. 19 55 35.8	9.638
1	12 44 33.65	2.2072	10 31 24.8	13.827	1	14 35 36.87	2.4318	20 5 10.4	9.516
2	12 46 46.19	2.2109	10 45 12.8	13.772	2	14 38 4.93	2.4366	20 14 37.6	9.390
3	12 48 58.95	2.2147	10 58 57.4	13.715	3	14 40 31.29	2.4417	20 23 57.2	9.263
4	12 51 11.95	2.2186	11 12 38.5	13.657	4	14 42 57.94	2.4466	20 33 9.1	9.138
5	12 53 25.18	2.2225	11 26 16.1	13.597	5	14 45 24.88	2.4515	20 42 13.3	9.006
6	12 55 38.65	2.2265	11 39 50.1	13.536	6	14 47 52.12	2.4564	20 51 9.7	8.874
7	12 57 52.36	2.2306	11 53 20.3	13.473	7	14 50 19.65	2.4613	20 59 58.2	8.743
8	13 0 6.32	2.2347	12 6 46.8	13.409	8	14 52 47.46	2.4662	21 8 38.8	8.608
9	13 2 20.53	2.2388	12 20 9.4	13.344	9	14 55 15.56	2.4707	21 17 11.3	8.474
10	13 4 34.98	2.2430	12 33 26.0	13.276	10	14 57 43.94	2.4754	21 25 35.7	8.338
11	13 6 49.09	2.2473	12 46 42.6	13.208	11	15 0 12.60	2.4800	21 33 51.9	8.201
12	13 9 4.65	2.2516	12 59 53.0	13.138	12	15 2 41.54	2.4846	21 41 59.9	8.063
13	13 11 19.88	2.2560	13 12 59.2	13.067	13	15 5 10.75	2.4891	21 49 59.5	7.923
14	13 13 35.37	2.2604	13 26 1.0	12.994	14	15 7 40.23	2.4936	21 57 50.7	7.782
15	13 15 51.13	2.2648	13 38 58.4	12.920	15	15 10 9.97	2.4978	22 5 33.4	7.640
16	13 18 7.15	2.2693	13 51 51.3	12.844	16	15 12 39.97	2.5022	22 13 7.5	7.497
17	13 20 23.45	2.2739	14 4 39.7	12.767	17	15 15 10.23	2.5066	22 20 33.0	7.353
18	13 22 40.02	2.2785	14 17 23.4	12.688	18	15 17 40.75	2.5107	22 27 49.8	7.206
19	13 24 56.87	2.2831	14 30 2.3	12.608	19	15 20 11.52	2.5148	22 34 57.8	7.060
20	13 27 13.99	2.2878	14 42 36.3	12.526	20	15 22 42.53	2.5189	21 41 57.0	6.912
21	13 29 31.40	2.2925	14 55 5.4	12.443	21	15 25 13.79	2.5229	22 48 47.3	6.763
22	13 31 49.09	2.2972	15 7 29.5	12.358	22	15 27 45.28	2.5268	22 55 28.6	6.613
23	13 34 7.06	2.3019	15 19 48.4	12.272	23	15 30 17.01	2.5307	23 2 0.9	6.462
24	13 36 25.32	2.3067	S. 15 32 2.1	12.184	24	15 32 48.96	2.5344	S. 23 8 24.2	6.310

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	D.M. for 1 m.	Declination.	D.M. for 1 m.	Hour.	Right Ascension.	D.M. for 1 m.	Declination.	D.M. for 1 m.
WEDNESDAY 17.					FRIDAY 19.				
0	15 32 48.96	2.5344	S. 23° 8' 24.2"	6.310	0	17 36 42.56	2.5787	S. 25° 3' 19.6"	1.534
1	15 35 21.14	2.5381	23 14 38.3	6.187	1	17 39 17.21	2.5783	25 1 36.6	1.980
2	15 37 53.53	2.5417	23 20 43.1	6.063	2	17 41 51.72	2.5780	24 59 43.6	1.923
3	15 40 26.14	2.5452	23 26 38.7	5.940	3	17 44 26.08	2.5712	24 57 40.7	2.120
4	15 42 58.95	2.5488	23 32 25.0	5.813	4	17 47 0.27	2.5686	24 55 28.0	2.284
5	15 45 31.96	2.5519	23 38 1.9	5.686	5	17 49 34.29	2.5687	24 53 5.4	2.458
6	15 48 5.17	2.5551	23 43 29.4	5.578	6	17 52 8.15	2.5627	24 50 33.0	2.621
7	15 50 38.57	2.5583	23 48 47.3	5.320	7	17 54 41.82	2.5686	24 47 50.9	2.783
8	15 53 12.15	2.5613	23 53 55.7	5.061	8	17 57 15.20	2.5664	24 44 59.0	2.944
9	15 55 45.91	2.5641	23 58 54.5	4.900	9	17 59 48.58	2.5630	24 41 57.5	3.105
10	15 58 19.84	2.5668	24 3 43.7	4.739	10	18 2 21.66	2.5495	24 38 46.3	3.265
11	16 0 53.94	2.5696	24 8 23.2	4.577	11	18 4 54.53	2.5469	24 35 25.6	3.424
12	16 3 28.19	2.5723	24 12 53.0	4.415	12	18 7 27.17	2.5422	24 31 55.4	3.582
13	16 6 2.59	2.5746	24 17 13.0	4.262	13	18 9 59.59	2.5363	24 28 15.7	3.740
14	16 8 37.14	2.5769	24 21 23.3	4.098	14	18 12 31.77	2.5344	24 24 26.6	3.897
15	16 11 11.83	2.5792	24 25 23.7	3.924	15	18 15 3.72	2.5304	24 20 28.1	4.052
16	16 13 46.64	2.5813	24 29 14.2	3.769	16	18 17 35.42	2.5292	24 16 20.4	4.206
17	16 16 21.58	2.5833	24 32 54.8	3.584	17	18 20 6.86	2.5219	24 12 3.4	4.360
18	16 18 56.63	2.5851	24 36 25.5	3.426	18	18 22 38.05	2.5175	24 7 37.2	4.512
19	16 21 31.78	2.5868	24 39 46.2	3.282	19	18 25 8.98	2.5131	24 3 1.9	4.663
20	16 24 7.04	2.5884	24 42 56.9	3.085	20	18 27 39.63	2.5085	23 58 17.6	4.813
21	16 26 42.39	2.5899	24 45 57.6	2.928	21	18 30 10.00	2.5038	23 53 24.3	4.963
22	16 29 17.83	2.5913	24 48 48.2	2.700	22	18 32 40.09	2.4991	23 48 22.0	5.112
23	16 31 53.35	2.5926	S. 24° 51' 28.8"	2.592	23	18 35 9.90	2.4943	S. 23° 43' 10.8"	5.260
THURSDAY 18.					SATURDAY 20.				
0	16 34 28.93	2.5936	S. 24° 53' 59.3"	2.484	0	18 37 39.41	2.4894	S. 23° 37' 50.9"	5.405
1	16 37 4.57	2.5945	24 56 19.7	2.285	1	18 40 8.63	2.4844	23 32 22.2	5.550
2	16 39 40.27	2.5954	24 58 29.9	2.086	2	18 42 37.54	2.4793	23 26 44.9	5.694
3	16 42 16.02	2.5961	25 0 29.9	1.988	3	18 45 6.14	2.4741	23 20 59.0	5.836
4	16 44 51.80	2.5966	25 2 19.8	1.747	4	18 47 34.43	2.4688	23 15 4.6	5.977
5	16 47 27.61	2.5970	25 3 59.5	1.577	5	18 50 2.40	2.4635	23 9 1.7	6.117
6	16 50 3.44	2.5973	25 5 20.0	1.407	6	18 52 30.05	2.4581	23 2 50.5	6.256
7	16 52 39.29	2.5975	25 6 48.3	1.287	7	18 54 57.37	2.4527	22 56 31.0	6.393
8	16 55 15.14	2.5975	25 7 57.4	1.087	8	18 57 24.37	2.4471	22 50 3.3	6.529
9	16 57 50.99	2.5974	25 8 56.3	0.886	9	18 59 51.03	2.4415	22 43 27.4	6.665
10	17 0 26.83	2.5971	25 9 44.9	0.736	10	19 2 17.35	2.4358	22 36 43.5	6.799
11	17 3 2.64	2.5967	25 10 23.3	0.586	11	19 4 43.38	2.4301	22 29 51.6	6.932
12	17 5 38.43	2.5961	25 10 51.5	0.386	12	19 7 8.97	2.4243	22 22 51.7	7.063
13	17 8 14.18	2.5954	25 11 9.6	0.216	13	19 9 34.25	2.4184	22 15 44.0	7.193
14	17 10 49.88	2.5946	25 11 17.5	0.046	14	19 11 59.18	2.4125	22 8 28.6	7.321
15	17 13 25.53	2.5937	25 11 15.2	0.128	15	19 14 23.75	2.4066	22 1 5.6	7.447
16	17 16 1.12	2.5926	25 11 2.8	0.392	16	19 16 47.97	2.4006	21 53 35.0	7.573
17	17 18 36.63	2.5913	25 10 40.2	0.461	17	19 19 11.82	2.3945	21 45 56.9	7.697
18	17 21 12.07	2.5899	25 10 7.5	0.690	18	19 21 35.31	2.3884	21 38 11.4	7.819
19	17 23 47.42	2.5883	25 9 24.6	0.798	19	19 23 58.43	2.3822	21 30 18.6	7.940
20	17 26 22.67	2.5866	25 8 31.7	0.906	20	19 26 21.18	2.3760	21 22 18.6	8.060
21	17 28 57.82	2.5848	25 7 28.7	1.134	21	19 28 43.56	2.3698	21 14 11.4	8.179
22	17 31 32.85	2.5829	25 6 15.7	1.301	22	19 31 5.56	2.3636	21 5 57.2	8.298
23	17 34 7.77	2.5809	25 4 52.7	1.468	23	19 33 27.19	2.3574	20 57 36.0	8.410
24	17 36 42.56	2.5787	S. 25° 3' 19.6"	1.634	24	19 35 48.45	2.3511	S. 20° 49' 8.0"	8.524

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
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SUNDAY 21.

0	19 35 48.45	2.2611	S. 20° 49' 8.0	8.824
1	19 38 9.33	2.2448	20 40 33.1	8.687
2	19 40 29.83	2.2385	20 31 51.5	8.748
3	19 42 49.95	2.2321	20 23 3.3	8.808
4	19 45 9.68	2.2258	20 14 8.6	8.868
5	19 47 29.03	2.2194	20 5 7.4	8.973
6	19 49 48.00	2.2130	19 55 59.9	9.178
7	19 52 6.59	2.2066	19 46 46.1	9.283
8	19 54 24.79	2.2002	19 37 26.1	9.384
9	19 56 42.60	2.2937	19 28 0.0	9.485
10	19 59 0.03	2.2873	19 18 27.9	9.584
11	20 1 17.07	2.2809	19 8 49.9	9.683
12	20 3 33.73	2.2744	18 59 6.1	9.778
13	20 5 50.00	2.2680	18 49 16.6	9.873
14	20 8 5.89	2.2616	18 39 21.4	9.968
15	20 10 21.39	2.2552	18 29 20.6	10.063
16	20 12 36.51	2.2488	18 19 14.4	10.148
17	20 14 51.25	2.2424	18 9 2.8	10.237
18	20 17 5.60	2.2360	17 58 45.9	10.324
19	20 19 19.57	2.2297	17 48 23.8	10.410
20	20 21 33.16	2.2233	17 37 56.7	10.494
21	20 23 46.36	2.2170	17 27 24.5	10.577
22	20 25 59.19	2.2107	17 16 47.4	10.660
23	20 28 11.64	2.2044	S. 17 6 5.4	10.739

TUESDAY 22.

0	21 21 25.76	2.0687	S. 12° 16' 28.7	12.287
1	21 23 29.13	2.0685	12 4 10.1	12.329
2	21 25 32.18	2.0684	11 51 48.9	12.376
3	21 27 34.93	2.0683	11 39 25.1	12.417
4	21 29 37.37	2.0682	11 26 58.9	12.466
5	21 31 39.51	2.0682	11 14 30.2	12.527
6	21 33 41.35	2.0682	11 1 59.2	12.585
7	21 35 42.89	2.0682	10 49 25.9	12.673
8	21 37 44.14	2.0186	10 36 50.4	12.669
9	21 39 45.10	2.0187	10 24 12.8	12.644
10	21 41 45.78	2.0090	10 11 33.1	12.678
11	21 43 46.17	2.0043	9 58 51.5	12.710
12	21 45 46.29	1.9997	9 46 7.9	12.741
13	21 47 46.14	1.9952	9 33 22.5	12.773
14	21 49 45.71	1.9907	9 20 35.3	12.801
15	21 51 45.02	1.9863	9 7 46.4	12.829
16	21 53 44.06	1.9820	8 54 55.8	12.846
17	21 55 42.85	1.9777	8 42 3.7	12.862
18	21 57 41.38	1.9735	8 29 10.0	12.907
19	21 59 39.66	1.9693	8 16 14.9	12.930
20	22 1 37.69	1.9652	8 3 18.4	12.962
21	22 3 35.48	1.9612	7 50 20.6	12.973
22	22 5 33.03	1.9572	7 37 21.6	12.993
23	22 7 30.35	1.9533	S. 7 24 21.4	12.013

MONDAY 22.

0	20 30 23.72	2.1861	S. 16 55 18.7	10.918
1	20 32 35.42	2.1919	16 44 27.3	10.896
2	20 34 46.75	2.1957	16 33 31.3	10.971
3	20 36 57.70	2.1795	16 22 30.8	11.046
4	20 39 8.29	2.1734	16 11 25.8	11.119
5	20 41 18.51	2.1673	16 0 16.5	11.190
6	20 43 28.36	2.1612	15 49 3.0	11.260
7	20 45 37.85	2.1551	15 37 45.3	11.328
8	20 47 46.97	2.1491	15 26 23.6	11.395
9	20 49 55.73	2.1431	15 14 57.9	11.461
10	20 52 4.14	2.1372	15 3 28.3	11.526
11	20 54 12.19	2.1313	14 51 54.8	11.589
12	20 56 19.89	2.1254	14 40 17.6	11.651
13	20 58 27.24	2.1196	14 28 36.7	11.711
14	21 0 34.24	2.1138	14 16 52.3	11.770
15	21 2 40.90	2.1081	14 5 4.4	11.827
16	21 4 47.21	2.1024	13 53 13.0	11.883
17	21 6 53.19	2.0968	13 41 18.3	11.938
18	21 8 58.83	2.0912	13 29 20.4	11.992
19	21 11 4.14	2.0857	13 17 19.3	12.045
20	21 13 9.11	2.0802	13 5 15.1	12.096
21	21 15 13.76	2.0748	12 53 7.8	12.145
22	21 17 18.08	2.0694	12 40 57.6	12.193
23	21 19 22.08	2.0640	12 28 44.5	12.241
24	21 21 25.76	2.0587	S. 12 16 28.7	12.287

WEDNESDAY 24.

0	22 9 27.43	1.9485	S. 7 11 20.0	12.081
1	22 11 24.28	1.9457	6 58 17.6	12.048
2	22 13 20.91	1.9430	6 45 14.2	12.004
3	22 15 17.32	1.9403	6 32 9.8	12.000
4	22 17 13.51	1.9377	6 19 4.5	12.006
5	22 19 9.49	1.9352	6 5 58.4	12.106
6	22 21 5.26	1.9328	5 52 51.5	12.120
7	22 23 0.83	1.9304	5 39 43.9	12.123
8	22 24 56.19	1.9211	5 26 35.7	12.143
9	22 26 51.36	1.9178	5 13 26.9	12.152
10	22 28 46.33	1.9147	5 0 17.5	12.160
11	22 30 41.12	1.9116	4 47 7.6	12.168
12	22 32 35.72	1.9086	4 33 57.3	12.175
13	22 34 30.14	1.9056	4 20 46.7	12.180
14	22 36 24.39	1.9027	4 7 35.7	12.184
15	22 38 18.46	1.8998	3 54 24.5	12.188
16	22 40 12.37	1.8970	3 41 13.1	12.191
17	22 42 6.11	1.8943	3 28 1.5	12.193
18	22 43 59.69	1.8917	3 14 49.9	12.194
19	22 45 53.12	1.8891	3 1 38.2	12.194
20	22 47 46.39	1.8866	2 48 26.6	12.198
21	22 49 39.52	1.8842	2 35 15.0	12.192
22	22 51 32.50	1.8818	2 22 3.5	12.190
23	22 53 25.34	1.8795	2 8 52.2	12.187
24	22 55 18.04	1.8773	S. 1 55 41.1	12.183

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
THURSDAY 25.					SATURDAY 27.				
0	22 55 18.04	1.8773	S. 1 55 41.1	13.183	0	0 24 6.14	1.8477	N. 8 18 1.2	12.116
1	22 57 10.61	1.8762	1 42 30.2	13.178	1	0 25 57.03	1.8486	8 30 7.0	12.077
2	22 59 3.06	1.8731	1 29 19.7	13.172	2	0 27 47.97	1.8496	8 42 10.5	12.038
3	23 0 55.38	1.8710	1 16 9.5	13.166	3	0 29 38.97	1.8506	8 54 11.6	11.998
4	23 2 47.58	1.8691	1 2 59.8	13.160	4	0 31 30.04	1.8517	9 6 10.2	11.957
5	23 4 39.67	1.8672	0 49 50.5	13.151	5	0 33 21.18	1.8529	9 18 6.4	11.916
6	23 6 31.64	1.8654	0 36 41.7	13.142	6	0 35 12.39	1.8541	9 30 0.1	11.874
7	23 8 23.51	1.8636	0 23 33.5	13.133	7	0 37 3.67	1.8554	9 41 51.3	11.831
8	23 10 15.27	1.8619	S. 0 10 25.8	13.123	8	0 38 55.04	1.8568	9 53 39.9	11.788
9	23 12 6.93	1.8603	N. 0 2 41.2	13.111	9	0 40 46.49	1.8582	10 5 25.9	11.744
10	23 13 58.50	1.8587	0 15 47.5	13.099	10	0 42 38.03	1.8597	10 17 9.2	11.699
11	23 15 49.97	1.8572	0 28 53.0	13.086	11	0 44 29.65	1.8612	10 28 49.8	11.654
12	23 17 41.36	1.8558	0 41 57.8	13.072	12	0 46 21.37	1.8628	10 40 27.7	11.608
13	23 19 32.67	1.8544	0 55 1.7	13.058	13	0 48 13.19	1.8644	10 52 2.8	11.562
14	23 21 23.89	1.8531	1 8 4.8	13.043	14	0 50 5.10	1.8661	11 3 35.1	11.515
15	23 23 15.04	1.8518	1 21 6.9	13.027	15	0 51 57.12	1.8678	11 15 4.6	11.467
16	23 25 6.11	1.8507	1 34 8.1	13.010	16	0 53 49.24	1.8696	11 26 31.2	11.419
17	23 26 57.12	1.8496	1 47 8.2	12.993	17	0 55 41.47	1.8715	11 37 54.9	11.370
18	23 28 48.06	1.8486	2 0 7.3	12.975	18	0 57 33.82	1.8734	11 49 15.6	11.320
19	23 30 38.95	1.8476	2 13 5.3	12.957	19	0 59 26.28	1.8753	12 0 33.3	11.269
20	23 32 29.78	1.8467	2 26 2.2	12.938	20	1 1 18.86	1.8774	12 11 47.9	11.218
21	23 34 20.56	1.8459	2 38 57.9	12.918	21	1 3 11.57	1.8795	12 22 59.5	11.167
22	23 36 11.29	1.8451	2 51 52.3	12.897	22	1 5 4.40	1.8816	12 34 7.9	11.115
23	23 38 1.98	1.8444	N. 3 4 45.5	12.875	23	1 6 57.36	1.8837	N.12 45 13.1	11.061
FRIDAY 26.					SUNDAY 28.				
0	23 39 52.63	1.8438	N. 3 17 37.4	12.853	0	1 8 50.45	1.8860	N.12 56 15.2	11.007
1	23 41 43.24	1.8432	3 30 27.9	12.830	1	1 10 43.68	1.8883	13 7 14.0	10.953
2	23 43 33.82	1.8427	3 43 17.0	12.807	2	1 12 37.05	1.8906	13 18 9.6	10.898
3	23 45 24.37	1.8423	3 56 4.7	12.783	3	1 14 30.56	1.8930	13 29 1.9	10.843
4	23 47 14.90	1.8419	4 8 50.9	12.758	4	1 16 24.21	1.8954	13 39 50.8	10.787
5	23 49 5.40	1.8416	4 21 35.6	12.732	5	1 18 18.01	1.8979	13 50 36.3	10.730
6	23 50 55.89	1.8414	4 34 18.7	12.705	6	1 20 11.96	1.9005	14 1 18.4	10.673
7	23 52 46.36	1.8412	4 47 0.2	12.678	7	1 22 6.07	1.9031	14 11 57.1	10.615
8	23 54 36.83	1.8411	4 59 40.0	12.650	8	1 24 0.33	1.9057	14 22 32.2	10.556
9	23 56 27.29	1.8410	5 12 18.2	12.622	9	1 25 54.75	1.9084	14 33 3.8	10.497
10	23 58 17.75	1.8410	5 24 54.6	12.593	10	1 27 49.34	1.9111	14 43 31.8	10.437
11	0 0 8.21	1.8411	5 37 29.3	12.563	11	1 29 44.09	1.9139	14 53 56.2	10.377
12	0 1 58.68	1.8412	5 50 2.1	12.532	12	1 31 39.00	1.9167	15 4 17.0	10.316
13	0 3 49.16	1.8414	6 2 33.1	12.501	13	1 33 34.09	1.9196	15 14 34.0	10.253
14	0 5 39.65	1.8417	6 15 2.2	12.469	14	1 35 29.35	1.9225	15 24 47.3	10.190
15	0 7 30.16	1.8420	6 27 29.4	12.437	15	1 37 24.79	1.9254	15 34 56.8	10.127
16	0 9 20.69	1.8424	6 39 54.7	12.404	16	1 39 20.40	1.9284	15 45 2.5	10.063
17	0 11 11.25	1.8428	6 52 17.9	12.370	17	1 41 16.20	1.9315	15 55 4.3	9.998
18	0 13 1.83	1.8433	7 4 39.1	12.336	18	1 43 12.18	1.9346	16 5 2.2	9.932
19	0 14 52.45	1.8439	7 16 58.2	12.301	19	1 45 8.35	1.9378	16 14 56.1	9.866
20	0 16 43.10	1.8445	7 29 15.2	12.265	20	1 47 4.71	1.9410	16 24 46.1	9.799
21	0 18 33.79	1.8452	7 41 30.1	12.229	21	1 49 1.26	1.9442	16 34 32.0	9.731
22	0 20 24.53	1.8460	7 53 42.7	12.192	22	1 50 58.01	1.9474	16 44 13.9	9.663
23	0 22 15.31	1.8468	8 5 53.1	12.154	23	1 52 54.95	1.9507	16 53 51.6	9.594
24	0 24 6.14	1.8477	N. 8 18 1.2	12.116	24	1 54 52.09	1.9540	N.17 3 25.2	9.525

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
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MONDAY 29.

0	1 54 52.09	1.9840	N.17° 3 25.2	9.295
1	1 56 49.43	1.9974	17 12 54.6	9.455
2	1 58 46.98	1.9908	17 22 19.8	9.364
3	2 0 44.73	1.9843	17 31 40.7	9.312
4	2 2 42.69	1.9877	17 40 57.2	9.389
5	2 4 40.86	1.9713	17 50 9.3	9.166
6	2 6 39.25	1.9749	17 59 17.0	9.092
7	2 8 37.85	1.9785	18 8 20.4	9.018
8	2 10 36.66	1.9821	18 17 19.3	8.943
9	2 12 35.69	1.9856	18 26 13.6	8.867
10	2 14 34.95	1.9885	18 35 3.3	8.790
11	2 16 34.43	1.9893	18 43 48.4	8.713
12	2 18 34.13	1.9909	18 52 28.9	8.635
13	2 20 34.06	2.0007	19 1 4.6	8.556
14	2 22 34.21	2.0045	19 9 35.6	8.477
15	2 24 34.59	2.0083	19 18 1.8	8.397
16	2 26 35.20	2.0121	19 26 23.2	8.316
17	2 28 36.04	2.0160	19 34 39.7	8.234
18	2 30 37.12	2.0199	19 42 51.2	8.151
19	2 32 38.44	2.0238	19 50 57.8	8.068
20	2 34 39.99	2.0278	19 58 59.4	7.984
21	2 36 41.78	2.0318	20 6 55.9	7.899
22	2 38 43.81	2.0357	20 14 47.3	7.813
23	2 40 46.07	2.0397	N.20 23 33.5	7.727

TUESDAY 30.

0	2 42 48.58	2.0436	N.20 30 14.6	7.640
1	2 44 51.33	2.0479	20 37 50.4	7.552
2	2 46 54.33	2.0520	20 45 20.9	7.464
3	2 48 57.57	2.0560	20 52 46.1	7.375
4	2 51 1.05	2.0601	21 0 6.0	7.286
5	2 53 4.78	2.0642	21 7 20.4	7.195
6	2 55 8.76	2.0683	21 14 29.4	7.104
7	2 57 12.99	2.0725	21 21 32.9	7.012
8	2 59 17.47	2.0766	21 28 30.8	6.919
9	3 1 22.19	2.0808	21 35 23.1	6.825
10	3 3 27.16	2.0849	21 42 9.8	6.731
11	3 5 32.38	2.0891	21 48 50.8	6.636
12	3 7 37.85	2.0932	21 55 26.1	6.540
13	3 9 43.57	2.0974	22 1 55.6	6.443
14	3 11 49.54	2.1015	22 8 19.2	6.345
15	3 13 55.76	2.1057	22 14 37.0	6.247
16	3 16 2.23	2.1098	22 20 48.9	6.148
17	3 18 8.95	2.1140	22 26 54.8	6.048
18	3 20 15.92	2.1181	22 32 54.7	5.948
19	3 22 23.14	2.1223	22 38 48.6	5.847
20	3 24 30.61	2.1264	22 44 36.4	5.745
21	3 26 38.32	2.1305	22 50 18.0	5.642
22	3 28 46.28	2.1347	22 55 53.5	5.539
23	3 30 54.49	2.1389	23 1 22.7	5.435
24	3 33 2.95	2.1430	N.23 6 45.7	5.330

WEDNESDAY 31.

0	3 33 2.95	2.1430	N.23 6 45.7	5.330
1	3 35 11.66	2.1471	23 12 2.3	5.224
2	3 37 20.61	2.1512	23 17 12.6	5.118
3	3 39 29.80	2.1553	23 22 16.5	5.011
4	3 41 39.24	2.1594	23 27 13.9	4.903
5	3 43 48.92	2.1634	23 32 4.8	4.794
6	3 45 58.85	2.1674	23 36 49.2	4.684
7	3 48 9.02	2.1714	23 41 27.0	4.574
8	3 50 19.42	2.1754	23 45 58.1	4.463
9	3 52 30.06	2.1793	23 50 22.6	4.352
10	3 54 40.94	2.1832	23 54 40.4	4.240
11	3 56 52.05	2.1871	23 58 51.4	4.127
12	3 59 3.40	2.1910	24 2 55.6	4.013
13	4 1 14.98	2.1948	24 6 53.0	3.899
14	4 3 26.78	2.1986	24 10 43.5	3.784
15	4 5 38.81	2.2024	24 14 27.1	3.668
16	4 7 51.07	2.2062	24 18 3.7	3.552
17	4 10 3.55	2.2099	24 21 33.3	3.436
18	4 12 16.26	2.2136	24 24 55.9	3.317
19	4 14 29.18	2.2173	24 28 11.4	3.199
20	4 16 42.32	2.2209	24 31 19.8	3.080
21	4 18 55.68	2.2244	24 34 21.0	2.961
22	4 21 9.25	2.2279	24 37 15.1	2.841
23	4 23 23.03	2.2314	N.24 40 1.9	2.720

THURSDAY, AUGUST 1.

0	4 25 37.01	2.2348	N.24 42 41.5	2.598
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PHASES OF THE MOON.

	d	h	m
● New Moon, . . .	7	14	12.5
☾ First Quarter, . . .	14	14	47.8
○ Full Moon, . . .	21	12	6.0
☾ Last Quarter, . . .	29	7	51.6

	d	h
☾ Apogee,	1	3.0
☾ Perigee,	15	20.3
☾ Apogee,	28	21.2

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Star's Name and Position.	Noon.	P. L. of Diff.	III ^h .	P. L. of Diff.	VI ^h .	P. L. of Diff.	IX ^h .	P. L. of Diff.	
1	α Aquilæ W.	83° 2' 52"	3008	84° 21' 18"	3006	85° 39' 47"	3001	86° 58' 20"	3008	
	Fomalhaut W.	58 5 1	3063	59 23 7	3063	60 39 34	3045	61 57 20	3027	
	α Pegasi W.	35 18 27	3007	36 38 43	3478	37 59 32	3450	39 20 52	3435	
	Aldebaran E.	44 20 5	3174	42 53 25	3180	41 26 52	3186	40 0 26	3192	
	SUN E.	74 51 29	3435	73 29 52	3434	72 8 14	3433	70 46 35	3431	
2	α Aquilæ W.	93 31 49	3567	94 50 36	3564	96 9 30	3563	97 28 23	3562	
	Fomalhaut W.	68 30 35	3562	69 50 2	3568	71 9 44	3525	72 29 40	3512	
	α Pegasi W.	46 13 52	3326	47 37 33	3309	49 1 34	3293	50 25 54	3277	
	Aldebaran E.	32 50 11	3231	31 24 38	3242	29 59 19	3255	28 34 15	3272	
	SUN E.	63 57 41	3416	62 35 43	3411	61 13 39	3407	59 51 30	3400	
3	α Aquilæ W.	104 3 1	3590	105 21 57	3582	106 40 51	3584	107 59 43	3597	
	Fomalhaut W.	79 12 48	3454	80 34 4	3443	81 55 33	3431	83 17 14	3422	
	α Pegasi W.	57 31 53	3207	58 57 54	3194	60 24 10	3181	61 50 42	3168	
	SUN E.	52 59 2	3368	51 36 9	3360	50 13 7	3362	48 49 56	3344	
	4	Fomalhaut W.	90 8 30	3372	91 31 18	3364	92 54 16	3346	94 17 23	3347
α Pegasi W.		69 7 13	3105	70 35 17	3068	72 3 35	3080	73 32 9	3066	
α Arietis W.		25 33 54	3033	27 3 26	3014	28 33 21	2997	30 3 37	2981	
SUN E.		41 51 26	3297	40 27 11	3287	39 2 44	3276	37 38 5	3265	
5		Fomalhaut W.	101 15 12	3313	102 39 8	3307	104 3 11	3303	105 27 19	3299
	α Pegasi W.	80 58 43	3007	82 28 47	2996	83 59 5	2984	85 29 38	2972	
	α Arietis W.	37 39 47	2908	39 11 56	2904	40 44 22	2881	42 17 5	2867	
	SUN E.	30 31 37	3208	29 5 39	3198	27 39 27	3196	26 13 1	3173	
	9	SUN W.	17 21 1	2837	18 54 41	2837	20 28 34	2816	22 2 39	2806
Saturn E.		31 55 15	2638	30 17 12	2639	28 39 10	2641	27 1 11	2646	
Spica E.		77 25 52	2525	75 45 14	2516	74 4 23	2507	72 23 20	2499	
Antares E.		123 5 26	2520	121 24 41	2511	119 43 43	2503	118 2 33	2493	
10		SUN W.	29 56 1	2765	31 31 15	2757	33 6 39	2749	34 42 14	2741
	Spica E.	63 55 15	2460	62 13 5	2453	60 30 45	2446	58 48 16	2439	
	Antares E.	109 33 45	2453	107 51 26	2445	106 8 56	2438	104 26 16	2431	
	11	SUN W.	42 42 35	2706	44 19 7	2700	45 55 47	2694	47 32 35	2687
		Spica E.	50 13 30	2408	48 30 7	2408	46 46 37	2396	45 2 59	2383
Antares E.		95 50 27	2398	94 6 50	2392	92 23 4	2386	90 39 9	2380	
12		SUN W.	55 38 36	2660	57 16 10	2656	58 53 51	2650	60 31 38	2645
		Jupiter W.	19 4 54	2538	20 45 15	2514	22 26 9	2494	24 7 30	2478
	Regulus W.	18 21 38	2460	20 3 47	2440	21 46 25	2424	23 29 26	2409	
	Spica E.	36 23 14	2373	34 39 1	2371	32 54 44	2366	31 10 23	2366	
	Antares E.	81 57 41	2355	80 13 1	2360	78 28 15	2346	76 43 22	2342	
13	SUN W.	68 42 5	2624	70 20 27	2621	71 58 54	2617	73 37 26	2612	
	Jupiter W.	32 38 52	2426	34 21 49	2419	36 4 57	2412	37 48 15	2406	
	Regulus W.	32 8 58	2356	33 53 33	2351	35 38 18	2346	37 23 12	2339	
	Saturn W.	24 2 17	2487	25 43 49	2487	27 25 48	2451	29 8 10	2436	
	Antares E.	67 57 28	2322	66 12 0	2318	64 26 27	2315	62 40 50	2312	
	α Aquilæ E.	118 44 46	3026	117 15 5	3000	115 44 52	2977	114 14 10	2954	
14	SUN W.	81 51 17	2597	83 30 16	2595	85 9 18	2593	86 48 23	2591	
	Jupiter W.	46 26 41	2392	48 10 42	2378	49 54 49	2374	51 39 1	2371	

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1	α Aquilæ W.	88° 16' 56"	3406	89° 35' 35"	3408	90° 54' 17"	3400	92° 13' 2"	3406	
	Fomalhaut W.	63 15 25	3411	64 33 47	3406	65 52 27	3400	67 11 23	3406	
	α Pegasi W.	40 42 40	3408	42 4 53	3381	43 27 31	3382	44 50 31	3344	
	Aldebaran E.	38 34 7	3186	37 7 55	3304	35 41 51	3219	34 15 56	3290	
	SUN E.	69 24 54	3490	68 3 11	3427	66 41 25	3423	65 19 35	3420	
2	α Aquilæ W.	98 47 17	3361	100 6 12	3460	101 25 8	3379	102 44 5	3360	
	Fomalhaut W.	73 49 51	3480	75 10 15	3408	76 30 53	3476	77 51 44	3464	
	α Pegasi W.	51 50 32	3363	53 15 27	3348	54 40 39	3284	56 6 8	3290	
	Aldebaran E.	27 9 31	3203	25 45 10	3316	24 21 16	3349	22 57 54	3379	
	SUN E.	58 29 14	3365	57 6 52	3380	55 44 23	3383	54 21 46	3376	
3	α Aquilæ W.	109 18 32	3380	110 37 18	3403	111 56 0	3388	113 14 37	3303	
	Fomalhaut W.	84 39 6	3411	86 1 10	3400	87 23 26	3301	88 45 53	3363	
	α Pegasi W.	63 17 30	3166	64 44 33	3143	66 11 51	3190	67 39 24	3117	
	SUN E.	47 26 35	3335	46 3 4	3325	44 39 22	3317	43 15 30	3306	
	4	Fomalhaut W.	95 40 40	3380	97 4 6	3323	98 27 40	3326	99 51 22	3319
α Pegasi W.		75 0 58	3066	76 30 2	3043	77 59 21	3092	79 28 54	3019	
α Arietis W.		31 34 13	2965	33 5 9	2961	34 36 23	2966	36 7 56	2923	
SUN E.		36 13 13	3255	34 48 9	3244	33 22 52	3223	31 57 21	3221	
5		Fomalhaut W.	106 51 32	3306	108 15 49	3308	109 40 9	3291	111 4 31	3291
	α Pegasi W.	87 0 26	2961	88 31 28	2949	90 2 45	2986	91 34 16	2927	
	α Arietis W.	43 50 6	2945	45 23 23	2942	46 56 57	2928	48 30 49	2916	
	SUN E.	24 46 20	3163	23 19 25	3149	21 52 15	3137	20 24 50	3125	
	9	SUN W.	23 36 56	3780	25 11 25	3790	26 46 6	3782	28 20 58	3773
Saturn E.		25 23 18	3664	23 45 36	3666	22 8 10	3693	20 31 6	3706	
Spica E.		70 42 6	2491	69 0 40	2482	67 19 2	2475	65 37 14	2467	
Antares E.		116 21 10	2485	114 39 36	2477	112 57 50	2469	111 15 53	2461	
10		SUN W.	36 17 59	3784	37 53 54	3737	39 29 58	3719	41 6 12	3713
	Spica E.	57 5 37	2483	55 22 48	2436	53 39 51	2430	51 56 45	2414	
	Antares E.	102 43 25	2434	101 0 25	2417	99 17 15	2411	97 33 56	2404	
	11	SUN W.	49 9 32	3681	50 46 37	3676	52 23 49	3670	54 1 9	3666
		Spica E.	43 19 14	2380	41 35 23	2384	39 51 25	2380	38 7 22	2377
Antares E.		88 55 6	2376	87 10 56	2370	85 26 38	2366	83 42 13	2360	
12		SUN W.	62 9 32	3640	63 47 32	3637	65 25 37	3628	67 3 48	3628
		Jupiter W.	25 49 14	2465	27 31 16	2456	29 13 33	2448	30 56 6	2434
	Regulus W.	25 12 48	2366	26 56 29	2365	26 40 25	2375	30 24 36	2366	
	Spica E.	29 26 0	2366	27 41 35	2364	25 57 9	2366	24 12 44	2366	
	Antares E.	74 58 23	2337	73 13 18	2333	71 28 7	2329	69 42 50	2326	
13	SUN W.	75 16 4	2610	76 54 46	2607	78 33 32	2604	80 12 22	2600	
	Jupiter W.	39 31 41	2401	41 15 15	2396	42 58 57	2390	44 42 46	2386	
	Regulus W.	39 8 14	2335	40 53 23	2330	42 38 40	2326	44 24 3	2321	
	Saturn W.	30 50 53	2424	32 33 54	2418	34 17 10	2404	36 0 39	2396	
	Antares E.	60 55 8	2300	59 9 21	2306	57 23 30	2302	55 37 34	2300	
	α Aquilæ E.	112 43 0	2305	111 11 25	2217	109 39 28	2201	108 7 10	2366	
14	SUN W.	88 27 31	2300	90 6 42	2306	91 45 56	2264	93 25 13	2362	
	Jupiter W.	53 23 18	2367	55 7 40	2366	56 52 5	2363	58 36 34	2360	

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14	Regulus W.	46° 9' 32"	2317	47° 55' 7"	2313	49° 40' 47"	2309	51° 26' 33"	2307
	Saturn W.	37 44 21	2307	39 28 14	2301	41 12 16	2375	42 56 27	2303
	Antares E.	53 51 35	2306	52 5 32	2305	50 19 26	2308	48 33 16	2301
	α Aquilæ E.	106 34 33	2373	105 1 39	2361	103 28 30	2361	101 55 8	2341
15	SUN W.	95 4 33	2350	96 43 55	2370	98 23 19	2378	100 2 44	2377
	Jupiter W.	60 21 6	2305	62 5 41	2305	63 50 19	2354	65 35 0	2352
	Regulus W.	60 16 23	2304	62 2 31	2302	63 48 42	2301	65 34 55	2359
	Saturn W.	51 39 11	2348	53 24 1	2345	55 8 55	2343	56 53 53	2340
	Antares E.	39 41 45	2303	37 55 20	2302	36 8 54	2301	34 22 27	2300
α Aquilæ E.	94 5 38	2310	92 31 23	2307	90 57 4	2305	89 22 43	2305	
16	SUN W.	108 20 12	2373	109 59 44	2374	111 39 15	2374	113 18 46	2374
	Regulus W.	74 26 30	2305	76 12 53	2304	77 59 16	2304	79 45 39	2305
	Jupiter W.	74 18 52	2348	76 3 42	2348	77 48 32	2348	79 33 22	2348
	Saturn W.	65 39 27	2333	67 24 40	2331	69 9 54	2331	70 55 8	2331
	Spica W.	20 28 5	2323	22 13 31	2316	23 59 7	2311	25 44 51	2306
	Antares E.	25 29 59	2360	23 43 30	2361	21 57 3	2363	20 10 29	2367
	α Aquilæ E.	81 31 11	2316	79 57 5	2328	78 23 7	2331	76 49 19	2333
	Fomalhaut E.	106 29 19	2738	104 53 29	2730	103 17 29	2724	101 41 21	2719
17	SUN W.	121 36 9	2370	123 15 33	2361	124 54 54	2353	126 34 12	2345
	Regulus W.	88 37 22	2306	90 23 39	2300	92 9 53	2301	93 56 5	2304
	Jupiter W.	88 17 22	2352	90 2 6	2354	91 46 47	2350	93 31 25	2350
	Saturn W.	79 41 18	2333	81 26 29	2335	83 11 38	2337	84 56 44	2339
	Spica W.	34 34 42	2307	36 20 46	2307	38 6 50	2306	39 52 53	2306
	α Aquilæ E.	69 3 36	2303	67 31 21	2300	65 59 28	2341	64 28 1	2303
	Fomalhaut E.	93 39 17	2705	92 2 45	2707	90 26 14	2708	88 49 45	2711
	α Pegasi E.	114 54 27	2447	113 11 59	2444	111 29 27	2442	109 46 52	2441
18	Regulus W.	102 46 6	2300	104 31 52	2313	106 17 33	2317	108 3 8	2321
	Jupiter W.	102 13 40	2373	103 57 53	2378	105 42 0	2382	107 26 1	2387
	Saturn W.	93 41 23	2363	95 26 5	2367	97 10 42	2361	98 55 13	2365
	Spica W.	48 42 40	2300	50 28 27	2311	52 14 10	2315	53 59 48	2318
	α Aquilæ E.	56 58 39	3111	55 30 43	3100	54 3 34	3103	52 37 17	3141
	Fomalhaut E.	80 48 40	2730	79 12 52	2748	77 37 16	2750	76 1 54	2760
	α Pegasi E.	101 13 44	2443	99 31 10	2445	97 48 39	2448	96 6 12	2450
19	Saturn W.	107 35 59	2308	109 19 44	2400	111 3 19	2407	112 46 44	2415
	Spica W.	62 46 27	2342	64 31 25	2348	66 16 14	2354	68 0 55	2361
	Antares W.	17 5 54	2349	18 50 42	2363	20 35 25	2367	22 20 2	2363
	α Aquilæ E.	45 41 42	2363	44 22 27	2349	43 4 45	2745	41 48 45	2363
	Fomalhaut E.	68 9 15	2345	66 35 46	2306	65 2 43	2307	63 30 7	2300
	α Pegasi E.	87 35 19	2478	85 53 31	2482	84 11 52	2480	82 30 24	2497
20	Spica W.	76 41 50	2303	78 25 28	2405	80 8 55	2415	81 52 9	2423
	Antares W.	31 0 57	2305	32 44 38	2403	34 26 8	2412	36 11 26	2421
	Fomalhaut E.	55 55 21	2050	54 26 22	2056	52 58 10	2123	51 30 47	2124
	α Pegasi E.	74 6 2	2345	72 25 51	2356	70 45 56	2403	69 6 17	2360
	α Arietis E.	116 45 28	2413	115 2 10	2419	113 19 3	2423	111 36 8	2426
21	Spica W.	90 25 2	2472	92 6 54	2483	93 48 31	2494	95 29 53	2505
	Antares W.	44 44 41	2469	46 26 38	2470	48 8 21	2480	49 49 49	2501
	Fomalhaut E.	44 28 55	2480	43 8 8	2556	41 48 46	2642	40 30 57	2737
	α Pegasi E.	60 52 43	2355	59 15 3	2373	57 37 47	2392	56 0 56	2711

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14	Regulus W.	53° 12' 28"	2804	54° 58' 17"	2800	56° 44' 16"	2806	58° 30' 18"	2806
	Saturn W.	44 40 47	2804	46 25 14	2800	48 9 48	2806	49 54 27	2802
	Antares E.	46 47 3	2800	45 0 47	2807	43 14 29	2805	41 28 8	2804
	α Aquilæ E.	100 21 33	2820	98 47 47	2806	97 13 51	2819	95 39 48	2814
15	SUN W.	101 42 11	2875	103 21 40	2874	105 1 10	2874	106 40 41	2874
	Jupiter W.	67 19 44	2861	69 4 29	2860	70 49 15	2849	72 34 3	2848
	Regulus W.	67 21 11	2867	69 7 29	2867	70 53 48	2866	72 40 8	2866
	Saturn W.	58 38 54	2867	60 23 59	2866	62 9 6	2864	63 54 16	2863
	Antares E.	32 35 58	2860	30 49 29	2870	29 2 59	2870	27 16 29	2870
	α Aquilæ E.	87 48 21	2806	86 14 0	2806	84 39 40	2808	83 5 23	2812
16	SUN W.	114 58 17	2874	116 37 47	2875	118 17 16	2877	119 56 43	2877
	Regulus W.	81 32 1	2800	83 18 23	2806	85 4 44	2806	86 51 4	2807
	Jupiter W.	81 18 12	2848	83 3 1	2848	84 47 50	2840	86 32 37	2851
	Saturn W.	72 40 23	2831	74 25 38	2831	76 10 52	2831	77 56 6	2833
	Spica W.	27 30 42	2802	29 16 38	2800	31 2 37	2808	32 48 30	2806
	Antares E.	18 24 20	2802	16 36 9	2840	14 52 9	2811	13 6 25	2837
	α Aquilæ E.	75 15 41	2848	73 42 16	2800	72 9 6	2873	70 36 12	2867
	Fomalhaut E.	100 5 6	2713	98 26 44	2710	96 52 18	2707	95 15 48	2707
17	SUN W.	128 13 27	2806	129 52 39	2801	131 31 47	2804	133 10 50	2806
	Regulus W.	95 42 13	2806	97 26 18	2809	99 14 19	2802	101 0 15	2806
	Jupiter W.	95 16 0	2800	97 0 32	2804	98 44 59	2806	100 29 22	2870
	Saturn W.	86 41 47	2841	88 26 47	2844	90 11 43	2846	91 56 35	2849
	Spica W.	41 38 55	2800	43 24 55	2801	45 10 53	2803	46 56 48	2806
	α Aquilæ E.	62 57 2	2807	61 26 33	3014	59 56 38	3043	58 27 19	3076
	Fomalhaut E.	87 13 20	2714	85 36 59	2719	84 0 45	2726	82 24 38	2732
	α Pegasi E.	108 4 15	2440	106 21 37	2440	104 38 59	2440	102 56 21	2441
18	Regulus W.	109 48 37	2826	111 33 59	2831	113 19 13	2837	115 4 19	2843
	Jupiter W.	109 9 55	2801	110 53 42	2800	112 37 22	2402	114 20 54	2406
	Saturn W.	100 39 37	2871	102 23 54	2876	104 8 4	2861	105 52 6	2867
	Spica W.	55 45 21	2823	57 30 48	2827	59 16 8	2832	61 1 21	2837
	α Aquilæ E.	51 11 56	2808	49 47 36	2801	48 24 24	2416	47 2 24	2404
	Fomalhaut E.	74 26 46	2703	72 51 55	2706	71 17 22	2811	69 43 8	2827
	α Pegasi E.	94 23 49	2464	92 41 31	2460	90 59 20	2464	89 17 16	2460
19	Saturn W.	114 29 58	2423	116 13 1	2431	117 55 52	2439	119 38 31	2448
	Spica W.	69 45 26	2806	71 29 47	2874	73 13 59	2882	74 58 0	2890
	Antares W.	24 4 31	2806	25 48 51	2874	27 33 3	2861	29 17 5	2866
	α Aquilæ E.	40 34 36	2873	39 22 29	4100	38 12 33	4208	37 5 1	4428
	Fomalhaut E.	61 58 0	2806	60 26 25	2803	58 55 25	2806	57 25 3	2825
	α Pegasi E.	80 49 7	2406	79 8 1	2616	77 27 8	2624	75 46 28	2634
20	Spica W.	83 35 11	2423	85 17 59	2423	87 0 34	2423	88 42 55	2423
	Antares W.	37 54 31	2430	39 37 24	2430	41 20 3	2448	43 2 29	2459
	Fomalhaut E.	50 4 19	2800	48 36 49	2807	47 14 22	2846	45 51 2	2408
	α Pegasi E.	67 26 55	2404	65 47 52	2806	64 9 8	2834	62 30 45	2630
	α Arietis E.	109 53 24	2445	108 10 53	2456	106 28 36	2464	104 46 32	2474
21	Spica W.	97 10 59	2617	98 51 49	2608	100 32 23	2640	102 12 41	2651
	Antares W.	51 31 1	2613	53 11 57	2620	54 52 38	2636	56 33 3	2647
	Fomalhaut E.	39 14 49	2643	38 0 31	2600	36 48 11	4000	35 38 0	4287
	α Pegasi E.	54 24 31	2732	52 48 33	2733	51 13 3	2776	49 38 4	2800

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21	α Arietis E.	103° 4' 42"	2484	101° 23' 6"	2484	99° 41' 44"	2504	98° 0' 37"	2516
22	Spica W.	103 52 43	2564	105 32 27	2572	107 11 55	2600	108 51 5	2601
	Antares W.	58 13 11	2600	59 53 2	2672	61 32 36	2663	63 11 54	2666
	α Pegasi E.	48 3 36	2626	46 29 42	2664	44 56 24	2663	43 23 43	2616
	α Arctis E.	89 39 0	2674	87 59 30	2667	86 20 17	2669	84 41 20	2611
23	Antares W.	71 24 5	2600	73 1 38	2672	74 38 54	2667	76 15 52	2609
	α Arietis E.	76 30 59	2677	74 58 48	2669	73 16 54	2704	71 40 19	2717
	Aldebaran E.	109 9 5	2712	107 32 41	2724	105 56 33	2726	104 20 41	2749
24	Antares W.	84 16 23	2764	85 51 38	2777	87 26 36	2790	89 1 17	2808
	α Aquilæ W.	39 29 2	2806	40 34 52	2809	41 42 3	2800	42 50 29	4121
	α Arietis E.	63 41 53	2786	62 7 5	2796	60 32 35	2812	58 58 23	2826
	Aldebaran E.	96 25 30	2811	94 51 17	2826	93 17 21	2828	91 43 42	2840
25	Antares W.	96 50 35	2866	98 23 39	2876	99 56 28	2887	101 29 3	2880
	α Aquilæ W.	48 47 10	2864	50 0 46	2860	51 14 57	2819	52 29 40	2722
	α Arietis E.	51 11 42	2892	49 39 13	2906	48 7 1	2918	46 35 5	2921
	Aldebaran E.	83 59 26	2912	82 27 22	2924	80 55 33	2926	79 24 0	2847
	SUN E.	137 53 14	2918	136 27 20	2926	135 1 41	2927	133 36 16	2920
26	Antares W.	109 8 27	2962	110 39 40	2969	112 10 41	2970	113 41 31	2979
	α Aquilæ W.	58 49 11	2967	60 6 1	2966	61 23 4	2972	62 40 20	2963
	α Arietis E.	38 59 30	2906	37 29 11	2906	35 59 8	2921	34 29 21	2924
	Aldebaran E.	71 49 49	2904	70 19 41	2914	68 49 46	2924	67 20 3	2924
	SUN E.	126 32 40	2906	125 8 36	2917	123 44 44	2926	122 21 3	2926
27	α Aquilæ W.	69 8 58	2928	70 27 2	2928	71 45 12	2919	73 3 26	2916
	Fomalhaut W.	44 45 44	2962	45 58 1	2921	47 10 59	2925	48 24 24	2922
	Aldebaran E.	59 54 32	2962	58 26 0	2921	56 57 39	2929	55 29 28	2926
	SUN E.	115 25 17	2979	114 2 37	2966	112 40 4	2962	111 17 39	2920
28	α Aquilæ W.	79 35 24	2964	80 53 54	2968	82 12 26	2901	83 30 59	2900
	Fomalhaut W.	54 40 5	2724	55 56 27	2766	57 13 9	2966	58 30 11	2966
	α Pegasi W.	31 48 49	2968	33 7 31	2966	34 26 55	2921	35 46 56	2492
	Aldebaran E.	48 11 2	2147	46 43 49	2164	45 16 45	2162	43 49 50	2170
	SUN E.	104 27 10	2428	103 5 20	2427	101 43 34	2420	100 21 51	2422
29	α Aquilæ W.	90 3 57	2966	91 22 34	2966	92 41 11	2966	93 59 48	2966
	Fomalhaut W.	64 59 40	2966	66 18 19	2964	67 37 11	2971	68 56 17	2966
	α Pegasi W.	42 34 13	2962	43 56 50	2965	45 19 47	2949	46 43 2	2922
	Aldebaran E.	36 37 38	2211	35 11 42	2222	33 45 59	2222	32 20 29	2246
	SUN E.	93 33 47	2427	92 12 12	2426	90 50 36	2424	89 28 58	2422
30	α Aquilæ W.	100 32 45	2969	101 51 17	2968	103 9 48	2965	104 28 17	2967
	Fomalhaut W.	75 34 52	2966	76 55 10	2496	78 15 39	2496	79 36 19	2476
	α Pegasi W.	53 43 27	2967	55 8 17	2964	56 33 22	2942	57 58 41	2921
	SUN E.	82 40 9	2416	81 18 11	2411	79 56 7	2406	78 33 57	2406
31	Fomalhaut W.	86 22 21	2429	87 44 5	2420	89 5 59	2412	90 28 2	2402
	α Pegasi W.	65 8 48	2171	66 35 32	2169	68 2 30	2147	69 29 43	2126
	α Arietis W.	21 32 13	2124	22 59 54	2101	24 28 2	2091	25 56 35	2092
	SUN E.	71 41 17	2964	70 18 19	2964	68 55 11	2946	67 31 52	2926

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Star's Name and Position.	Midnight.	P. L. of DM.	XV ^b .	P. L. of DM.	XVIII ^b .	P. L. of DM.	XXI ^b .	P. L. of DM.
21	α Arietis E.	96° 19' 46 ⁿ	2937	94° 39' 11 ^f	2938	92° 58' 51 ^f	2660	91° 18' 47 ⁿ	2662
22	Spica W.	110 29 58	2614	112 8 34	2627	113 46 52	2640	115 24 52	2624
	Antares W.	64 50 55	2606	66 29 39	2621	68 8 5	2634	69 46 14	2647
	α Pegasi E.	41 51 43	2649	40 20 26	2666	38 49 55	2626	37 20 13	2609
	α Arietis E.	83 2 40	2624	81 24 18	2636	79 46 14	2651	78 8 28	2663
23	Antares W.	77 52 33	2713	79 28 56	2726	81 5 2	2738	82 40 51	2751
	α Arietis E.	70 4 2	2731	68 26 3	2744	66 52 22	2756	65 16 59	2771
	Aldebaran E.	102 45 6	2761	101 9 47	2774	99 34 45	2786	97 59 59	2799
24	Antares W.	90 35 41	2615	92 9 49	2628	93 43 40	2641	95 17 15	2653
	α Aquilæ W.	44 0 1	4009	45 10 33	4014	46 21 59	2663	47 34 13	2622
	α Arietis E.	57 24 28	2639	55 50 51	2662	54 17 31	2666	52 44 28	2679
	Aldebaran E.	90 10 19	2692	88 37 12	2675	87 4 21	2687	85 31 46	2699
25	Antares W.	103 1 23	2610	104 33 29	2620	106 5 22	2631	107 37 1	2643
	α Aquilæ W.	53 44 50	2708	55 0 25	2748	56 16 21	2729	57 32 37	2713
	α Arietis E.	45 3 26	2644	43 32 3	2667	42 0 56	2669	40 30 5	2662
	Aldebaran E.	77 52 41	2669	76 21 37	2670	74 50 47	2681	73 20 11	2693
	SUN E.	132 11 6	2692	130 46 10	2673	129 21 27	2684	127 56 57	2696
26	Antares W.	115 12 10	2696	116 42 38	2696	118 12 56	2698	119 43 5	2610
	α Aquilæ W.	63 57 47	2664	65 15 23	2647	66 33 7	2639	67 50 59	2633
	α Arietis E.	32 59 50	2647	31 30 36	2600	30 1 38	2675	28 32 58	2681
	Aldebaran E.	65 50 33	2644	64 21 15	2664	62 52 9	2664	61 23 15	2673
	SUN E.	120 57 33	2646	119 34 14	2644	118 11 5	2663	116 48 6	2672
27	α Aquilæ W.	74 21 44	2612	75 40 5	2610	76 58 29	2606	78 16 55	2606
	Fomalhaut W.	49 38 43	2621	50 53 23	2794	52 8 31	2768	53 24 6	2746
	Aldebaran E.	54 1 28	2116	52 33 37	2124	51 5 56	2131	49 38 24	2130
	SUN E.	109 55 21	2466	108 33 10	2410	107 11 5	2416	105 49 5	2419
28	α Aquilæ W.	84 49 33	2609	86 8 8	2696	87 26 44	2596	88 45 20	2606
	Fomalhaut W.	59 47 32	2692	61 5 10	2636	62 23 5	2623	63 41 15	2606
	α Pegasi W.	37 7 29	2465	38 26 32	2441	39 50 2	2420	41 11 56	2400
	Aldebaran E.	42 23 5	2178	40 56 29	2166	39 30 2	2193	38 3 45	2202
	SUN E.	99 0 12	2434	97 38 34	2426	96 16 57	2437	94 55 22	2437
29	α Aquilæ W.	95 18 25	2696	96 37 1	2696	97 55 37	2699	99 14 12	2601
	Fomalhaut W.	70 15 36	2646	71 35 7	2687	72 54 50	2636	74 14 45	2615
	α Pegasi W.	48 6 35	2619	49 30 25	2606	50 54 30	2592	52 18 51	2379
	Aldebaran E.	30 55 13	2259	29 30 13	2276	28 5 33	2294	26 41 14	2316
	SUN E.	88 7 19	2431	86 45 37	2427	85 23 51	2424	84 2 2	2421
30	α Aquilæ W.	105 46 44	2610	107 5 8	2613	108 23 28	2616	109 41 45	2621
	Fomalhaut W.	80 57 10	2466	82 18 12	2467	83 39 24	2447	85 0 47	2436
	α Pegasi W.	59 24 14	2219	60 50 1	2207	62 16 2	2194	63 42 18	2188
	SUN E.	77 11 41	2364	75 49 18	2366	74 26 46	2379	73 4 6	2372
31	Fomalhaut W.	91 50 16	2393	93 12 40	2396	94 35 13	2377	95 57 56	2369
	α Pegasi W.	70 57 10	2123	72 24 52	2110	73 52 49	2097	75 21 2	2085
	α Arietis W.	27 25 31	2044	28 54 49	2027	30 24 28	2011	31 54 27	2005
	SUN E.	66 8 22	2226	64 44 41	2216	63 20 47	2206	61 56 41	2194

AT GREENWICH APPARENT NOON.

THE SUN'S															
Day of the Week.	Day of the Month.	Apparent Right Ascension.			Diff. for 1 hour.	Apparent Declination.			Diff. for 1 hour.	Semi-diameter.	Sideral Time of the Semi-diameter passing the Meridian.	Equation of Time, to be added to subtracted from Apparent Time.	Diff. for 1 hour.		
		^h	^m	^s		[°]	[']	["]						^m	^s
Thur.	1	8	46	20.17	9.708	N.17	58	56.1	37.95	15	48.10	66.64	6	0.55	0.147
Fri.	2	8	50	12.88	9.685	17	43	36.5	38.68	15	48.22	66.55	5	56.71	0.171
Sat.	3	8	54	5.00	9.660	17	27	59.6	39.39	15	48.35	66.46	5	52.27	0.196
Sun.	4	8	57	56.52	9.635	17	12	5.6	40.10	15	48.48	66.37	5	47.25	0.221
Mon.	5	9	1	47.44	9.610	16	55	54.8	40.79	15	48.62	66.28	5	41.62	0.246
Tues.	6	9	5	37.76	9.585	16	39	27.5	41.47	15	48.77	66.19	5	35.41	0.271
Wed.	7	9	9	27.50	9.561	16	22	43.9	42.14	15	48.92	66.11	5	28.61	0.296
Thur.	8	9	13	16.65	9.536	16	5	44.6	42.79	15	49.08	66.03	5	21.22	0.320
Fri.	9	9	17	5.21	9.512	15	48	29.9	43.43	15	49.25	65.94	5	13.24	0.345
Sat.	10	9	20	53.18	9.487	15	31	0.0	44.05	15	49.42	65.86	5	4.68	0.369
Sun.	11	9	24	40.55	9.463	15	13	15.3	44.67	15	49.59	65.78	4	55.52	0.393
Mon.	12	9	28	27.34	9.438	14	55	16.1	45.27	15	49.76	65.70	4	45.78	0.417
Tues.	13	9	32	13.56	9.416	14	37	2.7	45.86	15	49.94	65.62	4	35.48	0.441
Wed.	14	9	35	59.22	9.392	14	18	35.3	46.43	15	50.13	65.54	4	24.61	0.464
Thur.	15	9	39	44.32	9.369	13	59	54.5	46.98	15	50.32	65.46	4	13.19	0.487
Fri.	16	9	43	28.87	9.346	13	41	0.4	47.53	15	50.51	65.38	4	1.22	0.510
Sat.	17	9	47	12.90	9.325	13	21	53.2	48.07	15	50.70	65.31	3	48.72	0.532
Sun.	18	9	50	56.41	9.304	13	2	33.4	48.59	15	50.89	65.24	3	35.71	0.553
Mon.	19	9	54	39.42	9.283	12	43	1.2	49.10	15	51.08	65.17	3	22.20	0.573
Tues.	20	9	58	21.93	9.263	12	23	17.1	49.59	15	51.28	65.10	3	8.20	0.593
Wed.	21	10	2	3.96	9.243	12	3	21.1	50.08	15	51.48	65.03	2	53.71	0.613
Thur.	22	10	5	45.54	9.224	11	43	13.5	50.56	15	51.68	64.96	2	38.78	0.632
Fri.	23	10	9	26.67	9.206	11	22	54.8	51.02	15	51.88	64.90	2	23.39	0.650
Sat.	24	10	13	7.37	9.189	11	2	25.1	51.46	15	52.09	64.84	2	7.58	0.667
Sun.	25	10	16	47.67	9.172	10	41	44.8	51.90	15	52.30	64.78	1	51.37	0.684
Mon.	26	10	20	27.59	9.156	10	20	54.1	52.33	15	52.51	64.72	1	34.77	0.700
Tues.	27	10	24	7.13	9.142	9	59	53.5	52.73	15	52.72	64.66	1	17.82	0.715
Wed.	28	10	27	46.31	9.128	9	38	43.3	53.13	15	52.93	64.61	1	0.50	0.729
Thur.	29	10	31	25.16	9.113	9	17	23.7	53.52	15	53.15	64.56	0	42.84	0.743
Fri.	30	10	35	3.68	9.100	8	55	55.2	53.88	15	53.37	64.51	0	24.85	0.757
Sat.	31	10	38	41.87	9.087	8	34	18.0	54.24	15	53.59	64.46	0	6.53	0.770
Sun.	32	10	42	19.77	9.075	N. 8	12	32.3	54.58	15	53.82	64.41	0	12.06	0.781

NOTE. — Mean Time of the Semidiameter passing may be found by subtracting 0s.18 from the Sideral Time.

AT GREENWICH MEAN NOON.

THE SUN'S									
Day of the Week.	Day of the Month.	THE SUN'S				Equation of Time, to be subtracted from		Diff. for 1 hour.	Sidereal Time.
		Apparent Right Ascension.	Diff. for 1 hour.	Apparent Declination.	Diff. for 1 hour.	added to Mean Time.			
		h m s	s	N. 17° 56' 59.9"	"	m s	s	h m s	
Thur.	1	8 46 19.22	9.708	N.17° 56' 59.9"	37.95	6 05.56	0.147	8 40 18.66	
Fri.	2	8 50 11.94	9.685	17 43 40.3	38.68	5 56.72	0.171	8 44 15.22	
Sat.	3	8 54 4.07	9.660	17 28 3.4	39.39	5 52.29	0.196	8 48 11.78	
Sun.	4	8 57 55.60	9.635	17 12 9.4	40.10	5 47.27	0.221	8 52 8.33	
Mon.	5	9 1 46.53	9.610	16 55 58.6	40.79	5 41.64	0.246	8 56 4.89	
Tues.	6	9 5 36.87	9.585	16 39 31.3	41.47	5 35.43	0.271	9 0 1.44	
Wed.	7	9 9 26.63	9.561	16 22 47.7	42.14	5 28.63	0.296	9 3 58.00	
Thur.	8	9 13 15.80	9.536	16 5 48.4	42.79	5 21.25	0.320	9 7 54.55	
Fri.	9	9 17 4.38	9.512	15 48 33.7	43.43	5 13.27	0.345	9 11 51.11	
Sat.	10	9 20 52.37	9.487	15 31 3.8	44.05	5 4.71	0.369	9 15 47.66	
Sun.	11	9 24 39.77	9.463	15 13 19.1	44.65	4 55.55	0.393	9 19 44.22	
Mon.	12	9 28 26.59	9.438	14 55 19.8	45.27	4 45.81	0.417	9 23 40.78	
Tues.	13	9 32 12.84	9.416	14 37 6.2	45.86	4 35.51	0.441	9 27 37.33	
Wed.	14	9 35 58.53	9.392	14 18 38.7	46.43	4 24.64	0.464	9 31 33.89	
Thur.	15	9 39 43.66	9.369	13 59 57.8	46.98	4 13.22	0.487	9 35 30.44	
Fri.	16	9 43 28.24	9.346	13 41 3.6	47.53	4 1.25	0.510	9 39 26.99	
Sat.	17	9 47 12.30	9.325	13 21 56.3	48.07	3 48.75	0.532	9 43 23.55	
Sun.	18	9 50 55.85	9.304	13 2 36.3	48.59	3 35.74	0.553	9 47 20.11	
Mon.	19	9 54 38.89	9.283	12 43 4.0	49.10	3 22.23	0.573	9 51 16.66	
Tues.	20	9 58 21.44	9.263	12 23 19.7	49.59	3 8.23	0.593	9 55 13.21	
Wed.	21	10 2 3.51	9.243	12 3 23.5	50.08	2 53.74	0.613	9 59 9.77	
Thur.	22	10 5 45.18	9.224	11 43 15.7	50.56	2 38.81	0.632	10 3 6.32	
Fri.	23	10 9 26.30	9.206	11 22 56.8	51.02	2 23.42	0.650	10 7 2.88	
Sat.	24	10 13 7.04	9.189	11 2 26.9	51.46	2 7.61	0.667	10 10 59.43	
Sun.	25	10 16 47.38	9.172	10 41 46.4	51.90	1 51.40	0.684	10 14 55.98	
Mon.	26	10 20 27.34	9.156	10 20 55.5	52.33	1 34.80	0.700	10 18 52.54	
Tues.	27	10 24 6.93	9.142	9 59 54.7	52.73	1 17.84	0.715	10 22 49.09	
Wed.	28	10 27 46.16	9.128	9 38 44.2	53.13	1 0.51	0.729	10 26 45.65	
Thur.	29	10 31 25.05	9.113	9 17 24.4	53.52	0 42.85	0.743	10 30 42.20	
Fri.	30	10 35 3.61	9.100	8 55 55.6	53.88	0 24.86	0.757	10 34 38.75	
Sat.	31	10 38 41.85	9.087	8 34 18.1	54.24	0 6.54	0.770	10 38 35.31	
Sun.	32	10 42 19.80	9.075	N. 8 12 32.1	54.58	0 12.06	0.781	10 42 31.86	

NOTE. — The Semidiameter for Mean Noon may be assumed the same as that for Apparent Noon.

AT GREENWICH MEAN NOON.

		THE SUN'S					Logarithm of the Radius Vector of the Earth.	Diff. for 1 hour.	Mean Time of Sidereal Ob.
Day of the Month.	Day of the Year.	True LONGITUDE.		Diff. for 1 hour.	LATITUDE.				
		λ	λ'						
1	213	129° 8' 51.1"	8' 3.8"	143.62	+0.58	0.0063214	23.8	15 ^h 17 ^m 10.67 ^s	
2	214	130 6 18.6	5 31.2	143.67	0.45	.0062634	24.7	15 13 14.75	
3	215	131 3 47.2	2 59.7	143.71	0.32	.0062032	25.6	15 9 18.84	
4	216	132 1 16.9	0 29.2	143.75	0.19	.0061407	26.5	15 5 22.93	
5	217	132 58 47.8	57 59.9	143.79	+0.06	.0060759	27.5	15 1 27.02	
6	218	133 56 19.9	55 31.9	143.83	-0.05	.0060088	28.4	14 57 31.11	
7	219	134 53 53.0	53 4.8	143.88	0.15	.0059393	29.4	14 53 35.21	
8	220	135 51 27.1	50 38.8	143.93	0.23	.0058675	30.3	14 49 39.30	
9	221	136 49 2.2	48 13.7	143.97	0.29	.0057934	31.3	14 45 43.39	
10	222	137 46 38.2	45 49.5	144.01	0.31	.0057172	32.1	14 41 47.48	
11	223	138 44 15.3	43 26.5	144.05	0.29	.0056390	32.9	14 37 51.57	
12	224	139 41 53.4	41 4.5	144.10	0.24	.0055589	33.7	14 33 55.66	
13	225	140 39 32.5	38 43.5	144.15	0.18	.0054770	34.4	14 29 59.75	
14	226	141 37 12.5	36 23.3	144.19	-0.09	.0053935	35.1	14 26 3.84	
15	227	142 34 53.5	34 4.2	144.23	+0.03	.0053086	35.6	14 22 7.93	
16	228	143 32 35.7	31 46.3	144.27	0.15	.0052223	36.1	14 18 12.02	
17	229	144 30 18.9	29 29.4	144.32	0.29	.0051349	36.6	14 14 16.11	
18	230	145 28 3.2	27 13.6	144.37	0.42	.0050464	37.1	14 10 20.20	
19	231	146 25 48.8	24 59.0	144.43	0.53	.0049569	37.7	14 6 24.29	
20	232	147 23 35.8	22 45.9	144.49	0.63	.0048665	38.0	14 2 28.38	
21	233	148 21 24.2	20 34.2	144.55	0.72	.0047753	38.3	13 58 32.47	
22	234	149 19 14.0	18 23.9	144.61	0.77	.0046834	38.6	13 54 36.57	
23	235	150 17 5.4	16 15.2	144.68	0.80	.0045906	38.9	13 50 40.66	
24	236	151 14 58.5	14 8.1	144.75	0.80	.0044969	39.2	13 46 44.75	
25	237	152 12 53.4	12 2.9	144.82	0.77	.0044023	39.6	13 42 48.84	
26	238	153 10 50.0	9 59.4	144.90	0.72	.0043067	40.0	13 38 52.93	
27	239	154 8 48.5	7 57.8	144.98	0.63	.0042100	40.4	13 34 57.03	
28	240	155 6 49.0	5 58.2	145.06	0.51	.0041122	40.9	13 31 1.12	
29	241	156 4 51.2	4 0.2	145.14	0.38	.0040132	41.4	13 27 5.21	
30	242	157 2 55.4	2 4.3	145.22	0.25	.0039129	42.0	13 23 9.30	
31	243	158 1 1.5	0 10.3	145.30	+0.12	.0038111	42.7	13 19 13.39	
32	244	158 59 9.5	58 18.2	145.38	-0.01	0.0037078	43.3	13 15 17.49	

NOTE. — λ corresponds to the true equinox of the date, λ' to the mean equinox of January 0d.

GREENWICH MEAN TIME.

THE MOON'S

Day of the Month.	SEMI-DIAMETER.		HORIZONTAL PARALLAX.				MERIDIAN PASSAGE.		AGE.
	Noon.	Midnight.	Noon.	Diff. for 1 hour.	Midnight.	Diff. for 1 hour.		Diff. for 1 hour.	
							h m	m	
1	15' 1.9	15' 6.3	55' 3.4	+1.25	55' 19.4	+1.41	20 28.3	2.21	24.4
2	15 11.1	15 16.3	55 37.1	1.54	55 56.3	1.64	21 21.9	2.24	25.4
3	15 21.8	15 27.6	56 16.6	1.72	56 37.6	1.77	22 15.7	2.23	26.4
4	15 33.4	15 39.2	56 59.0	1.78	57 20.4	1.76	23 8.8	2.19	27.4
5	15 44.9	15 50.4	57 41.3	1.71	58 1.3	1.62	♄		28.4
6	15 55.5	16 0.2	58 20.1	1.50	58 37.4	1.36	0 0.6	2.13	0.0
7	16 4.4	16 8.0	58 52.7	1.19	59 5.9	1.01	0 51.1	2.08	1.0
8	16 10.9	16 13.2	59 16.9	0.81	59 25.4	0.61	1 40.7	2.06	2.0
9	16 14.9	16 16.0	59 31.6	0.41	59 35.4	+0.22	2 30.3	2.08	3.0
10	16 16.4	16 16.2	59 36.9	+0.04	59 36.3	-0.13	3 20.9	2.14	4.0
11	16 15.5	16 14.4	59 33.8	-0.28	59 29.5	0.42	4 13.3	2.23	5.0
12	16 12.8	16 10.9	59 23.7	0.54	59 16.5	0.64	5 8.2	2.34	6.0
13	16 8.6	16 6.1	59 8.2	0.73	58 58.9	0.81	6 5.7	2.44	7.0
14	16 3.3	16 0.3	58 48.8	0.88	58 37.8	0.94	7 5.0	2.48	8.0
15	15 57.1	15 53.8	58 26.2	1.00	58 13.9	1.05	8 4.4	2.45	9.0
16	15 50.3	15 46.6	58 0.9	1.10	57 47.4	1.15	9 2.1	2.35	10.0
17	15 42.8	15 38.8	57 33.3	1.19	57 18.8	1.23	9 56.8	2.21	11.0
18	15 34.7	15 30.5	57 3.9	1.26	56 48.6	1.28	10 48.0	2.05	12.0
19	15 26.3	15 22.1	56 33.1	1.30	56 17.5	1.30	11 35.6	1.92	13.0
20	15 17.9	15 13.7	56 2.0	1.29	55 46.6	1.27	12 20.4	1.82	14.0
21	15 9.6	15 5.7	55 31.6	1.22	55 17.2	1.16	13 3.3	1.76	15.0
22	15 2.0	14 58.6	55 3.7	1.09	54 51.2	1.00	13 45.2	1.74	16.0
23	14 55.6	14 52.9	54 39.9	0.88	54 30.2	0.74	14 27.0	1.75	17.0
24	14 50.7	14 49.0	54 22.1	0.59	54 15.9	0.43	15 9.5	1.80	18.0
25	14 47.9	14 47.4	54 11.8	-0.25	54 9.9	-0.06	15 53.4	1.87	19.0
26	14 47.5	14 48.3	54 10.3	+0.14	54 13.2	+0.35	16 39.4	1.96	20.0
27	14 49.7	14 51.9	54 18.6	0.56	54 26.6	0.77	17 27.6	2.06	21.0
28	14 54.8	14 58.3	54 37.2	0.98	54 50.2	1.19	18 18.0	2.14	22.0
29	15 2.5	15 7.4	55 5.7	1.39	55 23.5	1.57	19 10.1	2.19	23.0
30	15 12.8	15 18.7	55 43.4	1.74	56 5.2	1.88	20 3.0	2.21	24.0
31	15 25.1	15 31.8	56 28.6	2.00	56 53.2	2.09	20 55.9	2.19	25.0
32	15 38.8	15 45.8	57 18.6	+2.13	57 44.4	+2.14	21 48.1	2.16	26.0

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
THURSDAY 1.					SATURDAY 3.				
0	4 25 37.01	2.2848	N.24 42 41.5	2.288	0	6 15 44.94	2.2984	N.24 18 2.6	2.749
1	4 27 51.20	2.2882	24 45 13.7	2.476	1	6 18 4.65	2.2966	24 14 13.6	2.886
2	4 30 5.59	2.2416	24 47 38.6	2.268	2	6 20 24.37	2.2988	24 10 16.3	4.022
3	4 32 20.18	2.2448	24 49 56.1	2.229	3	6 22 44.10	2.2969	24 6 10.8	4.160
4	4 34 34.97	2.2460	24 52 6.1	2.105	4	6 25 3.84	2.2969	24 1 57.1	4.297
5	4 36 49.95	2.2512	24 54 8.7	1.980	5	6 27 23.57	2.2988	23 57 35.2	4.433
6	4 39 5.12	2.2544	24 56 3.8	1.855	6	6 29 43.30	2.2967	23 53 5.1	4.569
7	4 41 20.48	2.2576	24 57 51.3	1.729	7	6 32 3.02	2.2985	23 48 26.9	4.705
8	4 43 36.02	2.2608	24 59 31.3	1.603	8	6 34 22.72	2.2983	23 43 40.5	4.841
9	4 45 51.74	2.2635	25 1 3.7	1.476	9	6 36 42.41	2.2980	23 38 45.9	4.977
10	4 48 7.64	2.2664	25 2 28.4	1.349	10	6 39 2.08	2.2976	23 33 43.2	5.112
11	4 50 23.71	2.2692	25 3 45.5	1.222	11	6 41 21.72	2.2971	23 28 32.4	5.247
12	4 52 39.95	2.2720	25 4 55.0	1.094	12	6 43 41.33	2.2966	23 23 13.5	5.382
13	4 54 56.36	2.2748	25 5 56.7	0.965	13	6 46 0.91	2.2960	23 17 46.5	5.517
14	4 57 12.93	2.2775	25 6 50.7	0.836	14	6 48 20.45	2.2953	23 12 11.4	5.652
15	4 59 29.66	2.2802	25 7 36.9	0.706	15	6 50 39.95	2.2946	23 6 28.3	5.786
16	5 1 46.55	2.2828	25 8 15.4	0.576	16	6 52 59.40	2.2938	22 0 37.1	5.920
17	5 4 3.59	2.2853	25 8 46.0	0.445	17	6 55 18.81	2.2930	22 54 37.9	6.053
18	5 6 20.78	2.2877	25 9 8.8	0.314	18	6 57 38.16	2.2921	22 48 30.7	6.186
19	5 8 38.11	2.2900	25 9 23.7	0.182	19	6 59 57.45	2.2911	22 42 15.5	6.319
20	5 10 55.58	2.2923	25 9 30.6	0.050	20	7 2 16.69	2.2901	22 35 52.4	6.451
21	5 13 13.19	2.2946	25 9 29.6	0.083	21	7 4 35.87	2.2890	22 29 21.3	6.583
22	5 15 30.93	2.2968	25 9 20.7	0.216	22	7 6 54.98	2.2879	22 22 42.4	6.714
23	5 17 48.80	2.2989	N.25 9 3.8	0.349	23	7 9 14.02	2.2867	N.22 15 55.6	6.846
FRIDAY 2.					SUNDAY 4.				
0	5 20 6.80	2.2909	N.25 8 38.9	0.482	0	7 11 32.99	2.2855	N.22 9 1.0	6.975
1	5 22 24.92	2.2929	25 8 6.0	0.616	1	7 13 51.88	2.2842	22 1 58.6	7.106
2	5 24 43.15	2.2948	25 7 25.0	0.750	2	7 16 10.70	2.2829	21 54 48.4	7.236
3	5 27 1.49	2.2966	25 6 36.0	0.884	3	7 18 29.43	2.2815	21 47 30.5	7.363
4	5 29 19.94	2.2984	25 5 38.9	1.019	4	7 20 48.08	2.2801	21 40 4.8	7.491
5	5 31 38.50	2.2991	25 4 33.7	1.154	5	7 23 6.64	2.2786	21 32 31.5	7.619
6	5 33 57.15	2.3117	25 3 20.4	1.289	6	7 25 25.11	2.2771	21 24 50.5	7.746
7	5 36 15.90	2.3138	25 1 59.0	1.425	7	7 27 43.49	2.2755	21 17 2.0	7.872
8	5 38 34.74	2.3148	25 0 29.5	1.461	8	7 30 1.77	2.2739	21 9 5.9	7.996
9	5 40 53.67	2.3162	24 58 51.8	1.497	9	7 32 19.96	2.2723	21 1 2.3	8.123
10	5 43 12.68	2.3175	24 57 5.9	1.533	10	7 34 38.04	2.2706	20 52 51.2	8.247
11	5 45 31.76	2.3187	24 55 11.9	1.569	11	7 36 56.02	2.2688	20 44 32.7	8.370
12	5 47 50.92	2.3199	24 53 9.7	2.105	12	7 39 13.89	2.2670	20 36 6.8	8.492
13	5 50 10.15	2.3210	24 50 59.3	2.242	13	7 41 31.65	2.2652	20 27 33.5	8.615
14	5 52 29.44	2.3220	24 48 40.7	2.278	14	7 43 49.31	2.2634	20 18 52.9	8.737
15	5 54 48.79	2.3230	24 46 13.9	2.315	15	7 46 6.86	2.2615	20 10 5.0	8.858
16	5 57 8.20	2.3239	24 43 38.9	2.352	16	7 48 24.29	2.2596	20 1 9.9	8.978
17	5 59 27.66	2.3247	24 40 55.7	2.789	17	7 50 41.61	2.2577	19 52 7.6	9.097
18	6 1 47.17	2.3254	24 38 4.2	2.926	18	7 52 58.81	2.2557	19 42 58.2	9.216
19	6 4 6.72	2.3261	24 35 4.5	3.063	19	7 55 15.89	2.2537	19 33 41.7	9.334
20	6 6 26.30	2.3267	24 31 56.6	3.200	20	7 57 32.85	2.2517	19 24 18.1	9.451
21	6 8 45.92	2.3273	24 28 40.4	3.336	21	7 59 49.69	2.2496	19 14 47.5	9.567
22	6 11 5.57	2.3277	24 25 16.0	3.473	22	8 2 6.40	2.2475	19 5 10.0	9.682
23	6 13 25.24	2.3281	24 21 43.4	3.612	23	8 4 22.99	2.2454	18 55 25.6	9.796
24	6 15 44.94	2.3284	N.24 18 2.6	3.749	24	8 6 39.46	2.2433	N.18 45 34.4	9.909

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
MONDAY 5.					WEDNESDAY 7.				
0	8 6 39.46	2.3783	N.18 45 34.4	9.909	0	9 53 19.23	2.1768	N. 8 59 10.2	14.071
1	8 8 55.80	2.3712	18 35 36.4	10.022	1	9 55 29.80	2.1764	8 45 4.2	14.127
2	8 11 12.01	2.3691	18 25 31.7	10.134	2	9 57 40.28	2.1741	8 30 54.9	14.182
3	8 13 28.09	2.3669	18 15 20.4	10.244	3	9 59 50.69	2.1738	8 16 42.4	14.235
4	8 15 44.04	2.3648	18 5 2.4	10.363	4	10 2 1.02	2.1715	8 2 26.7	14.287
5	8 17 59.86	2.3626	17 54 37.9	10.482	5	10 4 11.28	2.1708	7 48 7.9	14.337
6	8 20 15.55	2.3604	17 44 6.9	10.570	6	10 6 21.46	2.1692	7 33 46.2	14.386
7	8 22 31.11	2.3583	17 33 29.4	10.677	7	10 8 31.58	2.1681	7 19 21.6	14.434
8	8 24 46.53	2.3560	17 22 45.6	10.788	8	10 10 41.63	2.1670	7 4 54.1	14.481
9	8 27 1.82	2.3537	17 11 55.4	10.888	9	10 12 51.62	2.1660	6 50 23.9	14.526
10	8 29 16.97	2.3515	17 0 59.0	10.992	10	10 15 1.55	2.1661	6 35 51.0	14.569
11	8 31 31.99	2.3493	16 49 56.4	11.096	11	10 17 11.43	2.1643	6 21 15.6	14.611
12	8 33 46.88	2.3471	16 38 47.7	11.197	12	10 19 21.25	2.1633	6 6 37.7	14.652
13	8 36 1.63	2.3448	16 27 32.9	11.297	13	10 21 31.02	2.1626	5 51 57.4	14.691
14	8 38 16.25	2.3426	16 16 12.1	11.396	14	10 23 40.75	2.1617	5 37 14.8	14.729
15	8 40 30.74	2.3403	16 4 45.4	11.494	15	10 25 50.43	2.1610	5 22 30.0	14.765
16	8 42 45.09	2.3381	15 53 12.8	11.591	16	10 28 0.07	2.1603	5 7 43.1	14.800
17	8 44 59.31	2.3360	15 41 34.4	11.687	17	10 30 9.67	2.1597	4 52 54.1	14.833
18	8 47 13.40	2.3337	15 29 50.3	11.782	18	10 32 19.24	2.1593	4 38 3.2	14.865
19	8 49 27.36	2.3315	15 18 0.5	11.877	19	10 34 28.78	2.1587	4 23 10.4	14.896
20	8 51 41.18	2.3293	15 6 5.0	11.970	20	10 36 38.29	2.1583	4 8 15.8	14.925
21	8 53 54.87	2.3271	14 54 4.0	12.062	21	10 38 47.77	2.1579	3 53 19.4	14.953
22	8 56 8.43	2.3249	14 41 57.5	12.153	22	10 40 57.24	2.1576	3 38 21.4	14.979
23	8 58 21.86	2.3228	N.14 29 45.7	12.243	23	10 43 6.69	2.1574	N. 3 23 21.9	15.008
TUESDAY 6.					THURSDAY 8.				
0	9 0 35.16	2.3206	N.14 17 28.5	12.330	0	10 45 16.13	2.1573	N. 3 8 21.0	15.036
1	9 2 48.34	2.3185	14 5 6.0	12.417	1	10 47 25.56	2.1571	2 53 18.7	15.064
2	9 5 1.39	2.3164	13 52 38.4	12.503	2	10 49 34.98	2.1570	2 38 15.2	15.088
3	9 7 14.31	2.3143	13 40 5.7	12.587	3	10 51 44.40	2.1569	2 23 10.5	15.087
4	9 9 27.11	2.3122	13 27 27.9	12.670	4	10 53 53.81	2.1570	2 8 4.7	15.104
5	9 11 39.78	2.3102	13 14 45.1	12.753	5	10 56 3.23	2.1571	1 52 57.9	15.120
6	9 13 52.33	2.3082	13 1 57.5	12.834	6	10 58 12.66	2.1573	1 37 50.2	15.134
7	9 16 4.76	2.3062	12 49 5.0	12.914	7	11 0 22.10	2.1576	1 22 41.7	15.147
8	9 18 17.07	2.3043	12 36 7.8	12.992	8	11 2 31.56	2.1578	1 7 32.5	15.158
9	9 20 29.26	2.3023	12 23 5.9	13.069	9	11 4 41.04	2.1583	0 52 22.7	15.168
10	9 22 41.33	2.3003	12 9 59.5	13.145	10	11 6 50.54	2.1586	0 37 12.3	15.177
11	9 24 53.29	2.2984	11 56 48.5	13.220	11	11 9 0.06	2.1590	0 22 1.4	15.184
12	9 27 5.14	2.2965	11 43 33.1	13.293	12	11 11 9.62	2.1596	N. 0 6 50.2	15.189
13	9 29 16.87	2.2947	11 30 13.3	13.365	13	11 13 19.21	2.1603	S. 0 8 21.3	15.193
14	9 31 28.50	2.2929	11 16 49.3	13.436	14	11 15 28.84	2.1609	0 23 33.0	15.195
15	9 33 40.02	2.2912	11 3 21.0	13.506	15	11 17 38.51	2.1616	0 38 44.8	15.196
16	9 35 51.44	2.2894	10 49 48.6	13.574	16	11 19 48.23	2.1624	0 53 56.6	15.196
17	9 38 2.75	2.2877	10 36 12.1	13.641	17	11 21 58.00	2.1633	1 9 8.3	15.194
18	9 40 13.96	2.2860	10 22 31.7	13.708	18	11 24 7.82	2.1643	1 24 19.9	15.190
19	9 42 25.07	2.2844	10 8 47.4	13.770	19	11 26 17.69	2.1651	1 39 31.2	15.185
20	9 44 36.09	2.2828	9 54 59.3	13.828	20	11 28 27.63	2.1662	1 54 42.1	15.179
21	9 46 47.01	2.2813	9 41 7.4	13.886	21	11 30 37.63	2.1673	2 9 52.6	15.171
22	9 48 57.84	2.2797	9 27 11.9	13.946	22	11 32 47.70	2.1684	2 25 2.6	15.161
23	9 51 8.58	2.2783	9 13 12.8	14.014	23	11 34 57.84	2.1696	2 40 11.9	15.149
24	9 53 19.23	2.2768	N. 8 59 10.2	14.071	24	11 37 8.05	2.1709	S. 2 55 20.5	15.136

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
FRIDAY 9.					SUNDAY 11.				
0	11 37 8.05	2.1709	S. 2° 55' 20.5"	15.136	0	13 23 58.89	2.3018	S. 14° 18' 26.9"	12.745
1	11 39 18.34	2.1723	3 10 28.3	15.122	1	13 26 17.12	2.3067	14 31 9.0	12.686
2	11 41 28.72	2.1737	3 25 35.2	15.106	2	13 26 35.58	2.3066	14 43 45.9	12.570
3	11 43 39.18	2.1762	3 40 41.1	15.089	3	13 30 54.27	2.3155	14 56 17.4	12.480
4	11 45 49.74	2.1767	3 55 45.9	15.070	4	13 33 13.20	2.3175	15 8 43.5	12.389
5	11 48 0.39	2.1763	4 10 49.5	15.050	5	13 35 32.37	2.3215	15 21 4.1	12.297
6	11 50 11.14	2.1800	4 25 51.9	15.029	6	13 37 51.78	2.3265	15 33 19.1	12.203
7	11 52 22.00	2.1818	4 40 53.0	15.006	7	13 40 11.43	2.3295	15 45 28.4	12.106
8	11 54 32.96	2.1836	4 55 52.6	14.981	8	13 42 31.32	2.3336	15 57 32.0	12.011
9	11 56 44.03	2.1854	5 10 50.7	14.954	9	13 44 51.46	2.3377	16 9 29.7	11.913
10	11 58 55.21	2.1874	5 25 47.1	14.926	10	13 47 11.84	2.3418	16 21 21.5	11.814
11	12 1 6.51	2.1894	5 40 41.8	14.897	11	13 49 32.47	2.3469	16 33 7.3	11.713
12	12 3 17.94	2.1915	5 55 34.8	14.866	12	13 51 53.35	2.3500	16 44 47.0	11.610
13	12 5 29.49	2.1936	6 10 25.9	14.834	13	13 54 14.47	2.3541	16 56 20.5	11.506
14	12 7 41.17	2.1958	6 25 14.9	14.800	14	13 56 35.84	2.3582	17 7 47.7	11.401
15	12 9 52.98	2.1980	6 40 1.8	14.764	15	13 58 57.46	2.3624	17 19 8.6	11.295
16	12 12 4.92	2.2003	6 54 46.6	14.727	16	14 1 19.33	2.3665	17 30 23.1	11.187
17	12 14 17.01	2.2027	7 9 29.1	14.688	17	14 3 41.45	2.3707	17 41 31.0	11.078
18	12 16 29.24	2.2051	7 24 9.2	14.648	18	14 6 3.82	2.3749	17 52 32.4	10.968
19	12 18 41.62	2.2075	7 38 46.9	14.607	19	14 8 26.44	2.3791	18 3 27.1	10.856
20	12 20 54.14	2.2100	7 53 22.1	14.564	20	14 10 49.31	2.3832	18 14 15.1	10.743
21	12 23 6.82	2.2126	8 7 54.7	14.520	21	14 13 12.43	2.3874	18 24 56.3	10.628
22	12 25 19.65	2.2153	8 22 24.5	14.474	22	14 15 35.80	2.3915	18 35 30.5	10.512
23	12 27 32.65	2.2180	S. 8° 36' 51.5"	14.426	23	14 17 59.42	2.3957	S. 18° 45' 57.7"	10.395
SATURDAY 10.					MONDAY 12.				
0	12 29 45.81	2.2206	S. 8° 51' 15.6"	14.377	0	14 20 23.29	2.3998	S. 18° 56' 17.9"	10.277
1	12 31 59.14	2.2232	9 5 36.7	14.326	1	14 22 47.41	2.4040	19 6 30.9	10.157
2	12 34 12.64	2.2264	9 19 54.7	14.274	2	14 25 11.77	2.4081	19 16 36.7	10.036
3	12 36 26.31	2.2293	9 34 9.5	14.220	3	14 27 36.38	2.4122	19 26 35.2	9.914
4	12 38 40.16	2.2323	9 48 21.1	14.165	4	14 30 1.23	2.4163	19 36 26.3	9.790
5	12 40 54.19	2.2353	10 2 29.3	14.108	5	14 32 26.33	2.4203	19 46 10.0	9.665
6	12 43 8.40	2.2384	10 16 34.1	14.050	6	14 34 51.67	2.4244	19 55 46.1	9.539
7	12 45 22.80	2.2416	10 30 35.3	13.990	7	14 37 17.25	2.4284	20 5 14.6	9.411
8	12 47 37.39	2.2448	10 44 32.9	13.929	8	14 39 43.08	2.4324	20 14 35.4	9.282
9	12 49 52.17	2.2480	10 58 26.8	13.866	9	14 42 9.15	2.4364	20 23 48.5	9.153
10	12 52 7.15	2.2513	11 12 16.8	13.802	10	14 44 35.45	2.4405	20 32 53.7	9.023
11	12 54 22.32	2.2546	11 26 2.9	13.736	11	14 47 1.98	2.4445	20 41 51.1	8.890
12	12 56 37.70	2.2580	11 39 45.1	13.669	12	14 49 28.75	2.4481	20 50 40.5	8.757
13	12 58 53.28	2.2614	11 53 23.2	13.600	13	14 51 55.75	2.4519	20 59 21.9	8.623
14	13 1 9.07	2.2649	12 6 57.1	13.530	14	14 54 22.97	2.4557	21 7 55.2	8.488
15	13 3 25.07	2.2684	12 20 26.7	13.458	15	14 56 50.42	2.4594	21 16 20.4	8.351
16	13 5 41.28	2.2720	12 33 52.0	13.385	16	14 59 18.10	2.4631	21 24 37.3	8.213
17	13 7 57.71	2.2756	12 47 12.8	13.310	17	15 1 46.00	2.4667	21 32 45.9	8.074
18	13 10 14.35	2.2792	13 0 29.1	13.234	18	15 4 14.11	2.4703	21 40 46.2	7.934
19	13 12 31.21	2.2828	13 13 40.8	13.156	19	15 6 42.43	2.4738	21 48 38.1	7.794
20	13 14 48.29	2.2865	13 26 47.8	13.077	20	15 9 10.97	2.4773	21 56 21.5	7.652
21	13 17 5.60	2.2903	13 39 50.0	12.996	21	15 11 39.71	2.4807	22 3 56.3	7.509
22	13 19 23.13	2.2941	13 52 47.3	12.914	22	15 14 8.66	2.4841	22 11 22.6	7.365
23	13 21 40.89	2.2980	14 5 39.6	12.830	23	15 16 37.81	2.4874	22 18 40.3	7.221
24	13 23 58.89	2.3018	S. 14° 18' 26.9"	12.745	24	15 19 7.15	2.4907	S. 22° 25' 49.2"	7.076

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
TUESDAY 13.					THURSDAY 15.				
0	15 19 7.15	2.4907	S. 22° 25' 49.2"	7.076	0	17 20 45.78	2.5377	S. 25° 5' 23.8"	0.552
1	15 21 36.69	2.4929	22 32 49.4	6.929	1	17 23 17.99	2.5360	25 4 45.8	0.713
2	15 24 6.42	2.4970	22 39 40.7	6.781	2	17 25 50.10	2.5343	25 3 58.2	0.874
3	15 26 36.33	2.5000	22 46 23.2	6.633	3	17 28 22.09	2.5325	25 3 0.9	1.035
4	15 29 6.42	2.5030	22 52 56.7	6.484	4	17 30 53.96	2.5301	25 1 54.0	1.196
5	15 31 36.69	2.5059	22 59 21.3	6.334	5	17 33 25.70	2.5279	25 0 37.5	1.356
6	15 34 7.13	2.5087	23 5 36.8	6.183	6	17 35 57.31	2.5256	24 59 11.5	1.514
7	15 36 37.74	2.5116	23 11 43.3	6.032	7	17 38 28.77	2.5232	24 57 36.0	1.672
8	15 39 8.51	2.5141	23 17 40.6	5.880	8	17 41 00.09	2.5207	24 55 50.9	1.830
9	15 41 39.44	2.5167	23 23 28.8	5.726	9	17 43 31.25	2.5180	24 53 56.4	1.988
10	15 44 10.52	2.5192	23 29 7.7	5.572	10	17 46 2.25	2.5153	24 51 52.4	2.146
11	15 46 41.74	2.5216	23 34 37.4	5.418	11	17 48 33.09	2.5125	24 49 39.0	2.301
12	15 49 13.11	2.5239	23 39 57.8	5.263	12	17 51 3.75	2.5096	24 47 16.3	2.457
13	15 51 44.61	2.5261	23 45 8.9	5.107	13	17 53 34.23	2.5066	24 44 44.2	2.612
14	15 54 16.25	2.5283	23 50 10.6	4.940	14	17 56 4.53	2.5033	24 42 2.9	2.766
15	15 56 48.01	2.5304	23 55 2.9	4.783	15	17 58 34.63	2.5001	24 39 12.4	2.919
16	15 59 19.90	2.5324	23 59 45.8	4.626	16	18 1 4.54	2.4968	24 36 12.6	3.072
17	16 1 51.90	2.5343	24 4 19.2	4.477	17	18 3 34.24	2.4933	24 33 3.7	3.226
18	16 4 24.01	2.5360	24 8 43.1	4.318	18	18 6 3.73	2.4897	24 29 45.6	3.377
19	16 6 56.22	2.5377	24 12 57.4	4.160	19	18 8 33.01	2.4861	24 26 18.5	3.527
20	16 9 28.53	2.5392	24 17 2.2	3.999	20	18 11 2.06	2.4824	24 22 42.4	3.677
21	16 12 0.93	2.5407	24 20 57.4	3.839	21	18 13 30.89	2.4786	24 18 57.3	3.826
22	16 14 33.41	2.5421	24 24 42.9	3.678	22	18 15 59.48	2.4746	24 15 3.3	3.974
23	16 17 5.97	2.5433	S. 24° 28' 18.8"	3.517	23	18 18 27.84	2.4706	S. 24° 11' 0.4"	4.122
WEDNESDAY 14.					FRIDAY 16.				
0	16 19 38.61	2.5444	S. 24° 31' 45.0"	3.356	0	18 20 55.95	2.4666	S. 24° 6' 48.7"	4.266
1	16 22 11.31	2.5465	24 35 15.0	3.194	1	18 23 23.82	2.4622	24 2 28.2	4.413
2	16 24 44.07	2.5484	24 38 8.3	3.032	2	18 25 51.43	2.4581	23 57 59.1	4.557
3	16 27 16.88	2.5472	24 41 5.4	2.870	3	18 28 18.79	2.4539	23 53 21.3	4.701
4	16 29 49.73	2.5478	24 43 52.7	2.708	4	18 30 45.89	2.4494	23 48 35.0	4.844
5	16 32 22.62	2.5484	24 46 30.3	2.545	5	18 33 12.72	2.4449	23 43 40.1	4.985
6	16 34 55.54	2.5489	24 48 58.1	2.382	6	18 35 39.28	2.4404	23 38 36.8	5.126
7	16 37 28.49	2.5493	24 51 16.1	2.219	7	18 38 5.57	2.4359	23 33 25.1	5.265
8	16 40 1.46	2.5496	24 53 24.4	2.056	8	18 40 31.58	2.4311	23 28 5.0	5.404
9	16 42 34.44	2.5497	24 55 22.9	1.893	9	18 42 57.31	2.4264	23 22 36.6	5.542
10	16 45 7.42	2.5497	24 57 11.5	1.730	10	18 45 22.75	2.4216	23 17 0.0	5.678
11	16 47 40.40	2.5497	24 58 50.3	1.566	11	18 47 47.90	2.4167	23 11 15.3	5.813
12	16 50 13.38	2.5496	25 0 19.4	1.403	12	18 50 12.75	2.4119	23 5 22.5	5.947
13	16 52 46.34	2.5491	25 1 38.7	1.239	13	18 52 37.31	2.4069	22 59 21.7	6.080
14	16 55 19.27	2.5486	25 2 48.1	1.076	14	18 55 1.56	2.4017	22 53 12.9	6.213
15	16 57 52.17	2.5481	25 3 47.7	0.912	15	18 57 25.51	2.3966	22 46 56.3	6.345
16	17 0 25.04	2.5474	25 4 37.5	0.749	16	18 59 49.15	2.3914	22 40 31.8	6.478
17	17 2 57.86	2.5466	25 5 17.5	0.586	17	19 2 12.48	2.3862	22 33 59.6	6.601
18	17 5 30.63	2.5457	25 5 47.7	0.422	18	19 4 35.49	2.3809	22 27 19.7	6.728
19	17 8 3.34	2.5447	25 6 8.1	0.258	19	19 6 58.18	2.3756	22 20 32.2	6.854
20	17 10 35.99	2.5435	25 6 18.7	0.095	20	19 9 20.56	2.3702	22 13 37.2	6.979
21	17 13 8.57	2.5422	25 6 19.6	0.007	21	19 11 42.61	2.3648	22 6 34.7	7.108
22	17 15 41.06	2.5408	25 6 10.7	0.229	22	19 14 4.34	2.3594	21 59 24.9	7.236
23	17 18 13.47	2.5393	25 5 52.1	0.391	23	19 16 25.74	2.3540	21 52 7.7	7.347
24	17 20 45.78	2.5377	S. 25° 5' 23.8"	0.552	24	19 18 46.82	2.3486	S. 21° 44' 43.3"	7.467

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
SATURDAY 17.					MONDAY 19.				
0	19 18 46.82	2.2486	S. 21 44 43.3	7.467	0	21 4 59.49	2.0618	S. 13 52 43.2	11.699
1	19 21 7.57	2.2480	21 37 11.7	7.465	1	21 7 4.22	2.0763	13 40 59.6	11.755
2	19 23 27.98	2.2374	21 29 33.1	7.703	2	21 9 8.65	2.0714	13 29 12.6	11.810
3	19 25 48.06	2.2318	21 21 47.4	7.819	3	21 11 12.79	2.0665	13 17 22.4	11.864
4	19 28 7.80	2.2262	21 13 54.8	7.934	4	21 13 16.63	2.0616	13 5 28.9	11.917
5	19 30 27.20	2.2206	21 5 55.3	8.047	5	21 15 20.18	2.0568	12 53 32.3	11.969
6	19 32 46.27	2.2149	20 57 49.1	8.169	6	21 17 23.44	2.0520	12 41 32.6	12.019
7	19 35 5.00	2.2092	20 49 36.2	8.270	7	21 19 26.42	2.0473	12 29 30.0	12.068
8	19 37 23.38	2.2035	20 41 16.7	8.360	8	21 21 29.11	2.0426	12 17 24.4	12.116
9	19 39 41.42	2.2078	20 32 50.8	8.469	9	21 23 31.52	2.0379	12 5 16.0	12.163
10	19 41 59.12	2.2021	20 24 18.0	8.566	10	21 25 33.66	2.0333	11 53 4.8	12.209
11	19 44 16.47	2.2063	20 15 39.1	8.702	11	21 27 35.52	2.0287	11 40 50.9	12.253
12	19 46 33.48	2.2006	20 6 53.8	8.807	12	21 29 37.11	2.0243	11 28 34.4	12.296
13	19 48 50.14	2.2748	19 58 2.3	8.910	13	21 31 38.43	2.0198	11 16 15.3	12.338
14	19 51 6.46	2.2691	19 49 4.6	9.012	14	21 33 39.49	2.0155	11 3 53.8	12.379
15	19 53 22.43	2.2633	19 40 0.8	9.113	15	21 35 40.29	2.0112	10 51 29.8	12.420
16	19 55 38.06	2.2576	19 30 51.0	9.212	16	21 37 40.83	2.0069	10 39 3.4	12.460
17	19 57 53.34	2.2518	19 21 35.4	9.310	17	21 39 41.12	2.0027	10 26 34.8	12.496
18	20 0 8.28	2.2460	19 12 13.9	9.407	18	21 41 41.15	1.9985	10 14 3.9	12.532
19	20 2 22.87	2.2402	19 2 46.6	9.503	19	21 43 40.94	1.9944	10 1 30.9	12.568
20	20 4 37.11	2.2344	18 53 13.6	9.596	20	21 45 40.48	1.9904	9 48 55.8	12.602
21	20 6 51.01	2.2287	18 43 35.0	9.689	21	21 47 39.78	1.9864	9 36 18.7	12.636
22	20 9 4.56	2.2229	18 33 50.8	9.781	22	21 49 38.85	1.9824	9 23 39.6	12.667
23	20 11 17.77	2.2172	S. 18 24 1.2	9.871	23	21 51 37.68	1.9786	S. 9 10 58.7	12.698
SUNDAY 18.					TUESDAY 20.				
0	20 13 30.63	2.2115	S. 18 14 6.3	9.960	0	21 53 36.27	1.9747	S. 8 58 15.9	12.728
1	20 15 43.15	2.2058	18 4 6.1	10.047	1	21 55 34.64	1.9709	8 45 31.4	12.756
2	20 17 55.33	2.2001	17 54 0.7	10.133	2	21 57 32.78	1.9671	8 32 45.2	12.784
3	20 20 7.17	2.1945	17 43 50.1	10.218	3	21 59 30.69	1.9634	8 19 57.3	12.811
4	20 22 18.67	2.1888	17 33 34.5	10.301	4	22 1 28.39	1.9598	8 7 7.9	12.837
5	20 24 29.83	2.1832	17 23 13.9	10.383	5	22 3 25.87	1.9562	7 54 17.0	12.861
6	20 26 40.65	2.1776	17 12 48.5	10.464	6	22 5 23.14	1.9527	7 41 24.6	12.884
7	20 28 51.14	2.1720	17 2 18.2	10.544	7	22 7 20.20	1.9492	7 28 30.9	12.906
8	20 31 1.29	2.1664	16 51 43.2	10.622	8	22 9 17.05	1.9456	7 15 35.9	12.927
9	20 33 11.11	2.1608	16 41 3.5	10.699	9	22 11 13.69	1.9424	7 2 39.6	12.948
10	20 35 20.59	2.1552	16 30 19.3	10.774	10	22 13 10.14	1.9392	6 49 42.2	12.967
11	20 37 29.74	2.1497	16 19 30.6	10.848	11	22 15 6.40	1.9360	6 36 43.6	12.986
12	20 39 38.56	2.1443	16 8 37.5	10.921	12	22 17 2.46	1.9329	6 23 44.0	12.003
13	20 41 47.06	2.1389	15 57 40.0	10.993	13	22 18 58.34	1.9298	6 10 43.4	12.018
14	20 43 55.23	2.1336	15 46 38.3	11.064	14	22 20 54.03	1.9268	5 57 41.8	12.032
15	20 46 3.08	2.1281	15 35 32.4	11.133	15	22 22 49.54	1.9238	5 44 39.3	12.046
16	20 48 10.60	2.1227	15 24 22.3	11.201	16	22 24 44.88	1.9209	5 31 36.0	12.061
17	20 50 17.80	2.1174	15 13 8.2	11.268	17	22 26 40.04	1.9180	5 18 32.0	12.073
18	20 52 24.69	2.1122	15 1 50.2	11.333	18	22 28 35.04	1.9162	5 5 27.2	12.084
19	20 54 31.27	2.1070	14 50 28.3	11.397	19	22 30 29.87	1.9126	4 52 21.8	12.096
20	20 56 37.53	2.1018	14 39 2.6	11.460	20	22 32 24.54	1.9098	4 39 15.8	12.105
21	20 58 43.48	2.0966	14 27 33.2	11.521	21	22 34 19.05	1.9073	4 26 9.2	12.112
22	21 0 49.12	2.0915	14 16 0.1	11.582	22	22 36 13.40	1.9047	4 13 2.2	12.120
23	21 2 54.46	2.0864	14 4 23.4	11.641	23	22 38 7.60	1.9022	3 59 54.8	12.127
24	21 4 59.49	2.0813	S. 13 52 43.2	11.699	24	22 40 1.66	1.8997	S. 3 46 47.0	12.133

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
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WEDNESDAY 21.

Hour	h	m	s	"	S.	°	'	"	"
0	22	40	1.66	1.8997	S.	3	46	47.0	13.133
1	22	41	55.57	1.8973		3	33	38.9	13.137
2	22	43	49.34	1.8950		3	20	30.6	13.141
3	22	45	42.97	1.8927		3	7	22.0	13.144
4	22	47	36.46	1.8905		2	54	13.3	13.146
5	22	49	29.82	1.8883		2	41	4.5	13.146
6	22	51	23.06	1.8862		2	27	55.7	13.146
7	22	53	16.17	1.8842		2	14	46.9	13.146
8	22	55	9.17	1.8823		2	1	38.1	13.145
9	22	57	2.05	1.8804		1	48	29.5	13.143
10	22	58	54.82	1.8785		1	35	21.0	13.140
11	23	0	47.48	1.8767		1	22	12.8	13.135
12	23	2	40.03	1.8750		1	9	4.9	13.130
13	23	4	32.48	1.8734		0	55	57.3	13.124
14	23	6	24.84	1.8718		0	42	50.0	13.117
15	23	8	17.10	1.8708		0	29	43.2	13.109
16	23	10	9.27	1.8698		0	16	36.9	13.101
17	23	12	1.36	1.8674	S.	0	3	31.1	13.093
18	23	13	53.36	1.8660	N.	0	9	34.1	13.093
19	23	15	45.28	1.8647		0	22	38.7	13.071
20	23	17	37.13	1.8635		0	35	42.6	13.060
21	23	19	28.90	1.8623		0	48	45.7	13.046
22	23	21	20.61	1.8612		1	1	48.1	13.033
23	23	23	12.25	1.8601	N.	1	14	49.6	13.018

FRIDAY 23.

Hour	h	m	s	"	N.	°	'	"	"
0	0	9	32.38	1.8627	N.	6	33	43.2	12.415
1	0	11	23.56	1.8632		6	46	7.1	12.361
2	0	13	14.76	1.8637		6	58	28.9	12.346
3	0	15	5.99	1.8642		7	10	48.6	12.311
4	0	16	57.26	1.8646		7	23	6.2	12.375
5	0	18	48.56	1.8654		7	35	21.7	12.389
6	0	20	39.91	1.8661		7	47	34.9	12.392
7	0	22	31.30	1.8669		7	59	45.9	12.164
8	0	24	22.74	1.8677		8	11	54.6	12.135
9	0	26	14.23	1.8686		8	24	0.9	12.086
10	0	28	5.77	1.8696		8	36	4.9	12.046
11	0	29	57.37	1.8696		8	48	6.5	12.006
12	0	31	49.03	1.8616		9	0	5.6	11.966
13	0	33	40.76	1.8627		9	12	2.2	11.922
14	0	35	32.55	1.8638		9	23	56.2	11.879
15	0	37	24.41	1.8650		9	35	47.7	11.836
16	0	39	16.34	1.8662		9	47	36.5	11.792
17	0	41	8.35	1.8676		9	59	22.7	11.747
18	0	43	0.44	1.8689		10	11	6.1	11.701
19	0	44	52.61	1.8708		10	22	46.8	11.655
20	0	46	44.87	1.8717		10	34	24.7	11.608
21	0	48	37.21	1.8732		10	45	59.8	11.560
22	0	50	29.65	1.8747		10	57	32.0	11.512
23	0	52	22.18	1.8763	N.	11	9	1.3	11.463

THURSDAY 22.

Hour	h	m	s	"	N.	°	'	"	"
0	23	25	3.83	1.8591	N.	1	27	50.3	13.003
1	23	26	55.35	1.8569		1	40	50.0	13.067
2	23	28	46.82	1.8573		1	53	48.8	13.970
3	23	30	38.23	1.8565		2	6	46.5	13.963
4	23	32	29.60	1.8557		2	19	43.2	13.985
5	23	34	20.93	1.8550		2	32	38.8	13.917
6	23	36	12.21	1.8544		2	45	33.2	13.998
7	23	38	3.46	1.8538		2	58	26.4	13.877
8	23	39	54.67	1.8533		3	11	18.4	13.866
9	23	41	45.85	1.8529		3	24	9.1	13.884
10	23	43	37.01	1.8524		3	36	58.5	13.811
11	23	45	28.15	1.8521		3	49	46.5	13.787
12	23	47	19.26	1.8518		4	2	33.0	13.763
13	23	49	10.36	1.8516		4	15	18.1	13.788
14	23	51	1.44	1.8514		4	28	1.6	13.712
15	23	52	52.52	1.8513		4	40	43.6	13.685
16	23	54	43.59	1.8512		4	53	23.9	13.660
17	23	56	34.66	1.8512		5	6	2.5	13.630
18	23	58	25.73	1.8512		5	18	39.5	13.602
19	0	0	16.81	1.8513		5	31	14.7	13.573
20	0	2	7.89	1.8515		5	43	48.2	13.543
21	0	3	58.99	1.8517		5	56	19.8	13.511
22	0	5	50.10	1.8520		6	8	49.5	13.480
23	0	7	41.23	1.8523		6	21	17.3	13.448
24	0	9	32.38	1.8527	N.	6	33	43.2	13.415

SATURDAY 24.

Hour	h	m	s	"	N.	°	'	"	"
0	0	54	14.80	1.8779	N.	11	20	27.6	11.414
1	0	56	7.52	1.8796		11	31	51.0	11.364
2	0	58	0.35	1.8813		11	43	11.3	11.313
3	0	59	53.29	1.8831		11	54	28.6	11.262
4	1	1	46.33	1.8849		12	5	42.7	11.210
5	1	3	39.48	1.8868		12	16	53.7	11.167
6	1	5	32.75	1.8887		12	28	1.5	11.108
7	1	7	26.14	1.8907		12	39	6.1	11.049
8	1	9	19.64	1.8927		12	50	7.4	10.994
9	1	11	13.27	1.8948		13	1	5.4	10.938
10	1	13	7.02	1.8969		13	12	0.0	10.882
11	1	15	0.90	1.8990		13	22	51.2	10.826
12	1	16	54.90	1.9012		13	33	39.0	10.767
13	1	18	49.04	1.9035		13	44	23.3	10.709
14	1	20	43.32	1.9058		13	55	4.1	10.650
15	1	22	37.73	1.9081		14	5	41.3	10.591
16	1	24	32.29	1.9104		14	16	15.0	10.531
17	1	26	26.99	1.9128		14	26	45.0	10.470
18	1	28	21.83	1.9153		14	37	11.4	10.408
19	1	30	16.82	1.9178		14	47	34.0	10.346
20	1	32	11.97	1.9203		14	57	52.9	10.283
21	1	34	7.27	1.9229		15	8	8.0	10.319
22	1	36	2.72	1.9255		15	18	19.2	10.165
23	1	37	58.33	1.9282		15	28	26.6	10.091
24	1	39	54.10	1.9309	N.	15	38	30.1	10.026

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
SUNDAY 25.					TUESDAY 27.				
0	1 39 54.10	1.9309	N.15° 38' 30.1"	10.026	0	3 16 14.63	2.0912	N.22° 11' 22.9"	6.065
1	1 41 50.04	1.9336	15 48 29.6	9.959	1	3 18 20.22	2.0949	22 17 25.0	5.986
2	1 43 46.14	1.9364	15 58 25.2	9.882	2	3 20 26.02	2.0985	22 23 21.2	5.907
3	1 45 42.41	1.9392	16 8 16.7	9.804	3	3 22 32.04	2.1022	22 29 11.4	5.787
4	1 47 38.84	1.9420	16 18 4.1	9.726	4	3 24 38.28	2.1058	22 34 55.6	5.666
5	1 49 35.44	1.9449	16 27 47.4	9.647	5	3 26 44.74	2.1095	22 40 33.7	5.545
6	1 51 32.22	1.9478	16 37 26.6	9.567	6	3 28 51.42	2.1131	22 46 5.7	5.423
7	1 53 29.17	1.9507	16 47 1.6	9.487	7	3 30 58.31	2.1167	22 51 31.7	5.300
8	1 55 26.30	1.9537	16 56 32.3	9.406	8	3 33 5.42	2.1203	22 56 51.5	5.177
9	1 57 23.61	1.9567	17 5 58.8	9.325	9	3 35 12.75	2.1239	23 2 5.0	5.173
10	1 59 21.10	1.9597	17 15 20.9	9.243	10	3 37 20.29	2.1275	23 7 12.3	5.089
11	2 1 18.77	1.9628	17 24 38.7	9.161	11	3 39 28.05	2.1311	23 12 13.3	4.964
12	2 3 16.63	1.9659	17 33 52.1	9.078	12	3 41 36.02	2.1347	23 17 8.0	4.838
13	2 5 14.68	1.9690	17 43 1.0	9.012	13	3 43 44.21	2.1383	23 21 56.3	4.731
14	2 7 12.91	1.9721	17 52 5.5	8.947	14	3 45 52.61	2.1418	23 26 38.1	4.644
15	2 9 11.33	1.9753	18 1 5.5	8.882	15	3 48 1.22	2.1453	23 31 13.5	4.536
16	2 11 9.95	1.9785	18 10 0.9	8.816	16	3 50 10.04	2.1488	23 35 42.5	4.428
17	2 13 8.76	1.9817	18 18 51.7	8.750	17	3 52 19.08	2.1523	23 40 4.9	4.319
18	2 15 7.76	1.9850	18 27 37.9	8.683	18	3 54 28.32	2.1558	23 44 20.8	4.209
19	2 17 6.96	1.9883	18 36 19.4	8.616	19	3 56 37.77	2.1592	23 48 30.1	4.099
20	2 19 6.36	1.9916	18 44 56.1	8.549	20	3 58 47.42	2.1626	23 52 32.7	3.988
21	2 21 5.96	1.9950	18 53 28.0	8.482	21	4 0 57.28	2.1660	23 56 28.6	3.877
22	2 23 5.76	1.9984	19 1 55.2	8.415	22	4 3 7.34	2.1694	24 0 17.9	3.765
23	2 25 5.76	2.0018	N.19° 10' 17.5"	8.348	23	4 5 17.60	2.1727	N.24° 4' 0.4"	3.652
MONDAY 26.					WEDNESDAY 28.				
0	2 27 5.97	2.0052	N.19° 18' 35.0"	8.280	0	4 7 28.07	2.1761	N.24° 7' 36.2"	3.539
1	2 29 6.38	2.0086	19 26 47.5	8.168	1	4 9 38.74	2.1794	24 11 5.1	3.425
2	2 31 7.00	2.0120	19 34 55.1	8.085	2	4 11 49.60	2.1826	24 14 27.2	3.311
3	2 33 7.83	2.0155	19 42 57.7	8.001	3	4 14 0.65	2.1858	24 17 42.4	3.196
4	2 35 8.86	2.0190	19 50 55.2	7.916	4	4 16 11.90	2.1890	24 20 50.7	3.080
5	2 37 10.10	2.0225	19 58 47.6	7.831	5	4 18 23.34	2.1922	24 23 52.0	2.964
6	2 39 11.56	2.0260	20 6 34.9	7.745	6	4 20 34.97	2.1953	24 26 46.4	2.848
7	2 41 13.22	2.0295	20 14 17.1	7.659	7	4 22 46.78	2.1984	24 29 33.8	2.731
8	2 43 15.10	2.0331	20 21 54.0	7.572	8	4 24 58.78	2.2015	24 32 14.1	2.613
9	2 45 17.19	2.0367	20 29 25.7	7.484	9	4 27 10.96	2.2046	24 34 47.3	2.494
10	2 47 19.50	2.0402	20 36 52.1	7.395	10	4 29 23.33	2.2076	24 37 13.4	2.376
11	2 49 22.02	2.0438	20 44 13.1	7.306	11	4 31 35.87	2.2105	24 39 32.4	2.257
12	2 51 24.75	2.0474	20 51 28.8	7.216	12	4 33 48.59	2.2134	24 41 44.2	2.137
13	2 53 27.70	2.0510	20 58 39.1	7.126	13	4 36 1.48	2.2163	24 43 48.8	2.016
14	2 55 30.87	2.0546	21 5 43.9	7.035	14	4 38 14.55	2.2191	24 45 46.1	1.895
15	2 57 34.26	2.0583	21 12 43.2	6.943	15	4 40 27.78	2.2219	24 47 36.2	1.774
16	2 59 37.87	2.0619	21 19 37.0	6.850	16	4 42 41.18	2.2247	24 49 19.0	1.652
17	3 1 41.70	2.0656	21 26 25.2	6.757	17	4 44 54.74	2.2274	24 50 54.5	1.530
18	3 3 45.74	2.0692	21 33 7.8	6.663	18	4 47 8.46	2.2301	24 52 22.6	1.407
19	3 5 50.00	2.0729	21 39 44.7	6.568	19	4 49 22.34	2.2327	24 53 43.3	1.283
20	3 7 54.49	2.0765	21 46 15.9	6.472	20	4 51 36.37	2.2353	24 54 56.6	1.160
21	3 9 59.20	2.0802	21 52 41.3	6.376	21	4 53 50.58	2.2378	24 56 2.5	1.036
22	3 12 4.12	2.0839	21 59 1.0	6.280	22	4 56 4.91	2.2403	24 57 0.9	0.911
23	3 14 9.26	2.0876	22 5 14.9	6.183	23	4 58 19.40	2.2427	24 57 51.8	0.786
24	3 16 14.63	2.0912	N.22° 11' 22.9"	6.085	24	5 0 34.03	2.2451	N.24° 58' 35.2"	0.661

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
THURSDAY 29.					SATURDAY 31.				
0	5 0 34.03	2.2461	N.24 58 35.2	0.861	0	6 50 1.74	2.2942	N.23 0 39.6	5.617
1	5 2 48.81	2.2474	24 59 11.1	0.835	1	6 52 19.39	2.2939	22 54 58.6	5.748
2	5 5 3.72	2.2487	24 59 39.4	0.409	2	6 54 37.01	2.2935	22 49 9.8	5.878
3	5 7 18.76	2.2519	25 0 0.1	0.282	3	6 56 54.61	2.2931	22 43 13.2	6.008
4	5 9 33.94	2.2541	25 0 13.2	0.165	4	6 59 12.18	2.2926	22 37 8.8	6.138
5	5 11 49.25	2.2562	25 0 18.7	0.038	5	7 1 29.72	2.2921	22 30 56.6	6.268
6	5 14 4.68	2.2568	25 0 16.5	0.100	6	7 3 47.23	2.2916	22 24 36.6	6.397
7	5 16 20.23	2.2608	25 0 6.6	0.328	7	7 6 4.71	2.2910	22 18 8.9	6.526
8	5 18 35.91	2.2623	24 59 49.1	0.356	8	7 8 22.15	2.2905	22 11 33.5	6.655
9	5 20 51.70	2.2643	24 59 23.9	0.485	9	7 10 39.55	2.2906	22 4 50.4	6.783
10	5 23 7.61	2.2680	24 58 50.9	0.614	10	7 12 56.90	2.2899	21 57 59.6	6.911
11	5 25 23.62	2.2678	24 58 10.2	0.743	11	7 15 14.21	2.2881	21 51 1.1	7.038
12	5 27 39.74	2.2686	24 57 21.7	0.872	12	7 17 31.47	2.2873	21 43 55.0	7.165
13	5 29 55.97	2.2712	24 56 25.5	1.002	13	7 19 48.69	2.2866	21 36 41.3	7.292
14	5 32 12.29	2.2738	24 55 21.4	1.132	14	7 22 5.85	2.2856	21 29 20.0	7.418
15	5 34 28.71	2.2744	24 54 9.5	1.263	15	7 24 22.96	2.2847	21 21 51.2	7.544
16	5 36 45.22	2.2769	24 52 49.8	1.394	16	7 26 40.01	2.2838	21 14 14.8	7.669
17	5 39 1.82	2.2774	24 51 22.2	1.525	17	7 28 57.01	2.2828	21 6 30.9	7.794
18	5 41 18.51	2.2788	24 49 46.8	1.656	18	7 31 13.95	2.2818	20 58 39.5	7.918
19	5 43 35.28	2.2801	24 48 3.5	1.787	19	7 33 30.83	2.2807	20 50 40.7	8.042
20	5 45 52.12	2.2814	24 46 12.4	1.918	20	7 35 47.64	2.2796	20 42 34.4	8.165
21	5 48 9.04	2.2826	24 44 13.4	2.050	21	7 38 4.39	2.2785	20 34 20.8	8.288
22	5 50 26.04	2.2838	24 42 6.4	2.182	22	7 40 21.07	2.2774	20 25 59.8	8.410
23	5 52 43.10	2.2849	N.24 39 51.5	2.314	23	7 42 37.68	2.2763	N.20 17 31.5	8.532
FRIDAY 30.					SUNDAY, SEPTEMBER 1.				
0	5 55 0.23	2.2880	N.24 37 28.7	2.446	0	7 44 54.23	2.2751	N.20 8 55.9	8.653
1	5 57 17.42	2.2870	24 34 58.0	2.578					
2	5 59 34.67	2.2879	24 32 19.3	2.710					
3	6 1 51.97	2.2887	24 29 32.7	2.843					
4	6 4 9.32	2.2895	24 26 38.2	2.974					
5	6 6 26.72	2.2903	24 23 35.7	3.107					
6	6 8 44.16	2.2910	24 20 25.3	3.239					
7	6 11 1.64	2.2917	24 17 6.9	3.372					
8	6 13 19.16	2.2923	24 13 40.6	3.504					
9	6 15 36.71	2.2929	24 10 6.3	3.637					
10	6 17 54.29	2.2933	24 6 24.1	3.769					
11	6 20 11.90	2.2937	24 2 33.9	3.902					
12	6 22 29.53	2.2941	23 58 35.8	4.034					
13	6 24 47.18	2.2944	23 54 29.7	4.167					
14	6 27 4.85	2.2946	23 50 15.7	4.299					
15	6 29 22.53	2.2948	23 45 53.7	4.432					
16	6 31 40.22	2.2949	23 41 23.8	4.564					
17	6 33 57.92	2.2960	23 36 46.0	4.697					
18	6 36 15.62	2.2960	23 32 0.2	4.829					
19	6 38 33.32	2.2950	23 27 6.5	4.961					
20	6 40 51.02	2.2949	23 22 4.9	5.093					
21	6 43 8.71	2.2948	23 16 55.4	5.224					
22	6 45 26.40	2.2947	23 11 38.0	5.355					
23	6 47 44.08	2.2945	23 6 12.7	5.486					
24	6 50 1.74	2.2942	N.23 0 39.6	5.617					

PHASES OF THE MOON.

- New Moon, 6 0 54.5
- ☾ First Quarter, 12 19 15.8
- Full Moon, 19 23 51.5
- ☾ Last Quarter, 28 1 23.2

- ☾ Perigee, 10 2.6
- ☾ Apogee, 25 15.8

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Star's Name and Position.	Noon.	P. L. of Diff.	IIIh.	P. L. of Diff.	VIh.	P. L. of Diff.	IXh.	P. L. of Diff.
1	Fomalhaut W.	97° 20' 48"	3361	98° 43' 49"	3353	100° 6' 59"	3346	101° 30' 17"	3339
	α Pegasi W.	76 49 30	3073	78 18 13	3060	79 47 12	3047	81 16 27	3034
	α Arietis W.	33 24 46	2980	34 55 24	2964	36 26 22	2949	37 57 39	2935
	SUN E.	60 32 22	3282	59 7 50	3370	57 43 4	3258	56 18 3	3246
2	Fomalhaut W.	108 28 37	3312	109 52 35	3306	111 16 37	3306	112 40 42	3304
	α Pegasi W.	88 46 43	2908	90 17 36	2905	91 48 45	2942	93 20 11	2928
	α Arietis W.	45 38 44	3080	47 11 54	3045	48 45 23	3030	50 19 12	3015
	Aldebaran W.	15 5 5	3502	16 23 48	3449	17 45 9	3335	19 8 40	3344
SUN E.	49 9 13	3179	47 42 39	3165	46 15 48	3162	44 48 41	3138	
3	α Pegasi W.	101 1 30	2986	102 34 35	2951	104 7 57	2939	105 41 34	2927
	α Arietis W.	58 13 11	3740	59 48 58	3725	61 25 5	3709	63 1 33	3694
	Aldebaran W.	26 28 27	2954	27 59 37	2917	29 31 34	2902	31 4 16	2886
	SUN E.	37 28 42	3055	35 59 49	3050	34 30 38	3035	33 1 9	3021
8	SUN W.	26 4 9	2586	27 43 23	2578	29 22 48	2571	31 2 23	2565
	Spica E.	40 20 37	2377	38 34 3	2373	36 47 23	2370	35 0 39	2367
	Antares E.	85 56 21	2302	84 9 26	2307	82 22 23	2303	80 35 14	2299
9	SUN W.	39 22 0	2545	41 2 11	2543	42 42 25	2540	44 22 42	2539
	Antares E.	71 38 13	2326	69 50 37	2323	68 2 59	2322	66 15 19	2321
	α Aquilæ E.	121 48 21	2991	120 17 57	2993	118 46 56	2985	117 15 22	2912
10	SUN W.	52 44 29	2637	54 24 51	2638	56 5 12	2639	57 45 31	2640
	Venus W.	28 47 51	3707	30 24 21	3700	32 1 1	3694	33 37 49	3689
	Antares E.	57 16 47	2331	55 29 6	2323	53 41 26	2323	51 53 48	2325
	α Aquilæ E.	109 30 59	2928	107 57 7	2916	106 23 0	2907	104 48 41	2798
11	SUN W.	66 6 29	2552	67 46 30	2555	69 26 27	2559	71 6 19	2561
	Venus W.	41 42 51	2982	43 19 55	2982	44 56 59	2983	46 34 2	2984
	Antares E.	42 56 26	2347	41 9 9	2351	39 21 57	2354	37 34 50	2356
	α Aquilæ E.	96 55 4	2779	95 20 9	2779	93 45 13	2780	92 10 19	2783
	Fomalhaut E.	121 58 57	2992	120 25 36	2992	118 51 50	2915	117 17 42	2901
12	SUN W.	79 24 21	2563	81 3 40	2568	82 42 52	2569	84 21 56	2569
	Venus W.	54 38 35	2998	56 15 18	2701	57 51 56	2705	59 28 29	2710
	Spica W.	17 19 3	2339	19 4 6	2333	20 49 18	2328	22 34 36	2327
	Antares E.	28 40 47	2361	26 54 19	2366	25 7 59	2391	23 21 47	2386
	α Aquilæ E.	84 16 59	2909	82 42 43	2918	81 8 38	2923	79 34 46	2930
Fomalhaut E.	109 23 5	2754	107 47 37	2749	106 12 2	2745	104 36 22	2743	
13	SUN W.	92 35 31	2926	94 13 51	2922	95 52 3	2923	97 30 7	2923
	Venus W.	67 29 42	2734	69 5 37	2739	70 41 25	2746	72 17 5	2750
	Spica W.	31 21 7	2330	33 6 16	2336	34 51 20	2342	36 36 18	2346
	α Aquilæ E.	71 49 31	2912	70 17 28	2921	68 45 48	2921	67 14 34	2973
	Fomalhaut E.	96 37 38	2744	95 1 57	2747	93 26 19	2761	91 50 47	2766
α Pegasi E.	117 59 12	2493	116 17 49	2494	114 36 27	2494	112 55 5	2486	
14	SUN W.	105 38 19	2976	107 15 31	2983	108 52 34	2989	110 29 27	2997
	Venus W.	80 13 30	2782	81 48 22	2786	83 23 6	2795	84 57 41	2801
	Spica W.	45 19 34	2371	47 3 51	2375	48 48 1	2382	50 32 2	2387
	α Aquilæ E.	59 46 4	3114	58 18 11	3148	56 51 0	3183	55 24 34	3228
	Fomalhaut E.	83 55 3	2792	82 20 25	2801	80 45 59	2812	79 11 47	2824
α Pegasi E.	104 28 57	2509	102 47 56	2513	101 7 1	2517	99 26 12	2522	

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Star's Name and Position.	Midnight.	P. L. of Dist.	XVh.	P. L. of Dist.	XVIIIh.	P. L. of Dist.	XXIh.	P. L. of Dist.
1	Fomalhaut W.	102° 53' 43"	2222	104° 17' 17"	2227	105° 40' 57"	2221	107° 4' 44"	2216
	a Pegasi W.	82 45 58	2021	84 15 45	2008	85 45 48	2005	87 16 7	2061
	a Arctis W.	39 29 14	2220	41 1 8	2005	42 33 21	2000	44 5 53	2076
	SUN E.	54 52 48	2222	53 27 17	2220	52 1 31	2207	50 35 30	2193
2	Fomalhaut W.	114 4 49	2203	115 28 57	2202	116 53 6	2204	118 17 13	2207
	a Pegasi W.	94 51 54	2016	96 23 53	2002	97 56 9	2000	99 28 41	2076
	a Arctis W.	51 53 21	2000	53 27 49	2785	55 2 37	2770	56 37 44	2765
	Aldebaran W.	20 33 57	2162	22 0 50	2162	23 28 57	2047	24 58 12	2006
	SUN E.	43 21 17	2122	41 53 35	2108	40 25 35	2092	38 57 17	2079
3	a Pegasi W.	107 15 27	2015	108 49 36	2004	110 23 59	2792	111 58 37	2782
	a Arctis W.	64 38 21	2079	66 15 29	2064	67 52 57	2049	69 30 46	2025
	Aldebaran W.	32 37 39	2021	34 11 39	2782	35 46 16	2766	37 21 28	2742
	SUN E.	31 31 22	2007	30 1 18	2092	28 30 56	2079	27 0 17	2066
8	SUN W.	32 42 6	2200	34 21 56	2255	36 1 52	2251	37 41 54	2248
	Spica E.	33 13 51	2206	31 27 1	2265	29 40 10	2266	27 53 19	2266
	Antares E.	78 48 0	2245	77 0 40	2242	75 13 15	2229	73 25 46	2227
9	SUN W.	46 3 1	2226	47 43 22	2227	49 23 44	2226	51 4 7	2225
	Antares E.	64 27 37	2221	62 39 55	2220	60 52 12	2220	59 4 29	2221
	a Aquilæ E.	115 43 18	2001	114 10 47	2072	112 37 52	2056	111 4 35	2040
10	SUN W.	59 25 48	2242	61 6 3	2244	62 46 15	2246	64 26 24	2249
	Venus W.	35 14 43	2027	36 51 41	2024	38 28 43	2022	40 5 47	2022
	Antares E.	50 6 13	2227	48 18 41	2220	46 31 12	2242	44 43 47	2245
	a Aquilæ E.	103 14 11	2792	101 39 33	2787	100 4 48	2782	98 29 58	2780
11	SUN W.	72 46 7	2265	74 25 50	2269	76 5 27	2274	77 44 57	2279
	Venus W.	48 11 3	2027	49 48 1	2029	51 24 56	2022	53 1 47	2024
	Antares E.	35 47 49	2262	34 0 54	2266	32 14 5	2270	30 27 22	2276
	a Aquilæ E.	90 35 28	2785	89 0 41	2789	87 25 59	2795	85 51 25	2801
	Fomalhaut E.	115 43 16	2788	114 8 33	2778	112 33 36	2769	110 58 26	2760
12	SUN W.	86 0 53	2002	87 39 44	2009	89 18 27	2014	90 57 3	2020
	Venus W.	61 4 56	2714	62 41 17	2719	64 17 32	2724	65 53 40	2729
	Spica W.	24 19 56	2206	26 5 17	2227	27 50 37	2229	29 35 54	2232
	Antares E.	21 35 45	2204	19 49 52	2212	18 4 10	2220	16 18 40	2221
	a Aquilæ E.	78 1 9	2051	76 27 47	2064	74 54 42	2079	73 21 56	2095
	Fomalhaut E.	103 0 39	2741	101 24 54	2741	99 49 8	2741	98 13 22	2742
13	SUN W.	99 8 3	2020	100 45 50	2026	102 23 29	2022	104 0 59	2070
	Venus W.	73 52 38	2766	75 28 3	2762	77 3 20	2769	78 38 29	2775
	Spica W.	38 21 11	2260	40 5 57	2265	41 50 36	2269	43 35 9	2265
	a Aquilæ E.	65 43 48	2027	64 13 31	2022	62 43 47	2021	61 14 37	2021
	Fomalhaut E.	90 15 21	2792	88 40 3	2788	87 4 53	2775	85 29 53	2782
	a Pegasi E.	111 13 45	2427	109 32 28	2429	107 51 14	2422	106 10 3	2405
14	SUN W.	112 6 11	2704	113 42 46	2711	115 19 11	2719	116 55 26	2726
	Venus W.	86 32 7	2008	88 6 24	2015	89 40 32	2022	91 14 31	2020
	Spica W.	52 15 55	2202	53 59 40	2209	55 43 16	2205	57 26 43	2211
	a Aquilæ E.	53 58 58	2272	52 34 14	2221	51 10 27	2275	49 47 42	2222
	Fomalhaut E.	77 37 50	2026	76 4 9	2049	74 30 45	2062	72 57 39	2078
	a Pegasi E.	97 45 29	2227	96 4 54	2222	94 24 27	2229	92 44 8	2245

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Star's Name and Position.	Noon.	P. L. of Dist.	III ^h .	P. L. of Dist.	VI ^h .	P. L. of Dist.	IX ^h .	P. L. of Dist.	
15	SUN W.	118° 31' 31"	2724	120° 7' 20"	2741	121° 43' 11"	2749	123° 18' 46"	2756	
	Venus W.	92 48 20	2637	94 22 0	2645	95 55 30	2652	97 28 50	2660	
	Spica W.	50 10 2	2417	60 53 12	2424	62 36 12	2431	64 19 3	2438	
	α Aquilæ E.	48 26 3	2497	47 5 36	2668	45 46 27	2644	44 28 40	2736	
	Fomalhaut E.	71 24 52	2694	69 52 26	2912	68 20 23	2931	66 48 44	2962	
	α Pegasi E.	91 3 57	2661	89 23 55	2669	87 44 3	2666	86 4 20	2673	
	α Arietis E.	134 12 10	2443	132 29 37	2448	130 47 11	2463	129 4 52	2466	
16	Venus W.	105 12 57	2601	106 45 15	2609	108 17 22	2616	109 49 18	2627	
	Spica W.	72 50 53	2473	74 32 45	2480	76 14 27	2487	77 55 59	2494	
	Antares W.	27 10 23	2473	28 52 14	2480	30 33 56	2486	32 15 29	2493	
	Fomalhaut E.	50 17 26	2676	57 48 46	2106	56 20 43	2139	54 53 21	2176	
	α Pegasi E.	77 48 32	2616	76 9 58	2626	74 31 37	2635	72 53 30	2646	
	α Arietis E.	120 35 18	2489	118 53 49	2496	117 12 30	2502	115 31 20	2510	
	17	Venus W.	117 26 6	2673	118 56 52	2684	120 27 25	2693	121 57 46	2704
Spica W.		86 20 58	2633	88 1 25	2643	89 41 40	2650	91 21 44	2666	
Antares W.		40 40 40	2831	42 21 10	2888	44 1 30	2947	45 41 38	2966	
Fomalhaut E.		47 48 21	2403	46 26 10	2462	45 5 3	2525	43 45 6	2586	
α Pegasi E.		64 46 37	2705	63 10 4	2719	61 33 49	2732	59 57 52	2747	
α Arietis E.		107 8 1	2546	105 27 52	2564	103 47 54	2592	102 8 7	2671	
18		Spica W.	99 39 11	2601	101 18 4	2610	102 56 45	2620	104 35 13	2629
	Antares W.	53 59 27	2593	55 38 25	2606	57 17 12	2615	58 55 46	2624	
	Fomalhaut E.	37 27 3	2679	36 16 41	2711	35 8 25	2761	34 2 28	2830	
	α Pegasi E.	52 3 23	2636	50 29 40	2646	48 56 23	2677	47 23 35	2701	
	α Arietis E.	93 52 5	2613	92 13 28	2623	90 35 3	2631	88 56 50	2640	
	Aldebaran E.	126 19 40	2667	124 42 16	2673	123 5 0	2679	121 27 52	2686	
	19	Spica W.	112 44 25	2676	114 21 37	2687	115 58 35	2696	117 35 20	2706
Antares W.		67 5 31	2671	68 42 50	2681	70 19 56	2691	71 56 48	2700	
α Pegasi E.		39 47 49	2646	38 18 36	2667	36 50 10	2729	35 22 35	2774	
α Arietis E.		80 48 55	2668	79 11 59	2668	77 35 16	2707	75 58 46	2717	
Aldebaran E.		113 24 37	2726	111 48 30	2733	110 12 34	2741	108 36 49	2760	
20		Antares W.	79 57 56	2780	81 33 30	2760	83 8 51	2769	84 43 59	2780
		α Aquilæ W.	36 41 19	2689	37 42 28	2660	38 45 27	2448	39 50 5	2447
	α Arietis E.	67 59 39	2769	66 24 31	2780	64 49 37	2790	63 14 56	2801	
	Aldebaran E.	100 41 1	2796	99 6 28	2806	97 32 8	2816	95 58 0	2825	
	21	Antares W.	92 36 18	2630	94 10 7	2640	95 43 43	2650	97 17 6	2660
		α Aquilæ W.	45 33 13	2693	46 44 59	2643	47 57 35	2601	49 10 54	2661
		α Arietis E.	55 25 5	2666	53 51 49	2667	52 18 48	2678	50 46 1	2686
Aldebaran E.		88 10 34	2676	86 37 43	2686	85 5 6	2696	83 32 41	2706	
Pollux E.		130 3 22	2690	128 30 50	2697	126 58 27	2706	125 26 14	2712	
22		Antares W.	105 0 54	2606	106 33 3	2617	108 5 0	2627	109 36 45	2636
		α Aquilæ W.	55 26 9	2723	56 42 32	2704	57 59 15	2696	59 16 17	2671
	Fomalhaut W.	32 53 30	2634	33 52 38	2601	34 53 45	2606	35 56 39	2486	
	α Arietis E.	43 5 44	2646	41 34 24	2656	40 3 19	2670	38 32 29	2682	
	Aldebaran E.	75 53 50	2666	74 22 42	2666	72 51 47	2676	71 21 4	2685	
	Pollux E.	117 47 39	2693	116 16 26	2690	114 45 23	2690	113 14 31	2677	
	23	Antares W.	117 12 46	2677	118 43 27	2686	120 13 58	2696	121 44 20	2701
α Aquilæ W.		65 44 51	2620	67 3 4	2613	68 21 24	2607	69 39 51	2602	

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Star's Name and Position	Midnight.	P. L. of Dist.	XVh.	P. L. of Dist.	XVIIIh.	P. L. of Dist.	XXIh.	P. L. of Dist.	
15	SUN W.	124° 54' 11"	3768	126° 29' 25"	3773	128° 4' 28"	3782	129° 39' 20"	3789	
	Venus W.	99 2 0	3808	100 35 0	3876	102 7 49	3884	103 40 28	3892	
	Spica W.	66 1 44	2444	67 44 16	2451	69 26 38	2458	71 8 51	2465	
	α Aquilæ E.	43 12 23	3829	41 57 44	3826	40 44 51	4043	39 33 54	4172	
	Fomalhaut E.	65 17 31	3973	63 46 45	3996	62 16 27	3921	60 46 40	3947	
	α Pegasi E.	84 24 48	3581	82 45 27	3589	81 6 17	3597	79 27 18	3607	
	α Arietis E.	127 22 40	3466	125 40 37	3470	123 58 42	3477	122 16 56	2482	
16	Venus W.	111 21 3	3986	112 52 36	3945	114 23 58	3954	115 55 8	3964	
	Spica W.	79 37 20	3809	81 18 31	3810	82 59 31	3817	84 40 20	3828	
	Antares W.	33 56 52	3500	35 38 5	3508	37 19 7	3515	38 59 59	3525	
	Fomalhaut E.	53 26 42	3213	52 0 48	3265	50 35 44	3301	49 11 34	3351	
	α Pegasi E.	71 15 37	3656	69 37 58	3688	68 0 35	3689	66 23 28	3692	
	α Arietis E.	113 50 20	3517	112 9 30	3524	110 28 50	3531	108 48 20	2539	
	17	Venus W.	123 27 54	3014	124 57 49	3025	126 27 31	3036	127 56 59	3047
Spica W.		93 1 37	2566	94 41 18	2576	96 20 47	2583	98 0 5	2592	
Antares W.		47 21 35	2564	49 1 20	2572	50 40 54	2580	52 20 16	2588	
Fomalhaut E.		42 26 26	3674	41 9 11	3760	39 53 27	3855	38 39 21	3951	
α Pegasi E.		58 23 15	3763	56 46 58	3779	55 12 3	3797	53 37 31	3815	
α Arietis E.		100 28 32	2579	98 49 8	2587	97 9 55	2596	95 30 54	2604	
18		Spica W.	106 13 29	2639	107 51 32	2648	109 29 22	2657	111 7 0	2666
	Antares W.	60 34 8	3633	62 12 18	3643	63 50 15	3652	65 27 59	2661	
	Fomalhaut E.	32 59 2	4721	31 58 20	4938	31 0 36	5199	30 6 6	5478	
	α Pegasi E.	45 51 17	3926	44 19 31	3963	42 48 19	3993	41 17 44	3914	
	α Arietis E.	87 18 49	3649	85 41 1	3669	84 3 26	3699	82 26 4	3678	
	Aldebaran E.	119 50 53	2692	118 14 3	2701	116 37 24	2708	115 0 55	2716	
	19	Spica W.	119 11 52	2716	120 48 11	2726	122 24 16	2737	124 0 7	2747
Antares W.		73 33 28	2710	75 9 55	2719	76 46 9	2730	78 22 9	2740	
α Pegasi E.		33 55 55	3226	32 30 17	3284	31 5 47	3348	29 42 31	3423	
α Arietis E.		74 22 29	2728	72 46 26	2738	71 10 37	2748	69 35 1	2759	
Aldebaran E.		107 1 15	2760	105 25 54	2768	103 50 44	2777	102 15 46	2787	
20		Antares W.	86 18 53	2790	87 53 34	2800	89 28 2	2810	91 2 16	2820
		α Aquilæ W.	40 56 14	4289	42 3 45	4180	43 12 30	4111	44 22 21	4048
	α Arietis E.	61 40 29	2812	60 6 17	2828	58 32 19	2834	56 58 35	2845	
	Aldebaran E.	94 24 5	2836	92 50 23	2845	91 16 54	2855	89 43 37	2866	
	21	Antares W.	96 50 16	2869	100 23 14	2879	101 56 0	2889	103 28 33	2898
		α Aquilæ W.	50 24 53	3827	51 39 27	3795	52 54 34	3768	54 10 9	3746
		α Arietis E.	49 13 29	2901	47 41 11	2912	46 9 8	2924	44 37 19	2935
Aldebaran E.		82 0 29	3916	80 28 30	3926	78 56 44	3936	77 25 11	3946	
Pollux E.		123 54 11	3920	122 22 18	3928	120 50 35	3936	119 19 2	3944	
22		Antares W.	111 8 19	3944	112 39 42	3953	114 10 54	3962	115 41 55	3969
		α Aquilæ W.	60 33 35	3668	61 51 7	3647	63 8 51	3636	64 26 46	3627
	Fomalhaut W.	37 1 10	4866	38 7 9	4374	39 14 26	4198	40 22 54	4180	
	α Arietis E.	37 1 54	2994	35 31 34	3007	34 1 30	3021	32 31 43	3034	
	Aldebaran E.	69 50 33	2995	68 20 14	3005	66 50 8	3015	65 20 14	3024	
	Pollux E.	111 43 49	3984	110 13 16	3992	108 42 53	3999	107 12 40	3997	
	23	Antares W.	123 14 32	3907	124 44 36	3914	126 14 31	3921	127 44 18	3926
α Aquilæ W.		70 58 23	3598	72 16 59	3595	73 35 39	3593	74 54 21	3591	

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Star's Name and Position.	Noon.	P. L. of Dist.	III ^h .	P. L. of Dist.	VI ^h .	P. L. of Dist.	IX ^h .	P. L. of Dist.
23	Fomalhaut W.	41° 32' 27"	4071	42° 42' 57"	4017	43° 54' 20"	3909	45° 6' 30"	3925
	a Arietis E.	31 2 13	3048	29 33 0	3064	28 4 6	3079	26 35 31	3086
	Aldebaran E.	63 50 31	3034	62 21 0	3043	60 51 41	3062	59 22 33	3061
	Pollux E.	105 42 36	3016	104 12 42	3023	102 42 57	3029	101 13 20	3033
24	a Aquilæ W.	76 13 5	3089	77 31 51	3088	78 50 38	3088	80 9 25	3088
	Fomalhaut W.	51 16 55	3768	52 32 31	3744	53 48 32	3722	55 4 56	3703
	a Pegasi W.	28 30 8	3709	29 46 45	3655	31 4 20	3610	32 22 44	3569
	Aldebaran E.	51 59 40	3106	50 31 38	3116	49 3 48	3124	47 36 8	3133
	Pollux E.	93 47 16	3067	92 18 26	3072	90 49 42	3078	89 21 5	3062
	SUN E.	134 8 39	3414	132 46 38	3419	131 24 43	3423	130 2 53	3428
25	a Aquilæ W.	86 43 16	3592	88 1 59	3594	89 20 40	3596	90 39 19	3596
	Fomalhaut W.	61 31 31	3637	62 49 36	3615	64 7 54	3603	65 26 25	3603
	a Pegasi W.	39 4 4	3432	40 25 44	3413	41 47 46	3395	43 10 8	3379
	Aldebaran E.	40 20 33	3180	38 54 0	3191	37 27 40	3201	36 1 32	3213
	Pollux E.	81 59 23	3102	80 31 16	3105	79 3 13	3109	77 35 14	3110
	SUN E.	123 14 58	3447	121 53 35	3450	120 32 15	3452	119 10 57	3454
26	a Aquilæ W.	97 11 54	3612	98 30 15	3615	99 48 33	3619	101 6 47	3622
	Fomalhaut W.	72 1 40	3547	73 21 12	3540	74 40 52	3532	76 0 41	3526
	a Pegasi W.	50 5 57	3318	51 29 48	3306	52 53 52	3297	54 18 7	3287
	Aldebaran E.	28 54 43	3289	27 30 19	3311	26 6 20	3326	24 42 50	3336
	Pollux E.	70 15 48	3117	68 47 59	3117	67 20 10	3116	65 52 20	3115
	SUN E.	112 24 50	3456	111 3 37	3456	109 42 23	3454	108 21 8	3452
27	a Aquilæ W.	107 36 47	3648	108 54 30	3633	110 12 7	3620	111 29 37	3627
	Fomalhaut W.	82 41 46	3489	84 2 22	3482	85 23 6	3475	86 43 58	3469
	a Pegasi W.	61 22 12	3240	62 47 34	3231	64 13 7	3231	65 38 51	3231
	Pollux E.	58 32 52	3107	57 4 51	3105	55 36 47	3101	54 8 39	3098
	SUN E.	101 34 8	3436	100 12 32	3431	98 50 50	3426	97 29 2	3419
28	Fomalhaut W.	93 30 7	3436	94 51 43	3430	96 13 26	3424	97 35 15	3418
	a Pegasi W.	72 50 25	3183	74 17 20	3182	75 44 27	3141	77 11 47	3129
	a Arietis W.	29 19 56	3081	30 48 29	3066	32 17 20	3052	33 46 29	3036
	Pollux E.	46 46 56	3078	45 18 20	3074	43 49 39	3069	42 20 52	3065
	SUN E.	90 38 11	3382	89 15 34	3373	87 52 47	3365	86 29 50	3355
	29	Fomalhaut W.	104 26 3	3390	105 48 31	3385	107 11 5	3381	108 33 43	3377
a Pegasi W.		84 31 54	3072	86 0 38	3060	87 29 37	3047	88 58 52	3034
a Arietis W.		41 16 28	2969	42 47 19	2953	44 18 28	2941	45 49 55	2927
Pollux E.		34 55 43	3047	33 26 29	3046	31 57 13	3046	30 27 57	3047
SUN E.		79 32 4	3298	78 7 50	3286	76 43 22	3273	75 18 39	3260
30		Fomalhaut W.	115 27 47	3367	116 50 41	3368	118 13 34	3370	119 36 25	3373
	a Pegasi W.	96 29 6	3069	97 59 58	3055	99 31 7	3041	101 2 34	2926
	a Arietis W.	53 31 49	2832	55 5 10	2835	56 38 52	2820	58 12 54	2804
	Aldebaran W.	22 0 18	3164	23 27 22	3099	24 55 33	3052	26 24 41	3008
	SUN E.	68 11 1	3188	66 44 37	3172	65 17 54	3157	63 50 53	3140
	31	a Pegasi W.	108 44 4	3080	110 17 14	3048	111 50 40	3035	113 24 23	3022
a Arietis W.		66 8 25	2721	67 44 37	2704	69 21 12	2687	70 58 10	2669
Aldebaran W.		34 2 13	2844	35 35 44	2817	37 9 50	2790	38 44 31	2764
SUN E.		56 30 49	3067	55 1 47	3039	53 32 23	3022	52 2 38	3006

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Star's Name and Position.	Midnight.	P. L. of Dif.	XVh.	P. L. of Dif.	XVIIIh.	P. L. of Dif.	XXIh.	P. L. of Dif.
23	Fomalhaut W.	46° 19' 24"	3087	47° 32' 57"	3083	48° 47' 6"	3021	50° 1' 46"	3793
	α Arietis E.	25 7 16	3115	23 39 25	3125	22 11 58	3155	20 44 59	3185
	Aldebaran E.	57 53 36	3070	56 24 50	3090	54 56 16	3098	53 27 52	3098
	Pollux E.	99 43 51	3043	98 14 31	3049	96 45 19	3055	95 16 14	3080
24	α Aquilæ W.	81 28 12	3088	82 46 59	3088	84 5 46	3089	85 24 32	3501
	Fomalhaut W.	56 21 40	3085	57 38 43	3088	58 56 4	3054	60 13 40	3640
	α Pegasi W.	33 41 52	3035	35 1 38	3004	36 21 58	3477	37 42 48	3454
	Aldebaran E.	46 8 39	3143	44 41 21	3163	43 14 14	3161	41 47 18	3170
	Pollux E.	87 52 34	3087	86 24 9	3091	84 55 49	3095	83 27 34	3099
	SUN E.	128 41 9	3433	127 19 30	3437	125 57 55	3440	124 36 24	3445
25	α Aquilæ W.	91 57 55	3000	93 16 29	3003	94 35 0	3005	95 53 29	3009
	Fomalhaut W.	66 45 7	3053	68 4 0	3073	69 23 4	3055	70 42 17	3555
	α Pegasi W.	44 32 47	3065	45 55 43	3351	47 18 54	3340	48 42 19	3329
	Aldebaran E.	34 35 38	3225	33 9 59	3239	31 44 36	3253	30 19 30	3270
	Pollux E.	76 7 17	3113	74 39 22	3114	73 11 29	3115	71 43 38	3116
	SUN E.	117 49 42	3455	116 28 28	3456	115 7 15	3456	113 46 2	3467
26	α Aquilæ W.	102 24 57	3027	103 43 2	3031	105 1 3	3036	106 18 58	3043
	Fomalhaut W.	77 20 38	3017	78 40 43	3010	80 0 56	3053	81 21 17	3496
	α Pegasi W.	55 42 34	3077	57 7 12	3068	58 32 1	3259	59 57 1	3249
	Aldebaran E.	23 19 55	3401	21 57 40	3444	20 36 13	3497	19 15 46	3503
	Pollux E.	64 24 29	3114	62 56 37	3114	61 28 44	3113	60 0 49	3110
	SUN E.	106 59 50	3450	105 38 30	3447	104 17 7	3444	102 55 40	3439
27	α Aquilæ W.	112 46 59	3076	114 4 12	3084	115 21 16	3094	116 38 9	3705
	Fomalhaut W.	88 4 57	3492	89 26 4	3455	90 47 18	3449	92 8 39	3443
	α Pegasi W.	67 4 47	3302	68 30 54	3193	69 57 13	3188	71 23 43	3173
	Pollux E.	52 40 27	3095	51 12 11	3091	49 43 51	3087	48 15 26	3083
	SUN E.	96 7 7	3413	94 45 5	3407	93 22 56	3399	92 0 38	3391
28	Fomalhaut W.	98 57 11	3411	100 19 15	3406	101 41 25	3400	103 3 41	3395
	α Pegasi W.	78 39 21	3119	80 7 8	3107	81 35 9	3096	83 3 24	3083
	α Arietis W.	35 15 55	3034	36 45 38	3010	38 15 38	3097	39 45 54	2988
	Pollux E.	40 52 0	3061	39 23 3	3087	37 54 1	3053	36 24 54	3040
	SUN E.	85 6 42	3345	83 43 22	3333	82 19 49	3322	80 56 3	3311
29	Fomalhaut W.	109 56 26	3373	111 19 13	3373	112 42 2	3369	114 4 54	3368
	α Pegasi W.	90 28 23	3022	91 58 9	3008	93 28 12	2995	94 58 31	2982
	α Arietis W.	47 21 40	3012	48 53 44	2998	50 26 6	2982	51 58 48	2987
	Pollux E.	28 58 42	3049	27 29 30	3054	26 0 24	3054	24 31 30	3077
	SUN E.	73 53 41	3345	72 28 26	3332	71 2 55	3218	69 37 7	3203
30	Fomalhaut W.	120 59 12	3378	122 21 54	3384	123 44 29	3393	125 6 54	3403
	α Pegasi W.	102 34 17	2914	104 6 18	2901	105 38 36	2897	107 11 11	2873
	α Arietis W.	59 47 17	2788	61 22 1	2771	62 57 7	2754	64 32 35	2738
	Aldebaran W.	27 54 42	2970	29 25 32	2935	30 57 6	2904	32 29 20	2873
	SUN E.	62 23 32	3124	60 55 52	3107	59 27 51	3091	57 59 30	3074
31	α Pegasi W.	114 58 22	2810	116 32 37	2798	118 7 8	2798	119 41 54	2775
	α Arietis W.	72 35 31	2653	74 13 16	2635	75 51 24	2618	77 29 55	2600
	Aldebaran W.	40 19 46	2740	41 55 33	2716	43 31 52	2693	45 8 41	2670
	SUN E.	50 32 32	2989	49 2 5	2973	47 31 17	2953	46 0 5	2935

AT GREENWICH APPARENT NOON.

Day of the Week.	Day of the Month.	THE SUN'S						Sideral Time of the Semidiameter passing the Meridian.	Equation of Time, to be subtracted from Apparent Time.	Diff. for 1 hour.
		Apparent Right Ascension.	Diff. for 1 hour.	Apparent Declination.	Diff. for 1 hour.	Semi-diameter.				
		h m s	"	° ' "	"	' "				
Sun.	1	10 42 19.77	9.075	N. 8 12 32.3	54.58	15 53.82	64.41	0 12.06	0.781	
Mon.	2	10 45 57.40	9.064	7 50 38.7	54.91	15 54.05	64.37	0 30.93	0.792	
Tues.	3	10 49 34.76	9.053	7 28 37.4	55.22	15 54.29	64.33	0 50.06	0.803	
Wed.	4	10 53 11.87	9.043	7 6 28.8	55.52	15 54.53	64.29	1 9.47	0.814	
Thur.	5	10 56 48.74	9.034	6 44 13.3	55.80	15 54.77	64.25	1 29.11	0.824	
Fri.	6	11 0 25.38	9.025	6 21 51.1	56.07	15 55.01	64.22	1 48.96	0.833	
Sat.	7	11 4 1.81	9.016	5 59 22.7	56.32	15 55.26	64.19	2 9.02	0.841	
Sun.	8	11 7 38.04	9.008	5 36 48.4	56.56	15 55.51	64.17	2 29.30	0.848	
Mon.	9	11 11 14.08	9.001	5 14 8.5	56.78	15 55.76	64.15	2 49.76	0.855	
Tues.	10	11 14 49.97	8.994	4 51 23.4	56.99	15 56.02	64.13	3 10.36	0.862	
Wed.	11	11 18 25.72	8.989	4 28 33.5	57.19	15 56.28	64.11	3 31.11	0.868	
Thur.	12	11 22 1.33	8.984	4 5 39.0	57.38	15 56.54	64.09	3 51.98	0.872	
Fri.	13	11 25 36.84	8.980	3 42 40.2	57.54	15 56.80	64.08	4 12.97	0.875	
Sat.	14	11 29 12.27	8.977	3 19 37.5	57.70	15 57.06	64.07	4 34.04	0.878	
Sun.	15	11 32 47.63	8.974	2 56 31.3	57.84	15 57.33	64.06	4 55.19	0.880	
Mon.	16	11 36 22.95	8.973	2 33 21.9	57.97	15 57.60	64.06	5 16.36	0.882	
Tues.	17	11 39 58.24	8.972	2 10 9.5	58.09	15 57.87	64.06	5 37.55	0.884	
Wed.	18	11 43 33.53	8.973	1 46 54.4	58.19	15 58.13	64.06	5 58.77	0.882	
Thur.	19	11 47 8.84	8.974	1 23 37.0	58.29	15 58.39	64.07	6 19.96	0.880	
Fri.	20	11 50 44.20	8.977	1 0 17.5	58.36	15 58.66	64.08	6 41.09	0.878	
Sat.	21	11 54 19.62	8.980	0 36 56.2	58.43	15 58.93	64.09	7 2.16	0.875	
Sun.	22	11 57 55.14	8.984	N. 0 13 33.4	58.48	15 59.20	64.11	7 23.12	0.871	
Mon.	23	12 1 30.78	8.990	S. 0 9 50.3	58.52	15 59.46	64.13	7 43.96	0.866	
Tues.	24	12 5 6.58	8.997	0 33 14.8	58.55	15 59.73	64.15	8 4.65	0.860	
Wed.	25	12 8 42.54	9.004	0 56 39.8	58.56	16 0.00	64.17	8 25.20	0.853	
Thur.	26	12 12 18.69	9.013	1 20 4.8	58.55	16 0.27	64.20	8 45.55	0.844	
Fri.	27	12 15 55.05	9.022	1 43 29.6	58.53	16 0.54	64.23	9 5.69	0.834	
Sat.	28	12 19 31.64	9.032	2 6 53.8	58.49	16 0.81	64.26	9 25.60	0.825	
Sun.	29	12 23 8.48	9.042	2 30 16.9	58.44	16 1.08	64.30	9 45.26	0.815	
Mon.	30	12 26 45.60	9.054	2 53 38.6	58.38	16 1.35	64.34	10 4.64	0.804	
Tues.	31	12 30 23.00	9.066	S. 3 16 58.6	58.31	16 1.62	64.38	10 23.74	0.791	

NOTE. — Mean Time of the Semidiameter passing may be found by subtracting 0s.18 from the Sideral Time.

AT GREENWICH MEAN NOON.

THE SUN'S								
Day of the Week.	Day of the Month.	THE SUN'S				Equation of Time, to be added to Mean Time.	Diff. for 1 hour.	Sidereal Time.
		Apparent Right Ascension.	Diff. for 1 hour.	Apparent Declination.	Diff. for 1 hour.			
Sun.	1	10 ^h 42 ^m 19.80 ^s	9.075	N. 8° 12' 32.1"	54.58	0 12.06	0.781	10 42 31.86
Mon.	2	10 45 57.48	9.064	7 50 38.2	54.91	0 30.94	0.792	10 46 28.42
Tues.	3	10 49 34.88	9.053	7 28 36.6	55.22	0 50.09	0.803	10 50 24.97
Wed.	4	10 53 12.04	9.043	7 6 27.7	55.52	1 9.48	0.814	10 54 21.52
Thur.	5	10 56 48.96	9.034	6 44 11.9	55.80	1 29.12	0.824	10 58 18.08
Fri.	6	11 0 25.65	9.025	6 21 49.4	56.07	1 48.98	0.833	11 2 14.63
Sat.	7	11 4 2.13	9.016	5 59 20.7	56.32	2 9.05	0.841	11 6 11.18
Sun.	8	11 7 38.41	9.008	5 36 46.1	56.56	2 29.33	0.848	11 10 7.74
Mon.	9	11 11 14.50	9.001	5 14 5.9	56.78	2 49.79	0.855	11 14 4.29
Tues.	10	11 14 50.44	8.994	4 51 20.5	56.99	3 10.40	0.862	11 18 0.84
Wed.	11	11 18 26.24	8.989	4 28 30.2	57.19	3 31.16	0.868	11 21 57.40
Thur.	12	11 22 1.91	8.984	4 5 35.3	57.38	3 52.04	0.872	11 25 53.95
Fri.	13	11 25 37.47	8.980	3 42 36.2	57.54	4 13.03	0.875	11 29 50.50
Sat.	14	11 29 12.95	8.977	3 19 33.2	57.70	4 34.10	0.878	11 33 47.05
Sun.	15	11 32 48.36	8.974	2 56 26.7	57.84	4 55.25	0.880	11 37 43.61
Mon.	16	11 36 23.73	8.973	2 33 16.9	57.97	5 16.43	0.882	11 41 40.16
Tues.	17	11 39 59.08	8.972	2 10 4.1	58.09	5 37.63	0.884	11 45 36.70
Wed.	18	11 43 34.42	8.973	1 46 48.6	58.19	5 58.85	0.882	11 49 33.27
Thur.	19	11 47 9.78	8.974	1 23 30.8	58.29	6 20.04	0.880	11 53 29.82
Fri.	20	11 50 45.19	8.977	1 0 10.9	58.36	6 41.18	0.878	11 57 26.37
Sat.	21	11 54 20.67	8.980	0 36 49.3	58.43	7 2.26	0.875	12 1 22.93
Sun.	22	11 57 56.25	8.985	N. 0 13 26.2	58.48	7 23.23	0.871	12 5 19.48
Mon.	23	12 1 31.95	8.990	S. 0 9 57.9	58.52	7 44.08	0.866	12 9 16.03
Tues.	24	12 5 7.80	8.997	0 33 22.8	58.55	8 4.78	0.860	12 13 12.58
Wed.	25	12 8 43.81	9.004	0 56 48.1	58.56	8 25.33	0.853	12 17 9.14
Thur.	26	12 12 20.01	9.013	1 20 13.4	58.55	8 45.68	0.844	12 21 5.69
Fri.	27	12 15 56.42	9.022	1 43 38.5	58.53	9 5.82	0.834	12 25 2.24
Sat.	28	12 19 33.06	9.032	2 7 3.0	58.49	9 25.74	0.825	12 28 58.80
Sun.	29	12 23 9.95	9.042	2 30 26.4	58.44	9 45.40	0.815	12 32 55.35
Mon.	30	12 26 47.12	9.054	2 53 48.4	58.38	10 4.78	0.804	12 36 51.90
Tues.	31	12 30 24.57	9.066	S. 3 17 8.7	58.31	10 23.88	0.791	12 40 48.45

NOTE. — The Semidiameter for Mean Noon may be assumed the same as that for Apparent Noon.

AT GREENWICH MEAN NOON.

		THE SUN'S					Logarithm of the Radius Vector of the Earth.	Diff. for 1 hour.	Mean Time of Sidereal Oh.
Day of the Month.	Day of the Year.	True LONGITUDE.		Diff. for 1 hour.	LATITUDE.				
		λ	λ'						
1	244	158° 59' 9.5"	58° 18.2"	145.38	-0.01	0.0037078	43.3	13 15 17.49	
2	245	159 57 19.4	56 28.0	145.45	0.14	.0036029	44.0	13 11 21.58	
3	246	160 55 31.1	54 39.6	145.52	0.25	.0034963	44.7	13 7 25.67	
4	247	161 53 44.6	52 53.0	145.59	0.34	.0033881	45.4	13 3 29.76	
5	248	162 51 59.9	51 8.2	145.66	0.40	.0032783	46.0	12 59 33.86	
6	249	163 50 17.0	49 25.2	145.73	0.42	.0031670	46.7	12 55 37.96	
7	250	164 48 35.8	47 43.9	145.80	0.41	.0030541	47.3	12 51 42.05	
8	251	165 46 56.2	46 4.2	145.87	0.37	.0029397	47.9	12 47 46.14	
9	252	166 45 18.2	44 26.1	145.94	0.31	.0028239	48.4	12 43 50.23	
10	253	167 43 41.7	42 49.5	146.01	0.22	.0027070	48.8	12 39 54.32	
11	254	168 42 6.9	41 14.6	146.08	-0.12	.0025891	49.2	12 35 58.42	
12	255	169 40 33.6	39 41.2	146.15	+0.01	.0024703	49.6	12 32 2.51	
13	256	170 39 2.0	38 9.5	146.22	0.14	.0023508	49.9	12 28 6.60	
14	257	171 37 32.0	36 39.4	146.29	0.27	.0022306	50.1	12 24 10.69	
15	258	172 36 3.7	35 11.0	146.36	0.40	.0021100	50.2	12 20 14.79	
16	259	173 34 37.0	33 44.2	146.43	0.50	.0019890	50.3	12 16 18.89	
17	260	174 33 12.1	32 19.2	146.51	0.58	.0018680	50.4	12 12 22.98	
18	261	175 31 49.0	30 56.0	146.59	0.64	.0017470	50.4	12 8 27.07	
19	262	176 30 27.8	29 34.7	146.67	0.68	.0016260	50.4	12 4 31.16	
20	263	177 29 8.6	28 15.4	146.75	0.68	.0015050	50.4	12 0 35.25	
21	264	178 27 51.4	26 58.1	146.83	0.65	.0013840	50.4	11 56 39.35	
22	265	179 26 36.3	25 42.9	146.92	0.60	.0012630	50.4	11 52 43.44	
23	266	180 25 23.3	24 29.8	147.01	0.51	.0011420	50.4	11 48 47.53	
24	267	181 24 12.6	23 19.0	147.10	0.40	.0010210	50.4	11 44 51.62	
25	268	182 23 4.2	22 10.5	147.20	0.28	.0009000	50.5	11 40 55.72	
26	269	183 21 58.1	21 4.3	147.29	0.15	.0007789	50.5	11 36 59.82	
27	270	184 20 54.2	20 0.3	147.39	+0.01	.0006576	50.6	11 33 3.91	
28	271	185 19 52.6	18 58.6	147.49	-0.12	.0005361	50.7	11 29 8.00	
29	272	186 18 53.3	17 59.2	147.59	0.25	.0004142	50.9	11 25 12.09	
30	273	187 17 56.2	17 2.0	147.68	0.36	.0002917	51.2	11 21 16.18	
31	274	188 17 1.4	16 7.1	147.77	-0.45	0.0001685	51.5	11 17 20.28	

NOTE. — λ corresponds to the true equinox of the date, λ' to the mean equinox of January 0d.

GREENWICH MEAN TIME.

THE MOON'S

Day of the Month.	SEMI-DIAMETER.		HORIZONTAL PARALLAX.				MERIDIAN PASSAGE.		AGE.
	Noon.	Midnight.	Noon.	Diff. for 1 hour.	Midnight.	Diff. for 1 hour.			
							h	m	
1	15 38.8	15 45.8	57 18.6	+2.13	57 44.4	+2.14	21 48.1	2.16	26.0
2	15 52.7	15 59.5	58 10.0	2.10	58 34.8	2.01	22 39.4	2.12	27.0
3	16 5.9	16 11.8	58 58.3	1.88	59 19.9	1.71	23 30.1	2.11	28.0
4	16 17.0	16 21.5	59 39.2	1.49	59 55.6	1.23	♄		29.0
5	16 25.1	16 27.7	60 8.7	0.95	60 18.3	0.65	0 20.9	2.13	0.6
6	16 29.3	16 29.9	60 24.3	+0.34	60 26.5	+0.03	1 12.5	2.18	1.6
7	16 29.5	16 28.2	60 25.1	-0.26	60 20.3	-0.53	2 5.9	2.27	2.6
8	16 26.1	16 23.2	60 12.4	0.78	60 1.7	0.99	3 1.7	2.37	3.6
9	16 19.6	16 15.5	59 48.6	1.17	59 33.7	1.31	3 59.8	2.46	4.6
10	16 11.0	16 6.3	59 17.3	1.41	58 59.9	1.48	4 59.6	2.50	5.6
11	16 1.4	15 56.4	58 41.8	1.52	58 23.3	1.54	5 59.4	2.47	6.6
12	15 51.3	15 46.3	58 4.8	1.53	57 46.5	1.51	6 57.6	2.37	7.6
13	15 41.4	15 36.6	57 28.5	1.49	57 10.9	1.45	7 52.7	2.22	8.6
14	15 32.0	15 27.5	56 53.7	1.41	56 37.1	1.36	8 44.2	2.07	9.6
15	15 23.1	15 18.9	56 21.1	1.31	56 5.7	1.25	9 32.1	1.93	10.6
16	15 14.9	15 11.1	55 51.0	1.20	55 37.0	1.14	10 17.2	1.83	11.6
17	15 7.4	15 4.0	55 23.6	1.08	55 11.0	1.02	11 0.3	1.77	12.6
18	15 0.8	14 57.8	54 59.1	0.95	54 48.1	0.88	11 42.2	1.74	13.6
19	14 55.0	14 52.5	54 37.9	0.80	54 28.8	0.71	12 23.8	1.74	14.6
20	14 50.3	14 48.5	54 20.8	0.62	54 14.0	0.51	13 6.0	1.78	15.6
21	14 47.0	14 46.0	54 8.6	0.39	54 4.8	-0.25	13 49.4	1.84	16.6
22	14 45.4	14 45.3	54 2.5	-0.11	54 2.1	+0.05	14 34.6	1.92	17.6
23	14 45.7	14 46.7	54 3.7	+0.22	54 7.4	0.40	15 21.7	2.01	18.6
24	14 48.3	14 50.5	54 13.3	0.59	54 21.4	0.78	16 10.8	2.08	19.6
25	14 53.4	14 56.9	54 32.0	0.98	54 45.0	1.19	17 1.4	2.13	20.6
26	15 1.1	15 6.0	55 0.5	1.39	55 18.3	1.58	17 52.8	2.15	21.6
27	15 11.5	15 17.5	55 38.4	1.76	56 0.6	1.94	18 44.3	2.14	22.6
28	15 24.1	15 31.2	56 24.8	2.09	56 50.8	2.22	19 35.5	2.12	23.6
29	15 38.6	15 46.3	57 18.1	2.31	57 46.3	2.37	20 26.0	2.10	24.6
30	15 54.1	16 1.9	58 15.0	2.38	58 43.5	2.35	21 16.2	2.09	25.6
31	16 9.4	16 16.6	59 11.3	+2.26	59 37.6	+2.11	22 6.6	2.12	26.6

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Dif. for 1 m.	Declination.	Dif. for 1 m.	Hour.	Right Ascension.	Dif. for 1 m.	Declination.	Dif. for 1 m.
SUNDAY 1.					TUESDAY 3.				
0	7 44 54.23	2.2761	N.20 8 55.9	8.653	0	9 32 34.15	2.2129	N.11 8 51.9	12.497
1	7 47 10.70	2.2789	20 0 13.1	8.773	1	9 34 46.90	2.2190	10 55 20.4	12.602
2	7 49 27.10	2.2797	19 51 23.1	8.893	2	9 36 59.59	2.2111	10 41 44.4	12.696
3	7 51 43.43	2.2716	19 42 25.9	9.012	3	9 39 12.23	2.2108	10 28 4.1	12.707
4	7 53 59.68	2.2702	19 33 21.6	9.130	4	9 41 24.82	2.2096	10 14 19.5	12.778
5	7 56 15.85	2.2689	19 24 10.2	9.248	5	9 43 37.37	2.2087	10 0 30.7	12.849
6	7 58 31.95	2.2676	19 14 51.8	9.366	6	9 45 49.87	2.2079	9 46 37.7	12.917
7	8 0 47.97	2.2668	19 5 26.3	9.482	7	9 48 2.32	2.2072	9 32 40.6	12.984
8	8 3 3.91	2.2660	18 55 53.9	9.598	8	9 50 14.73	2.2066	9 18 39.6	13.049
9	8 5 19.77	2.2656	18 46 14.6	9.713	9	9 52 27.10	2.2060	9 4 34.7	14.113
10	8 7 35.54	2.2658	18 36 28.4	9.827	10	9 54 39.43	2.2063	8 50 26.0	14.176
11	8 9 51.24	2.2669	18 26 35.3	9.940	11	9 56 51.73	2.2047	8 36 13.5	14.238
12	8 12 6.85	2.2685	18 16 35.5	10.053	12	9 59 4.00	2.2042	8 21 57.4	14.298
13	8 14 22.38	2.2661	18 6 28.9	10.165	13	10 1 16.24	2.2087	8 7 37.7	14.367
14	8 16 37.82	2.2667	17 56 15.7	10.276	14	10 3 28.45	2.2083	7 53 14.5	14.415
15	8 18 53.18	2.2663	17 45 55.8	10.387	15	10 5 40.64	2.2079	7 38 47.9	14.471
16	8 21 8.45	2.2689	17 35 29.3	10.497	16	10 7 52.80	2.2026	7 24 18.0	14.526
17	8 23 23.64	2.2626	17 24 56.3	10.606	17	10 10 4.94	2.2022	7 9 44.8	14.580
18	8 25 38.74	2.2611	17 14 16.7	10.713	18	10 12 17.07	2.2019	6 55 8.4	14.632
19	8 27 53.76	2.2497	17 3 30.7	10.821	19	10 14 29.18	2.2017	6 40 29.0	14.682
20	8 30 8.70	2.2468	16 52 38.2	10.928	20	10 16 41.28	2.2016	6 25 46.6	14.731
21	8 32 23.55	2.2468	16 41 39.4	11.033	21	10 18 53.37	2.2016	6 11 1.3	14.778
22	8 34 38.31	2.2454	16 30 34.3	11.137	22	10 21 5.46	2.2014	5 56 13.2	14.824
23	8 36 52.99	2.2439	N.16 19 23.0	11.240	23	10 23 17.54	2.2014	N. 5 41 22.4	14.869
MONDAY 2.					WEDNESDAY 4.				
0	8 39 7.58	2.2426	N.16 8 5.5	11.342	0	10 25 29.63	2.2015	N. 5 26 28.9	14.912
1	8 41 22.09	2.2411	15 56 41.9	11.444	1	10 27 41.72	2.2016	5 11 32.9	14.963
2	8 43 36.51	2.2397	15 45 12.2	11.546	2	10 29 53.82	2.2017	4 56 34.5	14.983
3	8 45 50.85	2.2383	15 33 36.5	11.644	3	10 32 5.92	2.2019	4 41 33.7	15.081
4	8 48 5.11	2.2369	15 21 54.9	11.743	4	10 34 18.04	2.2021	4 26 30.7	15.096
5	8 50 19.29	2.2356	15 10 7.4	11.840	5	10 36 30.18	2.2024	4 11 25.5	15.104
6	8 52 33.38	2.2342	14 58 14.1	11.937	6	10 38 42.33	2.2027	3 56 18.3	15.126
7	8 54 47.39	2.2329	14 46 15.0	12.032	7	10 40 54.50	2.2021	3 41 9.0	15.170
8	8 57 1.32	2.2315	14 34 10.2	12.126	8	10 43 6.70	2.2026	3 25 57.9	15.200
9	8 59 15.17	2.2303	14 21 59.8	12.220	9	10 45 18.93	2.2041	3 10 45.0	15.229
10	9 1 28.94	2.2289	14 9 43.8	12.312	10	10 47 31.19	2.2047	2 55 30.4	15.267
11	9 3 42.63	2.2276	13 57 22.3	12.403	11	10 49 43.49	2.2063	2 40 14.2	15.293
12	9 5 56.25	2.2263	13 44 55.4	12.493	12	10 51 55.82	2.2069	2 24 56.4	15.307
13	9 8 9.79	2.2251	13 32 23.1	12.583	13	10 54 8.19	2.2068	2 9 37.3	15.330
14	9 10 23.26	2.2238	13 19 45.4	12.671	14	10 56 20.61	2.2074	1 54 16.8	15.361
15	9 12 36.65	2.2226	13 7 2.5	12.757	15	10 58 33.08	2.2068	1 38 55.1	15.371
16	9 14 49.97	2.2214	12 54 14.5	12.843	16	11 0 45.60	2.2092	1 23 32.3	15.398
17	9 17 3.22	2.2203	12 41 21.3	12.928	17	11 2 58.18	2.2101	1 8 8.5	15.409
18	9 19 16.40	2.2192	12 28 23.1	13.012	18	11 5 10.81	2.2111	0 52 43.7	15.419
19	9 21 29.52	2.2181	12 15 19.9	13.094	19	11 7 23.50	2.2121	0 37 18.1	15.429
20	9 23 42.57	2.2170	12 2 11.8	13.175	20	11 9 36.26	2.2129	0 21 51.8	15.443
21	9 25 55.56	2.2159	11 48 58.9	13.255	21	11 11 49.09	2.2144	N. 0 6 24.9	15.463
22	9 28 8.48	2.2149	11 35 41.2	13.334	22	11 14 1.99	2.2157	S. 0 9 2.6	15.461
23	9 30 21.34	2.2139	11 22 18.9	13.411	23	11 16 14.97	2.2170	0 24 30.5	15.468
24	9 32 34.15	2.2129	N.11 8 51.9	13.487	24	11 18 28.03	2.2183	S. 0 39 58.8	15.473

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
THURSDAY 5.					SATURDAY 7.				
0	h m s	"	° ' "	"	0	h m s	"	° ' "	"
1	11 18 26.03	2.3188	S. 0 39' 58.8	15.478	1	13 7 31.93	2.3449	S. 12° 35' 8.3	13.654
2	11 20 41.17	2.3197	0 55 27.3	15.476	2	13 9 52.73	2.3486	12 48 45.1	13.673
3	11 22 54.40	2.3211	1 10 55.9	15.477	3	13 12 13.76	2.3523	13 2 17.1	13.690
4	11 25 7.71	2.3226	1 26 24.5	15.476	4	13 14 35.01	2.3560	13 15 44.1	13.706
5	11 27 21.12	2.3242	1 41 53.0	15.474	5	13 16 56.48	2.3598	13 29 5.9	13.720
6	11 29 34.62	2.3266	1 57 21.3	15.470	6	13 19 18.18	2.3636	13 42 22.5	13.733
7	11 31 48.22	2.3276	2 12 49.4	15.465	7	13 21 40.11	2.3674	13 55 33.9	13.744
8	11 34 1.93	2.3293	2 28 17.1	15.458	8	13 24 2.27	2.3713	14 8 39.9	13.754
9	11 36 15.74	2.3311	2 43 44.3	15.449	9	13 26 24.65	2.3750	14 21 40.4	13.762
10	11 38 29.66	2.3329	2 59 10.9	15.438	10	13 28 47.26	2.3789	14 34 35.3	13.768
11	11 40 43.69	2.3348	3 14 36.8	15.425	11	13 31 10.11	2.3827	14 47 24.5	13.772
12	11 42 57.84	2.3368	3 30 1.9	15.411	12	13 33 33.19	2.3866	15 0 8.0	13.776
13	11 45 12.11	2.3388	3 45 26.1	15.395	13	13 35 56.50	2.3904	15 12 45.6	13.778
14	11 47 26.50	2.3409	4 0 49.3	15.378	14	13 38 20.04	2.3943	15 25 17.2	13.778
15	11 49 41.02	2.3430	4 16 11.4	15.359	15	13 40 43.82	2.3982	15 37 42.7	13.774
16	11 51 55.67	2.3452	4 31 32.3	15.337	16	13 43 7.83	2.4021	15 50 2.1	13.771
17	11 54 10.45	2.3475	4 46 51.8	15.314	17	13 45 32.07	2.4060	16 2 15.2	13.766
18	11 56 25.36	2.3498	5 2 9.9	15.289	18	13 47 56.55	2.4099	16 14 21.9	13.760
19	11 58 40.42	2.3522	5 17 26.5	15.263	19	13 50 21.26	2.4138	16 26 22.2	13.751
20	12 0 55.62	2.3546	5 32 41.5	15.235	20	13 52 46.21	2.4177	16 38 16.0	13.741
21	12 3 10.97	2.3571	5 47 54.7	15.205	21	13 55 11.39	2.4216	16 50 3.1	13.730
22	12 5 26.47	2.3596	6 3 6.1	15.173	22	13 57 36.81	2.4255	17 1 43.5	13.717
23	12 7 42.12	2.3622	6 18 15.5	15.139	23	14 0 2.46	2.4294	17 13 17.1	13.702
24	12 9 57.93	2.3648	S. 6 33 22.8	15.104	24	14 2 28.34	2.4333	S. 17 24 43.7	13.686
FRIDAY 6.					SUNDAY 8.				
0	h m s	"	° ' "	"	0	h m s	"	° ' "	"
1	12 12 13.89	2.3675	S. 6 48 28.0	15.067	1	14 4 54.45	2.4372	S. 17 36 3.4	13.669
2	12 14 30.02	2.3702	7 3 30.9	15.028	2	14 7 20.79	2.4410	17 47 16.0	13.650
3	12 16 46.31	2.3730	7 18 31.4	14.983	3	14 9 47.37	2.4448	17 58 21.4	13.630
4	12 19 2.77	2.3758	7 33 29.4	14.946	4	14 12 14.17	2.4486	18 9 19.6	13.609
5	12 21 19.40	2.3786	7 48 24.9	14.902	5	14 14 41.20	2.4524	18 20 10.5	13.586
6	12 23 36.20	2.3815	8 3 17.7	14.856	6	14 17 8.46	2.4562	18 30 54.0	13.561
7	12 25 53.18	2.3845	8 18 7.7	14.808	7	14 19 35.94	2.4599	18 41 29.9	13.536
8	12 28 10.34	2.3875	8 32 54.7	14.759	8	14 22 3.64	2.4636	18 51 58.2	13.509
9	12 30 27.68	2.3906	8 47 38.7	14.708	9	14 24 31.56	2.4672	19 2 18.9	13.480
10	12 32 45.21	2.3937	9 2 19.6	14.655	10	14 26 59.70	2.4708	19 12 31.8	13.450
11	12 35 2.92	2.3968	9 16 57.3	14.600	11	14 29 28.06	2.4744	19 22 36.9	13.419
12	12 37 20.82	2.4000	9 31 31.7	14.544	12	14 31 56.63	2.4780	19 32 34.1	13.387
13	12 39 38.91	2.4032	9 46 2.6	14.486	13	14 34 25.42	2.4816	19 42 23.3	13.353
14	12 41 57.20	2.4066	10 0 30.0	14.427	14	14 36 54.42	2.4851	19 52 4.5	13.318
15	12 44 15.69	2.4099	10 14 53.8	14.365	15	14 39 23.63	2.4885	20 1 37.5	13.282
16	12 46 34.38	2.4133	10 29 13.8	14.302	16	14 41 53.04	2.4919	20 11 2.3	13.245
17	12 48 53.27	2.4166	10 43 30.0	14.237	17	14 44 22.66	2.4953	20 20 18.9	13.207
18	12 51 12.37	2.4200	10 57 42.2	14.170	18	14 46 52.48	2.4986	20 29 27.1	13.167
19	12 53 31.67	2.4235	11 11 50.4	14.101	19	14 49 22.49	2.5019	20 38 26.9	13.125
20	12 55 51.18	2.4270	11 25 54.4	14.031	20	14 51 52.70	2.5051	20 47 18.3	13.082
21	12 58 10.90	2.4305	11 39 54.1	13.959	21	14 54 23.10	2.5082	20 56 1.1	13.038
22	13 0 30.83	2.4341	11 53 49.5	13.886	22	14 56 53.69	2.5113	21 4 35.3	12.993
23	13 2 50.96	2.4377	12 7 40.4	13.811	23	14 59 24.46	2.5143	21 13 0.9	12.947
24	13 5 11.35	2.4413	12 21 26.7	13.733	24	15 1 55.41	2.5173	21 21 17.7	12.900
		2.4449	S. 12 35 8.3	13.654			2.5203	S. 21 29 25.7	12.852

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
MONDAY 9.					WEDNESDAY 11.				
0	15 4 26.53	2.5902	S. 21° 29' 25.7"	8.000	0	17 7 5.49	2.5806	S. 24° 54' 2.0"	0.243
1	15 6 57.83	2.5920	21 37 24.9	7.912	1	17 9 38.46	2.5485	24 54 17.7	0.180
2	15 9 29.29	2.5938	21 45 15.1	7.763	2	17 12 11.31	2.5464	24 54 23.6	0.017
3	15 12 0.92	2.5955	21 52 56.4	7.613	3	17 14 44.03	2.5443	24 54 19.8	0.145
4	15 14 32.71	2.5911	22 0 28.6	7.462	4	17 17 16.61	2.5418	24 54 6.2	0.307
5	15 17 4.65	2.5938	22 7 51.8	7.310	5	17 19 49.04	2.5393	24 53 43.0	0.468
6	15 19 36.74	2.5961	22 15 5.8	7.157	6	17 22 21.32	2.5367	24 53 10.1	0.628
7	15 22 8.98	2.5985	22 22 10.6	7.003	7	17 24 53.45	2.5341	24 52 27.6	0.788
8	15 24 41.36	2.5408	22 29 6.2	6.848	8	17 27 25.41	2.5313	24 51 35.6	0.947
9	15 27 13.87	2.5430	22 35 52.5	6.693	9	17 29 57.20	2.5284	24 50 34.0	1.106
10	15 29 46.52	2.5451	22 42 29.4	6.537	10	17 32 28.82	2.5264	24 49 22.9	1.264
11	15 32 19.29	2.5473	22 48 57.0	6.381	11	17 35 0.25	2.5223	24 48 2.3	1.422
12	15 34 52.19	2.5492	22 55 15.2	6.224	12	17 37 31.50	2.5191	24 46 32.3	1.579
13	15 37 25.20	2.5511	23 1 23.9	6.066	13	17 40 2.55	2.5166	24 44 52.9	1.735
14	15 39 58.32	2.5528	23 7 23.2	5.907	14	17 42 33.40	2.5134	24 43 4.1	1.890
15	15 42 31.54	2.5545	23 13 12.9	5.748	15	17 45 4.04	2.5099	24 41 6.0	2.046
16	15 45 4.86	2.5561	23 18 53.0	5.588	16	17 47 34.47	2.5063	24 38 58.7	2.199
17	15 47 38.27	2.5576	23 24 23.5	5.428	17	17 50 4.68	2.5017	24 36 42.1	2.352
18	15 50 11.77	2.5590	23 29 44.4	5.268	18	17 52 34.67	2.4979	24 34 16.4	2.505
19	15 52 45.35	2.5603	23 34 55.6	5.107	19	17 55 4.43	2.4940	24 31 41.5	2.657
20	15 55 19.01	2.5615	23 39 57.2	4.945	20	17 57 33.95	2.4901	24 28 57.5	2.808
21	15 57 52.73	2.5626	23 44 49.0	4.783	21	18 0 3.24	2.4861	24 26 4.5	2.958
22	16 0 26.52	2.5636	23 49 31.1	4.620	22	18 2 32.28	2.4820	24 23 2.5	3.107
23	16 3 0.36	2.5644	S. 23° 54' 3.4"	4.457	23	18 5 1.07	2.4778	S. 24° 19' 51.6"	3.256
TUESDAY 10.					THURSDAY 12.				
0	16 5 34.25	2.5652	S. 23° 58' 26.0"	4.294	0	18 7 29.61	2.4735	S. 24° 16' 31.8"	3.404
1	16 8 8.19	2.5669	24 2 38.7	4.130	1	18 9 57.89	2.4691	24 13 3.9	3.550
2	16 10 42.16	2.5685	24 6 41.6	3.966	2	18 12 25.91	2.4647	24 9 25.8	3.696
3	16 13 16.16	2.5699	24 10 34.7	3.802	3	18 14 53.66	2.4602	24 5 39.7	3.841
4	16 15 50.19	2.5673	24 14 17.9	3.638	4	18 17 21.13	2.4556	24 1 44.9	3.985
5	16 18 24.24	2.5676	24 17 51.2	3.473	5	18 19 48.32	2.4510	23 57 41.5	4.128
6	16 20 58.30	2.5677	24 21 14.6	3.308	6	18 22 15.24	2.4463	23 53 29.6	4.270
7	16 23 32.36	2.5677	24 24 28.1	3.143	7	18 24 41.87	2.4415	23 49 9.2	4.410
8	16 26 6.42	2.5676	24 27 31.7	2.978	8	18 27 8.22	2.4366	23 44 40.4	4.549
9	16 28 40.47	2.5674	24 30 25.4	2.813	9	18 29 34.27	2.4317	23 40 3.9	4.688
10	16 31 14.51	2.5671	24 33 9.1	2.647	10	18 32 0.02	2.4267	23 35 17.8	4.826
11	16 33 48.53	2.5667	24 35 42.9	2.481	11	18 34 25.48	2.4217	23 30 24.1	4.963
12	16 36 22.51	2.5661	24 38 6.8	2.316	12	18 36 50.63	2.4166	23 25 22.2	5.099
13	16 38 56.46	2.5654	24 40 20.8	2.150	13	18 39 15.48	2.4115	23 20 12.2	5.233
14	16 41 30.36	2.5646	24 42 24.8	1.985	14	18 41 40.01	2.4063	23 14 54.2	5.365
15	16 44 4.21	2.5637	24 44 18.9	1.820	15	18 44 4.23	2.4010	23 9 28.2	5.496
16	16 46 38.01	2.5627	24 46 3.1	1.655	16	18 46 28.13	2.3957	23 3 54.4	5.629
17	16 49 11.74	2.5616	24 47 37.5	1.490	17	18 48 51.71	2.3904	22 58 12.7	5.760
18	16 51 45.40	2.5604	24 49 2.0	1.325	18	18 51 14.96	2.3851	22 52 23.2	5.890
19	16 54 18.96	2.5590	24 50 16.6	1.161	19	18 53 37.92	2.3797	22 46 26.0	6.017
20	16 56 52.48	2.5575	24 51 21.3	0.997	20	18 56 0.54	2.3743	22 40 21.2	6.144
21	16 59 25.88	2.5559	24 52 16.2	0.833	21	18 58 22.83	2.3687	22 34 8.8	6.269
22	17 1 59.19	2.5542	24 53 1.3	0.669	22	19 0 44.78	2.3632	22 27 49.0	6.393
23	17 4 32.40	2.5525	24 53 36.6	0.505	23	19 3 6.40	2.3576	22 21 21.7	6.516
24	17 7 5.49	2.5506	S. 24° 54' 2.0"	0.343	24	19 5 27.69	2.3520	S. 22° 14' 47.1"	6.638

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
FRIDAY 13.					SUNDAY 15.				
0	19 5 27.69	2.2420	S. 22° 14' 47.1"	6.638	0	20 51 46.97	2.0832	S. 14° 58' 56.6"	11.050
1	19 7 48.64	2.2464	22 8 5.2	6.758	1	20 53 51.81	2.0782	14 47 51.7	11.113
2	19 10 9.25	2.2408	22 1 16.1	6.877	2	20 55 56.35	2.0732	14 36 43.0	11.176
3	19 12 29.53	2.2351	21 54 19.8	6.996	3	20 58 0.59	2.0682	14 25 30.7	11.238
4	19 14 49.46	2.2394	21 47 16.5	7.113	4	21 0 4.54	2.0634	14 14 14.8	11.294
5	19 17 9.05	2.2336	21 40 6.2	7.229	5	21 2 8.20	2.0586	14 2 55.4	11.352
6	19 19 28.99	2.2179	21 32 48.9	7.344	6	21 4 11.57	2.0539	13 51 32.6	11.409
7	19 21 47.19	2.2122	21 25 24.8	7.457	7	21 6 14.66	2.0492	13 40 6.4	11.464
8	19 24 5.75	2.2064	21 17 54.0	7.569	8	21 8 17.47	2.0445	13 28 36.9	11.518
9	19 26 23.96	2.2006	21 10 16.5	7.681	9	21 10 20.00	2.0399	13 17 4.2	11.572
10	19 28 41.82	2.2048	21 2 32.3	7.791	10	21 12 22.25	2.0353	13 5 28.3	11.624
11	19 30 59.34	2.2091	20 54 41.5	7.900	11	21 14 24.23	2.0307	12 53 49.3	11.675
12	19 33 16.51	2.2033	20 46 44.3	8.007	12	21 16 25.93	2.0262	12 42 7.3	11.725
13	19 35 33.33	2.2774	20 38 40.7	8.113	13	21 18 27.37	2.0218	12 30 22.3	11.774
14	19 37 49.80	2.2716	20 30 30.8	8.218	14	21 20 28.54	2.0174	12 18 34.4	11.822
15	19 40 5.92	2.2658	20 22 14.6	8.323	15	21 22 29.45	2.0131	12 6 43.7	11.868
16	19 42 21.70	2.2600	20 13 52.2	8.424	16	21 24 30.11	2.0088	11 54 50.2	11.914
17	19 44 37.12	2.2542	20 5 23.7	8.525	17	21 26 30.51	2.0046	11 42 54.0	11.959
18	19 46 52.20	2.2484	19 56 49.2	8.625	18	21 28 30.65	2.0004	11 30 55.1	12.003
19	19 49 6.93	2.2426	19 48 8.7	8.723	19	21 30 30.55	1.9963	11 18 53.7	12.045
20	19 51 21.31	2.2368	19 39 22.3	8.820	20	21 32 30.20	1.9922	11 6 49.7	12.088
21	19 53 35.34	2.2309	19 30 30.2	8.917	21	21 34 29.61	1.9881	10 54 43.3	12.127
22	19 55 49.02	2.2251	19 21 32.3	9.012	22	21 36 28.77	1.9841	10 42 34.5	12.166
23	19 58 2.36	2.2194	S. 19° 12' 28.7"	9.106	23	21 38 27.70	1.9802	S. 10° 30' 23.4"	12.204
SATURDAY 14.					MONDAY 16.				
0	20 0 15.85	2.2136	S. 19° 3' 19.6"	9.198	0	21 40 26.39	1.9764	S. 10° 18' 10.0"	12.241
1	20 2 27.99	2.2078	18 54 5.0	9.289	1	21 42 24.86	1.9726	10 5 54.4	12.277
2	20 4 40.29	2.2021	18 44 44.9	9.379	2	21 44 23.10	1.9688	9 53 36.7	12.312
3	20 6 52.25	2.1964	18 35 19.4	9.468	3	21 46 21.11	1.9651	9 41 16.9	12.347
4	20 9 3.87	2.1907	18 25 48.7	9.556	4	21 48 18.91	1.9615	9 28 55.0	12.380
5	20 11 15.15	2.1851	18 16 12.8	9.642	5	21 50 16.49	1.9579	9 16 31.2	12.412
6	20 13 26.09	2.1795	18 6 31.7	9.727	6	21 52 13.86	1.9544	9 4 5.5	12.443
7	20 15 36.69	2.1739	17 56 45.5	9.811	7	21 54 11.02	1.9510	8 51 38.0	12.473
8	20 17 46.96	2.1683	17 46 54.4	9.893	8	21 56 7.98	1.9476	8 39 8.7	12.502
9	20 19 56.90	2.1626	17 36 58.4	9.974	9	21 58 4.74	1.9443	8 26 37.7	12.531
10	20 22 6.50	2.1570	17 26 57.5	10.054	10	22 0 1.30	1.9410	8 14 5.0	12.558
11	20 24 15.77	2.1517	17 16 51.8	10.133	11	22 1 57.66	1.9378	8 1 30.7	12.584
12	20 26 24.71	2.1462	17 6 41.5	10.211	12	22 3 53.83	1.9346	7 48 54.9	12.609
13	20 28 33.32	2.1408	16 56 26.5	10.287	13	22 5 49.81	1.9315	7 36 17.6	12.634
14	20 30 41.61	2.1354	16 46 7.0	10.362	14	22 7 45.61	1.9284	7 23 38.8	12.657
15	20 32 49.57	2.1300	16 35 43.0	10.437	15	22 9 41.22	1.9254	7 10 58.7	12.679
16	20 34 57.21	2.1246	16 25 14.5	10.510	16	22 11 36.66	1.9223	6 58 17.3	12.700
17	20 37 4.53	2.1192	16 14 41.7	10.582	17	22 13 31.92	1.9193	6 45 34.6	12.721
18	20 39 11.53	2.1140	16 4 4.6	10.653	18	22 15 27.01	1.9167	6 32 50.7	12.741
19	20 41 18.21	2.1087	15 53 23.4	10.722	19	22 17 21.93	1.9139	6 20 5.7	12.759
20	20 43 24.58	2.1036	15 42 38.0	10.790	20	22 19 16.68	1.9112	6 7 19.6	12.777
21	20 45 30.64	2.0984	15 31 48.5	10.857	21	22 21 11.27	1.9086	5 54 32.5	12.794
22	20 47 36.39	2.0933	15 20 55.1	10.923	22	22 23 5.71	1.9060	5 41 44.3	12.810
23	20 49 41.83	2.0882	15 9 57.8	10.987	23	22 24 59.99	1.9034	5 28 55.2	12.826
24	20 51 46.97	2.0832	S. 14° 58' 56.6"	11.050	24	22 26 54.12	1.9009	S. 5° 16' 5.3"	12.839

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
TUESDAY 17.					THURSDAY 19.				
0	22 26 54.12	1.9009	S. 5 16 5.3	12.989	0	23 56 23.75	1.8496	N. 4 59 46.5	12.906
1	22 28 48.10	1.8985	5 3 14.6	12.982	1	23 58 14.74	1.8490	5 12 16.1	12.479
2	22 30 41.94	1.8963	4 50 23.1	12.984	2	0 0 5.74	1.8903	5 24 44.0	12.482
3	22 32 35.64	1.8939	4 37 30.9	12.976	3	0 1 56.76	1.8906	5 37 10.3	12.484
4	22 34 29.21	1.8917	4 24 38.1	12.966	4	0 3 47.81	1.8910	5 49 34.9	12.386
5	22 36 22.65	1.8896	4 11 44.7	12.964	5	0 5 38.88	1.8916	6 1 57.7	12.386
6	22 38 15.95	1.8874	3 58 50.8	12.968	6	0 7 29.99	1.8921	6 14 18.8	12.386
7	22 40 9.13	1.8853	3 45 56.4	12.911	7	0 9 21.13	1.8927	6 26 38.0	12.384
8	22 42 2.18	1.8833	3 33 1.5	12.918	8	0 11 12.31	1.8933	6 38 55.3	12.372
9	22 43 55.12	1.8813	3 20 6.3	12.923	9	0 13 3.53	1.8940	6 51 10.7	12.360
10	22 45 47.94	1.8794	3 7 10.7	12.928	10	0 14 54.79	1.8947	7 3 24.1	12.307
11	22 47 40.65	1.8776	2 54 14.9	12.933	11	0 16 46.10	1.8954	7 15 35.5	12.178
12	22 49 33.25	1.8759	2 41 18.8	12.938	12	0 18 37.45	1.8963	7 27 44.9	12.139
13	22 51 25.75	1.8741	2 28 22.6	12.938	13	0 20 28.86	1.8973	7 39 52.1	12.102
14	22 53 18.15	1.8724	2 15 26.2	12.940	14	0 22 20.32	1.8981	7 51 57.2	12.068
15	22 55 10.45	1.8708	2 2 29.8	12.941	15	0 24 11.83	1.8991	8 4 0.1	12.080
16	22 57 2.65	1.8690	1 49 33.3	12.941	16	0 26 3.41	1.8999	8 16 0.8	11.989
17	22 58 54.76	1.8678	1 36 36.9	12.940	17	0 27 55.05	1.8913	8 27 59.2	11.933
18	23 0 46.79	1.8664	1 23 40.5	12.938	18	0 29 46.76	1.8924	8 39 55.2	11.914
19	23 2 38.73	1.8650	1 10 44.3	12.935	19	0 31 38.53	1.8935	8 51 48.9	11.974
20	23 4 30.59	1.8637	0 57 48.3	12.932	20	0 33 30.38	1.8947	9 3 40.1	11.888
21	23 6 22.37	1.8624	0 44 52.5	12.928	21	0 35 22.30	1.8960	9 15 28.8	11.792
22	23 8 14.08	1.8613	0 31 57.0	12.923	22	0 37 14.30	1.8973	9 27 15.1	11.759
23	23 10 5.72	1.8601	S. 0 19 1.9	12.916	23	0 39 6.38	1.8987	N. 9 38 58.8	11.707
WEDNESDAY 18.					FRIDAY 20.				
0	23 11 57.29	1.8590	S. 0 6 7.1	12.909	0	0 40 58.55	1.8701	N. 9 50 40.0	11.688
1	23 13 48.80	1.8580	N. 0 6 47.2	12.901	1	0 42 50.80	1.8716	10 2 18.5	11.619
2	23 15 40.25	1.8570	0 19 41.1	12.892	2	0 44 43.14	1.8731	10 13 54.3	11.574
3	23 17 31.64	1.8561	0 32 34.4	12.883	3	0 46 35.57	1.8746	10 25 27.4	11.529
4	23 19 22.98	1.8552	0 45 27.1	12.873	4	0 48 28.09	1.8762	10 36 57.8	11.483
5	23 21 14.27	1.8544	0 58 19.2	12.862	5	0 50 20.71	1.8778	10 48 25.4	11.436
6	23 23 5.51	1.8537	1 11 10.6	12.851	6	0 52 13.42	1.8794	10 59 50.1	11.388
7	23 24 56.71	1.8530	1 24 1.3	12.839	7	0 54 6.23	1.8811	11 11 11.9	11.339
8	23 26 47.88	1.8524	1 36 51.3	12.826	8	0 55 59.15	1.8828	11 22 30.8	11.290
9	23 28 39.01	1.8518	1 49 40.4	12.813	9	0 57 52.17	1.8846	11 33 46.7	11.240
10	23 30 30.10	1.8513	2 2 28.7	12.797	10	0 59 45.30	1.8864	11 44 59.6	11.189
11	23 32 21.17	1.8509	2 15 16.0	12.781	11	1 1 38.54	1.8883	11 56 9.4	11.138
12	23 34 12.21	1.8505	2 28 2.4	12.764	12	1 3 31.90	1.8902	12 7 16.1	11.085
13	23 36 3.23	1.8501	2 40 47.8	12.747	13	1 5 25.37	1.8922	12 18 19.6	11.032
14	23 37 54.22	1.8498	2 53 32.1	12.730	14	1 7 18.96	1.8942	12 29 20.0	10.979
15	23 39 45.20	1.8496	3 6 15.3	12.710	15	1 9 12.67	1.8963	12 40 17.1	10.925
16	23 41 36.16	1.8493	3 18 57.3	12.690	16	1 11 6.50	1.8983	12 51 11.0	10.870
17	23 43 27.11	1.8492	3 31 38.1	12.670	17	1 13 0.46	1.9004	13 2 1.5	10.814
18	23 45 18.06	1.8491	3 44 17.7	12.649	18	1 14 54.54	1.9026	13 12 48.7	10.768
19	23 47 9.00	1.8490	3 56 56.0	12.628	19	1 16 48.75	1.9047	13 23 32.5	10.721
20	23 48 59.94	1.8490	4 9 33.0	12.606	20	1 18 43.10	1.9069	13 34 12.8	10.673
21	23 50 50.88	1.8491	4 22 8.6	12.581	21	1 20 37.58	1.9093	13 44 49.6	10.624
22	23 52 41.83	1.8492	4 34 42.7	12.556	22	1 22 32.20	1.9118	13 55 22.9	10.575
23	23 54 32.78	1.8494	4 47 15.4	12.531	23	1 24 26.96	1.9143	14 5 52.6	10.485
24	23 56 23.75	1.8496	N. 4 59 46.5	12.506	24	1 26 21.83	1.9168	N.14 16 18.7	10.404

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
SATURDAY 21.					MONDAY 23.				
0	1 26 21.85	1.9161	N.14 16 18.7	10.404	0	3 1 32.99	2.0568	N.21 12 44.4	6.087
1	1 28 16.89	1.9166	14 26 41.1	10.343	1	3 3 36.49	2.0600	21 19 22.8	6.523
2	1 30 12.07	1.9200	14 36 59.9	10.261	2	3 5 40.18	2.0632	21 25 55.6	6.490
3	1 32 7.40	1.9233	14 47 14.9	10.218	3	3 7 44.07	2.0663	21 32 22.7	6.404
4	1 34 2.87	1.9265	14 57 26.1	10.166	4	3 9 48.15	2.0695	21 38 44.0	6.306
5	1 35 58.49	1.9298	15 7 33.5	10.091	5	3 11 52.42	2.0727	21 44 59.6	6.212
6	1 37 54.37	1.9309	15 17 37.0	10.026	6	3 13 56.88	2.0760	21 51 9.4	6.116
7	1 39 50.20	1.9336	15 27 36.8	9.961	7	3 16 1.53	2.0791	21 57 13.4	6.018
8	1 41 46.39	1.9361	15 37 32.3	9.896	8	3 18 6.37	2.0823	22 3 11.5	5.920
9	1 43 42.53	1.9387	15 47 24.0	9.831	9	3 20 11.40	2.0855	22 9 3.7	5.821
10	1 45 38.93	1.9414	15 57 11.6	9.760	10	3 22 16.62	2.0887	22 14 50.0	5.722
11	1 47 35.49	1.9441	16 6 55.1	9.691	11	3 24 22.03	2.0918	22 20 30.4	5.622
12	1 49 32.22	1.9468	16 16 34.5	9.623	12	3 26 27.63	2.0949	22 26 4.7	5.523
13	1 51 29.11	1.9496	16 26 9.7	9.558	13	3 28 33.42	2.0980	22 31 33.0	5.421
14	1 53 26.16	1.9523	16 35 40.8	9.483	14	3 30 39.39	2.1011	22 36 55.2	5.320
15	1 55 23.38	1.9561	16 45 7.6	9.413	15	3 32 45.54	2.1041	22 42 11.3	5.218
16	1 57 20.77	1.9579	16 54 30.2	9.340	16	3 34 51.88	2.1073	22 47 21.3	5.116
17	1 59 18.33	1.9606	17 3 48.4	9.267	17	3 36 58.40	2.1103	22 52 25.1	5.011
18	2 1 16.06	1.9637	17 13 2.3	9.193	18	3 39 5.11	2.1133	22 57 22.6	4.907
19	2 3 13.97	1.9668	17 22 11.7	9.119	19	3 41 12.00	2.1163	23 2 13.9	4.803
20	2 5 12.05	1.9696	17 31 16.6	9.045	20	3 43 19.07	2.1193	23 6 58.9	4.698
21	2 7 10.31	1.9734	17 40 17.1	8.970	21	3 45 26.31	2.1223	23 11 37.6	4.592
22	2 9 8.74	1.9763	17 49 13.0	8.894	22	3 47 33.73	2.1253	23 16 9.9	4.486
23	2 11 7.35	1.9793	N.17 58 4.4	8.817	23	3 49 41.33	2.1283	N.23 20 35.9	4.379
SUNDAY 22.					TUESDAY 24.				
0	2 13 6.14	1.9813	N.18 6 51.2	8.740	0	3 51 49.11	2.1311	N.23 24 55.4	4.272
1	2 15 5.11	1.9843	18 15 33.3	8.662	1	3 53 57.06	2.1340	23 29 8.5	4.164
2	2 17 4.26	1.9873	18 24 10.7	8.584	2	3 56 5.18	2.1369	23 33 15.1	4.066
3	2 19 3.59	1.9904	18 32 43.4	8.506	3	3 58 13.48	2.1397	23 37 15.2	3.947
4	2 21 3.11	1.9934	18 41 11.3	8.428	4	4 0 21.94	2.1425	23 41 8.8	3.828
5	2 23 2.81	1.9965	18 49 34.4	8.344	5	4 2 30.57	2.1453	23 44 55.8	3.728
6	2 25 2.69	1.9996	18 57 52.6	8.263	6	4 4 39.37	2.1480	23 48 36.2	3.618
7	2 27 2.76	2.0027	19 6 5.9	8.181	7	4 6 48.33	2.1507	23 52 10.0	3.507
8	2 29 3.02	2.0060	19 14 14.3	8.098	8	4 8 57.45	2.1534	23 55 37.1	3.396
9	2 31 3.47	2.0090	19 22 17.7	8.016	9	4 11 6.73	2.1560	23 58 57.5	3.284
10	2 33 4.10	2.0121	19 30 16.1	7.931	10	4 13 16.17	2.1586	24 2 11.2	3.173
11	2 35 4.92	2.0153	19 38 9.4	7.846	11	4 15 25.77	2.1612	24 5 18.2	3.060
12	2 37 5.93	2.0184	19 45 57.6	7.761	12	4 17 35.52	2.1638	24 8 18.4	2.947
13	2 39 7.13	2.0216	19 53 40.7	7.675	13	4 19 45.42	2.1663	24 11 11.8	2.833
14	2 41 8.52	2.0248	20 1 18.6	7.589	14	4 21 55.48	2.1688	24 13 58.4	2.719
15	2 43 10.10	2.0280	20 8 51.3	7.501	15	4 24 5.69	2.1713	24 16 38.1	2.604
16	2 45 11.88	2.0312	20 16 18.7	7.413	16	4 26 16.04	2.1737	24 19 10.9	2.489
17	2 47 13.85	2.0344	20 23 40.8	7.324	17	4 28 26.54	2.1761	24 21 36.8	2.374
18	2 49 16.01	2.0376	20 30 57.6	7.235	18	4 30 37.18	2.1785	24 23 55.8	2.256
19	2 51 18.36	2.0408	20 38 9.1	7.145	19	4 32 47.96	2.1808	24 26 7.8	2.142
20	2 53 20.90	2.0440	20 45 15.1	7.055	20	4 34 58.88	2.1831	24 28 12.9	2.025
21	2 55 23.63	2.0472	20 52 15.7	6.964	21	4 37 9.93	2.1853	24 30 10.9	1.906
22	2 57 26.56	2.0504	20 59 10.8	6.873	22	4 39 21.12	2.1875	24 32 1.9	1.791
23	2 59 29.68	2.0536	21 6 0.4	6.780	23	4 41 32.44	2.1897	24 33 45.8	1.673
24	3 1 32.90	2.0568	N.21 12 44.4	6.687	24	4 43 43.89	2.1918	N.24 35 22.7	1.555

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
WEDNESDAY 25.					FRIDAY 27.				
0	4 43 43.89	2.1918	N.24° 35' 22.7"	1.565	0	6 30 31.27	2.2300	N.23° 29' 5.2"	4.370
1	4 45 55.46	2.1930	24 36 52.5	1.487	1	6 32 45.66	2.2306	23 24 39.3	4.484
2	4 48 7.16	2.1950	24 38 15.1	1.318	2	6 35 0.05	2.2307	23 20 5.9	4.619
3	4 50 18.98	2.1970	24 39 30.6	1.190	3	6 37 14.43	2.2306	23 15 25.1	4.743
4	4 52 30.91	2.1990	24 40 39.0	1.060	4	6 39 28.79	2.2308	23 10 36.8	4.867
5	4 54 42.96	2.2018	24 41 40.2	0.900	5	6 41 43.14	2.2309	23 5 41.1	4.991
6	4 56 55.12	2.2037	24 42 34.2	0.840	6	6 43 57.47	2.2307	23 0 37.9	5.115
7	4 59 7.40	2.2066	24 43 21.0	0.719	7	6 46 11.79	2.2304	22 55 27.3	5.238
8	5 1 19.78	2.2073	24 44 0.5	0.596	8	6 48 26.06	2.2300	22 50 9.3	5.362
9	5 3 32.27	2.2090	24 44 32.8	0.477	9	6 50 40.35	2.2276	22 44 43.9	5.485
10	5 5 44.86	2.2106	24 44 57.8	0.366	10	6 52 54.59	2.2273	22 39 11.1	5.608
11	5 7 57.55	2.2123	24 45 15.5	0.284	11	6 55 8.80	2.2307	22 33 30.9	5.731
12	5 10 10.33	2.2138	24 45 25.9	0.113	12	6 57 22.99	2.2302	22 27 43.4	5.854
13	5 12 23.21	2.2154	24 45 29.0	0.010	13	6 59 37.15	2.2307	22 21 48.5	5.976
14	5 14 36.18	2.2169	24 45 24.7	0.133	14	7 1 51.27	2.2302	22 15 46.3	6.098
15	5 16 49.24	2.2184	24 45 13.1	0.255	15	7 4 5.36	2.2346	22 9 36.8	6.220
16	5 19 2.39	2.2198	24 44 54.1	0.378	16	7 6 19.42	2.2340	22 3 19.9	6.341
17	5 21 15.62	2.2213	24 44 27.7	0.501	17	7 8 33.44	2.2333	21 56 55.8	6.462
18	5 23 28.93	2.2225	24 43 54.0	0.624	18	7 10 47.42	2.2326	21 50 24.4	6.583
19	5 25 42.31	2.2237	24 43 12.8	0.748	19	7 13 1.36	2.2319	21 43 45.8	6.702
20	5 27 55.77	2.2249	24 42 24.2	0.871	20	7 15 15.25	2.2312	21 37 0.0	6.823
21	5 30 9.30	2.2261	24 41 28.2	0.995	21	7 17 29.10	2.2305	21 30 7.0	6.943
22	5 32 22.90	2.2273	24 40 24.7	1.119	22	7 19 42.91	2.2298	21 23 6.8	7.063
23	5 34 36.57	2.2285	N.24 39 13.8	1.243	23	7 21 56.67	2.2290	N.21 15 59.5	7.183
THURSDAY 26.					SATURDAY 28.				
0	5 36 50.30	2.2298	N.24 37 55.5	1.367	0	7 24 10.39	2.2282	N.21 8 45.0	7.301
1	5 39 4.09	2.2303	24 36 29.7	1.492	1	7 26 24.06	2.2273	21 1 23.4	7.419
2	5 41 17.94	2.2313	24 34 56.4	1.617	2	7 28 37.68	2.2265	20 53 54.7	7.537
3	5 43 31.84	2.2321	24 33 15.6	1.743	3	7 30 51.24	2.2256	20 46 19.0	7.654
4	5 45 45.79	2.2330	24 31 27.4	1.867	4	7 33 4.75	2.2248	20 38 36.2	7.771
5	5 47 59.79	2.2338	24 29 31.7	1.992	5	7 35 18.21	2.2239	20 30 46.4	7.888
6	5 50 13.84	2.2345	24 27 28.5	2.117	6	7 37 31.61	2.2230	20 22 49.6	8.004
7	5 52 27.93	2.2351	24 25 17.7	2.243	7	7 39 44.96	2.2221	20 14 45.9	8.120
8	5 54 42.05	2.2357	24 22 59.4	2.367	8	7 41 58.26	2.2212	20 6 35.2	8.236
9	5 56 56.21	2.2363	24 20 33.6	2.493	9	7 44 11.50	2.2203	19 58 17.6	8.351
10	5 59 10.41	2.2368	24 18 0.3	2.618	10	7 46 24.68	2.2193	19 49 53.1	8.466
11	6 1 24.64	2.2373	24 15 19.5	2.743	11	7 48 37.80	2.2183	19 41 21.8	8.579
12	6 3 38.89	2.2378	24 12 31.2	2.868	12	7 50 50.87	2.2174	19 32 43.7	8.692
13	6 5 53.17	2.2382	24 9 35.4	2.993	13	7 53 3.88	2.2164	19 23 58.8	8.806
14	6 8 7.48	2.2386	24 6 32.0	3.118	14	7 55 16.83	2.2154	19 15 7.1	8.917
15	6 10 21.81	2.2389	24 3 21.1	3.244	15	7 57 29.72	2.2144	19 6 8.7	9.029
16	6 12 36.15	2.2392	24 0 2.7	3.369	16	7 59 42.56	2.2134	18 57 3.7	9.140
17	6 14 50.51	2.2394	23 56 36.8	3.494	17	8 1 55.34	2.2124	18 47 52.0	9.251
18	6 17 4.88	2.2396	23 53 3.4	3.619	18	8 4 8.05	2.2114	18 38 33.6	9.361
19	6 19 19.27	2.2398	23 49 22.5	3.745	19	8 6 20.70	2.2104	18 29 8.7	9.470
20	6 21 33.66	2.2399	23 45 34.1	3.870	20	8 8 33.30	2.2094	18 19 37.2	9.579
21	6 23 48.06	2.2400	23 41 38.1	3.995	21	8 10 45.84	2.2085	18 9 59.2	9.687
22	6 26 2.46	2.2400	23 37 34.6	4.120	22	8 12 58.32	2.2075	18 0 14.8	9.794
23	6 28 16.87	2.2400	23 33 23.6	4.245	23	8 15 10.74	2.2065	17 50 23.9	9.901
24	6 30 31.27	2.2399	N.23 29 5.2	4.370	24	8 17 23.10	2.2055	N.17 40 26.6	10.007

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
SUNDAY 29.					MONDAY 30.				
0	8 17 23.10	2.9065	N.17° 40' 26.6"	10.007	0	9 10 4.06	2.1865	N.13° 11' 22.4"	12.336
1	8 19 35.40	2.9046	17 30 23.0	10.113	1	9 12 15.23	2.1860	12 58 59.5	12.424
2	8 21 47.65	2.9026	17 20 13.0	10.218	2	9 14 26.38	2.1855	12 46 31.5	12.510
3	8 23 59.84	2.9027	17 9 56.7	10.323	3	9 16 37.50	2.1851	12 33 58.3	12.596
4	8 26 11.97	2.9017	16 59 34.2	10.427	4	9 18 48.60	2.1847	12 21 20.1	12.679
5	8 28 24.04	2.9008	16 49 5.5	10.530	5	9 20 59.67	2.1843	12 8 36.9	12.762
6	8 30 36.06	2.1899	16 38 30.6	10.632	6	9 23 10.72	2.1840	11 55 48.7	12.844
7	8 32 48.03	2.1890	16 27 49.6	10.733	7	9 25 21.75	2.1837	11 42 55.7	12.926
8	8 34 59.94	2.1881	16 17 2.6	10.834	8	9 27 32.77	2.1834	11 29 57.8	13.006
9	8 37 11.80	2.1873	16 6 9.5	10.935	9	9 29 43.77	2.1832	11 16 55.2	13.083
10	8 39 23.60	2.1863	15 55 10.4	11.035	10	9 31 54.76	2.1830	11 3 47.9	13.160
11	8 41 35.35	2.1854	15 44 5.4	11.133	11	9 34 5.74	2.1829	10 50 36.0	13.237
12	8 43 47.05	2.1846	15 32 54.5	11.231	12	9 36 16.71	2.1828	10 37 19.5	13.313
13	8 45 58.70	2.1838	15 21 37.7	11.328	13	9 38 27.68	2.1827	10 23 58.5	13.387
14	8 48 10.31	2.1830	15 10 15.2	11.424	14	9 40 38.64	2.1827	10 10 33.1	13.460
15	8 50 21.87	2.1822	14 58 46.9	11.519	15	9 42 49.61	2.1826	9 57 3.3	13.532
16	8 52 33.39	2.1815	14 47 13.0	11.613	16	9 45 0.58	2.1826	9 43 29.3	13.603
17	8 54 44.86	2.1808	14 35 33.4	11.707	17	9 47 11.56	2.1826	9 29 51.0	13.673
18	8 56 56.29	2.1801	14 23 48.2	11.800	18	9 49 22.54	2.1821	9 16 8.5	13.742
19	8 59 7.68	2.1805	14 11 57.4	11.892	19	9 51 33.53	2.1823	9 2 22.0	13.809
20	9 1 19.03	2.1806	14 0 1.2	11.983	20	9 53 44.54	2.1826	8 48 31.4	13.875
21	9 3 30.34	2.1802	13 47 59.5	12.073	21	9 55 55.57	2.1829	8 34 36.8	13.941
22	9 5 41.61	2.1876	13 35 52.5	12.163	22	9 58 6.61	2.1843	8 20 38.4	14.006
23	9 7 52.85	2.1871	13 23 40.1	12.251	23	10 0 17.67	2.1846	8 6 36.1	14.069
24	9 10 4.06	2.1866	N.13° 11' 22.4"	12.338	24	10 2 26.77	2.1861	N. 7° 52' 30.1"	14.131

PHASES OF THE MOON.

● New Moon,	d	h	m
☽ First Quarter,	4	10	12.9
○ Full Moon,	11	1	16.3
☾ Last Quarter,	18	14	1.8
	26	18	24.5

☾ Perigee,	d	h
☾ Apogee,	6	13.3
	22	8.6

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Star's Name and Position.	Noon.	P. L. of ME.	IIIh.	P. L. of ME.	VIh.	P. L. of ME.	IXh.	P. L. of ME.
1	α Arietis W.	79° 8' 50"	2563	80° 48' 9"	2565	82° 27' 52"	2548	84° 7' 59"	2580
	Aldebaran W.	46 46 1	2649	48 23 50	2627	50 2 8	2606	51 40 55	2585
	SUN E.	44 28 31	2619	42 56 36	2602	41 24 20	2586	39 51 43	2600
2	α Arietis W.	92 34 32	2448	94 17 2	2429	95 59 55	2414	97 43 10	2398
	Aldebaran W.	60 1 47	2487	61 43 18	2470	63 25 14	2451	65 7 36	2434
	Pollux W.	18 51 30	2779	20 26 26	2710	22 2 53	2683	23 40 36	2664
	SUN E.	32 3 30	2794	30 28 55	2781	28 54 2	2769	27 18 54	2780
6	SUN W.	22 13 59	2481	23 55 39	2470	25 37 34	2462	27 19 41	2455
	Antares E.	62 4 41	2168	60 13 47	2102	58 22 51	2102	56 31 55	2162
	α Aquilæ E.	113 36 53	2734	112 0 58	2716	110 24 40	2701	108 48 1	2688
7	SUN W.	35 52 7	2441	37 34 43	2442	39 17 18	2443	40 59 51	2445
	Antares E.	47 17 35	2111	45 26 53	2115	43 36 16	2119	41 45 46	2124
	α Aquilæ E.	100 41 14	2650	99 3 27	2648	97 25 37	2647	95 47 46	2648
8	SUN W.	49 31 22	2470	51 13 18	2476	52 55 5	2488	54 36 42	2490
	Spica W.	13 27 16	2341	15 14 43	2330	17 2 26	2323	18 50 19	2320
	Antares E.	32 35 18	2184	30 45 42	2163	28 56 18	2171	27 7 7	2180
	α Aquilæ E.	87 39 26	2674	86 2 10	2663	84 25 7	2663	82 48 18	2705
	Fomalhaut E.	112 56 59	2664	111 19 17	2648	109 41 27	2644	108 3 32	2643
9	SUN W.	63 2 0	2634	64 42 26	2644	66 22 38	2654	68 2 36	2664
	Venus W.	31 17 15	2687	32 54 39	2671	34 31 58	2676	36 9 11	2681
	Spica W.	27 49 38	2327	29 37 10	2345	31 24 31	2362	33 11 41	2383
	α Aquilæ E.	74 48 48	2788	73 14 2	2806	71 39 42	2828	70 5 51	2853
	Fomalhaut E.	99 53 55	2632	98 16 11	2656	96 38 35	2665	95 1 8	2672
	α Pegasi E.	121 18 17	2406	119 34 54	2410	117 51 34	2414	116 8 19	2418
10	SUN W.	76 18 47	2620	77 57 15	2631	79 35 28	2643	81 13 25	2656
	Venus W.	44 12 55	2723	45 49 5	2733	47 25 2	2742	49 0 46	2753
	Spica W.	42 4 19	2307	43 50 9	2317	45 35 44	2327	47 21 4	2337
	α Aquilæ E.	62 24 53	2807	60 54 37	2803	59 25 5	2811	57 56 20	2813
	Fomalhaut E.	86 56 48	2724	85 20 40	2738	83 44 50	2751	82 9 18	2766
	α Pegasi E.	107 33 59	2450	105 51 36	2459	104 9 25	2467	102 27 26	2477
11	SUN W.	89 19 7	2715	90 55 27	2728	92 31 30	2740	94 7 17	2752
	Venus W.	56 55 57	2807	58 30 16	2818	60 4 20	2830	61 38 9	2842
	Spica W.	56 3 53	2391	57 47 40	2408	59 31 11	2413	61 14 27	2434
	Fomalhaut E.	74 16 51	2693	72 43 31	2673	71 10 38	2664	69 38 12	2677
	α Pegasi E.	94 0 52	2327	92 20 16	2338	90 39 55	2349	88 50 50	2361
12	SUN W.	102 2 10	2613	103 36 21	2626	105 10 16	2638	106 43 55	2650
	Spica W.	69 46 49	2480	71 28 31	2490	73 9 58	2502	74 51 9	2512
	Venus W.	69 23 30	2900	70 55 49	2911	72 27 54	2923	73 59 44	2934
	Antares W.	24 7 51	2485	25 49 25	2494	27 30 46	2504	29 11 53	2514
	Fomalhaut E.	62 3 36	2647	60 34 22	2678	59 5 45	2710	57 37 48	2744
	α Pegasi E.	80 43 26	2621	79 5 0	2634	77 26 51	2646	75 48 59	2658
13	SUN W.	114 28 18	2609	116 0 25	2621	117 32 17	2633	119 3 54	2645
	Spica W.	83 13 22	2666	84 53 5	2676	86 32 33	2686	88 11 48	2696
	Venus W.	81 35 19	2991	83 5 43	3002	84 35 53	3014	86 5 49	3024
	Antares W.	37 34 0	2666	39 13 43	2674	40 53 13	2685	42 32 29	2695
	Fomalhaut E.	50 29 14	2384	49 6 5	2406	47 43 55	2422	46 22 48	2432

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Star's Name and Position.	Midnight.	P. L. of Dist.	XVh.	P. L. of Dist.	XVIIIh.	P. L. of Dist.	XXIh.	P. L. of Dist.
1	α Arietis W.	85° 48' 30"	2612	87° 29' 25"	2496	89° 10' 44"	2480	90° 52' 26"	2462
	Aldebaran W.	53 20 10	2606	54 59 53	2446	56 40 4	2626	58 20 42	2606
	SUN E.	38 18 45	2653	36 45 26	2636	35 11 47	2622	33 37 48	2606
2	α Arietis W.	99 26 48	2662	101 10 48	2606	102 55 11	2652	104 39 55	2637
	Aldebaran W.	66 50 22	2417	68 33 33	2400	70 17 8	2683	72 1 7	2667
	Pollux W.	25 19 25	2661	26 59 13	2623	28 39 54	2469	30 21 22	2468
	SUN E.	25 43 32	2760	24 7 58	2743	22 32 15	2740	20 56 28	2740
6	SUN W.	29 1 58	2446	30 44 24	2446	32 26 55	2442	34 9 30	2441
	Antares E.	54 40 59	2103	52 50 4	2104	50 59 11	2106	49 8 21	2109
	α Aquilæ E.	107 11 5	2677	105 33 54	2697	103 56 30	2660	102 18 56	2664
7	SUN W.	42 42 21	2449	44 24 46	2453	46 7 5	2456	47 49 17	2463
	Antares E.	39 55 23	2129	38 5 8	2136	36 15 2	2141	34 25 5	2147
	α Aquilæ E.	94 9 56	2650	92 32 9	2654	90 54 27	2650	89 16 52	2666
8	SUN W.	56 18 9	2498	57 59 25	2607	59 40 29	2615	61 21 21	2625
	Spica W.	20 38 17	2320	22 26 15	2322	24 14 10	2327	26 1 58	2332
	Antares E.	25 18 9	2190	23 29 26	2200	21 40 58	2211	19 52 47	2223
	α Aquilæ E.	81 11 45	2719	79 35 30	2728	77 59 34	2749	76 23 59	2767
	Fomalhaut E.	106 25 34	2622	104 47 36	2643	103 9 39	2645	101 31 45	2648
9	SUN W.	69 42 20	2676	71 21 49	2686	73 1 4	2697	74 40 3	2698
	Venus W.	37 46 16	2668	39 23 12	2696	40 59 57	2704	42 36 32	2713
	Spica W.	34 58 39	2360	36 45 24	2376	38 31 56	2387	40 18 15	2397
	α Aquilæ E.	68 32 30	2677	66 59 42	2684	65 27 28	2693	63 55 51	2664
	Fomalhaut E.	93 23 50	2661	91 46 44	2690	90 9 51	2701	88 33 12	2712
	α Pegasi E.	114 25 10	2424	112 42 9	2439	110 59 16	2426	109 16 32	2443
10	SUN W.	82 51 6	2686	84 28 31	2679	86 5 39	2691	87 42 31	2708
	Venus W.	50 36 17	2763	52 11 33	2776	53 46 35	2785	55 21 23	2796
	Spica W.	49 6 9	2348	50 50 58	2369	52 35 32	2370	54 19 50	2380
	α Aquilæ E.	56 28 26	2166	55 1 24	2203	53 35 18	2263	52 10 11	2307
	Fomalhaut E.	80 34 5	2762	78 59 13	2798	77 24 43	2816	75 50 36	2834
	α Pegasi E.	100 45 40	2466	99 4 7	2496	97 22 48	2506	95 41 43	2516
11	SUN W.	95 42 48	2764	97 18 3	2776	98 53 2	2789	100 27 44	2801
	Venus W.	63 11 43	2662	64 45 2	2685	66 18 6	2676	67 50 55	2687
	Spica W.	62 57 27	2486	64 40 11	2447	66 22 39	2466	68 4 52	2469
	Fomalhaut E.	68 6 15	2640	66 34 47	2666	65 3 50	2691	63 33 26	2618
	α Pegasi E.	87 20 1	2672	85 40 28	2684	84 1 11	2696	82 22 10	2698
12	SUN W.	108 17 18	2692	109 50 26	2673	111 23 19	2686	112 55 56	2698
	Spica W.	76 32 5	2622	78 12 46	2622	79 53 13	2644	81 33 25	2656
	Venus W.	75 31 20	2646	77 2 41	2667	78 33 48	2696	80 4 41	2690
	Antares W.	30 52 47	2622	32 33 26	2684	34 13 52	2646	35 54 3	2646
	Fomalhaut E.	56 10 32	2181	54 44 0	2230	53 18 14	2262	51 53 18	2306
	α Pegasi E.	74 11 25	2672	72 34 9	2687	70 57 12	2701	69 20 33	2715
13	SUN W.	120 35 16	2686	122 6 24	2696	123 37 17	2679	125 7 56	2691
	Spica W.	89 50 48	2606	91 29 35	2616	93 8 8	2626	94 46 27	2636
	Venus W.	87 35 32	2685	89 5 1	2646	90 34 17	2666	92 3 20	2668
	Antares W.	44 11 31	2604	45 50 20	2616	47 28 55	2624	49 7 17	2634
	Fomalhaut E.	45 2 48	2667	43 44 0	2659	42 26 29	2737	41 10 21	2622

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Day of the Month.	Star's Name and Position.	Noon.	P. L. of Dist.	IIIh.	P. L. of Dist.	VIh.	P. L. of Dist.	IXh.	P. L. of Dist.
13	α Pegasi E.	67° 44' 13"	2739	66° 8' 12"	2745	64° 32' 32"	2760	62° 57' 11"	2775
	α Arietis E.	110 13 46	2601	108 34 25	2601	106 55 18	2601	105 16 24	2610
14	SUN W.	126 38 20	2602	128 8 30	2614	129 38 25	2626	131 8 5	2607
	Spica W.	96 24 33	2646	98 2 26	2626	99 40 5	2666	101 17 31	2675
	Venus W.	93 32 9	2678	95 0 45	2699	96 29 8	2699	97 57 19	3119
	Antares W.	50 45 26	2643	52 23 22	2653	54 1 5	2663	55 38 35	2673
	Fomalhaut E.	39 55 43	2619	38 42 43	2624	37 31 27	2641	36 22 5	2671
	α Pegasi E.	55 5 47	2602	53 32 39	2600	51 59 55	2601	50 27 37	2621
α Arietis E.	97 5 15	2600	95 27 41	2600	93 50 19	2678	92 13 10	2608	
15	Spica W.	109 21 34	2721	110 57 46	2730	112 33 46	2730	114 9 34	2746
	Venus W.	105 15 5	2161	106 42 1	2170	108 8 46	2180	109 35 19	2190
	Antares W.	63 43 0	2716	65 19 16	2726	66 55 21	2736	68 31 14	2744
	α Pegasi E.	42 53 16	2647	41 24 2	2678	39 55 26	2113	38 27 32	2148
	α Arietis E.	84 10 35	2734	82 34 40	2744	80 58 58	2753	79 23 28	2762
	Aldebaran E.	116 46 0	2770	115 10 53	2778	113 35 56	2796	112 1 10	2794
16	Venus W.	116 45 9	2226	118 10 33	2247	119 35 46	2256	121 0 47	2267
	Antares W.	76 27 49	2707	78 2 34	2726	79 37 9	2808	81 11 33	2811
	α Arietis E.	71 28 54	2606	69 54 34	2616	68 20 25	2624	66 46 28	2632
	Aldebaran E.	104 9 46	2631	102 35 59	2639	101 2 22	2647	99 28 55	2655
17	Antares W.	89 0 54	2692	90 34 15	2699	92 7 27	2667	93 40 26	2675
	α Aquilæ W.	42 52 4	4190	44 1 9	4093	45 11 17	4086	46 22 21	2684
	α Arietis E.	58 59 32	2676	57 26 42	2684	55 54 4	2694	54 21 37	2694
	Aldebaran E.	91 44 11	2694	90 11 44	2693	88 39 28	2699	87 7 21	2677
18	Antares W.	101 23 7	2612	102 55 11	2618	104 27 5	2626	105 58 51	2634
	α Aquilæ W.	52 29 2	2728	53 44 11	2707	54 59 48	2743	56 15 50	2721
	α Arietis E.	46 42 12	2647	45 10 53	2666	43 39 47	2686	42 8 52	2677
	Aldebaran E.	79 29 13	2666	77 58 5	2663	76 27 6	2671	74 56 17	2679
	Pollux E.	121 23 35	2692	119 52 34	2697	118 21 40	2673	116 50 53	2679
19	Antares W.	113 35 24	2606	115 6 17	2674	116 37 2	2661	118 7 39	2667
	α Aquilæ W.	62 41 3	2641	63 58 53	2631	65 16 54	2621	66 35 6	2612
	Fomalhaut W.	38 45 4	4244	39 52 49	4172	41 1 42	4107	42 11 37	4049
	α Arietis E.	34 37 27	2629	33 7 50	2640	31 38 27	2653	30 9 20	2667
	Aldebaran E.	67 24 39	2616	65 54 48	2626	64 25 6	2633	62 55 34	2641
	Pollux E.	109 18 50	2608	107 48 47	2614	106 18 51	2619	104 49 2	2625
20	α Aquilæ W.	73 7 59	2686	74 26 50	2692	75 45 44	2660	77 4 40	2667
	Fomalhaut W.	48 13 41	2637	49 28 5	2606	50 43 1	2777	51 58 27	2728
	Aldebaran E.	55 30 17	2678	54 1 41	2667	52 33 16	2696	51 5 1	2164
	Pollux E.	97 21 42	2662	95 52 34	2667	94 23 32	2663	92 54 37	2666
21	α Aquilæ W.	83 39 39	2677	84 58 38	2679	86 17 35	2660	87 36 31	2668
	Fomalhaut W.	58 21 26	2666	59 38 58	2648	60 56 46	2630	62 14 48	2616
	α Pegasi W.	35 54 45	2499	37 15 29	2497	38 36 41	2496	39 58 17	2416
	Aldebaran E.	43 46 15	2146	42 19 1	2135	40 51 58	2165	39 25 7	2175
	Pollux E.	85 31 27	2696	84 3 5	2696	82 34 49	2696	81 6 37	2161
	Regulus E.	122 27 54	2697	120 59 4	2670	119 30 18	2673	118 1 36	2677
22	α Aquilæ W.	94 10 27	2698	95 29 3	2692	96 47 35	2667	98 6 2	2612
	Fomalhaut W.	68 47 53	2671	70 6 59	2663	71 26 14	2656	72 45 36	2650

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13	α Pegasi E.	61° 22' 11"	3793	59° 47' 32"	3806	58° 13' 14"	3825	56° 39' 19"	3843
	α Arietis E.	103 37 43	3831	101 59 16	3830	100 21 2	3840	98 43 2	3850
14	SUN W.	132 37 32	3849	134 6 44	3860	135 35 42	3873	137 4 25	3884
	Spica W.	102 54 45	3884	104 31 46	3884	106 8 34	3708	107 45 10	3712
	Venus W.	99 25 17	3130	100 53 2	3130	102 20 35	3140	103 47 56	3150
	Antares W.	57 15 53	3861	58 52 58	3860	60 29 51	3700	62 6 31	3708
	Fomalhaut E.	35 14 46	4418	34 9 41	4583	33 7 1	4789	32 6 59	4980
	α Pegasi E.	48 55 45	3844	47 24 22	3867	45 53 28	3893	44 23 5	3919
15	α Arietis E.	90 36 14	3868	88 50 31	3707	87 23 0	3716	85 46 42	3728
	Spica W.	115 45 10	3767	117 20 34	3766	118 55 46	3776	120 30 47	3784
16	Venus W.	111 1 40	3300	112 27 49	3300	113 53 47	3319	115 19 34	3329
	Antares W.	70 6 56	3763	71 42 26	3761	73 17 45	3769	74 52 53	3779
	α Pegasi E.	37 0 21	3188	35 33 58	3238	34 8 27	3283	32 43 54	3337
	α Arietis E.	77 48 10	3771	76 13 4	3779	74 38 9	3788	73 3 26	3797
	Aldebaran E.	110 26 34	3801	108 52 7	3808	107 17 50	3816	105 43 43	3824
	Venus W.	122 25 37	3376	123 50 16	3386	125 14 44	3394	126 39 2	3404
17	Antares W.	82 45 46	3819	84 19 49	3838	85 53 41	3856	87 27 23	3864
	α Arietis E.	65 12 42	3843	63 39 8	3850	62 5 45	3859	60 32 33	3867
	Aldebaran E.	97 55 38	3883	96 22 31	3871	94 49 35	3878	93 16 48	3886
	Antares W.	95 13 19	3883	96 46 0	3890	98 18 32	3898	99 50 54	3906
18	α Aquilæ W.	47 34 16	3887	48 46 58	3896	50 0 22	3897	51 14 25	3894
	α Arietis E.	52 49 21	3913	51 17 17	3920	49 45 24	3929	48 13 42	3939
	Aldebaran E.	85 35 24	3936	84 3 37	3933	82 31 59	3940	81 0 31	3948
	Antares W.	107 30 27	3941	109 1 54	3947	110 33 13	3954	112 4 23	3963
	α Aquilæ W.	57 32 15	3701	58 49 1	3683	60 6 6	3668	61 23 27	3654
	α Arietis E.	40 38 10	3986	39 7 40	3986	37 37 22	3907	36 7 18	3918
19	Aldebaran E.	73 25 38	3987	71 55 9	3984	70 24 49	3903	68 54 39	3910
	Pollux E.	115 20 14	3986	113 49 42	3990	112 19 17	3997	110 49 0	3993
	Antares W.	119 38 8	3993	121 8 29	3999	122 38 43	3906	124 8 49	3911
	α Aquilæ W.	67 53 27	3906	69 11 56	3909	70 30 31	3904	71 49 12	3908
	Fomalhaut W.	43 22 28	3997	44 34 11	3980	45 46 40	3908	46 59 52	3971
	α Arietis E.	28 40 30	3983	27 11 58	3987	25 43 45	3114	24 15 53	3133
20	Aldebaran E.	61 26 12	3943	59 56 59	3956	58 27 56	3964	56 59 2	3971
	Pollux E.	103 19 20	3930	101 49 45	3936	100 20 17	3943	98 50 56	3947
	α Aquilæ W.	78 23 39	3976	79 42 39	3976	81 1 39	3976	82 20 39	3976
	Fomalhaut W.	53 14 19	3730	54 30 34	3760	55 47 12	3800	57 4 10	3873
21	Aldebaran E.	49 36 56	3113	48 9 1	3119	46 41 15	3129	45 13 40	3137
	Pollux E.	91 25 48	3973	89 57 4	3977	88 28 26	3982	86 59 54	3986
	α Aquilæ W.	88 55 24	3886	90 14 15	3897	91 33 3	3891	92 51 47	3896
22	Fomalhaut W.	63 33 3	3897	64 51 30	3897	66 10 8	3897	67 28 56	3879
	α Pegasi W.	41 20 15	3399	42 42 33	3383	44 5 9	3370	45 28 0	3357
	Aldebaran E.	37 58 28	3188	36 32 2	3198	35 5 50	3209	33 39 52	3224
	Pollux E.	79 38 29	3166	78 10 25	3168	76 42 25	3111	75 14 29	3114
	Regulus E.	116 32 58	3079	115 4 23	3083	113 35 51	3084	112 7 22	3086
	α Aquilæ W.	99 24 23	3617	100 42 39	3623	102 0 48	3629	103 18 51	3636
Fomalhaut W.	74 5 5	3544	75 24 41	3538	76 44 23	3533	78 4 11	3528	

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22	α Pegasi W.	46° 51' 6"	3345	48° 14' 25"	3335	49° 37' 56"	3325	51° 1' 39"	3315
	Aldebaran E.	32 14 11	3238	30 48 47	3255	29 23 43	3273	27 59 0	3294
	Pollux E.	73 46 37	3117	72 18 48	3119	70 51 2	3121	69 23 18	3124
	Regulus E.	110 38 55	3057	109 10 30	3059	107 42 7	3060	106 13 45	3061
23	α Aquilæ W.	104 36 47	3043	105 54 36	3049	107 12 17	3055	108 29 49	3065
	Fomalhaut W.	79 24 4	3023	80 44 3	3018	82 4 7	3014	83 24 16	3009
	α Pegasi W.	58 2 39	3277	59 27 17	3270	60 52 4	3263	62 16 59	3257
	Pollux E.	62 5 10	3129	60 37 36	3130	59 10 3	3130	57 42 30	3131
	Regulus E.	98 52 4	3091	97 23 43	3090	95 55 21	3089	94 26 58	3087
	SUN E.	131 18 53	3485	129 58 12	3482	128 37 28	3480	127 16 41	3477
24	Fomalhaut W.	90 6 8	3490	91 26 43	3487	92 47 22	3484	94 8 4	3480
	α Pegasi W.	69 23 29	3223	70 49 11	3215	72 15 2	3208	73 41 1	3201
	α Arietis W.	25 48 35	3160	27 15 32	3147	28 42 45	3134	30 10 13	3123
	Pollux E.	50 24 45	3129	48 57 10	3137	47 29 33	3126	46 1 55	3125
	Regulus E.	87 4 17	3073	85 35 33	3069	84 6 45	3064	82 37 51	3060
	SUN E.	120 31 55	3458	119 10 44	3454	117 49 28	3447	116 28 5	3442
25	Fomalhaut W.	100 52 28	3485	102 13 30	3483	103 34 35	3482	104 55 42	3480
	α Pegasi W.	80 53 11	3162	82 20 6	3148	83 47 11	3148	85 14 26	3135
	α Arietis W.	37 31 0	3067	38 59 50	3056	40 28 53	3048	41 58 9	3035
	Pollux E.	38 43 27	3121	37 15 43	3131	35 47 59	3122	34 20 16	3123
	Regulus E.	75 11 43	3029	73 42 6	3022	72 12 20	3014	70 42 24	3005
	SUN E.	109 39 26	3407	108 17 17	3399	106 54 59	3399	105 32 30	3390
26	Fomalhaut W.	111 41 41	3485	113 2 54	3487	114 24 6	3488	115 45 17	3481
	α Pegasi W.	92 33 35	3057	94 2 1	3076	95 30 40	3065	96 59 32	3054
	α Arietis W.	49 27 58	3277	50 58 40	3266	52 29 37	3251	54 0 51	3239
	Aldebaran W.	18 9 20	3408	19 31 33	3337	20 55 13	3304	22 20 7	3210
	Pollux E.	27 2 32	3160	25 35 23	3164	24 8 31	3163	22 42 1	3207
	Regulus E.	63 10 3	3068	61 38 58	3048	60 7 40	3027	58 36 8	2928
	SUN E.	98 37 18	3327	97 13 38	3314	95 49 43	3293	94 25 34	3269
	27	α Pegasi W.	104 27 19	3297	105 57 36	3265	107 28 7	3278	108 58 54	3262
α Arietis W.		61 41 15	3269	63 14 14	3263	64 47 33	3258	66 21 11	3253
Aldebaran W.		29 38 18	3019	31 8 7	3260	32 38 33	3252	34 9 34	3235
Regulus E.		50 54 44	3063	49 21 38	3261	47 48 16	3257	46 14 36	3252
SUN E.		87 20 52	3318	85 55 4	3305	84 28 58	3198	83 2 34	3171
28		α Arietis W.	74 14 33	3741	75 50 19	3723	77 26 28	3706	79 3 0	3688
	Aldebaran W.	41 52 38	3215	43 26 46	3793	45 1 23	3771	46 36 29	3749
	Regulus E.	38 21 41	3761	36 46 9	3787	35 10 18	3723	33 34 9	3710
	SUN E.	75 45 32	3068	74 17 4	3007	72 48 14	3049	71 19 2	3030
29	α Arietis W.	87 11 42	3297	88 50 41	3279	90 30 5	3260	92 9 55	3242
	Aldebaran W.	54 39 10	3242	56 17 8	3231	57 55 35	3200	59 34 30	3200
	Regulus E.	25 28 52	3248	23 51 0	3238	22 12 56	3232	20 34 44	3238
	SUN E.	63 47 11	3285	62 15 37	3216	60 43 38	3206	59 11 14	3276
30	α Arietis W.	100 35 33	2448	102 17 59	2429	104 0 52	2412	105 44 10	2394
	Aldebaran W.	67 56 9	2477	69 37 54	2488	71 20 7	2488	73 2 47	2419
	Pollux W.	26 27 15	3223	28 5 40	3262	29 45 0	3248	31 25 9	3212
	SUN E.	51 23 0	2781	49 48 7	2761	48 12 48	2743	46 37 5	2726

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22	α Pegasi W.	52° 25' 32"	3307	53° 49' 35"	3300	55° 13' 47"	3291	56° 38' 9"	3284
	Aldebaran E.	26 34 42	3319	25 10 52	3346	23 47 34	3380	22 24 55	3420
	Pollux E.	67 55 37	3126	66 27 58	3197	65 0 21	3126	63 32 45	3129
	Regulus E.	104 45 24	3091	103 17 4	3091	101 48 44	3091	100 20 24	3091
23	α Aquilæ W.	109 47 13	3075	111 4 27	3084	112 21 31	3096	113 38 23	3706
	Fomalhaut W.	84 44 30	3006	86 4 48	3002	87 25 10	3497	88 45 37	3494
	α Pegasi W.	63 42 1	3260	65 7 11	3243	66 32 29	3296	67 57 55	3230
	Pollux E.	56 14 58	3130	54 47 25	3130	53 19 52	3130	51 52 19	3129
	Regulus E.	92 58 32	3084	91 30 3	3082	90 1 31	3079	88 32 56	3076
	SUN E.	125 55 51	3474	124 34 58	3471	123 14 2	3467	121 53 1	3463
24	Fomalhaut W.	95 28 50	3477	96 49 40	3474	98 10 33	3471	99 31 29	3469
	α Pegasi W.	75 7 9	3193	76 33 26	3187	77 59 51	3178	79 26 26	3170
	α Arietis W.	31 37 55	3111	33 5 51	3100	34 34 1	3089	36 2 24	3078
	Pollux E.	44 34 16	3124	43 6 36	3123	41 38 54	3122	40 11 11	3121
	Regulus E.	81 8 51	3054	79 39 45	3048	78 10 32	3043	76 41 11	3036
	SUN E.	115 6 36	3496	113 45 0	3490	112 23 17	3423	111 1 26	3416
25	Fomalhaut W.	106 16 51	3468	107 38 2	3467	108 59 14	3466	110 20 27	3466
	α Pegasi W.	86 41 53	3126	88 9 31	3117	89 37 20	3107	91 5 21	3096
	α Arietis W.	43 27 38	3024	44 57 21	3013	46 27 19	3001	47 57 31	2989
	Pollux E.	32 52 34	3126	31 24 55	3129	29 57 21	3133	28 29 52	3141
	Regulus E.	69 12 18	3097	67 42 2	3088	66 11 34	3079	64 40 55	3069
	SUN E.	104 9 51	3371	102 47 1	3360	101 23 59	3350	100 0 45	3338
26	Fomalhaut W.	117 6 25	3463	118 27 30	3466	119 48 30	3473	121 9 24	3480
	α Pegasi W.	98 28 38	3043	99 57 57	3032	101 27 30	3021	102 57 17	3009
	α Arietis W.	55 32 21	2926	57 4 8	2911	58 36 13	2908	60 8 35	2893
	Aldebaran W.	23 46 4	3163	25 12 57	3123	26 40 40	3068	28 9 8	3061
	Pollux E.	21 16 0	3238	19 50 36	3230	18 26 1	3233	17 2 34	3414
	Regulus E.	57 4 22	2914	55 32 21	2901	54 0 4	2900	52 27 32	2977
	SUN E.	93 1 10	3376	91 36 30	3362	90 11 34	3348	88 46 22	3323
	27	α Pegasi W.	110 29 55	2960	112 1 11	2937	113 32 43	2926	115 4 29	2913
α Arietis W.		67 55 9	2807	69 29 28	2791	71 4 8	2775	72 39 10	2766
Aldebaran W.		35 41 8	2910	37 13 14	2886	38 45 52	2862	40 19 0	2838
Regulus E.		44 40 38	2809	43 6 22	2796	41 31 47	2780	39 56 53	2766
SUN E.		81 35 50	3164	80 8 46	3136	78 41 22	3121	77 13 38	3103
28	α Arietis W.	80 39 56	2970	82 17 16	2962	83 55 0	2934	85 33 9	2916
	Aldebaran W.	48 12 4	2797	49 48 8	2706	51 24 40	2684	53 1 41	2663
	Regulus E.	31 57 42	2695	30 20 56	2682	28 43 52	2669	27 6 30	2657
	SUN E.	69 49 27	3012	68 19 29	2998	66 49 7	2973	65 18 21	2954
29	α Arietis W.	93 50 10	2923	95 30 51	2904	97 11 59	2498	98 53 33	2487
	Aldebaran W.	61 13 53	2569	62 53 45	2636	64 34 5	2516	66 14 53	2496
	Regulus E.	18 56 27	2629	17 18 11	2636	15 40 5	2644	14 2 23	2696
	SUN E.	57 38 25	2867	56 5 11	2836	54 31 32	2816	52 57 28	2800
30	α Arietis W.	107 27 54	2375	109 12 4	2367	110 56 40	2339	112 41 42	2323
	Aldebaran W.	74 45 55	2400	76 29 30	2381	78 13 32	2362	79 58 2	2343
	Pollux W.	33 6 4	2482	34 47 42	2463	36 30 1	2425	38 13 0	2399
	SUN E.	45 0 58	2797	43 24 27	2689	41 47 33	2673	40 10 16	2656

AT GREENWICH APPARENT NOON.

THE SUN'S															
Day of the Week.	Day of the Month.	Apparent Right Ascension.			Diff. for 1 hour.	Apparent Declination.			Diff. for 1 hour.	Semi-diameter.	Sideral Time of the Semi-diameter passing the Meridian.	Equation of Time, to be subtracted from Apparent Time.	D.M. for 1 hour.		
		^h	^m	^s		[°]	[']	["]							
Tues.	1	12	30	23.00	9.066	S. 3	16	58.6	58.31	16	1.62	64.38	10	23.74	0.791
Wed.	2	12	34	0.70	9.079	3	40	16.6	58.22	16	1.90	64.42	10	42.55	0.777
Thur.	3	12	37	38.73	9.093	4	3	32.1	58.10	16	2.17	64.47	11	1.03	0.763
Fri.	4	12	41	17.09	9.108	4	26	44.7	57.97	16	2.45	64.52	11	19.17	0.749
Sat.	5	12	44	55.80	9.123	4	49	54.0	57.82	16	2.73	64.57	11	36.96	0.734
Sun.	6	12	48	34.89	9.139	5	12	59.7	57.66	16	3.01	64.63	11	54.37	0.718
Mon.	7	12	52	14.37	9.155	5	36	1.4	57.49	16	3.29	64.69	12	11.39	0.701
Tues.	8	12	55	54.26	9.172	5	58	58.8	57.29	16	3.58	64.76	12	28.02	0.683
Wed.	9	12	59	34.57	9.190	6	21	51.4	57.09	16	3.86	64.83	12	44.21	0.665
Thur.	10	13	3	15.33	9.209	6	44	38.8	56.87	16	4.14	64.90	12	59.96	0.647
Fri.	11	13	6	56.54	9.228	7	7	20.6	56.63	16	4.42	64.97	13	15.27	0.628
Sat.	12	13	10	38.22	9.248	7	29	56.4	56.36	16	4.70	65.04	13	30.10	0.608
Sun.	13	13	14	20.39	9.270	7	52	26.0	56.09	16	4.98	65.12	13	44.44	0.587
Mon.	14	13	18	3.08	9.292	8	14	49.0	55.81	16	5.26	65.20	13	58.27	0.566
Tues.	15	13	21	46.31	9.314	8	37	5.0	55.52	16	5.54	65.28	14	11.55	0.544
Wed.	16	13	25	30.08	9.337	8	59	13.6	55.20	16	5.82	65.36	14	24.30	0.520
Thur.	17	13	29	14.42	9.361	9	21	14.6	54.88	16	6.10	65.45	14	36.49	0.496
Fri.	18	13	32	59.35	9.386	9	43	7.5	54.53	16	6.37	65.54	14	48.07	0.470
Sat.	19	13	36	44.89	9.413	10	4	51.9	54.17	16	6.64	65.63	14	59.04	0.444
Sun.	20	13	40	31.08	9.439	10	26	27.5	53.79	16	6.91	65.72	15	9.39	0.417
Mon.	21	13	44	17.92	9.467	10	47	53.9	53.40	16	7.18	65.81	15	19.08	0.389
Tues.	22	13	48	5.43	9.495	11	9	10.7	52.99	16	7.45	65.91	15	28.11	0.361
Wed.	23	13	51	53.64	9.525	11	30	17.6	52.57	16	7.71	66.01	15	36.42	0.333
Thur.	24	13	55	42.57	9.556	11	51	14.1	52.13	16	7.96	66.11	15	44.01	0.303
Fri.	25	13	59	32.23	9.586	12	11	59.9	51.67	16	8.21	66.21	15	50.89	0.273
Sat.	26	14	3	22.63	9.616	12	32	34.5	51.20	16	8.46	66.33	15	57.05	0.242
Sun.	27	14	7	13.76	9.647	12	52	57.6	50.71	16	8.71	66.43	16	2.46	0.209
Mon.	28	14	11	5.65	9.680	13	13	8.7	50.20	16	8.97	66.54	16	7.10	0.176
Tues.	29	14	14	58.34	9.713	13	33	7.4	49.67	16	9.22	66.65	16	10.96	0.143
Wed.	30	14	18	51.83	9.746	13	52	53.3	49.13	16	9.47	66.76	16	14.01	0.110
Thur.	31	14	22	46.12	9.780	14	12	25.9	48.56	16	9.72	66.87	16	16.28	0.077
Fri.	32	14	26	41.22	9.814	S. 14	31	44.8	47.99	16	9.96	66.98	16	17.73	0.043

NOTE. — Mean Time of the Semidiameter passing may be found by subtracting 0s.13 from the Sideral Time.

AT GREENWICH MEAN NOON.

THE SUN'S								
Day of the Week.	Day of the Month.	THE SUN'S				Equation of Time, to be added to Mean Time.	Diff. for 1 hour.	Sidereal Time.
		Apparent Right Ascension.	Diff. for 1 hour.	Apparent Declination.	Diff. for 1 hour.			
		h m s	s	° ' "	"	m s	s	h m s
Tues.	1	12 30 24.57	9.066	S. 3 17 8.7	58.31	10 23.88	0.791	12 40 48.45
Wed.	2	12 34 2.32	9.079	3 40 27.0	58.22	10 42.69	0.777	12 44 45.01
Thur.	3	12 37 40.39	9.093	4 3 42.8	58.10	11 1.17	0.763	12 48 41.56
Fri.	4	12 41 18.60	9.108	4 26 55.7	57.97	11 19.31	0.749	12 52 38.11
Sat.	5	12 44 57.57	9.123	4 50 5.3	57.82	11 37.10	0.734	12 56 34.67
Sun.	6	12 48 36.71	9.139	5 13 11.2	57.66	11 54.51	0.718	13 0 31.22
Mon.	7	12 52 16.24	9.155	5 36 13.1	57.49	12 11.53	0.701	13 4 27.77
Tues.	8	12 55 56.17	9.172	5 59 10.7	57.29	12 28.16	0.683	13 8 24.33
Wed.	9	12 59 36.53	9.190	6 22 3.5	57.09	12 44.35	0.665	13 12 20.88
Thur.	10	13 3 17.33	9.209	6 44 51.1	56.87	13 0.10	0.647	13 16 17.43
Fri.	11	13 6 58.58	9.228	7 7 33.1	56.63	13 15.41	0.628	13 20 13.99
Sat.	12	13 10 40.30	9.248	7 30 9.1	56.36	13 30.24	0.608	13 24 10.54
Sun.	13	13 14 22.51	9.270	7 52 38.9	56.09	13 44.58	0.587	13 28 7.09
Mon.	14	13 18 5.24	9.292	8 15 2.1	55.81	13 58.41	0.566	13 32 3.65
Tues.	15	13 21 48.51	9.314	8 37 18.2	55.52	14 11.69	0.544	13 36 0.20
Wed.	16	13 25 32.32	9.337	8 59 26.9	55.20	14 24.43	0.520	13 39 56.75
Thur.	17	13 29 16.70	9.361	9 21 28.0	54.88	14 36.61	0.495	13 43 53.31
Fri.	18	13 33 1.67	9.386	9 43 21.0	54.53	14 48.19	0.470	13 47 49.86
Sat.	19	13 36 47.25	9.413	10 5 5.5	54.17	14 59.16	0.444	13 51 46.41
Sun.	20	13 40 33.47	9.439	10 26 41.2	53.79	15 9.50	0.417	13 55 42.97
Mon.	21	13 44 20.34	9.467	10 48 7.6	53.40	15 19.18	0.389	13 59 39.52
Tues.	22	13 48 7.88	9.495	11 9 24.4	52.99	15 28.20	0.361	14 3 36.08
Wed.	23	13 51 56.12	9.525	11 30 31.3	52.57	15 36.51	0.332	14 7 32.63
Thur.	24	13 55 45.08	9.556	11 51 27.8	52.13	15 44.10	0.303	14 11 29.18
Fri.	25	13 59 34.77	9.586	12 12 13.6	51.67	15 50.97	0.273	14 15 25.74
Sat.	26	14 3 25.19	9.616	12 32 48.2	51.20	15 57.10	0.242	14 19 22.29
Sun.	27	14 7 16.33	9.647	12 53 11.2	50.71	16 2.52	0.209	14 23 18.85
Mon.	28	14 11 8.25	9.680	13 13 22.2	50.20	16 7.15	0.176	14 27 15.40
Tues.	29	14 15 0.96	9.713	13 33 20.8	49.67	16 11.00	0.143	14 31 11.96
Wed.	30	14 18 54.47	9.746	13 53 6.6	49.13	16 14.04	0.110	14 35 8.51
Thur.	31	14 22 48.77	9.780	14 12 39.1	48.56	16 16.30	0.077	14 39 5.07
Fri.	32	14 26 43.88	9.814	S. 14 31 57.8	47.99	16 17.74	0.043	14 43 1.62

NOTE. — The Semidiameter for Mean Noon may be assumed the same as that for Apparent Noon.

AT GREENWICH MEAN NOON.

THE SUN'S										
Day of the Month.	Day of the Year.	True LONGITUDE.				Dist. for 1 hour.	LATITUDE.	Logarithm of the Radius Vector of the Earth.	Diff. for 1 hour.	Mean Time of Sidereal Ob.
		λ		λ'						
		$^{\circ}$	$'$	$'$	$''$					
1	274	188	17 1.4	16 7.1	147.77	-0.45	0.0001685	51.5	11 17 20.28	
2	275	189	16 8.9	15 14.5	147.86	0.51	0.0000446	51.8	11 13 24.37	
3	276	190	15 18.5	14 24.0	147.95	0.54	9.9999201	52.0	11 9 28.46	
4	277	191	14 30.2	13 35.6	148.03	0.53	.9997949	52.3	11 5 32.55	
5	278	192	13 44.0	12 49.3	148.11	0.50	.9996692	52.5	11 1 36.65	
6	279	193	12 59.8	12 5.0	148.19	0.44	.9995430	52.7	10 57 40.75	
7	280	194	12 17.4	11 22.5	148.27	0.36	.9994164	52.9	10 53 44.84	
8	281	195	11 36.9	10 41.9	148.34	0.26	.9992894	53.0	10 49 48.92	
9	282	196	10 58.3	10 3.2	148.41	0.14	.9991621	53.0	10 45 53.02	
10	283	197	10 21.4	9 26.2	148.48	-0.02	.9990347	53.0	10 41 57.11	
11	284	198	9 46.3	8 51.0	148.56	+0.11	.9989074	52.9	10 38 1.21	
12	285	199	9 12.9	8 17.5	148.64	0.24	.9987802	52.9	10 34 5.30	
13	286	200	8 41.2	7 45.7	148.72	0.34	.9986535	52.7	10 30 9.39	
14	287	201	8 11.3	7 15.7	148.80	0.43	.9985273	52.4	10 26 13.48	
15	288	202	7 43.3	6 47.6	148.88	0.50	.9984019	52.0	10 22 17.57	
16	289	203	7 17.2	6 21.4	148.96	0.53	.9982773	51.7	10 18 21.67	
17	290	204	6 52.9	5 57.0	149.04	0.53	.9981537	51.3	10 14 25.76	
18	291	205	6 30.6	5 34.6	149.12	0.50	.9980312	50.8	10 10 29.85	
19	292	206	6 10.1	5 14.1	149.20	0.46	.9979096	50.3	10 6 33.94	
20	293	207	5 51.6	4 55.5	149.28	0.38	.9977894	49.8	10 2 38.03	
21	294	208	5 35.2	4 38.9	149.36	0.27	.9976703	49.3	9 58 42.13	
22	295	209	5 21.0	4 24.5	149.45	0.14	.9975524	48.9	9 54 46.22	
23	296	210	5 8.9	4 12.3	149.54	+0.01	.9974356	48.4	9 50 50.31	
24	297	211	4 59.0	4 2.3	149.63	-0.14	.9973199	48.0	9 46 54.40	
25	298	212	4 51.3	3 54.5	149.72	0.28	.9972051	47.7	9 42 58.49	
26	299	213	4 45.9	3 49.0	149.81	0.41	.9970911	47.3	9 39 2.59	
27	300	214	4 42.7	3 45.6	149.91	0.52	.9969778	47.0	9 35 6.68	
28	301	215	4 41.7	3 44.5	150.00	0.62	.9968655	46.6	9 31 10.77	
29	302	216	4 42.8	3 45.5	150.09	0.69	.9967538	46.4	9 27 14.86	
30	303	217	4 46.1	3 48.7	150.18	0.72	.9966426	46.2	9 23 18.95	
31	304	218	4 51.4	3 53.9	150.27	0.73	.9965319	46.0	9 19 23.05	
32	305	219	4 58.7	4 1.0	150.35	-0.70	9.9964217	45.8	9 15 27.14	

NOTE. — λ corresponds to the true equinox of the date, λ' to the mean equinox of January 0d.

GREENWICH MEAN TIME.

THE MOON'S

Day of the Month.

	SEMI-DIAMETER.		HORIZONTAL PARALLAX.				MERIDIAN PASSAGE.		AGE.
	Noon.	Midnight.	Noon.	Diff. for 1 hour.	Midnight.	Diff. for 1 hour.		Diff. for 1 hour.	
							^h ^m	^m	
1	16' 9.4"	16 16.6	59' 11.3"	+2.26	59 37.6	+2.11	22 6.6	2.12	26.6
2	16 23.1	16 28.9	60 1.7	1.90	60 23.0	1.64	22 58.0	2.18	27.6
3	16 33.8	16 37.6	60 40.8	1.33	60 54.7	0.97	23 51.5	2.28	28.6
4	16 40.1	16 41.4	61 4.1	+0.60	61 8.9	+0.20	♄		0.2
5	16 41.5	16 40.2	61 9.0	-0.19	61 4.4	-0.57	0 47.8	2.41	1.2
6	16 37.8	16 34.2	60 55.4	0.93	60 42.3	1.24	1 47.0	2.52	2.2
7	16 29.7	16 24.4	60 25.7	1.51	60 6.2	1.73	2 48.5	2.59	3.2
8	16 18.4	16 12.0	59 44.4	1.89	59 20.9	2.01	3 50.6	2.57	4.2
9	16 5.4	15 58.6	58 56.4	2.07	58 31.4	2.09	4 51.1	2.46	5.2
10	15 51.8	15 45.1	58 6.4	2.66	57 42.0	2.01	5 48.2	2.30	6.2
11	15 38.7	15 32.5	57 18.3	1.93	56 55.6	1.84	6 41.3	2.12	7.2
12	15 26.6	15 21.2	56 34.2	1.73	56 14.1	1.62	7 30.3	1.97	8.2
13	15 16.1	15 11.4	55 55.4	1.50	55 38.2	1.38	8 15.9	1.84	9.2
14	15 7.1	15 3.2	55 22.4	1.26	55 8.0	1.14	8 59.1	1.76	10.2
15	14 59.7	14 56.5	54 55.1	1.02	54 43.6	0.90	9 41.0	1.73	11.2
16	14 53.7	14 51.3	54 33.4	0.79	54 24.5	0.69	10 22.3	1.73	12.2
17	14 49.3	14 47.5	54 16.9	0.58	54 10.5	0.48	11 4.1	1.76	13.2
18	14 46.1	14 45.1	54 5.8	0.38	54 1.4	0.27	11 47.0	1.82	14.2
19	14 44.3	14 44.0	53 58.8	-0.17	53 57.4	-0.06	12 31.6	1.90	15.2
20	14 44.0	14 44.4	53 57.4	+0.06	53 58.9	+0.19	13 18.1	1.98	16.2
21	14 45.2	14 46.4	54 1.9	0.32	54 6.4	0.45	14 6.5	2.05	17.2
22	14 48.1	14 50.4	54 12.8	0.60	54 20.9	0.76	14 56.3	2.10	18.2
23	14 53.1	14 56.4	54 31.0	0.92	54 43.1	1.09	15 46.9	2.11	19.2
24	15 0.3	15 4.7	54 57.3	1.27	55 13.6	1.44	16 37.4	2.10	20.2
25	15 9.7	15 15.3	55 31.9	1.62	55 52.3	1.78	17 27.3	2.06	21.2
26	15 21.4	15 28.0	56 14.7	1.94	56 39.0	2.09	18 16.4	2.03	22.2
27	15 35.0	15 42.4	57 4.8	2.22	57 32.1	2.32	19 4.9	2.02	23.2
28	15 50.1	15 57.9	58 0.3	2.38	58 29.1	2.41	19 53.4	2.03	24.2
29	16 5.8	16 13.4	58 57.9	2.38	59 26.0	2.30	20 42.9	2.09	25.2
30	16 20.8	16 27.5	59 52.9	2.16	60 17.7	1.96	21 34.3	2.20	26.2
31	16 33.5	16 38.5	60 39.6	1.69	60 58.1	1.38	22 28.7	2.34	27.2
32	16 42.4	16 45.1	61 12.5	+1.01	61 22.2	+0.61	23 26.9	2.50	28.2

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
TUESDAY 1.					THURSDAY 3.				
0	10 2 28.77	2.1851	N. 7° 52' 30.1"	14.131	0	11 48 54.82	2.3770	S. 4° 10' 25.7"	14.305
1	10 4 39.89	2.1856	7 38 20.4	14.191	1	11 51 11.24	2.3762	4 25 49.0	14.301
2	10 6 51.04	2.1861	7 24 7.2	14.250	2	11 53 27.85	2.3755	4 41 11.4	14.305
3	10 9 2.23	2.1867	7 9 50.4	14.308	3	11 55 44.66	2.3819	4 56 32.8	14.347
4	10 11 13.45	2.1874	6 55 30.2	14.365	4	11 58 1.68	2.3863	5 11 53.1	14.327
5	10 13 24.71	2.1881	6 41 6.6	14.420	5	12 0 18.91	2.3888	5 27 12.1	14.306
6	10 15 36.02	2.1888	6 26 39.8	14.474	6	12 2 36.34	2.3923	5 42 29.8	14.322
7	10 17 47.37	2.1895	6 12 9.8	14.527	7	12 4 53.99	2.3959	5 57 46.0	14.327
8	10 19 58.77	2.1904	5 57 36.6	14.579	8	12 7 11.85	2.3995	6 13 0.6	14.329
9	10 22 10.22	2.1913	5 43 0.3	14.629	9	12 9 29.93	2.4022	6 28 13.5	14.300
10	10 24 21.73	2.1923	5 28 21.1	14.678	10	12 11 48.23	2.4059	6 43 24.6	14.310
11	10 26 33.30	2.1933	5 13 39.0	14.725	11	12 14 6.76	2.4107	6 58 33.8	14.316
12	10 28 44.93	2.1944	4 58 54.1	14.771	12	12 16 25.51	2.4145	7 13 40.9	14.311
13	10 30 56.63	2.1955	4 44 6.5	14.816	13	12 18 44.49	2.4183	7 28 45.9	14.304
14	10 33 8.39	2.1966	4 29 16.2	14.859	14	12 21 3.71	2.4222	7 43 48.6	14.325
15	10 35 20.22	2.1978	4 14 23.4	14.900	15	12 23 23.17	2.4262	7 58 48.9	14.304
16	10 37 32.13	2.1991	3 59 28.2	14.940	16	12 25 42.86	2.4303	8 13 46.7	14.341
17	10 39 44.12	2.2005	3 44 30.6	14.979	17	12 28 2.80	2.4345	8 28 41.9	14.397
18	10 41 56.19	2.2019	3 29 30.7	15.016	18	12 30 22.98	2.4388	8 43 34.3	14.351
19	10 44 8.35	2.2034	3 14 28.6	15.052	19	12 32 43.41	2.4432	8 58 23.9	14.399
20	10 46 20.60	2.2050	2 59 24.4	15.087	20	12 35 4.09	2.4476	9 13 10.5	14.751
21	10 48 32.95	2.2066	2 44 18.2	15.120	21	12 37 25.02	2.4519	9 27 54.0	14.398
22	10 50 45.39	2.2082	2 29 10.0	15.152	22	12 39 46.21	2.4562	9 42 34.3	14.443
23	10 52 57.93	2.2099	N. 2 14 0.0	15.183	23	12 42 7.65	2.4605	S. 9 57 11.3	14.397
WEDNESDAY 2.					FRIDAY 4.				
0	10 55 10.58	2.2117	N. 1 58 48.2	15.210	0	12 44 29.35	2.4648	S. 10 11 44.8	14.399
1	10 57 23.34	2.2135	1 43 34.8	15.237	1	12 46 51.31	2.4693	10 26 14.7	14.406
2	10 59 36.21	2.2155	1 28 19.8	15.262	2	12 49 13.54	2.4737	10 40 41.0	14.406
3	11 1 49.20	2.2175	1 13 3.4	15.285	3	12 51 36.04	2.4779	10 55 3.4	14.341
4	11 4 2.31	2.2195	0 57 45.6	15.307	4	12 53 58.80	2.4816	11 9 21.9	14.373
5	11 6 15.54	2.2216	0 42 26.5	15.327	5	12 56 21.83	2.4851	11 23 36.3	14.396
6	11 8 28.90	2.2237	0 27 6.3	15.346	6	12 58 45.13	2.4895	11 37 46.6	14.415
7	11 10 42.38	2.2258	N. 0 11 44.9	15.364	7	13 1 8.70	2.4939	11 51 52.6	14.403
8	11 12 56.00	2.2281	S. 0 3 37.4	15.379	8	13 3 32.55	2.4986	12 5 54.2	14.390
9	11 15 9.76	2.2304	0 19 0.6	15.393	9	13 5 56.68	2.4944	12 19 51.3	14.319
10	11 17 23.65	2.2328	0 34 24.6	15.406	10	13 8 21.08	2.4990	12 33 43.8	14.334
11	11 19 37.69	2.2352	0 49 49.3	15.417	11	13 10 45.76	2.4137	12 47 31.5	14.374
12	11 21 51.87	2.2377	1 5 14.6	15.426	12	13 13 10.72	2.4183	13 1 14.3	14.373
13	11 24 6.20	2.2403	1 20 40.4	15.433	13	13 15 35.96	2.4230	13 14 52.2	14.393
14	11 26 20.69	2.2428	1 36 6.5	15.438	14	13 18 1.48	2.4276	13 28 24.9	14.391
15	11 28 35.33	2.2454	1 51 32.9	15.442	15	13 20 27.38	2.4322	13 41 52.4	14.412
16	11 30 50.14	2.2481	2 6 59.5	15.444	16	13 22 53.96	2.4370	13 55 14.5	14.392
17	11 33 5.11	2.2509	2 22 26.2	15.444	17	13 25 19.72	2.4417	14 8 31.1	14.391
18	11 35 20.25	2.2538	2 37 52.8	15.442	18	13 27 46.37	2.4464	14 21 42.2	14.310
19	11 37 35.56	2.2567	2 53 19.3	15.439	19	13 30 13.30	2.4512	14 34 47.6	14.349
20	11 39 51.05	2.2596	3 8 45.5	15.434	20	13 32 40.51	2.4560	14 47 47.2	14.348
21	11 42 6.71	2.2626	3 24 11.4	15.427	21	13 35 8.01	2.4607	15 0 40.8	14.343
22	11 44 22.56	2.2657	3 39 36.8	15.418	22	13 37 35.79	2.4654	15 13 28.4	14.743
23	11 46 38.60	2.2688	3 55 1.6	15.408	23	13 40 3.85	2.4701	15 26 9.9	14.399
24	11 48 54.82	2.2720	S. 4 10 25.7	15.395	24	13 42 32.20	2.4748	S. 15 38 45.1	14.394

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
SATURDAY 5.					MONDAY 7.				
0	13 42 32.20	2.4748	S. 15° 38' 45.1"	12.3884	0	15 46 0.11	2.6422	S. 23° 7' 29.3"	5.642
1	13 45 0.83	2.4726	15 51 13.9	12.437	1	15 48 38.68	2.6424	23 13 2.7	5.671
2	13 47 29.74	2.4693	16 3 36.3	12.517	2	15 51 17.32	2.6445	23 18 25.8	5.300
3	13 49 58.94	2.4659	16 15 52.0	12.306	3	15 53 56.02	2.6465	23 23 38.7	6.128
4	13 52 28.41	2.4626	16 28 1.0	12.603	4	15 56 34.78	2.6484	23 28 41.2	4.966
5	13 54 58.16	2.4593	16 40 3.2	11.978	5	15 59 13.59	2.6472	23 33 33.4	4.783
6	13 57 28.19	2.4559	16 51 58.4	11.692	6	16 1 52.44	2.6478	23 38 15.2	4.610
7	13 59 58.49	2.4523	17 3 46.6	11.744	7	16 4 31.32	2.6482	23 42 46.6	4.437
8	14 2 29.07	2.4489	17 15 27.7	11.624	8	16 7 10.23	2.6485	23 47 7.6	4.263
9	14 4 59.92	2.4454	17 27 1.5	11.502	9	16 9 49.15	2.6487	23 51 18.1	4.088
10	14 7 31.04	2.4420	17 38 28.0	11.379	10	16 12 28.06	2.6488	23 55 18.2	3.914
11	14 10 2.43	2.4384	17 49 47.0	11.254	11	16 15 7.00	2.6487	23 59 7.8	3.739
12	14 12 34.09	2.4348	18 0 58.5	11.127	12	16 17 45.92	2.6485	24 2 46.9	3.565
13	14 15 6.01	2.4312	18 12 2.3	10.998	13	16 20 24.82	2.6482	24 6 15.5	3.390
14	14 17 38.20	2.4276	18 22 58.3	10.868	14	16 23 3.70	2.6477	24 9 33.7	3.215
15	14 20 10.64	2.4240	18 33 46.5	10.737	15	16 25 42.55	2.6471	24 12 41.4	3.040
16	14 22 43.34	2.4204	18 44 26.7	10.605	16	16 28 21.35	2.6468	24 15 38.5	2.865
17	14 25 16.30	2.4168	18 54 58.8	10.468	17	16 31 0.10	2.6464	24 18 25.1	2.690
18	14 27 49.50	2.4132	19 5 22.8	10.331	18	16 33 38.80	2.6464	24 21 1.3	2.515
19	14 30 22.95	2.4096	19 15 38.6	10.198	19	16 36 17.43	2.6462	24 23 27.0	2.340
20	14 32 56.64	2.4060	19 25 46.0	10.064	20	16 38 55.98	2.6461	24 25 42.1	2.165
21	14 35 30.58	2.4024	19 35 45.0	9.913	21	16 41 34.45	2.6464	24 27 46.7	1.990
22	14 38 4.75	2.3988	19 45 35.5	9.771	22	16 44 12.83	2.6468	24 29 40.9	1.815
23	14 40 39.15	2.3952	S. 19° 55' 17.4"	9.627	23	16 46 51.11	2.6472	S. 24° 31' 24.7"	1.642
SUNDAY 6.					TUESDAY 8.				
0	14 43 13.78	2.3916	S. 20° 4 50.7"	9.481	0	16 49 29.29	2.6486	S. 24° 32' 58.0"	1.468
1	14 45 48.64	2.3880	20 14 15.1	9.333	1	16 52 7.35	2.6488	24 34 20.9	1.293
2	14 48 23.71	2.3844	20 23 30.7	9.185	2	16 54 45.28	2.6492	24 35 33.4	1.122
3	14 50 59.00	2.3808	20 32 37.4	9.036	3	16 57 23.08	2.6499	24 36 35.5	0.949
4	14 53 34.50	2.3772	20 41 35.0	8.885	4	17 0 0.75	2.6496	24 37 27.3	0.777
5	14 56 10.21	2.3736	20 50 23.5	8.732	5	17 2 38.26	2.6499	24 38 8.8	0.605
6	14 58 46.12	2.3700	20 59 2.9	8.579	6	17 5 15.62	2.6498	24 38 39.9	0.433
7	15 1 22.22	2.3664	21 7 33.1	8.425	7	17 7 52.82	2.6495	24 39 0.8	0.262
8	15 3 58.51	2.3628	21 15 53.9	8.269	8	17 10 29.84	2.6496	24 39 11.4	0.092
9	15 6 34.90	2.3592	21 24 5.3	8.112	9	17 13 6.69	2.6496	24 39 11.8	0.078
10	15 9 11.64	2.3556	21 32 7.3	7.954	10	17 15 43.35	2.6494	24 39 2.0	0.347
11	15 11 48.47	2.3520	21 39 59.8	7.795	11	17 18 19.82	2.6491	24 38 42.1	0.415
12	15 14 25.46	2.3484	21 47 42.7	7.635	12	17 20 56.08	2.6497	24 38 12.2	0.263
13	15 17 2.62	2.3448	21 55 16.0	7.473	13	17 23 32.13	2.6491	24 37 32.2	0.780
14	15 19 39.93	2.3412	22 2 39.5	7.310	14	17 26 7.97	2.6484	24 36 42.2	0.916
15	15 22 17.39	2.3376	22 9 53.3	7.147	15	17 28 43.59	2.6497	24 35 42.2	1.082
16	15 24 54.90	2.3340	22 16 57.3	6.988	16	17 31 18.97	2.6495	24 34 32.3	1.247
17	15 27 32.73	2.3304	22 23 51.3	6.818	17	17 33 54.11	2.6497	24 33 12.5	1.413
18	15 30 10.60	2.3268	22 30 35.4	6.648	18	17 36 29.01	2.6496	24 31 42.9	1.578
19	15 32 48.50	2.3232	22 37 9.6	6.487	19	17 39 3.66	2.6494	24 30 3.6	1.737
20	15 35 26.69	2.3196	22 43 33.8	6.319	20	17 41 38.06	2.6491	24 28 14.5	1.898
21	15 38 4.90	2.3160	22 49 47.9	6.150	21	17 44 12.19	2.6487	24 26 15.8	2.059
22	15 40 43.21	2.3124	22 55 51.8	5.981	22	17 46 46.06	2.6481	24 24 7.4	2.218
23	15 43 21.62	2.3088	23 1 45.6	5.812	23	17 49 19.65	2.6474	24 21 49.5	2.377
24	15 46 0.11	2.3052	S. 23° 7' 29.3"	5.643	24	17 51 52.95	2.6468	S. 24° 19' 22.2"	2.535

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
WEDNESDAY 9.					FRIDAY 11				
0	17 51 52.95	2.5626	S. 24 19 22.2	2.585	0	19 47 39.92	2.2677	S. 19 38 32.5	8.689
1	17 54 25.97	2.5478	24 16 45.4	2.602	1	19 49 55.19	2.2612	19 29 49.5	8.764
2	17 56 58.69	2.5429	24 13 59.2	2.618	2	19 52 10.06	2.2447	19 21 0.8	8.838
3	17 59 31.12	2.5379	24 11 3.7	2.632	3	19 54 24.54	2.2282	19 12 6.5	8.911
4	18 2 3.24	2.5288	24 7 59.0	2.165	4	19 56 38.64	2.2217	19 3 6.7	9.042
5	18 4 35.05	2.5276	24 4 45.1	2.307	5	19 58 52.34	2.2252	18 54 1.4	9.132
6	18 7 6.55	2.5223	24 1 22.1	2.468	6	20 1 5.66	2.2187	18 44 50.8	9.220
7	18 9 37.73	2.5169	23 57 50.1	2.608	7	20 3 18.59	2.2122	18 35 34.9	9.306
8	18 12 8.58	2.5114	23 54 9.1	2.758	8	20 5 31.13	2.2059	18 26 13.8	9.394
9	18 14 39.10	2.5060	23 50 19.2	2.906	9	20 7 43.29	2.1996	18 16 47.6	9.479
10	18 17 9.29	2.5003	23 46 20.4	4.063	10	20 9 55.08	2.1933	18 7 16.3	9.562
11	18 19 39.14	2.4947	23 42 12.8	4.198	11	20 12 6.49	2.1870	17 57 40.1	9.644
12	18 22 8.65	2.4889	23 37 56.6	4.343	12	20 14 17.52	2.1807	17 47 59.0	9.726
13	18 24 37.81	2.4831	23 33 31.7	4.486	13	20 16 28.18	2.1745	17 38 13.1	9.806
14	18 27 6.62	2.4773	23 28 58.3	4.628	14	20 18 38.46	2.1683	17 28 22.4	9.884
15	18 29 35.08	2.4718	23 24 16.4	4.768	15	20 20 48.27	2.1622	17 18 27.0	9.961
16	18 32 3.18	2.4663	23 19 26.1	4.908	16	20 22 57.92	2.1561	17 8 27.1	10.037
17	18 34 30.91	2.4609	23 14 27.5	5.046	17	20 25 7.10	2.1500	16 58 22.7	10.111
18	18 36 58.28	2.4551	23 9 20.6	5.183	18	20 27 15.92	2.1440	16 48 13.8	10.186
19	18 39 25.28	2.4470	23 4 5.5	5.318	19	20 29 24.38	2.1381	16 38 0.5	10.267
20	18 41 51.92	2.4406	22 58 42.4	5.452	20	20 31 32.49	2.1322	16 27 42.9	10.338
21	18 44 18.18	2.4346	22 53 11.3	5.585	21	20 33 40.24	2.1263	16 17 21.1	10.398
22	18 46 44.07	2.4283	22 47 32.2	5.717	22	20 35 47.64	2.1206	16 6 55.1	10.467
23	18 49 9.58	2.4219	S. 22 41 45.2	5.847	23	20 37 54.69	2.1147	S. 15 56 25.1	10.534
THURSDAY 10.					SATURDAY 12.				
0	18 51 34.70	2.4156	S. 22 35 50.5	5.976	0	20 40 1.40	2.1089	S. 15 45 51.0	10.600
1	18 53 59.44	2.4091	22 29 48.1	6.104	1	20 42 7.76	2.1033	15 35 13.0	10.666
2	18 56 23.79	2.4027	22 23 38.0	6.230	2	20 44 13.79	2.0976	15 24 31.1	10.730
3	18 58 47.76	2.3962	22 17 20.4	6.355	3	20 46 19.48	2.0920	15 13 45.4	10.792
4	19 1 11.34	2.3896	22 10 55.4	6.479	4	20 48 24.83	2.0864	15 2 56.0	10.853
5	19 3 34.53	2.3833	22 4 23.0	6.602	5	20 50 29.85	2.0809	14 52 2.9	10.914
6	19 5 57.33	2.3768	21 57 43.2	6.723	6	20 52 34.54	2.0755	14 41 6.3	10.974
7	19 8 19.74	2.3702	21 50 56.3	6.842	7	20 54 38.91	2.0702	14 30 6.1	11.033
8	19 10 41.75	2.3636	21 44 2.2	6.960	8	20 56 42.96	2.0649	14 19 2.4	11.090
9	19 13 3.36	2.3569	21 37 1.0	7.077	9	20 58 46.69	2.0596	14 7 55.4	11.145
10	19 15 24.58	2.3503	21 29 52.9	7.193	10	21 0 50.11	2.0544	13 56 45.0	11.200
11	19 17 45.40	2.3437	21 22 37.9	7.307	11	21 2 53.21	2.0492	13 45 31.4	11.253
12	19 20 5.83	2.3371	21 15 16.1	7.420	12	21 4 56.01	2.0441	13 34 14.6	11.306
13	19 22 25.86	2.3305	21 7 47.5	7.532	13	21 6 58.51	2.0391	13 22 54.7	11.357
14	19 24 45.49	2.3238	21 0 12.3	7.643	14	21 9 0.70	2.0341	13 11 31.7	11.408
15	19 27 4.72	2.3172	20 52 30.5	7.750	15	21 11 2.59	2.0291	13 0 5.8	11.457
16	19 29 23.55	2.3105	20 44 42.3	7.857	16	21 13 4.19	2.0242	12 48 36.9	11.505
17	19 31 41.98	2.3038	20 36 47.7	7.963	17	21 15 5.50	2.0194	12 37 5.1	11.552
18	19 34 0.02	2.2973	20 28 46.7	8.068	18	21 17 6.52	2.0146	12 25 30.6	11.598
19	19 36 17.66	2.2907	20 20 39.5	8.173	19	21 19 7.25	2.0099	12 13 53.3	11.643
20	19 38 34.91	2.2840	20 12 26.1	8.274	20	21 21 7.71	2.0053	12 2 13.4	11.687
21	19 40 51.75	2.2774	20 4 6.6	8.375	21	21 23 7.90	2.0006	11 50 30.8	11.731
22	19 43 8.20	2.2708	19 55 41.1	8.474	22	21 25 7.81	1.9963	11 38 45.7	11.773
23	19 45 24.26	2.2643	19 47 9.7	8.573	23	21 27 7.45	1.9918	11 26 58.1	11.814
24	19 47 39.92	2.2577	S. 19 38 32.5	8.669	24	21 29 6.83	1.9875	S. 11 15 8.0	11.854

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
SUNDAY 13.					TUESDAY 15.				
0	21 29 6.83	1.9678	S. 11 15 8.0	11.844	0	23 0 40.67	1.8524	S. 1 17 39.3	12.709
1	21 31 5.95	1.9682	11 3 15.6	11.893	1	23 2 31.77	1.8611	1 4 56.8	12.707
2	21 33 4.81	1.9780	10 51 20.8	11.931	2	23 4 22.80	1.8499	0 52 14.5	12.704
3	21 35 3.41	1.9747	10 39 23.8	11.969	3	23 6 13.76	1.8488	0 39 32.4	12.700
4	21 37 1.77	1.9706	10 27 24.6	12.004	4	23 8 4.65	1.8477	0 26 50.5	12.695
5	21 38 59.88	1.9666	10 15 23.2	12.040	5	23 9 55.48	1.8467	0 14 9.0	12.689
6	21 40 57.75	1.9635	10 3 19.8	12.074	6	23 11 46.25	1.8457	S. 0 1 27.8	12.683
7	21 42 55.38	1.9605	9 51 14.3	12.107	7	23 13 36.97	1.8446	N. 0 11 13.0	12.677
8	21 44 52.77	1.9547	9 39 6.9	12.139	8	23 15 27.63	1.8440	0 23 53.4	12.669
9	21 46 49.94	1.9509	9 26 57.6	12.171	9	23 17 18.24	1.8432	0 36 33.3	12.660
10	21 48 46.88	1.9471	9 14 46.4	12.201	10	23 19 8.81	1.8426	0 49 12.6	12.650
11	21 50 43.59	1.9434	9 2 33.5	12.230	11	23 20 59.34	1.8416	1 1 51.3	12.640
12	21 52 40.09	1.9398	8 50 18.8	12.258	12	23 22 49.83	1.8412	1 14 29.4	12.629
13	21 54 36.37	1.9362	8 38 2.5	12.286	13	23 24 40.29	1.8407	1 27 6.9	12.616
14	21 56 32.44	1.9327	8 25 44.5	12.312	14	23 26 30.71	1.8402	1 39 43.6	12.605
15	21 58 28.30	1.9293	8 13 25.0	12.338	15	23 28 21.11	1.8398	1 52 19.5	12.592
16	22 0 23.96	1.9260	8 1 3.9	12.363	16	23 30 11.48	1.8394	2 4 54.7	12.579
17	22 2 19.42	1.9227	7 48 41.4	12.387	17	23 32 1.83	1.8391	2 17 29.0	12.565
18	22 4 14.68	1.9196	7 36 17.5	12.410	18	23 33 52.17	1.8389	2 30 2.5	12.549
19	22 6 9.75	1.9163	7 23 52.3	12.432	19	23 35 42.49	1.8387	2 42 35.0	12.533
20	22 8 4.63	1.9132	7 11 25.7	12.453	20	23 37 32.81	1.8385	2 55 6.5	12.516
21	22 9 59.33	1.9102	6 58 57.9	12.474	21	23 39 23.12	1.8384	3 7 37.0	12.499
22	22 11 53.85	1.9072	6 46 28.8	12.493	22	23 41 13.42	1.8384	3 20 6.4	12.481
23	22 13 48.19	1.9043	S. 6 33 58.6	12.512	23	23 43 3.72	1.8384	N. 3 32 34.7	12.462
MONDAY 14.					WEDNESDAY 16.				
0	22 15 42.36	1.9015	S. 6 21 27.4	12.530	0	23 44 54.03	1.8385	N. 3 45 1.8	12.442
1	22 17 36.36	1.8987	6 8 55.1	12.547	1	23 46 44.35	1.8387	3 57 27.8	12.422
2	22 19 30.20	1.8960	5 56 21.8	12.563	2	23 48 34.67	1.8389	4 9 52.5	12.401
3	22 21 23.88	1.8933	5 43 47.5	12.578	3	23 50 25.01	1.8391	4 22 15.9	12.379
4	22 23 17.40	1.8907	5 31 12.4	12.592	4	23 52 15.36	1.8394	4 34 38.0	12.356
5	22 25 10.76	1.8882	5 18 36.4	12.606	5	23 54 5.73	1.8398	4 46 58.7	12.333
6	22 27 3.98	1.8857	5 5 59.7	12.618	6	23 55 56.13	1.8402	4 59 18.0	12.309
7	22 28 57.05	1.8833	4 53 22.2	12.630	7	23 57 46.56	1.8407	5 11 35.8	12.284
8	22 30 49.98	1.8810	4 40 44.1	12.641	8	23 59 37.01	1.8412	5 23 52.1	12.259
9	22 32 42.77	1.8787	4 28 5.3	12.652	9	0 1 27.50	1.8417	5 36 6.9	12.233
10	22 34 35.43	1.8765	4 15 25.9	12.661	10	0 3 18.02	1.8423	5 48 20.1	12.206
11	22 36 27.95	1.8743	4 2 45.9	12.670	11	0 5 8.58	1.8430	6 0 31.6	12.178
12	22 38 20.35	1.8722	3 50 5.5	12.678	12	0 6 59.18	1.8438	6 12 41.5	12.150
13	22 40 12.62	1.8703	3 37 24.6	12.685	13	0 8 49.83	1.8446	6 24 49.6	12.121
14	22 42 4.78	1.8684	3 24 43.3	12.691	14	0 10 40.53	1.8454	6 36 56.0	12.091
15	22 43 56.83	1.8665	3 12 1.7	12.696	15	0 12 31.28	1.8463	6 49 0.6	12.061
16	22 45 48.76	1.8646	2 59 19.8	12.701	16	0 14 22.08	1.8472	7 1 3.3	12.029
17	22 47 40.58	1.8628	2 46 37.6	12.706	17	0 16 12.94	1.8482	7 13 4.1	11.997
18	22 49 32.30	1.8612	2 33 55.2	12.708	18	0 18 3.86	1.8492	7 25 2.9	11.964
19	22 51 23.92	1.8596	2 21 12.6	12.710	19	0 19 54.84	1.8503	7 36 59.8	11.931
20	22 53 15.45	1.8580	2 8 30.0	12.711	20	0 21 45.89	1.8514	7 48 54.6	11.897
21	22 55 6.88	1.8565	1 55 47.3	12.712	21	0 23 37.01	1.8526	8 0 47.4	11.862
22	22 56 58.23	1.8551	1 43 4.6	12.712	22	0 25 28.20	1.8538	8 12 38.0	11.826
23	22 58 49.49	1.8537	1 30 21.9	12.711	23	0 27 19.47	1.8551	8 24 26.5	11.790
24	23 0 40.67	1.8524	S. 1 17 39.3	12.709	24	0 29 10.81	1.8564	N. 8 36 12.8	11.753

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
THURSDAY 17.					SATURDAY 19.				
0	0 29 10.81	1.8664	N. 8° 36' 12.8"	11.763	0	2 0 35.08	1.8668	N. 17° 3' 43.3"	8.113
1	0 31 2.23	1.8678	8 47 56.9	11.716	1	2 2 33.08	1.8682	17 12 47.9	8.040
2	0 32 53.74	1.8692	8 59 38.6	11.676	2	2 4 31.26	1.8711	17 21 48.1	8.966
3	0 34 45.34	1.8697	9 11 18.0	11.637	3	2 6 29.62	1.8741	17 30 43.9	8.892
4	0 36 37.02	1.8692	9 22 55.0	11.597	4	2 8 28.15	1.8771	17 39 35.2	8.817
5	0 38 28.80	1.8697	9 34 29.6	11.546	5	2 10 26.87	1.8808	17 48 22.0	8.742
6	0 40 20.67	1.8693	9 46 1.7	11.514	6	2 12 25.77	1.8832	17 57 4.2	8.666
7	0 42 12.64	1.8698	9 57 31.3	11.472	7	2 14 24.85	1.8863	18 5 41.8	8.588
8	0 44 4.70	1.8693	10 8 58.4	11.430	8	2 16 24.12	1.8888	18 14 14.8	8.510
9	0 45 56.87	1.8708	10 20 22.9	11.388	9	2 18 23.57	1.8924	18 22 43.1	8.432
10	0 47 49.14	1.8721	10 31 44.7	11.341	10	2 20 23.21	1.8964	18 31 6.6	8.353
11	0 49 41.52	1.8739	10 43 3.8	11.296	11	2 22 23.03	1.8988	18 39 25.4	8.273
12	0 51 34.01	1.8757	10 54 20.2	11.260	12	2 24 23.03	2.0016	18 47 39.3	8.193
13	0 53 26.61	1.8776	11 5 33.9	11.204	13	2 26 23.22	2.0047	18 55 48.4	8.111
14	0 55 19.32	1.8796	11 16 44.7	11.166	14	2 28 23.60	2.0073	19 3 52.6	8.028
15	0 57 12.15	1.8816	11 27 52.7	11.108	15	2 30 24.17	2.0119	19 11 51.8	7.946
16	0 59 5.10	1.8836	11 38 57.7	11.060	16	2 32 24.92	2.0141	19 19 46.1	7.863
17	1 0 58.17	1.8866	11 49 59.8	11.010	17	2 34 25.86	2.0173	19 27 35.3	7.778
18	1 2 51.37	1.8877	12 0 58.9	10.960	18	2 36 26.99	2.0206	19 35 19.5	7.692
19	1 4 44.69	1.8898	12 11 54.9	10.908	19	2 38 28.31	2.0238	19 42 58.6	7.606
20	1 6 38.14	1.8920	12 22 47.9	10.857	20	2 40 29.82	2.0267	19 50 32.5	7.523
21	1 8 31.72	1.8942	12 33 37.8	10.806	21	2 42 31.53	2.0298	19 58 1.2	7.438
22	1 10 25.44	1.8964	12 44 24.5	10.761	22	2 44 33.40	2.0329	20 5 24.7	7.347
23	1 12 19.29	1.8987	N. 12° 55' 8.0"	10.697	23	2 46 35.47	2.0360	N. 20° 12' 42.9"	7.260
FRIDAY 18.					SUNDAY 20.				
0	1 14 13.28	1.9010	N. 13° 5' 48.2"	10.642	0	2 48 37.72	2.0382	N. 20° 19' 55.8"	7.170
1	1 16 7.41	1.9033	13 16 25.1	10.587	1	2 50 40.17	2.0423	20 27 3.3	7.081
2	1 18 1.68	1.9057	13 26 58.7	10.531	2	2 52 42.80	2.0464	20 34 5.5	6.991
3	1 19 56.10	1.9082	13 37 28.9	10.475	3	2 54 45.62	2.0505	20 41 2.2	6.900
4	1 21 50.66	1.9106	13 47 55.7	10.417	4	2 56 48.62	2.0546	20 47 53.5	6.809
5	1 23 45.37	1.9130	13 58 19.0	10.360	5	2 58 51.81	2.0587	20 54 39.3	6.717
6	1 25 40.22	1.9156	14 8 38.8	10.300	6	3 0 55.19	2.0628	21 1 19.5	6.624
7	1 27 35.23	1.9181	14 18 55.0	10.240	7	3 2 58.75	2.0669	21 7 54.2	6.531
8	1 29 30.39	1.9206	14 29 7.6	10.179	8	3 5 2.50	2.0710	21 14 23.2	6.437
9	1 31 25.70	1.9232	14 39 16.5	10.118	9	3 7 6.43	2.0751	21 20 46.6	6.342
10	1 33 21.17	1.9258	14 49 21.8	10.056	10	3 9 10.55	2.0791	21 27 4.2	6.246
11	1 35 16.80	1.9284	14 59 23.3	9.994	11	3 11 14.85	2.0731	21 33 16.1	6.150
12	1 37 12.59	1.9312	15 9 21.1	9.931	12	3 13 19.32	2.0771	21 39 22.2	6.053
13	1 39 8.54	1.9340	15 19 15.0	9.867	13	3 15 23.97	2.0731	21 45 22.5	5.956
14	1 41 4.66	1.9368	15 29 5.1	9.802	14	3 17 28.81	2.0721	21 51 16.9	5.858
15	1 43 0.94	1.9393	15 38 51.2	9.736	15	3 19 33.83	2.0711	21 57 5.5	5.760
16	1 44 57.38	1.9421	15 48 33.4	9.670	16	3 21 39.02	2.0700	22 2 48.1	5.661
17	1 46 53.99	1.9449	15 58 11.6	9.603	17	3 23 44.39	2.0689	22 8 24.8	5.562
18	1 48 50.77	1.9478	16 7 45.8	9.536	18	3 25 49.93	2.0678	22 13 55.5	5.462
19	1 50 47.72	1.9507	16 17 15.9	9.467	19	3 27 55.64	2.0667	22 19 20.2	5.361
20	1 52 44.85	1.9536	16 26 41.8	9.397	20	3 30 1.53	2.0656	22 24 38.8	5.260
21	1 54 42.15	1.9564	16 36 3.6	9.327	21	3 32 7.59	2.0644	22 29 51.3	5.158
22	1 56 39.62	1.9593	16 45 21.1	9.256	22	3 34 13.82	2.0632	22 34 57.7	5.056
23	1 58 37.26	1.9622	16 54 34.4	9.185	23	3 36 20.22	2.0620	22 39 57.9	4.952
24	2 0 35.08	1.9651	N. 17° 3' 43.3"	9.113	24	3 38 26.78	2.0608	N. 22° 44' 51.9"	4.848

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
MONDAY 21.					WEDNESDAY 23				
0	3 38 26.78	2.1106	N.22° 44' 51.9	4.548	0	5 22 15.60	2.1980	N.24° 29' 49.9	0.606
1	3 40 33.51	2.1196	22 49 39.7	4.744	1	5 24 27.50	2.1967	24 29 9.9	0.736
2	3 42 40.40	2.1182	22 54 21.2	4.640	2	5 26 39.44	2.1968	24 28 22.8	0.845
3	3 44 47.46	2.1180	22 58 56.5	4.585	3	5 28 51.41	2.1998	24 27 28.5	0.955
4	3 46 54.67	2.1216	23 3 25.4	4.480	4	5 31 3.42	2.2004	24 26 27.0	1.065
5	3 49 2.04	2.1242	23 7 48.0	4.323	5	5 33 15.46	2.2000	24 25 18.3	1.206
6	3 51 9.57	2.1268	23 12 4.2	4.218	6	5 35 27.53	2.2013	24 24 2.3	1.326
7	3 53 17.25	2.1280	23 16 14.0	4.100	7	5 37 39.62	2.2017	24 22 39.2	1.446
8	3 55 25.08	2.1219	23 20 17.3	4.002	8	5 39 51.73	2.2020	24 21 8.8	1.566
9	3 57 33.07	2.1242	23 24 14.2	3.894	9	5 42 3.86	2.2023	24 19 31.2	1.687
10	3 59 41.20	2.1268	23 28 4.6	3.785	10	5 44 16.00	2.2026	24 17 46.3	1.807
11	4 1 49.48	2.1282	23 31 48.4	3.678	11	5 46 28.16	2.2027	24 15 54.3	1.927
12	4 3 57.90	2.1416	23 35 25.7	3.567	12	5 48 40.22	2.2026	24 13 55.0	2.046
13	4 6 6.47	2.1438	23 38 56.4	3.457	13	5 50 52.49	2.2028	24 11 48.5	2.166
14	4 8 15.17	2.1462	23 42 20.5	3.346	14	5 53 4.66	2.2028	24 9 34.8	2.286
15	4 10 24.01	2.1494	23 45 37.9	3.236	15	5 55 16.83	2.2026	24 7 13.9	2.406
16	4 12 32.96	2.1607	23 48 48.7	3.124	16	5 57 29.00	2.2028	24 4 45.7	2.526
17	4 14 42.09	2.1620	23 51 52.8	3.012	17	5 59 41.16	2.2027	24 2 10.3	2.646
18	4 16 51.33	2.1641	23 54 50.1	2.900	18	6 1 53.32	2.2025	23 59 27.8	2.766
19	4 19 0.70	2.1672	23 57 40.7	2.788	19	6 4 5.47	2.2028	23 56 38.1	2.886
20	4 21 10.19	2.1682	24 0 24.6	2.675	20	6 6 17.60	2.2021	23 53 41.2	3.006
21	4 23 19.81	2.1612	24 3 1.7	2.562	21	6 8 29.72	2.2018	23 50 37.1	3.126
22	4 25 29.54	2.1632	24 5 32.0	2.448	22	6 10 41.82	2.2015	23 47 25.8	3.246
23	4 27 39.39	2.1661	N.24° 7' 55.5	2.334	23	6 12 53.90	2.2015	N.23° 44' 7.4	3.367
TUESDAY 22.					THURSDAY 24.				
0	4 29 49.35	2.1670	N.24° 10' 12.1	2.220	0	6 15 5.96	2.2006	N.23° 40' 41.8	3.486
1	4 31 59.43	2.1682	24 12 21.8	2.105	1	6 17 17.99	2.2006	23 37 9.1	3.606
2	4 34 9.62	2.1707	24 14 24.7	1.990	2	6 19 30.00	2.1998	23 33 29.2	3.724
3	4 36 19.91	2.1724	24 16 20.6	1.874	3	6 21 41.97	2.1992	23 29 42.2	3.843
4	4 38 30.31	2.1741	24 18 9.6	1.758	4	6 23 53.91	2.1987	23 25 48.0	3.963
5	4 40 40.81	2.1768	24 19 51.6	1.642	5	6 26 5.81	2.1981	23 21 46.7	4.080
6	4 42 51.40	2.1774	24 21 26.7	1.526	6	6 28 17.68	2.1974	23 17 38.4	4.199
7	4 45 2.09	2.1790	24 22 54.8	1.410	7	6 30 29.51	2.1968	23 13 22.9	4.317
8	4 47 12.88	2.1805	24 24 15.9	1.294	8	6 32 41.30	2.1961	23 9 0.4	4.435
9	4 49 23.76	2.1820	24 25 30.0	1.178	9	6 34 53.04	2.1945	23 4 30.8	4.553
10	4 51 34.72	2.1834	24 26 37.0	1.062	10	6 37 4.74	2.1945	22 59 54.1	4.670
11	4 53 45.76	2.1845	24 27 37.0	0.941	11	6 39 16.39	2.1937	22 55 10.4	4.787
12	4 55 56.89	2.1861	24 28 29.9	0.822	12	6 41 27.98	2.1928	22 50 19.7	4.904
13	4 58 8.09	2.1873	24 29 15.7	0.705	13	6 43 39.52	2.1919	22 45 21.9	5.021
14	5 0 19.37	2.1885	24 29 54.5	0.587	14	6 45 51.01	2.1911	22 40 17.2	5.137
15	5 2 30.72	2.1897	24 30 26.2	0.469	15	6 48 2.45	2.1902	22 35 5.5	5.253
16	5 4 42.14	2.1906	24 30 50.8	0.350	16	6 50 13.83	2.1892	22 29 46.9	5.369
17	5 6 53.62	2.1919	24 31 8.3	0.231	17	6 52 25.15	2.1882	22 24 21.3	5.484
18	5 9 5.17	2.1929	24 31 18.5	0.112	18	6 54 36.41	2.1872	22 18 48.8	5.599
19	5 11 16.78	2.1930	24 31 21.7	0.007	19	6 56 47.61	2.1862	22 13 9.4	5.713
20	5 13 28.44	2.1940	24 31 17.7	0.192	20	6 58 58.75	2.1851	22 7 23.2	5.828
21	5 15 40.15	2.1947	24 31 6.5	0.346	21	7 1 9.82	2.1830	22 1 30.1	5.942
22	5 17 51.92	2.1956	24 30 48.2	0.500	22	7 3 20.82	2.1828	21 55 30.1	6.056
23	5 20 3.74	2.1973	24 30 22.7	0.486	23	7 5 31.76	2.1817	21 49 23.3	6.169
24	5 22 15.60	2.1980	N.24° 29' 49.9	0.606	24	7 7 42.63	2.1806	N.21° 43' 9.8	6.282

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
FRIDAY 25.					SUNDAY 27.				
0	7 7 42.63	2.1806	N.21° 43' 9.8"	6.382	0	8 50 56.10	2.1233	N.14° 39' 56.7"	11.143
1	7 9 53.43	2.1794	21 36 49.5	6.385	1	8 53 3.47	2.1235	14 28 45.6	11.238
2	7 12 4.16	2.1782	21 30 22.4	6.388	2	8 55 10.80	2.1216	14 17 29.3	11.314
3	7 14 14.82	2.1770	21 23 48.6	6.390	3	8 57 18.09	2.1211	14 6 7.8	11.400
4	7 16 25.40	2.1766	21 17 8.0	6.781	4	8 59 25.33	2.1204	13 54 41.3	11.484
5	7 18 35.91	2.1746	21 10 20.8	6.842	5	9 1 32.53	2.1198	13 43 9.7	11.568
6	7 20 46.35	2.1724	21 3 26.9	6.943	6	9 3 39.70	2.1192	13 31 33.1	11.651
7	7 22 56.71	2.1721	20 56 26.4	7.063	7	9 5 46.83	2.1185	13 19 51.6	11.733
8	7 25 7.00	2.1708	20 49 19.3	7.173	8	9 7 53.93	2.1180	13 8 5.2	11.814
9	7 27 17.21	2.1696	20 42 5.6	7.283	9	9 10 0.99	2.1175	12 56 13.9	11.895
10	7 29 27.34	2.1693	20 34 45.4	7.393	10	9 12 8.03	2.1171	12 44 17.8	11.974
11	7 31 37.39	2.1690	20 27 18.6	7.501	11	9 14 15.04	2.1167	12 32 17.0	12.053
12	7 33 47.37	2.1686	20 19 45.3	7.609	12	9 16 22.03	2.1165	12 20 11.4	12.131
13	7 35 57.26	2.1683	20 12 5.5	7.717	13	9 18 29.00	2.1160	12 8 1.2	12.209
14	7 38 7.08	2.1680	20 4 19.3	7.824	14	9 20 35.95	2.1157	11 55 46.3	12.286
15	7 40 16.82	2.1617	19 56 26.6	7.931	15	9 22 42.88	2.1154	11 43 26.8	12.363
16	7 42 26.48	2.1604	19 48 27.6	8.037	16	9 24 49.80	2.1152	11 31 2.8	12.437
17	7 44 36.06	2.1590	19 40 22.2	8.143	17	9 26 56.71	2.1151	11 18 34.3	12.512
18	7 46 45.56	2.1576	19 32 10.4	8.248	18	9 29 3.61	2.1150	11 6 1.4	12.586
19	7 48 54.98	2.1563	19 23 52.3	8.353	19	9 31 10.51	2.1150	10 53 24.2	12.657
20	7 51 4.32	2.1550	19 15 28.0	8.457	20	9 33 17.41	2.1150	10 40 42.6	12.728
21	7 53 13.58	2.1537	19 6 57.4	8.561	21	9 35 24.31	2.1151	10 27 56.8	12.799
22	7 55 22.77	2.1524	18 58 20.7	8.664	22	9 37 31.22	2.1152	10 15 6.7	12.869
23	7 57 31.87	2.1511	N.18° 49' 37.8"	8.767	23	9 39 38.13	2.1153	N.10° 2' 12.5"	12.938
SATURDAY 26.					MONDAY 28.				
0	7 59 40.90	2.1498	N.18° 40' 48.7"	8.869	0	9 41 45.05	2.1156	N. 9° 49' 14.1"	13.006
1	8 1 49.85	2.1485	18 31 53.5	8.971	1	9 43 51.99	2.1157	9 36 11.7	13.073
2	8 3 58.72	2.1473	18 22 52.2	9.073	2	9 45 58.94	2.1160	9 23 5.3	13.139
3	8 6 7.52	2.1460	18 13 44.9	9.173	3	9 48 5.91	2.1164	9 9 55.0	13.204
4	8 8 16.24	2.1447	18 4 31.5	9.273	4	9 50 12.91	2.1169	8 56 40.8	13.268
5	8 10 24.88	2.1434	17 55 12.2	9.372	5	9 52 19.94	2.1174	8 43 22.8	13.332
6	8 12 33.45	2.1421	17 45 46.9	9.471	6	9 54 27.00	2.1179	8 30 1.0	13.394
7	8 14 41.94	2.1409	17 36 15.7	9.569	7	9 56 34.09	2.1185	8 16 35.5	13.456
8	8 16 50.36	2.1397	17 26 38.6	9.666	8	9 58 41.22	2.1191	8 3 6.4	13.516
9	8 18 58.71	2.1386	17 16 55.7	9.763	9	10 0 48.39	2.1198	7 49 33.6	13.576
10	8 21 6.96	2.1373	17 7 7.0	9.860	10	10 2 55.60	2.1206	7 35 57.3	13.634
11	8 23 15.19	2.1362	16 57 12.5	9.956	11	10 5 2.86	2.1215	7 22 17.5	13.691
12	8 25 23.33	2.1351	16 47 12.3	10.051	12	10 7 10.18	2.1224	7 8 34.4	13.747
13	8 27 31.40	2.1340	16 37 6.4	10.146	13	10 9 17.55	2.1233	6 54 47.9	13.803
14	8 29 39.41	2.1329	16 26 54.8	10.240	14	10 11 24.98	2.1243	6 40 58.1	13.858
15	8 31 47.35	2.1318	16 16 37.6	10.333	15	10 13 32.47	2.1254	6 27 5.0	13.911
16	8 33 55.22	2.1307	16 6 14.9	10.426	16	10 15 40.03	2.1265	6 13 8.8	13.963
17	8 36 3.03	2.1297	15 55 46.6	10.518	17	10 17 47.65	2.1277	5 59 9.5	14.014
18	8 38 10.78	2.1287	15 45 12.8	10.609	18	10 19 55.35	2.1290	5 45 7.1	14.064
19	8 40 18.47	2.1277	15 34 33.5	10.700	19	10 22 3.13	2.1303	5 31 1.8	14.112
20	8 42 26.10	2.1267	15 23 48.8	10.790	20	10 24 10.99	2.1317	5 16 53.6	14.160
21	8 44 33.68	2.1256	15 12 58.7	10.879	21	10 26 18.94	2.1332	5 2 42.5	14.207
22	8 46 41.20	2.1246	15 2 3.3	10.967	22	10 28 26.97	2.1347	4 48 28.7	14.253
23	8 48 48.67	2.1234	14 51 2.6	11.055	23	10 30 35.10	2.1363	4 34 12.2	14.297
24	8 50 56.10	2.1233	N.14° 39' 56.7"	11.143	24	10 32 43.32	2.1379	N. 4° 19' 53.1"	14.340

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
TUESDAY 29.					THURSDAY 31.				
0	10 32 43.32	2.1379	N. 4 19 53.1	14.340	0	12 18 32.40	2.3075	S. 7 32 40.7	14.763
1	10 34 51.64	2.1396	4 5 31.4	14.382	1	12 20 50.40	2.3094	7 47 25.6	14.782
2	10 37 0.07	2.1414	3 51 7.3	14.423	2	12 23 8.69	2.3074	8 2 8.6	14.698
3	10 39 8.61	2.1433	3 36 40.7	14.463	3	12 25 27.99	2.3126	8 16 49.5	14.663
4	10 41 17.26	2.1451	3 22 11.8	14.501	4	12 27 46.19	2.3176	8 31 26.2	14.625
5	10 43 26.03	2.1471	3 7 40.6	14.538	5	12 30 5.40	2.3226	8 46 4.6	14.587
6	10 45 34.91	2.1492	2 53 7.2	14.574	6	12 32 24.92	2.3290	9 0 38.7	14.546
7	10 47 43.92	2.1513	2 38 31.7	14.609	7	12 34 44.75	2.3332	9 15 10.3	14.504
8	10 49 53.06	2.1535	2 23 54.1	14.643	8	12 37 4.90	2.3365	9 29 39.2	14.459
9	10 52 2.34	2.1557	2 9 14.6	14.674	9	12 39 25.37	2.3420	9 44 5.3	14.412
10	10 54 11.75	2.1580	1 54 33.2	14.705	10	12 41 46.17	2.3498	9 58 26.6	14.363
11	10 56 21.30	2.1604	1 39 50.0	14.734	11	12 44 7.29	2.3548	10 12 48.9	14.313
12	10 58 31.00	2.1629	1 25 5.1	14.763	12	12 46 28.74	2.3603	10 27 6.1	14.260
13	11 0 40.85	2.1654	1 10 18.5	14.789	13	12 48 50.52	2.3666	10 41 20.1	14.205
14	11 2 50.85	2.1680	0 55 30.4	14.815	14	12 51 12.64	2.3714	10 55 30.7	14.148
15	11 5 1.01	2.1707	0 40 40.7	14.839	15	12 53 35.09	2.3770	11 9 37.8	14.088
16	11 7 11.34	2.1736	0 25 49.7	14.862	16	12 55 57.88	2.3837	11 23 41.3	14.027
17	11 9 21.83	2.1763	N. 0 10 57.4	14.883	17	12 58 21.01	2.3884	11 37 41.1	13.964
18	11 11 32.49	2.1792	S. 0 3 56.2	14.908	18	13 0 44.49	2.3941	11 51 37.0	13.899
19	11 13 43.33	2.1823	0 18 50.9	14.921	19	13 3 8.31	2.3999	12 5 29.0	13.832
20	11 15 54.35	2.1855	0 33 46.7	14.936	20	13 5 32.48	2.4067	12 19 16.9	13.763
21	11 18 5.55	2.1888	0 48 43.5	14.954	21	13 7 57.00	2.4116	12 33 0.6	13.692
22	11 20 16.94	2.1914	1 3 41.2	14.968	22	13 10 21.87	2.4174	12 46 40.0	13.619
23	11 22 28.52	2.1945	S. 1 18 30.7	14.980	23	13 12 47.09	2.4233	S. 13 0 14.9	13.544
WEDNESDAY 30.					FRIDAY, NOVEMBER 1.				
0	11 24 40.29	2.1979	S. 1 33 38.8	14.991	0	13 15 12.67	2.4292	S. 13 13 45.3	13.467
1	11 26 52.26	2.2013	1 48 38.6	15.001					
2	11 29 4.44	2.2047	2 3 38.9	15.009					
3	11 31 16.83	2.2082	2 18 39.6	15.015					
4	11 33 29.43	2.2118	2 33 40.7	15.020					
5	11 35 42.24	2.2154	2 48 42.0	15.023					
6	11 37 55.28	2.2192	3 3 43.5	15.025					
7	11 40 8.55	2.2230	3 18 45.0	15.025					
8	11 42 22.04	2.2269	3 33 46.5	15.023					
9	11 44 35.77	2.2308	3 48 47.8	15.020					
10	11 46 49.73	2.2348	4 3 48.9	15.015					
11	11 49 3.94	2.2388	4 18 49.6	15.008					
12	11 51 18.39	2.2429	4 33 49.9	15.000					
13	11 53 33.09	2.2471	4 48 49.6	14.990					
14	11 55 48.04	2.2514	5 3 48.7	14.978					
15	11 58 3.25	2.2557	5 18 47.0	14.965					
16	12 0 18.73	2.2601	5 33 44.5	14.950					
17	12 2 34.47	2.2645	5 48 41.0	14.933					
18	12 4 50.48	2.2691	6 3 36.5	14.914					
19	12 7 6.77	2.2737	6 18 30.8	14.894					
20	12 9 23.33	2.2783	6 33 23.8	14.871					
21	12 11 40.17	2.2830	6 48 15.4	14.847					
22	12 13 57.29	2.2878	7 3 5.5	14.821					
23	12 16 14.70	2.2926	7 17 54.0	14.793					
24	12 18 32.40	2.2975	S. 7 32 40.7	14.763					

PHASES OF THE MOON.

● New Moon, 3 18 57.5
 ☽ First Quarter, 10 10 9.4
 ○ Full Moon, 18 6 38.4
 ☾ Last Quarter, 26 9 54.7

☾ Perigee, 4 18.2
 ☽ Apogee, 19 18.1

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Star's Name and Position.	Noon.	P. L. of Dist.	III ^h .	P. L. of Dist.	VI ^h .	P. L. of Dist.	IX ^h .	P. L. of Dist.
1	Aldebaran W.	81° 42' 59"	2222	83° 28' 22"	2208	85° 14' 10"	2291	87° 0' 23"	2274
	Pollux W.	39 56 35	2272	41 40 48	2260	43 25 34	2222	45 10 52	2207
	SUN E.	38 32 37	2240	36 54 37	2234	35 16 15	2212	33 37 36	2209
6	SUN W.	31 34 12	2205	33 17 54	2205	35 1 31	2403	36 45 1	2409
	α Aquilæ E.	79 15 33	2279	77 36 9	2269	75 57 8	2212	74 18 31	2202
	Fomalhaut E.	104 37 15	2500	102 56 2	2461	101 14 50	2503	99 33 41	2209
	α Pegasi E.	126 9 33	2220	124 22 20	2222	122 35 10	2255	120 48 4	2226
7	SUN W.	45 19 54	2452	47 2 14	2455	48 44 17	2477	50 26 2	2490
	α Aquilæ E.	66 12 57	2761	64 37 38	2729	63 2 59	2628	61 29 7	2623
	Fomalhaut E.	91 10 13	2461	89 30 10	2464	87 50 26	2572	86 11 1	2202
	α Pegasi E.	111 53 43	2204	110 7 19	2202	108 21 9	2202	106 35 13	2211
8	SUN W.	58 50 4	2261	60 29 53	2272	62 9 21	2402	63 48 27	2207
	Venus W.	20 28 45	2222	22 6 56	2245	23 44 50	2259	25 22 26	2271
	α Aquilæ E.	53 52 47	2202	52 24 33	2154	50 57 29	2212	49 31 41	2226
	Fomalhaut E.	77 59 31	2222	76 22 31	2702	74 45 59	2720	73 9 59	2724
	α Pegasi E.	97 49 28	2272	96 5 14	2227	94 21 20	2401	92 87 46	2412
9	SUN W.	71 58 32	2222	73 35 26	2702	75 11 58	2722	76 48 7	2722
	Venus W.	33 25 39	2742	35 1 15	2744	36 36 30	2722	38 11 22	2727
	Antares W.	20 37 17	2271	22 21 34	2264	24 5 32	2222	25 49 10	2412
	Fomalhaut E.	65 18 29	2222	63 46 4	2277	62 14 20	2222	60 43 19	2227
	α Pegasi E.	84 5 23	2424	82 24 2	2212	80 43 6	2222	79 2 33	2242
10	SUN W.	84 43 22	2224	86 17 19	2240	87 50 55	2222	89 24 10	2274
	Venus W.	46 0 24	2222	47 33 7	2227	49 5 29	2212	50 37 32	2222
	Antares W.	34 22 14	2422	36 3 49	2200	37 45 2	2212	39 25 55	2222
	Fomalhaut E.	53 20 9	2222	51 54 11	2222	50 29 12	2212	49 5 16	2270
	α Pegasi E.	70 45 57	2222	69 7 54	2222	67 30 18	2277	65 53 7	2222
	α Arietis E.	113 24 22	2200	111 43 9	2212	110 2 18	2222	108 21 47	2244
11	SUN W.	97 5 8	2224	98 36 19	2222	100 7 10	2224	101 37 43	2222
	Venus W.	58 12 36	2222	59 42 37	2222	61 12 19	2222	62 41 43	2222
	Antares W.	47 45 16	2222	49 24 9	2212	51 2 43	2222	52 40 59	2212
	α Pegasi E.	57 53 57	2222	56 19 31	2222	54 45 33	2242	53 12 4	2222
	α Arietis E.	100 4 12	2212	98 25 41	2222	96 47 28	2242	95 9 35	2222
12	SUN W.	109 5 50	2272	110 34 34	2222	112 3 1	2100	113 31 11	2112
	Venus W.	70 4 14	2122	71 31 52	2122	72 59 14	2122	74 26 21	2122
	Antares W.	60 47 45	2702	62 24 14	2712	64 0 28	2722	65 36 25	2744
	α Pegasi E.	45 32 35	2201	44 2 23	2222	42 32 48	2224	41 3 54	2222
	α Arietis E.	87 4 38	2722	85 28 31	2727	83 52 40	2742	82 17 5	2721
	Aldebaran E.	119 41 57	2721	118 6 38	2722	116 31 33	2722	114 56 41	2722
13	SUN W.	120 48 10	2172	122 14 48	2122	123 41 12	2122	125 7 22	2222
	Venus W.	81 38 6	2227	83 3 43	2227	84 29 8	2242	85 54 20	2222
	Antares W.	73 32 23	2200	75 6 51	2212	76 41 6	2222	78 15 8	2222
	α Arietis E.	74 23 3	2212	72 48 59	2222	71 15 10	2241	69 41 35	2222
	Aldebaran E.	107 5 41	2242	105 32 8	2242	103 58 48	2222	102 25 41	2271
14	Venus W.	92 57 14	2210	94 21 14	2212	95 45 3	2222	97 8 42	2227
	Antares W.	86 2 10	2272	87 34 59	2224	89 7 38	2222	90 40 6	2221
	α Aquilæ W.	40 37 0	2224	41 43 33	2242	42 51 18	2174	44 0 9	2111

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Star's Name and Position.	Midnight.	P. L. of Dist.	XVh.	P. L. of Dist.	XVIIIh.	P. L. of Dist.	XXIh.	P. L. of Dist.
1	Aldebaran W.	88° 47' 0"	2228	90° 34' 1"	2228	92° 21' 26"	2227	94° 9' 14"	2219
	Pollux W.	46 56 41	2228	48 43 2	2227	50 29 50	2247	52 17 8	2220
	SUN E.	31 58 39	2228	30 19 24	2276	28 39 55	2566	27 0 16	2562
6	SUN W.	38 28 23	2417	40 11 34	2426	41 54 33	2433	43 37 20	2442
	α Aquilæ E.	72 40 22	2654	71 2 42	2678	69 25 33	2709	67 48 56	2731
	Fomalhaut E.	97 52 40	2618	96 11 47	2621	94 31 3	2590	92 50 32	2539
	α Pegasi E.	119 1 2	2228	117 14 2	2222	115 27 7	2226	113 40 20	2274
7	SUN W.	52 7 29	2604	53 48 36	2617	55 29 25	2632	57 9 54	2645
	α Aquilæ E.	59 56 1	2626	58 23 48	2646	56 52 26	2696	55 22 7	2643
	Fomalhaut E.	84 31 56	2618	82 53 13	2622	81 14 53	2646	79 37 0	2663
	α Pegasi E.	104 49 30	2623	103 4 4	2626	101 18 55	2646	99 34 2	2359
8	SUN W.	65 27 12	2624	67 5 35	2629	68 43 37	2627	70 21 15	2672
	Venus W.	26 59 45	2626	28 36 44	2701	30 13 23	2716	31 49 41	2723
	α Aquilæ E.	48 7 12	2626	46 44 9	2429	45 22 37	2626	44 2 40	2610
	Fomalhaut E.	71 34 31	2779	69 59 36	2607	68 25 17	2722	66 51 34	2664
	α Pegasi E.	90 54 33	2421	89 11 42	2446	87 29 13	2463	85 47 7	2478
9	SUN W.	78 23 55	2726	79 59 20	2774	81 34 22	2790	83 9 3	2607
	Venus W.	39 45 54	2614	41 20 4	2620	42 53 53	2648	44 27 19	2664
	Antares W.	27 32 26	2426	29 15 26	2441	30 58 3	2456	32 40 19	2470
	Fomalhaut E.	59 18 2	2626	57 43 33	2675	56 14 53	2717	54 47 4	2762
	α Pegasi E.	77 22 23	2626	75 42 40	2622	74 3 20	2621	72 24 26	2619
	α Arietis E.	106 41 35	2629	105 1 44	2674	103 22 14	2698	101 43 3	2603
10	SUN W.	90 57 2	2629	92 29 34	2626	94 1 46	2622	95 33 37	2628
	Venus W.	52 9 14	2646	53 40 35	2622	55 11 36	2678	56 42 16	2694
	Antares W.	41 6 28	2644	42 46 40	2629	44 26 31	2673	46 6 3	2667
	Fomalhaut E.	47 42 26	2426	46 20 45	2429	45 0 20	2671	43 41 14	2649
	α Pegasi E.	64 16 24	2717	62 40 7	2727	61 4 16	2756	59 26 53	2779
	α Arietis E.	106 41 35	2629	105 1 44	2674	103 22 14	2698	101 43 3	2603
11	SUN W.	103 7 57	2614	104 37 52	2629	106 7 29	2643	107 36 48	2667
	Venus W.	64 10 59	2629	65 39 38	2623	67 8 8	2626	68 36 20	2712
	Antares W.	54 18 56	2626	55 56 35	2670	57 38 55	2622	59 10 59	2626
	α Pegasi E.	51 39 6	2624	50 6 39	2629	48 34 45	2644	47 3 22	2673
	α Arietis E.	93 31 59	2673	91 54 42	2626	90 17 43	2629	88 41 2	2712
	α Arietis E.	93 31 59	2673	91 54 42	2626	90 17 43	2629	88 41 2	2712
12	SUN W.	114 59 7	2726	116 26 45	2726	117 54 8	2751	119 21 16	2768
	Venus W.	75 53 12	2778	77 19 48	2726	78 46 9	2723	80 12 15	2716
	Antares W.	67 12 7	2726	68 47 33	2767	70 22 44	2778	71 57 41	2789
	α Pegasi E.	39 35 40	2726	38 8 11	2773	36 41 30	2816	35 15 40	2822
	α Arietis E.	80 41 46	2773	79 6 43	2726	77 31 55	2726	75 57 22	2607
	α Arietis E.	80 41 46	2773	79 6 43	2726	77 31 55	2726	75 57 22	2607
	Aldebaran E.	113 22 2	2623	111 47 37	2612	110 13 26	2629	108 39 27	2622
13	SUN W.	126 33 19	2822	127 59 1	2824	129 24 30	2844	130 49 46	2856
	Venus W.	87 19 19	2670	88 44 5	2629	90 8 40	2629	91 33 3	2300
	Antares W.	79 48 57	2640	81 22 33	2649	82 55 57	2646	84 29 10	2668
	α Arietis E.	68 8 12	2621	66 35 3	2670	65 2 7	2621	63 29 23	2629
	Aldebaran E.	100 52 45	2621	99 20 2	2629	97 47 30	2629	96 15 9	2627
	Aldebaran E.	100 52 45	2621	99 20 2	2629	97 47 30	2629	96 15 9	2627
14	Venus W.	96 32 11	2846	99 55 30	2844	101 18 39	2822	102 41 39	2300
	Antares W.	92 12 24	2629	93 44 32	2616	95 16 30	2624	96 48 18	2621
	α Aquilæ W.	45 10 6	2626	46 20 45	2626	47 32 20	2629	48 44 40	2618

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Star's Name and Position.	Noon.	P. L. of Dist.	IIIh.	P. L. of Dist.	VIh.	P. L. of Dist.	IXh.	P. L. of Dist.
14	α Arietis E.	61° 56' 51"	2900	60° 24' 32"	2909	58° 52' 24"	2918	57° 20' 28"	2927
	Aldebaran E.	94 42 59	2916	93 11 0	2924	91 39 12	2933	90 7 35	2940
15	Venus W.	104 4 31	2977	105 27 14	2985	106 49 48	2992	108 12 14	2998
	Antares W.	98 19 57	2938	99 51 28	2945	101 22 50	2961	102 54 4	2966
	α Aquilæ W.	49 57 42	2982	51 11 20	2948	52 25 33	2918	53 40 17	2792
	α Arietis E.	49 43 38	2971	48 12 49	2960	46 42 11	2968	45 11 43	2986
	Aldebaran E.	82 31 54	2978	81 1 14	2985	79 30 43	2998	78 0 21	2999
	Pollux E.	124 24 4	2994	122 53 44	2999	121 23 30	3004	119 53 22	3009
16	α Aquilæ W.	60 0 10	2989	61 17 9	2974	62 34 24	2961	63 51 53	2949
	Fomalhaut W.	36 32 13	4479	37 36 24	4384	38 42 0	4300	39 48 53	4223
	α Arietis E.	37 42 4	2040	36 12 41	2051	34 43 31	2060	33 14 32	2071
	Aldebaran E.	70 30 54	2031	69 1 0	2038	67 31 34	2044	66 2 16	2051
	Pollux E.	112 24 12	2029	110 54 35	2034	109 25 5	2041	107 55 42	2044
17	α Aquilæ W.	70 22 11	2903	71 40 42	2966	72 59 19	2922	74 18 2	2987
	Fomalhaut W.	45 39 2	2945	46 51 36	2904	48 4 51	2970	49 18 41	2936
	α Pegasi W.	23 5 47	4107	24 15 42	3990	25 27 31	3994	26 40 57	3913
	Aldebaran E.	58 37 37	2060	57 9 3	2067	55 40 37	2091	54 12 17	2097
	Pollux E.	100 30 1	2064	99 1 7	2067	97 32 17	2073	96 3 33	2074
18	α Aquilæ W.	80 52 36	2974	82 11 39	2978	83 30 43	2973	84 49 47	2973
	Fomalhaut W.	55 35 34	2709	56 52 12	2691	58 9 9	2673	59 26 26	2667
	α Pegasi W.	33 5 45	2647	34 25 17	2616	35 45 25	2484	37 6 7	2459
	Aldebaran E.	46 52 30	2129	45 24 56	2137	43 57 31	2144	42 30 15	2153
	Pollux E.	88 40 49	2091	87 12 28	2094	85 44 11	2099	84 15 56	2099
19	α Aquilæ W.	91 25 0	2978	92 43 58	2982	94 2 52	2984	95 21 44	2986
	Fomalhaut W.	65 56 41	2993	67 15 23	2964	68 34 15	2976	69 53 17	2966
	α Pegasi W.	43 55 55	2965	45 18 52	2951	46 42 5	2939	48 5 31	2928
	Aldebaran E.	35 16 25	2198	33 50 14	2210	32 24 17	2220	30 58 36	2229
	Pollux E.	76 55 31	2111	75 27 35	2118	73 59 41	2114	72 31 49	2117
20	α Aquilæ W.	101 54 51	2913	103 13 11	2920	104 31 24	2927	105 49 29	2934
	Fomalhaut W.	76 30 29	2934	77 50 16	2929	79 10 8	2926	80 30 5	2921
	α Pegasi W.	55 5 35	2284	56 30 5	2276	57 54 44	2270	59 19 30	2264
	Pollux E.	65 13 4	2125	63 45 25	2126	62 17 47	2128	60 50 11	2129
	Regulus E.	102 0 52	2087	100 32 26	2087	99 4 1	2087	97 35 35	2087
	Jupiter E.	122 10 7	2176	120 43 28	2174	119 16 49	2173	117 50 8	2173
	Saturn E.	122 10 54	2163	120 43 48	2162	119 16 41	2161	117 49 33	2149
	Fomalhaut W.	87 10 52	2904	88 31 12	2903	89 51 33	2900	91 11 57	2898
21	α Pegasi W.	66 25 8	2296	67 50 35	2290	69 16 9	2226	70 41 49	2220
	α Arietis W.	22 47 48	2199	24 13 58	2163	25 40 27	2166	27 7 14	2166
	Pollux E.	53 32 32	2134	52 5 4	2136	50 37 37	2136	49 10 11	2137
	Regulus E.	90 13 13	2082	88 44 41	2079	87 16 6	2077	85 47 28	2074
	Saturn E.	110 33 23	2149	109 6 2	2138	107 38 38	2136	106 11 11	2133
	Jupiter E.	110 36 15	2163	109 9 22	2161	107 42 26	2160	106 15 28	2157
	Fomalhaut W.	97 54 20	2494	99 14 51	2494	100 35 22	2494	101 55 53	2494
	α Pegasi W.	77 51 41	2193	79 17 58	2186	80 44 22	2183	82 10 52	2176
22	α Arietis W.	34 24 22	2108	35 52 22	2101	37 20 31	2093	38 48 50	2093
	Pollux E.	41 53 23	2144	40 26 7	2147	38 56 54	2149	37 31 44	2153
	Regulus E.	78 23 36	2060	76 54 37	2066	75 25 34	2063	73 56 26	2047

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Star's Name and Position.	Midnight.	P. L. of Dist.	XVh.	P. L. of Dist.	XVIIIh.	P. L. of Dist.	XXIh.	P. L. of Dist.
14	α Arietis E.	55° 48' 44"	3036	54° 17' 11"	3045	52° 45' 49"	3054	51° 14' 38"	3062
	Aldebaran E.	88 36 7	3048	87 4 49	3056	85 33 41	3064	84 2 43	3071
15	Venus W.	109 34 31	3406	110 56 41	3412	112 18 44	3418	113 40 40	3425
	Antares W.	104 25 10	3064	105 56 8	3069	107 26 59	3076	108 57 42	3082
	α Aquilæ W.	54 55 28	3768	56 11 6	3744	57 27 7	3734	58 43 29	3706
	α Arietis E.	43 41 25	3005	42 11 19	3014	40 41 23	3023	39 11 38	3031
	Aldebaran E.	76 30 7	3005	75 0 1	3013	73 30 4	3019	72 0 15	3026
	Pollux E.	118 23 20	3014	116 53 25	3019	115 23 36	3023	113 53 52	3027
16	α Aquilæ W.	65 9 35	3637	66 27 29	3627	67 45 34	3619	69 3 48	3610
	Fomalhaut W.	40 56 58	4156	42 6 7	4006	43 16 14	4040	44 27 14	3991
	α Arietis E.	31 45 47	3062	30 17 15	3094	28 48 58	3106	27 20 56	3116
	Aldebaran E.	64 33 6	3056	63 4 3	3063	61 35 8	3068	60 6 19	3073
	Pollux E.	106 26 24	3048	104 57 11	3052	103 28 3	3056	101 59 0	3060
17	α Aquilæ W.	75 36 49	3584	76 55 41	3580	78 14 37	3578	79 33 35	3576
	Fomalhaut W.	50 33 6	3805	51 48 3	3777	53 3 29	3753	54 19 20	3731
	α Pegasi W.	27 55 46	3743	29 11 48	3681	30 28 55	3681	31 46 56	3667
	Aldebaran E.	52 44 4	3105	51 16 0	3110	49 48 2	3116	48 20 12	3123
	Pollux E.	94 34 52	3078	93 6 15	3081	91 37 42	3085	90 9 14	3087
18	α Aquilæ W.	86 8 52	3873	87 27 56	3874	88 46 59	3876	90 6 0	3876
	Fomalhaut W.	60 43 59	3641	62 1 49	3628	63 19 53	3615	64 38 11	3604
	α Pegasi W.	38 27 17	3435	39 48 54	3415	41 10 54	3396	42 33 15	3379
	Aldebaran E.	41 3 9	3160	39 36 12	3168	38 9 25	3178	36 42 49	3188
	Pollux E.	82 47 44	3101	81 19 36	3108	79 51 32	3106	78 23 30	3109
19	α Aquilæ W.	96 40 31	3892	97 59 14	3897	99 17 52	3902	100 36 24	3907
	Fomalhaut W.	71 12 28	3559	72 31 47	3552	73 51 14	3545	75 10 48	3539
	α Pegasi W.	49 29 10	3318	50 53 1	3310	52 17 2	3300	53 41 14	3292
	Aldebaran E.	29 33 13	3257	28 8 11	3276	26 43 30	3298	25 19 16	3323
	Pollux E.	71 4 0	3119	69 36 13	3120	68 8 28	3122	66 40 45	3124
20	α Aquilæ W.	107 7 27	3643	108 25 15	3652	109 42 53	3663	111 0 21	3673
	Fomalhaut W.	81 50 6	3516	83 10 12	3513	84 30 22	3509	85 50 36	3507
	α Pegasi W.	60 44 24	3259	62 9 24	3252	63 34 32	3246	64 59 47	3241
	Pollux E.	59 22 37	3130	57 55 4	3131	56 27 32	3129	55 0 1	3123
	Regulus E.	96 7 9	3086	94 38 42	3085	93 10 14	3083	91 41 44	3082
	Jupiter E.	116 23 25	3170	114 56 40	3168	113 29 53	3168	112 3 5	3166
	Saturn E.	116 22 23	3148	114 55 11	3146	113 27 57	3144	112 0 41	3143
	Fomalhaut W.	92 32 23	3497	93 52 50	3496	95 13 19	3494	96 33 50	3495
21	α Pegasi W.	72 7 35	3214	73 33 27	3209	74 59 26	3204	76 25 30	3198
	α Arietis W.	28 34 14	3146	30 1 28	3135	31 28 54	3125	32 56 33	3117
	Pollux E.	47 42 46	3138	46 15 23	3140	44 48 2	3141	43 20 42	3142
	Regulus E.	84 18 47	3073	82 50 4	3071	81 21 19	3068	79 52 30	3064
	Saturn E.	104 43 41	3129	103 16 7	3126	101 48 29	3123	100 20 47	3119
	Jupiter E.	104 48 27	3153	103 21 22	3149	101 54 12	3147	100 26 59	3143
	Fomalhaut W.	103 16 24	3495	104 36 54	3497	105 57 22	3499	107 17 47	3499
22	α Pegasi W.	83 37 30	3171	85 4 14	3165	86 31 5	3159	87 58 3	3153
	α Arietis W.	40 17 20	3076	41 45 59	3068	43 14 48	3060	44 43 46	3052
	Pollux E.	36 4 39	3157	34 37 38	3161	33 10 42	3168	31 43 54	3174
	Regulus E.	72 27 12	3043	70 57 51	3038	69 28 25	3033	67 58 53	3026

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Star's Name and Position.	Noon.	P. L. of DM.	III ^h .	P. L. of DM.	VI ^h .	P. L. of DM.	IX ^h .	P. L. of DM.
22	Saturn E.	98° 53' 0"	3114	97° 25' 8"	3111	95° 57' 12"	3106	94° 39' 16"	3102
	Jupiter E.	98 59 42	3139	97 32 20	3135	96 4 53	3130	94 37 30	3124
23	α Pegasi W.	89 25 9	3147	90 52 22	3140	92 19 43	3133	93 47 12	3127
	α Arietis W.	46 12 54	3044	47 42 12	3036	49 11 41	3037	50 41 20	3018
	Aldebaran W.	15 8 45	3044	16 26 32	3033	17 46 20	3046	19 7 45	3376
	Regulus E.	66 29 13	3023	64 59 27	3016	63 29 33	3009	61 59 31	3002
	Saturn E.	87 7 27	3073	85 38 45	3067	84 9 55	3060	82 46 57	3053
	Jupiter E.	87 18 0	3096	85 49 46	3091	84 21 26	3084	82 52 57	3077
	SUN E.	128 38 57	3406	127 16 49	3400	125 54 32	3391	124 32 5	3383
24	α Pegasi W.	101 6 44	3091	102 35 5	3082	104 3 36	3074	105 32 17	3067
	α Arietis W.	58 12 24	2971	59 43 13	2960	61 14 16	2950	62 45 31	2940
	Aldebaran W.	26 11 22	3103	27 38 28	3124	29 6 8	3096	30 34 23	3073
	Regulus E.	54 27 7	2964	52 56 9	2955	51 25 0	2946	49 53 40	2936
	Saturn E.	75 13 45	3013	73 43 48	3003	72 13 39	2994	70 43 19	2986
	Jupiter E.	75 28 9	3086	73 58 41	3076	72 29 1	3016	70 59 8	3006
	SUN E.	117 37 12	3333	116 13 39	3328	114 49 54	3313	113 25 57	3301
25	α Arietis W.	70 25 21	2980	71 58 6	2968	73 31 6	2954	75 4 24	2948
	Aldebaran W.	38 2 40	2964	39 33 37	2946	41 4 58	2926	42 36 44	2909
	Regulus E.	42 13 56	2987	40 41 21	2976	39 8 32	2966	37 35 30	2955
	Saturn E.	63 8 30	2931	61 36 51	2921	60 4 59	2909	58 32 51	2897
	Jupiter E.	63 26 33	2992	61 55 20	2941	60 23 53	2926	58 52 10	2916
	SUN E.	106 22 42	3337	104 57 17	3324	103 31 37	3309	102 5 38	3196
	26	α Arietis W.	82 55 21	2769	84 30 30	2758	86 5 59	2738	87 41 49	2723
Aldebaran W.		50 21 21	2817	51 55 27	2799	53 29 56	2781	55 4 49	2763
Saturn E.		58 48 19	2835	49 14 36	2821	47 40 35	2808	46 6 18	2796
Jupiter E.		51 9 35	2850	49 36 14	2837	48 2 34	2824	46 26 37	2810
SUN E.		94 51 23	3117	93 23 34	3101	91 55 26	3084	90 26 56	3067
27	α Arietis W.	95 46 19	2639	97 24 21	2621	99 2 47	2606	100 41 35	2587
	Aldebaran W.	63 5 16	2670	64 42 36	2651	66 20 22	2633	67 58 32	2614
	Pollux W.	21 56 46	2917	23 28 43	2903	25 1 49	2815	26 35 57	2778
	Saturn E.	38 10 46	2735	36 34 52	2723	34 58 43	2713	33 22 21	2704
	Jupiter E.	38 34 22	2744	36 58 40	2730	35 22 40	2717	33 46 23	2706
	SUN E.	82 59 8	2977	81 28 27	2969	79 57 22	2959	78 25 53	2950
	28	Aldebaran W.	76 15 55	2818	77 56 43	2799	79 37 57	2780	81 19 38	2761
Pollux W.		34 39 27	2901	36 18 20	2874	37 57 51	2846	39 38 0	2821
SUN E.		70 42 18	2923	69 8 19	2903	67 33 54	2873	65 59 5	2763
29	Aldebaran W.	89 54 46	2808	91 39 7	2789	93 23 55	2771	95 9 10	2753
	Pollux W.	48 7 29	2901	49 51 3	2878	51 35 9	2847	53 19 45	2827
	SUN E.	57 58 21	2965	56 20 54	2946	54 43 2	2927	53 4 44	2909
30	Aldebaran W.	104 1 42	2230	105 49 25	2214	107 37 32	2200	109 26 0	2184
	Pollux W.	62 10 9	2239	63 57 39	2220	65 45 36	2204	67 33 58	2186
	Regulus W.	25 9 6	2254	26 56 13	2230	28 43 56	2206	30 32 12	2186
	SUN E.	44 47 4	2923	43 6 21	2906	41 25 15	2891	39 43 49	2875
31	Pollux W.	76 41 53	2119	78 32 34	2099	80 23 34	2086	82 14 54	2078
	Regulus W.	39 40 54	2096	41 31 56	2084	43 23 20	2070	45 15 5	2063
	SUN E.	31 11 51	2416	29 28 39	2409	27 45 17	2406	26 1 45	2396

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Star's Name and Position.	Midnight.	P. L. of Dist.	XVh.	P. L. of Dist.	XVIIIh.	P. L. of Dist.	XXIh.	P. L. of Dist.
22	Saturn E.	93° 1' 3"	3096	91° 32' 49"	3091	90° 4' 29"	3086	88° 36' 2"	3079
	Jupiter E.	93 9 40	3190	91 41 55	3116	90 14 4	3110	88 46 6	3103
23	α Pegasi W.	95 14 49	3119	96 42 35	3113	98 10 29	3105	99 38 32	3098
	α Arietis W.	52 11 10	3090	53 41 11	3080	55 11 24	3091	56 41 48	3081
	Aldebaran W.	20 30 30	3215	21 54 24	3265	23 19 16	3223	24 44 58	3188
	Regulus E.	60 29 21	3095	58 59 2	3087	57 28 33	3090	55 57 55	3073
	Saturn E.	81 11 50	3045	79 42 33	3038	78 13 7	3030	76 43 31	3023
	Jupiter E.	81 24 19	3089	79 55 32	3081	78 26 35	3082	76 57 27	3044
	SUN E.	123 9 28	3373	121 46 40	3364	120 23 42	3354	119 0 33	3344
24	α Pegasi W.	107 1 7	3050	108 30 7	3050	109 59 18	3043	111 28 38	3036
	α Arietis W.	64 16 59	2926	65 48 43	2917	67 20 40	2905	68 52 53	2893
	Aldebaran W.	32 3 7	3049	33 32 20	3026	35 2 1	3005	36 32 8	2985
	Regulus E.	48 22 7	2927	46 50 23	2918	45 18 27	2906	43 46 18	2896
	Saturn E.	69 12 48	2974	67 42 3	2964	66 11 5	2954	64 39 54	2943
	Jupiter E.	69 29 3	2997	67 58 46	2986	66 28 16	2975	64 57 32	2963
	SUN E.	112 1 47	3289	110 37 23	3276	109 12 44	3264	107 47 50	3252
25	α Arietis W.	76 37 58	2937	78 11 51	2913	79 46 2	2798	81 20 32	2784
	Aldebaran W.	44 8 53	2999	45 41 25	2971	47 14 21	2954	48 47 39	2935
	Regulus E.	36 2 14	2945	34 28 45	2936	32 55 2	2924	31 21 5	2914
	Saturn E.	57 0 28	2985	55 27 49	2973	53 54 55	2960	52 21 45	2948
	Jupiter E.	57 20 11	2904	55 47 57	2891	54 15 27	2878	52 42 40	2864
	SUN E.	100 39 24	3180	99 12 51	3166	97 46 1	3149	96 18 51	3134
26	α Arietis W.	89 17 59	2768	90 54 31	2699	92 31 25	2673	94 8 41	2667
	Aldebaran W.	56 40 5	2744	58 15 46	2725	59 51 52	2707	61 28 22	2689
	Saturn E.	44 31 45	2783	42 56 55	2770	41 21 48	2757	39 46 24	2747
	Jupiter E.	44 54 22	2794	43 19 49	2783	41 44 59	2769	40 9 50	2756
	SUN E.	88 58 7	2649	87 28 55	2633	85 59 22	2614	84 29 26	2596
27	α Arietis W.	102 20 48	2898	104 0 25	2851	105 40 27	2834	107 20 53	2817
	Aldebaran W.	69 37 8	2994	71 16 11	2975	72 55 40	2957	74 35 34	2938
	Pollux W.	28 11 1	2733	29 46 58	2697	31 23 42	2683	33 1 12	2639
	Saturn E.	31 45 46	2995	30 9 1	2989	28 32 7	2985	26 55 7	2983
	Jupiter E.	32 9 50	2998	30 33 1	2987	28 56 0	2981	27 18 55	2978
	SUN E.	76 54 0	3091	75 21 42	3081	73 48 59	3063	72 15 51	3048
28	Aldebaran W.	83 1 46	2443	84 44 21	2424	86 27 22	2404	88 10 51	2386
	Pollux W.	41 18 44	2494	43 0 5	2470	44 42 0	2448	46 24 29	2426
	SUN E.	64 23 48	2744	62 48 6	2733	61 11 57	2703	59 35 21	2688
29	Aldebaran W.	96 54 50	2996	98 40 56	2979	100 27 27	2962	102 14 22	2945
	Pollux W.	55 4 51	2915	56 50 28	2906	58 36 33	2976	60 23 8	2956
	SUN E.	51 26 1	2691	49 46 53	2673	48 7 20	2656	46 27 24	2636
30	Aldebaran W.	111 14 51	3170	113 4 3	3156	114 53 34	3145	116 43 25	3136
	Pollux W.	69 22 46	2170	71 11 58	2155	73 1 34	2140	74 51 32	2126
	Regulus W.	32 21 1	2167	34 10 19	2148	36 0 5	2133	37 50 16	2114
	SUN E.	38 2 1	2462	36 19 54	2450	34 37 30	2437	32 54 48	2426
31	Pollux W.	84 6 32	2064	85 58 26	2054	87 50 36	2045	89 43 0	2039
	Regulus W.	47 7 9	2045	48 59 33	2034	50 52 14	2024	52 45 11	2015
	SUN E.	24 18 8	2396	22 34 27	2386	20 50 49	2403	19 7 18	2411

AT GREENWICH APPARENT NOON.

Day of the Week.	Day of the Month.	THE SUN'S					Sideral Time of the Semi-diameter passing the Meridian.	Equation of Time, to be subtracted from Apparent Time.	DIFF. for 1 hour.
		Apparent Right Ascension.	DIFF. for 1 hour.	Apparent Declination.	DIFF. for 1 hour.	Semi-diameter.			
Fri.	1	14 ^h 26 ^m 41.22 ^s	9.814	S. 14° 31' 44.8"	47.99	16' 9.96"	66.98	16 17.73	0.043
Sat.	2	14 30 37.12	9.847	14 50 49.5	47.39	16 10.21	67.09	16 18.38	0.010
Sun.	3	14 34 33.64	9.881	15 9 39.8	46.77	16 10.45	67.21	16 18.21	0.024
Mon.	4	14 38 31.37	9.915	15 28 15.2	46.14	16 10.69	67.33	16 17.24	0.058
Tues.	5	14 42 29.71	9.949	15 46 35.3	45.49	16 10.98	67.45	16 15.44	0.092
Wed.	6	14 46 28.88	9.983	16 4 39.6	44.83	16 11.17	67 57	16 12.80	0.126
Thur.	7	14 50 28.88	10.017	16 22 27.6	44.15	16 11.41	67.69	16 9.33	0.160
Fri.	8	14 54 29.71	10.051	16 39 59.1	43.45	16 11.65	67.81	16 5.05	0.194
Sat.	9	14 58 31.36	10.085	16 57 13.6	42.73	16 11.89	67.93	15 59.94	0.228
Sun.	10	15 2 33.84	10.120	17 14 10.6	41.99	16 12.12	68.05	15 54.02	0.263
Mon.	11	15 6 37.15	10.155	17 30 49.8	41.24	16 12.35	68.17	15 47.27	0.298
Tues.	12	15 10 41.30	10.189	17 47 10.8	40.47	16 12.57	68.29	15 39.68	0.332
Wed.	13	15 14 46.29	10.224	18 3 13.3	39.69	16 12.79	68.41	15 31.26	0.366
Thur.	14	15 18 52.11	10.259	18 18 56.9	38.90	16 13.01	68.53	15 22.00	0.400
Fri.	15	15 22 58.76	10.293	18 34 21.1	38.08	16 13.22	68.65	15 11.92	0.435
Sat.	16	15 27 6.24	10.328	18 49 25.6	37.25	16 13.43	68.76	15 1.01	0.471
Sun.	17	15 31 14.56	10.363	19 4 10.0	36.41	16 13.63	68.88	14 49.27	0.506
Mon.	18	15 35 23.72	10.397	19 18 33.9	35.55	16 13.83	69.00	14 36.70	0.541
Tues.	19	15 39 33.71	10.431	19 32 37.0	34.68	16 14.03	69.11	14 23.28	0.576
Wed.	20	15 43 44.53	10.466	19 46 19.1	33.79	16 14.22	69.22	14 9.04	0.611
Thur.	21	15 47 56.17	10.500	19 59 39.6	32.88	16 14.41	69.33	13 53.99	0.644
Fri.	22	15 52 8.62	10.534	20 12 38.1	31.96	16 14.59	69.44	13 38.13	0.677
Sat.	23	15 56 21.87	10.567	20 25 14.3	31.02	16 14.76	69.55	13 21.48	0.710
Sun.	24	16 0 35.93	10.600	20 37 28.0	30.08	16 14.93	69.66	13 4.02	0.743
Mon.	25	16 4 50.78	10.633	20 49 18.6	29.12	16 15.10	69.76	12 45.75	0.776
Tues.	26	16 9 6.40	10.665	21 0 45.8	28.13	16 15.27	69.86	12 26.73	0.808
Wed.	27	16 13 22.77	10.695	21 11 49.4	27.13	16 15.43	69.96	12 6.97	0.838
Thur.	28	16 17 39.88	10.725	21 22 29.0	26.12	16 15.59	70.06	11 46.47	0.868
Fri.	29	16 21 57.71	10.755	21 32 44.3	25.10	16 15.74	70.15	11 25.26	0.898
Sat.	30	16 26 16.22	10.783	21 42 34.9	24.07	16 15.89	70.24	11 3.37	0.928
Sun.	31	16 30 35.41	10.810	S. 21° 52' 0.5"	23.03	16 16.04	70.33	10 40.80	0.956

NOTE. — Mean Time of the Semi-diameter passing may be found by subtracting 0s.18 from the Sideral Time.

AT GREENWICH MEAN NOON.

THE SUN'S											
Day of the Week.	Day of the Month.	Apparent			Diff. for 1 hour.	Apparent			Equation of Time, to be added to Mean Time.	Diff. for 1 hour.	Sidereal Time.
		Right Ascension.				Declination.					
Fri.	1	14 ^h 26 ^m 43.88 ^s	9.814	S. 14° 31' 57.8"	47.99	16 ^m 17.74 ^s	0.043	14 ^h 43 ^m 1.62 ^s			
Sat.	2	14 30 39.79	9.847	14 51 2.4	47.39	16 18.39	0.010	14 46 58.16			
Sun.	3	14 34 36.52	9.881	15 9 52.5	46.77	16 18.21	0.024	14 50 54.73			
Mon.	4	14 38 34.06	9.915	15 28 27.7	46.14	16 17.23	0.058	14 54 51.29			
Tues.	5	14 42 32.41	9.949	15 46 47.6	45.49	16 15.43	0.092	14 58 47.84			
Wed.	6	14 46 31.58	9.983	16 4 51.7	44.83	16 12.82	0.126	15 2 44.40			
Thur.	7	14 50 31.58	10.017	16 22 39.5	44.15	16 9.37	0.160	15 6 40.95			
Fri.	8	14 54 32.41	10.051	16 30 10.8	43.45	16 5.10	0.194	15 10 37.51			
Sat.	9	14 58 34.06	10.085	16 57 25.1	42.73	16 0.00	0.228	15 14 34.06			
Sun.	10	15 2 36.53	10.120	17 14 21.8	41.99	15 54.09	0.263	15 18 30.62			
Mon.	11	15 6 39.83	10.155	17 31 0.7	41.24	15 47.35	0.298	15 22 27.18			
Tues.	12	15 10 43.97	10.189	17 47 21.4	40.47	15 39.76	0.332	15 26 23.73			
Wed.	13	15 14 48.94	10.224	18 3 23.6	39.69	15 31.35	0.366	15 30 20.29			
Thur.	14	15 18 54.74	10.259	18 19 6.9	38.90	15 22.10	0.400	15 34 16.84			
Fri.	15	15 23 1.37	10.293	18 34 30.8	38.08	15 12.03	0.435	15 38 13.40			
Sat.	16	15 27 8.83	10.328	18 49 34.9	37.25	15 1.13	0.471	15 42 9.96			
Sun.	17	15 31 17.12	10.363	19 4 19.0	36.41	14 49.39	0.506	15 46 6.51			
Mon.	18	15 35 26.25	10.397	19 18 42.6	35.55	14 36.82	0.541	15 50 3.07			
Tues.	19	15 39 36.21	10.431	19 32 45.4	34.68	14 23.41	0.576	15 53 59.62			
Wed.	20	15 43 47.00	10.466	19 46 27.1	33.79	14 9.18	0.611	15 57 56.18			
Thur.	21	15 47 58.60	10.500	19 59 47.2	32.88	13 54.14	0.644	16 1 52.74			
Fri.	22	15 52 11.01	10.534	20 12 45.3	31.96	13 38.28	0.677	16 5 49.29			
Sat.	23	15 56 24.22	10.567	20 25 21.1	31.02	13 21.63	0.710	16 9 45.85			
Sun.	24	16 0 38.24	10.600	20 37 34.4	30.08	13 4.17	0.743	16 13 42.41			
Mon.	25	16 4 53.05	10.633	20 49 24.7	29.12	12 45.91	0.776	16 17 38.97			
Tues.	26	16 9 8.62	10.665	21 0 51.6	28.13	12 26.90	0.808	16 21 35.52			
Wed.	27	16 13 24.94	10.695	21 11 54.8	27.13	12 7.14	0.838	16 25 32.06			
Thur.	28	16 17 41.99	10.725	21 22 34.0	26.12	11 46.64	0.868	16 29 28.63			
Fri.	29	16 21 59.76	10.755	21 32 49.0	25.10	11 25.43	0.898	16 33 25.19			
Sat.	30	16 26 18.21	10.783	21 42 39.3	24.07	11 3.54	0.928	16 37 21.75			
Sun.	31	16 30 37.34	10.810	S. 21° 52' 4.6"	23.03	10 40.97	0.956	16 41 18.31			

NOTE. — The Semidiameter for Mean Noon may be assumed the same as that for Apparent Noon.

AT GREENWICH MEAN NOON.

THE SUN'S										
Day of the Month.	Day of the Year.	True LONGITUDE.				Dist. for 1 hour.	LATITUDE.	Logarithm of the Radius Vector of the Earth.	Diff. for 1 hour.	Mean Time of Sidereal Ob.
		λ		λ'						
		°	'	°	'					
1	305	219	4 58.7	4 1.0	150.35	-0.70	9.9964217	45.8	9 15 27.14	
2	306	220	5 8.0	4 10.2	150.43	0.65	.9963120	45.6	9 11 31.23	
3	307	221	5 19.1	4 21.2	150.50	0.57	.9962027	45.4	9 7 35.32	
4	308	222	5 32.1	4 34.1	150.57	0.47	.9960939	45.2	9 3 39.41	
5	309	223	5 46.6	4 48.4	150.64	0.37	.9959855	44.9	8 59 43.50	
6	310	224	6 2.8	5 4.4	150.71	0.25	.9958778	44.6	8 55 47.59	
7	311	225	6 20.6	5 22.1	150.77	-0.12	.9957710	44.3	8 51 51.68	
8	312	226	6 39.7	5 41.1	150.82	+0.01	.9956651	43.9	8 47 55.77	
9	313	227	7 0.4	6 1.7	150.88	0.12	.9955603	43.4	8 43 59.86	
10	314	228	7 22.4	6 23.5	150.94	0.21	.9954566	42.9	8 40 3.96	
11	315	229	7 45.8	6 46.7	151.00	0.28	.9953542	42.3	8 36 8.04	
12	316	230	8 10.5	7 11.3	151.06	0.33	.9952534	41.6	8 32 12.13	
13	317	231	8 36.6	7 37.3	151.12	0.34	.9951542	40.8	8 28 16.22	
14	318	232	9 4.2	8 4.7	151.18	0.31	.9950569	40.0	8 24 20.31	
15	319	233	9 33.2	8 33.5	151.24	0.26	.9949616	39.2	8 20 24.40	
16	320	234	10 3.5	9 3.6	151.30	0.18	.9948683	38.4	8 16 28.49	
17	321	235	10 35.4	9 35.4	151.36	+0.08	.9947772	37.5	8 12 32.58	
18	322	236	11 8.8	10 8.7	151.42	-0.04	.9946882	36.6	8 8 36.67	
19	323	237	11 43.7	10 43.4	151.48	0.17	.9946014	35.7	8 4 40.76	
20	324	238	12 20.2	11 19.7	151.55	0.31	.9945167	34.8	8 0 44.85	
21	325	239	12 58.2	11 57.5	151.62	0.44	.9944340	34.0	7 56 48.94	
22	326	240	13 37.9	12 37.1	151.69	0.57	.9943534	33.1	7 52 53.03	
23	327	241	14 19.2	13 18.3	151.76	0.69	.9942749	32.3	7 48 57.12	
24	328	242	15 2.1	14 1.0	151.83	0.79	.9941983	31.5	7 45 1.21	
25	329	243	15 46.6	14 45.3	151.90	0.86	.9941236	30.7	7 41 5.30	
26	330	244	16 32.8	15 31.3	151.96	0.90	.9940508	30.0	7 37 9.39	
27	331	245	17 20.5	16 18.9	152.02	0.91	.9939792	29.4	7 33 13.48	
28	332	246	18 9.6	17 7.9	152.08	0.89	.9939093	28.9	7 29 17.57	
29	333	247	19 0.2	17 58.3	152.14	0.83	.9938408	28.3	7 25 21.66	
30	334	248	19 52.1	18 50.1	152.19	0.75	.9937736	27.8	7 21 25.74	
31	335	249	20 45.3	19 43.0	152.24	-0.66	9.9937077	27.2	7 17 29.83	

NOTE. — λ corresponds to the true equinox of the date, λ' to the mean equinox of January 0d.

GREENWICH MEAN TIME.

THE MOON'S

Day of the Month.

	SEMI-DIAMETER.		HORIZONTAL PARALLAX.				MERIDIAN PASSAGE.		AGE.
	Noon.	Midnight.	Noon.	Diff. for 1 hour.	Midnight.	Diff. for 1 hour.	h m	m	
1	16 42.4	16 45.1	61 12.5	+1.01	61 22.2	+0.61	23 26.9	2.50	28.2
2	16 46.4	16 46.3	61 27.0	+0.19	61 26.6	-0.25	6		29.2
3	16 44.8	16 41.9	61 21.1	-0.67	61 10.6	1.07	0 28.7	2.63	0.8
4	16 37.8	16 32.6	60 55.5	1.43	60 36.5	1.74	1 32.7	2.68	1.8
5	16 26.5	16 19.6	60 14.0	2.00	59 48.8	2.19	2 36.5	2.62	2.8
6	16 12.2	16 4.5	59 21.6	2.32	58 53.3	2.39	3 37.5	2.46	3.8
7	15 56.7	15 48.8	58 24.4	2.41	57 55.7	2.37	4 34.1	2.26	4.8
8	15 41.2	15 33.9	57 27.6	2.30	57 0.7	2.19	5 25.9	2.06	5.8
9	15 26.9	15 20.4	56 35.1	2.06	56 11.3	1.91	6 13.4	1.91	6.8
10	15 14.5	15 9.0	55 49.4	1.75	55 29.5	1.58	6 57.8	1.80	7.8
11	15 4.2	14 59.9	55 11.6	1.40	54 55.8	1.23	7 40.1	1.74	8.8
12	14 56.1	14 52.9	54 42.0	1.06	54 30.3	0.90	8 21.5	1.72	9.8
13	14 50.2	14 48.1	54 20.5	0.74	54 12.5	0.59	9 2.9	1.74	10.8
14	14 46.4	14 45.2	54 6.3	0.44	54 1.9	0.31	9 45.3	1.79	11.8
15	14 44.4	14 44.0	53 59.0	-0.18	53 57.6	-0.06	10 29.2	1.87	12.8
16	14 44.0	14 44.3	53 57.5	+0.05	53 58.8	+0.16	11 15.2	1.96	13.8
17	14 45.1	14 46.1	54 1.4	0.26	54 5.2	0.37	12 3.2	2.04	14.8
18	14 47.4	14 49.1	54 10.2	0.47	54 16.5	0.57	12 52.8	2.09	15.8
19	14 51.2	14 53.6	54 23.9	0.68	54 32.7	0.79	13 43.4	2.11	16.8
20	14 56.3	14 59.4	54 42.8	0.90	54 54.3	1.01	14 33.9	2.09	17.8
21	15 3.0	15 6.9	55 7.2	1.14	55 21.6	1.26	15 23.7	2.05	18.8
22	15 11.2	15 15.9	55 37.4	1.38	55 54.8	1.51	16 12.2	2.00	19.8
23	15 21.1	15 26.6	56 13.6	1.63	56 34.0	1.76	16 59.7	1.96	20.8
24	15 32.5	15 38.8	56 55.8	1.87	57 18.8	1.96	17 46.5	1.95	21.8
25	15 45.3	15 52.1	57 42.8	2.04	58 7.7	2.09	18 33.6	1.98	22.8
26	15 59.0	16 5.9	58 33.0	2.12	58 58.3	2.10	19 22.0	2.06	23.8
27	16 12.7	16 19.1	59 23.2	2.03	59 47.0	1.92	20 13.0	2.19	24.8
28	16 25.2	16 30.5	60 9.1	1.75	60 28.8	1.53	21 7.5	2.26	25.8
29	16 35.1	16 38.6	60 45.5	1.25	60 58.5	0.92	22 6.4	2.54	26.8
30	16 41.1	16 42.3	61 7.5	+0.56	61 11.9	+0.17	23 9.1	2.67	27.8
31	16 42.2	16 40.8	61 11.5	-0.23	61 6.4	-0.63	6		28.8

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
FRIDAY 1.					SUNDAY 3.				
0	13 15 12.67	2.4292	S. 13° 13' 45.3"	13.467	0	15 18 25.74	2.6667	S. 21° 52' 30.6"	7.429
1	13 17 38.60	2.4262	13 27 10.9	13.397	1	15 21 7.05	2.6602	21 59 51.3	7.262
2	13 20 4.89	2.4411	13 40 31.7	13.306	2	15 23 48.57	2.6636	22 7 2.0	7.003
3	13 22 31.54	2.4471	13 53 47.5	13.222	3	15 26 30.29	2.6669	22 14 2.5	6.752
4	13 24 58.54	2.4591	14 6 58.3	13.136	4	15 29 12.20	2.7001	22 20 52.8	6.762
5	13 27 25.91	2.4691	14 20 3.9	13.048	5	15 31 54.30	2.7031	22 27 32.8	6.681
6	13 29 53.63	2.4650	14 33 4.1	12.966	6	15 34 36.57	2.7060	22 34 2.5	6.466
7	13 32 21.71	2.4710	14 45 58.8	12.866	7	15 37 19.02	2.7097	22 40 21.7	6.323
8	13 34 50.15	2.4770	14 58 48.0	12.772	8	15 40 1.02	2.7118	22 46 30.5	6.066
9	13 37 18.95	2.4830	15 11 31.5	12.676	9	15 42 44.37	2.7137	22 52 28.7	5.893
10	13 39 48.11	2.4891	15 24 9.1	12.577	10	15 45 27.27	2.7160	22 58 16.4	5.706
11	13 42 17.63	2.4951	15 36 40.8	12.477	11	15 48 10.30	2.7182	23 3 53.5	5.529
12	13 44 47.52	2.5011	15 49 6.4	12.376	12	15 50 53.45	2.7202	23 9 19.9	5.356
13	13 47 17.77	2.5071	16 1 25.8	12.271	13	15 53 36.72	2.7230	23 14 35.5	5.171
14	13 49 48.37	2.5130	16 13 38.9	12.164	14	15 56 20.09	2.7257	23 19 40.4	4.991
15	13 52 19.33	2.5189	16 25 45.5	12.056	15	15 59 3.56	2.7282	23 24 34.5	4.811
16	13 54 50.64	2.5249	16 37 45.6	11.946	16	16 1 47.11	2.7266	23 29 17.7	4.629
17	13 57 22.31	2.5306	16 49 39.0	11.833	17	16 4 30.75	2.7278	23 33 50.0	4.447
18	13 59 54.34	2.5367	17 1 25.6	11.718	18	16 7 14.45	2.7288	23 38 11.3	4.263
19	14 2 26.72	2.5426	17 13 5.2	11.602	19	16 9 58.21	2.7297	23 42 21.7	4.082
20	14 4 59.45	2.5485	17 24 37.8	11.483	20	16 12 42.01	2.7304	23 46 21.2	3.899
21	14 7 32.53	2.5543	17 36 3.2	11.363	21	16 15 25.85	2.7309	23 50 9.7	3.716
22	14 10 5.96	2.5601	17 47 21.3	11.240	22	16 18 9.72	2.7313	23 53 47.1	3.532
23	14 12 39.74	2.5658	S. 17° 58' 32.0"	11.116	23	16 20 53.61	2.7316	S. 23° 57' 13.5"	3.347
SATURDAY 2.					MONDAY 4.				
0	14 15 13.86	2.5716	S. 18° 9' 35.2"	10.989	0	16 23 37.50	2.7316	S. 24° 0' 28.8"	3.163
1	14 17 48.32	2.5772	18 20 30.7	10.861	1	16 26 21.39	2.7318	24 3 33.0	2.978
2	14 20 23.12	2.5828	18 31 18.5	10.731	2	16 29 5.26	2.7310	24 6 26.2	2.794
3	14 22 58.25	2.5883	18 41 58.4	10.599	3	16 31 49.11	2.7308	24 9 8.3	2.610
4	14 25 33.72	2.5938	18 52 30.4	10.464	4	16 34 32.93	2.7309	24 11 39.4	2.425
5	14 28 9.51	2.5992	19 2 54.2	10.328	5	16 37 16.70	2.7301	24 13 59.4	2.240
6	14 30 45.63	2.6045	19 13 9.8	10.191	6	16 40 0.42	2.7300	24 16 8.2	2.056
7	14 33 22.06	2.6098	19 23 17.1	10.052	7	16 42 44.07	2.7308	24 18 5.9	1.870
8	14 35 58.81	2.6151	19 33 16.0	9.910	8	16 45 27.64	2.7355	24 19 52.6	1.685
9	14 38 35.88	2.6203	19 43 6.4	9.767	9	16 48 11.13	2.7341	24 21 28.2	1.501
10	14 41 13.25	2.6254	19 52 48.1	9.622	10	16 50 54.53	2.7324	24 22 52.7	1.317
11	14 43 50.93	2.6304	20 2 21.1	9.476	11	16 53 37.82	2.7305	24 24 6.2	1.133
12	14 46 28.90	2.6353	20 11 45.2	9.328	12	16 56 20.99	2.7184	24 25 8.6	0.949
13	14 49 7.17	2.6402	20 21 0.4	9.178	13	16 59 4.03	2.7162	24 26 0.0	0.765
14	14 51 45.72	2.6449	20 30 6.6	9.026	14	17 1 46.94	2.7139	24 26 40.5	0.583
15	14 54 24.55	2.6495	20 39 3.6	8.873	15	17 4 29.70	2.7114	24 27 10.0	0.401
16	14 57 3.66	2.6541	20 47 51.4	8.719	16	17 7 12.31	2.7097	24 27 28.6	0.219
17	14 59 43.04	2.6586	20 56 29.9	8.563	17	17 9 54.75	2.7069	24 27 36.3	0.036
18	15 2 22.69	2.6629	21 4 58.9	8.405	18	17 12 37.02	2.7039	24 27 33.2	0.143
19	15 5 2.59	2.6671	21 13 18.4	8.246	19	17 15 19.10	2.6997	24 27 19.2	0.322
20	15 7 42.74	2.6712	21 21 28.4	8.085	20	17 18 0.98	2.6963	24 26 54.5	0.502
21	15 10 23.14	2.6753	21 29 28.7	7.923	21	17 20 42.66	2.6926	24 26 19.0	0.681
22	15 13 3.78	2.6792	21 37 19.2	7.760	22	17 23 24.12	2.6892	24 25 32.8	0.860
23	15 15 44.65	2.6830	21 44 59.9	7.596	23	17 26 5.37	2.6856	24 24 35.9	1.036
24	15 18 25.74	2.6867	S. 21° 52' 30.6"	7.429	24	17 28 46.38	2.6816	S. 24° 23' 28.5"	1.212

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
TUESDAY 5.					THURSDAY 7.				
0	17 28 46.38	2.6916	S. 24° 23' 28.5"	1.312	0	19 30 46.34	2.3731	S. 20° 24' 45.9"	8.186
1	17 31 27.15	2.6774	24 22 10.5	1.368	1	19 33 8.50	2.3650	20 16 31.6	8.293
2	17 34 7.67	2.6731	24 20 42.0	1.662	2	19 35 30.20	2.3579	20 8 10.8	8.400
3	17 36 47.98	2.6687	24 19 3.0	1.786	3	19 37 51.45	2.3508	19 59 43.6	8.506
4	17 39 27.92	2.6643	24 17 13.7	1.909	4	19 40 12.24	2.3437	19 51 10.2	8.606
5	17 42 7.64	2.6600	24 15 14.0	2.061	5	19 42 32.58	2.3366	19 42 30.6	8.710
6	17 44 47.07	2.6546	24 13 4.0	2.261	6	19 44 52.46	2.3276	19 33 45.0	8.810
7	17 47 26.31	2.6499	24 10 43.9	2.490	7	19 47 11.89	2.3201	19 24 53.4	8.908
8	17 50 5.06	2.6449	24 8 13.6	2.868	8	19 49 30.87	2.3126	19 15 56.0	9.006
9	17 52 43.60	2.6397	24 5 33.2	2.766	9	19 51 49.39	2.3050	19 6 52.7	9.102
10	17 55 21.82	2.6344	24 2 42.9	2.923	10	19 54 7.47	2.2975	18 57 43.8	9.196
11	17 57 59.72	2.6289	23 59 42.6	3.067	11	19 56 25.10	2.2901	18 48 29.3	9.286
12	18 0 37.29	2.6233	23 56 32.5	3.261	12	19 58 42.28	2.2826	18 39 9.3	9.379
13	18 3 14.52	2.6177	23 53 12.6	3.413	13	20 0 59.01	2.2752	18 29 43.9	9.466
14	18 5 51.41	2.6120	23 49 42.9	3.674	14	20 3 15.30	2.2678	18 20 13.1	9.546
15	18 8 27.95	2.6061	23 46 3.6	3.784	15	20 5 31.15	2.2605	18 10 37.1	9.643
16	18 11 4.14	2.6000	23 42 14.8	3.893	16	20 7 46.56	2.2532	18 0 55.9	9.728
17	18 13 39.96	2.5939	23 38 16.4	4.061	17	20 10 1.53	2.2458	17 51 9.7	9.811
18	18 16 15.41	2.5877	23 34 8.7	4.207	18	20 12 16.07	2.2386	17 41 18.7	9.893
19	18 18 50.49	2.5815	23 29 51.7	4.361	19	20 14 30.17	2.2314	17 31 22.5	9.974
20	18 21 25.19	2.5751	23 25 25.4	4.514	20	20 16 43.84	2.2243	17 21 21.7	10.063
21	18 23 59.50	2.5687	23 20 50.0	4.688	21	20 18 57.06	2.2173	17 11 16.2	10.131
22	18 26 33.43	2.5622	23 16 5.5	4.817	22	20 21 9.90	2.2101	17 1 6.0	10.207
23	18 29 6.96	2.5556	S. 23° 11' 12.0"	4.966	23	20 23 22.29	2.2030	S. 16° 50' 51.3"	10.283
WEDNESDAY 6.					FRIDAY 8.				
0	18 31 40.10	2.5489	S. 23° 6' 9.6"	5.113	0	20 25 34.26	2.1960	S. 16° 40' 32.1"	10.356
1	18 34 12.83	2.5421	23 0 58.4	5.269	1	20 27 45.81	2.1891	16 30 8.6	10.427
2	18 36 45.15	2.5352	22 55 38.5	5.403	2	20 29 56.95	2.1822	16 19 40.8	10.496
3	18 39 17.05	2.5282	22 50 10.0	5.546	3	20 32 7.68	2.1754	16 9 8.8	10.567
4	18 41 48.54	2.5213	22 44 33.0	5.687	4	20 34 18.00	2.1686	15 58 32.8	10.635
5	18 44 19.60	2.5143	22 38 47.5	5.827	5	20 36 27.92	2.1619	15 47 52.7	10.701
6	18 46 50.24	2.5071	22 32 53.7	5.965	6	20 38 37.43	2.1553	15 37 8.6	10.767
7	18 49 20.45	2.5000	22 26 51.7	6.102	7	20 40 46.55	2.1487	15 26 20.7	10.831
8	18 51 50.24	2.4928	22 20 41.5	6.237	8	20 42 55.27	2.1421	15 15 29.0	10.893
9	18 54 19.59	2.4856	22 14 23.2	6.371	9	20 45 3.60	2.1356	15 4 33.6	10.964
10	18 56 48.50	2.4783	22 7 57.0	6.503	10	20 47 11.54	2.1292	14 53 34.5	11.014
11	18 59 16.98	2.4709	22 1 22.8	6.634	11	20 49 19.10	2.1228	14 42 31.8	11.073
12	19 1 45.01	2.4635	21 54 40.9	6.763	12	20 51 26.27	2.1166	14 31 25.7	11.131
13	19 4 12.60	2.4561	21 47 51.3	6.890	13	20 53 33.07	2.1102	14 20 16.2	11.187
14	19 6 39.74	2.4487	21 40 54.1	7.016	14	20 55 39.49	2.1040	14 9 3.3	11.243
15	19 9 6.44	2.4413	21 33 49.4	7.140	15	20 57 45.54	2.0978	13 57 47.2	11.296
16	19 11 32.69	2.4338	21 26 37.3	7.262	16	20 59 51.23	2.0917	13 46 27.9	11.347
17	19 13 58.49	2.4262	21 19 18.0	7.383	17	21 1 56.55	2.0857	13 35 5.5	11.396
18	19 16 23.83	2.4186	21 11 51.4	7.503	18	21 4 1.51	2.0796	13 23 40.1	11.448
19	19 18 48.72	2.4110	21 4 17.7	7.620	19	21 6 6.12	2.0739	13 12 11.7	11.497
20	19 21 13.15	2.4034	20 56 37.0	7.736	20	21 8 10.38	2.0681	13 0 40.4	11.546
21	19 23 37.13	2.3958	20 48 49.4	7.851	21	21 10 14.29	2.0623	12 49 6.3	11.592
22	19 26 0.65	2.3882	20 40 54.9	7.964	22	21 12 17.86	2.0567	12 37 29.4	11.638
23	19 28 23.72	2.3807	20 32 53.7	8.075	23	21 14 21.09	2.0511	12 25 49.8	11.683
24	19 30 46.34	2.3731	S. 20° 24' 45.9"	8.186	24	21 16 23.99	2.0456	S. 12° 14' 7.6"	11.728

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
SATURDAY 9.					MONDAY 11.				
0	21 16 23.99	2.0456	S. 12 14 7.6	11.736	0	23 49 34.52	1.8649	S. 2 20 49.2	12.688
1	21 18 26.56	2.0401	12 2 22.8	11.767	1	23 51 26.35	1.8629	2 8 10.1	12.682
2	21 20 28.80	2.0347	11 50 35.6	11.808	2	23 53 18.07	1.8610	1 55 31.0	12.680
3	21 22 30.72	2.0293	11 38 45.9	11.847	3	23 55 9.67	1.8591	1 42 52.1	12.648
4	21 24 32.32	2.0240	11 26 53.9	11.886	4	23 57 1.16	1.8574	1 30 13.3	12.644
5	21 26 33.60	2.0188	11 14 59.7	11.923	5	23 58 52.55	1.8557	1 17 34.8	12.640
6	21 28 34.58	2.0137	11 3 3.2	11.960	6	23 0 43.84	1.8540	1 4 56.5	12.636
7	21 30 35.25	2.0087	10 51 4.5	11.995	7	23 2 35.03	1.8524	0 52 18.6	12.632
8	21 32 35.62	2.0037	10 39 3.8	12.029	8	23 4 26.13	1.8508	0 39 41.0	12.628
9	21 34 35.70	1.9988	10 27 1.0	12.063	9	23 6 17.14	1.8493	0 27 3.8	12.615
10	21 36 35.48	1.9940	10 14 56.3	12.096	10	23 8 8.07	1.8478	0 14 27.1	12.609
11	21 38 34.98	1.9893	10 2 49.6	12.127	11	23 9 58.92	1.8463	S. 0 1 50.8	12.601
12	21 40 34.19	1.9846	9 50 41.1	12.157	12	23 11 49.69	1.8448	N. 0 10 45.0	12.593
13	21 42 33.12	1.9799	9 38 30.8	12.186	13	23 13 40.39	1.8434	0 23 20.2	12.585
14	21 44 31.78	1.9754	9 26 18.8	12.214	14	23 15 31.03	1.8420	0 35 54.8	12.577
15	21 46 30.17	1.9710	9 14 5.1	12.242	15	23 17 21.60	1.8407	0 48 28.8	12.569
16	21 48 28.30	1.9666	9 1 49.8	12.269	16	23 19 12.11	1.8414	1 1 2.1	12.560
17	21 50 26.16	1.9623	8 49 32.9	12.294	17	23 21 2.57	1.8406	1 13 34.7	12.537
18	21 52 23.77	1.9580	8 37 14.5	12.318	18	23 22 52.98	1.8397	1 26 6.5	12.523
19	21 54 21.12	1.9538	8 24 54.7	12.343	19	23 24 43.34	1.8389	1 38 37.5	12.509
20	21 56 18.23	1.9497	8 12 33.5	12.364	20	23 26 33.65	1.8382	1 51 7.6	12.495
21	21 58 15.09	1.9457	8 0 11.0	12.386	21	23 28 23.92	1.8376	2 3 36.9	12.480
22	22 0 11.72	1.9418	7 47 47.2	12.407	22	23 30 14.16	1.8370	2 16 5.2	12.464
23	22 2 8.11	1.9379	S. 7 35 22.2	12.427	23	23 32 4.36	1.8365	N. 2 28 32.6	12.448
SUNDAY 10.					TUESDAY 12.				
0	22 4 4.27	1.9341	S. 7 22 56.0	12.446	0	23 33 54.54	1.8361	N. 2 40 58.9	12.431
1	22 6 0.21	1.9304	7 10 28.7	12.464	1	23 35 44.69	1.8357	2 53 24.2	12.413
2	22 7 55.92	1.9268	6 58 0.3	12.481	2	23 37 34.82	1.8354	3 5 48.5	12.394
3	22 9 51.42	1.9233	6 45 30.9	12.497	3	23 39 24.94	1.8350	3 18 11.6	12.375
4	22 11 46.70	1.9197	6 33 0.6	12.512	4	23 41 15.04	1.8346	3 30 33.5	12.355
5	22 13 41.78	1.9162	6 20 29.4	12.527	5	23 43 5.13	1.8343	3 42 54.2	12.334
6	22 15 36.65	1.9128	6 7 57.3	12.541	6	23 44 55.22	1.8340	3 55 13.6	12.313
7	22 17 31.32	1.9095	5 55 24.4	12.555	7	23 46 45.31	1.8338	4 7 31.8	12.292
8	22 19 25.80	1.9064	5 42 50.7	12.567	8	23 48 35.40	1.8336	4 19 48.6	12.269
9	22 21 20.09	1.9033	5 30 16.3	12.578	9	23 50 25.50	1.8335	4 32 4.1	12.246
10	22 23 14.19	1.9002	5 17 41.3	12.588	10	23 52 15.60	1.8334	4 44 18.1	12.223
11	22 25 8.11	1.8972	5 5 5.7	12.598	11	23 54 5.71	1.8333	4 56 30.7	12.199
12	22 27 1.85	1.8943	4 52 29.5	12.607	12	23 55 55.84	1.8333	5 8 41.9	12.173
13	22 28 55.42	1.8914	4 39 52.8	12.616	13	23 57 45.99	1.8333	5 20 51.5	12.147
14	22 30 48.82	1.8886	4 27 15.7	12.623	14	23 59 36.16	1.8333	5 32 59.5	12.120
15	22 32 42.05	1.8860	4 14 38.1	12.629	15	0 1 26.36	1.8333	5 45 5.9	12.093
16	22 34 35.13	1.8835	4 2 0.2	12.634	16	0 3 16.60	1.8333	5 57 10.7	12.065
17	22 36 28.05	1.8810	3 49 22.0	12.639	17	0 5 6.87	1.8333	6 9 13.8	12.037
18	22 38 20.82	1.8786	3 36 43.5	12.643	18	0 6 57.18	1.8333	6 21 15.1	12.009
19	22 40 13.45	1.8763	3 24 4.7	12.647	19	0 8 47.53	1.8333	6 33 14.7	11.979
20	22 42 5.93	1.8740	3 11 25.8	12.650	20	0 10 37.92	1.8333	6 45 12.5	11.948
21	22 43 58.27	1.8718	2 58 46.7	12.653	21	0 12 28.36	1.8333	6 57 8.4	11.917
22	22 45 50.48	1.8697	2 46 7.6	12.655	22	0 14 18.85	1.8333	7 9 2.5	11.885
23	22 47 42.56	1.8676	2 33 28.4	12.657	23	0 16 9.40	1.8333	7 20 54.6	11.852
24	22 49 34.52	1.8656	S. 2 20 49.2	12.658	24	0 18 0.00	1.8333	N. 7 32 44.7	11.819

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
WEDNESDAY 13.					FRIDAY 15.				
0	0 18 0.00	1.8438	N. 7° 32' 44.7"	11.819	0	1 48 34.71	1.8463	N. 16° 8' 57.8"	9.422
1	0 19 50.66	1.8449	7 44 32.8	11.785	1	1 50 31.57	1.8492	16 18 21.1	9.385
2	0 21 41.39	1.8460	7 56 18.9	11.751	2	1 52 28.62	1.8523	16 27 40.4	9.287
3	0 23 32.18	1.8473	8 8 2.9	11.716	3	1 54 25.85	1.8554	16 36 55.5	9.218
4	0 25 23.05	1.8484	8 19 44.8	11.680	4	1 56 23.27	1.8585	16 46 6.5	9.148
5	0 27 13.99	1.8497	8 31 24.5	11.645	5	1 58 20.87	1.8616	16 55 13.3	9.078
6	0 29 5.01	1.8510	8 43 2.0	11.606	6	2 0 18.66	1.8647	17 4 15.9	9.007
7	0 30 56.11	1.8523	8 54 37.3	11.569	7	2 2 16.64	1.8678	17 13 14.2	8.935
8	0 32 47.29	1.8537	9 6 10.3	11.530	8	2 4 14.80	1.8710	17 22 8.1	8.863
9	0 34 38.56	1.8552	9 17 40.9	11.491	9	2 6 13.16	1.8743	17 30 57.7	8.790
10	0 36 29.92	1.8567	9 29 9.2	11.451	10	2 8 11.71	1.8774	17 39 42.9	8.716
11	0 38 21.37	1.8583	9 40 35.0	11.410	11	2 10 10.45	1.8806	17 48 23.6	8.643
12	0 40 12.92	1.8600	9 51 58.4	11.369	12	2 12 9.38	1.8838	17 56 59.9	8.568
13	0 42 4.57	1.8617	10 3 19.3	11.327	13	2 14 8.51	1.8871	18 5 31.6	8.490
14	0 43 56.32	1.8634	10 14 37.7	11.284	14	2 16 7.83	1.8903	18 13 58.7	8.413
15	0 45 48.17	1.8651	10 25 53.5	11.243	15	2 18 7.35	1.8936	18 22 21.2	8.336
16	0 47 40.13	1.8669	10 37 6.7	11.198	16	2 20 7.06	1.8969	18 30 39.0	8.257
17	0 49 32.20	1.8687	10 48 17.2	11.153	17	2 22 6.97	2.0002	18 38 52.1	8.178
18	0 51 24.38	1.8706	10 59 25.1	11.108	18	2 24 7.08	2.0035	18 47 0.4	8.098
19	0 53 16.68	1.8726	11 10 30.2	11.063	19	2 26 7.39	2.0068	18 55 3.9	8.018
20	0 55 9.09	1.8746	11 21 32.5	11.018	20	2 28 7.90	2.0101	19 3 2.6	7.937
21	0 57 1.63	1.8767	11 32 32.0	10.968	21	2 30 8.61	2.0134	19 10 56.4	7.856
22	0 58 54.29	1.8787	11 43 28.6	10.920	22	2 32 9.52	2.0168	19 18 45.3	7.773
23	1 0 47.08	1.8808	N. 11° 54' 22.3"	10.871	23	2 34 10.63	2.0201	N. 19° 26' 29.2"	7.689
THURSDAY 14.					SATURDAY 16.				
0	1 2 39.99	1.8830	N. 12° 5' 13.1"	10.821	0	2 36 11.93	2.0236	N. 19° 34' 8.1"	7.606
1	1 4 33.04	1.8852	12 16 0.9	10.771	1	2 38 13.44	2.0268	19 41 41.9	7.521
2	1 6 26.22	1.8874	12 26 45.6	10.720	2	2 40 15.15	2.0301	19 49 10.6	7.436
3	1 8 19.54	1.8897	12 37 27.3	10.669	3	2 42 17.06	2.0334	19 56 34.2	7.350
4	1 10 12.99	1.8921	12 48 5.9	10.616	4	2 44 19.16	2.0368	20 3 52.6	7.263
5	1 12 6.59	1.8945	12 58 41.3	10.563	5	2 46 21.47	2.0401	20 11 5.8	7.176
6	1 14 0.33	1.8969	13 9 13.5	10.509	6	2 48 23.97	2.0434	20 18 13.7	7.087
7	1 15 54.22	1.8994	13 19 42.4	10.455	7	2 50 26.67	2.0467	20 25 16.3	6.998
8	1 17 48.26	1.9019	13 30 8.1	10.400	8	2 52 29.57	2.0500	20 32 13.5	6.909
9	1 19 42.45	1.9044	13 40 30.5	10.345	9	2 54 32.67	2.0533	20 39 5.4	6.819
10	1 21 36.79	1.9069	13 50 49.5	10.288	10	2 56 35.97	2.0566	20 45 51.8	6.728
11	1 23 31.28	1.9095	14 1 5.1	10.231	11	2 58 39.47	2.0599	20 52 32.7	6.636
12	1 25 25.93	1.9121	14 11 17.2	10.173	12	3 0 43.16	2.0632	20 59 8.1	6.544
13	1 27 20.74	1.9148	14 21 25.9	10.116	13	3 2 47.05	2.0664	21 5 37.9	6.451
14	1 29 15.71	1.9175	14 31 31.0	10.058	14	3 4 51.13	2.0697	21 12 2.2	6.357
15	1 31 10.85	1.9203	14 41 32.5	9.999	15	3 6 55.41	2.0730	21 18 20.8	6.263
16	1 33 6.15	1.9230	14 51 30.4	9.944	16	3 8 59.88	2.0761	21 24 33.7	6.168
17	1 35 1.62	1.9258	15 1 24.6	9.873	17	3 11 4.54	2.0793	21 30 40.9	6.073
18	1 36 57.25	1.9287	15 11 15.1	9.810	18	3 13 9.40	2.0825	21 36 42.3	5.976
19	1 38 53.06	1.9316	15 21 1.8	9.748	19	3 15 14.45	2.0857	21 42 38.0	5.879
20	1 40 49.04	1.9344	15 30 44.8	9.684	20	3 17 19.68	2.0889	21 48 27.8	5.781
21	1 42 45.19	1.9373	15 40 23.9	9.620	21	3 19 25.11	2.0920	21 54 11.7	5.682
22	1 44 41.52	1.9402	15 49 59.2	9.554	22	3 21 30.72	2.0951	21 59 49.7	5.583
23	1 46 38.03	1.9432	15 59 30.5	9.488	23	3 23 36.51	2.0981	22 5 21.7	5.484
24	1 48 34.71	1.9463	N. 16° 8' 57.8"	9.423	24	3 25 42.49	2.1012	N. 22° 10' 47.8"	5.384

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
SUNDAY 17.					TUESDAY 19.				
0	3 25 42.49	2.1012	N.22° 10' 47.8"	5.384	0	5 9 22.21	2.1997	N.24° 24' 3.3"	0.014
1	3 27 48.65	2.1042	22 16 7.8	5.283	1	5 11 34.21	2.2004	24 24 0.6	0.186
2	3 29 54.99	2.1072	22 21 21.8	5.182	2	5 13 46.26	2.2011	24 23 50.7	0.225
3	3 32 1.51	2.1102	22 26 29.7	5.081	3	5 15 58.35	2.2017	24 23 33.6	0.245
4	3 34 8.21	2.1131	22 31 31.5	4.978	4	5 18 10.47	2.2023	24 23 9.3	0.486
5	3 36 15.08	2.1160	22 36 27.1	4.874	5	5 20 22.63	2.2028	24 22 37.8	0.505
6	3 38 22.13	2.1189	22 41 16.4	4.771	6	5 22 34.81	2.2033	24 21 59.1	0.794
7	3 40 29.35	2.1217	22 45 59.5	4.667	7	5 24 47.02	2.2037	24 21 13.2	0.834
8	3 42 36.74	2.1245	22 50 36.4	4.562	8	5 26 59.26	2.2040	24 20 20.2	0.944
9	3 44 44.30	2.1273	22 55 7.0	4.457	9	5 29 11.51	2.2043	24 19 20.0	1.064
10	3 46 52.02	2.1301	22 59 31.2	4.351	10	5 31 23.77	2.2046	24 18 12.5	1.184
11	3 48 59.91	2.1328	23 3 49.1	4.244	11	5 33 36.05	2.2047	24 16 57.9	1.304
12	3 51 7.96	2.1355	23 8 0.5	4.137	12	5 35 48.33	2.2048	24 15 36.0	1.424
13	3 53 16.17	2.1382	23 12 5.5	4.029	13	5 38 0.62	2.2048	24 14 6.9	1.545
14	3 55 24.54	2.1408	23 16 4.0	3.921	14	5 40 12.91	2.2048	24 12 30.6	1.665
15	3 57 33.06	2.1434	23 19 56.1	3.813	15	5 42 25.19	2.2047	24 10 47.1	1.784
16	3 59 41.73	2.1459	23 23 41.6	3.704	16	5 44 37.47	2.2046	24 8 56.5	1.904
17	4 1 50.55	2.1483	23 27 20.6	3.595	17	5 46 49.74	2.2044	24 6 58.6	2.024
18	4 3 59.52	2.1506	23 30 53.0	3.485	18	5 49 2.00	2.2043	24 4 53.6	2.144
19	4 6 8.63	2.1529	23 34 18.8	3.374	19	5 51 14.24	2.2039	24 2 41.4	2.263
20	4 8 17.88	2.1554	23 37 37.9	3.263	20	5 53 26.47	2.2034	24 0 22.0	2.383
21	4 10 27.27	2.1577	23 40 50.3	3.152	21	5 55 38.67	2.2031	23 57 55.4	2.503
22	4 12 36.80	2.1599	23 43 56.1	3.040	22	5 57 50.84	2.2028	23 55 21.7	2.621
23	4 14 46.46	2.1621	N.23° 46' 55.1"	2.928	23	6 0 2.98	2.2021	N.23° 52' 40.9"	2.740
MONDAY 18.					WEDNESDAY 20.				
0	4 16 56.25	2.1643	N.23° 49' 47.4"	2.815	0	6 2 15.09	2.2015	N.23° 49' 52.9"	2.859
1	4 19 6.17	2.1663	23 52 32.9	2.702	1	6 4 27.16	2.2008	23 46 57.8	2.976
2	4 21 16.21	2.1684	23 55 11.6	2.589	2	6 6 39.19	2.2003	23 43 55.6	3.097
3	4 23 26.38	2.1704	23 57 43.5	2.476	3	6 8 51.18	2.1995	23 40 46.2	3.215
4	4 25 36.66	2.1724	24 0 8.6	2.361	4	6 11 3.13	2.1987	23 37 29.8	3.333
5	4 27 47.06	2.1743	24 2 26.8	2.246	5	6 13 15.03	2.1978	23 34 6.3	3.451
6	4 29 57.58	2.1761	24 4 38.1	2.131	6	6 15 26.87	2.1970	23 30 35.7	3.569
7	4 32 8.20	2.1779	24 6 42.5	2.016	7	6 17 38.66	2.1961	23 26 58.0	3.687
8	4 34 18.93	2.1796	24 8 40.0	1.900	8	6 19 50.40	2.1951	23 23 13.3	3.804
9	4 36 29.76	2.1813	24 10 30.5	1.784	9	6 22 2.08	2.1941	23 19 21.6	3.920
10	4 38 40.69	2.1829	24 12 14.1	1.668	10	6 24 13.69	2.1930	23 15 22.9	4.037
11	4 40 51.71	2.1845	24 13 50.7	1.551	11	6 26 25.24	2.1919	23 11 17.2	4.153
12	4 43 2.83	2.1860	24 15 20.2	1.434	12	6 28 36.72	2.1908	23 7 4.5	4.269
13	4 45 14.04	2.1875	24 16 42.7	1.317	13	6 30 48.13	2.1896	23 2 44.9	4.385
14	4 47 25.33	2.1889	24 17 58.2	1.200	14	6 32 59.47	2.1884	22 58 18.3	4.501
15	4 49 33.71	2.1902	24 19 6.7	1.083	15	6 35 10.73	2.1871	22 53 44.8	4.616
16	4 51 48.16	2.1915	24 20 8.1	0.964	16	6 37 21.92	2.1857	22 49 4.4	4.731
17	4 53 59.69	2.1927	24 21 2.4	0.846	17	6 39 33.02	2.1843	22 44 17.1	4.845
18	4 56 11.29	2.1939	24 21 49.6	0.728	18	6 41 44.04	2.1830	22 39 23.0	4.959
19	4 58 22.96	2.1950	24 22 29.7	0.609	19	6 43 54.98	2.1815	22 34 22.0	5.073
20	5 0 34.69	2.1961	24 23 2.7	0.491	20	6 46 5.83	2.1801	22 29 14.2	5.186
21	5 2 46.49	2.1971	24 23 28.6	0.372	21	6 48 16.59	2.1786	22 23 59.6	5.299
22	5 4 58.34	2.1980	24 23 47.3	0.253	22	6 50 27.26	2.1771	22 18 38.3	5.411
23	5 7 10.25	2.1989	24 23 58.9	0.133	23	6 52 37.84	2.1756	22 13 10.3	5.523
24	5 9 22.21	2.1997	N.24° 24' 3.3"	0.014	24	6 54 48.33	2.1740	N.22° 7' 35.5"	5.635

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
THURSDAY 21.					SATURDAY 23.				
0	6 54 48.33	2.1746	N.22° 7' 35.5"	5.685	0	8 37 1.47	2.0660	N.15° 38' 8.9"	10.364
1	6 56 58.72	2.1728	22 1 54.0	5.747	1	8 39 6.52	2.0684	15 27 44.5	10.447
2	6 59 9.01	2.1708	21 56 5.9	5.806	2	8 41 11.48	2.0618	15 17 15.2	10.530
3	7 1 19.20	2.1689	21 50 11.2	5.866	3	8 43 16.34	2.0603	15 6 40.9	10.612
4	7 3 29.28	2.1673	21 44 9.8	5.978	4	8 45 21.11	2.0787	14 56 1.8	10.693
5	7 5 39.26	2.1654	21 38 1.8	6.167	5	8 47 25.79	2.0773	14 45 17.8	10.773
6	7 7 49.14	2.1638	21 31 47.3	6.296	6	8 49 30.38	2.0766	14 34 29.0	10.852
7	7 9 58.91	2.1620	21 25 26.3	6.404	7	8 51 34.89	2.0744	14 23 35.5	10.931
8	7 12 8.58	2.1603	21 18 58.8	6.512	8	8 53 39.31	2.0780	14 12 37.3	11.009
9	7 14 18.14	2.1584	21 12 24.8	6.620	9	8 55 43.65	2.0717	14 1 34.5	11.086
10	7 16 27.59	2.1566	21 5 44.4	6.737	10	8 57 47.91	2.0703	13 50 27.0	11.162
11	7 18 36.93	2.1547	20 58 57.5	6.834	11	8 59 52.09	2.0690	13 39 15.0	11.238
12	7 20 46.16	2.1529	20 52 4.3	6.940	12	9 1 56.19	2.0676	13 27 58.4	11.313
13	7 22 55.28	2.1510	20 45 4.7	7.046	13	9 4 0.22	2.0666	13 16 37.4	11.387
14	7 25 4.28	2.1491	20 37 58.8	7.151	14	9 6 4.18	2.0664	13 5 11.9	11.460
15	7 27 13.17	2.1473	20 30 46.6	7.255	15	9 8 8.07	2.0643	12 53 42.1	11.533
16	7 29 21.94	2.1453	20 23 28.2	7.359	16	9 10 11.90	2.0632	12 42 7.9	11.605
17	7 31 30.59	2.1433	20 16 3.5	7.463	17	9 12 15.66	2.0622	12 30 29.4	11.677
18	7 33 39.13	2.1414	20 8 32.7	7.565	18	9 14 19.36	2.0612	12 18 46.7	11.747
19	7 35 47.55	2.1394	20 0 55.7	7.668	19	9 16 23.01	2.0608	12 6 59.8	11.817
20	7 37 55.86	2.1375	19 53 12.6	7.770	20	9 18 26.60	2.0594	11 55 8.7	11.886
21	7 40 4.05	2.1355	19 45 23.4	7.871	21	9 20 30.14	2.0586	11 43 13.5	11.954
22	7 42 12.12	2.1336	19 37 28.1	7.971	22	9 22 33.63	2.0576	11 31 14.2	12.021
23	7 44 20.07	2.1316	N.19° 29' 26.8"	8.071	23	9 24 37.07	2.0570	N.11° 19' 10.9"	12.086
FRIDAY 22.					SUNDAY 24.				
0	7 46 27.91	2.1297	N.19° 21' 19.6"	8.170	0	9 26 40.47	2.0563	N.11° 7' 3.6"	12.158
1	7 48 35.63	2.1277	19 13 6.4	8.269	1	9 28 43.33	2.0557	10 54 52.4	12.216
2	7 50 43.23	2.1257	19 4 47.3	8.367	2	9 30 47.15	2.0551	10 42 37.4	12.282
3	7 52 50.71	2.1237	18 56 22.4	8.464	3	9 32 50.44	2.0545	10 30 18.5	12.346
4	7 54 58.07	2.1217	18 47 51.6	8.561	4	9 34 53.69	2.0540	10 17 55.9	12.406
5	7 57 5.31	2.1197	18 39 15.0	8.657	5	9 36 56.92	2.0536	10 5 29.5	12.470
6	7 59 12.44	2.1177	18 30 32.7	8.753	6	9 39 0.12	2.0532	9 52 59.5	12.530
7	8 1 19.45	2.1156	18 21 44.6	8.849	7	9 41 3.30	2.0528	9 40 25.9	12.590
8	8 3 26.34	2.1136	18 12 50.8	8.944	8	9 43 6.46	2.0525	9 27 48.7	12.649
9	8 5 33.12	2.1116	18 3 51.4	9.038	9	9 45 9.61	2.0522	9 15 7.9	12.706
10	8 7 39.78	2.1104	17 54 46.3	9.131	10	9 47 12.74	2.0522	9 2 23.7	12.765
11	8 9 46.33	2.1083	17 45 35.7	9.223	11	9 49 15.87	2.0522	8 49 36.0	12.822
12	8 11 52.76	2.1063	17 36 19.6	9.315	12	9 51 19.00	2.0521	8 36 45.0	12.878
13	8 13 59.08	2.1044	17 26 58.0	9.406	13	9 53 22.12	2.0521	8 23 50.6	12.933
14	8 16 5.29	2.1025	17 17 30.9	9.497	14	9 55 25.25	2.0522	8 10 53.0	12.987
15	8 18 11.39	2.1007	17 7 58.4	9.587	15	9 57 28.39	2.0523	7 57 52.2	13.040
16	8 20 17.38	2.0989	16 58 20.5	9.676	16	9 59 31.53	2.0525	7 44 48.2	13.092
17	8 22 23.26	2.0971	16 48 37.2	9.765	17	10 1 34.69	2.0527	7 31 41.1	13.143
18	8 24 29.03	2.0953	16 38 48.7	9.852	18	10 3 37.86	2.0530	7 18 31.0	13.194
19	8 26 34.70	2.0936	16 28 55.0	9.939	19	10 5 41.05	2.0534	7 5 17.8	13.244
20	8 28 40.26	2.0918	16 18 56.0	10.026	20	10 7 44.27	2.0539	6 52 1.7	13.293
21	8 30 45.72	2.0901	16 8 51.9	10.113	21	10 9 47.52	2.0544	6 38 42.7	13.341
22	8 32 51.07	2.0884	15 58 42.6	10.197	22	10 11 50.80	2.0550	6 25 20.8	13.387
23	8 34 56.32	2.0867	15 48 28.3	10.281	23	10 13 54.11	2.0556	6 11 56.2	13.433
24	8 37 1.47	2.0850	N.15° 38' 8.9"	10.364	24	10 15 57.47	2.0563	N. 5° 58' 28.8"	13.478

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
MONDAY 25.					WEDNESDAY 27.				
0	10 15 57.47	2.0863	N. 5 58 28.8	13.478	0	11 56 50.61	2.1761	S. 5 20 38.8	14.971
1	10 18 0.87	2.0871	5 44 58.7	13.623	1	11 59 1.31	2.1805	5 35 0.7	14.830
2	10 20 4.32	2.0880	5 31 26.1	13.665	2	12 1 12.27	2.1849	5 49 21.9	14.845
3	10 22 7.83	2.0889	5 17 50.9	13.608	3	12 3 23.50	2.1894	6 3 42.2	14.830
4	10 24 11.39	2.0899	5 4 13.1	13.649	4	12 5 35.00	2.1940	6 18 1.5	14.813
5	10 26 15.01	2.0909	4 50 32.9	13.689	5	12 7 46.78	2.1987	6 32 19.8	14.803
6	10 28 18.70	2.0920	4 36 50.4	13.728	6	12 9 58.85	2.2034	6 46 36.9	14.773
7	10 30 22.45	2.0932	4 23 5.5	13.767	7	12 12 11.20	2.2082	7 0 52.8	14.804
8	10 32 26.28	2.0945	4 9 18.4	13.804	8	12 14 23.84	2.2131	7 15 7.4	14.821
9	10 34 30.18	2.0958	3 55 29.0	13.841	9	12 16 36.78	2.2181	7 29 20.5	14.806
10	10 36 34.17	2.0972	3 41 37.5	13.878	10	12 18 50.01	2.2231	7 43 32.1	14.800
11	10 38 38.25	2.0987	3 27 43.9	13.910	11	12 21 3.55	2.2282	7 57 42.1	14.813
12	10 40 42.41	2.0702	3 13 48.3	13.943	12	12 23 17.40	2.2334	8 11 50.4	14.813
13	10 42 46.67	2.0718	2 59 50.7	13.976	13	12 25 31.56	2.2387	8 25 56.9	14.092
14	10 44 51.03	2.0735	2 45 51.2	14.007	14	12 27 46.04	2.2440	8 40 1.5	14.059
15	10 46 55.49	2.0752	2 31 49.9	14.037	15	12 30 0.83	2.2495	8 54 4.0	14.025
16	10 49 0.06	2.0771	2 17 46.8	14.066	16	12 32 15.95	2.2547	9 8 4.5	13.989
17	10 51 4.75	2.0791	2 3 42.0	14.094	17	12 34 31.39	2.2602	9 22 2.8	13.952
18	10 53 9.55	2.0811	1 49 35.5	14.121	18	12 36 47.17	2.2657	9 35 58.8	13.913
19	10 55 14.47	2.0831	1 35 27.4	14.147	19	12 39 3.28	2.2713	9 49 52.4	13.873
20	10 57 19.52	2.0853	1 21 17.8	14.173	20	12 41 19.73	2.2770	10 3 43.4	13.829
21	10 59 24.70	2.0876	1 7 6.8	14.198	21	12 43 36.52	2.2827	10 17 31.9	13.788
22	11 1 30.02	2.0900	0 52 54.4	14.218	22	12 45 53.66	2.2885	10 31 17.6	13.739
23	11 3 35.47	2.0921	N. 0 38 40.7	14.239	23	12 48 11.14	2.2943	S. 10 45 0.5	13.691
TUESDAY 26.					THURSDAY 28.				
0	11 5 41.07	2.0846	N. 0 24 25.7	14.250	0	12 50 28.98	2.3002	S. 10 58 40.5	13.641
1	11 7 46.82	2.0871	N. 0 10 9.6	14.278	1	12 52 47.17	2.3062	11 12 17.4	13.599
2	11 9 52.72	2.0907	S. 0 4 7.7	14.296	2	12 55 5.73	2.3123	11 25 51.2	13.538
3	11 11 58.77	2.1023	0 18 26.0	14.313	3	12 57 24.65	2.3184	11 39 21.7	13.481
4	11 14 4.99	2.1050	0 32 45.3	14.329	4	12 59 43.94	2.3245	11 52 48.9	13.434
5	11 16 11.37	2.1078	0 47 5.4	14.343	5	13 2 3.60	2.3307	12 6 12.6	13.385
6	11 18 17.93	2.1107	1 1 26.4	14.356	6	13 4 23.63	2.3369	12 19 32.7	13.334
7	11 20 24.66	2.1137	1 15 48.2	14.368	7	13 6 44.04	2.3432	12 32 49.2	13.283
8	11 22 31.58	2.1168	1 30 10.6	14.379	8	13 9 4.82	2.3495	12 46 1.8	13.232
9	11 24 38.68	2.1199	1 44 33.6	14.388	9	13 11 25.98	2.3559	12 59 10.5	13.181
10	11 26 45.97	2.1232	1 58 57.2	14.397	10	13 13 47.53	2.3623	13 12 15.1	13.130
11	11 28 53.46	2.1266	2 13 21.3	14.404	11	13 16 9.47	2.3688	13 25 15.6	13.077
12	11 31 1.15	2.1299	2 27 45.7	14.409	12	13 18 31.79	2.3753	13 38 11.9	13.024
13	11 33 9.04	2.1333	2 42 10.4	14.413	13	13 20 54.51	2.3818	13 51 3.8	12.971
14	11 35 17.14	2.1368	2 56 35.3	14.416	14	13 23 17.61	2.3883	14 3 51.2	12.918
15	11 37 25.45	2.1403	3 11 0.4	14.418	15	13 25 41.11	2.3949	14 16 34.0	12.874
16	11 39 33.98	2.1440	3 25 25.5	14.418	16	13 28 5.00	2.4015	14 29 12.1	12.829
17	11 41 42.73	2.1477	3 39 50.6	14.418	17	13 30 29.29	2.4082	14 41 45.3	12.783
18	11 43 51.71	2.1516	3 54 15.6	14.416	18	13 32 53.99	2.4149	14 54 13.6	12.738
19	11 46 0.92	2.1556	4 8 40.4	14.412	19	13 35 19.08	2.4216	15 6 36.8	12.692
20	11 48 10.37	2.1596	4 23 5.0	14.407	20	13 37 44.58	2.4283	15 18 54.8	12.646
21	11 50 20.06	2.1635	4 37 29.2	14.400	21	13 40 10.48	2.4350	15 31 7.5	12.600
22	11 52 29.99	2.1676	4 51 53.0	14.392	22	13 42 36.78	2.4417	15 43 14.7	12.554
23	11 54 40.17	2.1718	5 6 16.2	14.383	23	13 45 3.49	2.4485	15 55 16.4	12.508
24	11 56 50.61	2.1761	S. 5 20 38.8	14.371	24	13 47 30.60	2.4552	S. 16 7 12.4	12.462

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
FRIDAY 29.					SATURDAY 30.				
	^h ^m ^s	^{''}	S. [°] ['] ^{''}	^{''}		^h ^m ^s	^{''}	S. [°] ['] ^{''}	^{''}
0	13 47 30.60	2.4659	8.16 7 12.4	11.985	0	14 48 21.60	2.6125	8.20 20 10.2	9.009
1	13 49 58.12	2.4690	16 19 2.6	11.787	1	14 50 58.53	2.6186	20 29 6.5	8.866
2	13 52 26.04	2.4698	16 30 46.9	11.686	2	14 53 35.82	2.6244	20 37 54.1	8.730
3	13 54 54.37	2.4706	16 42 25.2	11.587	3	14 56 13.46	2.6302	20 46 32.9	8.573
4	13 57 23.11	2.4823	16 53 57.4	11.484	4	14 58 51.45	2.6360	20 55 2.9	8.434
5	13 59 52.25	2.4891	17 5 23.3	11.378	5	15 1 29.78	2.6417	21 3 23.9	8.274
6	14 2 21.80	2.4959	17 16 42.8	11.271	6	15 4 8.45	2.6473	21 11 35.8	8.123
7	14 4 51.76	2.5027	17 27 55.9	11.163	7	15 6 47.45	2.6527	21 19 38.6	7.980
8	14 7 22.12	2.5095	17 39 2.3	11.051	8	15 9 26.77	2.6580	21 27 32.1	7.814
9	14 9 52.89	2.5162	17 50 2.0	10.938	9	15 12 6.41	2.6633	21 35 16.2	7.667
10	14 12 24.06	2.5229	18 0 54.8	10.823	10	15 14 46.37	2.6684	21 42 50.9	7.499
11	14 14 55.63	2.5296	18 11 40.7	10.706	11	15 17 26.63	2.6734	21 50 16.1	7.339
12	14 17 27.60	2.5361	18 22 19.5	10.586	12	15 20 7.18	2.6783	21 57 31.6	7.177
13	14 19 59.97	2.5427	18 32 51.1	10.466	13	15 22 48.03	2.6832	22 4 37.4	7.014
14	14 22 32.73	2.5493	18 43 15.3	10.343	14	15 25 29.16	2.6879	22 11 33.3	6.860
15	14 25 5.89	2.5559	18 53 32.1	10.217	15	15 28 10.57	2.6924	22 18 19.4	6.695
16	14 27 39.44	2.5624	19 3 41.4	10.090	16	15 30 52.25	2.6969	22 24 55.5	6.616
17	14 30 13.38	2.5689	19 13 43.0	9.963	17	15 33 34.19	2.7012	22 31 21.5	6.349
18	14 32 47.71	2.5753	19 23 36.8	9.831	18	15 36 16.39	2.7053	22 37 37.4	6.179
19	14 35 22.42	2.5817	19 33 22.7	9.699	19	15 38 58.83	2.7093	22 43 43.0	6.008
20	14 37 57.51	2.5880	19 43 0.7	9.564	20	15 41 41.51	2.7132	22 49 38.4	5.836
21	14 40 32.98	2.5943	19 52 30.5	9.428	21	15 44 24.42	2.7170	22 55 23.4	5.663
22	14 43 8.82	2.6004	20 1 52.1	9.290	22	15 47 7.55	2.7206	23 0 58.0	5.489
23	14 45 45.03	2.6065	20 11 5.4	9.151	23	15 49 50.89	2.7240	23 6 22.1	5.314
24	14 48 21.60	2.6126	S. 20 20 10.2	9.009	24	15 52 34.43	2.7273	S. 23 11 35.7	5.138

PHASES OF THE MOON.

● New Moon,	d	h	m
☽ First Quarter,	8	23	44.6
○ Full Moon,	17	1	7.0
☾ Last Quarter,	24	23	7.4

☾ Perigee,	d	h
☾ Apogee,	15	18.4
☾ Perigee,	30	17.1

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Star's Name and Position.	Noon.	P. L. of Dist.	IIIh.	P. L. of Dist.	VIh.	P. L. of Dist.	IXh.	P. L. of Dist.
4	SUN W.	26° 5' 54"	2206	27° 49' 34"	2404	29° 33' 3"	2412	31° 16' 20"	2422
	Fomalhaut E.	83 23 56	2487	81 42 24	2504	80 1 16	2522	78 20 33	2540
	α Pegasi E.	103 30 3	2186	101 41 15	2196	99 52 42	2206	98 4 24	2218
5	SUN W.	39 48 54	2486	41 30 29	2500	43 11 42	2516	44 52 34	2532
	Fomalhaut E.	70 4 5	2660	68 26 32	2689	66 49 37	2719	65 13 23	2732
	α Pegasi E.	89 7 35	2267	87 21 17	2304	85 35 24	2321	83 49 55	2336
6	SUN W.	53 11 1	2621	54 49 28	2638	56 27 30	2656	58 5 6	2676
	Fomalhaut E.	57 23 45	2947	55 52 26	2992	54 22 5	3043	52 52 45	3086
	α Pegasi E.	75 9 5	2484	73 26 19	2456	71 44 3	2476	70 2 16	2499
7	SUN W.	66 6 38	2776	67 41 38	2796	69 16 13	2816	70 50 21	2834
	Venus W.	22 42 3	2826	24 15 58	2843	25 49 30	2862	27 22 38	2881
	Fomalhaut E.	45 43 36	3424	44 21 47	3506	43 1 28	3593	41 42 46	3691
	α Pegasi E.	61 41 17	2616	60 2 44	2640	58 24 44	2666	56 47 19	2692
	α Arietis E.	104 3 42	2453	102 21 22	2471	100 39 28	2489	98 58 0	2506
8	SUN W.	78 34 48	2931	80 6 27	2960	81 37 43	2989	83 8 35	2997
	Venus W.	35 2 6	2977	36 32 47	2996	38 3 5	3014	39 33 0	3033
	α Pegasi E.	48 49 16	2836	47 15 35	2867	45 42 34	2900	44 10 15	2935
	α Arietis E.	90 36 58	2598	88 58 0	2616	87 19 25	2632	85 41 14	2660
9	SUN W.	90 37 18	3076	92 5 57	3091	93 34 17	3109	95 2 16	3124
	Venus W.	46 56 58	3122	48 24 41	3138	49 52 4	3164	51 19 8	3171
	α Pegasi E.	36 40 27	3148	35 13 9	3193	33 46 51	3249	32 21 40	3310
	α Arietis E.	77 36 3	2783	76 0 6	2747	74 24 29	2764	72 49 14	2780
	Aldebaran E.	110 21 6	2757	108 45 42	2773	107 10 38	2786	105 35 52	2801
10	SUN W.	102 17 31	3200	103 43 40	3218	105 9 34	3227	106 35 11	3240
	Venus W.	58 29 43	3247	59 54 57	3260	61 19 55	3274	62 44 37	3288
	α Arietis E.	64 57 49	2850	63 24 27	2865	61 51 23	2876	60 18 34	2891
	Aldebaran E.	97 46 33	2868	96 13 33	2890	94 40 48	2892	93 8 19	2906
11	SUN W.	113 39 33	3301	115 3 43	3311	116 27 42	3323	117 51 27	3332
	Venus W.	69 44 25	3347	71 7 42	3356	72 30 46	3368	73 53 39	3379
	α Aquilæ W.	47 29 52	3036	48 42 34	3000	49 55 54	3066	51 9 48	3094
	α Arietis E.	52 38 35	2961	51 7 21	2962	49 36 20	2973	48 5 33	2984
	Aldebaran E.	85 29 34	2969	83 58 31	2969	82 27 40	2978	80 57 0	2989
12	SUN W.	124 47 32	3378	126 10 14	3386	127 32 47	3393	128 55 12	3400
	Venus W.	80 45 20	3423	82 7 11	3431	83 28 53	3438	84 50 27	3445
	α Aquilæ W.	57 26 12	3723	58 42 35	3708	59 59 14	3693	61 16 9	3678
	Fomalhaut W.	34 39 25	4740	35 39 51	4621	36 41 58	4514	37 45 38	4419
	α Arietis E.	40 35 0	3087	39 5 33	3047	37 36 19	3056	36 7 16	3066
	Aldebaran E.	73 26 35	3031	71 57 1	3039	70 27 37	3047	68 58 22	3064
	Pollux E.	115 17 18	3039	113 47 53	3044	112 18 35	3060	110 49 24	3066
13	Venus W.	91 36 27	3476	92 57 19	3479	94 18 7	3484	95 38 49	3486
	α Aquilæ W.	67 43 54	3628	69 1 58	3621	70 20 10	3614	71 38 29	3609
	Fomalhaut W.	43 22 39	4076	44 33 4	4026	45 44 18	3992	46 56 15	3939
	Aldebaran E.	61 34 14	3067	60 5 48	3092	58 37 29	3099	57 9 18	3104
	Pollux E.	103 25 4	3078	101 56 28	3062	100 27 57	3067	98 59 31	3060
14	Venus W.	102 21 17	3505	103 41 36	3507	105 1 52	3510	106 22 5	3511

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Star's Name and Position.	Midnight.	P. L. of Dif.	XVh.	P. L. of Dif.	XVIIIh.	P. L. of Dif.	XXIh.	P. L. of Dif.
4	SUN W.	32° 59' 24"	2483	34° 42' 13"	2444	36° 24' 45"	2457	38° 6' 59"	2470
	Fomalhaut E.	76 40 15	2560	75 0 25	2581	73 21 4	2607	71 42 18	2631
	α Pegasi E.	96 16 23	2321	94 28 41	2343	92 41 18	2357	90 54 15	2373
5	SUN W.	46 33 3	2548	48 13 9	2566	49 52 51	2583	51 32 9	2602
	Fomalhaut E.	63 37 52	2766	62 3 6	2823	60 29 8	2863	58 56 0	2903
	α Pegasi E.	82 4 51	2356	80 20 13	2375	78 36 3	2394	76 52 20	2414
6	SUN W.	59 42 16	2607	61 19 0	2716	62 55 19	2736	64 31 11	2765
	Fomalhaut E.	51 24 30	3153	49 57 24	3213	48 31 30	3278	47 6 53	3347
	α Pegasi E.	68 21 1	2521	66 40 17	2543	65 0 4	2568	63 20 25	2591
7	SUN W.	72 24 5	2654	73 57 23	2673	75 30 16	2693	77 2 44	2712
	Venus W.	28 55 21	2901	30 27 38	2920	31 59 32	2939	33 31 1	2968
	Fomalhaut E.	40 25 49	3797	39 10 44	3813	37 57 37	4041	36 46 38	4188
	α Pegasi E.	55 10 28	2720	53 34 15	2747	51 58 38	2775	50 23 37	2805
	α Arietis E.	97 16 57	2525	95 36 20	2544	93 56 8	2561	92 16 20	2580
8	SUN W.	84 39 4	3005	86 9 10	3023	87 38 55	3041	89 8 17	3058
	Venus W.	41 2 32	3052	42 31 41	3069	44 0 26	3087	45 28 53	3104
	α Pegasi E.	42 38 41	2973	41 7 53	3010	39 37 53	3051	38 8 43	3095
	α Arietis E.	84 3 27	2667	82 26 3	2684	80 49 1	2700	79 12 21	2716
9	SUN W.	96 29 57	3140	97 57 18	3156	99 24 20	3171	100 51 4	3185
	Venus W.	52 45 52	3187	54 12 17	3203	55 38 23	3217	57 4 12	3232
	α Pegasi E.	30 57 40	3379	29 34 59	3455	28 13 45	3543	26 54 8	3640
	α Arietis E.	71 14 19	2794	69 39 44	2806	68 5 27	2823	66 31 29	2837
	Aldebaran E.	104 1 24	2815	102 27 16	2828	100 53 25	2841	99 19 50	2855
10	SUN W.	108 0 33	3233	109 25 39	3255	110 50 31	3278	112 15 8	3298
	Venus W.	64 9 3	3300	65 33 15	3313	66 57 12	3325	68 20 55	3336
	α Arietis - E.	58 46 3	2903	57 13 48	2916	55 41 49	2927	54 10 4	2939
	Aldebaran E.	91 36 5	2916	90 4 7	2927	88 32 22	2938	87 0 51	2950
11	SUN W.	119 15 2	3340	120 38 25	3351	122 1 38	3360	123 24 40	3369
	Venus W.	75 16 20	3397	76 38 51	3397	78 1 11	3406	79 23 21	3415
	α Aquilæ W.	52 24 15	3808	53 39 9	3784	54 54 28	3763	56 10 9	3742
	α Arietis E.	46 35 0	2995	45 4 41	3005	43 34 35	3015	42 4 41	3025
	Aldebaran E.	79 26 33	2998	77 56 18	3006	76 26 13	3016	74 56 19	3023
12	SUN W.	130 17 28	3406	131 39 36	3414	133 1 37	3421	134 23 30	3427
	Venus W.	86 11 53	3451	87 33 12	3456	88 54 23	3463	90 15 28	3469
	α Aquilæ W.	62 33 18	3666	63 50 40	3657	65 8 15	3646	66 26 0	3636
	Fomalhaut W.	38 50 42	4324	39 57 3	4290	41 4 33	4192	42 13 7	4181
	α Arietis E.	34 38 25	3078	33 9 49	3091	31 41 29	3103	30 13 23	3106
	Aldebaran E.	67 29 17	3061	66 0 19	3067	64 31 29	3074	63 2 48	3080
	Pollux E.	109 20 21	3080	107 51 23	3065	106 22 31	3070	104 53 45	3074
13	Venus W.	96 59 27	3492	98 20 0	3496	99 40 29	3498	101 0 55	3502
	α Aquilæ W.	72 56 54	3608	74 15 26	3596	75 34 2	3594	76 52 44	3599
	Fomalhaut W.	48 8 55	3903	49 22 12	3899	50 36 3	3897	51 50 27	3899
	Aldebaran E.	55 41 13	3110	54 13 16	3115	52 45 25	3121	51 17 41	3125
	Pollux E.	97 31 9	3093	96 2 51	3096	94 34 36	3099	93 6 25	3101
14	Venus W.	107 42 17	3513	109 2 27	3515	110 22 34	3515	111 42 41	3517

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Star's Name and Position.	Noon.	P. L. of Dist.	IIIh.	P. L. of Dist.	VIh.	P. L. of Dist.	IXh.	P. L. of Dist.
14	α Aquilæ W.	78° 11' 29"	3087	79° 30' 19"	3083	80° 49' 11"	3081	82° 8' 6"	3079
	Fomalhaut W.	53 5 20	3783	54 20 40	3783	55 36 26	3787	56 52 34	3715
	Aldebaran E.	49 50 2	3131	48 22 30	3128	46 55 7	3143	45 27 50	3160
	Pollux E.	91 38 17	3104	90 10 12	3106	88 42 10	3108	87 14 10	3110
15	α Aquilæ W.	88 43 5	3075	90 2 7	3075	91 21 9	3076	92 40 10	3077
	Fomalhaut W.	63 18 15	3033	64 26 14	3021	65 54 26	3008	67 12 52	3007
	α Pegasi W.	41 7 3	3306	42 29 24	3379	43 52 4	3305	45 15 1	3349
	Aldebaran E.	38 13 15	3133	36 46 45	3120	35 20 24	3300	33 54 15	3300
	Pollux E.	79 54 39	3117	78 26 50	3117	76 59 1	3119	75 31 14	3119
16	α Aquilæ W.	99 14 45	3000	100 33 31	3003	101 52 13	3006	103 10 50	3003
	Fomalhaut W.	73 47 53	3042	75 7 23	3042	76 27 1	3036	77 46 46	3023
	α Pegasi W.	52 13 38	3300	53 38 1	3322	55 2 34	3373	56 27 17	3356
	Pollux E.	68 12 25	3121	66 44 41	3120	65 16 55	3121	63 49 11	3120
	Regulus E.	105 1 43	3034	103 33 14	3023	102 4 43	3031	100 36 10	3030
17	Fomalhaut W.	84 27 13	3002	85 47 35	3006	87 8 1	3006	88 28 31	3002
	α Pegasi W.	63 33 13	3326	64 58 49	3322	66 24 32	3315	67 50 23	3308
	Pollux E.	56 30 26	3130	55 2 41	3120	53 34 57	3120	52 7 12	3120
	Regulus E.	93 12 57	3070	91 44 11	3067	90 15 21	3065	88 46 29	3063
	Saturn E.	116 1 1	3133	114 33 19	3119	113 5 34	3116	111 37 44	3113
	Jupiter E.	118 10 44	3143	116 43 26	3133	115 16 4	3136	113 48 38	3133
18	α Pegasi W.	75 1 26	3181	76 27 58	3176	77 54 36	3170	79 21 21	3164
	α Arietis W.	31 30 27	3105	32 58 31	3093	34 26 45	3086	35 55 10	3080
	Pollux E.	44 48 37	3125	43 20 58	3127	41 53 21	3129	40 25 46	3131
	Regulus E.	81 21 18	3048	79 52 5	3044	78 22 47	3040	76 53 24	3038
	Saturn E.	104 17 30	3004	102 49 14	3001	101 20 52	3007	99 52 26	3002
	Jupiter E.	106 30 26	3116	105 2 35	3110	103 34 37	3106	102 6 35	3103
19	α Pegasi W.	86 36 42	3130	88 4 4	3124	89 31 32	3129	90 59 6	3124
	α Arietis W.	43 19 35	3043	44 48 55	3036	46 18 23	3029	47 48 0	3022
	Pollux E.	33 8 59	3156	31 41 59	3163	30 15 12	3179	28 48 38	3190
	Regulus E.	69 25 24	3013	67 55 33	3013	66 25 33	3009	64 55 33	3004
	Saturn E.	92 28 57	3020	90 59 58	3015	89 30 53	3010	88 1 42	3015
	Jupiter E.	94 45 7	3078	93 16 32	3074	91 47 51	3069	90 19 4	3064
20	α Arietis W.	55 18 13	3067	56 48 42	3060	58 19 19	3073	59 50 6	3065
	Aldebaran W.	23 21 27	3210	24 47 24	3173	26 13 59	3161	27 41 7	3134
	Regulus E.	57 23 51	3076	55 53 11	3073	54 22 25	3067	52 51 31	3062
	Saturn E.	80 34 10	3013	79 4 19	3011	77 34 20	3005	76 4 13	3009
	Jupiter E.	82 53 29	3035	81 24 0	3030	79 54 24	3022	78 24 39	3017
	Spica E.	111 23 56	3035	109 52 59	3033	108 21 54	3022	106 50 41	3015
	Mars E.	118 24 9	3026	116 58 31	3019	115 32 44	3013	114 6 49	3004
	α Arietis W.	67 26 27	3026	68 58 13	3017	70 30 11	3009	72 2 19	3000
21	Aldebaran W.	35 4 0	3023	36 33 44	3003	38 3 49	3000	39 34 14	2975
	Regulus E.	45 15 10	3031	43 43 31	3025	42 11 44	3019	40 39 49	3012
	Saturn E.	68 31 39	3006	67 0 43	3003	65 29 38	3001	63 58 24	3013
	Jupiter E.	70 53 54	3031	69 23 18	3073	67 52 32	3005	66 21 37	3008
	Spica E.	99 12 20	3035	97 40 11	3000	96 7 52	2993	94 35 23	3003
	Mars E.	106 54 52	3103	105 27 59	3154	104 0 55	3146	102 33 41	3123
	SUN E.	136 31 47	3306	135 7 22	3376	133 42 45	3370	132 17 58	3369

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Star's Name and Position	Midnight.	P. L. of ME.	XVh.	P. L. of ME.	XVIIIh.	P. L. of ME.	XXIh.	P. L. of ME.
14	α Aquilæ W.	83° 27' 3"	3077	84° 46' 2"	3076	86° 5' 2"	3076	87° 24' 3"	3076
	Fomalhaut W.	58 9 5	3006	59 25 56	3079	60 43 5	3068	62 0 32	3048
	Aldebaran E.	44 0 41	3106	42 33 39	3100	41 6 42	3100	39 39 54	3175
	Pollux E.	85 46 12	3111	84 18 17	3119	82 50 23	3114	81 22 30	3116
15	α Aquilæ W.	93 59 9	3079	95 18 7	3081	96 37 2	3083	97 55 55	3086
	Fomalhaut W.	68 31 30	3006	69 50 20	3076	71 9 21	3066	72 28 32	3057
	α Pegasi W.	46 38 16	3226	48 1 47	3204	49 25 31	3213	50 49 28	3201
	Aldebaran E.	32 28 17	3119	31 2 30	3223	29 37 0	3250	28 11 50	3270
16	Pollux E.	74 3 27	3119	72 35 41	3120	71 7 56	3119	69 40 10	3120
	α Aquilæ W.	104 29 22	3009	105 47 47	3014	107 6 6	3021	108 24 18	3030
	Fomalhaut W.	79 6 39	3023	80 26 39	3016	81 46 45	3012	83 6 56	3006
	α Pegasi W.	57 52 10	3226	59 17 13	3240	60 42 25	3243	62 7 45	3235
17	Pollux E.	62 21 26	3120	60 53 41	3120	58 25 56	3120	57 58 11	3120
	Regulus E.	99 7 36	3078	97 39 0	3076	96 10 21	3074	94 41 40	3073
	Fomalhaut W.	89 49 4	3008	91 9 41	3006	92 30 21	3006	93 51 2	3003
	α Pegasi W.	69 16 22	3208	70 42 26	3197	72 6 41	3193	73 35 0	3186
18	Pollux E.	50 39 28	3121	49 11 44	3129	47 44 1	3128	46 16 19	3124
	Regulus E.	87 17 34	3000	85 48 35	3007	84 19 33	3006	82 50 28	3001
	Saturn E.	110 9 50	3110	108 41 52	3105	107 13 49	3102	105 45 42	3099
	Jupiter E.	112 21 8	3120	110 53 34	3126	109 25 56	3123	107 58 13	3118
19	α Pegasi W.	80 48 14	3100	82 15 12	3104	83 42 10	3109	85 9 26	3104
	α Arietis W.	37 23 44	3071	38 52 29	3066	40 21 22	3067	41 50 24	3060
	Pollux E.	38 58 13	3124	37 30 46	3140	36 3 25	3144	34 36 9	3149
	Regulus E.	75 23 58	3024	73 54 27	3030	72 24 51	3026	70 55 10	3022
20	Saturn E.	98 23 55	3079	96 55 19	3073	95 26 37	3069	93 57 50	3065
	Jupiter E.	100 38 29	3000	99 10 18	3008	97 42 0	3009	96 13 37	3003
	α Pegasi W.	92 26 46	3119	98 54 33	3114	95 22 25	3109	96 50 24	3106
	α Arietis W.	49 17 45	3015	50 47 39	3008	52 17 42	3001	53 47 53	2994
21	Pollux E.	27 22 17	3200	25 56 18	3203	24 30 48	3207	23 5 46	3202
	Regulus E.	63 25 25	2900	61 55 11	2904	60 24 51	2909	58 54 24	2904
	Saturn E.	86 32 25	3040	85 3 1	3034	83 33 31	3029	82 3 54	3023
	Jupiter E.	88 50 10	3000	87 21 11	3003	85 52 3	3008	84 22 50	3001
22	α Arietis W.	61 21 3	2940	62 52 9	2950	64 23 25	2942	65 54 51	2934
	Aldebaran W.	29 8 48	3009	30 36 59	3070	32 5 36	3068	33 34 37	3040
	Regulus E.	51 20 30	2946	49 49 22	2950	48 18 6	2943	46 46 42	2937
	Saturn E.	74 33 59	3002	73 3 36	3005	71 33 7	3079	70 2 26	2973
23	Jupiter E.	76 54 47	3010	75 24 47	3003	73 54 38	2996	72 24 20	2989
	Spica E.	105 19 19	2920	103 47 48	2921	102 16 9	2924	100 44 20	2915
	Mars E.	112 40 45	3107	111 14 32	3106	109 48 8	3100	108 21 35	3172
	α Arietis W.	73 34 39	2901	75 7 10	2901	76 39 54	2872	78 12 49	2862
24	Aldebaran W.	41 4 58	2900	42 36 1	2946	44 7 21	2933	45 38 58	2919
	Regulus E.	39 7 46	2906	37 35 35	2900	36 3 15	2904	34 30 48	2887
	Saturn E.	62 27 0	2906	60 55 27	2926	59 23 43	2920	57 51 49	2912
	Jupiter E.	64 50 32	2900	63 19 17	2943	61 47 52	2924	60 16 16	2925
25	Spica E.	93 2 43	2975	91 29 52	2906	89 56 48	2857	88 23 34	2846
	Mars E.	101 6 15	3126	99 38 37	3117	96 10 48	3107	96 42 47	3097
	Sun E.	130 52 58	2349	129 27 47	2326	128 2 23	2328	126 36 47	2318

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Star's Name and Position.	Noon.	P. L. of Dist.	III ^h .	P. L. of Dist.	VI ^h .	P. L. of Dist.	IX ^h .	P. L. of Dist.
22	α Arietis W.	79° 45' 57"	2852	81° 19' 17"	2842	82° 52' 51"	2831	84° 26' 38"	2821
	Aldebaran W.	47 10 53	2905	48 43 6	2891	50 15 35	2879	51 48 21	2866
	Regulus E.	32 58 13	2882	31 25 31	2877	29 52 43	2872	28 19 48	2860
	Saturn E.	56 19 45	2903	54 47 31	2896	53 15 6	2887	51 42 31	2879
	Jupiter E.	58 44 29	2916	57 12 30	2907	55 40 20	2898	54 7 59	2889
	Spica E.	86 50 6	2837	85 16 26	2827	83 42 33	2817	82 8 27	2808
	Mars E.	95 14 34	2887	93 46 8	2876	92 17 29	2865	90 48 37	2854
	SUN E.	125 10 59	3307	123 44 58	3195	122 18 43	3184	120 52 15	3172
23	α Arietis W.	92 19 8	2764	93 54 22	2752	95 29 53	2740	97 5 40	2727
	Aldebaran W.	59 36 31	2798	61 11 2	2785	62 45 50	2770	64 20 57	2756
	Pollux W.	18 49 56	3171	20 16 40	3096	21 44 52	3080	23 14 17	3069
	Saturn E.	43 56 56	2838	42 23 18	2831	40 49 30	2823	39 15 32	2814
	Jupiter E.	46 23 17	2842	44 49 44	2832	43 15 58	2826	41 42 2	2815
	Spica E.	74 14 28	2750	72 38 55	2738	71 3 5	2728	69 27 0	2714
	Mars E.	83 20 42	2804	81 50 22	2802	80 19 47	2800	78 48 55	2800
	SUN E.	113 36 14	3110	112 8 16	3096	110 40 1	3082	109 11 30	3069
24	α Arietis W.	105 8 50	2863	106 46 20	2849	108 24 9	2835	110 2 17	2821
	Aldebaran W.	72 21 10	2885	73 58 10	2870	75 35 30	2855	77 13 11	2840
	Pollux W.	30 55 2	2802	32 29 27	2776	34 4 27	2761	35 39 59	2750
	Saturn E.	31 23 37	2792	29 48 58	2791	28 14 18	2792	26 39 40	2798
	Jupiter E.	33 49 29	2775	32 14 28	2769	30 39 19	2764	29 4 4	2761
	Spica E.	61 22 21	2848	59 44 31	2834	58 6 22	2820	56 27 54	2807
	Mars E.	71 10 23	2887	69 37 47	2873	68 4 53	2866	66 31 40	2843
	SUN E.	101 44 34	2996	100 14 16	2980	98 43 38	2965	97 12 41	2949
25	Aldebaran W.	85 26 46	2864	87 6 31	2848	88 46 37	2833	90 27 5	2815
	Pollux W.	43 45 44	2812	45 24 23	2802	47 3 29	2872	48 43 3	2862
	Spica E.	48 10 43	2833	46 30 15	2816	44 49 27	2808	43 8 18	2800
	Mars E.	58 40 44	2767	57 5 33	2782	55 30 2	2785	53 54 9	2771
	SUN E.	89 32 52	2887	87 59 51	2850	86 26 28	2833	84 52 43	2816
26	Pollux W.	57 7 37	2457	58 49 51	2438	60 32 32	2420	62 15 38	2403
	Regulus W.	20 9 37	2809	21 50 38	2475	23 32 24	2449	25 14 51	2430
	Mars E.	45 49 42	2844	44 11 47	2829	42 33 31	2816	40 54 56	2801
	SUN E.	76 58 22	2729	75 22 21	2712	73 45 57	2694	72 9 9	2678
27	Pollux W.	70 57 30	2816	72 43 6	2299	74 29 6	2284	76 15 30	2267
	Regulus W.	33 55 47	2812	35 41 29	2292	37 27 40	2274	39 14 17	2266
	Mars E.	32 37 24	2839	30 57 5	2830	29 16 33	2821	27 35 49	2816
	SUN E.	63 59 25	2691	62 20 18	2675	60 40 49	2658	59 0 57	2642
28	Pollux W.	85 13 12	2194	87 1 47	2181	88 50 44	2169	90 39 59	2156
	Regulus W.	48 13 51	2175	50 2 58	2160	51 52 25	2147	53 42 13	2132
	Saturn W.	25 14 57	2344	26 59 52	2310	28 45 36	2280	30 32 5	2268
	Jupiter W.	22 16 18	2363	24 0 46	2326	25 46 7	2296	27 32 14	2286
	SUN E.	50 36 12	2467	48 54 12	2463	47 11 53	2440	45 29 15	2426
29	Pollux W.	99 50 44	2102	101 41 40	2094	103 32 49	2086	105 24 8	2079
	Regulus W.	62 56 6	2075	64 47 44	2064	66 39 38	2055	68 31 46	2046
	Saturn W.	39 33 19	2152	41 22 57	2138	43 12 58	2124	45 3 20	2112
	Jupiter W.	36 31 50	2165	38 21 11	2149	40 10 55	2136	42 1 0	2124
	SUN E.	36 51 41	2371	35 7 24	2362	33 22 54	2348	31 38 12	2346

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Star's Name and Position.	Midnight.	P. L. of Dist.	XVh.	P. L. of Dist.	XVIIIh.	P. L. of Dist.	XXIh.	P. L. of Dist.
22	α Arietis W.	86° 0' 39"	2810	87° 34' 54"	2798	89° 9' 24"	2788	90° 44' 8"	2775
	Aldebaran W.	53 21 24	2862	54 54 45	2838	56 28 23	2825	58 2 18	2811
	Regulus E.	26 46 49	2866	25 13 46	2863	23 40 40	2864	22 7 35	2866
	Saturn E.	50 9 45	2871	48 36 49	2862	47 3 42	2854	45 30 24	2846
	Jupiter E.	52 35 27	2882	51 2 42	2873	49 29 45	2863	47 56 38	2855
	Spica E.	80 34 9	2795	78 59 35	2785	77 24 47	2774	75 49 45	2763
	Mars E.	89 19 31	3043	87 50 11	3031	86 20 37	3018	84 50 47	3006
	SUN E.	119 25 32	3160	117 58 35	3148	116 31 23	3135	115 3 56	3123
23	α Arietis W.	98 41 44	2715	100 18 4	2701	101 54 42	2689	103 31 37	2675
	Aldebaran W.	65 56 22	2743	67 32 6	2729	69 8 8	2713	70 44 30	2700
	Pollux W.	24 44 44	2842	26 16 9	2803	27 48 24	2870	29 21 21	2836
	Saturn E.	37 41 22	2806	36 7 4	2803	34 32 40	2798	32 58 10	2796
	Jupiter E.	40 7 54	2805	38 33 34	2797	36 59 3	2788	35 24 21	2782
	Spica E.	67 50 39	2701	66 14 1	2688	64 37 5	2675	62 59 52	2662
	Mars E.	77 17 47	2843	75 46 23	2828	74 14 40	2816	72 42 41	2801
	SUN E.	107 42 42	3055	106 13 37	3040	104 44 14	3024	103 14 33	3011
24	α Arietis W.	111 40 45	2806	113 19 32	2802	114 58 38	2877	116 38 4	2863
	Aldebaran W.	78 51 11	2824	80 29 33	2808	82 8 17	2803	83 47 21	2878
	Pollux W.	37 16 6	2700	38 52 46	2878	40 29 56	2856	42 7 35	2834
	Saturn E.	25 5 10	2806	23 30 49	2819	21 56 46	2839	20 23 9	2869
	Jupiter E.	27 28 45	2760	25 53 25	2761	24 18 6	2768	22 42 54	2776
	Spica E.	54 49 8	2892	53 10 2	2877	51 30 35	2863	49 50 49	2846
	Mars E.	64 58 8	2828	63 24 17	2812	61 50 5	2798	60 15 35	2782
	SUN E.	95 41 24	2833	94 9 47	2817	92 37 50	2801	91 5 32	2863
25	Aldebaran W.	92 7 56	2499	93 49 10	2485	95 30 45	2468	96 12 43	2453
	Pollux W.	50 23 4	2533	52 3 32	2513	53 44 27	2494	55 25 49	2476
	Spica E.	41 26 48	2473	39 44 57	2458	38 2 45	2443	36 20 11	2429
	Mars E.	52 17 57	2705	50 41 24	2690	49 4 31	2674	47 27 16	2660
	SUN E.	83 18 36	2798	81 44 6	2782	80 9 14	2764	78 33 59	2747
26	Pollux W.	63 59 11	2884	65 43 8	2866	67 27 30	2850	69 12 17	2833
	Regulus W.	26 57 57	2896	28 41 37	2873	30 25 50	2853	32 10 32	2831
	Mars E.	39 16 2	2867	37 36 49	2873	35 57 17	2861	34 17 28	2850
	SUN E.	70 31 59	2860	68 54 25	2843	67 16 28	2826	65 38 8	2809
27	Pollux W.	78 2 18	2882	79 49 28	2837	81 37 1	2823	83 24 55	2807
	Regulus W.	41 1 23	2840	42 48 53	2821	44 36 47	2806	46 25 6	2187
	Mars E.	25 54 57	2811	24 13 59	2811	22 33 1	2814	20 52 7	2817
	SUN E.	57 20 43	2826	55 40 6	2812	53 59 9	2497	52 17 51	2482
28	Pollux W.	92 29 35	3142	94 19 29	3132	96 9 40	3123	98 0 4	3113
	Regulus W.	55 32 23	3119	57 22 53	3109	59 13 39	3096	61 4 44	3085
	Saturn W.	32 19 14	2297	34 7 1	2307	35 55 18	2187	37 44 5	2170
	Jupiter W.	29 19 4	2242	31 6 29	2220	32 54 27	2200	34 42 55	2182
	SUN E.	43 46 18	2414	42 3 3	2403	40 19 32	2381	38 35 44	2360
29	Pollux W.	107 15 41	2873	109 7 22	2866	110 59 13	2862	112 51 10	2857
	Regulus W.	70 24 7	2839	72 16 39	2833	74 9 23	2826	76 2 16	2820
	Saturn W.	46 54 1	3101	48 44 59	3090	50 36 13	3081	52 27 41	3073
	Jupiter W.	43 51 23	2112	45 42 4	2101	47 33 1	2093	49 24 11	2085
	SUN E.	29 53 19	2839	28 8 17	2838	26 23 6	2828	24 37 48	2825

AT GREENWICH APPARENT NOON.

Day of the Week.	Day of the Month.	THE SUN'S						Sideral Time of the Semi-diameter passing the Meridian.	Equation of Time, to be subtracted from		Dist. for 1 hour.					
		Apparent Right Ascension.			Diff. for 1 hour.	Apparent Declination.			Diff. for 1 hour.	Semi-diameter.		added to Apparent Time.				
		h	m	s		°	'						"			
Sun.	1	16	30	35.41	10.810	S. 21	52	0.5	23.03	16	16.04	70.33	m	s	s	0.956
Mon.	2	16	34	55.25	10.836	22	1	1.0	21.97	16	16.18	70.41	10	40.80	0.982	
Tues.	3	16	39	15.70	10.861	22	9	36.0	20.90	16	16.32	70.49	9	53.76	1.007	
Wed.	4	16	43	36.74	10.885	22	17	45.2	19.83	16	16.46	70.57	9	29.35	1.030	
Thur.	5	16	47	58.33	10.908	22	25	28.4	18.74	16	16.60	70.65	9	4.40	1.052	
Fri.	6	16	52	20.44	10.929	22	32	45.3	17.64	16	16.73	70.72	8	38.93	1.072	
Sat.	7	16	56	43.05	10.949	22	39	35.8	16.54	16	16.86	70.79	8	12.96	1.094	
Sun.	8	17	1	6.14	10.968	22	45	59.6	15.42	16	16.99	70.85	7	46.50	1.112	
Mon.	9	17	5	29.67	10.985	22	51	56.3	14.29	16	17.11	70.91	7	19.62	1.130	
Tues.	10	17	9	53.61	11.002	22	57	25.9	13.16	16	17.23	70.97	6	52.33	1.146	
Wed.	11	17	14	17.94	11.018	23	2	28.3	12.02	16	17.34	71.02	6	24.65	1.161	
Thur.	12	17	18	42.61	11.032	23	7	3.4	10.88	16	17.44	71.07	5	56.62	1.175	
Fri.	13	17	23	7.62	11.045	23	11	10.9	9.73	16	17.54	71.11	5	28.26	1.189	
Sat.	14	17	27	32.92	11.056	23	14	50.8	8.57	16	17.64	71.15	4	59.62	1.201	
Sun.	15	17	31	58.48	11.067	23	18	2.9	7.41	16	17.73	71.19	4	30.72	1.212	
Mon.	16	17	36	24.27	11.076	23	20	46.9	6.25	16	17.81	71.22	4	1.59	1.220	
Tues.	17	17	40	50.27	11.083	23	23	2.9	5.08	16	17.88	71.24	3	32.25	1.227	
Wed.	18	17	45	16.46	11.090	23	24	50.8	3.90	16	17.95	71.26	3	2.71	1.233	
Thur.	19	17	49	42.78	11.095	23	26	10.6	2.72	16	17.02	71.28	2	33.05	1.238	
Fri.	20	17	54	9.23	11.100	23	27	2.1	1.54	16	18.08	71.29	2	3.26	1.243	
Sat.	21	17	58	35.76	11.103	23	27	25.3	0.36	16	18.13	71.30	1	33.39	1.246	
Sun.	22	18	3	2.36	11.105	23	27	20.1	0.81	16	18.17	71.30	1	3.46	1.247	
Mon.	23	18	7	28.98	11.105	23	26	46.6	1.99	16	18.21	71.30	0	33.50	1.247	
Tues.	24	18	11	55.58	11.104	23	25	44.8	3.17	16	18.25	71.29	0	3.55	1.246	
Wed.	25	18	16	22.14	11.101	23	24	14.7	4.35	16	18.28	71.28	0	26.37	1.244	
Thur.	26	18	20	48.63	11.097	23	22	16.2	5.52	16	18.30	71.27	0	56.22	1.241	
Fri.	27	18	25	15.01	11.092	23	19	49.5	6.70	16	18.32	71.25	1	25.96	1.236	
Sat.	28	18	29	41.23	11.085	23	16	54.6	7.87	16	18.33	71.22	1	55.54	1.229	
Sun.	29	18	34	7.27	11.077	23	13	31.6	9.04	16	18.34	71.19	2	24.95	1.220	
Mon.	30	18	38	33.08	11.067	23	9	40.7	10.20	16	18.35	71.15	2	54.12	1.209	
Tues.	31	18	42	58.63	11.056	23	5	21.9	11.36	16	18.36	71.11	3	23.03	1.197	
Wed.	32	18	47	23.88	11.043	S. 23	0	35.3	12.51	16	18.36	71.07	3	51.64	1.185	

NOTE. — Mean Time of the Semi-diameter passing may be found by subtracting 0s.18 from the Sideral Time.

AT GREENWICH MEAN NOON.

Day of the Week.	Day of the Month.	THE SUN'S				Equation of Time, to be added to		Diff. for 1 hour.	Sidereal Time.						
		Apparent Right Ascension.		Diff. for 1 hour.	Apparent Declination.		Diff. for 1 hour.			subtracted from Mean Time.					
		h	m	s	°	'	"								
Sun.	1	16	30	37.34	10.810	S. 21	52	4.6	23.03	10	40.97	0.956	16	41	18.31
Mon.	2	16	34	57.11	10.836	22	1	4.7	21.97	10	17.76	0.982	16	45	14.87
Tues.	3	16	39	17.49	10.861	22	9	39.4	20.90	9	53.93	1.007	16	49	11.42
Wed.	4	16	43	38.46	10.885	22	17	48.3	19.83	9	29.52	1.030	16	53	7.98
Thur.	5	16	47	59.98	10.908	22	25	31.2	18.74	9	4.56	1.052	16	57	4.54
Fri.	6	16	52	22.02	10.929	22	32	47.8	17.64	8	39.08	1.072	17	1	1.10
Sat.	7	16	56	44.55	10.949	22	39	38.0	16.54	8	13.11	1.092	17	4	57.66
Sun.	8	17	1	7.56	10.968	22	46	1.5	15.42	7	46.65	1.112	17	8	54.21
Mon.	9	17	5	31.01	10.985	22	51	58.0	14.29	7	19.76	1.130	17	12	50.77
Tues.	10	17	9	54.87	11.002	22	57	27.4	13.16	6	52.46	1.147	17	16	47.33
Wed.	11	17	14	19.12	11.018	23	2	29.6	12.02	6	24.77	1.161	17	20	43.89
Thur.	12	17	18	43.71	11.032	23	7	4.5	10.88	5	56.74	1.175	17	24	40.45
Fri.	13	17	23	8.63	11.045	23	11	11.8	9.73	5	28.37	1.189	17	28	37.00
Sat.	14	17	27	33.84	11.056	23	14	51.5	8.57	4	59.72	1.201	17	32	33.56
Sun.	15	17	31	59.31	11.067	23	18	3.4	7.41	4	30.81	1.212	17	36	30.12
Mon.	16	17	36	25.01	11.076	23	20	47.3	6.25	4	1.67	1.220	17	40	26.68
Tues.	17	17	40	50.92	11.083	23	23	3.2	5.08	3	32.32	1.227	17	44	23.24
Wed.	18	17	45	17.02	11.090	23	24	51.0	3.90	3	2.77	1.233	17	48	19.79
Thur.	19	17	49	43.25	11.095	23	26	10.7	2.72	2	33.10	1.238	17	52	16.35
Fri.	20	17	54	9.61	11.100	23	27	2.2	1.54	2	3.30	1.243	17	56	12.91
Sat.	21	17	58	36.05	11.103	23	27	25.3	0.36	1	33.42	1.246	18	0	9.47
Sun.	22	18	3	2.55	11.105	23	27	20.1	0.81	1	3.48	1.247	18	4	6.03
Mon.	23	18	7	29.08	11.105	23	26	46.6	1.99	0	33.51	1.247	18	8	2.59
Tues.	24	18	11	55.59	11.104	23	25	44.8	3.17	0	3.55	1.246	18	11	59.14
Wed.	25	18	16	22.06	11.101	23	24	14.7	4.35	0	26.36	1.244	18	15	55.70
Thur.	26	18	20	48.46	11.097	23	22	16.3	5.52	0	56.20	1.241	18	19	52.26
Fri.	27	18	25	14.75	11.092	23	19	49.7	6.70	1	25.93	1.236	18	23	48.82
Sat.	28	18	29	40.88	11.085	23	16	54.9	7.87	1	55.50	1.229	18	27	45.38
Sun.	29	18	34	6.83	11.077	23	13	32.0	9.04	2	24.90	1.220	18	31	41.93
Mon.	30	18	38	32.55	11.067	23	9	41.2	10.20	2	54.06	1.209	18	35	38.49
Tues.	31	18	42	58.01	11.056	23	5	22.5	11.36	3	22.96	1.197	18	39	35.05
Wed.	32	18	47	23.17	11.043	S. 23	0	36.0	12.51	3	51.56	1.185	18	43	31.61

NOTE. — The Semidiameter for Mean Noon may be assumed the same as that for Apparent Noon.

AT GREENWICH MEAN NOON.

		THE SUN'S					Logarithm of the Radius Vector of the Earth.	Diff. for 1 hour.	Mean Time of Sidereal Ob.
Day of the Month.	Day of the Year.	True LONGITUDE.		Diff. for 1 hour.	LATITUDE.				
		λ	λ'						
1	335	249 ^o 20' 45.3 ⁿ	19 ^h 43.0 ^m	152.24	-0.66	9.9987077	27.2	7 17 29.83	
2	336	250 21 89.7	20 37.3	152.28	0.56	.9986431	26.6	7 13 33.92	
3	337	251 22 35.1	21 32.5	152.32	0.44	.9985798	26.1	7 9 38.01	
4	338	252 23 31.5	22 28.7	152.36	0.31	.9985179	25.5	7 5 42.10	
5	339	253 24 28.7	23 25.7	152.40	0.18	.9984575	24.9	7 1 46.18	
6	340	254 25 26.8	24 23.6	152.44	-0.07	.9983987	24.2	6 57 50.27	
7	341	255 26 25.6	25 22.3	152.47	+0.03	.9983415	23.5	6 53 54.36	
8	342	256 27 25.0	26 21.5	152.49	0.11	.9982861	22.7	6 49 58.45	
9	343	257 28 25.0	27 21.3	152.51	0.17	.9982325	21.9	6 46 2.54	
10	344	258 29 25.5	28 21.6	152.53	0.19	.9981810	21.0	6 42 6.62	
11	345	259 30 26.6	29 22.5	152.55	0.17	.9981316	20.1	6 38 10.71	
12	346	260 31 28.1	30 23.9	152.57	0.12	.9980845	19.1	6 34 14.80	
13	347	261 32 30.1	31 25.7	152.59	+0.06	.9980398	18.0	6 30 18.89	
14	348	262 33 32.6	32 28.0	152.61	-0.03	.9929977	16.9	6 26 22.98	
15	349	263 34 35.5	33 30.7	152.63	0.15	.9929582	15.8	6 22 27.06	
16	350	264 35 39.0	34 34.0	152.66	0.28	.9929215	14.7	6 18 31.15	
17	351	265 36 43.1	35 37.9	152.69	0.41	.9928877	13.5	6 14 35.24	
18	352	266 37 47.7	36 42.3	152.72	0.54	.9928567	12.3	6 10 39.33	
19	353	267 38 53.0	37 47.4	152.75	0.67	.9928285	11.2	6 6 43.42	
20	354	268 39 58.9	38 53.1	152.77	0.78	.9928029	10.1	6 2 47.50	
21	355	269 41 5.4	39 59.4	152.79	0.88	.9927799	9.0	5 58 51.59	
22	356	270 42 12.6	41 6.4	152.82	0.95	.9927596	8.0	5 54 55.68	
23	357	271 43 20.5	42 14.1	152.84	0.99	.9927417	7.0	5 50 59.77	
24	358	272 44 29.0	43 22.4	152.86	0.99	.9927262	6.0	5 47 3.86	
25	359	273 45 37.9	44 31.1	152.88	0.99	.9927130	5.0	5 43 7.94	
26	360	274 46 47.3	45 40.4	152.90	0.96	.9927020	4.1	5 39 12.03	
27	361	275 47 57.3	46 50.2	152.92	0.89	.9926929	3.4	5 35 16.12	
28	362	276 49 7.7	48 0.4	152.94	0.79	.9926857	2.6	5 31 20.21	
29	363	277 50 18.4	49 10.9	152.95	0.67	.9926803	1.9	5 27 24.30	
30	364	278 51 29.4	50 21.7	152.96	0.55	.9926766	1.2	5 23 28.37	
31	365	279 52 40.6	51 32.8	152.97	0.43	.9926746	0.5	5 19 32.46	
32	366	280 53 52.0	52 44.0	152.97	-0.31	.9926743	0.3	5 15 36.55	

NOTE. — λ corresponds to the true equinox of the date, λ' to the mean equinox of January 04.

GREENWICH MEAN TIME.

THE MOON'S

Day of the Month.	SEMI-DIAMETER.		HORIZONTAL PARALLAX.			MERIDIAN PASSAGE.		AGE.
	Noon.	Midnight.	Noon.	Diff. for 1 hour.	Midnight.	Diff. for 1 hour.	h m	
							m	
1	16' 42.2	16' 40.8	61' 11.5	-0.23	61' 6.4	-0.63	0 6	28.8
2	16 38.0	16 34.1	60 56.4	1.02	60 42.0	1.38	0 13.9	0.4
3	16 29.1	16 23.1	60 23.6	1.69	60 1.6	1.95	1 18.0	1.4
4	16 16.4	16 9.1	59 36.9	2.16	59 10.0	2.31	2 18.8	2.4
5	16 1.4	15 53.5	58 41.6	2.40	58 12.6	2.43	3 14.7	3.4
6	15 45.5	15 37.8	57 43.5	2.41	57 15.0	2.34	4 5.8	4.4
7	15 30.3	15 23.2	56 47.5	2.23	56 21.5	2.09	4 52.8	5.4
8	15 16.6	15 10.6	55 57.4	1.93	55 35.3	1.75	5 36.8	6.4
9	15 5.2	15 0.4	55 15.4	1.56	54 57.9	1.36	6 19.1	7.4
10	14 56.3	14 52.9	54 42.9	1.15	54 30.2	0.95	7 0.8	8.4
11	14 50.1	14 48.0	54 20.1	0.75	54 12.2	0.56	7 42.9	9.4
12	14 46.5	14 45.6	54 6.7	0.37	54 3.3	-0.19	8 26.2	10.4
13	14 45.2	14 45.4	54 2.0	-0.03	54 2.6	+0.13	9 11.4	11.4
14	14 46.0	14 47.1	54 5.0	+0.27	54 8.9	0.39	9 58.7	12.4
15	14 48.6	14 50.4	54 14.4	0.51	54 21.1	0.61	10 48.1	13.4
16	14 52.6	14 55.0	54 29.0	0.71	54 38.0	0.79	11 38.8	14.4
17	14 57.7	15 0.6	54 47.9	0.86	54 58.7	0.93	12 29.9	15.4
18	15 3.8	15 7.1	55 10.2	0.99	55 22.5	1.05	13 20.6	16.4
19	15 10.7	15 14.4	55 35.5	1.11	55 49.1	1.16	14 9.9	17.4
20	15 18.3	15 22.3	56 3.4	1.22	56 18.3	1.27	14 57.9	18.4
21	15 26.6	15 31.0	56 33.9	1.32	56 50.1	1.38	15 44.6	19.4
22	15 35.5	15 40.3	57 6.9	1.43	57 24.3	1.47	16 30.9	20.4
23	15 45.2	15 50.1	57 42.1	1.51	58 0.5	1.54	17 17.5	21.4
24	15 55.2	16 0.3	58 19.0	1.55	58 37.6	1.55	18 5.8	22.4
25	16 5.3	16 10.1	58 56.0	1.52	59 13.9	1.45	18 56.7	23.4
26	16 14.7	16 19.0	59 30.8	1.36	59 46.4	1.23	19 51.4	24.4
27	16 22.7	16 25.8	60 0.1	1.06	60 11.6	0.85	20 50.1	25.4
28	16 28.2	16 29.7	60 20.3	0.60	60 25.9	+0.32	21 52.3	26.4
29	16 30.3	16 29.9	60 28.0	+0.02	60 26.3	-0.29	22 56.0	27.4
30	16 28.4	16 25.9	60 20.9	-0.61	60 11.7	0.92	23 58.5	28.4
31	16 22.4	16 18.0	59 58.9	1.22	59 42.6	1.48	0	29.4
32	16 12.7	16 6.8	59 23.4	-1.72	59 1.6	-1.91	0 57.6	0.9

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
SUNDAY 1.					TUESDAY 3.				
0	15 52 34.43	2.7273	S. 23° 11' 35.7"	5.188	0	18 3 57.10	2.6780	S. 23° 46' 26.2"	3.028
1	15 55 18.16	2.7304	23 16 38.6	4.900	1	18 6 37.63	2.6728	23 42 43.6	3.785
2	15 58 2.08	2.7334	23 21 30.9	4.781	2	18 9 17.84	2.6676	23 38 50.8	3.982
3	16 0 46.17	2.7362	23 26 12.4	4.692	3	18 11 57.73	2.6622	23 34 48.0	4.129
4	16 3 30.43	2.7388	23 30 43.2	4.622	4	18 14 37.30	2.6566	23 30 35.2	4.295
5	16 6 14.84	2.7413	23 35 3.1	4.541	5	18 17 16.52	2.6508	23 26 12.7	4.439
6	16 8 59.39	2.7436	23 39 12.1	4.489	6	18 19 55.40	2.6448	23 21 40.2	4.622
7	16 11 44.08	2.7458	23 43 10.2	4.457	7	18 22 33.93	2.6389	23 16 58.1	4.783
8	16 14 28.89	2.7477	23 46 57.3	4.434	8	18 25 12.09	2.6329	23 12 6.3	4.943
9	16 17 13.81	2.7495	23 50 33.4	4.419	9	18 27 49.89	2.6268	23 7 5.0	5.101
10	16 19 58.83	2.7511	23 53 58.5	4.402	10	18 30 27.31	2.6206	23 1 54.2	5.258
11	16 22 43.95	2.7526	23 57 12.5	4.381	11	18 33 4.35	2.6142	22 56 34.0	5.413
12	16 25 29.14	2.7539	24 0 15.4	4.365	12	18 35 41.01	2.6076	22 51 4.6	5.567
13	16 28 14.40	2.7549	24 3 7.1	4.353	13	18 38 17.27	2.6010	22 45 26.0	5.719
14	16 30 59.72	2.7557	24 5 47.7	4.343	14	18 40 53.13	2.5943	22 39 38.2	5.870
15	16 33 45.09	2.7563	24 8 17.0	4.335	15	18 43 28.59	2.5876	22 33 41.6	6.019
16	16 36 30.50	2.7570	24 10 35.2	4.329	16	18 46 3.64	2.5807	22 27 36.0	6.166
17	16 39 15.93	2.7573	24 12 42.2	4.322	17	18 48 38.27	2.5737	22 21 21.6	6.312
18	16 42 1.38	2.7575	24 14 37.9	4.316	18	18 51 12.48	2.5667	22 14 58.6	6.456
19	16 44 46.83	2.7575	24 16 22.4	4.311	19	18 53 46.27	2.5596	22 8 26.9	6.599
20	16 47 32.28	2.7573	24 17 55.6	4.306	20	18 56 19.63	2.5524	22 1 46.7	6.740
21	16 50 17.71	2.7569	24 19 17.6	4.301	21	18 58 52.56	2.5452	21 54 58.1	6.879
22	16 53 3.11	2.7563	24 20 28.3	4.295	22	19 1 25.05	2.5378	21 48 1.2	7.017
23	16 55 48.47	2.7555	S. 24° 21' 27.8"	4.289	23	19 3 57.10	2.5304	S. 21° 40' 56.0"	7.158
MONDAY 2.					WEDNESDAY 4.				
0	16 58 33.77	2.7545	S. 24° 22' 16.1"	4.710	0	19 6 28.70	2.5229	S. 21° 33' 42.8"	7.297
1	17 1 19.01	2.7534	24 22 53.1	4.692	1	19 8 59.85	2.5155	21 26 21.6	7.419
2	17 4 4.18	2.7520	24 23 18.9	4.678	2	19 11 30.56	2.5080	21 18 52.5	7.538
3	17 6 49.26	2.7505	24 23 33.5	4.668	3	19 14 0.81	2.5004	21 11 15.6	7.679
4	17 9 34.24	2.7489	24 23 36.9	4.660	4	19 16 30.61	2.4928	21 3 31.0	7.806
5	17 12 19.11	2.7469	24 23 29.1	4.652	5	19 18 59.95	2.4851	20 55 36.8	7.928
6	17 15 3.87	2.7448	24 23 10.1	4.646	6	19 21 28.82	2.4774	20 47 39.2	8.055
7	17 17 48.50	2.7426	24 22 40.0	4.641	7	19 23 57.24	2.4697	20 39 32.2	8.177
8	17 20 32.98	2.7402	24 21 58.9	4.637	8	19 26 25.19	2.4620	20 31 18.0	8.297
9	17 23 17.32	2.7376	24 21 6.7	4.632	9	19 28 52.67	2.4542	20 22 56.6	8.415
10	17 26 1.49	2.7347	24 20 3.5	4.626	10	19 31 19.69	2.4464	20 14 26.2	8.533
11	17 28 45.49	2.7317	24 18 49.3	4.621	11	19 33 46.24	2.4386	20 5 52.8	8.647
12	17 31 29.30	2.7286	24 17 24.1	4.616	12	19 36 12.32	2.4307	19 57 10.6	8.760
13	17 34 12.92	2.7253	24 15 48.0	4.611	13	19 38 37.93	2.4228	19 48 21.7	8.871
14	17 36 56.33	2.7218	24 14 1.1	4.605	14	19 41 3.06	2.4149	19 39 26.1	8.980
15	17 39 39.53	2.7182	24 12 3.3	4.600	15	19 43 27.72	2.4071	19 30 24.0	9.088
16	17 42 22.51	2.7143	24 9 54.8	4.595	16	19 45 51.91	2.3992	19 21 15.5	9.194
17	17 45 5.25	2.7103	24 7 35.6	4.590	17	19 48 15.63	2.3913	19 12 0.7	9.298
18	17 47 47.75	2.7063	24 5 5.7	4.585	18	19 50 38.87	2.3834	19 2 39.7	9.401
19	17 50 30.00	2.7019	24 2 25.2	4.580	19	19 53 1.64	2.3756	18 53 12.6	9.502
20	17 53 11.98	2.6974	23 59 34.2	4.575	20	19 55 23.94	2.3677	18 43 39.5	9.601
21	17 55 53.69	2.6929	23 56 32.7	4.570	21	19 57 45.77	2.3598	18 34 0.5	9.698
22	17 58 35.12	2.6881	23 53 20.8	4.565	22	20 0 7.13	2.3521	18 24 15.8	9.793
23	18 1 16.26	2.6832	23 49 58.6	4.560	23	20 2 28.02	2.3443	18 14 25.4	9.886
24	18 3 57.10	2.6780	S. 23° 40' 26.2"	4.555	24	20 4 48.44	2.3365	S. 18° 4' 29.5"	9.978

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
THURSDAY 5.					SATURDAY 7.				
0	20 4 48.44	2.2266	S. 18° 4 29.5	9.978	0	21 48 45.75	2.0177	S. 8 49 32.4	12.001
1	20 7 8.39	2.2267	17 54 28.1	10.068	1	21 50 46.66	2.0127	8 36 55.7	12.028
2	20 9 27.88	2.2268	17 44 21.3	10.157	2	21 52 47.27	2.0078	8 24 17.7	12.044
3	20 11 46.90	2.2122	17 34 9.2	10.244	3	21 54 47.59	2.0029	8 11 38.4	12.066
4	20 14 5.46	2.2055	17 23 52.0	10.329	4	21 56 47.62	1.9981	7 58 57.9	12.084
5	20 16 23.55	2.2078	17 13 29.7	10.413	5	21 58 47.36	1.9934	7 46 16.3	12.708
6	20 18 41.19	2.2001	17 3 2.4	10.496	6	22 0 46.83	1.9888	7 33 33.6	12.730
7	20 20 58.37	2.2025	16 52 30.3	10.575	7	22 2 46.02	1.9843	7 20 49.8	12.787
8	20 23 15.09	2.2749	16 41 53.4	10.654	8	22 4 44.94	1.9798	7 8 5.1	12.753
9	20 25 31.36	2.2673	16 31 11.8	10.731	9	22 6 43.60	1.9754	6 55 19.5	12.767
10	20 27 47.17	2.2596	16 20 25.7	10.806	10	22 8 41.99	1.9711	6 42 33.0	12.780
11	20 30 2.54	2.2524	16 9 35.1	10.879	11	22 10 40.13	1.9668	6 29 45.8	12.798
12	20 32 17.46	2.2450	15 58 40.2	10.951	12	22 12 38.01	1.9627	6 16 57.8	12.806
13	20 34 31.94	2.2377	15 47 41.0	11.022	13	22 14 35.65	1.9586	6 4 9.2	12.816
14	20 36 45.98	2.2303	15 36 37.6	11.091	14	22 16 33.04	1.9546	5 51 19.9	12.826
15	20 38 59.58	2.2230	15 25 30.1	11.158	15	22 18 30.20	1.9507	5 38 30.1	12.834
16	20 41 12.74	2.2158	15 14 18.6	11.224	16	22 20 27.13	1.9469	5 25 39.8	12.841
17	20 43 25.47	2.2086	15 3 3.2	11.288	17	22 22 23.83	1.9431	5 12 49.1	12.848
18	20 45 37.77	2.2015	14 51 44.0	11.351	18	22 24 20.30	1.9394	4 59 58.0	12.854
19	20 47 49.65	2.1944	14 40 21.0	11.413	19	22 26 16.56	1.9358	4 47 6.5	12.860
20	20 50 1.10	2.1874	14 28 54.4	11.473	20	22 28 12.60	1.9323	4 34 14.8	12.864
21	20 52 12.13	2.1804	14 17 24.3	11.531	21	22 30 8.43	1.9288	4 21 22.8	12.868
22	20 54 22.75	2.1735	14 5 50.7	11.588	22	22 32 4.06	1.9255	4 8 30.7	12.870
23	20 56 32.95	2.1667	S. 13 54 13.7	11.645	23	22 33 59.49	1.9222	S. 3 55 38.4	12.873
FRIDAY 6.					SUNDAY 8.				
0	20 58 42.75	2.1599	S. 13 42 33.5	11.697	0	22 35 54.72	1.9189	S. 3 42 46.0	12.873
1	21 0 52.14	2.1532	13 30 50.1	11.750	1	22 37 49.76	1.9167	3 29 53.6	12.873
2	21 3 1.13	2.1466	13 19 3.5	11.801	2	22 39 44.61	1.9147	3 17 1.2	12.873
3	21 5 9.73	2.1400	13 7 13.9	11.851	3	22 41 39.28	1.9097	3 4 8.9	12.871
4	21 7 17.93	2.1335	12 55 21.4	11.900	4	22 43 33.78	1.9068	2 51 16.7	12.868
5	21 9 25.74	2.1270	12 43 26.0	11.947	5	22 45 28.10	1.9040	2 38 24.7	12.866
6	21 11 33.17	2.1206	12 31 27.8	11.993	6	22 47 22.26	1.9012	2 25 32.9	12.861
7	21 13 40.22	2.1143	12 19 26.9	12.037	7	22 49 16.25	1.8985	2 12 41.3	12.857
8	21 15 46.89	2.1080	12 7 23.4	12.080	8	22 51 10.08	1.8959	1 59 50.1	12.851
9	21 17 53.18	2.1018	11 55 17.3	12.122	9	22 53 3.75	1.8933	1 46 59.3	12.844
10	21 19 59.11	2.0957	11 43 8.8	12.162	10	22 54 57.28	1.8909	1 34 8.8	12.837
11	21 22 4.67	2.0897	11 30 57.9	12.201	11	22 56 50.66	1.8885	1 21 18.7	12.830
12	21 24 9.88	2.0837	11 18 44.7	12.239	12	22 58 43.90	1.8862	1 8 29.2	12.821
13	21 26 14.73	2.0778	11 6 29.2	12.276	13	23 0 37.00	1.8839	0 55 40.2	12.812
14	21 28 19.22	2.0720	10 54 11.6	12.311	14	23 2 29.97	1.8818	0 42 51.8	12.802
15	21 30 23.37	2.0662	10 41 51.9	12.345	15	23 4 22.82	1.8797	0 30 4.0	12.792
16	21 32 27.17	2.0605	10 29 30.2	12.378	16	23 6 15.54	1.8777	0 17 16.8	12.780
17	21 34 30.63	2.0549	10 17 6.5	12.410	17	23 8 8.14	1.8758	S. 0 4 30.4	12.767
18	21 36 33.76	2.0494	10 4 41.0	12.441	18	23 10 0.63	1.8740	N. 0 8 15.3	12.754
19	21 38 36.56	2.0439	9 52 13.7	12.470	19	23 11 53.01	1.8722	0 21 0.2	12.741
20	21 40 39.03	2.0385	9 39 44.6	12.498	20	23 13 45.29	1.8705	0 33 44.2	12.737
21	21 42 41.18	2.0332	9 27 13.9	12.525	21	23 15 37.47	1.8688	0 46 27.4	12.713
22	21 44 43.01	2.0280	9 14 41.6	12.552	22	23 17 29.55	1.8672	0 59 9.6	12.696
23	21 46 44.53	2.0228	9 2 7.7	12.577	23	23 19 21.54	1.8657	1 11 50.9	12.680
24	21 48 45.75	2.0177	S. 8 49 32.4	12.601	24	23 21 13.44	1.8643	N. 1 24 31.2	12.663

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
MONDAY 9.					WEDNESDAY 11.				
0	23 21 13.44	1.8643	N. 1° 24' 31.2"	12.663	0	0 50 21.21	1.8728	N. 11° 0' 33.4"	11.100
1	23 23 5.26	1.8630	1 37 10.4	12.645	1	0 52 13.68	1.8754	11 11 37.9	11.082
2	23 24 57.00	1.8617	1 49 48.6	12.627	2	0 54 6.26	1.8771	11 22 39.6	11.063
3	23 26 48.66	1.8604	2 2 25.7	12.608	3	0 55 58.94	1.8788	11 33 38.3	10.984
4	23 28 40.25	1.8593	2 15 1.6	12.588	4	0 57 51.73	1.8807	11 44 34.1	10.904
5	23 30 31.77	1.8582	2 27 36.3	12.568	5	0 59 44.62	1.8825	11 55 26.9	10.824
6	23 32 23.23	1.8572	2 40 9.8	12.547	6	1 1 37.63	1.8844	12 6 16.6	10.743
7	23 34 14.63	1.8562	2 52 42.0	12.525	7	1 3 30.75	1.8863	12 17 3.3	10.662
8	23 36 5.98	1.8554	3 5 12.8	12.503	8	1 5 23.99	1.8883	12 27 46.9	10.580
9	23 37 57.28	1.8546	3 17 42.3	12.480	9	1 7 17.35	1.8904	12 38 27.3	10.497
10	23 39 48.53	1.8539	3 30 10.4	12.456	10	1 9 10.84	1.8926	12 49 4.6	10.413
11	23 41 39.74	1.8532	3 42 37.1	12.432	11	1 11 4.46	1.8947	12 59 38.6	10.329
12	23 43 30.92	1.8526	3 55 2.3	12.407	12	1 12 58.21	1.8969	13 10 9.3	10.244
13	23 45 22.06	1.8521	4 7 26.0	12.382	13	1 14 52.09	1.8992	13 20 36.7	10.159
14	23 47 13.17	1.8517	4 19 48.1	12.356	14	1 16 46.11	1.9015	13 31 0.8	10.073
15	23 49 4.26	1.8513	4 32 8.7	12.329	15	1 18 40.26	1.9038	13 41 21.6	9.987
16	23 50 55.33	1.8510	4 44 27.6	12.301	16	1 20 34.56	1.9063	13 51 38.9	9.900
17	23 52 46.38	1.8507	4 56 44.8	12.273	17	1 22 29.00	1.9086	14 1 52.8	9.812
18	23 54 37.42	1.8505	5 9 0.4	12.245	18	1 24 23.59	1.9110	14 12 3.2	9.724
19	23 56 28.45	1.8504	5 21 14.2	12.216	19	1 26 18.33	1.9135	14 22 10.0	9.634
20	23 58 19.47	1.8504	5 33 26.3	12.186	20	1 28 13.21	1.9160	14 32 13.3	9.544
21	0 0 10.49	1.8504	5 45 36.5	12.155	21	1 30 8.25	1.9186	14 42 12.9	9.453
22	0 2 1.52	1.8505	5 57 44.9	12.124	22	1 32 3.44	1.9212	14 52 8.9	9.362
23	0 3 52.56	1.8507	N. 6° 9' 51.4"	12.092	23	1 33 58.79	1.9239	N. 15° 2' 1.2"	9.271
TUESDAY 10.					THURSDAY 12.				
0	0 5 43.60	1.8509	N. 6° 21' 56.0"	12.060	0	1 35 54.31	1.9266	N. 15° 11' 49.8"	9.178
1	0 7 34.66	1.8511	6 33 58.6	12.027	1	1 37 49.99	1.9293	15 21 34.6	9.115
2	0 9 25.73	1.8514	6 45 59.2	11.993	2	1 39 45.83	1.9321	15 31 15.6	9.051
3	0 11 16.83	1.8518	6 57 57.8	11.959	3	1 41 41.84	1.9349	15 40 52.7	8.987
4	0 13 7.95	1.8522	7 9 54.3	11.924	4	1 43 38.02	1.9378	15 50 26.0	8.922
5	0 14 59.10	1.8527	7 21 48.7	11.889	5	1 45 34.37	1.9407	15 59 55.2	8.856
6	0 16 50.28	1.8533	7 33 41.0	11.853	6	1 47 30.90	1.9436	16 9 20.7	8.789
7	0 18 41.50	1.8539	7 45 31.1	11.816	7	1 49 27.60	1.9465	16 18 42.0	8.722
8	0 20 32.75	1.8546	7 57 18.9	11.779	8	1 51 24.48	1.9495	16 27 59.3	8.654
9	0 22 24.05	1.8554	8 9 4.5	11.741	9	1 53 21.54	1.9525	16 37 12.5	8.586
10	0 24 15.40	1.8562	8 20 47.8	11.703	10	1 55 18.78	1.9555	16 46 21.5	8.518
11	0 26 6.80	1.8571	8 32 28.8	11.664	11	1 57 16.20	1.9586	16 55 26.4	8.449
12	0 27 58.25	1.8581	8 44 7.5	11.624	12	1 59 13.80	1.9616	17 4 27.0	8.379
13	0 29 49.76	1.8591	8 55 43.8	11.584	13	2 1 11.59	1.9647	17 13 23.4	8.308
14	0 31 41.34	1.8601	9 7 17.6	11.543	14	2 3 9.57	1.9678	17 22 15.5	8.237
15	0 33 32.98	1.8612	9 18 48.9	11.501	15	2 5 7.74	1.9710	17 31 3.2	8.165
16	0 35 24.68	1.8624	9 30 17.7	11.459	16	2 7 6.09	1.9742	17 39 46.6	8.093
17	0 37 16.46	1.8636	9 41 43.9	11.416	17	2 9 4.64	1.9774	17 48 25.5	8.021
18	0 39 8.31	1.8649	9 53 7.6	11.373	18	2 11 3.38	1.9806	17 57 0.0	7.948
19	0 41 0.24	1.8662	10 4 28.7	11.329	19	2 13 2.32	1.9839	18 5 30.0	7.875
20	0 42 52.26	1.8676	10 15 47.1	11.284	20	2 15 1.45	1.9871	18 13 55.4	7.802
21	0 44 44.36	1.8691	10 27 2.8	11.239	21	2 17 0.78	1.9904	18 22 16.2	7.728
22	0 46 36.55	1.8706	10 38 15.8	11.193	22	2 19 0.30	1.9937	18 30 32.4	7.654
23	0 48 28.83	1.8722	10 49 26.0	11.147	23	2 21 0.02	1.9971	18 38 43.9	7.579
24	0 50 21.21	1.8738	N. 11° 0' 33.4"	11.100	24	2 22 59.95	2.0004	N. 18° 46' 50.7"	7.503

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Dif. for 1 m.	Declination.	Dif. for 1 m.	Hour.	Right Ascension.	Dif. for 1 m.	Declination.	Dif. for 1 m.
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FRIDAY 13.

Hour	h	m	s	"	N.18°	46'	50.7"	"
0	2	22	59.95	2.0004			6.073	
1	2	25	0.07	2.0088	18	54	52.7	7.904
2	2	27	0.40	2.0073	19	2	50.0	7.914
3	2	29	0.93	2.0106	19	10	42.4	7.883
4	2	31	1.67	2.0139	19	18	30.0	7.751
5	2	33	2.61	2.0173	19	26	12.6	7.669
6	2	35	3.75	2.0207	19	33	50.3	7.806
7	2	37	5.10	2.0242	19	41	22.9	7.603
8	2	39	6.66	2.0277	19	48	50.5	7.417
9	2	41	8.43	2.0313	19	56	13.0	7.333
10	2	43	10.40	2.0346	20	3	30.3	7.946
11	2	45	12.58	2.0380	20	10	42.5	7.180
12	2	47	14.96	2.0415	20	17	49.4	7.073
13	2	49	17.55	2.0449	20	24	51.1	6.984
14	2	51	20.35	2.0484	20	31	47.5	6.895
15	2	53	23.36	2.0518	20	38	38.5	6.806
16	2	55	26.57	2.0553	20	45	24.2	6.716
17	2	57	29.99	2.0587	20	52	4.5	6.626
18	2	59	33.61	2.0622	20	58	39.3	6.534
19	3	1	37.44	2.0656	21	5	8.6	6.442
20	3	3	41.48	2.0690	21	11	32.3	6.349
21	3	5	45.72	2.0723	21	17	50.5	6.256
22	3	7	50.16	2.0756	21	24	3.0	6.163
23	3	9	54.81	2.0792	N.21	30	9.9	6.068

SUNDAY 15.

Hour	h	m	s	"	N.23°	30'	27.7"	"
0	4	2	54.32	2.1673			2.483	
1	4	5	3.84	2.1809	23	33	54.0	3.363
2	4	7	13.51	2.1925	23	37	13.6	3.373
3	4	9	23.34	2.1651	23	40	26.6	3.161
4	4	11	33.32	2.1677	23	43	32.9	3.049
5	4	13	43.46	2.1702	23	46	32.4	2.936
6	4	15	53.74	2.1726	23	49	25.2	2.823
7	4	18	4.17	2.1750	23	52	11.2	2.709
8	4	20	14.74	2.1774	23	54	50.3	2.596
9	4	22	25.46	2.1797	23	57	22.6	2.483
10	4	24	36.31	2.1820	23	59	48.1	2.367
11	4	26	47.29	2.1842	24	2	6.7	2.253
12	4	28	58.41	2.1864	24	4	18.4	2.136
13	4	31	9.66	2.1885	24	6	23.1	2.021
14	4	33	21.03	2.1906	24	8	20.9	1.906
15	4	35	32.53	2.1927	24	10	11.7	1.788
16	4	37	44.15	2.1946	24	11	55.5	1.671
17	4	39	55.88	2.1965	24	13	32.2	1.553
18	4	42	7.73	2.1983	24	15	1.9	1.435
19	4	44	19.68	2.2001	24	16	24.5	1.317
20	4	46	31.74	2.2018	24	17	40.0	1.199
21	4	48	43.90	2.2035	24	18	48.4	1.081
22	4	50	56.16	2.2051	24	19	49.7	0.963
23	4	53	8.52	2.2067	N.24	20	43.8	0.845

SATURDAY 14.

Hour	h	m	s	"	N.21°	36'	11.1"	"
0	3	11	59.66	2.0826			5.972	
1	3	14	4.71	2.0859	21	42	6.5	5.876
2	3	16	9.97	2.0893	21	47	56.2	5.779
3	3	18	15.43	2.0927	21	53	40.0	5.681
4	3	20	21.09	2.0960	21	59	17.9	5.583
5	3	22	26.95	2.0993	22	4	50.0	5.485
6	3	24	33.01	2.1026	22	10	16.1	5.385
7	3	26	39.27	2.1060	22	15	36.2	5.285
8	3	28	45.72	2.1092	22	20	50.3	5.184
9	3	30	52.37	2.1124	22	25	58.3	5.083
10	3	32	59.21	2.1156	22	31	0.3	4.981
11	3	35	6.24	2.1188	22	35	56.1	4.879
12	3	37	13.47	2.1220	22	40	45.8	4.776
13	3	39	20.89	2.1252	22	45	29.2	4.673
14	3	41	28.49	2.1283	22	50	6.4	4.569
15	3	43	36.27	2.1313	22	54	37.4	4.463
16	3	45	44.24	2.1343	22	59	2.0	4.356
17	3	47	52.39	2.1373	23	3	20.3	4.247
18	3	50	0.72	2.1403	23	7	32.2	4.145
19	3	52	9.23	2.1432	23	11	37.7	4.039
20	3	54	17.91	2.1461	23	15	36.7	3.930
21	3	56	26.76	2.1490	23	19	29.3	3.823
22	3	58	35.78	2.1517	23	23	15.3	3.713
23	4	0	44.97	2.1545	23	26	54.8	3.603
24	4	2	54.32	2.1573	N.23	30	27.7	3.493

MONDAY 16.

Hour	h	m	s	"	N.24°	21'	30.8"	"
0	4	55	20.96	2.2061			0.723	
1	4	57	33.49	2.2095	24	22	10.6	0.603
2	4	59	46.10	2.2109	24	22	43.2	0.483
3	5	1	58.79	2.2122	24	23	8.6	0.363
4	5	4	11.56	2.2134	24	23	26.7	0.243
5	5	6	24.40	2.2145	24	23	37.6	0.122
6	5	8	37.30	2.2156	24	23	41.3	0.001
7	5	10	50.27	2.2167	24	23	37.7	0.120
8	5	13	3.30	2.2178	24	23	26.9	0.241
9	5	15	16.38	2.2184	24	23	8.7	0.363
10	5	17	29.51	2.2188	24	22	43.3	0.484
11	5	19	42.69	2.2201	24	22	10.6	0.603
12	5	21	55.92	2.2208	24	21	30.6	0.727
13	5	24	9.19	2.2214	24	20	43.3	0.849
14	5	26	22.49	2.2220	24	19	48.7	0.971
15	5	28	35.83	2.2225	24	18	46.8	1.093
16	5	30	49.19	2.2229	24	17	37.5	1.215
17	5	33	2.58	2.2233	24	16	20.9	1.337
18	5	35	15.99	2.2236	24	14	57.1	1.459
19	5	37	29.41	2.2238	24	13	26.0	1.580
20	5	39	42.85	2.2240	24	11	47.5	1.702
21	5	41	56.30	2.2242	24	10	1.7	1.824
22	5	44	9.75	2.2243	24	8	8.6	1.946
23	5	46	23.20	2.2242	24	6	8.2	2.068
24	5	48	36.65	2.2241	N.24	4	0.4	2.190

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
TUESDAY 17.					THURSDAY 19.				
0	5 48 36.65	2.2241	N.24° 4' 0.4"	2.190	0	7 34 12.37	2.1684	N.20° 3' 9.9"	7.891
1	5 50 50.10	2.2240	24 1 45.3	2.212	1	7 36 21.80	2.1661	19 55 25.4	7.793
2	5 53 3.53	2.2228	23 59 23.0	2.434	2	7 38 31.10	2.1688	19 47 34.7	7.695
3	5 55 16.95	2.2225	23 56 53.3	2.555	3	7 40 40.26	2.1616	19 39 37.9	7.597
4	5 57 30.35	2.2221	23 54 16.4	2.676	4	7 42 49.28	2.1498	19 31 35.1	6.607
5	5 59 43.73	2.2227	23 51 32.2	2.797	5	7 44 58.17	2.1470	19 23 26.3	6.197
6	6 1 57.08	2.2222	23 48 40.7	2.918	6	7 47 6.92	2.1447	19 15 11.5	6.286
7	6 4 10.40	2.2217	23 45 42.0	3.039	7	7 49 15.53	2.1423	19 6 50.7	6.286
8	6 6 23.69	2.2212	23 42 36.0	3.160	8	7 51 24.00	2.1400	18 58 24.1	6.482
9	6 8 36.94	2.2206	23 39 22.8	3.281	9	7 53 32.33	2.1377	18 49 51.6	6.580
10	6 10 50.16	2.2199	23 36 2.3	3.401	10	7 55 40.52	2.1353	18 41 13.4	6.678
11	6 13 3.33	2.2192	23 32 34.6	3.521	11	7 57 48.57	2.1329	18 32 29.4	6.776
12	6 15 16.46	2.2184	23 28 59.8	3.641	12	7 59 56.47	2.1306	18 23 39.6	6.874
13	6 17 29.54	2.2176	23 25 17.7	3.761	13	8 2 4.23	2.1282	18 14 44.2	6.972
14	6 19 42.56	2.2168	23 21 28.5	3.880	14	8 4 11.86	2.1259	18 5 43.2	6.980
15	6 21 55.52	2.2160	23 17 32.1	3.999	15	8 6 19.35	2.1236	17 56 36.6	6.138
16	6 24 8.42	2.2144	23 13 28.6	4.118	16	8 8 26.69	2.1212	17 47 24.5	6.247
17	6 26 21.25	2.2138	23 9 18.0	4.237	17	8 10 33.89	2.1188	17 38 6.9	6.356
18	6 28 34.02	2.2132	23 5 0.2	4.356	18	8 12 40.95	2.1165	17 28 43.9	6.454
19	6 30 46.72	2.2116	23 0 35.3	4.475	19	8 14 47.87	2.1142	17 19 15.5	6.516
20	6 32 59.34	2.2097	22 56 3.4	4.594	20	8 16 54.65	2.1119	17 9 41.7	6.607
21	6 35 11.88	2.2084	22 51 24.5	4.707	21	8 19 1.29	2.1096	17 0 2.6	6.686
22	6 37 24.35	2.2071	22 46 38.5	4.824	22	8 21 7.80	2.1073	16 50 18.2	6.784
23	6 39 36.74	2.2057	N.22° 41' 45.6"	4.940	23	8 23 14.17	2.1050	N.16° 40' 28.6"	6.882
WEDNESDAY 18.					FRIDAY 20.				
0	6 41 49.04	2.2043	N.22° 36' 45.7"	5.056	0	8 25 20.40	2.1027	N.16° 30' 33.9"	6.986
1	6 44 1.25	2.2027	22 31 38.8	5.172	1	8 27 26.49	2.1004	16 20 34.0	10.080
2	6 46 13.37	2.2012	22 26 25.0	5.287	2	8 29 32.45	2.0982	16 10 29.1	10.134
3	6 48 25.40	2.1997	22 21 4.3	5.402	3	8 31 38.28	2.0960	16 0 19.1	10.200
4	6 50 37.33	2.1981	22 15 36.8	5.516	4	8 33 43.97	2.0938	15 50 4.1	10.280
5	6 52 49.17	2.1964	22 10 2.4	5.630	5	8 35 49.53	2.0916	15 39 44.2	10.372
6	6 55 0.90	2.1947	22 4 21.2	5.743	6	8 37 54.96	2.0894	15 29 19.4	10.463
7	6 57 12.53	2.1929	21 58 33.2	5.856	7	8 40 0.26	2.0872	15 18 49.8	10.553
8	6 59 24.05	2.1911	21 52 38.5	5.968	8	8 42 5.43	2.0850	15 8 15.4	10.642
9	7 1 35.46	2.1893	21 46 37.0	6.080	9	8 44 10.48	2.0828	14 57 36.3	10.691
10	7 3 46.77	2.1875	21 40 28.9	6.191	10	8 46 15.40	2.0806	14 46 52.5	10.780
11	7 5 57.97	2.1857	21 34 14.1	6.302	11	8 48 20.20	2.0784	14 36 4.1	10.844
12	7 8 9.05	2.1837	21 27 52.6	6.412	12	8 50 24.87	2.0762	14 25 11.2	10.920
13	7 10 20.01	2.1817	21 21 24.5	6.522	13	8 52 29.42	2.0740	14 14 13.7	10.986
14	7 12 30.86	2.1797	21 14 49.9	6.631	14	8 54 33.86	2.0718	14 3 11.8	11.050
15	7 14 41.58	2.1777	21 8 8.8	6.740	15	8 56 38.18	2.0710	13 52 5.4	11.142
16	7 16 52.18	2.1756	21 1 21.1	6.849	16	8 58 42.38	2.0691	13 40 54.7	11.215
17	7 19 2.65	2.1735	20 54 26.9	6.957	17	9 0 46.47	2.0673	13 29 39.7	11.288
18	7 21 13.00	2.1714	20 47 26.3	7.063	18	9 2 50.44	2.0654	13 18 20.4	11.357
19	7 23 23.22	2.1692	20 40 19.3	7.169	19	9 4 54.31	2.0636	13 6 56.9	11.427
20	7 25 33.31	2.1671	20 33 6.0	7.275	20	9 6 58.07	2.0618	12 55 29.2	11.496
21	7 27 43.27	2.1649	20 25 46.3	7.380	21	9 9 1.72	2.0600	12 43 57.4	11.564
22	7 29 53.10	2.1628	20 18 20.4	7.484	22	9 11 5.37	2.0582	12 32 21.5	11.631
23	7 32 2.80	2.1606	20 10 48.3	7.588	23	9 13 8.72	2.0567	12 20 41.6	11.698
24	7 34 12.37	2.1584	N.20° 3' 9.9"	7.691	24	9 15 12.07	2.0550	N.12° 8' 57.8"	11.763

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
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SATURDAY 21.

0	9 15 12.07	2.0660	N. 12° 8' 57.8"	11.763
1	9 17 15.32	2.0634	11 57 10.0	11.938
2	9 19 18.48	2.0619	11 45 18.4	11.891
3	9 21 21.55	2.0604	11 33 23.0	11.904
4	9 23 24.53	2.0490	11 21 23.9	12.916
5	9 25 27.43	2.0476	11 9 21.1	12.077
6	9 27 30.24	2.0462	10 57 14.6	12.188
7	9 29 32.97	2.0449	10 45 4.6	12.197
8	9 31 35.63	2.0436	10 32 51.0	12.265
9	9 33 38.91	2.0424	10 20 33.9	12.313
10	9 35 40.72	2.0412	10 8 13.4	12.370
11	9 37 43.16	2.0401	9 55 49.5	12.426
12	9 39 45.53	2.0390	9 43 22.3	12.480
13	9 41 47.84	2.0380	9 30 51.9	12.534
14	9 43 50.09	2.0370	9 18 18.2	12.587
15	9 45 52.28	2.0361	9 5 41.4	12.639
16	9 47 54.42	2.0353	8 53 1.5	12.690
17	9 49 56.50	2.0345	8 40 18.5	12.741
18	9 51 58.54	2.0338	8 27 32.6	12.790
19	9 54 0.54	2.0332	8 14 43.7	12.838
20	9 56 2.49	2.0328	8 1 52.0	12.886
21	9 58 4.41	2.0317	7 48 57.4	12.932
22	10 0 6.29	2.0311	7 36 0.1	12.978
23	10 2 8.14	2.0306	N. 7° 23' 0.0"	13.023

MONDAY 23.

0	10 52 55.18	2.0390	N. 1° 46' 4.1"	12.929
1	10 54 57.55	2.0402	1 32 13.8	12.948
2	10 57 0.00	2.0415	1 18 22.3	12.966
3	10 59 2.53	2.0428	1 4 29.8	12.984
4	11 1 5.14	2.0442	0 50 36.2	12.991
5	11 3 7.84	2.0457	0 36 41.7	12.916
6	11 5 10.63	2.0473	0 22 46.3	12.930
7	11 7 13.52	2.0489	N. 0° 8' 50.1"	12.943
8	11 9 16.50	2.0506	S. 0° 5' 6.8"	12.964
9	11 11 19.59	2.0524	0 19 4.4	12.986
10	11 13 22.79	2.0543	0 33 2.6	12.974
11	11 15 26.11	2.0562	0 47 1.4	12.983
12	11 17 29.54	2.0582	1 1 0.6	12.991
13	11 19 33.10	2.0602	1 15 0.3	12.997
14	11 21 36.78	2.0623	1 29 0.3	14.003
15	11 23 40.60	2.0647	1 43 0.6	14.007
16	11 25 44.55	2.0671	1 57 1.2	14.010
17	11 27 48.65	2.0696	2 11 1.9	14.012
18	11 29 52.89	2.0720	2 25 2.7	14.013
19	11 31 57.28	2.0745	2 39 3.5	14.012
20	11 34 1.83	2.0771	2 53 4.2	14.011
21	11 36 6.54	2.0798	3 7 4.8	14.008
22	11 38 11.41	2.0826	3 21 5.2	14.006
23	11 40 16.45	2.0854	S. 3° 35' 5.4"	14.000

SUNDAY 22.

0	10 4 9.96	2.0303	N. 7° 9' 57.3"	12.067
1	10 6 11.76	2.0308	6 56 52.0	12.110
2	10 8 13.54	2.0306	6 43 44.1	12.152
3	10 10 15.30	2.0302	6 30 33.8	12.193
4	10 12 17.05	2.0300	6 17 21.0	12.233
5	10 14 18.79	2.0300	6 4 5.9	12.273
6	10 16 20.52	2.0300	5 50 48.4	12.310
7	10 18 22.25	2.0300	5 37 28.7	12.347
8	10 20 23.98	2.0300	5 24 6.7	12.383
9	10 22 25.72	2.0301	5 10 42.6	12.418
10	10 24 27.47	2.0302	4 57 16.5	12.453
11	10 26 29.23	2.0304	4 43 48.3	12.487
12	10 28 31.01	2.0306	4 30 18.1	12.519
13	10 30 32.81	2.0303	4 16 46.0	12.550
14	10 32 34.64	2.0307	4 3 12.1	12.580
15	10 34 36.49	2.0312	3 49 36.4	12.610
16	10 36 38.38	2.0318	3 35 58.9	12.639
17	10 38 40.30	2.0324	3 22 19.8	12.665
18	10 40 42.27	2.0332	3 8 39.1	12.692
19	10 42 44.29	2.0340	2 54 56.8	12.717
20	10 44 46.35	2.0349	2 41 13.0	12.742
21	10 46 48.47	2.0359	2 27 27.8	12.765
22	10 48 50.64	2.0368	2 13 41.2	12.788
23	10 50 52.88	2.0378	1 59 53.3	12.809
24	10 52 55.18	2.0390	N. 1° 46' 4.1"	12.829

TUESDAY 24.

0	11 42 21.66	2.0883	S. 3° 49' 5.2"	12.984
1	11 44 27.05	2.0913	4 3 4.6	12.986
2	11 46 32.62	2.0944	4 17 3.5	12.977
3	11 48 38.37	2.0976	4 31 1.9	12.967
4	11 50 44.32	2.1008	4 44 59.6	12.946
5	11 52 50.46	2.1041	4 58 56.6	12.944
6	11 54 56.81	2.1075	5 12 52.9	12.981
7	11 57 3.36	2.1109	5 26 48.4	12.917
8	11 59 10.12	2.1144	5 40 42.9	12.900
9	12 1 17.09	2.1180	5 54 36.4	12.883
10	12 3 24.28	2.1217	6 8 28.8	12.964
11	12 5 31.70	2.1255	6 22 20.1	12.845
12	12 7 39.34	2.1293	6 36 10.2	12.894
13	12 9 47.21	2.1332	6 49 59.0	12.862
14	12 11 55.32	2.1373	7 3 46.4	12.778
15	12 14 3.67	2.1413	7 17 32.3	12.783
16	12 16 12.27	2.1453	7 31 16.7	12.737
17	12 18 21.11	2.1495	7 44 59.5	12.699
18	12 20 30.21	2.1538	7 58 40.6	12.670
19	12 22 39.56	2.1581	8 12 19.9	12.639
20	12 24 49.18	2.1625	8 25 57.3	12.607
21	12 26 59.06	2.1669	8 39 32.8	12.574
22	12 29 9.21	2.1715	8 53 6.2	12.540
23	12 31 19.64	2.1761	9 6 37.5	12.504
24	12 33 30.34	2.1808	S. 9° 20' 6.7"	12.467

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
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WEDNESDAY 25.

Hour	h	m	s	"	S.	°	'	"	"
0	12	33	30.34	2.1868	S.	9	20	6.7	13.467
1	12	35	41.33	2.1866		9	33	33.6	13.438
2	12	37	52.60	2.1903		9	46	58.1	13.398
3	12	40	4.17	2.1962		10	0	20.1	13.346
4	12	42	16.03	2.2003		10	13	39.6	13.303
5	12	44	28.19	2.2062		10	26	56.5	13.258
6	12	46	40.66	2.2104		10	40	10.6	13.212
7	12	48	53.44	2.2168		10	53	21.9	13.166
8	12	51	6.53	2.2208		11	6	30.4	13.116
9	12	53	19.94	2.2261		11	19	35.9	13.066
10	12	55	33.66	2.2314		11	32	38.3	13.014
11	12	57	47.70	2.2368		11	45	37.5	12.960
12	13	0	2.07	2.2432		11	58	33.5	12.905
13	13	2	16.77	2.2477		12	11	26.2	12.849
14	13	4	31.80	2.2533		12	24	15.4	12.791
15	13	6	47.17	2.2599		12	37	1.1	12.731
16	13	9	2.87	2.2646		12	49	43.1	12.670
17	13	11	18.92	2.2703		13	2	21.5	12.607
18	13	13	35.31	2.2761		13	14	56.0	12.543
19	13	15	52.05	2.2820		13	27	26.6	12.477
20	13	18	9.15	2.2879		13	39	53.2	12.409
21	13	20	26.60	2.2938		13	52	15.7	12.340
22	13	22	44.40	2.2998		14	4	34.0	12.269
23	13	25	2.56	2.3068	S.	14	16	48.0	12.197

FRIDAY 27.

Hour	h	m	s	"	S.	°	'	"	"
0	14	24	39.44	2.4652	S.	18	54	29.7	9.843
1	14	27	7.54	2.4716		19	4	16.8	9.796
2	14	29	36.03	2.4780		19	13	56.8	9.686
3	14	32	4.90	2.4843		19	23	29.7	9.486
4	14	34	34.15	2.4907		19	32	55.3	9.286
5	14	37	3.78	2.4971		19	42	13.6	9.243
6	14	39	33.80	2.5034		19	51	24.5	9.116
7	14	42	4.20	2.5097		20	0	27.9	8.993
8	14	44	34.97	2.5160		20	9	23.6	8.864
9	14	47	6.11	2.5223		20	18	11.6	8.736
10	14	49	37.63	2.5284		20	26	51.8	8.604
11	14	52	9.52	2.5346		20	35	24.1	8.471
12	14	54	41.77	2.5406		20	43	48.3	8.336
13	14	57	14.39	2.5466		20	52	4.4	8.200
14	14	59	47.36	2.5526		21	0	12.3	8.063
15	15	2	20.69	2.5584		21	8	11.9	7.923
16	15	4	54.37	2.5642		21	16	3.1	7.783
17	15	7	28.40	2.5700		21	23	45.8	7.640
18	15	10	2.77	2.5757		21	31	19.9	7.497
19	15	12	37.48	2.5813		21	38	45.4	7.353
20	15	15	12.53	2.5868		21	46	2.1	7.206
21	15	17	47.91	2.5923		21	53	9.9	7.056
22	15	20	23.61	2.5977		22	0	8.8	6.907
23	15	22	59.63	2.6030	S.	22	6	58.7	6.756

THURSDAY 26.

Hour	h	m	s	"	S.	°	'	"	"
0	13	27	21.09	2.3119	S.	14	28	57.6	12.133
1	13	29	39.99	2.3180		14	41	2.7	12.047
2	13	31	59.25	2.3241		14	53	3.2	11.970
3	13	34	18.88	2.3303		15	4	59.0	11.891
4	13	36	38.88	2.3365		15	16	50.1	11.810
5	13	38	59.26	2.3428		15	28	36.2	11.737
6	13	41	20.02	2.3491		15	40	17.4	11.663
7	13	43	41.16	2.3554		15	51	53.5	11.588
8	13	46	2.67	2.3618		16	3	24.4	11.471
9	13	48	24.57	2.3682		16	14	50.0	11.382
10	13	50	46.85	2.3745		16	26	10.2	11.291
11	13	53	9.51	2.3809		16	37	24.9	11.198
12	13	55	32.56	2.3873		16	48	34.0	11.104
13	13	57	56.00	2.3938		16	59	37.4	11.008
14	14	0	19.82	2.4002		17	10	35.0	10.911
15	14	2	44.03	2.4067		17	21	26.8	10.812
16	14	5	8.63	2.4132		17	32	12.5	10.711
17	14	7	33.62	2.4197		17	42	52.1	10.608
18	14	9	59.00	2.4262		17	53	25.5	10.504
19	14	12	24.77	2.4327		18	3	52.6	10.398
20	14	14	50.92	2.4392		18	14	13.3	10.290
21	14	17	17.46	2.4457		18	24	27.5	10.181
22	14	19	44.40	2.4522		18	34	35.0	10.069
23	14	22	11.73	2.4587		18	44	35.8	9.966
24	14	24	39.44	2.4652	S.	18	54	29.7	9.843

SATURDAY 28.

Hour	h	m	s	"	S.	°	'	"	"
0	15	25	35.97	2.6092	S.	22	13	39.5	6.608
1	15	28	12.02	2.6132		22	20	11.1	6.449
2	15	30	49.57	2.6183		22	26	33.4	6.294
3	15	33	26.82	2.6233		22	32	46.3	6.137
4	15	36	4.36	2.6281		22	38	49.8	5.979
5	15	38	42.19	2.6328		22	44	43.8	5.820
6	15	41	20.30	2.6374		22	50	28.2	5.659
7	15	43	58.68	2.6418		22	56	2.9	5.497
8	15	46	37.32	2.6462		23	1	27.9	5.336
9	15	49	16.22	2.6504		23	6	43.1	5.171
10	15	51	55.38	2.6546		23	11	48.4	5.007
11	15	54	34.78	2.6588		23	16	43.8	4.841
12	15	57	14.41	2.6633		23	21	29.3	4.674
13	15	59	54.27	2.6683		23	26	4.7	4.505
14	16	2	34.35	2.6733		23	30	29.9	4.336
15	16	5	14.64	2.6782		23	34	45.0	4.166
16	16	7	55.14	2.6831		23	38	49.8	3.996
17	16	10	35.83	2.6879		23	42	44.4	3.823
18	16	13	16.70	2.6927		23	46	28.6	3.650
19	16	15	57.75	2.6975		23	50	2.4	3.477
20	16	18	38.96	2.7023		23	53	25.8	3.303
21	16	21	20.33	2.7070		23	56	38.7	3.126
22	16	24	1.86	2.7118		23	59	41.1	2.952
23	16	26	43.53	2.7166		24	2	32.9	2.776
24	16	29	25.33	2.7213	S.	24	5	14.2	2.599

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.	Hour.	Right Ascension.	Diff. for 1 m.	Declination.	Diff. for 1 m.
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SUNDAY 29.

h	m	s	°	'	"	
0	16	29	25.33	2.6977	S. 24 5 14.2	2.599
1	16	32	7.25	2.6987	24 7 44.8	2.421
2	16	34	49.29	2.7014	24 10 4.7	2.243
3	16	37	31.42	2.7030	24 12 14.0	2.065
4	16	40	13.65	2.7045	24 14 12.5	1.886
5	16	42	55.96	2.7066	24 16 0.2	1.706
6	16	45	38.35	2.7089	24 17 37.2	1.527
7	16	48	20.80	2.7079	24 19 3.4	1.347
8	16	51	3.30	2.7087	24 20 18.8	1.167
9	16	53	45.84	2.7098	24 21 23.4	0.987
10	16	56	28.42	2.7098	24 22 17.2	0.806
11	16	59	11.02	2.7101	24 23 0.1	0.626
12	17	1	53.63	2.7103	24 23 32.2	0.444
13	17	4	36.24	2.7102	24 23 53.4	0.263
14	17	7	18.85	2.7099	24 24 3.8	0.082
15	17	10	1.44	2.7095	24 24 3.3	0.099
16	17	12	43.99	2.7089	24 23 52.0	0.379
17	17	15	26.51	2.7082	24 23 29.9	0.459
18	17	18	8.97	2.7072	24 22 56.9	0.640
19	17	20	51.37	2.7061	24 22 13.1	0.820
20	17	23	33.70	2.7048	24 21 18.5	1.000
21	17	26	15.95	2.7034	24 20 13.1	1.179
22	17	28	58.11	2.7018	24 18 57.0	1.358
23	17	31	40.17	2.7001	S. 24 17 30.1	1.537

MONDAY 30.

0	17	34	22.12	2.6981	S. 24 15 52.6	1.715
1	17	37	3.95	2.6980	24 14 4.4	1.593
2	17	39	45.64	2.6987	24 12 5.5	2.070
3	17	42	27.20	2.6913	24 9 56.0	2.247
4	17	45	8.60	2.6897	24 7 35.9	2.423
5	17	47	49.84	2.6859	24 5 5.2	2.598
6	17	50	30.91	2.6830	24 2 24.1	2.772
7	17	53	11.80	2.6800	23 59 32.5	2.946
8	17	55	52.51	2.6766	23 56 30.6	3.119
9	17	58	33.02	2.6734	23 53 18.3	3.291
10	18	1	13.32	2.6699	23 49 55.7	3.462
11	18	3	53.40	2.6662	23 46 22.9	3.632
12	18	6	33.26	2.6624	23 42 39.8	3.802
13	18	9	12.89	2.6584	23 38 46.6	3.970
14	18	11	52.27	2.6543	23 34 43.4	4.138
15	18	14	31.40	2.6501	23 30 30.1	4.304
16	18	17	10.28	2.6457	23 26 6.9	4.469
17	18	19	48.89	2.6412	23 21 33.8	4.633
18	18	22	27.23	2.6366	23 16 50.9	4.796
19	18	25	5.28	2.6318	23 11 58.2	4.958
20	18	27	43.05	2.6269	23 6 55.9	5.119
21	18	30	20.52	2.6219	23 1 44.0	5.277
22	18	32	57.68	2.6168	22 56 22.6	5.435
23	18	35	34.53	2.6115	22 50 51.8	5.592
24	18	38	11.06	2.6062	S. 22 45 11.6	5.747

TUESDAY 31.

h	m	s	°	'	"	
0	18	38	11.06	2.6032	S. 22 45 11.6	5.747
1	18	40	47.27	2.6007	22 39 22.1	5.901
2	18	43	23.14	2.5951	22 33 23.5	6.054
3	18	45	58.68	2.5894	22 27 15.7	6.205
4	18	48	33.87	2.5836	22 20 58.9	6.354
5	18	51	8.72	2.5778	22 14 33.2	6.502
6	18	53	43.21	2.5719	22 7 58.6	6.649
7	18	56	17.34	2.5658	22 1 15.2	6.795
8	18	58	51.11	2.5596	21 54 23.2	6.939
9	19	1	24.50	2.5534	21 47 22.6	7.081
10	19	3	57.52	2.5471	21 40 13.5	7.221
11	19	6	30.16	2.5408	21 32 56.0	7.360
12	19	9	2.42	2.5343	21 25 30.3	7.498
13	19	11	34.29	2.5278	21 17 56.3	7.634
14	19	14	5.76	2.5213	21 10 14.2	7.768
15	19	16	36.84	2.5147	21 2 24.1	7.900
16	19	19	7.52	2.5080	20 54 26.2	8.031
17	19	21	37.79	2.5012	20 46 20.4	8.160
18	19	24	7.66	2.4944	20 38 7.0	8.287
19	19	26	37.12	2.4876	20 29 46.0	8.413
20	19	29	6.17	2.4807	20 21 17.4	8.537
21	19	31	34.80	2.4737	20 12 41.4	8.660
22	19	34	3.01	2.4667	20 3 58.2	8.780
23	19	36	30.80	2.4597	S. 19 55 7.8	8.899

WEDNESDAY, JANUARY 1, 1862.

0	19	38	58.17	2.4526	S. 19 46 10.3	9.016
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PHASES OF THE MOON.

	d	h	m
☉ New Moon, . . .	1	14	17.4
☽ First Quarter, . . .	8	15	9.7
☾ Full Moon, . . .	16	20	8.0
☾ Last Quarter, . . .	24	9	52.0
☉ New Moon, . . .	31	1	54.6

	d	h
☾ Apogee,	13	2.0
☾ Perigee,	29	0.9

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Star's Name and Position.	Noon.	P. L. of Diff.	IIIh.	P. L. of Diff.	VIh.	P. L. of Diff.	IXh.	P. L. of Diff.
3	SUN W.	19° 32' 8"	2445	21° 14' 36"	2426	22° 56' 50"	2470	24° 38' 45"	2463
	Fomalhaut E.	62 59 50	2609	61 23 10	2726	59 47 17	2773	58 12 14	2914
	α Pegasi E.	81 18 19	2252	79 31 11	2209	77 44 26	2266	75 58 4	2204
4	SUN W.	33 3 22	2561	34 43 10	2579	36 22 34	2597	38 1 33	2615
	Fomalhaut E.	50 31 21	2665	49 2 29	2126	47 34 56	2199	46 8 46	2275
	α Pegasi E.	67 12 45	2208	65 29 7	2419	63 45 59	2441	62 3 22	2465
	α Arietis E.	109 48 13	2266	108 1 9	2273	106 14 29	2299	104 28 14	2307
5	SUN W.	46 10 7	2712	47 46 30	2723	49 22 27	2752	50 57 58	2772
	Fomalhaut E.	39 22 27	2776	38 7 0	2907	36 53 46	2954	35 43 0	2922
	α Pegasi E.	53 39 2	2506	52 0 2	2626	50 21 42	2657	48 44 4	2699
	α Arietis E.	95 43 26	2266	93 59 48	2417	92 16 37	2435	90 33 52	2455
6	SUN W.	58 48 50	2875	60 21 41	2885	61 54 6	2916	63 26 5	2936
	α Pegasi E.	40 47 17	2976	39 14 27	2921	37 42 34	2968	36 11 41	3020
	α Arietis E.	82 6 55	2551	80 26 52	2599	78 47 15	2599	77 8 5	2607
	Aldebaran E.	114 52 40	2578	113 13 15	2597	111 34 16	2615	109 55 41	2632
7	SUN W.	70 59 43	3084	72 29 14	3092	73 58 22	3073	75 27 6	3090
	Venus W.	24 48 20	3137	26 15 45	3149	27 42 55	3161	29 9 51	3173
	α Arietis E.	68 58 35	2701	67 21 56	2719	65 45 41	2736	64 9 49	2754
	Aldebaran E.	101 48 44	2719	100 12 30	2737	98 36 39	2754	97 1 11	2770
8	SUN W.	82 45 22	3177	84 11 59	3193	85 38 17	3208	87 4 17	3222
	α Aquilæ W.	44 33 13	3060	45 45 42	3005	46 58 57	3065	48 12 52	3030
	Venus W.	36 20 47	3226	37 46 11	3232	39 11 19	3265	40 36 11	3278
	α Arietis E.	56 16 13	2838	54 42 35	2855	53 9 18	2870	51 36 21	2895
	Aldebaran E.	89 9 10	2850	87 35 47	2866	86 2 44	2880	84 29 59	2894
9	SUN W.	94 9 55	3294	95 34 14	3306	96 58 18	3319	98 22 8	3330
	α Aquilæ W.	54 30 13	3709	55 46 51	3692	57 3 47	3676	58 21 0	3663
	Venus W.	47 36 48	3240	49 0 13	3261	50 23 25	3263	51 46 24	3272
	Aldebaran E.	76 50 40	2961	75 19 38	2972	73 48 50	2984	72 18 18	2996
	Pollux E.	118 38 14	2975	117 7 30	2985	115 36 58	2995	114 6 39	3002
10	SUN W.	105 18 6	3382	106 40 43	3389	108 3 10	3400	109 25 27	3418
	α Aquilæ W.	64 50 2	3617	66 8 18	3611	67 26 40	3605	68 45 8	3601
	Venus W.	58 38 29	3420	60 0 23	3429	61 22 7	3437	62 43 42	3442
	Fomalhaut W.	40 57 22	4196	42 5 52	4123	43 15 23	4076	44 25 48	4027
	Aldebaran E.	64 49 4	3048	63 19 51	3058	61 50 50	3069	60 22 1	3076
	Pollux E.	106 37 48	3046	105 8 32	3054	103 39 26	3061	102 10 29	3068
11	α Aquilæ W.	75 18 33	3586	76 37 23	3582	77 56 16	3581	79 15 11	3581
	Venus W.	69 29 50	3472	70 50 45	3477	72 11 35	3481	73 32 20	3485
	Fomalhaut W.	50 28 21	3848	51 42 34	3820	52 57 16	3793	54 12 25	3770
	α Pegasi W.	27 37 13	3728	28 53 20	3680	30 10 28	3632	31 28 28	3599
	Aldebaran E.	53 0 28	3116	51 32 38	3124	50 4 57	3131	48 37 25	3136
	Pollux E.	94 47 36	3095	93 19 20	3101	91 51 11	3104	90 23 6	3109
12	α Aquilæ W.	85 49 59	3677	87 8 58	3677	88 27 57	3677	89 46 56	3679
	Venus W.	80 15 14	3497	81 35 41	3496	82 56 7	3499	84 16 32	3496
	Fomalhaut W.	60 33 37	3678	61 50 47	3664	63 8 13	3649	64 25 55	3636
	α Pegasi W.	38 8 24	3441	39 29 54	3420	40 51 48	3401	42 14 3	3385
	Aldebaran E.	41 21 48	3173	39 55 7	3190	38 28 34	3186	37 2 11	3187

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Star's Name and Position.	Midnight.	P. L. of Dist.	XVh.	P. L. of Dist.	XVIIIh.	P. L. of Dist.	XXIh.	P. L. of Dist.
3	SUN W.	26° 20' 22"	2497	26° 1' 40"	2413	29° 42' 37"	2528	31° 23' 11"	2545
	Fomalhaut E.	56 38 4	2666	55 4 49	2904	53 32 35	2964	52 1 24	3008
	α Pegasi E.	74 12 7	2219	72 26 35	2327	70 41 30	2357	68 56 53	2377
4	SUN W.	39 40 8	2684	41 18 17	2668	42 56 0	2672	44 33 17	2692
	Fomalhaut E.	44 44 5	2366	43 20 58	2447	41 59 35	2546	40 40 2	2655
	α Pegasi E.	60 21 19	2469	58 39 51	2516	56 58 59	2540	55 18 42	2667
	α Arietis E.	102 42 24	2224	100 57 0	2243	99 12 2	2261	97 27 31	2279
5	SUN W.	52 33 2	2798	54 7 39	2614	55 41 49	2634	57 15 33	2655
	Fomalhaut E.	34 34 55	4486	33 29 39	4615	32 27 27	4654	31 28 35	5129
	α Pegasi E.	47 7 9	2723	45 30 59	2768	43 55 36	2796	42 21 1	2824
	α Arietis E.	88 51 35	2474	87 9 45	2498	85 28 22	2512	83 47 25	2531
6	SUN W.	64 57 38	2966	66 28 46	2976	67 59 29	2995	69 29 48	3014
	α Pegasi E.	34 41 53	2076	33 13 14	2187	31 45 49	2205	30 19 46	2263
	α Arietis E.	75 29 20	2627	73 51 2	2645	72 13 8	2663	70 35 39	2682
	Aldebaran E.	108 17 31	2680	106 30 44	2687	105 2 20	2696	103 25 21	2702
7	SUN W.	76 55 28	3108	78 23 28	3128	79 51 7	3143	81 18 25	3162
	Venus W.	30 36 33	3185	32 3 0	3196	33 29 11	3211	34 55 7	3225
	α Arietis E.	62 34 21	2771	60 59 15	2786	59 24 32	2806	57 50 12	2822
	Aldebaran E.	95 26 4	2787	93 51 19	2803	92 16 55	2819	90 42 52	2835
8	SUN W.	88 29 59	2220	89 55 23	2253	91 20 30	2266	92 45 21	2281
	α Aquilæ W.	49 27 23	2709	50 42 26	2773	51 57 57	2747	53 13 54	2737
	Venus W.	42 0 48	2291	43 25 10	2304	44 49 17	2316	46 13 10	2329
	α Arietis E.	50 3 44	2201	48 31 26	2216	46 59 27	2231	45 27 47	2246
	Aldebaran E.	82 57 33	2260	81 25 25	2221	79 53 33	2235	78 21 59	2247
9	SUN W.	99 45 45	2341	101 9 9	2363	102 32 20	2363	103 55 19	2373
	α Aquilæ W.	59 38 27	2662	60 56 5	2642	62 18 54	2633	63 31 53	2623
	Venus W.	53 9 12	2383	54 31 48	2383	55 54 12	2403	57 16 25	2411
	Aldebaran E.	70 48 0	2007	69 17 56	2016	67 48 6	2026	66 18 28	2036
	Pollux E.	112 36 30	2013	111 6 33	2023	109 36 48	2030	108 7 13	2039
10	SUN W.	110 47 35	2424	112 9 35	2421	113 31 28	2426	114 53 15	2433
	α Aquilæ W.	70 3 41	2697	71 22 19	2693	72 41 1	2690	73 59 46	2698
	Venus W.	64 5 10	2450	65 26 30	2456	66 47 43	2463	68 8 49	2467
	Fomalhaut E.	45 37 1	2663	46 48 57	2645	48 1 31	2611	49 14 40	2679
	Aldebaran E.	58 53 22	2065	57 24 54	2093	55 56 36	2101	54 28 27	2109
	Pollux E.	100 41 40	2073	99 12 58	2080	97 44 24	2086	96 15 56	2091
11	α Aquilæ W.	80 34 6	2879	81 53 3	2873	83 12 1	2877	84 31 0	2877
	Venus W.	74 53 1	2498	76 13 38	2491	77 34 12	2493	78 54 44	2496
	Fomalhaut W.	55 27 58	2746	56 43 54	2729	58 0 10	2711	59 16 45	2695
	α Pegasi W.	32 47 14	2492	34 6 41	2619	35 26 44	2489	36 47 20	2464
	Aldebaran E.	47 10 1	2145	45 42 46	2132	44 15 39	2156	42 48 40	2164
	Pollux E.	88 55 7	2111	87 27 11	2114	85 59 19	2117	84 31 30	2119
12	α Aquilæ W.	91 5 53	2879	92 24 50	2880	93 43 46	2882	95 2 40	2888
	Venus W.	85 36 58	2499	86 57 23	2499	88 17 48	2498	89 38 14	2498
	Fomalhaut W.	65 43 51	2624	67 2 0	2611	68 20 22	2600	69 38 56	2600
	α Pegasi W.	43 36 37	2369	44 59 29	2354	46 22 38	2340	47 46 3	2327
	Aldebaran E.	35 35 58	2206	34 9 56	2216	32 44 6	2227	31 18 29	2239

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Star's Name and Position.	Noon.	P. L. of DM.	III ^h .	P. L. of DM.	VI ^h .	P. L. of DM.	IX ^h .	P. L. of DM.
12	Pollux E.	83° 3' 44"	3121	81° 36' 0"	3124	80° 8' 19"	3126	78° 40' 40"	3126
	Regulus E.	119 59 38	3096	118 31 24	3096	117 8 10	3096	115 34 56	3096
13	α Aquilæ W.	96 21 33	3085	97 40 24	3097	98 59 12	3090	100 17 57	3093
	Venus W.	90 58 40	3497	92 19 7	3496	93 39 37	3492	95 0 10	3499
	Fomalhaut W.	70 57 42	3079	72 16 38	3070	73 35 44	3061	74 55 1	3062
	α Pegasi W.	49 9 43	3015	50 33 37	3304	51 57 44	3294	53 22 2	3285
	Pollux E.	71 22 37	3128	69 55 1	3128	68 27 25	3127	66 59 48	3128
	Regulus E.	108 13 46	3094	106 45 29	3092	105 17 10	3091	103 48 49	3088
14	Venus W.	101 43 38	3475	103 4 30	3471	104 25 26	3467	105 46 27	3463
	Fomalhaut W.	81 33 39	3515	82 53 47	3509	84 14 1	3508	85 34 23	3497
	α Pegasi W.	60 26 22	3288	61 51 46	3281	63 17 20	3222	64 43 3	3214
	Pollux E.	59 41 26	3120	58 13 41	3119	56 45 54	3117	55 18 5	3115
	Regulus E.	96 26 17	3073	94 57 35	3071	93 28 50	3067	92 0 0	3063
	Saturn E.	120 42 19	3119	119 14 32	3113	117 46 38	3107	116 18 37	3101
15	Fomalhaut W.	92 17 36	3474	93 38 29	3470	94 59 27	3467	96 20 28	3465
	α Pegasi W.	71 54 2	3176	73 20 40	3168	74 47 28	3161	76 14 24	3153
	α Arietis W.	28 20 6	3111	29 48 2	3098	31 16 14	3087	32 44 40	3075
	Pollux E.	47 58 34	3109	46 30 35	3108	45 2 35	3108	43 34 35	3108
	Regulus E.	84 34 31	3039	83 5 8	3035	81 35 39	3031	80 6 5	3026
	Saturn E.	108 56 53	3074	107 28 12	3069	105 59 24	3063	104 30 29	3057
	Jupiter E.	112 51 22	3069	111 22 59	3062	109 54 28	3076	108 25 49	3070
	Fomalhaut W.	103 6 6	3458	104 27 17	3459	105 48 27	3461	107 9 35	3461
16	α Pegasi W.	83 31 14	3119	84 59 1	3111	86 26 57	3106	87 55 1	3099
	α Arietis W.	40 10 0	3027	41 39 39	3018	43 9 29	3009	44 39 31	3001
	Pollux E.	36 14 44	3117	34 46 55	3121	33 19 11	3126	31 51 33	3133
	Regulus E.	72 36 31	3097	71 6 15	3093	69 35 53	3086	68 5 23	3077
	Saturn E.	97 4 5	3026	95 34 25	3021	94 4 38	3014	92 34 43	3009
	Jupiter E.	101 0 42	3039	99 31 17	3032	98 1 44	3026	96 32 3	3019
	α Pegasi W.	95 17 17	3066	96 46 8	3060	98 15 6	3055	99 44 11	3050
	α Arietis W.	52 12 12	2960	53 43 15	2962	55 14 28	2946	56 45 50	2936
17	Aldebaran W.	20 26 19	3264	21 51 13	3211	23 17 9	3172	24 43 52	3136
	Regulus E.	60 30 51	2949	58 59 34	2943	57 28 10	2937	55 56 38	2931
	Saturn E.	85 3 4	2974	83 32 19	2968	82 1 26	2961	80 30 24	2954
	Jupiter E.	89 1 33	2963	87 31 1	2978	86 0 21	2971	84 29 32	2964
	Spica E.	114 31 27	2938	112 59 56	2931	111 28 16	2923	109 56 26	2916
	α Pegasi W.	107 11 16	3022	108 41 1	3018	110 10 51	3015	111 40 45	3011
	α Arietis W.	64 25 15	2997	65 57 38	2989	67 30 11	2980	69 2 55	2973
18	Aldebaran W.	32 6 27	3013	33 36 24	2996	35 6 43	2979	36 37 22	2962
	Regulus E.	48 17 2	2901	46 44 44	2894	45 12 18	2887	43 39 43	2883
	Saturn E.	72 53 6	2920	71 21 13	2914	69 49 12	2907	68 17 2	2900
	Jupiter E.	76 53 14	2929	75 21 32	2922	73 49 41	2915	72 17 41	2908
	Spica E.	102 14 54	2879	100 42 8	2871	99 9 12	2863	97 36 8	2856
	α Arietis W.	76 49 5	2834	78 22 49	2826	79 56 44	2818	81 30 51	2809
	Aldebaran W.	44 15 22	2864	45 47 48	2852	47 20 30	2871	48 53 26	2859
19	Regulus E.	35 55 9	2858	34 21 56	2846	32 48 37	2840	31 15 14	2846
	Saturn E.	60 34 5	2868	59 1 5	2862	57 27 57	2855	55 54 40	2848
	Jupiter E.	64 35 25	2873	63 2 31	2866	61 29 28	2859	59 56 16	2851
	Spica E.	89 48 18	2818	88 14 14	2811	86 40 0	2804	85 5 37	2796

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Star's Name and Position.	Midnight.	P. L. of Dist.	XVh.	P. L. of Dist.	XVIIIh.	P. L. of Dist.	XXIh.	P. L. of Dist.
12	Pollux E.	77° 13' 2"	3126	75° 45' 24"	3126	74° 17' 48"	3126	72° 50' 12"	3126
	Regulus E.	114 6 42	3096	112 38 28	3097	111 10 15	3096	109 42 1	3096
13	α Aquilæ W.	101 36 40	3596	102 55 19	3600	104 13 53	3606	105 32 22	3613
	Venus W.	96 20 46	3488	97 41 24	3488	99 2 5	3482	100 22 49	3478
	Fomalhaut W.	76 14 28	3244	77 34 3	3266	78 53 47	3229	80 13 39	3222
	α Pegasi W.	54 46 31	3275	56 11 12	3265	57 36 4	3255	59 1 8	3247
	Pollux E.	65 32 10	3126	64 4 31	3124	62 36 50	3124	61 9 9	3122
	Regulus E.	102 20 25	3096	100 51 58	3083	99 23 28	3061	97 54 55	3077
14	Venus W.	107 7 33	3456	108 28 44	3484	109 50 0	3448	111 11 22	3442
	Fomalhaut W.	86 54 50	3491	88 15 24	3486	89 36 3	3481	90 56 48	3478
	α Pegasi W.	66 8 56	3206	67 34 59	3198	69 1 11	3190	70 27 32	3183
	Pollux E.	53 50 14	3114	52 22 22	3113	50 54 28	3111	49 26 32	3110
	Regulus E.	90 31 5	3060	89 2 4	3044	87 32 58	3031	86 3 48	3045
	Saturn E.	114 50 29	3066	113 22 15	3083	111 53 54	3066	110 25 27	3060
15	Fomalhaut W.	97 41 31	3463	99 2 37	3461	100 23 45	3459	101 44 55	3466
	α Pegasi W.	77 41 29	3116	79 8 43	3139	80 36 5	3133	82 3 35	3125
	α Arietis W.	34 13 20	3065	35 42 13	3056	37 11 17	3047	38 40 32	3036
	Pollux E.	42 6 35	3108	40 38 34	3109	39 10 35	3110	37 42 38	3113
	Regulus E.	78 36 24	3020	77 6 36	3014	75 36 41	3009	74 6 40	3003
	Saturn E.	103 1 27	3062	101 32 18	3045	100 3 1	3039	98 33 37	3033
	Jupiter E.	106 57 3	3064	105 28 9	3068	103 59 8	3052	102 29 59	3045
16	Fomalhaut W.	108 30 43	3464	109 51 47	3467	111 12 48	3471	112 33 44	3476
	α Pegasi W.	89 23 12	3092	90 51 31	3096	92 19 58	3078	93 48 34	3073
	α Arietis W.	46 9 42	3093	47 40 3	3083	49 10 37	3077	50 41 19	3068
	Pollux E.	30 24 3	3143	28 56 46	3168	27 29 46	3173	26 3 4	3169
	Regulus E.	66 34 42	3073	65 3 56	3067	63 33 2	3061	62 2 0	3055
	Saturn E.	91 4 40	3001	89 34 29	2994	88 4 9	2988	86 33 41	2981
	Jupiter E.	95 2 14	3013	93 32 17	3004	92 2 11	2998	90 31 56	2992
17	α Pegasi W.	101 13 22	3044	102 42 40	3089	104 12 5	3033	105 41 37	3027
	α Arietis W.	58 17 23	3028	59 49 6	3020	61 20 59	3012	62 53 2	3005
	Aldebaran W.	26 11 15	3108	27 39 15	3080	29 7 49	3054	30 36 55	3033
	Regulus E.	54 24 58	3025	52 53 11	3019	51 21 16	3012	49 49 13	3006
	Saturn E.	78 59 13	2947	77 27 54	2941	75 56 27	2934	74 24 51	2927
	Jupiter E.	82 58 34	2968	81 27 28	2950	79 56 12	2942	78 24 47	2936
	Spica E.	108 24 26	2908	106 52 17	2900	105 19 58	2894	103 47 31	2886
18	α Pegasi W.	113 10 44	3007	114 40 48	3003	116 10 57	3000	117 41 10	2997
	α Arietis W.	70 35 48	2866	72 8 52	2857	73 42 6	2849	75 15 30	2841
	Aldebaran W.	38 8 22	2847	39 39 41	2833	41 11 18	2820	42 43 12	2807
	Regulus E.	42 7 2	2877	40 34 14	2871	39 1 18	2869	37 28 17	2862
	Saturn E.	66 44 43	2894	65 12 16	2887	63 39 41	2880	62 6 57	2874
	Jupiter E.	70 45 32	2901	69 13 14	2894	67 40 47	2887	66 8 11	2879
	Spica E.	96 2 53	2849	94 29 29	2842	92 55 55	2835	91 22 12	2826
19	α Arietis W.	83 5 8	2801	84 39 35	2792	86 14 13	2786	87 49 1	2775
	Aldebaran W.	50 26 38	2848	52 0 4	2837	53 33 44	2826	55 7 38	2816
	Regulus E.	29 41 46	2845	28 8 16	2844	26 34 45	2845	25 1 15	2846
	Saturn E.	54 21 15	2841	52 47 42	2837	51 14 2	2831	49 40 15	2827
	Jupiter E.	58 22 54	2844	56 49 23	2838	55 15 44	2831	53 41 57	2825
	Spica E.	83 31 2	2787	81 56 17	2779	80 21 21	2772	78 46 16	2763

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Star's Name and Position.	Noon.	P. L. of Dist.	IIIh.	P. L. of Dist.	VIh.	P. L. of Dist.	IXh.	P. L. of Dist.
19	Mars E.	116° 3' 26"	2026	114° 34' 35"	2026	113° 5' 32"	2047	111° 36' 18"	2020
20	α Arietis W.	89 24 1	2767	90 59 12	2760	92 34 33	2750	94 10 6	2768
	Aldebaran W.	56 41 45	2805	58 16 6	2795	59 50 41	2785	61 25 29	2774
	Saturn E.	48 6 22	2821	46 32 22	2816	44 58 15	2811	43 24 1	2806
	Jupiter E.	52 8 1	2818	50 33 56	2811	48 59 43	2805	47 25 22	2799
	Spica E.	77 10 59	2754	75 35 31	2746	73 59 52	2738	72 24 2	2730
	Mars E.	104 7 25	2894	102 37 5	2880	101 6 34	2976	99 35 51	2886
21	α Arietis W.	102 10 38	2689	103 47 19	2689	105 24 13	2681	107 1 18	2673
	Aldebaran W.	69 22 49	2724	70 58 57	2714	72 35 18	2704	74 11 52	2694
	Pollux W.	28 4 21	2876	29 37 10	2846	31 10 35	2824	32 44 32	2801
	Saturn E.	35 31 43	2795	33 57 9	2786	32 22 34	2796	30 48 1	2800
	Jupiter E.	39 31 43	2772	37 56 39	2769	36 21 30	2766	34 46 18	2765
	Spica E.	64 22 2	2686	62 45 3	2677	61 7 52	2669	59 30 30	2660
	Mars E.	91 59 20	2820	90 27 26	2810	88 55 20	2801	87 23 2	2800
22	Aldebaran W.	82 18 8	2643	83 56 4	2632	85 34 15	2623	87 12 39	2613
	Pollux W.	40 41 14	2705	42 17 47	2688	43 54 43	2673	45 31 59	2657
	Spica E.	51 20 31	2612	49 41 53	2602	48 3 1	2592	46 23 55	2583
	Mars E.	79 38 15	2840	78 4 39	2829	76 30 49	2818	74 56 44	2807
	SUN E.	120 3 32	2860	118 32 16	2850	117 0 46	2828	115 29 3	2817
	23	Aldebaran W.	95 28 14	2660	97 8 4	2650	98 48 8	2638	100 28 28	2628
Pollux W.		53 43 20	2586	55 22 34	2573	57 2 6	2569	58 41 57	2547
Regulus W.		16 49 37	2896	18 26 36	2848	20 4 26	2815	21 43 0	2809
Spica E.		38 5 11	2585	36 24 47	2526	34 44 10	2516	33 3 19	2507
Mars E.		67 2 51	2763	65 27 21	2742	63 51 37	2731	62 15 38	2719
SUN E.		107 46 54	2890	106 13 44	2848	104 40 19	2836	103 6 38	2826
24		Pollux W.	67 5 41	2482	68 47 19	2469	70 29 16	2467	72 11 31	2443
	Regulus W.	30 3 57	2467	31 45 29	2470	33 27 25	2453	35 9 44	2436
	Mars E.	54 11 56	2663	52 34 26	2651	50 56 40	2640	49 18 39	2629
	Antares E.	70 3 49	2438	68 21 9	2425	66 38 10	2412	64 54 53	2401
	SUN E.	95 14 20	2763	93 39 4	2751	92 3 32	2739	90 27 44	2726
	25	Pollux W.	80 47 4	2364	82 31 1	2372	84 15 16	2360	85 59 48	2348
Regulus W.		43 46 30	2368	45 30 51	2365	47 15 30	2343	49 0 27	2326
Mars E.		41 4 49	2874	39 25 19	2854	37 45 35	2854	36 5 37	2845
Antares E.		56 14 15	2343	54 29 18	2332	52 44 5	2320	50 58 35	2308
SUN E.		82 24 36	2663	80 47 9	2652	79 9 25	2640	77 31 25	2629
26		Pollux W.	94 46 30	2296	96 32 37	2284	98 19 0	2274	100 5 38	2266
	Regulus W.	57 49 45	2270	59 36 28	2280	61 23 28	2248	63 10 44	2287
	Antares E.	42 7 10	2368	40 20 8	2347	38 32 51	2287	36 45 19	2226
	SUN E.	69 17 21	2669	67 37 44	2656	65 57 52	2648	64 17 45	2637
	27	Regulus W.	72 10 51	2190	73 59 34	2181	75 48 30	2173	77 37 38	2168
Spica W.		18 12 12	2229	19 59 56	2213	21 48 4	2198	23 36 34	2185
Antares E.		27 44 28	2190	25 55 45	2184	24 6 53	2177	22 17 51	2173
SUN E.		55 53 34	2488	54 12 4	2479	52 30 21	2470	50 48 26	2462
28		Regulus W.	86 46 0	2134	88 36 7	2129	90 26 22	2126	92 16 43	2120
	Spica W.	32 43 21	2188	34 33 22	2182	36 23 33	2126	38 13 53	2121
	SUN E.	42 16 15	2429	40 33 22	2424	38 50 21	2419	37 7 14	2416

GREENWICH MEAN TIME.

LUNAR DISTANCES.

Day of the Month.	Star's Name and Position.	Midnight.	P. L. of D.M.	XV ^h .	P. L. of D.M.	XVIII ^h .	P. L. of D.M.	XXI ^h .	P. L. of D.M.
19	Mars E.	110° 6' 53"	2000	108° 37' 17"	2022	107° 7' 31"	2013	105° 37' 34"	2003
20	α Arietis W.	95 45 49	2724	97 21 44	2725	96 57 50	2717	100 34 8	2707
	Aldebaran W.	63 0 31	2764	64 35 46	2754	66 11 14	2744	67 46 55	2735
	Saturn E.	41 49 41	2802	40 15 16	2799	38 40 47	2797	37 6 15	2797
	Jupiter E.	45 50 53	2798	44 16 16	2788	42 41 32	2782	41 6 41	2777
	Spica E.	70 48 1	2730	69 11 48	2712	67 35 24	2704	65 58 49	2696
Mars E.	96 4 56	2806	96 33 50	2808	95 2 32	2800	93 31 2	2820	
21	α Arietis W.	108 38 36	2683	110 16 5	2655	111 53 46	2644	113 31 41	2636
	Aldebaran W.	75 48 40	2684	77 25 41	2674	79 2 56	2663	80 40 25	2653
	Pollux W.	34 18 59	2779	35 53 55	2799	37 29 17	2741	39 5 3	2722
	Saturn E.	29 13 33	2806	27 39 13	2816	26 5 5	2827	24 31 12	2842
	Jupiter E.	33 11 4	2764	31 35 49	2763	30 0 33	2763	28 25 17	2764
	Spica E.	57 52 55	2649	56 15 7	2640	54 37 7	2632	52 58 56	2622
	Mars E.	85 50 30	2680	84 17 45	2670	82 44 48	2660	81 11 38	2650
22	Aldebaran W.	88 51 18	2601	90 30 11	2601	92 9 18	2601	93 48 39	2671
	Pollux W.	47 9 36	2643	48 47 32	2629	50 25 48	2613	52 4 25	2600
	Spica E.	44 44 37	2674	43 5 6	2664	41 25 21	2653	39 45 22	2644
	Mars E.	73 22 25	2796	71 47 52	2766	70 13 6	2776	68 38 6	2764
	Sun E.	113 57 6	2806	112 24 55	2804	110 52 29	2803	109 19 49	2872
23	Aldebaran W.	102 9 2	2618	103 49 50	2607	105 30 53	2497	107 12 11	2486
	Pollux W.	60 22 5	2683	62 2 32	2620	63 43 17	2607	65 24 20	2494
	Regulus W.	23 22 10	2664	25 1 54	2643	26 42 8	2623	28 22 49	2604
	Spica E.	31 22 16	2499	29 41 1	2499	27 59 33	2482	26 17 54	2473
	Mars E.	60 39 24	2708	59 2 55	2697	57 26 11	2686	55 49 11	2678
	Sun E.	101 32 42	2812	99 58 30	2801	98 24 3	2788	96 49 20	2776
24	Pollux W.	73 54 3	2482	75 36 52	2419	77 19 59	2406	79 3 23	2396
	Regulus W.	36 52 24	2494	38 35 25	2409	40 18 47	2396	42 2 29	2389
	Mars E.	47 40 23	2618	46 1 52	2607	44 23 6	2606	42 44 5	2606
	Antares E.	63 11 19	2689	61 27 28	2677	59 43 20	2666	57 58 56	2654
	Sun E.	88 51 39	2714	87 15 18	2701	85 38 40	2689	84 1 46	2678
25	Pollux W.	87 44 36	2386	89 29 40	2326	91 15 1	2316	93 0 37	2304
	Regulus W.	50 45 43	2317	52 31 17	2306	54 17 9	2294	56 3 18	2281
	Mars E.	34 25 27	2686	32 45 4	2668	31 4 30	2660	29 23 44	2611
	Antares E.	49 12 49	2299	47 26 48	2288	45 40 31	2277	43 53 58	2267
	Sun E.	75 53 9	2616	74 14 36	2604	72 35 47	2593	70 56 42	2581
26	Pollux W.	101 52 28	2267	103 39 31	2249	105 26 46	2240	107 14 14	2232
	Regulus W.	64 58 16	2267	66 46 3	2217	68 34 5	2206	70 22 21	2198
	Antares E.	34 57 33	2280	33 9 35	2211	31 21 24	2204	29 33 2	2196
	Sun E.	62 37 23	2606	60 56 46	2616	59 15 55	2607	57 34 51	2497
27	Regulus W.	79 26 58	2189	81 16 28	2181	83 6 9	2145	84 56 0	2139
	Spica W.	25 25 24	2173	27 14 32	2163	29 3 55	2154	30 53 32	2145
	Antares E.	20 28 42	2170	18 39 30	2170	16 50 18	2172	15 1 9	2178
	Sun E.	49 6 20	2455	47 24 3	2448	45 41 36	2441	43 59 0	2436
28	Regulus W.	94 7 11	2118	95 57 43	2116	97 48 19	2113	99 38 59	2111
	Spica W.	40 4 20	2118	41 54 52	2114	43 45 30	2110	45 36 14	2108
	Sun E.	35 24 1	2412	33 40 43	2409	31 57 21	2407	30 13 56	2405

GREENWICH MEAN TIME.

JANUARY.						FEBRUARY.					
Day of Month.	Apparent Right Ascension.	Var. of R.A. for 1 Hour.	Apparent Declination.	Var. of Dec. for 1 Hour.	Meridian Passage.	Day of Month.	Apparent Right Ascension.	Var. of R.A. for 1 Hour.	Apparent Declination.	Var. of Dec. for 1 Hour.	Meridian Passage.
	Noon.	Noon.	Noon.	Noon.			Noon.	Noon.	Noon.	Noon.	
	h m s	s	° ' "	"	h m		h m s	"	° ' "	"	h m
1	16 32 15.21	13.984	20 28 45.7	33.11	21 49.0	1	19 17 51.73	13.378	22 11 30.3	17.92	22 32.4
2	16 37 27.37	13.026	20 41 43.3	31.08	21 50.2	2	19 23 12.54	13.365	22 4 0.0	19.59	22 33.8
3	16 42 40.47	13.066	20 54 6.3	30.22	21 51.5	3	19 28 32.78	13.350	21 55 49.8	21.26	22 35.2
4	16 47 54.55	13.106	21 5 54.1	28.74	21 52.8	4	19 33 52.40	13.304	21 46 59.7	23.91	22 36.6
5	16 53 9.57	13.144	21 17 6.0	27.24	21 54.1	5	19 39 11.36	13.274	21 37 30.3	24.84	22 38.0
6	16 58 25.49	13.182	21 27 41.5	25.71	21 55.5	6	19 44 29.59	13.244	21 27 21.9	26.16	22 39.3
7	17 3 42.29	13.218	21 37 40.1	24.16	21 56.8	7	19 49 47.07	13.212	21 16 34.9	27.76	22 40.7
8	17 8 59.90	13.249	21 47 1.4	23.60	21 58.2	8	19 55 3.75	13.177	21 5 9.8	29.33	22 42.0
9	17 14 18.28	13.280	21 55 44.9	21.02	21 59.5	9	20 0 19.57	13.141	20 53 7.1	30.89	22 43.3
10	17 19 37.36	13.309	22 3 50.2	19.41	22 0.9	10	20 5 34.52	13.105	20 40 27.0	32.43	22 44.6
11	17 24 57.10	13.336	22 11 16.8	17.79	22 2.3	11	20 10 48.56	13.065	20 27 10.2	33.94	22 45.9
12	17 30 17.45	13.360	22 18 4.3	16.16	22 3.7	12	20 16 1.64	13.024	20 13 17.1	35.45	22 47.1
13	17 35 38.40	13.384	22 24 12.3	14.80	22 5.1	13	20 21 13.74	13.003	19 58 48.3	36.93	22 48.4
14	17 40 59.88	13.404	22 29 40.5	12.84	22 6.5	14	20 26 24.84	13.941	19 43 44.6	38.39	22 49.6
15	17 46 21.81	13.421	22 34 28.7	11.17	22 7.9	15	20 31 34.90	13.898	19 28 6.3	39.80	22 50.8
16	17 51 44.13	13.438	22 38 36.6	9.48	22 9.4	16	20 36 43.92	13.853	19 11 54.0	41.21	22 52.0
17	17 57 6.81	13.452	22 42 3.8	7.78	22 10.8	17	20 41 51.86	13.808	18 55 8.3	42.59	22 53.2
18	18 2 29.81	13.463	22 44 50.3	6.06	22 12.3	18	20 46 58.71	13.762	18 37 49.7	43.94	22 54.3
19	18 7 53.04	13.473	22 46 55.7	4.37	22 13.8	19	20 52 4.46	13.716	18 19 59.0	45.27	22 55.5
20	18 13 16.46	13.478	22 48 20.1	2.65	22 15.2	20	20 57 9.08	13.670	18 1 36.8	46.57	22 56.7
21	18 18 40.00	13.483	22 49 3.2	-0.98	22 16.7	21	21 2 12.60	13.623	17 42 43.8	47.84	22 57.8
22	18 24 3.60	13.488	22 49 5.0	+0.79	22 18.1	22	21 7 14.98	13.573	17 23 20.6	49.08	22 58.8
23	18 29 27.23	13.484	22 48 25.2	2.51	22 19.5	23	21 12 16.21	13.523	17 3 27.7	50.30	22 59.9
24	18 34 50.82	13.481	22 47 4.2	4.24	22 21.0	24	21 17 16.32	13.481	16 43 6.0	51.49	23 0.9
25	18 40 14.33	13.476	22 45 1.7	5.96	22 22.5	25	21 22 15.32	13.435	16 22 16.0	52.66	23 01.9
26	18 45 37.69	13.469	22 42 17.9	7.69	22 23.9	26	21 27 13.20	13.388	16 0 58.5	53.79	23 2.9
27	18 51 0.85	13.460	22 38 52.6	9.41	22 25.4	27	21 32 9.97	13.342	15 39 14.0	54.90	23 3.8
28	18 56 23.75	13.448	22 34 46.1	11.13	22 26.8	28	21 37 5.62	13.296	15 17 3.3	55.98	23 4.8
29	19 1 46.35	13.433	22 29 58.3	12.84	22 28.2	29	21 42 0.16	13.250	14 54 27.3	57.03	23 5.7
30	19 7 8.57	13.416	22 24 29.6	14.56	22 29.6	30	21 46 53.63	13.205	14 31 26.4	58.04	23 6.7
31	19 12 30.38	13.399	22 18 20.2	16.24	22 31.1	31	21 51 46.03	13.162	14 8 1.4	59.03	23 7.5
32	19 17 51.73	13.378	22 11 30.3	17.92	22 32.4	32	21 56 37.39	13.118	-13 44 13.1	59.98	23 8.4

Day of Month, 1st.	6th.	11th.	16th.	21st.	26th.	31st.	Day of the Month,	5th.	10th.	15th.	20th.	25th.
Semidiam. "	6.4	6.2	6.1	6.0	5.9	5.8	Semidiameter	5.6	5.6	5.5	5.4	5.4
Hor. Par.	6.4	6.3	6.2	6.1	6.0	5.9	Horizontal Parallax	5.7	5.6	5.5	5.5	5.4

GREENWICH MEAN TIME.

MARCH.							APRIL.													
Day of Month.	Apparent Right Ascension.			Var. of R.A. for 1 Hour.	Apparent Declination.			Var. of Dec. for 1 Hour.	Meridian Passage.	Day of Month.	Apparent Right Ascension.			Var. of R.A. for 1 Hour.	Apparent Declination.			Var. of Dec. for 1 Hour.	Meridian Passage.	
	Noon.			Noon.	Noon.			Noon.			Noon.			Noon.	Noon.			Noon.		
	h	m	s	"	°	'	"	"	h	m	h	m	s	"	°	'	"	"	h	m
1	21	42	0.16	12-260	-14	54	27.3	67-02	23 5.7	1	0	7	1.55	11-361	-	0	49	53.0	74-34	23 28.3
2	21	46	53.63	12-206	14	31	26.4	68-04	23 6.7	2	0	11	33.90	11-346	-	0	20	7.5	74-43	23 28.9
3	21	51	46.03	12-162	14	8	1.4	68-08	23 7.5	3	0	16	6.15	11-342	+	0	9	39.5	74-47	23 29.5
4	21	56	37.39	12-118	13	44	13.1	68-08	23 8.4	4	0	20	38.34	11-342	0	39	27.1	74-48	23 30.0	
5	22	1	27.69	12-074	13	20	2.3	68-01	23 9.4	5	0	25	10.55	11-342	1	9	14.8	74-48	23 30.6	
6	22	6	16.96	12-031	12	55	29.6	61-80	23 10.3	6	0	29	42.76	11-342	1	39	2.2	74-45	23 31.2	
7	22	11	5.19	11-990	12	30	35.8	62-67	23 11.2	7	0	34	15.02	11-345	2	8	48.5	74-36	23 31.8	
8	22	15	52.47	11-949	12	5	21.5	63-51	23 12.0	8	0	38	47.37	11-351	2	38	32.4	74-27	23 32.4	
9	22	20	38.78	11-909	11	39	47.5	64-21	23 12.8	9	0	43	19.89	11-360	3	8	13.5	74-14	23 33.0	
10	22	25	24.12	11-870	11	13	54.8	65-07	23 13.6	10	0	47	52.62	11-368	3	37	51.1	73-08	23 33.6	
11	22	30	8.52	11-831	10	47	44.1	65-51	23 14.4	11	0	52	25.56	11-377	4	7	24.7	73-79	23 34.2	
12	22	34	52.02	11-794	10	21	16.1	66-51	23 15.2	12	0	56	58.74	11-389	4	36	53.4	73-66	23 34.9	
13	22	39	34.64	11-759	9	54	31.6	67-19	23 15.9	13	1	1	32.21	11-403	5	6	16.3	73-32	23 35.5	
14	22	44	16.42	11-723	9	27	31.0	67-34	23 16.7	14	1	6	6.03	11-417	5	35	32.7	73-03	23 36.2	
15	22	48	57.36	11-689	9	0	15.2	68-46	23 17.4	15	1	10	40.24	11-434	6	4	41.9	72-73	23 36.8	
16	22	53	37.54	11-656	8	32	45.1	68-04	23 18.1	16	1	15	14.35	11-451	6	33	43.4	72-38	23 37.4	
17	22	58	16.96	11-627	8	5	1.3	68-59	23 18.8	17	1	19	49.92	11-471	7	2	36.4	72-02	23 38.1	
18	23	2	55.64	11-607	7	37	4.6	70-19	23 19.5	18	1	24	25.48	11-493	7	31	20.2	71-62	23 38.8	
19	23	7	33.62	11-609	7	8	55.8	70-61	23 20.2	19	1	29	1.57	11-514	7	59	54.0	71-19	23 39.5	
20	23	12	10.95	11-543	6	40	35.4	71-07	23 20.9	20	1	33	38.22	11-540	8	28	17.2	70-73	23 40.2	
21	23	16	47.64	11-517	6	12	4.2	71-51	23 21.5	21	1	38	15.47	11-568	8	56	28.8	70-23	23 40.9	
22	23	21	23.76	11-494	5	43	23.0	71-01	23 22.2	22	1	42	53.38	11-596	9	24	28.3	69-71	23 41.5	
23	23	25	59.34	11-473	5	14	32.6	72-28	23 22.8	23	1	47	31.95	11-623	9	52	15.1	69-17	23 42.2	
24	23	30	34.41	11-451	4	45	33.4	72-63	23 23.5	24	1	52	11.23	11-659	10	19	48.4	68-59	23 42.9	
25	23	35	8.99	11-431	4	16	26.2	72-05	23 24.1	25	1	56	51.27	11-684	10	47	7.3	67-97	23 43.7	
26	23	39	43.16	11-416	3	47	11.8	73-28	23 24.7	26	2	1	32.11	11-718	11	14	11.1	67-33	23 44.4	
27	23	44	16.96	11-401	3	17	50.9	73-49	23 25.3	27	2	6	13.76	11-753	11	40	59.3	66-66	23 45.2	
28	23	48	50.40	11-387	2	48	24.1	73-72	23 25.9	28	2	10	56.24	11-799	12	7	31.1	65-97	23 46.0	
29	23	53	23.53	11-375	2	18	52.2	73-92	23 26.5	29	2	15	39.62	11-827	12	33	45.7	65-23	23 46.8	
30	23	57	56.41	11-365	1	49	15.9	74-09	23 27.1	30	2	20	23.94	11-864	12	59	42.3	64-47	23 47.6	
31	0	2	29.07	11-357	1	19	36.0	74-23	23 27.7	31	2	25	9.17	11-904	13	25	20.3	63-68	23 48.4	
32	0	7	1.55	11-351	-	0	49	53.0	74-34	23 28.3	32	2	29	55.32	11-944	+13	50	38.9	62-86	23 49.2

Day of the Month,	2d.	7th.	13th.	17th.	23d.	29th.	Day of the Month,	1st.	6th.	11th.	16th.	21st.	26th.
Semidiameter	5.3	5.3	5.2	5.2	5.1	5.1	Semidiameter	5.1	5.0	5.0	5.0	5.0	4.9
Hor. Parallax	5.4	5.3	5.3	5.2	5.2	5.1	Hor. Parallax	5.1	5.1	5.0	5.0	5.0	5.0

GREENWICH MEAN TIME.

MAY.						JUNE.					
Day of Month.	Apparent Right Ascension.	Var. of R.A. for 1 Hour.	Apparent Declination.	Var. of Dec. for 1 Hour.	Meridian Passage.	Day of Month.	Apparent Right Ascension.	Var. of R.A. for 1 Hour.	Apparent Declination.	Var. of Dec. for 1 Hour.	Meridian Passage.
	noon.	noon.	noon.	noon.			noon.	noon.	noon.	noon.	
1	2 25 9.17	11.984	+13 25 20.3	68.08	23 48.4	1	5 1 16.96	13.285	+22 59 37.6	24.51	0 21.5
2	2 29 55.32	11.944	13 50 38.9	62.55	23 49.2	2	5 6 34.98	13.265	23 9 6.0	23.84	0 22.9
3	2 34 42.48	11.987	14 15 37.3	68.08	23 50.1	3	5 11 53.68	13.294	23 17 54.0	21.16	0 24.3
4	2 39 30.68	12.029	14 40 14.9	61.11	23 51.0	4	5 17 17.07	13.221	23 26 1.6	19.47	0 25.7
5	2 44 19.88	12.071	15 4 30.7	60.19	23 51.9	5	5 22 33.08	13.245	23 33 23.4	17.73	0 27.1
6	2 49 10.10	12.116	15 28 24.1	59.24	23 52.8	6	5 27 53.64	13.266	23 40 13.9	16.08	0 28.5
7	2 54 01.45	12.162	15 51 54.3	60.26	23 53.7	7	5 33 14.69	13.286	23 46 17.8	14.29	0 29.8
8	2 58 53.86	12.207	16 15 00.5	67.25	23 54.6	8	5 38 36.19	13.404	23 51 40.0	13.54	0 31.2
9	3 3 47.40	12.253	16 37 42.4	66.21	23 55.6	9	5 43 58.08	13.417	23 56 20.1	10.79	0 32.6
10	3 8 42.03	12.299	16 59 58.9	65.14	23 56.6	10	5 49 20.30	13.421	24 0 18.0	9.02	0 34.1
11	3 13 37.75	12.345	17 21 49.1	64.08	23 57.6	11	5 54 42.79	13.441	24 3 33.4	7.25	0 35.5
12	3 18 34.58	12.391	17 43 12.4	63.09	23 58.6	12	6 0 5.49	13.460	24 6 6.1	5.47	0 36.9
13	3 23 32.52	12.437	18 4 8.1	61.73	23 59.7	13	6 5 26.34	13.454	24 7 55.8	3.68	0 38.4
14	3 28 31.57	12.484	18 24 35.6	60.54	0 0.7	14	6 10 51.28	13.456	24 9 2.8	1.89	0 39.8
15	3 33 31.76	12.531	18 44 34.2	49.23	0 0.7	15	6 16 14.24	13.456	24 9 26.9	+0.11	0 41.3
16	3 38 33.10	12.578	19 4 3.1	48.07	0 1.8	16	6 21 37.17	13.454	24 9 8.0	-1.08	0 42.7
17	3 43 35.54	12.624	19 23 1.5	46.78	0 2.9	17	6 26 59.99	13.447	24 8 6.1	3.47	0 44.2
18	3 48 39.08	12.670	19 41 28.7	45.47	0 4.1	18	6 32 22.64	13.439	24 6 21.2	6.27	0 45.6
19	3 53 43.72	12.716	19 59 24.3	44.14	0 5.3	19	6 37 45.07	13.429	24 3 53.3	7.03	0 47.0
20	3 58 49.46	12.762	20 16 47.6	42.78	0 6.4	20	6 43 7.25	13.418	24 0 42.8	6.28	0 48.4
21	4 3 56.29	12.808	20 33 37.9	41.40	0 7.5	21	6 48 29.12	13.408	23 56 49.7	10.00	0 49.8
22	4 9 4.17	12.850	20 49 54.4	39.97	0 8.7	22	6 53 59.59	13.394	23 52 13.8	13.28	0 51.3
23	4 14 13.10	12.888	21 5 36.7	38.53	0 9.9	23	6 59 11.58	13.384	23 46 55.5	14.14	0 52.7
24	4 19 23.05	12.926	21 20 44.1	37.06	0 11.2	24	7 4 32.07	13.343	23 40 55.1	16.69	0 54.1
25	4 24 34.03	12.978	21 35 15.8	35.56	0 12.4	25	7 9 52.02	13.319	23 34 12.9	17.09	0 55.5
26	4 29 46.00	13.019	21 49 11.2	34.05	0 13.7	26	7 15 11.39	13.293	23 26 48.9	19.36	0 56.8
27	4 34 58.94	13.069	22 2 30.2	32.52	0 14.0	27	7 20 30.08	13.269	23 18 43.5	21.08	0 58.2
28	4 40 12.81	13.097	22 15 12.4	30.96	0 16.2	28	7 25 48.06	13.223	23 9 57.0	23.79	0 59.5
29	4 45 27.58	13.123	22 27 16.6	29.37	0 17.5	29	7 31 5.27	13.201	23 0 29.7	24.47	1 0.8
30	4 50 43.21	13.169	22 38 42.4	27.77	0 18.8	30	7 36 21.71	13.167	22 50 22.1	26.15	1 2.1
31	4 55 59.69	13.208	22 49 29.6	26.16	0 20.2	31	7 41 37.32	13.123	22 39 34.5	27.90	1 3.5
32	5 1 16.96	13.225	+22 59 37.6	24.51	0 21.5	32	7 46 52.07	13.095	+22 28 7.5	29.44	1 4.9

Day of Month, 1st.	6th.	11th.	16th.	21st.	26th.	31st.	Day of the Month, 5th.	10th.	15th.	20th.	25th.	30th.
Semidiam. "	4.9	4.9	4.9	4.9	4.9	4.9	Semidiameter	5.0	5.0	5.0	5.0	5.1
Hor. Par.	5.0	5.0	5.0	5.0	5.0	5.0	Hor. Parallax	5.0	5.0	5.1	5.1	5.2

GREENWICH MEAN TIME.

JULY.						AUGUST.					
Day of Month.	Apparent Right Ascension.	Var. of R.A. for 1 Hour.	Apparent Declination.	Var. of Dec. for 1 Hour.	Meridian Passage.	Day of Month.	Apparent Right Ascension.	Var. of R.A. for 1 Hour.	Apparent Declination.	Var. of Dec. for 1 Hour.	Meridian Passage.
	Noon.	Noon.	Noon.	Noon.			Noon.	Noon.	Noon.	Noon.	
	h m s	"	° ' "	"	h m		h m s	"	° ' "	"	h m
1	7 41 37.32	13-123	+22 39 34.5	37-80	1 3.5	1	10 15 24.94	11-645	+12 25 54.3	66-76	1 35.2
2	7 46 52.07	13-098	22 28 7.5	39-44	1 4.9	2	10 20 3.89	11-602	11 59 2.3	67-55	1 35.9
3	7 52 5.90	13-055	22 16 1.3	41-05	1 6.2	3	10 24 41.83	11-561	11 31 51.8	68-31	1 36.5
4	7 57 18.73	13-033	22 3 16.5	42-08	1 7.4	4	10 29 18.79	11-522	11 4 23.3	69-05	1 37.2
5	8 2 30.53	12-970	21 49 53.6	44-24	1 8.7	5	10 33 54.80	11-481	10 36 37.5	69-79	1 37.9
6	8 7 41.30	12-927	21 35 53.1	45-79	1 09.9	6	10 38 29.87	11-443	10 8 35.3	70-43	1 38.5
7	8 12 51.02	12-882	21 21 15.5	47-28	1 11.2	7	10 43 4.06	11-406	9 40 17.2	71-07	1 39.1
8	8 17 59.65	12-836	21 6 1.5	48-59	1 12.4	8	10 47 37.36	11-370	9 11 44.0	71-69	1 39.7
9	8 23 7.15	12-789	20 50 11.5	50-31	1 13.5	9	10 52 9.84	11-336	8 42 56.6	72-25	1 40.3
10	8 28 13.51	12-741	20 33 46.3	51-77	1 14.7	10	10 56 41.50	11-303	8 13 55.7	72-80	1 40.9
11	8 33 18.71	12-691	20 16 46.5	53-29	1 15.8	11	11 1 12.38	11-271	7 44 42.1	73-32	1 41.5
12	8 38 22.70	12-641	19 59 12.5	54-50	1 17.0	12	11 5 42.51	11-241	7 15 16.3	73-81	1 42.0
13	8 43 25.47	12-589	19 41 4.9	56-29	1 18.1	13	11 10 11.96	11-213	6 45 39.2	74-27	1 42.6
14	8 48 27.00	12-538	19 22 24.6	57-35	1 19.1	14	11 14 40.74	11-186	6 15 51.4	74-70	1 43.1
15	8 53 27.29	12-487	19 3 12.2	58-07	1 20.2	15	11 19 8.86	11-160	5 45 53.8	75-09	1 43.6
16	8 58 26.37	12-436	18 43 28.4	58-57	1 21.2	16	11 23 36.36	11-136	5 15 46.9	74-45	1 44.2
17	9 3 24.21	12-384	18 23 13.7	59-24	1 22.3	17	11 28 3.33	11-114	4 45 31.5	74-81	1 44.7
18	9 8 20.79	12-331	18 2 29.0	59-47	1 23.2	18	11 32 29.82	11-090	4 15 8.2	75-12	1 45.2
19	9 13 16.09	12-278	17 41 14.9	59-58	1 24.1	19	11 36 55.82	11-074	3 44 37.8	75-40	1 45.7
20	9 18 10.13	12-226	17 19 32.1	59-58	1 25.1	20	11 41 21.36	11-066	3 14 0.9	75-55	1 46.2
21	9 23 2.92	12-174	16 57 21.4	59-02	1 26.1	21	11 45 46.53	11-041	2 43 18.3	76-09	1 46.7
22	9 27 54.49	12-122	16 34 43.2	57-15	1 27.1	22	11 50 11.35	11-026	2 12 30.6	77-07	1 47.2
23	9 32 44.82	12-073	16 11 28.3	56-24	1 28.0	23	11 54 35.85	11-015	1 41 28.7	77-24	1 47.6
24	9 37 33.93	12-020	15 48 7.6	55-29	1 28.9	24	11 59 0.07	11-006	1 10 43.1	77-37	1 48.0
25	9 42 21.82	11-971	15 24 11.7	54-24	1 29.8	25	12 3 24.08	10-997	0 39 44.6	77-49	1 48.5
26	9 47 8.54	11-921	14 59 51.3	53-24	1 30.6	26	12 7 47.91	10-991	+ 0 8 43.7	77-57	1 49.0
27	9 51 54.08	11-873	14 35 7.3	52-32	1 31.4	27	12 12 11.63	10-996	- 0 22 19.1	77-59	1 49.4
28	9 56 38.47	11-826	14 10 0.0	51-27	1 32.2	28	12 16 35.25	10-994	0 53 22.8	77-55	1 49.9
29	10 1 21.72	11-780	13 44 30.2	50-19	1 32.9	29	12 20 58.83	10-992	1 24 26.6	77-54	1 50.3
30	10 6 3.87	11-734	13 18 38.9	49-07	1 33.7	30	12 25 22.38	10-992	1 55 29.8	77-52	1 50.7
31	10 10 44.94	11-689	12 52 26.7	48-02	1 34.4	31	12 29 45.95	10-996	2 26 32.0	77-56	1 51.9
32	10 15 24.94	11-645	+12 25 54.3	66-76	1 35.2	32	12 34 9.65	10-991	- 2 57 32.7	77-47	1 51.7

Day of the Month.	5th.	10th.	15th.	20th.	25th.	30th.	Day of the Month.	4th.	9th.	14th.	19th.	24th.	29th.
Semidiameter	" 5.2	" 5.2	" 5.3	" 5.3	" 5.4	" 5.5	Semidiameter	" 5.5	" 5.6	" 5.7	" 5.8	" 5.9	" 6.1
Hor. Parallax	5.2	5.3	5.4	5.4	5.4	5.5	Hor. Parallax	5.6	5.7	5.8	5.9	6.0	6.1

GREENWICH MEAN TIME.

SEPTEMBER.						OCTOBER.					
Day of Month.	Apparent Right Ascension.	Var. of R.A. for 1 Hour.	Apparent Declination.	Var. of Dec. for 1 Hour.	Meridian Passage.	Day of Month.	Apparent Right Ascension.	Var. of R.A. for 1 Hour.	Apparent Declination.	Var. of Dec. for 1 Hour.	Meridian Passage.
	h m s	h m s	o ' "	h m s			h m s	h m s	h m s	o ' "		h m s
1	12 34 9.65	10.991	2 57 32.7	77.47	1 51.7	1	14 49 42.76	11.807	17 13 56.0	80.73	2 9.0
2	12 38 33.50	10.996	3 28 30.7	77.24	1 52.2	2	14 54 26.65	11.811	17 38 1.1	80.69	2 9.8
3	12 42 57.47	11.003	3 59 25.2	77.20	1 52.7	3	14 59 11.62	11.816	18 1 41.1	80.62	2 10.6
4	12 47 21.64	11.018	4 30 15.7	77.01	1 53.1	4	15 3 57.67	11.841	18 24 55.4	80.54	2 11.4
5	12 51 46.07	11.025	5 1 1.7	76.80	1 53.5	5	15 8 44.80	11.927	18 47 43.2	80.42	2 12.2
6	12 56 10.76	11.035	5 31 42.3	76.56	1 54.0	6	15 13 33.04	12.033	19 10 3.5	80.29	2 13.1
7	13 0 35.76	11.049	6 2 16.6	76.29	1 54.5	7	15 18 22.39	12.078	19 31 55.6	80.07	2 14.0
8	13 5 1.15	11.066	6 32 44.0	76.99	1 55.0	8	15 23 12.81	12.123	19 53 19.0	80.06	2 14.9
9	13 9 26.92	11.083	7 3 3.9	76.65	1 55.5	9	15 28 4.30	12.168	20 14 12.9	81.61	2 15.8
10	13 13 53.12	11.101	7 33 15.4	76.29	1 55.9	10	15 32 56.87	12.212	20 34 36.5	80.34	2 16.7
11	13 18 19.78	11.121	8 3 17.7	74.89	1 56.4	11	15 37 50.50	12.256	20 54 29.2	80.04	2 17.7
12	13 22 46.94	11.143	8 33 10.5	74.49	1 56.9	12	15 42 45.16	12.299	21 13 50.3	80.70	2 18.7
13	13 27 14.64	11.166	9 2 52.9	74.03	1 57.4	13	15 47 40.85	12.341	21 32 39.0	80.34	2 19.7
14	13 31 42.91	11.191	9 32 23.9	73.54	1 57.9	14	15 52 37.54	12.383	21 50 54.8	80.02	2 20.7
15	13 36 11.79	11.216	10 1 42.9	73.06	1 58.5	15	15 57 35.24	12.424	22 8 36.9	80.54	2 21.7
16	13 40 41.30	11.244	10 30 49.3	72.49	1 59.1	16	16 2 33.90	12.463	22 25 44.9	80.10	2 22.8
17	13 45 11.49	11.273	10 59 42.4	71.92	1 59.7	17	16 7 33.48	12.502	22 42 17.9	80.64	2 23.8
18	13 49 42.39	11.303	11 28 21.4	71.31	2 0.3	18	16 12 34.00	12.540	22 58 15.5	80.18	2 24.9
19	13 54 14.03	11.334	11 56 45.6	70.70	2 0.8	19	16 17 35.42	12.575	23 13 37.0	80.63	2 25.9
20	13 58 46.45	11.366	12 24 54.2	70.09	2 1.4	20	16 22 37.66	12.609	23 28 22.0	80.09	2 27.0
21	14 3 19.69	11.402	12 52 46.5	69.39	2 2.0	21	16 27 40.66	12.642	23 42 29.7	80.53	2 28.1
22	14 7 53.75	11.437	13 20 21.9	68.61	2 2.6	22	16 32 44.46	12.675	23 55 59.6	80.04	2 29.2
23	14 12 28.67	11.474	13 47 39.6	67.85	2 3.2	23	16 37 49.06	12.707	24 8 51.2	80.34	2 30.3
24	14 17 45.52	11.513	14 14 38.8	67.07	2 3.9	24	16 42 54.39	12.738	24 21 4.3	80.78	2 31.4
25	14 21 41.29	11.552	14 41 18.9	66.25	2 4.6	25	16 48 0.34	12.769	24 32 38.3	80.00	2 32.6
26	14 26 19.02	11.592	15 7 39.1	65.41	2 5.3	26	16 53 6.87	12.794	24 43 32.5	80.42	2 33.8
27	14 30 57.71	11.633	15 33 38.6	64.53	2 6.0	27	16 58 13.98	12.804	24 53 46.6	80.74	2 35.0
28	14 35 37.42	11.676	15 59 16.8	63.63	2 6.7	28	17 3 21.60	12.827	25 3 20.2	80.06	2 36.2
29	14 40 18.15	11.719	16 24 32.9	62.70	2 7.4	29	17 8 29.66	12.844	25 12 13.1	81.34	2 37.4
30	14 44 59.93	11.763	16 49 26.3	61.73	2 8.2	30	17 13 38.10	12.858	25 20 24.6	80.61	2 38.6
31	14 49 42.76	11.807	17 13 56.0	60.72	2 9.0	31	17 18 46.85	12.870	25 27 54.5	80.02	2 39.8
32	14 54 26.65	11.851	17 38 1.1	59.69	2 9.8	32	17 23 55.84	12.878	25 34 42.8	80.14	2 41.0

Day of the Month,	3d.	8th.	13th.	18th.	23d.	28th.	Day of the Month,	3d.	8th.	13th.	18th.	23d.	28th.
Semidiameter	" 6.2	" 6.3	" 6.5	" 6.6	" 6.8	" 6.9	Semidiameter	" 7.1	" 7.3	" 7.5	" 7.8	" 8.0	" 8.3
Hor. Parallax	6.2	6.4	6.5	6.7	6.8	7.0	Hor. Parallax	7.2	7.4	7.6	7.8	8.1	8.3

GREENWICH MEAN TIME.

NOVEMBER.

DECEMBER.

Day of Month.	Apparent Right Ascension.		Var. of R.A. for 1 Hour.	Apparent Declination.			Var. of Dec. for 1 Hour.	Meridian Passage.	Day of Month.	Apparent Right Ascension.		Var. of R.A. for 1 Hour.	Apparent Declination.			Var. of Dec. for 1 Hour.	Meridian Passage.			
	Noon.		Noon.	Noon.			Noon.			Noon.		Noon.	Noon.			Noon.				
	h	m	s	"	O	I	N			"	h	m	s	"	O	I		N	"	
1	17	23	55.84	12.678	25	34	42.8	16.14	2	19	54	0.89	11.666	23	34	58.6	24.38	3	12.7	
2	17	29	4.99	12.684	25	40	49.1	14.36	2	19	58	39.93	11.664	23	20	56.3	25.66	3	13.4	
3	17	34	14.29	12.689	25	46	13.1	12.61	2	20	3	16.91	11.497	23	6	20.6	27.19	3	14.1	
4	17	39	23.66	12.690	25	50	54.6	10.64	2	20	7	51.77	11.407	22	51	12.3	28.51	3	14.8	
5	17	44	33.00	12.686	25	54	53.6	9.07	2	20	12	24.43	11.314	22	35	32.1	29.53	3	15.4	
6	17	49	42.21	12.679	25	58	9.8	7.26	2	20	16	54.85	11.219	22	19	20.7	41.16	3	15.9	
7	17	54	51.19	12.668	26	0	43.3	5.49	2	20	21	22.95	11.121	22	2	39.1	42.34	3	16.4	
8	17	59	59.87	12.654	26	2	33.7	3.71	2	20	25	48.68	11.022	21	45	28.3	43.44	3	16.9	
9	18	5	8.19	12.638	26	3	41.4	1.98	2	20	30	12.02	10.921	21	27	49.3	44.70	3	17.4	
10	18	10	16.08	12.618	26	4	6.2	-0.18	2	20	34	32.89	10.817	21	9	42.7	45.94	3	17.7	
11	18	15	23.44	12.794	26	3	48.5	+1.02	2	20	38	51.24	10.711	20	51	9.1	46.94	3	18.1	
12	18	20	30.18	12.766	26	2	48.4	2.20	2	20	43	7.01	10.603	20	32	9.4	48.01	3	18.4	
13	18	25	36.23	12.736	26	1	5.9	3.16	2	20	47	20.17	10.493	20	12	44.5	49.04	3	18.7	
14	18	30	41.50	12.702	25	58	40.8	4.02	2	20	51	30.65	10.380	19	52	55.6	50.02	3	19.0	
15	18	35	45.93	12.665	25	55	33.7	3.07	2	20	55	38.42	10.266	19	32	43.4	50.97	3	19.2	
16	18	40	49.42	12.624	25	51	44.6	10.41	2	20	59	43.42	10.151	19	12	8.9	51.89	3	19.3	
17	18	45	51.87	12.579	25	47	14.0	12.12	2	21	3	45.62	10.032	18	51	12.8	52.77	3	19.3	
18	18	50	53.21	12.532	25	42	2.1	13.86	3	0.9	21	7	44.96	9.912	18	29	56.1	53.61	3	19.4
19	18	55	53.44	12.484	25	36	9.2	15.55	3	2.0	21	11	41.41	9.791	18	8	19.7	54.40	3	19.4
20	19	0	52.48	12.433	25	29	35.8	17.23	3	3.0	21	15	34.94	9.669	17	46	24.7	55.16	3	19.3
21	19	5	50.23	12.377	25	22	21.9	18.91	3	4.0	21	19	25.49	9.543	17	24	11.9	55.99	3	19.1
22	19	10	46.58	12.317	25	14	28.3	20.55	3	5.0	22	23	13.02	9.417	17	1	42.1	56.69	3	19.0
23	19	15	41.45	12.254	25	5	55.4	22.19	3	6.0	23	26	57.49	9.288	16	38	56.2	57.23	3	18.9
24	19	20	34.79	12.190	24	56	43.7	23.78	3	7.0	24	30	38.85	9.157	16	15	55.3	57.63	3	18.7
25	19	25	26.58	12.124	24	46	53.7	25.37	3	7.9	25	34	17.02	9.023	15	52	40.3	58.29	3	18.3
26	19	30	16.77	12.055	24	36	25.9	26.94	3	8.8	26	37	51.96	8.889	15	29	12.5	58.90	3	17.8
27	19	35	5.25	11.983	24	25	20.5	28.49	3	9.7	27	41	23.67	8.753	15	5	32.8	59.28	3	17.4
28	19	39	51.94	11.909	24	13	38.2	30.01	3	10.5	28	44	52.08	8.612	14	41	42.1	59.63	3	17.0
29	19	44	36.82	11.831	24	1	19.9	31.49	3	11.3	29	48	17.07	8.469	14	17	41.4	60.22	3	16.5
30	19	49	19.82	11.751	23	48	26.6	32.94	3	12.0	30	51	38.59	8.322	13	53	31.5	60.66	3	15.9
31	19	54	0.89	11.669	23	34	58.6	34.38	3	12.7	31	54	56.54	8.173	13	29	13.7	60.98	3	15.3
32	19	58	39.93	11.584	23	20	56.3	35.80	3	13.4	32	58	10.89	8.021	13	4	49.0	61.14	3	14.5

Day of the Month,	2d.	7th.	12th.	17th.	22d.	27th.
Semidiameter	8.6	8.9	9.3	9.6	10.0	10.5
Hor. Parallax	8.6	9.0	9.3	9.7	10.1	10.6

Day of Month,	2d.	7th.	12th.	17th.	22d.	27th.	32d.
Semidiam.	11.0	11.6	12.1	12.8	13.6	14.4	15.4
Hor. Par.	11.1	11.6	12.2	12.9	13.7	14.5	15.5

GREENWICH MEAN TIME.

JANUARY.						FEBRUARY.												
Day of Month.	Apparent Right Ascension.		Var. of R.A. for 1 Hour.	Apparent Declination.		Var. of Dec. for 1 Hour.	Meridian Passage.	Day of Month.	Apparent Right Ascension.		Var. of R.A. for 1 Hour.	Apparent Declination.		Var. of Dec. for 1 Hour.	Meridian Passage.			
	Noon.			Noon.					Noon.			Noon.				Noon.		
	h	m	s	°	'	"			h	m	s	°	'	"		h	m	
1	23	52	10.30	6-183	-	1 13 12.0	48-84	5	7.3	1	9	36.24	6-388	+	7 38 45.4	41-11	4	23.6
2	23	54	38.71	6-186		0 55 41.4	48-83	5	5.9	2	1 13 8.16	6-388		7 55 10.1	40-04	4	21.2	
3	23	57	7.21	6-189		0 38 10.6	48-80	5	4.4	3	1 14 49.25	6-341		8 11 30.5	48-76	4	19.8	
4	23	59	35.78	6-191		0 20 40.0	48-78	5	2.9	4	1 17 19.53	6-349		8 27 46.6	48-68	4	18.3	
5	0	2	4.40	6-194	-	0 3 9.6	48-76	5	1.4	5	1 19 45.00	6-357		8 43 58.4	48-60	4	17.0	
6	0	4	33.09	6-197	+	0 14 30.3	48-73	4	59.9	6	1 22 17.66	6-365		9 0 5.7	48-51	4	15.6	
7	0	7	1.87	6-201		0 31 49.6	48-70	4	58.5	7	1 24 50.53	6-374		9 16 8.3	48-61	4	14.2	
8	0	9	30.74	6-205		0 49 18.1	48-66	4	57.1	8	1 27 23.60	6-382		9 32 6.2	48-61	4	12.8	
9	0	11	50.70	6-209		1 6 45.6	48-62	4	55.7	9	1 29 56.88	6-391		9 47 50.2	48-60	4	11.5	
10	0	14	28.75	6-212		1 24 12.1	48-57	4	54.2	10	1 32 30.36	6-399		10 3 47.2	48-60	4	10.1	
11	0	16	57.89	6-216		1 41 37.3	48-52	4	52.7	11	1 35 4.05	6-408		10 19 30.1	48-58	4	8.7	
12	0	19	27.14	6-220		1 59 1.2	48-46	4	51.3	12	1 37 37.96	6-417		10 35 7.7	48-56	4	7.3	
13	0	21	56.49	6-225		2 16 23.6	48-39	4	49.8	13	1 40 12.08	6-426		10 50 39.9	48-56	4	6.0	
14	0	24	25.94	6-230		2 33 44.3	48-33	4	48.4	14	1 42 46.42	6-435		11 6 6.7	48-56	4	4.6	
15	0	26	55.51	6-234		2 51 3.2	48-26	4	46.9	15	1 45 21.00	6-445		11 21 27.9	48-56	4	3.2	
16	0	29	25.19	6-239		3 8 20.2	48-16	4	45.5	16	1 47 55.80	6-454		11 36 43.4	48-52	4	1.8	
17	0	31	54.98	6-244		3 25 35.2	48-08	4	44.1	17	1 50 30.82	6-464		11 51 53.0	47-78	4	0.5	
18	0	34	24.89	6-248		3 42 48.0	48-00	4	42.6	18	1 53 6.06	6-473		12 6 56.7	47-02	3	59.1	
19	0	36	54.91	6-253		3 59 58.5	48-00	4	41.2	19	1 55 41.53	6-483		12 21 54.2	47-26	3	57.8	
20	0	39	25.04	6-258		4 17 6.6	48-78	4	39.7	20	1 58 17.22	6-492		12 36 45.4	47-00	3	56.4	
21	0	41	55.27	6-262		4 34 12.0	48-67	4	38.3	21	2 0 53.12	6-500		12 51 30.2	46-72	3	55.1	
22	0	44	25.62	6-267		4 51 14.7	48-55	4	36.9	22	2 3 29.24	6-509		13 6 8.5	46-46	3	53.8	
23	0	46	56.08	6-273		5 8 14.6	48-43	4	35.4	23	2 6 5.59	6-519		13 20 40.2	46-16	3	52.4	
24	0	49	26.66	6-277		5 25 11.6	48-31	4	34.0	24	2 8 42.16	6-529		13 35 5.2	46-00	3	51.1	
25	0	51	57.36	6-282		5 42 5.5	48-18	4	32.6	25	2 11 18.97	6-539		13 49 23.4	46-01	3	49.8	
26	0	54	28.19	6-287		5 58 56.1	48-04	4	31.1	26	2 13 56.03	6-549		14 3 34.7	46-22	3	48.5	
27	0	56	59.15	6-293		6 15 43.4	41-00	4	29.7	27	2 16 33.33	6-559		14 17 39.0	46-08	3	47.1	
28	0	59	30.25	6-299		6 32 27.2	41-78	4	28.3	28	2 19 10.88	6-570		14 31 36.2	46-22	3	45.8	
29	1	2	1.50	6-305		6 49 7.4	41-60	4	26.9	29	2 21 48.68	6-580		14 45 26.1	46-43	3	44.5	
30	1	4	32.91	6-311		7 5 43.9	41-44	4	25.5	30	2 24 26.74	6-591		14 59 8.8	46-12	3	43.2	
31	1	7	4.49	6-319		7 22 16.6	41-28	4	24.0	31	2 27 5.06	6-602		15 12 44.1	46-22	3	41.9	
32	1	9	36.24	6-326	+	7 38 45.4	41-11	4	22.6	32	2 29 43.63	6-613	+	15 26 11.9	46-50	3	40.6	

Day of the Month,	1st.	9th.	17th.	25th.	Day of the Month,	2d.	10th.	18th.	26th.
Polar Semidiameter	" 3.8	" 3.6	" 3.4	" 3.3	Polar Semidiameter	" 3.2	" 3.1	" 2.9	" 2.8
Horizontal Parallax	6.5	6.1	5.8	5.6	Horizontal Parallax	5.4	5.2	5.0	4.8

GREENWICH MEAN TIME.

MARCH.							APRIL.														
Day of Month.	Apparent Right Ascension.			Var. of R.A. for 1 Hour.	Apparent Declination.			Var. of Dec. for 1 Hour.	Meridian Passage.	Day of Month.	Apparent Right Ascension.			Var. of R.A. for 1 Hour.	Apparent Declination.			Var. of Dec. for 1 Hour.	Meridian Passage.		
	Noon.				Noon.						Noon.				Noon.						
	h	m	s	"	°	'	"	"	h	m	s	"	°	'	"	"	h	m			
1	2	21	48.68	6.680	+14	45	26.1	34.43	3	44.5	1	3	45	30.82	6.919	+20	45	24.5	23.99	3	6.1
2	2	24	26.74	6.691	14	59	8.8	34.13	3	43.2	2	3	48	16.84	6.922	20	54	31.1	23.56	3	4.9
3	2	27	5.06	6.692	15	12	44.1	33.81	3	41.9	3	3	51	3.09	6.932	21	3	27.4	23.16	3	3.7
4	2	29	43.63	6.613	15	26	11.9	33.50	3	40.6	4	3	53	49.57	6.942	21	12	13.3	21.69	3	2.5
5	2	32	22.47	6.625	15	39	32.1	33.18	3	39.3	5	3	56	36.29	6.951	21	20	48.8	21.26	3	1.4
6	2	35	1.57	6.635	15	52	44.6	32.86	3	38.0	6	3	59	23.24	6.961	21	29	13.8	20.82	3	0.2
7	2	37	40.94	6.646	16	5	49.2	32.53	3	36.7	7	4	2	10.42	6.970	21	37	28.2	20.37	2	59.1
8	2	40	20.58	6.657	16	18	45.9	32.19	3	35.5	8	4	4	57.81	6.979	21	45	31.9	19.93	2	57.9
9	2	43	0.50	6.669	16	31	34.6	31.86	3	34.2	9	4	7	45.42	6.988	21	53	24.9	19.48	2	56.8
10	2	45	40.70	6.681	16	44	15.2	31.52	3	32.9	10	4	10	33.24	6.997	22	1	7.1	19.03	2	55.6
11	2	48	21.18	6.692	16	56	47.5	31.17	3	31.6	11	4	13	21.26	7.005	22	8	38.5	18.58	2	54.5
12	2	51	1.92	6.703	17	9	11.5	30.83	3	30.4	12	4	16	9.48	7.013	22	15	58.9	18.12	2	53.3
13	2	53	42.94	6.714	17	21	27.1	30.47	3	29.1	13	4	18	57.88	7.020	22	23	8.4	17.66	2	52.2
14	2	56	24.22	6.726	17	33	34.1	30.11	3	27.9	14	4	21	46.46	7.028	22	30	6.8	17.20	2	51.1
15	2	59	5.77	6.737	17	45	32.4	29.75	3	26.6	15	4	24	35.22	7.035	22	36	54.1	16.74	2	49.9
16	3	1	47.59	6.748	17	57	22.0	29.38	3	25.4	16	4	27	24.14	7.042	22	43	30.3	16.27	2	48.8
17	3	4	29.66	6.758	18	9	2.7	29.01	3	24.2	17	4	30	13.22	7.049	22	39	55.2	15.80	2	47.7
18	3	7	12.00	6.769	18	20	34.3	28.63	3	22.9	18	4	33	2.46	7.055	22	56	8.8	15.33	2	46.6
19	3	9	54.59	6.780	18	31	56.9	28.25	3	21.7	19	4	35	51.84	7.060	23	2	11.2	14.86	2	45.5
20	3	12	37.44	6.791	18	43	10.3	27.86	3	20.5	20	4	38	41.36	7.066	23	8	2.2	14.39	2	44.4
21	3	15	20.55	6.801	18	54	14.5	27.47	3	19.2	21	4	41	31.01	7.071	23	13	41.9	13.91	2	43.2
22	3	18	3.90	6.811	19	5	9.3	27.08	3	18.0	22	4	44	20.79	7.076	23	19	10.2	13.44	2	42.1
23	3	20	47.50	6.822	19	15	54.6	26.69	3	16.8	23	4	47	10.68	7.081	23	24	27.0	12.96	2	41.0
24	3	23	31.34	6.833	19	26	30.4	26.29	3	15.6	24	4	50	0.68	7.085	23	29	32.4	12.48	2	39.9
25	3	26	15.43	6.843	19	36	56.7	25.89	3	14.4	25	4	52	50.78	7.089	23	34	26.2	12.00	2	38.8
26	3	28	59.76	6.852	19	47	13.2	25.48	3	13.2	26	4	55	40.99	7.094	23	39	8.4	11.52	2	37.7
27	3	31	44.34	6.862	19	57	20.0	25.07	3	12.0	27	4	58	31.30	7.098	23	43	39.1	11.03	2	36.6
28	3	34	29.15	6.872	20	7	16.9	24.66	3	10.8	28	5	1	21.70	7.102	23	47	58.1	10.55	2	35.5
29	3	37	14.31	6.882	20	17	3.9	24.25	3	9.6	29	5	4	12.18	7.105	23	52	5.5	10.06	2	34.4
30	3	39	59.51	6.892	20	26	40.8	23.83	3	8.4	30	5	7	2.75	7.109	23	56	1.1	9.57	2	33.3
31	3	42	45.04	6.902	20	36	7.7	23.41	3	7.2	31	5	9	53.40	7.112	23	59	45.0	9.08	2	32.2
32	3	45	30.32	6.912	+20	45	24.5	22.99	3	6.1	32	5	12	44.13	7.115	+24	3	17.1	8.59	2	31.1

Day of the Month,	6th.	14th.	22d.	30th.	Day of the Month,	7th.	15th.	23d.
Polar Semidiameter	" 2.7	" 2.6	" 2.5	" 2.5	Polar Semidiameter	" 2.4	" 2.4	" 2.3
Horizontal Parallax	4.6	4.4	4.3	4.2	Horizontal Parallax	4.1	4.0	3.9

GREENWICH MEAN TIME.

MAY.						JUNE.					
Day of Month.	Apparent Right Ascension.	Var. of R.A. for 1 Hour.	Apparent Declination.	Var. of Dec. for 1 Hour.	Meridian Passage.	Day of Month.	Apparent Right Ascension.	Var. of R.A. for 1 Hour.	Apparent Declination.	Var. of Dec. for 1 Hour.	Meridian Passage.
	Noon.	Noon.	Noon.	Noon.			Noon.	Noon.	Noon.	Noon.	
	h m s	"	° ' "	"	h m		h m s	"	° ' "	"	h m
1	5 9 53.40	7.119	+23 59 45.0	0.06	2 32.2	1	6 37 57.72	7.009	+24 18 11.3	6.02	1 58.1
2	5 12 44.13	7.116	24 3 17.1	0.09	2 31.1	2	6 40 46.58	7.002	24 15 41.1	6.09	1 56.9
3	5 15 34.92	7.118	24 6 37.4	0.10	2 30.0	3	6 43 35.26	7.005	24 12 59.6	6.07	1 55.8
4	5 18 25.77	7.120	24 9 46.0	7.61	2 28.9	4	6 46 23.76	7.017	24 10 6.8	7.43	1 54.7
5	5 21 16.66	7.122	24 12 42.8	7.19	2 27.8	5	6 49 12.08	7.009	24 7 2.9	7.09	1 53.5
6	5 24 7.60	7.123	24 15 27.8	6.08	2 26.7	6	6 52 0.20	7.001	24 3 47.8	6.20	1 52.4
7	5 26 58.57	7.124	24 18 1.0	6.14	2 25.6	7	6 54 48.12	6.992	24 0 21.6	6.02	1 51.2
8	5 29 49.57	7.125	24 20 22.5	6.60	2 24.5	8	6 57 35.83	6.983	23 56 44.3	6.29	1 50.1
9	5 32 40.58	7.126	24 22 32.2	6.18	2 23.4	9	7 0 23.32	6.974	23 52 56.0	6.74	1 48.9
10	5 35 31.60	7.126	24 24 30.0	4.06	2 22.3	10	7 3 10.59	6.965	23 48 56.8	10.19	1 47.8
11	5 38 22.62	7.125	24 26 16.0	4.17	2 21.2	11	7 5 57.63	6.955	23 44 46.7	10.08	1 46.6
12	5 41 13.62	7.124	24 27 50.2	3.08	2 20.2	12	7 8 44.44	6.945	23 40 25.8	11.09	1 45.5
13	5 44 4.61	7.123	24 29 12.5	3.18	2 19.1	13	7 11 31.01	6.934	23 35 54.2	11.08	1 44.3
14	5 46 55.57	7.122	24 30 23.1	3.09	2 18.0	14	7 14 17.32	6.924	23 31 12.0	11.08	1 43.2
15	5 49 46.49	7.120	24 31 21.8	2.20	2 16.9	15	7 17 3.37	6.913	23 26 19.1	12.42	1 42.0
16	5 52 37.35	7.118	24 32 8.7	1.71	2 15.8	16	7 19 49.16	6.902	23 21 15.7	12.08	1 40.8
17	5 55 28.14	7.116	24 32 43.8	1.22	2 14.7	17	7 22 34.66	6.891	23 16 1.9	13.20	1 39.6
18	5 58 18.87	7.112	24 33 7.1	0.78	2 13.6	18	7 25 19.94	6.880	23 10 37.7	12.72	1 38.4
19	6 1 9.52	7.109	24 33 18.7	0.24	2 12.5	19	7 28 4.92	6.868	23 5 3.1	14.16	1 37.2
20	6 4 0.09	7.105	24 33 18.5	0.25	2 11.4	20	7 30 49.61	6.856	22 59 18.3	14.20	1 36.0
21	6 6 50.56	7.101	24 33 6.7	0.72	2 10.3	21	7 33 34.02	6.844	22 53 23.4	16.00	1 34.8
22	6 9 40.93	7.096	24 32 43.2	1.22	2 9.2	22	7 36 18.14	6.832	22 47 18.3	15.42	1 33.6
23	6 12 31.19	7.091	24 32 8.0	1.71	2 8.1	23	7 39 1.96	6.820	22 41 3.2	15.04	1 32.4
24	6 15 21.33	7.087	24 31 21.2	2.19	2 7.0	24	7 41 45.49	6.807	22 34 38.1	16.26	1 31.2
25	6 18 11.36	7.082	24 30 22.9	2.67	2 5.9	25	7 44 28.72	6.795	22 28 3.1	16.08	1 30.0
26	6 21 1.27	7.078	24 29 12.9	3.16	2 4.8	26	7 47 11.65	6.782	22 21 18.3	17.07	1 28.7
27	6 23 51.04	7.071	24 27 51.4	3.64	2 3.7	27	7 49 54.28	6.770	22 14 23.8	17.47	1 27.5
28	6 26 40.67	7.065	24 26 18.3	4.12	2 2.6	28	7 52 36.61	6.757	22 7 19.6	17.09	1 26.3
29	6 29 30.16	7.059	24 24 33.7	4.60	2 1.4	29	7 55 18.63	6.744	22 0 5.7	16.27	1 25.0
30	6 32 19.50	7.053	24 22 37.6	5.07	2 0.3	30	7 58 0.35	6.732	21 52 42.3	16.07	1 23.8
31	6 35 8.69	7.046	24 20 30.1	5.55	1 59.2	31	8 0 41.77	6.719	21 45 9.4	16.00	1 22.5
32	6 37 57.72	7.039	+24 18 11.3	6.02	1 58.1	32	8 3 22.89	6.707	+21 37 27.2	16.46	1 21.3

Day of the Month,	1st.	9th.	17th.	25th.	Day of the Month,	2d.	10th.	18th.	26th.
Polar Semidiameter	2.3	2.2	2.1	2.1	Polar Semidiameter	2.1	2.0	2.0	2.0
Horizontal Parallax	3.8	3.7	3.6	3.5	Horizontal Parallax	3.5	3.4	3.4	3.3

GREENWICH MEAN TIME.

JULY.

AUGUST.

Day of Month.	Apparent Right Ascension.			Var. of R.A. for 1 Hour.	Apparent Declination.			Var. of Dec. for 1 Hour.	Meridian Passage.	Day of Month.	Apparent Right Ascension.			Var. of R.A. for 1 Hour.	Apparent Declination.			Var. of Dec. for 1 Hour.	Meridian Passage.		
	Noon.				Noon.						Noon.				Noon.						
	h	m	s	"	o	'	"	"	h	m	s	"	o	'	"	"	h	m			
1	8	0	41.77	6.719	+21	45	9.4	19.08	1	22.5	1	9	21	26.30	6.307	+16	41	10.5	20.36	0	41.1
2	8	3	22.89	6.707	21	37	27.2	19.43	1	21.3	2	9	23	57.51	6.294	16	29	22.5	20.64	0	39.7
3	8	6	3.70	6.694	21	29	35.7	19.84	1	20.0	3	9	26	28.42	6.282	16	17	27.9	20.90	0	38.3
4	8	8	44.30	6.681	21	21	34.9	20.22	1	18.7	4	9	28	59.04	6.270	16	5	27.0	20.17	0	36.8
5	8	11	24.38	6.667	21	13	25.0	20.60	1	17.5	5	9	31	29.38	6.256	15	53	19.8	20.43	0	35.4
6	8	14	4.94	6.654	21	5	6.1	20.97	1	16.2	6	9	33	59.44	6.246	15	41	6.4	20.68	0	33.9
7	8	16	43.79	6.641	20	56	38.3	21.34	1	14.9	7	9	36	29.21	6.234	15	28	46.9	20.93	0	32.5
8	8	19	23.02	6.628	20	48	1.7	21.71	1	13.6	8	9	38	58.70	6.223	15	16	21.5	21.18	0	31.0
9	8	22	1.94	6.615	20	39	16.3	22.07	1	12.3	9	9	41	27.90	6.211	15	3	50.2	21.43	0	29.6
10	8	24	40.52	6.601	20	30	22.3	22.43	1	11.0	10	9	43	56.83	6.199	14	51	13.1	21.68	0	28.1
11	8	27	18.77	6.587	20	21	19.7	22.78	1	9.7	11	9	46	25.49	6.186	14	38	30.4	21.89	0	26.6
12	8	29	56.68	6.573	20	12	8.7	23.13	1	8.4	12	9	48	53.87	6.177	14	26	42.1	22.13	0	25.2
13	8	32	34.26	6.559	20	2	49.3	23.48	1	7.1	13	9	51	21.98	6.165	14	12	48.3	22.38	0	23.7
14	8	35	11.51	6.545	19	53	21.6	23.82	1	5.8	14	9	53	49.82	6.154	13	59	49.1	22.57	0	22.2
15	8	37	48.43	6.531	19	43	45.8	24.16	1	4.5	15	9	56	17.38	6.143	13	46	44.7	22.79	0	20.8
16	8	40	25.02	6.517	19	34	1.8	24.50	1	3.1	16	9	58	44.67	6.132	13	33	35.0	23.01	0	19.3
17	8	43	1.27	6.503	19	24	9.8	24.83	1	1.8	17	10	1	11.71	6.122	13	20	20.2	23.22	0	17.8
18	8	45	37.19	6.489	19	14	10.0	25.15	1	0.5	18	10	3	38.51	6.112	13	7	0.4	23.43	0	16.3
19	8	48	12.77	6.476	19	4	2.3	25.47	0	59.1	19	10	6	5.07	6.102	12	53	35.6	23.63	0	14.8
20	8	50	48.02	6.462	18	53	46.9	25.80	0	57.7	20	10	8	31.40	6.092	12	40	6.0	23.83	0	13.3
21	8	53	22.95	6.448	18	43	23.9	26.12	0	56.4	21	10	10	57.50	6.083	12	26	31.6	24.03	0	11.8
22	8	55	57.55	6.434	18	32	53.3	26.43	0	55.0	22	10	13	23.37	6.073	12	12	52.5	24.23	0	10.3
23	8	58	31.82	6.421	18	22	15.2	26.74	0	53.7	23	10	15	49.02	6.064	11	59	8.7	24.42	0	8.8
24	9	1	5.77	6.408	18	11	29.7	27.05	0	52.3	24	10	18	14.46	6.056	11	45	20.4	24.61	0	7.2
25	9	3	39.40	6.395	18	0	37.0	27.35	0	50.9	25	10	20	39.70	6.047	11	31	27.6	24.79	0	5.7
26	9	6	12.72	6.382	17	49	37.1	27.65	0	49.5	26	10	23	4.74	6.039	11	17	30.5	24.97	0	4.2
27	9	8	45.74	6.369	17	38	30.0	27.93	0	48.1	27	10	25	29.59	6.031	11	3	29.1	25.16	0	2.7
28	9	11	18.46	6.357	17	27	15.8	28.22	0	46.7	28	10	27	54.25	6.023	10	49	23.5	25.32	0	1.1
29	9	13	50.87	6.344	17	15	54.7	28.52	0	45.3	29	10	30	18.71	6.015	10	35	13.8	25.49	23	58.1
30	9	16	22.96	6.332	17	4	26.7	28.81	0	43.9	30	10	32	42.98	6.007	10	21	0.1	25.64	23	56.5
31	9	18	54.79	6.319	16	52	51.9	29.09	0	42.5	31	10	35	7.07	6.000	10	6	42.5	25.81	23	55.0
32	9	21	26.30	6.307	+16	41	10.5	29.36	0	41.1	32	10	37	30.98	6.992	+ 9	52	21.1	25.97	23	53.4

Day of the Month,	4th.	13th.	20th.	29th.	Day of the Month,	5th.	13th.	21st.	29th.
Polar Semidiameter	2.0	2.0	2.0	1.9	Polar Semidiameter	1.9	1.9	1.9	1.9
Horizontal Parallax	3.3	3.3	3.3	3.2	Horizontal Parallax	3.2	3.2	3.2	3.2

GREENWICH MEAN TIME.

SEPTEMBER.						OCTOBER.							
Day of Month.	Apparent Right Ascension.			Var. of R.A. for 1 Hour.		Meridian Passage.	Day of Month.	Apparent Right Ascension.			Var. of R.A. for 1 Hour.		Meridian Passage.
	Noon.			Noon.	Noon.			Noon.			Noon.	Noon.	
	h	m	s	s	° ' "	h m s	h	m	s	s	° ' "	h m s	
1	10	37	30.98	5-928	+ 9 52 21.1	23 53.4	1	11	48	34.35	5-888	+ 2 19 59.2	23 6.1
2	10	39	54.72	5-926	9 37 55.9	23 51.9	2	11	50	55.68	5-889	2 4 25.8	23 4.5
3	10	42	18.31	5-920	9 23 27.2	23 50.3	3	11	53	17.02	5-889	1 48 51.5	23 2.9
4	10	44	41.75	5-974	9 8 55.0	23 48.8	4	11	55	38.38	5-890	1 33 16.4	23 1.3
5	10	47	5.05	5-928	8 54 19.4	23 47.2	5	11	57	59.76	5-891	1 17 40.6	23 59.8
6	10	49	28.20	5-922	8 39 40.6	23 45.7	6	12	0	21.17	5-892	1 2 4.2	23 56.2
7	10	51	51.21	5-926	8 24 58.5	23 44.1	7	12	2	42.62	5-894	0 46 27.4	23 56.6
8	10	54	14.08	5-950	8 10 13.3	23 42.5	8	12	5	4.11	5-896	0 30 50.3	23 55.0
9	10	56	36.80	5-944	7 55 25.0	23 41.0	9	12	7	25.64	5-899	+ 0 15 12.9	23 53.4
10	10	58	59.39	5-928	7 40 33.8	23 39.4	10	12	9	47.22	5-900	- 0 0 24.7	23 51.8
11	11	1	21.85	5-922	7 25 39.8	23 37.8	11	12	12	8.84	5-902	0 16 2.3	23 50.3
12	11	3	44.19	5-927	7 10 43.1	23 36.3	12	12	14	30.53	5-905	0 31 39.8	23 48.7
13	11	6	6.41	5-923	6 55 43.7	23 34.7	13	12	16	52.29	5-906	0 47 17.3	23 47.1
14	11	8	28.51	5-919	6 40 41.8	23 33.1	14	12	19	14.14	5-912	1 2 54.5	23 45.5
15	11	10	50.51	5-914	6 25 37.4	23 31.5	15	12	21	36.07	5-916	1 18 31.5	23 44.0
16	11	13	12.40	5-910	6 10 30.6	23 29.9	16	12	23	58.09	5-920	1 34 8.1	23 42.4
17	11	15	34.20	5-906	5 55 21.5	23 28.4	17	12	26	20.21	5-924	1 49 44.2	23 40.8
18	11	17	55.92	5-903	5 40 10.2	23 26.8	18	12	28	42.44	5-928	2 5 19.8	23 39.3
19	11	20	17.57	5-901	5 24 56.8	23 25.2	19	12	31	4.78	5-923	2 20 54.8	23 37.7
20	11	22	39.17	5-899	5 9 41.4	23 23.6	20	12	33	27.24	5-926	2 86 29.1	23 36.1
21	11	25	0.72	5-897	4 54 24.0	23 22.0	21	12	35	49.83	5-944	2 52 2.6	23 34.5
22	11	27	22.21	5-894	4 39 4.6	23 20.4	22	12	38	12.55	5-960	3 7 35.2	23 33.0
23	11	29	43.65	5-892	4 23 43.4	23 18.8	23	12	40	35.42	5-926	3 23 6.9	23 31.4
24	11	32	5.05	5-891	4 8 20.4	23 17.3	24	12	42	58.43	5-922	3 38 37.5	23 29.8
25	11	34	26.42	5-890	3 52 55.8	23 15.7	25	12	45	21.61	5-929	3 54 6.9	23 28.3
26	11	36	47.77	5-889	3 37 29.7	23 14.1	26	12	47	44.95	5-976	4 9 35.0	23 26.7
27	11	39	9.10	5-889	3 22 2.1	23 12.5	27	12	50	8.47	5-923	4 25 1.7	23 25.2
28	11	41	30.41	5-888	3 6 33.2	23 10.9	28	12	52	32.16	5-990	4 40 26.9	23 33.7
29	11	43	51.72	5-888	2 51 3.0	23 9.3	29	12	55	56.03	5-926	4 55 50.5	23 22.1
30	11	46	13.03	5-888	2 35 31.6	23 7.7	30	12	57	20.09	6-006	5 11 12.4	23 20.6
31	11	48	34.35	5-888	2 19 59.2	23 6.1	31	12	59	44.33	6-014	5 26 32.5	23 19.1
32	11	50	55.68	5-889	+ 2 4 25.8	23 4.5	32	13	2	8.77	6-022	- 5 41 50.7	23 17.5

Day of the Month,	6th.	14th.	22d.	30th.	Day of the Month,	8th.	16th.	24th.
Polar Semidiameter	" 1.9	" 1.9	" 1.9	" 1.9	Polar Semidiameter	" 2.0	" 2.0	" 2.0
Horizontal Parallax	3.2	3.2	3.2	3.2	Horizontal Parallax	3.3	3.3	3.3

GREENWICH MEAN TIME.

NOVEMBER.

DECEMBER.

Day of Month.	Apparent Right Ascension.			Var. of R.A. for 1 Hour.	Apparent Declination.			Var. of Dec. for 1 Hour.	Meridian Passage.	Day of Month.	Apparent Right Ascension.			Var. of R.A. for 1 Hour.	Apparent Declination.			Var. of Dec. for 1 Hour.	Meridian Passage.		
	h	m	s		h	m	s				h	m	s		h	m	s			h	m	s
1	13	2	8.77	6.022	5	41	50.7	36.21	22	17.5	1	14	16	18.67	6.373	12	57	18.3	32.70	21	33.5
2	13	4	33.40	6.030	5	57	6.8	36.12	22	15.9	2	14	18	51.81	6.366	13	10	44.5	32.49	21	32.1
3	13	6	58.24	6.039	6	12	20.7	36.03	22	14.4	3	14	21	25.29	6.402	13	24	5.3	32.25	21	30.8
4	13	9	23.29	6.048	6	27	32.4	37.04	22	12.9	4	14	23	59.12	6.417	13	37	20.5	32.02	21	29.3
5	13	11	48.55	6.057	6	42	41.7	37.04	22	11.4	5	14	26	33.31	6.432	13	50	30.1	32.78	21	28.0
6	13	14	14.04	6.066	6	57	48.6	37.73	22	9.9	6	14	29	7.86	6.447	14	3	34.0	32.54	21	26.6
7	13	16	39.74	6.076	7	12	52.9	37.62	22	8.4	7	14	31	42.77	6.462	14	16	32.0	32.29	21	25.3
8	13	19	5.66	6.086	7	27	54.5	37.51	22	6.9	8	14	34	18.05	6.477	14	29	24.0	32.04	21	23.9
9	13	21	31.82	6.096	7	42	53.3	37.39	22	5.4	9	14	36	53.69	6.492	14	42	10.0	31.79	21	22.6
10	13	23	58.21	6.106	7	57	49.3	37.27	22	3.9	10	14	39	29.70	6.508	14	54	49.8	31.53	21	21.2
11	13	26	24.85	6.115	8	12	42.3	37.14	22	2.4	11	14	42	6.09	6.524	15	7	23.3	31.28	21	19.9
12	13	28	51.75	6.126	8	27	32.2	37.01	22	0.9	12	14	44	42.85	6.540	15	19	50.4	30.99	21	18.6
13	13	31	18.91	6.137	8	42	18.9	36.88	21	59.4	13	14	47	20.00	6.556	15	32	11.0	30.72	21	17.2
14	13	33	46.33	6.148	8	57	2.3	36.74	21	57.9	14	14	49	57.54	6.572	15	44	25.0	30.44	21	15.9
15	13	36	14.02	6.159	9	11	42.3	36.60	21	56.4	15	14	52	35.46	6.588	15	56	32.2	30.16	21	14.6
16	13	38	41.99	6.170	9	26	18.9	36.45	21	54.9	16	14	55	13.78	6.605	16	8	32.5	29.87	21	13.4
17	13	41	10.23	6.182	9	40	51.9	36.30	21	53.5	17	14	57	52.50	6.622	16	20	25.9	29.58	21	12.1
18	13	43	38.75	6.194	9	55	21.2	36.14	21	52.0	18	15	0	31.62	6.638	16	32	12.2	29.28	21	10.8
19	13	46	7.56	6.207	10	9	46.8	35.98	21	50.6	19	15	3	11.14	6.654	16	43	51.3	28.98	21	9.5
20	13	48	36.68	6.220	10	24	8.5	35.82	21	49.1	20	15	5	51.07	6.672	16	55	23.1	28.67	21	8.2
21	13	51	6.12	6.233	10	38	26.2	35.65	21	47.6	21	15	8	31.41	6.689	17	6	47.6	28.36	21	7.0
22	13	53	35.88	6.247	10	52	39.8	35.48	21	46.2	22	15	11	12.16	6.707	17	18	4.6	28.05	21	5.7
23	13	56	5.96	6.261	11	6	49.2	35.30	21	44.8	23	15	13	53.33	6.724	17	29	14.1	27.73	21	4.4
24	13	58	36.38	6.274	11	20	54.2	35.12	21	43.3	24	15	16	34.91	6.741	17	40	15.8	27.40	21	3.2
25	14	1	7.12	6.288	11	34	54.8	34.92	21	41.9	25	15	19	16.90	6.758	17	51	9.6	27.07	21	2.0
26	14	3	38.20	6.302	11	48	50.9	34.74	21	40.5	26	15	21	59.30	6.775	18	1	55.4	26.74	21	0.7
27	14	6	9.61	6.316	12	2	42.2	34.54	21	39.1	27	15	24	42.11	6.792	18	12	33.1	26.40	20	59.5
28	14	8	41.35	6.330	12	16	28.7	34.33	21	37.7	28	15	27	25.32	6.809	18	23	2.5	26.05	20	58.3
29	14	11	13.45	6.344	12	30	10.3	34.13	21	36.3	29	15	30	8.94	6.826	18	33	23.5	25.70	20	57.1
30	14	13	45.88	6.359	12	43	46.9	33.92	21	34.9	30	15	32	52.96	6.843	18	43	36.0	25.34	20	55.9
31	14	16	18.67	6.373	12	57	18.3	33.70	21	33.5	31	15	35	37.38	6.859	18	53	40.0	24.98	20	54.7
32	14	18	51.81	6.388	13	10	44.5	33.48	21	32.1	32	15	38	22.20	6.875	19	3	35.3	24.62	20	53.5

Day of the Month,	1st.	9th.	17th.	25th.	Day of the Month,	3d.	11th.	19th.	27th.
Polar Semidiameter	2.0	2.0	2.1	2.1	Polar Semidiameter	2.1	2.2	2.3	2.3
Horizontal Parallax	3.4	3.4	3.5	3.6	Horizontal Parallax	3.6	3.7	3.8	3.9

GREENWICH MEAN TIME.

JANUARY.						FEBRUARY.					
Day of Month.	Apparent Right Ascension.	Var. of R.A. for 1 Hour.	Apparent Declination.	Var. of Dec. for 1 Hour.	Meridian Passage.	Day of Month.	Apparent Right Ascension.	Var. of R.A. for 1 Hour.	Apparent Declination.	Var. of Dec. for 1 Hour.	Meridian Passage.
	Noon.	Noon.	Noon.	Noon.			Noon.	Noon.	Noon.	Noon.	
	h m s	"	° ' "	"	h m		h m s	"	° ' "	"	h m
1	9 55 54.31	0.593	+13 38 43.8	3.77	15 8.9	1	9 43 51.48	1.244	+14 47 43.4	6.68	12 54.8
2	9 55 39.59	0.624	13 40 17.1	3.63	15 4.6	2	9 43 21.50	1.263	14 50 24.1	6.71	12 50.4
3	9 55 24.27	0.653	13 41 53.3	4.06	15 0.4	3	9 42 51.32	1.261	14 53 5.3	6.72	12 45.9
4	9 55 8.26	0.681	13 43 32.9	4.22	14 56.2	4	9 42 20.95	1.269	14 55 46.9	6.73	12 41.5
5	9 54 51.57	0.709	13 45 15.9	4.26	14 52.0	5	9 41 51.41	1.276	14 58 23.7	6.74	12 37.1
6	9 54 34.22	0.736	13 47 2.3	4.60	14 47.8	6	9 41 19.73	1.280	15 1 10.7	6.75	12 32.6
7	9 54 16.20	0.764	13 48 51.9	4.63	14 43.5	7	9 40 48.93	1.285	15 3 52.6	6.75	12 28.1
8	9 53 57.53	0.791	13 50 44.7	4.76	14 39.2	8	9 40 18.04	1.288	15 6 34.5	6.74	12 23.7
9	9 53 38.22	0.817	13 52 40.6	4.89	14 35.0	9	9 39 47.07	1.291	15 9 16.1	6.73	12 19.3
10	9 53 18.28	0.843	13 54 39.5	5.01	14 30.8	10	9 39 16.06	1.292	15 11 57.3	6.71	12 14.8
11	9 52 57.73	0.869	13 56 41.4	5.13	14 26.5	11	9 38 45.02	1.293	15 14 38.0	6.68	12 10.3
12	9 52 36.57	0.894	13 58 46.1	5.25	14 22.2	12	9 38 13.96	1.292	15 17 18.0	6.64	12 5.9
13	9 52 14.52	0.918	14 0 53.6	5.37	14 17.9	13	9 37 42.97	1.291	15 19 57.2	6.62	12 1.4
14	9 51 52.50	0.941	14 3 3.8	5.48	14 13.6	14	9 37 12.00	1.288	15 22 35.5	6.58	11 56.9
15	9 51 29.62	0.964	14 5 16.5	5.56	14 9.3	15	9 36 41.10	1.285	15 25 12.9	6.54	11 52.5
16	9 51 6.20	0.987	14 7 31.7	5.68	14 5.0	16	9 36 10.29	1.281	15 27 49.2	6.49	11 48.0
17	9 50 42.24	1.009	14 9 49.2	5.78	14 0.7	17	9 35 39.61	1.276	15 30 24.3	6.43	11 43.6
18	9 50 17.77	1.030	14 12 9.0	5.87	13 56.3	18	9 35 9.07	1.269	15 32 58.1	6.37	11 39.2
19	9 49 52.81	1.050	14 14 31.0	5.96	13 52.0	19	9 34 38.70	1.261	15 35 30.5	6.31	11 34.8
20	9 49 27.38	1.069	14 16 55.0	6.04	13 47.6	20	9 34 8.51	1.253	15 38 1.4	6.25	11 30.3
21	9 49 1.49	1.088	14 19 20.9	6.12	13 43.2	21	9 33 38.53	1.244	15 40 30.7	6.18	11 25.9
22	9 48 35.15	1.106	14 21 48.7	6.19	13 38.8	22	9 33 8.78	1.234	15 42 58.3	6.11	11 21.5
23	9 48 8.39	1.122	14 24 18.2	6.26	13 34.5	23	9 32 39.27	1.222	15 45 24.1	6.02	11 17.1
24	9 47 41.22	1.140	14 26 49.3	6.33	13 30.1	24	9 32 10.03	1.219	15 47 48.0	5.95	11 12.7
25	9 47 13.66	1.156	14 29 21.9	6.39	13 25.7	25	9 31 41.08	1.199	15 50 9.9	5.87	11 8.3
26	9 46 45.74	1.171	14 31 55.9	6.44	13 21.3	26	9 31 12.44	1.186	15 52 29.8	5.79	11 3.9
27	9 46 17.46	1.184	14 34 31.3	6.49	13 16.9	27	9 30 44.13	1.172	15 54 47.5	5.69	10 59.5
28	9 45 48.85	1.198	14 37 7.8	6.54	13 12.5	28	9 30 16.16	1.157	15 57 3.0	5.60	10 55.1
29	9 45 19.93	1.211	14 39 45.4	6.58	13 8.1	29	9 29 48.56	1.143	15 59 16.2	5.50	10 50.7
30	9 44 50.71	1.223	14 42 23.9	6.62	13 3.6	30	9 29 21.34	1.126	16 1 27.0	5.40	10 46.3
31	9 44 21.22	1.234	14 45 3.3	6.65	12 59.2	31	9 28 54.53	1.108	16 3 35.4	5.30	10 42.0
32	9 43 51.48	1.244	+14 47 43.4	6.68	12 54.8	32	9 28 26.14	1.090	+16 5 41.2	5.19	10 37.6

Day of the Month,	1st.	11th.	21st.	31st.	Day of the Month,	1st.	11th.	21st.	31st.
Polar Semidiameter	20.1	20.6	21.0	21.2	Polar Semidiameter	21.2	21.3	21.2	21.0
Horizontal Parallax	1.9	1.9	1.9	2.0	Horizontal Parallax	2.0	2.0	2.0	1.9

GREENWICH MEAN TIME.

MARCH.						APRIL.					
Day of Month.	Apparent Right Ascension.	Var. of R.A. for 1 Hour.	Apparent Declination.	Var. of Dec. for 1 Hour.	Meridian Passage.	Day of Month.	Apparent Right Ascension.	Var. of R.A. for 1 Hour.	Apparent Declination.	Var. of Dec. for 1 Hour.	Meridian Passage.
	Noon.	Noon.	Noon.	Noon.	h m		Noon.	Noon.	Noon.	Noon.	h m
	h m s	"	° ' "	"	h m		h m s	"	° ' "	"	h m
1	9 29 48.56	1.143	+15 59 16.2	8.40	10 50.7	1	9 20 1.30	0.323	+16 43 38.7	1.43	8 39.3
2	9 29 21.34	1.136	16 1 27.0	8.40	10 46.3	2	9 19 52.98	0.321	16 44 11.0	1.27	8 35.3
3	9 28 54.53	1.108	16 3 35.4	8.30	10 42.0	3	9 19 45.40	0.300	16 44 39.9	1.18	8 31.2
4	9 28 28.14	1.090	16 5 41.2	8.19	10 37.6	4	9 19 38.56	0.269	16 45 5.2	0.98	8 27.2
5	9 28 2.19	1.072	16 7 44.5	8.08	10 33.3	5	9 19 32.46	0.228	16 45 26.9	0.83	8 23.2
6	9 27 36.69	1.053	16 9 45.1	7.94	10 28.9	6	9 19 27.11	0.207	16 45 45.1	0.68	8 19.1
7	9 27 11.67	1.023	16 11 42.9	7.82	10 24.6	7	9 19 22.51	0.176	16 45 59.8	0.54	8 15.1
8	9 26 47.15	1.011	16 13 38.0	7.73	10 20.2	8	9 19 18.66	0.145	16 46 11.0	0.39	8 11.1
9	9 26 23.13	0.989	16 15 30.2	7.61	10 15.9	9	9 19 15.56	0.112	16 46 18.6	0.24	8 7.1
10	9 25 59.64	0.967	16 17 19.4	7.48	10 11.6	10	9 19 13.21	0.082	16 46 22.7	+0.10	8 3.1
11	9 25 36.69	0.944	16 19 5.6	7.34	10 7.3	11	9 19 11.61	0.051	16 46 23.3	-0.05	7 59.2
12	9 25 14.30	0.921	16 20 48.8	7.22	10 3.0	12	9 19 10.76	0.020	16 46 20.3	0.20	7 55.2
13	9 24 52.48	0.897	16 22 28.9	7.10	9 58.7	13	9 19 10.66	+0.012	16 46 13.8	0.34	7 51.3
14	9 24 31.25	0.872	16 24 5.9	6.97	9 54.4	14	9 19 11.32	0.042	16 46 3.8	0.49	7 47.3
15	9 24 10.63	0.846	16 25 39.6	6.83	9 50.2	15	9 19 12.72	0.074	16 45 50.3	0.63	7 43.4
16	9 23 50.62	0.820	16 27 10.1	6.70	9 45.9	16	9 19 14.86	0.105	16 45 33.4	0.78	7 39.5
17	9 23 31.23	0.794	16 28 37.4	6.57	9 41.7	17	9 19 17.75	0.135	16 45 13.1	0.92	7 35.6
18	9 23 12.48	0.767	16 30 1.3	6.43	9 37.4	18	9 19 21.38	0.166	16 44 49.3	1.06	7 31.7
19	9 22 54.38	0.740	16 31 21.9	6.29	9 33.2	19	9 19 25.74	0.196	16 44 22.1	1.20	7 27.9
20	9 22 36.93	0.712	16 32 39.2	6.15	9 29.0	20	9 19 30.83	0.227	16 43 51.5	1.34	7 24.1
21	9 22 20.15	0.685	16 33 53.1	6.00	9 24.8	21	9 19 36.64	0.257	16 43 17.5	1.48	7 20.3
22	9 22 4.04	0.657	16 35 3.6	5.84	9 20.6	22	9 19 43.18	0.287	16 42 40.2	1.62	7 16.5
23	9 21 48.61	0.628	16 36 10.6	5.72	9 16.4	23	9 19 50.44	0.317	16 41 59.6	1.76	7 12.7
24	9 21 33.86	0.600	16 37 14.2	5.58	9 12.2	24	9 19 58.40	0.346	16 41 15.7	1.89	7 8.9
25	9 21 19.81	0.570	16 38 14.4	5.43	9 8.0	25	9 20 7.07	0.376	16 40 28.6	2.03	7 5.1
26	9 21 6.46	0.541	16 39 11.1	5.29	9 3.9	26	9 20 16.45	0.405	16 39 38.2	2.16	7 1.3
27	9 20 53.81	0.512	16 40 4.4	5.15	8 59.8	27	9 20 26.52	0.434	16 38 44.5	2.30	6 57.5
28	9 20 41.87	0.482	16 40 54.3	5.00	8 55.7	28	9 20 37.39	0.462	16 37 47.7	2.43	6 53.8
29	9 20 30.65	0.452	16 41 40.7	4.86	8 51.6	29	9 20 48.74	0.491	16 36 47.6	2.56	6 50.0
30	9 20 20.14	0.422	16 42 23.5	4.71	8 47.5	30	9 21 0.88	0.520	16 35 44.4	2.70	6 46.3
31	9 20 10.36	0.392	16 43 2.8	4.56	8 43.4	31	9 21 13.70	0.548	16 34 37.9	2.84	6 42.6
32	9 20 1.30	0.362	+16 43 38.7	4.43	8 39.3	32	9 21 27.19	0.576	+16 33 28.2	2.97	6 38.9

Day of the Month,	1st.	11th.	21st.	31st.	Day of the Month,	1st.	11th.	21st.	31st.
Polar Semidiameter	21.0	20.7	20.2	19.7	Polar Semidiameter	19.7	19.1	18.6	18.0
Horizontal Parallax	1.9	1.9	1.9	1.8	Horizontal Parallax	1.8	1.8	1.7	1.7

GREENWICH MEAN TIME.

MAY.						JUNE.					
Day of Month.	Apparent Right Ascension.	Var. of R.A. for 1 Hour.	Apparent Declination.	Var. of Dec. for 1 Hour.	Meridian Passage.	Day of Month.	Apparent Right Ascension.	Var. of R.A. for 1 Hour.	Apparent Declination.	Var. of Dec. for 1 Hour.	Meridian Passage.
	Noon.	Noon.	Noon.	Noon.			Noon.	Noon.	Noon.	Noon.	
	h m s	"	° ' "	"	h m		h m s	"	° ' "	"	h m
1	9 21 13.70	-0.548	+16 34 37.9	2.84	6 42.6	1	9 32 54.77	1.290	+15 35 46.3	6.51	4 52.4
2	9 21 27.19	-0.576	16 33 28.2	2.97	6 38.9	2	9 33 25.96	1.309	15 33 8.9	6.61	4 49.0
3	9 21 41.35	-0.604	16 32 15.4	3.10	6 35.2	3	9 33 57.60	1.328	15 30 29.0	6.71	4 45.6
4	9 21 56.17	-0.631	16 30 59.4	3.23	6 31.5	4	9 34 29.71	1.347	15 27 46.6	6.81	4 42.2
5	9 22 11.65	-0.658	16 29 40.3	3.36	6 27.9	5	9 35 2.26	1.365	15 25 1.8	6.91	4 38.8
6	9 22 27.79	-0.686	16 28 18.1	3.49	6 24.2	6	9 35 35.25	1.383	15 22 14.5	7.02	4 35.4
7	9 22 44.58	-0.713	16 26 52.8	3.61	6 20.5	7	9 36 8.68	1.401	15 19 24.8	7.12	4 32.1
8	9 23 2.01	-0.739	16 25 24.5	3.74	6 16.9	8	9 36 42.54	1.419	15 16 32.7	7.22	4 28.7
9	9 23 20.08	-0.766	16 23 53.1	3.87	6 13.3	9	9 37 16.80	1.436	15 13 38.2	7.32	4 25.3
10	9 23 38.78	-0.792	16 22 18.7	3.99	6 9.7	10	9 37 51.49	1.453	15 10 41.4	7.42	4 21.9
11	9 23 58.10	-0.817	16 20 41.3	4.12	6 6.0	11	9 38 26.58	1.470	15 7 42.2	7.51	4 18.6
12	9 24 18.04	-0.843	16 19 0.9	4.24	6 2.4	12	9 39 2.07	1.486	15 4 40.8	7.60	4 15.2
13	9 24 38.59	-0.868	16 17 17.6	4.36	5 58.8	13	9 39 37.95	1.503	15 1 37.1	7.70	4 11.9
14	9 24 59.74	-0.893	16 15 31.3	4.48	5 55.3	14	9 40 14.22	1.519	14 58 31.2	7.79	4 8.6
15	9 25 21.48	-0.918	16 13 42.1	4.60	5 51.7	15	9 40 50.87	1.534	14 55 23.1	7.88	4 5.3
16	9 25 43.81	-0.943	16 11 50.1	4.73	5 48.2	16	9 41 27.89	1.549	14 52 12.8	7.97	4 1.9
17	9 26 6.72	-0.968	16 9 55.2	4.84	5 44.6	17	9 42 5.26	1.564	14 49 0.3	8.06	3 58.6
18	9 26 30.20	-0.990	16 7 57.4	4.96	5 41.1	18	9 42 42.99	1.579	14 45 45.7	8.15	3 55.3
19	9 26 54.25	-1.012	16 5 56.9	5.08	5 37.5	19	9 43 21.07	1.594	14 42 29.0	8.24	3 52.0
20	9 27 18.26	-1.036	16 3 53.6	5.19	5 34.0	20	9 43 59.49	1.608	14 39 10.1	8.32	3 48.7
21	9 27 44.00	-1.059	16 1 47.6	5.30	5 30.5	21	9 44 38.24	1.622	14 35 49.2	8.41	3 45.4
22	9 28 9.69	-1.081	15 59 38.9	5.41	5 27.0	22	9 45 17.32	1.635	14 32 26.2	8.50	3 42.1
23	9 28 35.91	-1.103	15 57 27.5	5.52	5 23.5	23	9 45 56.72	1.648	14 29 1.2	8.58	3 38.9
24	9 29 2.66	-1.125	15 55 13.4	5.64	5 20.0	24	9 46 36.44	1.661	14 25 34.2	8.66	3 35.6
25	9 29 29.93	-1.147	15 52 56.6	5.75	5 16.5	25	9 47 16.47	1.674	14 22 5.2	8.75	3 32.3
26	9 29 57.71	-1.167	15 50 37.2	5.86	5 13.1	26	9 47 56.80	1.687	14 18 34.2	8.83	3 29.0
27	9 30 25.99	-1.188	15 48 15.2	5.97	5 9.6	27	9 48 37.44	1.699	14 15 1.2	8.91	3 25.8
28	9 30 54.77	-1.209	15 45 50.5	6.08	5 6.2	28	9 49 18.38	1.711	14 11 26.3	8.99	3 22.5
29	9 31 24.04	-1.229	15 43 23.3	6.18	5 2.7	29	9 49 59.60	1.723	14 7 49.5	9.07	3 19.3
30	9 31 53.80	-1.250	15 40 53.5	6.29	4 59.3	30	9 50 41.11	1.735	14 4 10.8	9.15	3 16.1
31	9 32 24.05	-1.270	15 38 21.2	6.40	4 55.8	31	9 51 22.90	1.747	14 0 30.2	9.23	3 12.9
32	9 32 54.77	-1.290	+15 35 46.3	6.51	4 52.4	32	9 52 4.97	1.758	+13 56 47.7	9.31	3 9.6

Day of the Month,	1st.	11th.	21st.	31st.	Day of the Month,	1st.	11th.	21st.	31st.
Polar Semidiameter	18.0	17.5	17.0	16.5	Polar Semidiameter	16.4	16.0	15.7	15.4
Horizontal Parallax	1.7	1.6	1.6	1.5	Horizontal Parallax	1.5	1.5	1.4	1.4

GREENWICH MEAN TIME.

JULY.						AUGUST.					
Day of Month.	Apparent Right Ascension.	Var. of R.A. for 1 Hour.	Apparent Declination.	Var. of Dec. for 1 Hour.	Meridian Passage.	Day of Month.	Apparent Right Ascension.	Var. of R.A. for 1 Hour.	Apparent Declination.	Var. of Dec. for 1 Hour.	Meridian Passage.
	Noon.	Noon.	Noon.	Noon.			Noon.	Noon.	Noon.	Noon.	
	h m s	s	° ' "	"	h m		h m s	s	° ' "	"	h m
1	9 51 22.90	1.747	+14 0 30.2	9.28	3 12.9	1	10 14 46.11	1.800	+11 53 4.4	11.16	1 34.2
2	9 52 4.97	1.788	13 56 47.7	9.31	3 9.6	2	10 15 33.94	1.806	11 48 35.9	11.21	1 31.1
3	9 52 47.30	1.789	13 53 3.4	9.30	3 6.4	3	10 16 21.87	1.899	11 44 6.3	11.25	1 27.9
4	9 53 29.89	1.780	13 49 17.3	9.46	3 3.2	4	10 17 9.91	2.003	11 39 35.6	11.30	1 24.8
5	9 54 12.75	1.791	13 45 29.3	9.53	3 0.0	5	10 17 58.05	2.007	11 35 3.8	11.34	1 21.7
6	9 54 55.86	1.801	13 41 39.5	9.61	2 56.7	6	10 18 46.28	2.011	11 30 31.0	11.38	1 18.6
7	9 55 39.21	1.811	13 37 48.0	9.70	2 53.5	7	10 19 34.60	2.015	11 25 57.2	11.42	1 15.4
8	9 56 22.80	1.821	13 33 54.7	9.78	2 50.3	8	10 20 23.01	2.018	11 21 22.4	11.46	1 12.3
9	9 57 6.63	1.831	13 29 59.8	9.82	2 47.1	9	10 21 11.49	2.021	11 16 46.7	11.50	1 9.2
10	9 57 50.68	1.840	13 26 3.2	9.89	2 43.0	10	10 22 0.05	2.024	11 12 10.2	11.54	1 6.1
11	9 58 34.95	1.849	13 22 5.0	9.96	2 40.7	11	10 22 48.68	2.027	11 7 32.5	11.58	1 2.9
12	9 59 19.44	1.858	13 18 5.1	10.02	2 37.5	12	10 23 37.37	2.030	11 2 54.5	11.61	0 59.8
13	10 0 4.13	1.867	13 14 3.6	10.09	2 34.3	13	10 24 26.12	2.032	10 58 15.4	11.64	0 56.7
14	10 0 49.03	1.875	13 10 0.6	10.16	2 31.1	14	10 25 14.92	2.034	10 53 35.5	11.67	0 53.6
15	10 1 34.13	1.883	13 5 56.0	10.22	2 27.9	15	10 26 3.77	2.036	10 48 54.9	11.70	0 50.4
16	10 2 19.42	1.890	13 1 49.9	10.28	2 24.7	16	10 26 52.66	2.038	10 44 13.6	11.73	0 47.3
17	10 3 4.89	1.898	12 57 42.3	10.34	2 21.6	17	10 27 41.60	2.040	10 39 31.5	11.76	0 44.2
18	10 3 50.54	1.906	12 53 33.2	10.40	2 18.4	18	10 28 30.58	2.041	10 34 48.8	11.79	0 41.1
19	10 4 36.37	1.913	12 49 22.7	10.46	2 15.2	19	10 29 19.50	2.042	10 30 5.4	11.82	0 37.9
20	10 5 22.37	1.920	12 45 10.8	10.52	2 12.0	20	10 30 8.63	2.043	10 25 21.0	11.84	0 34.8
21	10 6 8.54	1.927	12 40 57.5	10.58	2 8.9	21	10 30 57.69	2.044	10 20 36.8	11.87	0 31.7
22	10 6 54.87	1.933	12 36 42.8	10.64	2 5.7	22	10 31 46.77	2.045	10 15 51.6	11.89	0 28.6
23	10 7 41.35	1.940	12 32 26.7	10.70	2 2.6	23	10 32 35.87	2.046	10 11 5.8	11.91	0 25.4
24	10 8 27.99	1.946	12 28 9.3	10.76	1 59.4	24	10 33 24.99	2.046	10 6 19.5	11.93	0 22.3
25	10 9 14.78	1.952	12 23 50.6	10.80	1 56.3	25	10 34 14.12	2.047	10 1 32.7	11.95	0 19.2
26	10 10 1.71	1.958	12 19 30.6	10.85	1 53.1	26	10 35 3.26	2.047	9 56 45.4	11.98	0 16.1
27	10 10 48.78	1.964	12 15 9.3	10.91	1 50.0	27	10 35 52.49	2.047	9 51 57.7	12.00	0 13.0
28	10 11 35.99	1.970	12 10 46.7	10.96	1 46.8	28	10 36 41.54	2.047	9 47 9.5	12.01	0 9.9
29	10 12 23.34	1.976	12 6 22.9	11.01	1 43.7	29	10 37 30.68	2.047	9 42 20.9	12.03	0 6.8
30	10 13 10.81	1.980	12 1 57.9	11.06	1 40.5	30	10 38 19.81	2.046	9 37 32.0	12.04	0 3.7
31	10 13 58.40	1.985	11 57 31.7	11.11	1 37.4	31	10 39 8.92	2.046	9 32 42.7	12.06	{ 0 0.6 23 57.5
32	10 14 46.11	1.990	+11 53 4.4	11.16	1 34.2	32	10 39 58.02	2.045	+ 9 27 53.1	12.07	23 54.3

Day of the Month,	1st.	11th.	21st.	31st.	Day of the Month,	1st.	11th.	21st.	31st.
Polar Semidiameter	" 15.4	" 15.1	" 14.9	" 14.7	Polar Semidiameter	" 14.7	" 14.6	" 14.5	" 14.5
Horizontal Parallax	1.4	1.4	1.4	1.4	Horizontal Parallax	1.4	1.3	1.3	1.3

GREENWICH MEAN TIME.

SEPTEMBER.						OCTOBER.													
Day of Month.	Apparent Right Ascension.			Var. of R.A. for 1 Hour.	Apparent Declination.			Var. of Dec. for 1 Hour.	Meridian Passage.	Day of Month.	Apparent Right Ascension.			Var. of R.A. for 1 Hour.	Apparent Declination.			Var. of Dec. for 1 Hour.	Meridian Passage.
	Noon.			Noon.	Noon.			Noon.			Noon.			Noon.	Noon.			Noon.	
	h	m	s	s	°	'	"	"	h	m	s	s	°	'	"	"	h	m	s
1	10	39	58.02	2.045	+	9	27	53.1	12.07	23	54.3	1.933	+	7	3	37.3	11.77	22	20.3
2	10	40	47.10	2.044		9	23	3.3	12.08	23	51.2	1.927		6	58	55.3	11.73	22	17.2
3	10	41	36.15	2.043		9	18	13.2	12.09	23	48.1	1.920		6	54	14.1	11.70	22	14.0
4	10	42	25.17	2.042		9	13	23.0	12.10	23	45.0	1.913		6	49	33.8	11.66	22	10.8
5	10	43	14.15	2.040		9	8	32.6	12.10	23	41.8	1.906		6	44	54.4	11.62	22	7.6
6	10	44	3.09	2.038		9	3	42.1	12.10	23	38.7	1.900		6	40	16.0	11.58	22	4.4
7	10	44	51.98	2.036		8	58	51.5	12.11	23	35.6	1.890		6	35	38.5	11.54	22	1.2
8	10	45	40.82	2.034		8	54	0.8	12.11	23	32.5	1.881		6	31	2.0	11.50	21	58.0
9	10	46	29.60	2.031		8	49	10.1	12.10	23	29.3	1.873		6	26	26.6	11.45	21	54.8
10	10	47	18.32	2.029		8	44	19.5	12.10	23	26.2	1.866		6	21	52.3	11.40	21	51.6
11	10	48	6.97	2.026		8	39	28.9	12.10	23	23.1	1.856		6	17	19.1	11.35	21	48.4
12	10	48	55.56	2.023		8	34	38.4	12.09	23	20.0	1.847		6	12	47.1	11.30	21	45.2
13	10	49	44.07	2.020		8	29	48.1	12.09	23	16.8	1.838		6	8	16.3	11.25	21	42.0
14	10	50	32.50	2.016		8	24	57.9	12.09	23	13.7	1.829		6	3	46.8	11.20	21	38.8
15	10	51	20.85	2.013		8	20	7.9	12.08	23	10.6	1.820		5	59	18.5	11.15	21	35.6
16	10	52	9.12	2.009		8	15	18.0	12.07	23	7.5	1.811		5	54	51.6	11.09	21	32.4
17	10	52	57.29	2.005		8	10	28.4	12.06	23	4.3	1.801		5	50	26.1	11.03	21	29.2
18	10	53	45.36	2.001		8	5	39.1	12.06	23	1.2	1.791		5	46	2.0	10.97	21	26.0
19	10	54	33.34	1.997		8	0	50.1	12.04	22	58.1	1.781		5	41	39.3	10.91	21	22.8
20	10	55	21.22	1.993		7	56	1.4	12.02	22	55.0	1.771		5	37	18.0	10.85	21	19.6
21	10	56	8.99	1.988		7	51	13.1	12.00	22	51.8	1.760		5	32	58.3	10.79	21	16.3
22	10	56	56.65	1.983		7	46	25.2	11.99	22	48.7	1.749		5	28	40.2	10.73	21	13.1
23	10	57	44.20	1.979		7	41	37.7	11.97	22	45.5	1.738		5	24	23.6	10.66	21	9.8
24	10	58	31.63	1.974		7	36	50.7	11.95	22	42.4	1.727		5	20	8.7	10.59	21	6.6
25	10	59	18.94	1.968		7	32	4.1	11.93	22	39.2	1.716		5	15	55.4	10.51	21	3.3
26	11	0	6.12	1.963		7	27	18.1	11.90	22	36.1	1.704		5	11	43.9	10.44	21	0.1
27	11	0	53.17	1.958		7	22	32.7	11.88	22	32.9	1.692		5	7	34.1	10.37	20	56.8
28	11	1	40.09	1.952		7	17	47.8	11.86	22	29.8	1.680		5	3	26.2	10.29	20	53.5
29	11	2	26.87	1.946		7	13	3.6	11.83	22	26.6	1.667		4	59	20.2	10.21	20	50.2
30	11	3	13.50	1.940		7	8	20.1	11.80	22	23.5	1.654		4	55	16.1	10.13	20	47.0
31	11	3	59.98	1.933		7	3	37.3	11.77	22	20.3	1.641		4	51	14.0	10.04	20	43.7
32	11	4	46.31	1.927	+	6	58	55.3	11.73	22	17.2	1.628	+	4	47	13.9	9.96	20	40.4

Day of the Month,	1st.	11th.	21st.	31st.	Day of the Month,	1st.	11th.	21st.	31st.
Polar Semidiameter	14.5	14.5	14.6	14.7	Polar Semidiameter	14.7	14.9	15.1	15.4
Horizontal Parallax	1.3	1.3	1.4	1.4	Horizontal Parallax	1.4	1.4	1.4	1.4

GREENWICH MEAN TIME.

NOVEMBER.

DECEMBER.

Day of Month.	Apparent Right Ascension.			Var. of R.A. for 1 Hour.	Apparent Declination.			Var. of Dec. for 1 Hour.	Meridian Passage.	Day of Month.	Apparent Right Ascension.			Var. of R.A. for 1 Hour.	Apparent Declination.			Var. of Dec. for 1 Hour.	Meridian Passage.				
	h	m	s	s	°	'	"	"			h	m	s	s	°	'	"	"					
1	11	26	17.69	1.628	+	4	47	13.9	9.96	20	40.4	1	11	42	57.20	1.109	+	3	6	29.5	6.56	18	58.9
2	11	26	56.60	1.614		4	43	15.8	9.87	20	37.1	2	11	43	23.56	1.087		3	3	54.1	6.40	18	55.4
3	11	27	35.19	1.600		4	39	19.9	9.78	20	33.8	3	11	43	49.39	1.065		3	1	22.2	6.25	18	51.9
4	11	28	13.44	1.586		4	35	26.1	9.69	20	30.5	4	11	44	14.69	1.042		2	58	53.9	6.10	18	48.4
5	11	28	51.34	1.571		4	31	34.4	9.60	20	27.2	5	11	44	39.45	1.020		2	56	29.1	5.96	18	44.9
6	11	29	28.90	1.556		4	27	45.0	9.51	20	23.9	6	11	45	3.69	0.998		2	54	8.0	5.80	18	41.3
7	11	30	6.10	1.541		4	23	57.9	9.41	20	20.6	7	11	45	27.37	0.975		2	51	50.5	5.66	18	37.8
8	11	30	42.94	1.526		4	20	13.2	9.31	20	17.3	8	11	45	50.49	0.952		2	49	36.6	5.50	18	34.2
9	11	31	19.41	1.511		4	16	30.9	9.21	20	14.0	9	11	46	13.06	0.928		2	47	26.5	5.34	18	30.7
10	11	31	55.51	1.496		4	12	51.0	9.11	20	10.6	10	11	46	35.06	0.904		2	45	20.2	5.18	18	27.1
11	11	32	31.24	1.480		4	9	13.6	9.01	20	7.3	11	11	46	56.49	0.880		2	43	17.6	5.03	18	23.5
12	11	33	6.58	1.464		4	5	38.7	8.90	20	3.9	12	11	47	17.35	0.856		2	41	18.8	4.87	18	19.9
13	11	33	41.53	1.448		4	2	6.3	8.80	20	0.6	13	11	47	37.63	0.831		2	39	23.9	4.70	18	16.3
14	11	34	16.09	1.431		3	58	36.5	8.69	19	57.2	14	11	47	57.32	0.807		2	37	33.0	4.54	18	12.7
15	11	34	50.24	1.414		3	55	9.3	8.58	19	53.9	15	11	48	16.41	0.783		2	35	46.0	4.38	18	9.1
16	11	35	23.99	1.397		3	51	44.8	8.46	19	50.5	16	11	48	34.91	0.758		2	34	2.9	4.21	18	5.4
17	11	35	57.33	1.380		3	48	23.1	8.34	19	47.1	17	11	48	52.80	0.732		2	32	23.9	4.04	18	1.8
18	11	36	30.25	1.363		3	45	4.1	8.23	19	43.7	18	11	49	10.09	0.707		2	30	48.9	3.87	17	58.1
19	11	37	2.75	1.346		3	41	47.9	8.11	19	40.3	19	11	49	26.76	0.681		2	29	17.9	3.70	17	54.5
20	11	37	34.82	1.327		3	38	34.6	8.00	19	36.9	20	11	49	42.80	0.655		2	27	51.1	3.53	17	50.8
21	11	38	6.45	1.309		3	35	24.1	7.88	19	33.5	21	11	49	58.22	0.629		2	26	28.5	3.36	17	47.1
22	11	38	37.64	1.290		3	32	16.5	7.75	19	30.1	22	11	50	13.02	0.603		2	25	10.0	3.18	17	43.4
23	11	39	8.38	1.271		3	29	12.0	7.63	19	26.7	23	11	50	27.19	0.576		2	23	55.8	3.00	17	39.7
24	11	39	38.66	1.252		3	26	10.5	7.49	19	23.2	24	11	50	40.70	0.549		2	22	45.9	2.82	17	36.0
25	11	40	8.47	1.233		3	23	12.1	7.36	19	19.8	25	11	50	53.55	0.521		2	21	40.2	2.64	17	32.3
26	11	40	37.81	1.213		3	20	16.8	7.23	19	16.3	26	11	51	5.73	0.493		2	20	39.0	2.46	17	28.5
27	11	41	6.68	1.193		3	17	24.7	7.10	19	12.9	27	11	51	17.25	0.466		2	19	42.1	2.28	17	24.8
28	11	41	35.06	1.172		3	14	35.9	6.96	19	9.4	28	11	51	28.11	0.438		2	18	49.6	2.10	17	21.0
29	11	42	2.94	1.151		3	11	50.4	6.82	19	5.9	29	11	51	38.30	0.410		2	18	1.5	1.91	17	17.2
30	11	42	30.32	1.130		3	9	8.3	6.69	19	2.4	30	11	51	47.82	0.382		2	17	17.9	1.72	17	13.4
31	11	42	57.20	1.109		3	6	29.5	6.56	18	58.9	31	11	51	56.66	0.354		2	16	38.8	1.54	17	9.6
32	11	43	23.56	1.087	+	3	3	54.1	6.40	18	55.4	32	11	52	4.82	0.326	+	2	16	4.1	1.36	17	5.8

Day of the Month,	1st.	11th.	21st.	31st.	Day of the Month,	1st.	11th.	21st.	31st.
Polar Semidiameter	15.4	15.3	16.2	16.6	Polar Semidiameter	16.6	17.1	17.6	18.1
Horizontal Parallax	1.4	1.5	1.5	1.5	Horizontal Parallax	1.5	1.6	1.6	1.7

GREENWICH MEAN TIME.

JANUARY.						FEBRUARY.															
Day of Month.	Apparent Right Ascension.			Var. of R.A. for 1 Hour.	Apparent Declination.			Var. of Dec. for 1 Hour.	Meridian Passage.	Day of Month.	Apparent Right Ascension.			Var. of R.A. for 1 Hour.	Apparent Declination.			Var. of Dec. for 1 Hour.	Meridian Passage.		
	Noon.			Noon.	Noon.			Noon.			Noon.			Noon.	Noon.			Noon.			
	h	m	s	s	°	'	"	"	h	m	s	s	°	'	"	"	h	m	s		
1	10	46	33.18	-0.200	9	41	13.3	+1.87	15	59.4	1	10	41	9.69	-0.692	+10	20	48.1	+4.24	13	52.1
2	10	46	28.18	0.217	9	41	59.4	1.97	15	55.4	2	10	40	54.40	0.642	10	23	30.4	4.29	13	47.9
3	10	46	22.78	0.233	9	42	47.9	2.07	15	51.4	3	10	40	38.88	0.661	10	24	13.8	4.32	13	43.7
4	10	46	16.99	0.260	9	43	38.7	2.16	15	47.3	4	10	40	23.14	0.680	10	25	58.2	4.37	13	39.5
5	10	46	10.80	0.266	9	44	31.8	2.26	15	43.3	5	10	40	7.19	0.699	10	27	43.6	4.41	13	35.3
6	10	46	4.21	0.283	9	45	27.1	2.35	15	39.2	6	10	39	51.04	0.677	10	29	29.9	4.45	13	31.1
7	10	45	57.22	0.299	9	46	24.7	2.45	15	35.2	7	10	39	34.69	0.685	10	31	17.0	4.48	13	26.9
8	10	45	49.84	0.315	9	47	24.6	2.54	15	31.1	8	10	39	18.16	0.692	10	33	4.9	4.51	13	22.7
9	10	45	42.08	0.331	9	48	26.7	2.63	15	27.0	9	10	39	1.45	0.700	10	34	53.5	4.54	13	18.5
10	10	45	33.95	0.347	9	49	30.9	2.72	15	23.0	10	10	38	44.58	0.706	10	36	42.8	4.59	13	14.3
11	10	45	25.44	0.362	9	50	37.2	2.81	15	18.9	11	10	38	27.56	0.712	10	38	32.6	4.59	13	10.1
12	10	45	16.55	0.378	9	51	45.6	2.89	15	14.8	12	10	38	10.40	0.718	10	40	22.9	4.61	13	5.9
13	10	45	7.30	0.393	9	52	56.1	2.98	15	10.7	13	10	37	53.10	0.724	10	42	13.7	4.63	13	1.6
14	10	44	57.68	0.408	9	54	8.6	3.06	15	6.6	14	10	37	35.67	0.729	10	44	4.9	4.64	12	57.4
15	10	44	47.71	0.423	9	55	23.0	3.14	15	2.5	15	10	37	18.13	0.733	10	45	56.4	4.65	12	53.2
16	10	44	37.39	0.437	9	56	39.4	3.22	14	58.4	16	10	37	0.49	0.737	10	47	48.2	4.66	12	49.0
17	10	44	26.72	0.451	9	57	57.7	3.30	14	54.3	17	10	36	42.76	0.740	10	49	40.1	4.67	12	44.8
18	10	44	15.72	0.465	9	59	17.9	3.38	14	50.2	18	10	36	24.95	0.743	10	51	32.2	4.67	12	40.5
19	10	44	4.38	0.479	10	0	39.8	3.45	14	46.1	19	10	36	7.07	0.746	10	53	24.4	4.67	12	36.3
20	10	43	52.72	0.492	10	2	3.5	3.52	14	42.0	20	10	35	49.12	0.749	10	55	16.6	4.67	12	32.1
21	10	43	40.74	0.506	10	3	28.9	3.59	14	37.9	21	10	35	31.12	0.751	10	57	8.7	4.67	12	27.8
22	10	43	28.44	0.519	10	4	56.0	3.66	14	33.7	22	10	35	13.08	0.752	10	59	0.7	4.66	12	23.6
23	10	43	15.83	0.531	10	6	24.7	3.73	14	29.6	23	10	34	55.01	0.753	11	0	52.5	4.66	12	19.3
24	10	43	2.93	0.544	10	7	54.9	3.79	14	25.4	24	10	34	36.91	0.754	11	2	44.2	4.65	12	15.1
25	10	42	49.74	0.556	10	9	26.7	3.86	14	21.3	25	10	34	18.80	0.755	11	4	35.6	4.64	12	10.9
26	10	42	36.26	0.568	10	11	0.0	3.92	14	17.1	26	10	34	0.69	0.754	11	6	26.6	4.62	12	6.6
27	10	42	22.40	0.579	10	12	34.7	3.98	14	13.0	27	10	33	42.59	0.754	11	8	17.2	4.60	12	2.4
28	10	42	8.45	0.591	10	14	10.8	4.03	14	8.8	28	10	33	24.51	0.753	11	10	7.4	4.58	11	58.1
29	10	41	54.14	0.602	10	15	48.2	4.09	14	4.6	29	10	33	6.46	0.751	11	11	57.1	4.56	11	53.9
30	10	41	39.57	0.612	10	17	26.9	4.14	14	0.5	30	10	32	48.44	0.750	11	13	46.2	4.52	11	49.6
31	10	41	24.75	0.622	10	19	6.9	4.19	13	56.3	31	10	32	30.46	0.748	11	15	34.7	4.51	11	45.4
32	10	41	9.69	-0.632	+10	20	48.1	+4.24	13	52.1	32	10	32	12.54	-0.745	+11	17	22.5	+4.48	11	41.2

Day of the Month,	1st.	11th.	21st.	31st.	Day of the Month,	1st.	11th.	21st.	31st.
Polar Semidiameter	"	9.1	9.2	9.3	Polar Semidiameter	9.3	9.4	9.4	9.4
Horizontal Parallax	1.0	1.0	1.0	1.0	Horizontal Parallax	1.0	1.0	1.0	1.0

GREENWICH MEAN TIME.

MARCH.						APRIL.													
Day of Month.	Apparent Right Ascension.			Var. of R.A. for 1 Hour.	Apparent Declination.			Var. of Dec. for 1 Hour.	Meridian Passage.	Day of Month.	Apparent Right Ascension.			Var. of R.A. for 1 Hour.	Apparent Declination.			Var. of Dec. for 1 Hour.	Meridian Passage.
	h	m	s		°	'	"				h	m	s		°	'	"		
1	10	33	6.46	-0.751	+11	11	57.1	+4.56	11 53.9	1	10	24	53.13	-0.517	+11	59	23.8	+2.79	9 43.8
2	10	32	48.44	-0.750	11	13	46.2	4.53	11 49.6	2	10	24	40.88	-0.504	12	0	29.8	2.71	9 39.7
3	10	32	30.46	-0.748	11	15	34.7	4.51	11 45.4	3	10	24	28.94	-0.491	12	1	33.8	2.63	9 35.6
4	10	32	12.54	-0.745	11	17	22.5	4.48	11 41.2	4	10	24	17.32	-0.478	12	2	35.8	2.54	9 31.5
5	10	31	54.69	-0.743	11	19	9.5	4.44	11 37.0	5	10	24	6.01	-0.464	12	3	35.8	2.46	9 27.4
6	10	31	36.91	-0.739	11	20	55.6	4.40	11 32.8	6	10	23	55.03	-0.450	12	4	33.7	2.37	9 23.3
7	10	31	19.22	-0.735	11	22	40.9	4.37	11 28.6	7	10	23	44.39	-0.436	12	5	29.4	2.28	9 19.2
8	10	31	1.63	-0.731	11	24	25.3	4.33	11 24.3	8	10	23	34.09	-0.422	12	6	23.0	2.19	9 15.1
9	10	30	44.15	-0.726	11	26	8.7	4.29	11 20.1	9	10	23	24.12	-0.408	12	7	14.4	2.10	9 11.0
10	10	30	26.79	-0.721	11	27	51.2	4.25	11 15.9	10	10	23	14.50	-0.393	12	8	3.7	2.01	9 6.9
11	10	30	9.55	-0.716	11	29	32.6	4.20	11 11.7	11	10	23	5.24	-0.378	12	8	50.8	1.91	9 2.8
12	10	29	52.45	-0.709	11	31	12.8	4.15	11 7.4	12	10	22	56.34	-0.363	12	9	35.6	1.82	8 58.7
13	10	29	35.50	-0.703	11	32	51.8	4.10	11 3.2	13	10	22	47.80	-0.348	12	10	18.2	1.73	8 54.6
14	10	29	18.71	-0.696	11	34	29.5	4.04	10 59.0	14	10	22	39.62	-0.333	12	10	58.5	1.63	8 50.6
15	10	29	2.09	-0.689	11	36	5.8	3.99	10 54.8	15	10	22	31.80	-0.318	12	11	36.6	1.54	8 46.5
16	10	28	45.64	-0.682	11	37	40.8	3.93	10 50.6	16	10	22	24.36	-0.302	12	12	12.4	1.44	8 42.5
17	10	28	29.37	-0.674	11	39	14.4	3.87	10 46.4	17	10	22	17.30	-0.286	12	12	45.9	1.35	8 38.5
18	10	28	13.30	-0.666	11	40	46.6	3.81	10 42.2	18	10	22	10.62	-0.270	12	13	17.1	1.25	8 34.4
19	10	27	57.44	-0.658	11	42	17.3	3.75	10 38.0	19	10	22	4.32	-0.253	12	13	46.1	1.16	8 30.4
20	10	27	41.79	-0.647	11	43	46.5	3.68	10 33.8	20	10	21	58.40	-0.239	12	14	12.7	1.06	8 26.4
21	10	27	26.36	-0.638	11	45	14.1	3.62	10 29.6	21	10	21	52.87	-0.222	12	14	37.0	0.96	8 22.3
22	10	27	11.16	-0.628	11	46	40.1	3.55	10 25.4	22	10	21	47.72	-0.206	12	14	50.0	0.87	8 18.3
23	10	26	56.19	-0.619	11	48	4.4	3.48	10 21.2	23	10	21	42.96	-0.190	12	15	18.7	0.77	8 14.3
24	10	26	41.46	-0.609	11	49	27.0	3.41	10 17.0	24	10	21	38.50	-0.174	12	15	36.1	0.68	8 10.3
25	10	26	26.07	-0.598	11	50	48.0	3.34	10 12.9	25	10	21	34.61	-0.158	12	15	51.2	0.58	8 6.3
26	10	26	12.74	-0.587	11	52	7.2	3.26	10 8.7	26	10	21	31.02	-0.141	12	16	3.9	0.48	8 2.3
27	10	25	58.78	-0.576	11	53	24.6	3.19	10 4.5	27	10	21	27.83	-0.125	12	16	14.3	0.39	7 58.3
28	10	25	45.09	-0.565	11	54	40.2	3.11	10 0.4	28	10	21	25.04	-0.108	12	16	22.4	0.29	7 54.3
29	10	25	31.67	-0.553	11	55	53.9	3.03	9 56.2	29	10	21	22.64	-0.092	12	16	28.2	0.19	7 50.4
30	10	25	18.53	-0.541	11	57	5.8	2.95	9 52.1	30	10	21	20.63	-0.075	12	16	31.6	+0.09	7 46.4
31	10	25	5.68	-0.529	11	58	15.8	2.88	9 48.0	31	10	21	19.03	-0.058	12	16	32.7	0.00	7 42.4
32	10	24	53.13	-0.517	+11	59	23.8	+2.79	9 43.8	32	10	21	17.83	-0.042	+12	16	31.5	-0.10	7 38.5

Day of the Month,	1st.	11th.	21st.	31st.	Day of the Month,	1st.	11th.	21st.	31st.
Polar Semidiameter	9.4	9.4	9.3	9.2	Polar Semidiameter	9.2	9.1	9.0	8.8
Horizontal Parallax	1.0	1.0	1.0	1.0	Horizontal Parallax	1.0	1.0	1.0	1.0

GREENWICH MEAN TIME.

MAY.						JUNE.					
Day of Month.	Apparent Right Ascension.	Var. of R.A. for 1 Hour.	Apparent Declination.	Var. of Dec. for 1 Hour.	Meridian Passage.	Day of Month.	Apparent Right Ascension.	Var. of R.A. for 1 Hour.	Apparent Declination.	Var. of Dec. for 1 Hour.	Meridian Passage.
	Noon.	Noon.	Noon.	Noon.			Noon.	Noon.	Noon.	Noon.	
1	10 21 19.03	-0.056	+12 16 32.7	-0.00	7 42.4	1	10 23 45.82	+0.443	+11 58 15.5	-2.07	5 43.0
2	10 21 17.83	-0.042	12 16 31.5	-0.10	7 38.5	2	10 23 56.62	-0.487	11 57 5.6	-2.06	5 39.2
3	10 21 17.03	-0.025	12 16 27.9	-0.20	7 34.5	3	10 24 7.78	-0.472	11 55 53.6	-2.04	5 35.5
4	10 21 16.63	-0.008	12 16 22.0	-0.29	7 30.6	4	10 24 19.29	-0.487	11 54 39.6	-2.12	5 31.7
5	10 21 16.63	+0.008	12 16 13.8	-0.39	7 26.7	5	10 24 31.16	-0.302	11 53 23.6	-2.21	5 28.0
6	10 21 17.03	-0.025	12 16 3.2	-0.49	7 22.7	6	10 24 43.38	-0.516	11 52 5.6	-2.29	5 24.3
7	10 21 17.84	-0.042	12 15 50.2	-0.59	7 18.8	7	10 24 55.94	-0.520	11 50 45.7	-2.37	5 20.6
8	10 21 19.05	-0.069	12 15 34.9	-0.69	7 14.9	8	10 25 8.84	-0.545	11 49 23.9	-2.45	5 16.9
9	10 21 20.66	-0.076	12 15 17.3	-0.78	7 11.0	9	10 25 22.08	-0.539	11 48 0.1	-2.53	5 13.2
10	10 21 22.67	-0.092	12 14 57.4	-0.88	7 7.1	10	10 25 35.66	-0.972	11 46 34.4	-2.61	5 9.5
11	10 21 25.09	-0.109	12 14 35.2	-0.97	7 3.2	11	10 25 49.57	-0.986	11 45 6.9	-2.69	5 5.8
12	10 21 27.91	-0.126	12 14 10.7	-1.07	6 59.3	12	10 26 3.81	-0.800	11 43 37.5	-2.76	5 2.1
13	10 21 31.13	-0.142	12 13 43.9	-1.17	6 55.4	13	10 26 18.37	-0.612	11 42 6.3	-2.84	4 58.4
14	10 21 34.75	-0.159	12 13 14.7	-1.26	6 51.6	14	10 26 33.24	-0.626	11 40 33.2	-2.92	4 54.7
15	10 21 38.77	-0.176	12 12 43.3	-1.36	6 47.7	15	10 26 48.43	-0.640	11 38 58.3	-2.99	4 51.0
16	10 21 43.18	-0.192	12 12 9.6	-1.45	6 43.9	16	10 27 3.94	-0.668	11 37 21.6	-3.06	4 47.3
17	10 21 47.98	-0.208	12 11 33.7	-1.54	6 40.1	17	10 27 19.76	-0.665	11 35 43.2	-3.14	4 43.6
18	10 21 53.17	-0.225	12 10 55.6	-1.63	6 36.2	18	10 27 35.88	-0.678	11 34 3.1	-3.21	4 40.0
19	10 21 58.76	-0.241	12 10 15.3	-1.72	6 32.4	19	10 27 52.30	-0.690	11 32 21.2	-3.28	4 36.3
20	10 22 4.73	-0.257	12 9 32.8	-1.82	6 28.6	20	10 28 9.02	-0.702	11 30 37.6	-3.35	4 32.7
21	10 22 11.09	-0.273	12 8 48.1	-1.91	6 24.7	21	10 28 26.04	-0.715	11 28 52.3	-3.42	4 29.1
22	10 22 17.83	-0.289	12 8 1.2	-2.00	6 20.9	22	10 28 43.35	-0.727	11 27 5.4	-3.49	4 25.4
23	10 22 24.95	-0.305	12 7 12.1	-2.09	6 17.1	23	10 29 0.94	-0.739	11 25 16.9	-3.56	4 21.8
24	10 22 32.45	-0.320	12 6 20.9	-2.18	6 13.3	24	10 29 18.82	-0.751	11 23 26.7	-3.62	4 18.2
25	10 22 40.33	-0.336	12 5 27.5	-2.27	6 9.5	25	10 29 36.98	-0.762	11 21 34.9	-3.69	4 14.5
26	10 22 48.58	-0.351	12 4 32.0	-2.36	6 5.7	26	10 29 55.41	-0.774	11 19 41.5	-3.76	4 10.9
27	10 22 57.20	-0.367	12 3 34.4	-2.44	6 1.9	27	10 30 14.12	-0.785	11 17 46.6	-3.82	4 7.3
28	10 23 6.19	-0.382	12 2 34.8	-2.52	5 58.1	28	10 30 33.10	-0.796	11 15 50.1	-3.89	4 3.7
29	10 23 15.55	-0.396	12 1 33.1	-2.61	5 54.3	29	10 30 52.34	-0.807	11 13 52.1	-3.95	4 0.0
30	10 23 25.28	-0.412	12 0 29.3	-2.70	5 50.5	30	10 31 11.84	-0.818	11 11 52.6	-4.01	3 56.4
31	10 23 35.37	-0.428	11 59 23.4	-2.79	5 46.7	31	10 31 31.60	-0.829	11 9 51.5	-4.07	3 52.8
32	10 23 45.82	+0.443	+11 58 15.5	-2.87	5 43.0	32	10 31 51.62	+0.840	+11 7 49.0	-4.12	3 49.2

Day of the Month,	1st.	11th.	21st.	31st.	Day of the Month,	1st.	11th.	21st.	31st.
Polar Semidiameter	8.8	8.6	8.4	8.3	Polar Semidiameter	8.3	8.1	8.0	7.9
Horizontal Parallax	1.0	0.9	0.9	0.9	Horizontal Parallax	0.9	0.9	0.9	0.9

GREENWICH MEAN TIME.

JULY.

AUGUST.

Day of Month.	Apparent Right Ascension.			Var. of R.A. for 1 Hour.	Apparent Declination.			Var. of Dec. for 1 Hour.	Meridian Passage.	Day of Month.	Apparent Right Ascension.			Var. of R.A. for 1 Hour.	Apparent Declination.			Var. of Dec. for 1 Hour.	Meridian Passage.
	h	m	s	"	°	'	"	"			h	m	s	"	°	'	"	"	
1	10	31	31.60	+0.820	11	9	51.5	-5.07	3 52.8	1	10	43	31.65	+1.080	9	56	53.1	-6.55	2 2.9
2	10	31	51.62	0.840	11	7	49.0	5.12	3 49.2	2	10	43	57.65	1.086	9	54	15.4	6.59	1 59.4
3	10	32	11.90	0.860	11	5	45.1	5.19	3 45.6	3	10	44	23.78	1.091	9	51	36.9	6.62	1 55.9
4	10	32	32.42	0.880	11	3	39.7	5.25	3 42.0	4	10	44	50.04	1.097	9	48	57.6	6.65	1 52.4
5	10	32	53.19	0.970	11	1	32.9	5.31	3 38.4	5	10	45	16.43	1.102	9	46	17.6	6.68	1 48.9
6	10	33	14.20	0.880	10	59	24.7	5.37	3 34.8	6	10	45	42.94	1.107	9	43	36.9	6.71	1 45.4
7	10	33	35.44	0.890	10	57	15.1	5.43	3 31.2	7	10	46	9.56	1.111	9	40	55.5	6.74	1 41.9
8	10	33	56.92	0.900	10	55	4.1	5.49	3 27.7	8	10	46	36.29	1.116	9	38	13.4	6.77	1 38.4
9	10	34	18.63	0.909	10	52	51.8	5.54	3 24.1	9	10	47	3.13	1.120	9	35	30.7	6.79	1 34.9
10	10	34	40.56	0.918	10	50	38.2	5.59	3 20.5	10	10	47	30.07	1.125	9	32	47.4	6.82	1 31.4
11	10	35	2.71	0.928	10	48	23.3	5.65	3 17.0	11	10	47	57.11	1.129	9	30	3.4	6.84	1 27.9
12	10	35	25.08	0.937	10	46	7.1	5.70	3 13.4	12	10	48	24.24	1.132	9	27	18.9	6.86	1 24.5
13	10	35	47.67	0.945	10	43	49.7	5.75	3 9.9	13	10	48	51.46	1.136	9	24	33.9	6.89	1 21.0
14	10	36	10.46	0.954	10	41	31.1	5.80	3 6.3	14	10	49	18.77	1.140	9	21	48.4	6.91	1 17.5
15	10	36	33.45	0.962	10	39	11.3	5.85	3 2.8	15	10	49	46.16	1.143	9	19	2.4	6.93	1 14.0
16	10	36	56.64	0.970	10	36	50.3	5.90	2 59.3	16	10	50	13.63	1.146	9	16	15.9	6.95	1 10.5
17	10	37	20.03	0.978	10	34	28.2	5.94	2 55.7	17	10	50	41.17	1.149	9	13	28.9	6.97	1 7.1
18	10	37	43.61	0.986	10	32	5.0	5.99	2 52.2	18	10	51	8.78	1.152	9	10	41.5	6.98	1 3.6
19	10	38	7.37	0.994	10	29	40.7	6.04	2 48.6	19	10	51	36.46	1.155	9	7	53.7	7.00	1 0.1
20	10	38	31.32	1.002	10	27	15.3	6.08	2 45.1	20	10	52	4.20	1.157	9	5	5.6	7.01	0 56.7
21	10	38	55.45	1.009	10	24	48.8	6.13	2 41.6	21	10	52	32.00	1.160	9	2	17.1	7.03	0 53.2
22	10	39	19.75	1.016	10	22	21.3	6.17	2 38.0	22	10	52	59.86	1.162	8	59	28.3	7.04	0 49.8
23	10	39	44.23	1.022	10	19	52.7	6.21	2 34.5	23	10	53	27.77	1.164	8	56	39.2	7.05	0 46.3
24	10	40	8.87	1.029	10	17	23.1	6.25	2 31.0	24	10	53	55.73	1.166	8	53	49.7	7.07	0 42.8
25	10	40	33.68	1.037	10	14	52.5	6.29	2 27.4	25	10	54	23.74	1.168	8	50	59.9	7.08	0 39.4
26	10	40	58.65	1.044	10	12	21.0	6.32	2 23.9	26	10	54	51.79	1.169	8	48	9.9	7.09	0 35.9
27	10	41	23.78	1.050	10	9	48.6	6.37	2 20.4	27	10	55	19.87	1.171	8	45	19.7	7.10	0 32.5
28	10	41	49.06	1.056	10	7	15.3	6.41	2 16.9	28	10	55	47.99	1.172	8	42	29.3	7.10	0 29.0
29	10	42	14.49	1.062	10	4	41.1	6.44	2 13.4	29	10	56	16.14	1.173	8	39	38.7	7.11	0 25.5
30	10	42	40.07	1.069	10	2	6.0	6.48	2 9.9	30	10	56	44.32	1.174	8	36	47.9	7.12	0 22.0
31	10	43	5.79	1.075	9	59	30.0	6.52	2 6.4	31	10	57	12.52	1.175	8	33	57.0	7.12	0 18.6
32	10	43	31.65	+1.080	+ 9	56	53.1	-6.55	2 2.9	32	10	57	40.74	+1.176	+ 8	31	5.9	-7.13	0 15.1

Day of the Month,	1st.	11th.	21st.	31st.	Day of the Month,	1st.	11th.	21st.	31st.
Polar Semidiameter	7.9	7.8	7.7	7.7	Polar Semidiameter	7.6	7.6	7.6	7.5
Horizontal Parallax	0.9	0.9	0.8	0.8	Horizontal Parallax	0.8	0.8	0.8	0.8

GREENWICH MEAN TIME.

SEPTEMBER.						OCTOBER.															
Day of Month.	Apparent Right Ascension.			Var. of R.A. for 1 Hour.	Apparent Declination.			Var. of Dec. for 1 Hour.	Meridian Passage.	Day of Month.	Apparent Right Ascension.			Var. of R.A. for 1 Hour.	Apparent Declination.			Var. of Dec. for 1 Hour.	Meridian Passage.		
	Noon.				Noon.						Noon.				Noon.						
	h	m	s	"	°	'	"	"	h	m	s	"	°	'	"	"	h	m	s	"	
1	10	57	40.74	+1.176	8	31	5.9	-7.13	0	15.1	1	11	11	35.72	+1.119	7	7	3.6	-6.72	22	27.5
2	10	58	8.98	1.177	8	28	14.8	7.13	0	11.6	2	11	12	2.53	1.115	7	4	22.8	6.69	22	24.1
3	10	58	37.23	1.177	8	25	23.7	7.13	0	8.1	3	11	12	29.23	1.110	7	1	42.7	6.65	22	20.6
4	10	59	5.48	1.177	8	22	32.6	7.13	0	4.7	4	11	12	55.81	1.105	6	59	3.4	6.62	22	17.1
5	10	59	33.73	1.177	8	19	41.5	7.13	{ ₂₂ 0 1.2 27.7		5	11	13	22.26	1.099	6	56	24.9	6.59	22	13.6
6	11	0	1.98	1.177	8	16	50.4	7.13	23	54.3	6	11	13	48.58	1.094	6	53	47.2	6.55	22	10.1
7	11	0	30.22	1.176	8	13	59.4	7.12	23	50.8	7	11	14	14.78	1.089	6	51	10.4	6.51	22	6.6
8	11	0	58.45	1.176	8	11	8.5	7.12	23	47.3	8	11	14	40.85	1.083	6	48	34.6	6.47	22	3.1
9	11	1	26.67	1.175	8	8	17.7	7.11	23	43.9	9	11	15	6.78	1.077	6	45	59.7	6.43	21	59.6
10	11	1	54.87	1.175	8	5	27.1	7.10	23	40.4	10	11	15	32.57	1.071	6	43	25.8	6.39	21	56.1
11	11	2	23.05	1.174	8	2	36.7	7.10	23	37.0	11	11	15	58.21	1.065	6	40	52.9	6.35	21	52.6
12	11	2	51.20	1.172	7	59	46.5	7.09	23	33.5	12	11	16	23.70	1.059	6	38	21.0	6.31	21	49.1
13	11	3	19.32	1.171	7	56	56.5	7.08	23	30.0	13	11	16	49.04	1.052	6	35	50.2	6.26	21	45.6
14	11	3	47.40	1.169	7	54	6.8	7.07	23	26.6	14	11	17	14.22	1.046	6	33	20.4	6.22	21	42.1
15	11	4	15.44	1.167	7	51	17.3	7.06	23	23.1	15	11	17	39.24	1.039	6	30	51.7	6.17	21	38.6
16	11	4	43.44	1.166	7	48	28.1	7.04	23	19.7	16	11	18	4.10	1.032	6	28	24.2	6.13	21	35.0
17	11	5	11.39	1.164	7	45	39.3	7.03	23	16.2	17	11	18	28.79	1.025	6	25	57.8	6.09	21	31.5
18	11	5	39.29	1.161	7	42	50.8	7.01	23	12.7	18	11	18	53.31	1.018	6	23	32.6	6.05	21	27.9
19	11	6	7.14	1.159	7	40	2.7	7.00	23	9.3	19	11	19	17.65	1.010	6	21	8.6	6.01	21	24.4
20	11	6	34.93	1.157	7	37	15.0	6.98	23	5.8	20	11	19	41.81	1.003	6	18	45.8	5.97	21	20.9
21	11	7	2.66	1.154	7	34	27.7	6.96	23	2.3	21	11	20	5.79	0.995	6	16	24.3	5.93	21	17.3
22	11	7	30.33	1.151	7	31	40.8	6.94	22	58.8	22	11	20	29.59	0.987	6	14	4.1	5.89	21	13.8
23	11	7	57.93	1.148	7	28	54.4	6.92	22	55.4	23	11	20	53.19	0.979	6	11	45.2	5.85	21	10.3
24	11	8	25.45	1.145	7	26	8.5	6.90	22	51.9	24	11	21	16.59	0.971	6	9	27.7	5.81	21	6.7
25	11	8	52.89	1.142	7	23	23.1	6.88	22	48.4	25	11	21	39.79	0.963	6	7	11.5	5.77	21	3.2
26	11	9	20.25	1.138	7	20	38.3	6.86	22	44.9	26	11	22	2.79	0.954	6	4	56.7	5.73	20	59.6
27	11	9	47.53	1.135	7	17	54.1	6.83	22	41.5	27	11	22	25.58	0.945	6	2	43.3	5.69	20	56.1
28	11	10	14.72	1.131	7	15	10.5	6.80	22	38.0	28	11	22	48.15	0.936	6	0	31.4	5.65	20	52.5
29	11	10	41.81	1.127	7	12	27.5	6.78	22	34.5	29	11	23	10.50	0.927	5	58	21.0	5.61	20	48.9
30	11	11	8.81	1.123	7	9	45.2	6.75	22	31.0	30	11	23	32.63	0.917	5	56	12.1	5.57	20	45.4
31	11	11	35.72	1.119	7	7	3.6	6.72	22	27.5	31	11	23	54.54	0.908	5	54	4.8	5.53	20	41.8
32	11	12	2.53	+1.115	7	4	22.8	-6.69	22	24.1	32	11	24	16.22	+0.898	5	51	59.1	-5.50	20	38.2

Day of the Month,	1st.	11th.	21st.	31st.	Day of the Month,	1st.	11th.	21st.	31st.
Polar Semidiameter	" 7.5	" 7.5	" 7.6	" 7.6	Polar Semidiameter	" 7.6	" 7.7	" 7.7	" 7.8
Horizontal Parallax	0.8	0.8	0.8	0.8	Horizontal Parallax	0.8	0.8	0.8	0.9

GREENWICH MEAN TIME.

NOVEMBER.

DECEMBER.

Day of Month.	Apparent Right Ascension.		Var. of R.A. for 1 Hour.	Apparent Declination.		Var. of Dec. for 1 Hour.	Meridian Passage.	Day of Month.	Apparent Right Ascension.		Var. of R.A. for 1 Hour.	Apparent Declination.		Var. of Dec. for 1 Hour.	Meridian Passage.						
	Noon.			Noon.	Noon.				Noon.	Noon.			Noon.	Noon.							
	h	m	s	"	°	'			"	"	h	m	s	"		°	'	"	"		
1	11	24	16.22	+0.098	5	51	59.1	-5.20	20	38.2	1	11	32	58.42	+0.029	5	3	36.9	-2.70	18	48.8
2	11	24	37.66	0.098	5	49	55.0	5.14	20	34.7	2	11	33	10.93	0.014	5	2	33.2	2.60	18	45.1
3	11	24	58.86	0.078	5	47	52.6	6.07	30	31.1	3	11	33	23.08	0.499	5	1	31.9	2.50	18	41.3
4	11	25	19.81	0.068	5	45	51.9	6.00	20	27.5	4	11	33	34.87	0.484	5	0	33.0	2.40	18	37.6
5	11	25	40.50	0.057	5	43	52.8	4.98	20	23.9	5	11	33	46.31	0.469	4	59	36.5	2.30	18	33.8
6	11	26	0.94	0.047	5	41	55.4	4.86	20	20.3	6	11	33	57.38	0.454	4	58	42.4	2.20	18	30.1
7	11	26	21.13	0.036	5	39	59.8	4.78	20	16.7	7	11	34	8.08	0.438	4	57	50.8	2.10	18	26.3
8	11	26	41.05	0.025	5	38	6.0	4.70	20	13.1	8	11	34	18.41	0.422	4	57	1.7	2.00	18	22.5
9	11	27	0.71	0.014	5	36	14.1	4.63	20	9.5	9	11	34	28.36	0.407	4	56	15.0	1.89	18	18.8
10	11	27	20.10	0.002	5	34	24.0	4.55	20	5.9	10	11	34	37.94	0.391	4	55	30.8	1.79	18	15.0
11	11	27	39.21	0.791	5	32	35.7	4.47	20	2.3	11	11	34	47.14	0.375	4	54	49.1	1.69	18	11.2
12	11	27	58.05	0.779	5	30	49.3	4.39	19	58.7	12	11	34	55.96	0.360	4	54	9.9	1.68	18	7.4
13	11	28	16.61	0.767	5	29	4.8	4.31	19	55.0	13	11	35	4.40	0.344	4	53	33.2	1.48	18	3.6
14	11	28	34.88	0.755	5	27	22.2	4.23	19	51.4	14	11	35	12.47	0.328	4	52	59.0	1.37	17	59.8
15	11	28	52.87	0.743	5	25	41.6	4.15	19	47.7	15	11	35	20.15	0.312	4	52	27.4	1.26	17	56.0
16	11	29	10.56	0.731	5	24	2.9	4.07	19	44.1	16	11	35	27.44	0.296	4	51	58.3	1.16	17	52.2
17	11	29	27.96	0.719	5	22	26.2	3.99	19	40.4	17	11	35	34.34	0.279	4	51	31.8	1.05	17	48.4
18	11	29	45.06	0.706	5	20	51.6	3.90	19	36.7	18	11	35	40.85	0.263	4	51	7.8	0.95	17	44.5
19	11	30	1.86	0.693	5	19	19.1	3.81	19	33.1	19	11	35	46.97	0.247	4	50	46.4	0.84	17	40.7
20	11	30	18.35	0.681	5	17	48.6	3.73	19	29.4	20	11	35	52.69	0.230	4	50	27.5	0.73	17	36.8
21	11	30	34.53	0.668	5	16	20.2	3.64	19	25.7	21	11	35	58.02	0.214	4	50	11.2	0.62	17	33.0
22	11	30	50.40	0.655	5	14	53.9	3.56	19	22.1	22	11	36	2.95	0.197	4	49	57.6	0.51	17	29.1
23	11	31	5.95	0.641	5	13	29.8	3.46	19	18.4	23	11	36	7.48	0.180	4	49	46.6	0.40	17	25.2
24	11	31	21.18	0.628	5	12	7.8	3.37	19	14.7	24	11	36	11.60	0.163	4	49	38.2	0.30	17	21.4
25	11	31	36.08	0.614	5	10	48.0	3.28	19	11.0	25	11	36	15.32	0.147	4	49	32.4	0.19	17	17.5
26	11	31	50.65	0.600	5	9	30.4	3.19	19	7.3	26	11	36	18.64	0.130	4	49	29.2	-0.08	17	13.6
27	11	32	4.89	0.586	5	8	15.1	3.09	19	3.6	27	11	36	21.55	0.113	4	49	28.7	+0.08	17	9.8
28	11	32	18.79	0.572	5	7	2.1	2.99	18	59.9	28	11	36	24.05	0.096	4	49	30.8	0.14	17	5.9
29	11	32	32.35	0.558	5	5	51.4	2.90	18	56.2	29	11	36	26.14	0.079	4	49	35.5	0.25	17	2.0
30	11	32	45.56	0.543	5	4	43.0	2.80	18	52.5	30	11	36	27.83	0.063	4	49	42.9	0.36	16	58.1
31	11	32	58.42	0.529	5	3	36.9	2.70	18	48.8	31	11	36	29.11	0.046	4	49	52.9	0.47	16	54.2
32	11	33	10.93	+0.514	5	2	33.2	-2.60	18	45.1	32	11	36	29.98	+0.028	4	50	5.5	+0.38	16	50.3

Day of the Month,	1st.	11th.	21st.	31st.	Day of the Month,	1st.	11th.	21st.	31st.
Polar Semidiameter	7.8	7.9	8.0	8.2	Polar Semidiameter	8.2	8.3	8.5	8.6
Horizontal Parallax	0.9	0.9	0.9	0.9	Horizontal Parallax	0.9	0.9	0.9	0.9

242 SUN'S COÖRDINATES, 1861.

Greenwich Mean Noon.		X.	Y.	Z.	Greenwich Mean Noon.		X.	Y.	Z.		
Jan.	1	d			Mar.	1	d				
	1	1	+1900099	—8849469		—3840195	60	+9371183	—2970609	—1289119	
	2	2	.2071426	.8817163	.3826182	2	61	.9428836	.2820552	.1223999	
	3	3	.2242125	.8782115	.3810978	3	62	.9483637	.2669628	.1158502	
	4	4	.2412140	.8744331	.3794584	4	63	.9535569	.2517883	.1092648	
	5	5	.2581417	.8703821	.3777004	5	64	.9584616	.2365362	.1026456	
	6	6	+2749905	—8660594	—3758243	6	65	+9630763	—2212111	—0959947	
	7	7	.2917549	.8614662	.3738307	7	66	.9673994	.2058176	.0893140	
	8	8	.3084292	.8566036	.3717201	8	67	.9714296	.1903605	.0826056	
	9	9	.3250081	.8514731	.3694932	9	68	.9751656	.1748445	.0758718	
	10	10	.3414862	.8460762	.3671506	10	69	.9786060	.1592748	.0691149	
	11	11	+3578579	—8404147	—3646931	11	70	+9817498	—1436569	—0623372	
	12	12	.3741177	.8344904	.3621217	12	71	.9845964	.1279957	.0555408	
	13	13	.3902602	.8283053	.3594372	13	72	.9871452	.1122961	.0487279	
	14	14	.4062801	.8218616	.3566405	14	73	.9893957	.0965629	.0419006	
	15	15	.4221723	.8151616	.3537325	15	74	.9913474	.0808012	.0350610	
	16	16	+4379317	—8082075	—3507144	16	75	+9930001	—0650160	—0282112	
	17	17	.4535534	.8010021	.3475875	17	76	.9943540	.0492125	.0213536	
	18	18	.4690324	.7935481	.3443529	18	77	.9954095	.0333957	.0144905	
	19	19	.4843642	.7858483	.3410118	19	78	.9961667	.0175704	.0076239	
	20	20	.4995443	.7779054	.3375653	20	79	.9966259	—0017412	—0007559	
	21	21	+5145683	—7697223	—3340147	21	80	+9967879	+0140871	+0061121	
	22	22	.5294321	.7613018	.3303612	22	81	.9986531	.0299099	.0129776	
	23	23	.5441313	.7526466	.3266060	23	82	.9992219	.0457228	.0198389	
	24	24	.5586614	.7437593	.3227503	24	83	.9994550	.0615212	.0266942	
	25	25	.5730185	.7346437	.3187948	25	84	.9944729	.0773008	.0335414	
	26	26	+5871991	—7252997	—3147413	26	85	+9931564	+0930572	+0403785	
	27	27	.6011990	.7157333	.3105907	27	86	.9915462	.1087860	.0472037	
	28	28	.6150139	.7059463	.3063442	28	87	.9896431	.1244827	.0540153	
	29	29	.6286398	.6959415	.3020031	29	88	.9874477	.1401431	.0608114	
	30	30	.6420728	.6857217	.2975685	30	89	.9849605	.1557631	.0675900	
	31	31	+6553068	—6752898	—2930418	31	90	+9821822	+1713383	+0743492	
Feb.	1	32	.6683437	.6646487	.2884243	Apr.	1	91	.9891134	.1868642	.0810871
	2	33	.6811735	.6538015	.2837171		2	92	.9757549	.2023363	.0878018
	3	34	.6937943	.6427512	.2789217	3	93	.9721076	.2177500	.0944912	
	4	35	.7062021	.6315013	.2740395	4	94	.9681726	.2331009	.1011533	
	5	36	+7183927	—6200555	—2690720	5	95	+9639510	+2483843	+1077661	
	6	37	.7303620	.6084174	.2640310	6	96	.9594441	.2635954	.1143875	
	7	38	.7421060	.5965903	.2588980	7	97	.9546533	.2787294	.1209533	
	8	39	.7536208	.5845778	.2536747	8	98	.9495799	.2937817	.1274875	
	9	40	.7649024	.5723839	.2483928	9	99	.9442253	.3087477	.1339821	
	10	41	+7759476	—5600127	—2430139	10	100	+9385919	+3236230	+1404372	
	11	42	.7867534	.5474686	.2375699	11	101	.9326815	.3384028	.1468506	
	12	43	.7973159	.5347558	.2320527	12	102	.9264961	.3530824	.1532206	
	13	44	.8076316	.5218786	.2264644	13	103	.9200382	.3676575	.1595445	
	14	45	.8176974	.5088413	.2208068	14	104	.9133104	.3821235	.1658213	
	15	46	+8275110	—4956484	—2150819	15	105	+9063151	+3964760	+1720488	
	16	47	.8370699	.4823042	.2092915	16	106	.8990549	.4107110	.1782253	
	17	48	.8463715	.4688132	.2034376	17	107	.8915326	.4248247	.1843492	
	18	49	.8554130	.4551799	.1975221	18	108	.8837507	.4388131	.1904187	
	19	50	.8641919	.4414087	.1915468	19	109	.8757120	.4526725	.1964322	
	20	51	+8727061	—4275041	—1855137	20	110	+8674194	+4663992	+3023681	
	21	52	.8809540	.4134706	.1794246	21	111	.8588759	.4799897	.3062849	
	22	53	.8889335	.3993123	.1732814	22	112	.8500641	.4934403	.3141213	
	23	54	.8966426	.3850333	.1670857	23	113	.8410467	.5067474	.3198957	
	24	55	.9040794	.3706879	.1608394	24	114	.8317666	.5199077	.3256066	
	25	56	+9112425	—3561303	—1545443	25	115	+8222464	+5329177	+3312524	
	26	57	.9181298	.3415145	.1482022	26	116	.8124889	.5457741	.3368316	
	27	58	.9247395	.3267948	.1418148	27	117	.8024969	.5584736	.3423427	
	28	59	.9310696	.3119755	.1353841	28	118	.7922733	.5710127	.3477844	
	29	60	.9371183	.2970609	.1289119	29	119	.7818209	.5833883	.3531553	
	30	61	+9428836	—2820552	—1223999	30	120	+7711424	+5955968	+3584537	

SUN'S COÖRDINATES, 1861. 243

Greenwich Mean Noon.		X.	Y.	Z.	Greenwich Mean Noon.		X.	Y.	Z.		
May	1	121	+7602404	+6076344	+2636780	July	1	182	-1687875	+9198020	+3991374
	2	122	.7491179	.6194977	.2688267		2	183	.1854491	.9171060	.3979672
	3	123	.7377783	.6311835	.2738982		3	184	.2020599	.9141510	.3966844
	4	124	.7262246	.6426882	.2788909		4	185	.2186149	.9109374	.3952894
	5	125	.7144602	.6540083	.2838034		5	186	.2351091	.9074661	.3937825
6	126	+7024887	+6651405	+2886341	6	187	-2515375	+9037378	+3921639		
7	127	.6903136	.6760813	.2933816	7	188	.2678952	.8997585	.3904342		
8	128	.6779386	.6868273	.2980444	8	189	.2841771	.8955144	.3885941		
9	129	.6653675	.6973753	.3026212	9	190	.3003782	.8910217	.3866441		
10	130	.6526041	.7077220	.3071106	10	191	.3164935	.8862769	.3845847		
11	131	+6896528	+7178644	+3115112	11	192	-3325182	+8812815	+3824167		
12	132	.6265176	.7277997	.3158218	12	193	.3484478	.8760373	.3801409		
13	133	.6132027	.7375251	.3200413	13	194	.3642778	.8705461	.3777581		
14	134	.5997127	.7470377	.3241685	14	195	.3800039	.8648096	.3752689		
15	135	.5860518	.7563352	.3282023	15	196	.3956214	.8588296	.3726739		
16	136	+5722243	+7654151	+3321417	16	197	-4111259	+8526079	+3699741		
17	137	.5582343	.7742753	.3359857	17	198	.4265132	.8461467	.3671706		
18	138	.5440863	.7829137	.3397336	18	199	.4417791	.8394480	.3642642		
19	139	.5297848	.7913281	.3433845	19	200	.4569196	.8325139	.3612559		
20	140	.5153337	.7995168	.3469377	20	201	.4719309	.8253465	.3581465		
21	141	+5007370	+8074780	+3503923	21	202	-4868096	+8179478	+3549366		
22	142	.4859992	.8152098	.3537475	22	203	.5015515	.8103197	.3516271		
23	143	.4711245	.8227103	.3570024	23	204	.5161525	.8024838	.3482189		
24	144	.4561168	.8299775	.3601563	24	205	.5306089	.7943824	.3447127		
25	145	.4409900	.8370098	.3632084	25	206	.5449168	.7860776	.3411095		
26	146	+4257179	+8438057	+3661580	26	207	-5590720	+7775514	+3374101		
27	147	.4103345	.8503634	.3690043	27	208	.5730706	.7688059	.3336153		
28	148	.3948342	.8566810	.3717464	28	209	.5869087	.7598430	.3297260		
29	149	.3792214	.8627567	.3743835	29	210	.6005823	.7506847	.3257430		
30	150	.3635002	.8685888	.3769148	30	211	.6140873	.7412730	.3216673		
31	151	+3476746	+8741755	+3793394	31	212	-6274199	+7316704	+3175000		
June	1	152	.3317487	.8795148	.3816566	Aug.	1	213	.6405758	.7218594	.3132422
	2	153	.3157271	.8846051	.3838657		2	214	.6535506	.7118426	.3088949
	3	154	.2996144	.8894449	.3859659		3	215	.6663403	.7016827	.3044594
	4	155	.2834153	.8940327	.3879565		4	216	.6789408	.6912025	.2999369
5	156	+2671347	+8963667	+3898368	5	217	-6913480	+6805847	+2953288		
6	157	.2507773	.9024454	.3916062	6	218	.7035579	.6697724	.2906365		
7	158	.2343482	.9062675	.3932641	7	219	.7155668	.6587690	.2858613		
8	159	.2178523	.9098320	.3948102	8	220	.7273712	.6475776	.2810047		
9	160	.2012946	.9131379	.3962440	9	221	.7389674	.6362015	.2760682		
10	161	+1846801	+9161843	+3975652	10	222	-7508519	+6246445	+2710531		
11	162	.1680189	.9189704	.3987734	11	223	.7615213	.6129100	.2659611		
12	163	.1513008	.9214957	.3998684	12	224	.7724728	.6010016	.2607939		
13	164	.1345460	.9237596	.4008502	13	225	.7832021	.5889230	.2555529		
14	165	.1177546	.9257621	.4017186	14	226	.7937077	.5766777	.2502397		
15	166	+1009316	+9275029	+4024736	15	227	-8039864	+5642693	+2448558		
16	167	.0840818	.9289820	.4031152	16	228	.8140353	.5517012	.2394027		
17	168	.0673099	.9301991	.4036434	17	229	.8238517	.5389770	.2338820		
18	169	.0503206	.9311542	.4040581	18	230	.8334332	.5261002	.2282951		
19	170	.0334183	.9318476	.4043593	19	231	.8427773	.5130745	.2226435		
20	171	+0185076	+9322795	+4045470	20	232	-8518814	+4999035	+2169287		
21	172	-.0004069	.9324499	.4046213	21	233	.8607430	.4865907	.2111522		
22	173	-.0173207	.9323590	.4045823	22	234	.8693597	.4731391	.2053153		
23	174	.0342294	.9320068	.4044300	23	235	.8777290	.4595522	.1994196		
24	175	.0511289	.9313985	.4041644	24	236	.8858484	.4458336	.1934668		
25	176	-.0680147	+9305192	+4037857	25	237	-8937152	+4319869	+1874582		
26	177	.0848822	.9293841	.4032939	26	238	.9013268	.4180154	.1813952		
27	178	.1017270	.9279883	.4026889	27	239	.9086807	.4039228	.1752795		
28	179	.1185447	.9263320	.4019707	28	240	.9157744	.3897131	.1691127		
29	180	.1353306	.9244153	.4011393	29	241	.9226054	.3753902	.1628965		
30	181	.1520797	.9222385	.4001948	30	242	.9291711	.3609578	.1566329		
31	182	-.1687875	+9198020	+3991374	31	243	-9354689	+3464198	+1503237		

244 SUN'S COÖRDINATES, 1861.

Greenwich Mean Noon.		X.	Y.	Z.	Greenwich Mean Noon.		X.	Y.	Z.	
	d					d				
Sept. 1	244	-.9414965	+.3317805	+.1489707	Nov. 1	305	-.7698643	-.5735956	-.2489039	
	2	.9472517	.3170443	.1375757		2	306	.7586140	.5857172	.2541634
	3	.9527324	.3022156	.1311405		3	307	.7471321	.5976602	.2593453
	4	.9579366	.2872986	.1246670		4	308	.7354921	.6094206	.2644479
	5	.9628626	.2722979	.1181573		5	309	.7234878	.6209943	.2694695
6	249	-.9675087	+.2572182	+.1116135	6	310	-.7113331	-.6323775	-.2744083	
	7	.9718729	.2420640	.1050376		7	311	.6989617	.6435667	.2792627
	8	.9759537	.2268400	.0984316		8	312	.6863776	.6545585	.2840314
	9	.9797498	.2115510	.0917976		9	313	.6735850	.6653492	.2887130
	10	.9832604	.1962017	.0851376		10	314	.6605880	.6759355	.2933062
11	254	-.9864847	+.1807967	+.0784535	11	315	-.6473905	-.6863143	-.2978095	
	12	.9894290	.1653405	.0717472		12	316	.6339966	.6964828	.3022217
	13	.9920718	.1498377	.0650205		13	317	.6204104	.7064381	.3065414
	14	.9944318	.1342925	.0582754		14	318	.6066380	.7161772	.3107674
	15	.9965031	.1187095	.0515140		15	319	.5926775	.7256973	.3148986
16	259	-.9982847	+.1080932	+.0447382	16	320	-.5785389	-.7349957	-.3189337	
	17	.9997761	.0874480	.0379497		17	321	.5642241	.7440698	.3228716
	18	1.0009770	.0717782	.0311503		18	322	.5497372	.7529169	.3267111
	19	1.0018870	.0560878	.0243419		19	323	.5350819	.7615342	.3304511
	20	1.0025054	.0403810	.0175262		20	324	.5202622	.7699189	.3340901
21	264	-1.0028316	+.0246624	+.0107052	21	325	-.5052827	-.7780683	-.3376269	
	22	1.0028653	+.0089362	+.0038807		22	326	.4901475	.7859800	.3410604
	23	1.0026059	-.0067936	-.0029454		23	327	.4748608	.7936513	.3443896
	24	1.0020533	.0225227	.0097711		24	328	.4594267	.8010795	.3476132
	25	1.0012072	.0382463	.0165946		25	329	.4438496	.8082618	.3507300
26	269	-1.0000671	-.0539599	-.0284141	26	330	-.4281343	-.8151954	-.3537388	
	27	.9986327	.0696591	.0302274		27	331	.4122856	.8218780	.3566385
	28	.9969040	.0853393	.0370323		28	332	.3963081	.8283070	.3594280
	29	.9948807	.1009958	.0438268		29	333	.3802065	.8344799	.3621063
	30	.9925628	.1166237	.0506089		30	334	.3639857	.8403942	.3646723
Oct. 1	274	-.9899504	-.1322182	-.0573763	Dec. 1	335	-.3476512	-.8460478	-.3671250	
	2	.9870440	.1477743	.0641269		2	336	.3312085	.8514386	.3694636
	3	.9838439	.1632872	.0708586		3	337	.3146630	.8565646	.3716872
	4	.9803508	.1787518	.0775692		4	338	.2980201	.8614240	.3737950
	5	.9765655	.1941631	.0842565		5	339	.2812852	.8660155	.3757865
6	279	-.9724890	-.2095162	-.0909184	6	340	-.2644639	-.8703377	-.3776613	
	7	.9681224	.2248061	.0975527		7	341	.2475617	.8743892	.3794187
	8	.9634672	.2400279	.1041574		8	342	.2305840	.8781687	.3810582
	9	.9585249	.2551770	.1107304		9	343	.2135363	.8816750	.3825793
	10	.9532973	.2702488	.1172698		10	344	.1964299	.8849072	.3839817
11	284	-.9477859	-.2852386	-.1237736	11	345	-.1792520	-.8878647	-.3852651	
	12	.9419924	.3001417	.1302399		12	346	.1620261	.8905469	.3864292
	13	.9359187	.3149538	.1366669		13	347	.1447515	.8929534	.3874737
	14	.9295666	.3296709	.1430527		14	348	.1274335	.8950835	.3883984
	15	.9229377	.3442888	.1493955		15	349	.1100769	.8969368	.3892031
16	289	-.9160340	-.3588033	-.1556936	16	350	-.0926869	-.8985128	-.3898876	
	17	.9088576	.3732098	.1619453		17	351	.0752683	.8998111	.3904515
	18	.9014104	.3875041	.1681487		18	352	.0578262	.9008312	.3908946
	19	.8936945	.4016827	.1743018		19	353	.0403657	.9015725	.3912169
	20	.8857116	.4157418	.1804027		20	354	.0228920	.9020347	.3914181
21	294	-.8774638	-.4296772	-.1864497	21	355	-.0054101	-.9022176	-.3914980	
	22	.8689531	.4434845	.1924413		22	356	+.0120750	.9021208	.3914563
	23	.8601815	.4571596	.1983758		23	357	.0295579	.9017441	.3912929
	24	.8511512	.4706984	.2042513		24	358	.0470331	.9010872	.3910078
	25	.8418640	.4840967	.2100660		25	359	.0644950	.9001500	.3906009
26	299	-.8323220	-.4973505	-.2158179	26	360	+.0819383	.8989324	-.3900722	
	27	.8225274	.5104552	.2215050		27	361	.0993575	.8974341	.3894217
	28	.8124831	.5234067	.2271255		28	362	.1167472	.8956555	.3886494
	29	.8021917	.5362008	.2326775		29	363	.1341016	.8935969	.3877556
	30	.7916563	.5488332	.2381591		30	364	.1514149	.8912587	.3867404
31	304	-.7808795	.5612995	.2435685	31	365	.1686814	.8886416	.3856042	
	305	-.7698643	-.5735956	-.2489039	32	366	+.1858954	-.8857464	-.3843472	

MOON'S LONGITUDE, &c., 1861. 245

FOR GREENWICH MEAN NOON AND MIDNIGHT.

Day of Month.	JANUARY.		FEBRUARY.		MARCH.	
	True Longitude.	Latitude.	True Longitude.	Latitude.	True Longitude.	Latitude.
1.0	157° 9' 27.8	-3° 41' 41.2	210° 39' 59.0	-5° 12' 8.1	220° 52' 16.5	-4° 50' 16.5
1.5	164 14 28.5	4 7 53.1	217 45 15.8	5 4 21.7	228 4 22.3	4 35 16.8
2.0	171 20 8.8	4 30 19.5	224 46 55.1	4 52 4.6	235 10 44.7	4 16 11.8
2.5	178 26 10.0	4 48 38.5	231 44 48.7	4 35 34.7	242 11 13.8	3 53 30.6
3.0	185 32 14.5	5 2 32.5	238 38 53.1	4 15 13.3	249 5 48.4	3 27 42.0
3.5	192 38 5.2	5 11 48.8	245 29 8.2	3 51 24.1	255 54 34.9	2 59 16.0
4.0	199 43 25.8	5 16 19.5	252 15 37.2	3 24 32.8	262 37 46.5	2 28 43.2
4.5	206 48 0.2	5 16 1.6	258 58 25.5	2 55 6.6	269 15 41.0	1 56 33.4
5.0	213 51 32.2	5 10 57.3	265 37 39.4	2 23 33.4	275 48 39.6	1 23 15.1
5.5	220 53 45.7	5 1 13.5	272 13 26.2	1 50 21.8	282 17 5.3	0 49 15.9
6.0	227 54 24.6	4 47 1.7	278 45 53.6	1 16 0.4	288 41 22.2	-0 15 2.6
6.5	234 53 12.5	4 28 38.0	285 15 8.9	0 40 57.7	295 1 54.0	+0 19 0.1
7.0	241 49 52.8	4 6 22.5	291 41 18.9	-0 5 41.7	301 19 3.8	0 52 28.7
7.5	248 44 8.8	3 40 38.7	298 4 29.7	+0 29 20.5	307 33 13.1	1 25 0.8
8.0	255 35 44.3	3 11 53.3	304 24 46.9	1 3 43.1	313 44 41.6	1 56 15.7
8.5	262 24 23.6	2 40 35.5	310 42 15.7	1 37 1.7	319 53 47.0	2 25 54.0
9.0	269 9 51.9	2 7 16.2	316 57 1.2	2 8 53.7	326 0 44.9	2 53 38.0
9.5	275 51 55.7	1 32 27.3	323 9 8.6	2 38 58.3	332 5 48.8	3 19 11.6
10.0	282 30 23.2	0 56 40.9	329 18 43.5	3 6 56.9	338 9 10.5	3 42 20.2
10.5	289 5 5.1	-0 20 28.8	335 25 52.7	3 32 33.2	344 11 0.6	4 2 50.9
11.0	295 35 54.9	+0 15 38.4	341 30 44.4	3 55 33.1	350 11 26.5	4 20 32.7
11.5	302 2 49.0	0 51 12.0	347 33 28.5	4 15 44.7	356 10 43.1	4 35 16.7
12.0	308 25 46.9	1 25 45.3	353 34 16.8	4 32 58.3	2 8 53.4	4 46 55.5
12.5	314 44 51.8	1 58 53.9	359 33 23.5	4 47 6.3	8 6 8.9	4 55 23.6
13.0	321 0 10.7	2 30 16.4	5 31 5.3	4 58 2.8	14 2 40.0	5 0 37.6
13.5	327 11 54.1	2 59 34.0	11 27 41.4	5 5 43.8	19 58 36.6	5 2 35.2
14.0	333 20 16.1	3 26 30.5	17 23 33.6	5 10 6.6	25 54 18.4	5 1 16.2
14.5	339 25 34.7	3 50 52.2	23 19 6.3	5 11 9.8	31 49 55.4	4 56 42.0
15.0	345 28 10.6	4 12 27.6	29 14 46.6	5 8 53.1	37 45 47.9	4 48 54.9
15.5	351 28 27.8	4 31 7.5	35 11 3.9	5 3 17.4	43 42 16.9	4 37 59.0
16.0	357 26 53.3	4 46 44.3	41 8 29.6	4 54 24.3	49 39 46.1	4 23 59.1
16.5	3 23 55.9	4 59 11.9	47 7 37.0	4 42 16.3	55 38 42.0	4 7 1.4
17.0	9 20 6.9	5 8 25.4	53 9 1.1	4 26 57.0	61 39 33.6	3 47 13.2
17.5	15 15 59.2	5 14 21.0	59 13 18.3	4 8 31.0	67 42 52.3	3 24 43.2
18.0	21 12 7.1	5 16 55.5	65 21 4.9	3 47 4.3	73 49 11.6	2 59 41.0
18.5	27 9 5.7	5 16 6.7	71 32 57.2	3 22 44.4	79 59 6.8	2 32 17.9
19.0	33 7 30.6	5 11 53.2	77 49 30.9	2 55 40.6	86 13 14.1	2 2 47.0
19.5	39 7 57.4	5 4 14.4	84 11 19.7	2 26 4.8	92 32 9.9	1 31 23.2
20.0	45 11 1.2	4 53 10.4	90 35 54.7	1 54 11.7	98 56 30.2	0 58 23.9
20.5	51 17 16.2	4 38 42.5	97 12 42.8	1 20 19.2	105 26 49.3	+0 24 9.1
21.0	57 27 14.8	4 20 53.6	103 53 5.8	0 44 48.8	112 3 38.3	-0 10 58.2
21.5	63 41 27.1	3 59 48.3	110 40 18.3	+0 8 6.2	118 47 23.6	0 46 31.6
22.0	70 0 20.2	3 35 33.4	117 34 26.7	-0 29 18.7	125 38 25.1	1 22 1.1
22.5	76 24 17.3	3 8 18.5	124 35 28.1	1 6 51.7	132 36 54.3	1 56 53.6
23.0	82 53 37.1	2 38 16.3	131 43 8.6	1 43 54.9	139 42 51.9	2 30 33.0
23.5	89 28 32.9	2 5 43.4	138 57 2.7	2 19 47.7	146 56 6.3	3 2 20.1
24.0	96 9 11.6	1 31 0.2	146 16 33.5	2 53 47.8	154 16 12.7	3 31 34.8
24.5	102 55 33.4	0 54 31.6	153 40 52.8	3 25 12.5	161 42 31.7	3 57 37.5
25.0	109 47 31.5	+0 16 46.6	161 9 1.7	3 53 21.0	169 14 9.1	4 19 50.1
25.5	116 44 51.5	-0 21 41.7	168 39 53.8	4 17 36.2	176 49 57.6	4 37 38.8
26.0	123 47 11.0	1 0 16.6	176 12 16.8	4 37 26.5	184 28 40.2	4 50 36.2
26.5	130 54 0.2	1 38 18.6	183 44 56.0	4 52 27.0	192 8 52.1	4 58 21.7
27.0	138 4 43.3	2 15 6.8	191 16 37.4	5 2 21.0	199 49 4.1	5 0 44.8
27.5	145 18 38.8	2 50 0.3	198 46 10.8	5 7 0.7	207 27 47.7	4 57 43.9
28.0	152 35 0.8	3 22 19.2	206 12 32.8	5 6 26.5	215 3 39.0	4 49 27.5
28.5	159 53 0.9	3 51 26.4	213 34 49.4	5 0 46.7	222 35 22.8	4 36 12.4
29.0	167 11 49.1	4 16 49.0	220 52 16.5	4 50 16.5	230 1 55.1	4 18 22.9
29.5	174 30 36.8	4 37 59.5	228 4 22.3	4 35 16.8	237 22 24.9	3 56 28.9
30.0	181 48 37.6	4 54 36.5	235 10 44.7	4 16 11.8	244 36 15.9	3 31 3.7
30.5	189 5 8.8	5 6 24.0	242 11 13.8	3 53 30.6	251 43 5.5	3 2 43.2
31.0	196 19 32.9	5 13 16.5	249 5 48.4	3 27 42.0	258 42 44.5	2 32 3.2
31.5	203 31 18.2	-5 15 9.5	255 54 34.9	-2 59 16.0	265 35 15.0	-1 59 39.2

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FOR GREENWICH MEAN NOON AND MIDNIGHT.						
Day of Month.	APRIL.		MAY.		JUNE.	
	True Longitude.	Latitude.	True Longitude.	Latitude.	True Longitude.	Latitude.
1.0	272 20 48.9	-1 26 4.6	307 23 44.9	+1 51 51.3	352 46 33.1	+4 50 42.6
1.5	278 59 46.1	0 51 51.0	313 42 2.7	2 22 21.6	358 45 57.4	5 0 53.3
2.0	285 32 32.2	-0 17 27.3	319 55 36.3	2 50 46.1	4 43 5.7	5 7 45.9
2.5	291 59 36.6	+0 16 39.9	326 5 1.7	3 16 51.3	10 39 30.9	5 11 18.7
3.0	298 21 31.2	0 50 6.6	332 10 54.6	3 40 25.4	16 35 21.7	5 11 31.1
3.5	304 38 49.0	1 22 31.1	338 13 49.8	4 1 18.3	22 31 8.7	5 8 23.3
4.0	310 52 3.0	1 53 33.9	344 14 20.7	4 19 21.3	28 27 17.4	5 1 56.8
4.5	317 1 45.4	2 22 57.2	350 12 58.7	4 34 27.2	34 24 12.0	4 52 13.9
5.0	323 8 26.9	2 50 24.9	356 10 12.7	4 46 29.7	40 22 14.2	4 39 18.5
5.5	329 12 36.2	3 15 42.7	2 6 29.0	4 55 23.7	46 21 43.0	4 23 16.1
6.0	335 14 39.4	3 38 37.6	8 2 11.3	5 1 5.5	52 22 55.5	4 4 13.2
6.5	341 14 59.8	3 58 58.1	13 57 40.8	5 3 32.3	58 26 6.5	3 42 19.2
7.0	347 13 58.4	4 16 33.8	19 53 16.2	5 2 42.7	64 31 28.2	3 17 44.8
7.5	353 11 53.2	4 31 16.0	25 49 13.7	4 58 36.6	70 39 13.2	2 50 42.8
8.0	359 8 59.9	4 42 57.4	31 45 47.8	4 51 15.6	76 49 30.1	2 21 28.5
8.5	5 5 32.4	4 51 31.9	37 43 11.3	4 40 42.5	83 2 26.2	1 50 19.3
9.0	11 1 42.6	4 56 55.2	43 41 35.4	4 27 2.3	89 18 9.4	1 17 34.7
9.5	16 57 40.7	4 59 4.2	49 41 10.4	4 10 21.4	95 36 46.0	0 43 36.4
10.0	22 53 38.2	4 57 58.5	55 42 6.3	3 50 48.3	101 58 22.4	+0 8 47.8
10.5	28 49 43.4	4 53 38.2	61 44 33.1	3 28 33.0	108 23 5.0	-0 26 26.1
11.0	34 46 6.8	4 46 5.4	67 48 41.2	3 3 47.8	114 51 0.0	1 1 38.6
11.5	40 42 59.3	4 35 24.1	73 54 41.8	2 36 46.2	121 22 14.0	1 36 22.1
12.0	46 40 32.8	4 21 40.0	80 2 47.4	2 7 44.0	127 56 53.7	2 10 8.2
12.5	52 39 0.7	4 4 59.8	86 13 12.0	1 36 58.3	124 35 6.2	2 42 28.0
13.0	58 38 39.0	3 45 32.3	92 26 11.5	1 4 48.0	141 16 57.4	3 12 52.6
13.5	64 39 45.8	3 23 27.3	98 42 3.3	+0 31 33.5	148 2 32.6	3 40 53.4
14.0	70 42 41.7	2 58 56.1	106 1 6.5	-0 2 23.5	154 51 55.7	4 6 2.6
14.5	76 47 49.8	2 32 11.8	111 23 41.9	0 36 39.7	161 45 9.8	4 27 53.5
15.0	82 55 35.7	2 3 28.4	117 50 11.2	1 10 50.5	168 42 11.3	4 46 1.4
15.5	89 6 27.3	1 33 1.4	124 20 56.5	1 44 29.9	175 42 59.0	5 0 3.8
16.0	95 20 54.6	1 1 8.2	130 56 19.4	2 17 10.7	182 47 23.9	5 9 41.3
16.5	101 39 29.1	+0 28 7.7	137 36 40.3	2 48 24.7	189 55 13.2	5 14 38.2
17.0	108 2 42.7	-0 5 39.5	144 22 17.2	3 17 42.7	197 6 8.5	5 14 43.3
17.5	114 31 7.3	0 39 50.4	151 13 24.9	3 44 35.0	204 19 45.3	5 9 50.4
18.0	121 5 13.6	1 13 59.8	158 10 12.6	4 8 31.6	211 35 34.1	4 59 59.4
18.5	127 45 30.0	1 47 40.3	165 12 43.2	4 29 3.4	218 53 0.0	4 45 16.2
19.0	134 32 20.6	2 20 22.2	172 20 51.6	4 45 42.1	226 11 23.0	4 25 53.1
19.5	141 26 3.9	2 51 34.2	179 34 23.3	4 58 2.1	233 20 59.5	4 2 9.3
20.0	148 26 50.3	3 20 42.4	186 52 53.7	5 5 41.3	240 48 3.1	3 34 29.7
20.5	155 34 40.2	3 47 11.5	194 15 47.2	5 8 22.4	248 4 46.2	3 3 25.7
21.0	162 49 22.3	4 10 27.2	201 42 18.0	5 5 54.2	255 19 21.7	2 29 32.0
21.5	170 10 32.0	4 29 55.3	209 11 30.5	4 58 12.9	262 31 4.8	1 53 27.4
22.0	177 37 31.0	4 45 4.4	216 42 21.5	4 45 22.2	269 39 14.1	1 15 52.6
22.5	185 9 27.0	4 55 28.9	224 13 42.3	4 27 34.2	276 43 12.9	-0 37 26.5
23.0	192 45 14.3	5 0 45.6	231 44 21.5	4 5 9.6	283 42 30.9	+0 1 5.2
23.5	200 23 37.1	5 0 42.4	239 13 8.0	3 38 36.6	290 36 43.9	0 39 11.1
24.0	208 3 12.0	4 55 16.4	246 38 54.3	3 8 29.6	297 26 34.8	1 16 15.1
24.5	215 42 31.4	4 44 32.6	254 0 39.3	2 35 27.5	304 8 53.8	1 51 45.1
25.0	223 20 9.0	4 28 45.7	261 17 29.9	2 0 12.0	310 46 37.9	2 25 14.8
25.5	230 54 42.3	4 8 19.3	268 28 43.1	1 23 25.6	317 18 51.0	2 56 21.9
26.0	238 24 56.6	3 43 44.2	275 33 46.5	0 45 50.2	323 45 42.6	3 24 48.1
26.5	245 49 48.4	3 15 36.6	282 32 18.9	-0 8 5.3	330 7 28.1	3 50 18.8
27.0	253 8 27.1	2 44 35.8	289 24 9.7	+0 29 12.9	336 24 27.6	4 12 42.9
27.5	260 20 16.1	2 11 22.4	296 9 17.9	1 5 31.8	342 37 4.7	4 31 52.3
28.0	267 24 52.5	1 36 36.8	302 47 51.5	1 40 23.0	348 45 45.9	4 47 41.3
28.5	274 22 6.3	1 0 57.3	309 20 5.5	2 13 22.6	354 51 2.8	5 0 6.2
29.0	281 11 59.3	-0 25 0.2	315 46 21.5	2 44 10.3	0 53 26.9	5 9 5.3
29.5	287 54 43.0	+0 10 42.4	322 7 5.9	3 12 29.7	6 53 30.5	5 14 38.0
30.0	294 30 37.1	0 45 41.4	328 22 48.4	3 38 7.6	12 51 47.5	5 16 44.7
30.5	301 0 7.6	1 19 31.6	334 34 1.7	4 0 53.2	18 48 52.5	5 15 26.8
31.0	307 23 44.9	1 51 51.3	340 41 20.2	4 20 38.3	24 45 19.2	5 10 46.5
31.5	313 42 2.7	+2 22 21.6	346 45 18.9	+4 37 16.4	30 41 43.2	+5 2 46.9

MOON'S LONGITUDE, &c., 1861. 247

FOR GREENWICH MEAN NOON AND MIDNIGHT.

Day of Month.	JULY.		AUGUST.		SEPTEMBER.	
	True Longitude.	Latitude.	True Longitude.	Latitude.	True Longitude.	Latitude.
1.0	24° 45' 19.9	+5° 10' 46.5	68° 38' 47.6	+2° 59' 14.7	114° 30' 57.0	-1° 6' 10.3
1.5	30 41 43.2	5 2 46.9	74 46 45.9	2 30 36.2	121 11 0.9	1 40 28.2
2.0	36 38 34.8	4 51 31.6	80 58 33.6	1 59 54.8	127 57 39.6	2 13 52.4
2.5	42 36 26.3	4 37 5.8	87 14 36.9	1 27 26.9	134 50 52.7	2 45 49.5
3.0	48 35 47.3	4 19 35.2	93 35 18.1	0 53 31.7	141 50 20.6	3 15 44.7
3.5	54 37 5.2	3 59 7.1	100 0 55.2	+0 18 31.2	148 56 9.3	3 43 2.5
4.0	60 40 45.5	3 35 50.4	106 31 40.8	-0 17 10.0	156 7 19.7	4 7 8.3
4.5	66 47 10.8	3 9 55.8	113 7 41.8	0 53 42.1	163 23 18.8	4 27 29.5
5.0	72 56 40.9	2 41 36.0	119 48 58.9	1 28 41.3	170 43 15.4	4 43 37.2
5.5	79 9 32.8	2 11 6.3	126 35 26.3	2 3 28.9	178 6 11.1	4 55 7.7
6.0	85 26 0.0	1 38 44.1	133 26 51.2	2 36 53.0	185 31 2.6	5 1 43.7
6.5	91 46 12.8	1 4 49.6	140 22 54.4	3 8 19.2	192 56 44.1	5 3 15.3
7.0	98 10 18.1	+0 29 45.6	147 23 10.1	3 37 13.2	200 22 10.9	4 59 40.3
7.5	104 38 19.4	-0 6 2.7	154 27 7.3	4 3 2.3	207 46 21.8	4 51 4.4
8.0	111 10 16.9	0 42 7.7	161 34 10.3	4 26 16.1	215 8 21.4	4 37 40.4
8.5	117 46 7.8	1 18 0.1	168 43 40.1	4 43 28.3	222 27 22.3	4 19 47.7
9.0	124 25 46.3	1 53 9.0	175 54 56.0	4 57 16.9	229 42 46.2	3 57 50.9
9.5	131 9 4.2	2 27 2.7	183 7 16.9	5 6 25.5	236 54 4.2	3 32 18.7
10.0	137 55 50.9	2 59 9.4	190 20 3.0	5 10 43.8	244 0 56.9	3 3 42.4
10.5	144 45 53.8	3 28 57.8	197 32 36.7	5 10 7.5	251 3 13.8	2 32 35.3
11.0	151 38 58.9	3 55 57.8	204 44 24.2	5 4 38.1	258 0 51.7	1 59 30.9
11.5	158 34 51.0	4 19 41.4	211 54 55.6	4 54 23.1	264 53 53.9	1 25 2.9
12.0	165 33 13.7	4 39 43.2	219 3 45.8	4 39 35.5	271 42 28.2	0 49 44.1
12.5	172 33 50.2	4 55 41.0	226 10 34.4	4 20 33.1	278 26 46.3	-0 14 6.0
13.0	179 36 22.9	5 7 16.7	233 15 5.6	3 57 37.4	285 7 1.8	+0 21 21.2
13.5	186 40 34.0	5 14 16.2	240 17 7.5	3 31 13.8	291 43 29.3	0 56 9.4
14.0	193 46 5.5	5 16 30.2	247 16 32.0	3 1 50.1	298 16 23.7	1 29 52.1
14.5	200 52 38.7	5 13 54.3	254 13 13.5	2 29 56.3	304 45 50.0	2 2 5.0
15.0	207 59 54.9	5 6 29.2	261 7 8.7	1 56 3.9	311 12 28.1	2 32 26.0
15.5	215 7 34.7	4 54 20.7	267 58 15.6	1 20 45.4	317 36 2.5	3 0 35.1
16.0	222 15 18.5	4 37 39.8	274 46 32.8	0 44 33.5	323 56 51.8	3 26 14.7
16.5	229 22 45.9	4 16 42.4	281 31 59.3	-0 8 0.5	330 15 4.1	3 49 9.5
17.0	236 29 36.1	3 51 49.4	288 14 33.8	+0 28 21.8	336 30 45.9	4 9 6.6
17.5	243 35 27.5	3 23 25.8	294 54 14.5	1 4 2.7	342 44 2.2	4 25 55.6
18.0	250 39 58.3	2 52 0.6	301 30 58.7	1 38 33.5	348 54 57.5	4 39 28.7
18.5	257 42 46.0	2 18 5.9	308 4 43.4	2 11 27.4	355 3 26.2	4 49 40.3
19.0	264 43 28.2	1 42 16.1	314 35 25.1	2 42 20.0	1 10 2.5	4 56 27.4
19.5	271 41 42.7	1 5 7.5	321 3 0.4	3 10 50.0	7 14 21.5	4 59 49.2
20.0	278 37 7.7	-0 27 16.7	327 27 26.5	3 36 38.6	13 16 40.1	4 59 47.0
20.5	285 29 23.0	+0 10 39.9	333 48 41.4	3 59 30.6	19 17 6.8	4 56 24.1
21.0	292 18 9.7	0 48 7.2	340 6 44.8	4 19 13.6	25 15 52.3	4 49 45.6
21.5	299 3 11.0	1 24 32.0	346 21 38.0	4 35 38.3	31 13 9.8	4 39 57.9
22.0	305 44 12.9	1 59 23.9	352 33 25.3	4 48 38.4	37 9 15.7	4 27 9.0
22.5	312 21 4.8	2 32 16.1	358 42 13.7	4 58 10.4	43 4 29.2	4 11 27.8
23.0	318 53 40.0	3 2 45.0	4 48 13.3	5 4 13.0	48 59 12.6	3 53 4.3
23.5	325 21 55.7	3 30 31.1	10 51 37.2	5 6 47.2	54 53 51.2	3 32 9.2
24.0	331 45 53.5	3 55 18.4	16 52 42.1	5 5 55.8	60 48 53.9	3 8 54.1
24.5	338 5 38.8	4 16 54.8	22 51 47.8	5 1 42.9	66 44 52.0	2 43 31.1
25.0	344 21 21.7	4 35 11.2	28 49 17.6	4 54 14.0	72 42 19.8	2 16 13.2
25.5	350 33 16.2	4 50 1.6	34 45 37.7	4 43 35.8	78 41 53.8	1 47 14.2
26.0	356 41 40.2	5 1 22.7	40 41 17.0	4 29 55.6	84 44 12.3	1 16 48.8
26.5	2 46 54.9	5 9 13.1	46 36 47.3	4 13 21.5	90 49 54.9	0 45 13.1
27.0	8 49 24.8	5 13 33.2	52 32 42.7	3 54 2.2	96 59 41.9	+0 12 44.4
27.5	14 49 37.4	5 14 25.2	58 29 39.3	3 32 7.4	103 14 13.2	-0 20 18.0
28.0	20 48 2.7	5 11 52.2	64 28 14.5	3 7 47.3	109 34 7.1	0 53 33.3
28.5	26 45 12.6	5 5 58.0	70 29 6.8	2 41 13.2	115 59 59.7	1 26 38.1
29.0	32 41 40.7	4 56 47.8	76 32 55.0	2 12 37.5	122 32 23.2	1 59 6.7
29.5	38 38 1.9	4 44 26.9	82 40 17.4	1 42 14.1	129 11 44.4	2 30 31.2
30.0	44 34 51.7	4 29 1.6	88 51 51.5	1 10 18.7	135 58 22.5	3 0 21.2
30.5	50 32 46.0	4 10 39.2	95 8 12.3	0 37 9.1	142 52 26.3	3 28 4.6
31.0	56 32 20.4	3 49 27.6	101 29 52.3	+0 3 5.4	149 54 1.5	3 53 7.9
31.5	62 34 9.7	+3 25 35.9	107 57 19.6	-0 31 29.6	157 2 49.6	-4 14 57.6

248 MOON'S LONGITUDE, &c., 1861.

FOR GREENWICH MEAN NOON AND MIDNIGHT.						
Day of Month.	OCTOBER.		NOVEMBER.		DECEMBER.	
	True Longitude.	Latitude.	True Longitude.	Latitude.	True Longitude.	Latitude.
1.0	149° 54' 15"	-3° 53' 7.9"	202° 21' 8.9"	-4° 52' 41.4"	240° 56' 16.1"	-2° 53' 42.2"
1.5	157 2 49.6	4 14 57.6	209 59 13.2	4 38 41.7	248 30 14.3	2 17 40.0
2.0	164 18 26.9	4 33 1.0	217 38 52.6	4 19 38.3	256 1 57.4	1 39 22.1
2.5	171 40 14.3	4 46 48.1	225 18 40.7	3 55 52.9	263 30 17.8	0 59 36.4
3.0	179 7 18.9	4 55 53.4	232 57 11.8	3 27 55.5	270 54 14.7	-0 19 11.4
3.5	186 38 36.5	4 59 57.2	240 33 4.6	2 56 23.4	278 12 57.0	+0 21 6.0
4.0	194 12 53.2	4 58 47.6	248 5 5.5	2 21 59.0	285 25 44.0	1 0 32.0
4.5	201 48 48.6	4 52 21.1	255 32 11.7	1 45 27.5	292 32 6.1	1 38 27.8
5.0	209 24 59.9	4 40 43.4	262 53 32.7	1 7 34.9	299 31 44.8	2 14 19.2
5.5	217 0 5.5	4 24 9.4	270 8 31.1	-0 29 6.0	306 24 32.1	2 47 38.2
6.0	224 32 48.5	4 3 1.9	277 16 42.9	+0 9 17.3	313 10 29.5	3 18 2.7
6.5	232 2 0.9	3 37 50.7	284 17 56.4	0 46 56.8	319 49 46.9	3 45 15.3
7.0	239 26 44.9	3 9 10.7	291 12 11.1	1 23 18.9	326 22 41.5	4 9 3.9
7.5	246 46 15.3	2 37 40.2	297 59 35.9	1 57 54.8	332 49 35.6	4 29 20.1
8.0	253 59 59.6	2 3 59.0	304 40 27.1	2 30 20.3	339 10 56.4	4 45 58.9
8.5	261 7 38.0	1 28 46.6	311 15 7.1	3 0 15.5	345 27 13.7	4 58 58.2
9.0	268 9 2.3	0 52 41.7	317 44 2.2	3 27 24.5	351 38 59.6	5 8 17.9
9.5	275 4 14.0	-0 16 20.0	324 7 41.5	3 51 34.5	357 46 47.4	5 13 59.8
10.0	281 53 23.1	+0 19 45.1	330 26 35.2	4 12 35.7	3 51 10.7	5 16 6.8
10.5	288 36 45.6	0 55 3.5	336 41 14.3	4 30 20.9	9 52 42.7	5 14 43.4
11.0	295 14 42.1	1 29 8.2	342 52 9.1	4 44 45.1	15 51 56.1	5 9 54.4
11.5	301 47 36.0	2 1 35.3	348 59 48.9	4 55 44.7	21 49 22.4	5 1 46.0
12.0	308 15 52.2	2 32 4.0	355 4 41.6	5 3 18.0	27 45 31.6	4 50 24.9
12.5	314 39 56.0	3 0 16.0	1 7 13.4	5 7 24.9	33 40 51.9	4 35 58.9
13.0	321 0 12.1	3 25 55.6	7 7 48.4	5 8 6.2	39 35 49.8	4 18 36.8
13.5	327 17 3.9	3 48 49.5	13 6 48.5	5 5 24.6	45 30 49.6	3 58 28.3
14.0	333 30 53.3	4 8 46.6	19 4 33.8	4 59 23.7	51 26 13.8	3 35 44.4
14.5	339 42 0.2	4 25 37.6	25 1 22.2	4 50 8.5	57 22 22.6	3 10 37.4
15.0	345 50 42.3	4 39 15.6	30 57 30.1	4 37 45.7	63 19 34.5	2 43 21.0
15.5	351 57 15.1	4 49 35.3	36 53 12.1	4 22 23.1	69 18 6.1	2 14 10.4
16.0	358 1 52.3	4 56 33.3	42 48 41.9	4 4 10.0	75 18 12.2	1 43 22.2
16.5	4 4 45.6	5 0 8.3	48 44 12.2	3 43 17.4	81 20 6.4	1 11 14.5
17.0	10 6 5.4	5 0 20.6	54 39 55.4	3 19 57.4	87 24 0.8	0 38 7.2
17.5	16 6 1.2	4 57 12.5	60 36 3.5	2 54 23.6	93 30 6.7	+0 4 21.0
18.0	22 4 41.8	4 50 47.9	66 32 49.3	2 26 50.9	99 38 34.9	-0 29 41.8
18.5	28 2 16.2	4 41 12.6	72 30 26.1	1 57 35.5	105 49 35.6	1 3 38.3
19.0	33 58 53.9	4 28 33.9	78 29 8.3	1 26 54.6	112 3 18.9	1 37 4.6
19.5	39 54 45.1	4 13 0.5	84 29 11.5	0 55 6.5	118 19 55.1	2 9 36.2
20.0	45 50 1.7	3 54 42.7	90 30 53.5	+0 22 30.2	124 39 34.8	2 40 48.5
20.5	51 44 57.4	3 33 51.9	96 34 33.6	-0 10 34.1	131 2 28.8	3 10 16.7
21.0	57 39 48.0	3 10 40.6	102 40 33.2	0 43 46.0	137 28 48.1	3 37 36.5
21.5	63 34 51.9	2 45 22.4	108 49 15.4	1 16 43.9	143 58 43.9	4 2 23.8
22.0	69 30 30.1	2 18 11.6	115 1 5.2	1 49 5.8	150 32 27.3	4 24 15.3
22.5	75 27 6.4	1 49 23.4	121 16 28.9	2 20 29.1	157 10 8.8	4 42 49.0
23.0	81 25 7.5	1 19 13.7	127 35 53.8	2 50 30.4	163 51 58.0	4 57 44.2
23.5	87 25 2.7	0 47 59.4	133 59 47.1	3 18 46.0	170 38 3.0	5 8 41.9
24.0	93 27 24.0	+0 15 57.9	140 28 35.9	3 44 51.3	177 28 29.9	5 15 25.4
24.5	99 32 45.5	-0 16 32.2	147 2 45.9	4 8 21.7	184 23 21.6	5 17 40.6
25.0	105 41 43.0	0 49 11.4	153 42 40.0	4 28 52.1	191 22 37.8	5 15 17.1
25.5	111 54 53.2	1 21 38.9	160 28 37.3	4 45 57.9	198 26 13.1	5 8 8.1
26.0	118 12 53.3	1 53 32.6	167 20 51.9	4 59 14.9	205 33 57.1	4 56 11.6
26.5	124 36 19.6	2 24 28.9	174 19 31.2	5 8 20.7	212 45 33.2	4 39 30.8
27.0	131 5 46.5	2 54 2.5	181 24 34.1	5 12 55.0	220 0 38.4	4 18 15.0
27.5	137 41 45.1	3 21 46.8	188 35 50.0	5 12 40.7	227 18 42.8	3 52 39.6
28.0	144 24 41.6	3 47 13.4	195 52 57.6	5 7 25.9	234 39 10.2	3 23 6.8
28.5	151 14 55.7	4 9 53.2	203 15 24.4	4 57 4.0	242 1 18.1	2 50 5.1
29.0	158 12 38.2	4 29 16.6	210 42 26.3	4 41 35.9	249 24 19.3	2 14 8.9
29.5	165 17 49.5	4 44 54.0	218 13 8.9	4 21 10.2	256 47 22.4	1 35 57.7
30.0	172 30 17.8	4 56 17.9	225 46 28.8	3 56 4.3	264 9 34.3	0 56 14.6
30.5	179 49 38.0	5 3 3.5	233 21 15.9	3 26 43.8	271 30 1.0	-0 15 45.0
31.0	187 15 10.7	5 4 50.6	240 56 16.1	2 53 42.2	278 47 50.1	+0 24 45.4
31.5	194 46 2.8	-5 1 25.3	248 30 14.3	-2 17 40.0	286 2 12.4	+1 4 32.2

ASTRONOMICAL EPHEMERIS

FOR THE

MERIDIAN OF WASHINGTON.

250 OBLIQUITY OF THE ECLIPTIC, &c.

Sidereal O ^h .	Apparent Obliquity.	Equation of Equinoxes.		Precession of Equinoxes in Longitude.	The Sun's		Mean Longitude of Moon's Ascending Node.
		In Longitude.	In R. A.		Aberration.	Hor. Parallax.	
1861.	23° 27'						
0	29 ^u .10	+16 ^u .16	+0.99	0 ^u .00	-20 ^u .80	8 ^u .72	298° 26 ^u .2
10	29.11	16.63	1.02	1.37	20.79	8.72	292 54.5
20	29.18	16.99	1.04	2.74	20.77	8.71	292 22.8
30	29.28	17.21	1.05	4.12	20.75	8.70	291 51.2
40	29.38	17.26	1.06	5.49	20.72	8.69	291 19.5
50	29.47	17.16	1.05	6.86	20.67	8.67	290 43.8
60	29.52	16.93	1.04	8.23	20.62	8.65	290 16.1
70	29.51	16.60	1.02	9.60	20.57	8.63	289 44.4
80	29.44	16.22	0.99	10.98	20.51	8.61	289 12.7
90	29.31	15.86	0.97	12.35	20.45	8.58	288 41.0
100	29.12	15.54	0.95	13.72	20.40	8.56	288 9.3
110	28.88	15.33	0.94	15.09	20.34	8.53	287 37.6
120	28.61	15.23	0.93	16.47	20.29	8.51	287 5.9
130	28.33	15.28	0.94	17.84	20.24	8.49	286 34.3
140	28.07	15.45	0.95	19.21	20.19	8.47	286 2.6
150	27.84	15.74	0.96	20.59	20.16	8.46	285 30.9
160	27.65	16.12	0.99	21.95	20.13	8.45	284 59.2
170	27.51	16.55	1.01	23.33	20.12	8.44	284 27.5
180	27.44	16.98	1.04	24.70	20.11	8.44	283 55.8
190	27.42	17.37	1.06	26.07	20.11	8.44	283 24.1
200	27.45	17.69	1.08	27.44	20.12	8.44	282 52.4
210	27.52	17.89	1.09	28.81	20.14	8.45	282 20.7
220	27.60	17.96	1.10	30.19	20.17	8.46	281 49.0
230	27.68	17.89	1.09	31.56	20.21	8.48	281 17.4
240	27.74	17.70	1.08	32.93	20.25	8.50	280 45.7
250	27.77	17.40	1.07	34.31	20.30	8.52	280 14.0
260	27.74	17.02	1.04	35.68	20.35	8.54	279 42.3
270	27.64	16.61	1.02	37.05	20.41	8.57	279 10.6
280	27.48	16.23	0.99	38.42	20.47	8.59	278 38.9
290	27.27	15.92	0.97	39.79	20.53	8.61	278 7.2
300	27.01	15.72	0.96	41.16	20.59	8.64	277 35.5
310	26.72	15.67	0.96	42.54	20.64	8.66	277 3.8
320	26.44	15.77	0.97	43.91	20.68	8.68	276 32.1
330	26.17	16.03	0.98	45.28	20.73	8.70	276 0.5
340	25.94	16.40	1.01	46.65	20.76	8.71	275 28.8
350	25.77	16.87	1.03	48.02	20.78	8.71	274 57.1
360	25.67	17.36	1.06	49.40	20.79	8.72	274 25.4
370	25.64	+17.81	+1.09	50.77	-20.79	8.72	273 53.7
Mean Obliquity, 1861.0, 23° 27' 25^u.89 Precession for 1861.5, 50.2550 Log. Precession in a Sidereal Day, 9.13740 Log. Precession in a Solar Day, 9.13859							Daily Motion. 3.169

FOR WASHINGTON MEAN MIDNIGHT.

LOGARITHMS FOR CORRECTING THE PLACES OF THE FIXED STARS.

Date.	A.	B.	C.	D.	Date.	A.	B.	C.	D.
Jan. 1	-0.58636	+1.30120	+9.50926	-0.50617	Mar. 1	-1.25046	+0.80859	+9.69832	-0.56820
2	0.62157	1.29950	9.51424	0.50625	2	1.25290	0.78501	9.70018	0.56862
3	0.65403	1.29767	9.51917	0.50640	3	1.25520	0.75993	9.70203	0.56897
4	0.68409	1.29568	9.52399	0.50663	4	1.25736	0.73319	9.70387	0.56925
5	0.71208	1.29354	9.52876	0.50684	5	1.25937	0.70456	9.70568	0.56946
6	-0.73825	+1.29126	+9.53344	-0.50734	6	-1.26123	+0.67379	+9.70747	-0.56960
7	0.76280	1.28883	9.53806	0.50782	7	1.26296	0.64054	9.70924	0.56968
8	0.78590	1.28625	9.54261	0.50838	8	1.26455	0.60442	9.71099	0.56968
9	0.80771	1.28351	9.54709	0.50901	9	1.26600	0.56489	9.71272	0.56961
10	0.82834	1.28061	9.55150	0.50973	10	1.26731	0.52126	9.71443	0.56945
11	-0.84790	+1.27756	+9.55583	-0.51049	11	-1.26849	+0.47266	+9.71614	-0.56921
12	0.86648	1.27435	9.56009	0.51132	12	1.26953	0.41779	9.71782	0.56890
13	0.88416	1.27097	9.56428	0.51222	13	1.27043	0.35488	9.71949	0.56853
14	0.90102	1.26743	9.56841	0.51318	14	1.27120	0.28116	9.72115	0.56808
15	0.91712	1.26373	9.57241	0.51420	15	1.27186	0.19221	9.72279	0.56755
16	-0.93250	+1.25986	+9.57646	-0.51526	16	-1.27237	+0.08015	+9.72442	-0.56694
17	0.94722	1.25581	9.58039	0.51638	17	1.27275	9.92866	9.72606	0.56626
18	0.96133	1.25159	9.58425	0.51753	18	1.27299	9.69399	9.72768	0.56549
19	0.97485	1.24719	9.58804	0.51873	19	1.27311	+9.14667	9.72929	0.56464
20	0.98782	1.24261	9.59175	0.51998	20	1.27310	-9.32995	9.73090	0.56371
21	-1.00029	+1.23784	+9.59541	-0.52127	21	-1.27295	-9.75390	+9.73249	-0.56270
22	1.01227	1.23288	9.59903	0.52259	22	1.27268	9.96410	9.73408	0.56161
23	1.02379	1.22773	9.60258	0.52394	23	1.27228	0.10498	9.73567	0.56043
24	1.03488	1.22238	9.60607	0.52533	24	1.27174	0.21101	9.73725	0.55920
25	1.04556	1.21682	9.60950	0.52674	25	1.27108	0.29602	9.73883	0.55788
26	-1.05585	+1.21106	+9.61286	-0.52817	26	-1.27028	-0.36693	+9.74041	-0.55647
27	1.06576	1.20508	9.61617	0.52961	27	1.26936	0.42773	9.74199	0.55496
28	1.07531	1.19889	9.61942	0.53107	28	1.26831	0.48091	9.74356	0.55338
29	1.08452	1.19247	9.62259	0.53254	29	1.26712	0.52815	9.74515	0.55171
30	1.09340	1.18581	9.62572	0.53403	30	1.26581	0.57060	9.74674	0.54996
31	-1.10197	+1.17891	+9.62881	-0.53551	31	-1.26436	-0.60915	+9.74833	-0.54812
Feb. 1	1.11024	1.17177	9.63184	0.53700	Apr. 1	1.26277	0.64441	9.74991	0.54621
2	1.11822	1.16437	9.63480	0.53849	2	1.26106	0.67689	9.75151	0.54422
3	1.12593	1.15670	9.63772	0.53997	3	1.25921	0.70696	9.75311	0.54215
4	1.13336	1.14876	9.64058	0.54144	4	1.25722	0.73498	9.75470	0.54000
5	-1.14053	+1.14054	+9.64339	-0.54290	5	-1.25510	-0.76114	+9.75629	-0.53777
6	1.14745	1.13202	9.64616	0.54433	6	1.25284	0.78569	9.75790	0.53546
7	1.15412	1.12319	9.64888	0.54576	7	1.25044	0.80879	9.75951	0.53307
8	1.16056	1.11406	9.65154	0.54720	8	1.24790	0.83060	9.76114	0.53060
9	1.16677	1.10458	9.65416	0.54859	9	1.24522	0.85122	9.76277	0.52805
10	-1.17275	+1.09475	+9.65674	-0.54996	10	-1.24239	-0.87079	+9.76442	-0.52542
11	1.17852	1.08457	9.65927	0.55120	11	1.23942	0.88937	9.76606	0.52271
12	1.18408	1.07401	9.66176	0.55261	12	1.23631	0.90706	9.76772	0.51992
13	1.18943	1.06305	9.66420	0.55390	13	1.23304	0.92393	9.76938	0.51705
14	1.19457	1.05168	9.66660	0.55513	14	1.22963	0.94002	9.77104	0.51411
15	-1.19953	+1.03987	+9.66895	-0.55634	15	-1.22606	-0.95542	+9.77272	-0.51109
16	1.20429	1.02759	9.67128	0.55751	16	1.22234	0.97016	9.77441	0.50800
17	1.20886	1.01482	9.67357	0.55865	17	1.21846	0.98428	9.77611	0.50485
18	1.21326	1.00154	9.67582	0.55972	18	1.21448	0.99782	9.77783	0.50164
19	1.21747	0.98771	9.67803	0.56077	19	1.21022	1.01083	9.77966	0.49835
20	-1.22151	+0.97329	+9.68020	-0.56176	20	-1.20586	-1.02333	+9.78129	-0.49499
21	1.22537	0.95825	9.68233	0.56270	21	1.20133	1.03535	9.78304	0.49156
22	1.22907	0.94253	9.68443	0.56358	22	1.19662	1.04691	9.78480	0.48806
23	1.23260	0.92610	9.68650	0.56441	23	1.19174	1.05806	9.78657	0.48448
24	1.23597	0.90889	9.68854	0.56519	24	1.18668	1.06879	9.78834	0.48084
25	-1.23918	+0.89083	+9.69055	-0.56593	25	-1.18143	-1.07913	+9.79013	-0.47715
26	1.24223	0.87187	9.69253	0.56660	26	1.17600	1.08911	9.79194	0.47341
27	1.24512	0.85191	9.69449	0.56719	27	1.17037	1.09874	9.79375	0.46960
28	1.24787	0.83085	9.69642	0.56773	28	1.16455	1.10804	9.79556	0.46575
29	1.25046	0.80859	9.69832	0.56820	29	1.15853	1.11701	9.79740	0.46185
30	-1.25290	+0.78501	+9.70018	-0.56862	30	-1.15229	-1.12567	+9.79924	-0.45788
31	-1.25520	+0.75993	+9.70203	-0.56897	31	-1.14584	-1.13404	+9.80110	-0.45387

FOR WASHINGTON MEAN MIDNIGHT.

LOGARITHMS FOR CORRECTING THE PLACES OF THE FIXED STARS.

Date.	A.	B.	C.	D.	Date.	A.	B.	C.	D.
May 1	-1.14584	-1.13404	+9.20110	-0.45397	July 1	+0.52232	-1.30362	+9.92242	-0.24797
2	1.13918	1.14213	9.80297	0.44982	2	0.56105	1.30225	9.92425	0.24758
3	1.13229	1.14995	9.80485	0.44571	3	0.59607	1.30076	9.92609	0.24733
4	1.12516	1.15750	9.80674	0.44155	4	0.62337	1.29914	9.92790	0.24723
5	1.11778	1.16479	9.80864	0.43734	5	0.65833	1.29740	9.92970	0.24726
6	-1.11015	-1.17184	+9.81055	-0.43310	6	+0.69623	-1.29552	+9.93148	-0.24741
7	1.10227	1.17866	9.81247	0.42883	7	0.71234	1.29352	9.93325	0.24768
8	1.09412	1.18524	9.81439	0.42454	8	0.73686	1.29139	9.93502	0.24807
9	1.08570	1.19160	9.81633	0.42022	9	0.75996	1.28912	9.93676	0.24859
10	1.07699	1.19775	9.81828	0.41587	10	0.78177	1.28673	9.93849	0.24921
11	-1.06797	-1.20369	+9.82023	-0.41150	11	+0.80242	-1.28420	+9.94020	-0.24986
12	1.05864	1.20949	9.82220	0.40710	12	0.82202	1.28153	9.94189	0.25083
13	1.04999	1.21495	9.82418	0.40267	13	0.84066	1.27873	9.94357	0.25183
14	1.03900	1.22029	9.82617	0.39822	14	0.85843	1.27578	9.94523	0.25294
15	1.02665	1.22544	9.82816	0.39377	15	0.87537	1.27269	9.94688	0.25414
16	-1.01792	-1.23041	+9.83016	-0.38931	16	+0.89157	-1.26949	+9.94852	-0.25542
17	1.00681	1.23520	9.83216	0.38484	17	0.90706	1.26609	9.95013	0.25679
18	0.99598	1.23991	9.83417	0.38038	18	0.92191	1.26256	9.95173	0.25826
19	0.98331	1.24425	9.83620	0.37594	19	0.93615	1.25889	9.95331	0.25983
20	0.97069	1.24852	9.83824	0.37151	20	0.94983	1.25506	9.95487	0.26147
21	-0.95799	-1.25262	+9.84028	-0.36708	21	+0.96297	-1.25108	+9.95642	-0.26316
22	0.94457	1.25657	9.84232	0.36266	22	0.97561	1.24694	9.95795	0.26491
23	0.93059	1.26036	9.84435	0.35826	23	0.98778	1.24263	9.95947	0.26673
24	0.91603	1.26399	9.84639	0.35388	24	0.99950	1.23815	9.96097	0.26862
25	0.90085	1.26747	9.84843	0.34953	25	1.01080	1.23351	9.96245	0.27056
26	-0.88500	-1.27081	+9.85049	-0.34522	26	+1.02170	-1.22869	+9.96391	-0.27251
27	0.86842	1.27399	9.85254	0.34096	27	1.03222	1.22370	9.96535	0.27457
28	0.85106	1.27703	9.85460	0.33674	28	1.04237	1.21853	9.96678	0.27664
29	0.83286	1.27993	9.85666	0.33256	29	1.05217	1.21317	9.96819	0.27875
30	0.81375	1.28269	9.85872	0.32842	30	1.06164	1.20761	9.96958	0.28090
31	-0.79362	-1.28531	+9.86078	-0.32434	31	+1.07080	-1.20186	+9.97097	-0.28307
June 1	0.77239	1.28779	9.86284	0.32033	Aug. 1	1.07966	1.19591	9.97233	0.28524
2	0.74994	1.29014	9.86490	0.31639	2	1.08822	1.18975	9.97367	0.28742
3	0.72617	1.29235	9.86695	0.31253	3	1.09650	1.18338	9.97500	0.28961
4	0.70068	1.29443	9.86900	0.30874	4	1.10450	1.17679	9.97632	0.29183
5	-0.67390	-1.29638	+9.87106	-0.30503	5	+1.11224	-1.16997	+9.97762	-0.29406
6	0.64503	1.29820	9.87311	0.30138	6	1.11973	1.16291	9.97889	0.29627
7	0.61396	1.29989	9.87517	0.29782	7	1.12698	1.15561	9.98015	0.29846
8	0.58037	1.30146	9.87722	0.29436	8	1.13399	1.14806	9.98140	0.30065
9	0.54385	1.30290	9.87926	0.29100	9	1.14077	1.14025	9.98263	0.30286
10	-0.50385	-1.30421	+9.88129	-0.28774	10	+1.14733	-1.13217	+9.98384	-0.30501
11	0.45967	1.30540	9.88333	0.28458	11	1.15367	1.12381	9.98504	0.30711
12	0.41034	1.30647	9.88536	0.28153	12	1.15980	1.11516	9.98622	0.30918
13	0.35457	1.30741	9.88738	0.27859	13	1.16573	1.10621	9.98738	0.31122
14	0.29047	1.30822	9.88940	0.27577	14	1.17146	1.09694	9.98854	0.31323
15	-0.21508	-1.30892	+9.89141	-0.27308	15	+1.17699	-1.08734	+9.98967	-0.31519
16	0.12369	1.30950	9.89342	0.27052	16	1.18234	1.07739	9.99079	0.31712
17	0.00767	1.30995	9.89543	0.26808	17	1.18750	1.06709	9.99189	0.31902
18	9.84874	1.31028	9.89741	0.26576	18	1.19248	1.05641	9.99298	0.32087
19	9.59533	1.31049	9.89939	0.26357	19	1.19728	1.04532	9.99406	0.32263
20	-8.91245	-1.31059	+9.90137	-0.26150	20	+1.20192	-1.03381	+9.99512	-0.32436
21	+9.36239	1.31056	9.90334	0.25957	21	1.20639	1.02186	9.99617	0.32602
22	9.73426	1.31041	9.90530	0.25777	22	1.21069	1.00944	9.99720	0.32760
23	9.93154	1.31014	9.90724	0.25612	23	1.21483	0.99632	9.99822	0.32913
24	0.06660	1.30975	9.90918	0.25460	24	1.21881	0.98307	9.99923	0.33059
25	+0.16937	-1.30924	+9.91110	-0.25323	25	+1.22264	-0.96905	+0.00022	-0.33197
26	0.25230	1.30861	9.91301	0.25200	26	1.22630	0.95443	0.00121	0.33327
27	0.32183	1.30786	9.91492	0.25091	27	1.22981	0.93918	0.00219	0.33449
28	0.38164	1.30698	9.91682	0.24996	28	1.23318	0.92322	0.00315	0.33562
29	0.43408	1.30598	9.91870	0.24915	29	1.23641	0.90652	0.00410	0.33666
30	+0.48077	-1.30486	+9.92057	-0.24849	30	+1.23948	-0.88901	+0.00504	-0.33762
31	+0.52232	-1.30362	+9.92242	-0.24797	31	+1.24242	-0.87062	+0.00597	-0.33850

FOR WASHINGTON MEAN MIDNIGHT.

LOGARITHMS FOR CORRECTING THE PLACES OF THE FIXED STARS.

Date.	A.	B.	C.	D.	Date.	A.	B.	C.	D.
Sept. 1	+1.24521	-0.25129	+0.00639	-0.33927	Nov. 1	+1.15864	+1.11683	+0.05896	-0.12951
2	1.24736	0.23091	0.00779	0.33995	2	1.15220	1.12580	0.05996	0.12054
3	1.25037	0.20938	0.00869	0.34052	3	1.14552	1.13446	0.06099	0.11136
4	1.25275	0.18659	0.00957	0.34102	4	1.13859	1.12822	0.06202	0.10195
5	1.25499	0.16238	0.01044	0.34139	5	1.13141	1.15089	0.06306	0.09230
6	+1.25710	-0.73661	+0.01131	-0.34169	6	+1.12397	+1.15969	+0.06410	-0.08239
7	1.25907	0.70907	0.01218	0.34183	7	1.11627	1.16622	0.06516	0.07225
8	1.26091	0.67950	0.01304	0.34189	8	1.10828	1.17350	0.06622	0.06190
9	1.26262	0.64763	0.01389	0.34183	9	1.10001	1.18053	0.06730	0.05131
10	1.26419	0.61309	0.01473	0.34169	10	1.09144	1.18732	0.06838	0.04048
11	+1.26564	-0.57539	+0.01557	-0.34141	11	+1.08256	+1.19387	+0.06947	-0.02940
12	1.26696	0.53395	0.01642	0.34104	12	1.07334	1.20020	0.07057	0.01808
13	1.26815	0.48800	0.01725	0.34052	13	1.06378	1.20631	0.07169	0.00651
14	1.26921	0.43642	0.01806	0.33987	14	1.05388	1.21220	0.07281	9.99469
15	1.27014	0.37770	0.01886	0.33913	15	1.04360	1.21788	0.07394	9.98259
16	+1.27095	-0.30958	+0.01967	-0.33824	16	+1.03292	+1.22336	+0.07507	-9.97021
17	1.27163	0.22859	0.02048	0.33722	17	1.02184	1.22864	0.07621	9.95761
18	1.27218	0.12872	0.02128	0.33606	18	1.01032	1.23372	0.07737	9.94478
19	1.27260	0.99853	0.02207	0.33478	19	0.99834	1.23861	0.07853	9.93172
20	1.27290	9.31142	0.02287	0.33339	20	0.98587	1.24332	0.07969	9.91845
21	+1.27307	-9.47500	+0.02367	-0.33185	21	+0.97290	+1.24785	+0.08086	-9.90488
22	1.27312	+8.70831	0.02446	0.33019	22	0.95938	1.25220	0.08204	9.89109
23	1.27304	9.60285	0.02525	0.32840	23	0.94528	1.25637	0.08323	9.87708
24	1.27283	9.27539	0.02604	0.32646	24	0.93057	1.26037	0.08442	9.86273
25	1.27249	0.04156	0.02683	0.32434	25	0.91518	1.26420	0.08562	9.84813
26	+1.27203	+0.16142	+0.02762	-0.32207	26	+0.89908	+1.26786	+0.08682	-9.83321
27	1.27143	0.25520	0.02842	0.31969	27	0.88222	1.27136	0.08803	9.81809
28	1.27071	0.33223	0.02921	0.31714	28	0.86452	1.27470	0.08925	9.80277
29	1.26985	0.39756	0.03000	0.31448	29	0.84592	1.27788	0.09047	9.78725
30	1.26887	0.45425	0.03079	0.31165	30	0.82634	1.28090	0.09170	9.77150
31	+1.26776	+0.50431	+0.03159	-0.30967	31	+0.80569	+1.28377	+0.09293	-9.75572
Oct. 1	1.26776	0.50431	0.03159	0.30867	Dec. 1	0.80569	1.28377	0.09293	9.75572
2	1.26651	0.54909	0.03238	0.30552	2	0.78385	1.28648	0.09416	9.73965
3	1.26513	0.58960	0.03318	0.30224	3	0.76071	1.28904	0.09540	9.72337
4	1.26361	0.62655	0.03399	0.29890	4	0.73613	1.29145	0.09664	9.70697
5	+1.26196	+0.66051	+0.03480	-0.29518	5	+0.70991	+1.29372	+0.09788	-9.69046
6	1.26017	0.69189	0.03561	0.29139	6	0.68186	1.29584	0.09912	9.67376
7	1.25824	0.72105	0.03642	0.28745	7	0.65171	1.29781	0.10036	9.65696
8	1.25618	0.74828	0.03724	0.28337	8	0.61916	1.29963	0.10161	9.64008
9	1.25397	0.77379	0.03806	0.27910	9	0.58382	1.30131	0.10286	9.62315
10	+1.25162	+0.79776	+0.03889	-0.27464	10	+0.54519	+1.30285	+0.10410	-9.60627
11	1.24913	0.82036	0.03973	0.27001	11	0.50263	1.30425	0.10535	9.58950
12	1.24648	0.84174	0.04057	0.26522	12	0.45528	1.30551	0.10661	9.57287
13	1.24369	0.86200	0.04142	0.26026	13	0.40197	1.30662	0.10786	9.55630
14	1.24076	0.88124	0.04227	0.25513	14	0.34101	1.30760	0.10911	9.53995
15	+1.23767	+0.89955	+0.04313	-0.24983	15	+0.26992	+1.30844	+0.11036	-9.52375
16	1.23442	0.91701	0.04399	0.24430	16	0.18468	1.30914	0.11160	9.50776
17	1.23101	0.93367	0.04487	0.23862	17	0.07832	1.30970	0.11284	9.49248
18	1.22745	0.94959	0.04575	0.23274	18	9.93695	1.31013	0.11408	9.47741
19	1.22372	0.96485	0.04663	0.22668	19	9.72576	1.31042	0.11532	9.46270
20	+1.21982	+0.97946	+0.04753	-0.22041	20	+9.29778	+1.31057	+0.11656	-9.44855
21	1.21576	0.99347	0.04844	0.21394	21	-9.14728	1.31058	0.11780	9.43505
22	1.21152	1.00693	0.04934	0.20726	22	9.67560	1.31045	0.11903	9.42226
23	1.20710	1.01987	0.05026	0.20040	23	9.90696	1.31019	0.12026	9.41027
24	1.20250	1.03231	0.05120	0.19336	24	0.05494	1.30979	0.12147	9.39915
25	+1.19772	+1.04428	+0.05214	-0.18614	25	-0.16664	+1.30926	+0.12269	-9.38917
26	1.19275	1.05581	0.05308	0.17870	26	0.25531	1.30858	0.12390	9.38021
27	1.18759	1.06632	0.05404	0.17102	27	0.32878	1.30777	0.12511	9.37236
28	1.18222	1.07763	0.05500	0.16314	28	0.39151	1.30681	0.12631	9.36568
29	1.17665	1.08796	0.05597	0.15506	29	0.44619	1.30572	0.12750	9.36003
30	+1.17086	+1.09793	+0.05696	-0.14676	30	-0.49462	+1.30448	+0.12869	-9.35545
31	+1.16486	+1.10755	+0.05796	-0.13824	31	-0.53807	+1.30311	+0.12987	-9.35238

FOR WASHINGTON MEAN MIDNIGHT.

CONSTANTS FOR FACILITATING THE REDUCTION OF THE FIXED STARS.

1861.	<i>f.</i>	Log. <i>g.</i>	<i>g.</i>	Log. <i>h.</i>	<i>h.</i>	Log. <i>i.</i>	<i>r.</i>
Jan. 1	+14.88	0.8591	333 40 ^o	1.3091	349 5 ^j	-0.2239	0.000
6	15.75	0.8789	334 51	1.3077	344 22	0.3757	0.014
11	16.59	0.8979	335 49	1.3057	339 36	0.4854	0.027
16	17.39	0.9160	336 35	1.3033	334 48	0.5700	0.041
21	18.16	0.9331	337 12	1.3006	329 57	0.6378	0.055
26	+18.90	0.9490	337 41	1.2976	325 2	-0.6934	0.068
31	19.60	0.9637	338 5	1.2943	320 3	0.7395	0.082
Feb. 5	20.26	0.9772	338 25	1.2910	315 0	0.7780	0.096
10	20.89	0.9896	338 42	1.2877	309 53	0.8103	0.110
15	21.49	1.0011	338 58	1.2845	304 42	0.8370	0.123
20	+22.06	1.0116	339 13	1.2815	299 27	-0.8590	0.137
25	22.60	1.0212	339 29	1.2789	294 9	0.8767	0.151
Mar. 2	23.11	1.0300	339 47	1.2767	288 48	0.8904	0.164
7	23.60	1.0381	340 7	1.2750	283 25	0.9005	0.178
12	24.07	1.0457	340 30	1.2738	278 1	0.9070	0.192
17	+24.52	1.0528	340 57	1.2732	273 36	-0.9103	0.205
22	24.97	1.0595	341 28	1.2732	267 11	0.9102	0.219
27	25.43	1.0659	342 2	1.2738	261 48	0.9069	0.233
April 1	25.90	1.0723	342 40	1.2750	256 28	0.9003	0.246
6	26.38	1.0787	343 22	1.2767	251 10	0.8903	0.260
11	+26.88	1.0852	344 6	1.2789	245 56	-0.8769	0.274
16	27.40	1.0919	344 53	1.2815	240 46	0.8598	0.287
21	27.95	1.0988	345 42	1.2843	235 41	0.8388	0.301
26	28.53	1.1061	346 32	1.2873	230 42	0.8135	0.315
May 1	29.14	1.1139	347 22	1.2905	225 47	0.7833	0.329
6	+29.79	1.1221	348 11	1.2937	220 57	-0.7477	0.342
11	30.46	1.1306	348 59	1.2968	216 12	0.7055	0.356
16	31.16	1.1394	349 45	1.2997	211 31	0.6554	0.370
21	31.89	1.1485	350 29	1.3024	206 54	0.5955	0.383
26	32.65	1.1579	351 9	1.3048	202 21	0.5225	0.397
31	+33.44	1.1675	351 45	1.3068	197 52	-0.4311	0.411
June 5	34.25	1.1772	352 17	1.3084	193 25	0.3114	0.424
10	35.07	1.1870	352 45	1.3096	189 0	0.1414	0.438
15	35.89	1.1967	353 9	1.3103	184 36	9.8526	0.452
20	36.72	1.2064	353 29	1.3105	180 14	-8.5500	0.465
25	+37.55	1.2159	353 45	1.3103	175 51	+9.8069	0.479
30	38.37	1.2252	353 57	1.3097	171 28	0.1183	0.493
July 5	39.18	1.2342	354 5	1.3086	167 4	0.2958	0.507
10	39.98	1.2429	354 10	1.3070	162 38	0.4193	0.520
15	40.77	1.2513	354 13	1.3050	158 10	0.5129	0.534
20	+41.54	1.2593	354 14	1.3027	153 39	+0.5873	0.548
25	42.28	1.2669	354 13	1.3001	149 5	0.6483	0.561
30	42.98	1.2741	354 10	1.2972	144 27	0.6991	0.575
Aug. 4	43.65	1.2809	354 7	1.2941	139 45	0.7490	0.589
9	44.28	1.2872	354 3	1.2910	134 58	0.7783	0.602
14	+44.87	1.2931	353 59	1.2879	130 6	+0.8090	0.616
19	45.43	1.2987	353 56	1.2849	125 10	0.8348	0.630
24	45.97	1.3039	353 54	1.2820	120 10	0.8563	0.643
29	46.49	1.3088	353 53	1.2794	115 5	0.8739	0.657
Sept. 3	46.99	1.3134	353 53	1.2772	109 55	0.8879	0.671
8	+47.47	1.3177	353 56	1.2754	104 41	+0.8984	0.684
13	47.94	1.3218	354 1	1.2741	99 25	0.9057	0.698
18	48.40	1.3258	354 8	1.2733	94 7	0.9097	0.712
23	48.85	1.3297	354 17	1.2731	88 47	0.9105	0.726
28	49.29	1.3335	354 28	1.2736	83 26	0.9062	0.739
Oct. 3	+49.73	1.3373	354 42	1.2746	78 5	+0.9026	0.753
8	50.19	1.3411	354 59	1.2762	72 45	0.8937	0.767
13	+50.68	1.3451	355 17	1.2783	67 27	+0.8812	0.780

FOR WASHINGTON MEAN MIDNIGHT.

CONSTANTS FOR FACILITATING THE REDUCTION OF THE FIXED STARS.

1861.	<i>f</i> .	Log. <i>g</i> .	<i>g</i> .	Log. <i>h</i> .	<i>H</i> .	Log. <i>i</i> .	<i>τ</i> .
Oct. 18	+51.19	1.3493	355 37	1.2808	62 12	+0.8650	0.794
23	51.73	1.3536	355 58	1.2836	56 59	0.8446	0.808
28	52.30	1.3581	356 20	1.2867	51 50	0.8197	0.821
Nov. 7	52.91	1.3629	356 43	1.2899	46 45	0.8897	0.835
2	53.55	1.3679	357 6	1.2932	41 43	0.7538	0.849
12	+54.22	1.3732	357 28	1.2964	36 45	+0.7108	0.862
17	54.92	1.3787	357 50	1.2995	31 51	0.6593	0.876
22	55.66	1.3844	358 10	1.3023	27 0	0.5969	0.890
27	56.43	1.3904	358 28	1.3048	22 12	0.5197	0.903
Dec. 2	57.22	1.3965	358 44	1.3069	17 27	0.4214	0.917
7	+58.04	1.4026	358 58	1.3086	12 44	+0.2892	0.931
12	58.88	1.4088	359 10	1.3098	8 2	0.0928	0.945
17	59.74	1.4150	359 19	1.3105	3 21	+9.7158	0.958
22	60.60	1.4212	359 26	1.3106	358 40	-9.3131	0.972
27	61.46	1.4273	359 30	1.3102	354 0	9.9663	0.986
32	+62.32	1.4333	359 31	1.3093	349 20	-0.2150	0.999

BESSEL'S FORMULÆ OF REDUCTION FOR THE FIXED STARS,

WITH DR. PETERS'S COEFFICIENTS, AND THE NOTATION OF THE CATALOGUE OF STARS OF THE BRITISH ASSOCIATION.

$$A = -20''.4451 \cos \omega \cos \odot.$$

$$B = -20''.4451 \sin \odot.$$

$$C = \tau - 0.34238 \sin \Omega + 0.00410 \sin 2 \Omega - 0.02519 \sin 2 \odot + 0.00294 \sin (\odot + 82^\circ 34') - 0.00405 \sin 2 \llcorner + 0.00135 \sin (\llcorner - I').$$

$$D = -9''.2226 \cos \Omega + 0''.0896 \cos 2 \Omega - 0''.5507 \cos 2 \odot - 0''.0092 \cos (\odot + 280^\circ 22') - 0''.0885 \cos 2 \llcorner.$$

$$E = -0''.0481 \sin \Omega + 0''.0014 \sin 2 \Omega - 0''.0034 \sin 2 \odot.$$

$$a = \cos \alpha \sec \delta.$$

$$b = \sin \alpha \sec \delta.$$

$$c = 46''.0780 + 20''.0560 \sin \alpha \tan \delta.$$

$$d = \cos \alpha \tan \delta.$$

$$a' = \tan \omega \cos \delta - \sin \alpha \sin \delta.$$

$$b' = \cos \alpha \sin \delta.$$

$$c' = 20''.0560 \cos \alpha.$$

$$d' = -\sin \alpha.$$

μ = the annual proper motion in right ascension.

μ' = the annual proper motion in declination.

τ = the time from the beginning of the year in fractional parts of the year.

\odot = the sun's longitude.

\llcorner = the moon's longitude.

Ω = the longitude of the moon's ascending node.

ω = the obliquity of the ecliptic.

α = the star's mean right ascension for the beginning of the year.

δ = the star's mean declination for the beginning of the year.

a' = the star's apparent right ascension at the time τ .

δ' = the star's apparent declination at the time τ .

$$a' - \alpha = A a + B b + C c + D d + E + \tau \mu.$$

$$\delta' - \delta = A a' + B b' + C c' + D d' + \tau \mu'.$$

The following formulæ may also be used by putting

$$f = 46''.0780 C.$$

$$g \cos G = 20''.0560 C.$$

$$g \sin G = D.$$

$$i = A \tan \alpha.$$

$$h \cos H = B.$$

$$h \sin H = A.$$

$$a' - \alpha = f + \tau \mu + g \sin (G + \alpha) \tan \delta + h \sin (H + \alpha) \sec \delta.$$

$$\delta' - \delta = i \cos \delta + \tau \mu' + g \cos (G + \alpha) + h \cos (H + \alpha) \sin \delta.$$

MEAN PLACES OF 100 PRINCIPAL FIXED STARS, FOR
JANUARY 1, 1861.

Star's Name.	Magnitude.	Right Ascension.	An. Variation.	Declination.	An. Variation.
α ANDROMEDÆ	2	h m s 0 1 12.50	+ 3.085	+28° 19' 22.7	+19.91
γ PEGASI (<i>Algenib</i>)	3.2	0 6 4.85	3.081	+14 24 37.9	20.03
β Hydri	3	0 18 23.35	3.286	-78 2 16.6	20.24
α CASSIOPEÆ	var.	0 32 38.44	3.360	+55 46 28.2	19.83
β Ceti	2	0 36 36.57	3.016	-18 45 1.2	19.62
α URS. MIN. (<i>Polaris</i>)	2	1 8 21.30	+18.935	+88 34 6.5	+19.18
β Ceti	3	1 17 4.60	3.000	- 8 54 6.3	18.75
α Eridani (<i>Achernar</i>)	1	1 32 31.92	2.238	-57 56 37.3	18.45
α ARIETIS	2	1 59 20.65	3.366	+22 48 11.9	17.24
γ Ceti	3.4	2 36 6.03	3.102	+ 2 38 52.1	15.89
α CETI	2.3	2 55 0.98	+ 3.127	+ 3 32 30.3	+14.36
α PERSEI	2	3 14 24.97	4.244	+49 21 46.4	13.23
η Tauri	3	3 39 13.61	3.553	+23 40 20.3	11.53
γ Eridani	3	3 51 32.67	2.796	-13 54 23.8	10.57
α TAURI (<i>Aldebaran</i>)	1	4 27 56.89	3.435	+16 13 35.6	7.65
α AURIGÆ (<i>Capella</i>)	1	5 6 25.60	+ 4.423	+45 51 7.5	+ 4.20
β ORIONIS (<i>Rigel</i>)	1	5 7 51.51	2.880	- 8 21 55.8	4.48
β TAURI	2	5 17 30.42	3.788	+28 29 8.9	3.48
δ ORIONIS	2	5 24 54.42	3.066	- 0 24 19.4	3.04
α Leporis	3	5 26 36.07	2.648	-17 55 28.4	2.93
ϵ ORIONIS	2	5 29 9.67	+ 3.044	- 1 17 38.1	+ 2.70
α Columbæ	2	5 34 37.10	2.177	-34 9 0.1	2.22
α ORIONIS	var.	5 47 38.81	3.246	+ 7 22 39.1	+ 1.06
μ Geminorum	3	6 14 33.09	3.636	+22 34 51.6	- 1.40
α Argus (<i>Canopus</i>)	1	6 20 52.11	1.330	-52 37 15.5	1.81
51 (Hev.) Cephei	5	6 34 8.99	+30.454	+87 14 50.6	- 2.97
α CANIS MAJ. (<i>Sirius</i>)	1	6 39 1.51	2.647	-16 31 40.5	4.62
ϵ Canis Majoris	2.1	6 53 9.82	2.360	-28 47 8.3	4.61
δ Geminorum	3.4	7 11 49.20	3.597	+22 14 4.8	6.18
α^2 GEMINOR. (<i>Castor</i>)	2.1	7 25 43.29	3.840	+32 11 20.9	7.44
α CAN. MIN. (<i>Procyon</i>)	1	7 32 1.42	+ 3.146	+ 5 34 42.7	- 8.90
β GEMINOR. (<i>Pollux</i>)	1.2	7 36 48.33	3.682	+28 21 30.0	8.31
15 Argus	3	8 1 37.50	2.558	-23 54 21.0	10.07
ϵ Hydræ	3.4	8 39 24.82	3.189	+ 6 55 35.2	12.67
ι Ursæ Majoris	3	8 49 40.34	4.142	+48 35 4.0	13.79
ι Argus	2	9 13 22.11	+ 1.602	-58 41 32.7	-14.89
α HYDRÆ	2	9 20 45.35	2.948	- 8 3 29.5	15.38
θ URSÆ Majoris	3	9 23 32.30	4.058	+52 18 29.6	16.12
ϵ Leonis	3	9 37 57.35	3.424	+24 24 44.7	16.35
α LEONIS (<i>Regulus</i>)	1.2	10 0 57.94	3.202	+12 38 41.9	17.42
η Argus	2	10 39 40.58	+ 2.305	-58 57 14.0	-18.73
α URSÆ MAJORIS	2	10 55 7.22	3.775	+62 30 1.4	19.34
δ LEONIS	2.3	11 6 42.72	3.208	+21 17 4.9	19.65
δ Hydræ et Crateris	3.4	11 12 23.57	+ 2.997	-14 1 36.9	-19.45

MEAN PLACES OF 100 PRINCIPAL FIXED STARS, FOR
JANUARY 1, 1861.

Star's Name.	Magnitude.	Right Ascension.	An. Variation.	Declination.	An. Variation.
β LEONIS	2	^h 11 ^m 41 ^s 58.01	+ 3.065	+15° 20' 56.2"	-20.10
γ URSE MAJORIS	2.3	11 46 30.17	3.194	+54 28 2.9	20.04
β CHAMÆLEONTIS	5	12 10 15.96	3.323	-78 32 25.6	20.05
α^1 CRUCIS	1	12 18 53.35	3.259	-62 19 39.8	19.94
β CORVI	2.3	12 27 5.35	3.132	-22 37 39.5	19.99
δ CANUM VENATICORUM	3	12 49 31.16	+ 2.822	+39 4 11.2	-19.56
α VIRGINIS (<i>Spica</i>)	1	13 17 52.41	3.150	-10 26 5.8	18.95
η URSE MAJORIS	2	13 42 3.55	2.371	+50 0 29.1	18.14
η BOOTIS	3	13 48 3.99	2.862	+19 5 45.5	18.23
β CENTAURI	1	13 54 2.84	4.154	-59 42 0.6	17.72
α BOOTIS (<i>Arcturus</i>)	1	14 9 19.30	+ 2.732	+19 54 27.7	-18.91
α^2 CENTAURI	1	14 30 12.01	4.028	-60 15 23.9	15.06
ϵ BOOTIS	2.3	14 38 54.95	2.622	+27 39 43.1	15.44
α^2 LIBRÆ	3	14 43 11.62	+ 3.305	-15 27 42.8	15.23
β URSE MINORIS	2	14 51 8.93	- 0.259	+74 43 23.9	14.78
β LIBRÆ	2	15 9 31.83	+ 3.220	- 8 52 2.7	-13.59
α CORONÆ BOREALIS	2	15 28 48.19	2.538	+27 11 4.8	12.35
α SERPENTIS	2.3	15 37 25.35	+ 2.949	+ 6 51 55.0	11.63
ζ URSE MINORIS	4.5	15 49 6.11	- 2.307	+78 13 13.0	10.84
β^1 SCORPII	2	15 57 21.54	+ 3.479	-19 25 18.4	10.27
δ OPHIUCHI	3	16 7 3.79	+ 3.138	- 3 20 0.3	- 9.62
α SCORPII (<i>Antares</i>)	1.2	16 20 53.36	3.666	-26 7 12.8	8.42
η DRACONIS	3.2	16 22 7.37	0.821	+61 49 46.9	8.23
α TRIANGULI AUSTRALIS	2	16 33 59.06	+ 6.273	-68 45 57.6	7.45
ϵ URSE MINORIS	4.5	17 0 20.61	- 6.423	+82 15 35.9	5.15
α HERCULIS	var.	17 8 18.60	+ 2.732	+14 33 5.2	- 4.43
β DRACONIS	3.2	17 27 17.59	1.353	+52 24 20.4	2.85
α OPHIUCHI	2	17 28 28.97	2.781	+12 39 50.9	2.94
σ OCTANTIS	6	17 49 57.56	109.765	-89 16 41.3	- 0.79
γ DRACONIS	2.3	17 53 22.76	1.394	+51 30 23.5	- 0.61
μ^1 SAGITTARII	4	18 5 26.94	+ 3.587	-21 5 29.3	+ 0.48
δ URSE MINORIS	4.5	18 17 11.07	-19.355	+86 36 8.4	1.52
α LYRÆ (<i>Vega</i>)	1	18 32 13.94	+ 2.031	+38 39 22.3	3.10
β LYRÆ	var.	18 44 56.83	2.215	+33 12 12.2	3.88
ζ AQUILÆ	3	18 59 1.17	2.755	+13 39 35.3	5.04
δ AQUILÆ	3.4	19 18 29.32	+ 3.027	+ 2 50 26.4	+ 6.83
γ AQUILÆ	3	19 39 39.03	2.852	+10 16 37.6	8.46
α AQUILÆ (<i>Altair</i>)	1.2	19 44 0.04	2.928	+ 8 30 13.7	9.18
β AQUILÆ	4	19 48 29.06	+ 2.946	+ 6 3 43.2	8.68
λ URSE MINORIS	5	20 2 57.51	-56.594	+88 53 34.8	10.23
α^2 CAPRICORNI	3.4	20 10 20.34	+ 3.333	-12 58 23.5	+10.81
α PAVONIS	2	20 14 38.00	4.801	-57 10 33.6	11.07
α CYGNI	2.1	20 36 41.62	2.043	+44 47 6.3	12.68
δ^1 CYGNI	5.6	21 0 39.90	+ 2.676	+38 4 4.2	+17.46

MEAN PLACES OF 100 PRINCIPAL FIXED STARS, FOR
JANUARY 1, 1861.

Star's Name.	Magnitude.	Right Ascension.	An. Variation.	Declination.	An. Variation.
ζ Cygni	3	^h 21 ^m 7 ^s 1.23	+ 2.550	+29° 39' 30.7"	+14.54
α CEPHEI	3.2	21 15 15.52	1.439	+61 59 50.5	15.10
β AQUARI	3	21 24 14.27	3.163	— 6 10 50.1	15.62
β CEPHEI	3	21 26 51.18	0.803	+69 57 2.9	15.69
ε Pegasi	2.3	21 37 21.53	2.951	+ 9 14 22.0	16.31
α AQUARI	3	21 56 38.57	+ 3.083	— 0 59 37.9	+17.31
α Gruis	2	21 59 27.32	3.820	—47 37 54.6	17.15
ζ Pegasi	3.4	22 34 31.65	2.990	+10 6 25.0	18.69
α PIS.AUS. (<i>Fomalhaut</i>)	1.2	22 49 57.71	3.330	—30 21 31.5	18.94
α PEGASI (<i>Markab</i>) .	2	22 57 50.33	2.983	+14 27 29.6	19.31
ι Piscium	4.5	23 32 48.12	+ 3.064	+ 4 52 23.8	+19.47
γ Cephei	3.4	23 33 40.30	+ 2.396	+76 51 24.2	+20.07

APPARENT PLACES OF α URSÆ MINORIS, (*Polaris*), FOR THE
UPPER TRANSIT AT WASHINGTON.

Sidereal Day of the Month.	JANUARY.		FEBRUARY.		MARCH.		APRIL.		Sidereal Day of the Month.
	R.A.	Dec. North.	R.A.	Dec. North.	R.A.	Dec. North.	R.A.	Dec. North.	
	^h 1 ^m 7	88° 34'	^h 1 ^m 7	88° 34'	^h 1 ^m 7	88° 34'	^h 1 ^m 7	88° 34'	
1	85.06	33.90	59.47	33.57	41.05	28.40	32.93	19.48	1
2	84.19	33.95	58.79	33.45	40.66	28.15	32.90	19.20	2
3	83.36	34.01	58.12	33.34	40.28	27.92	32.84	18.91	3
4	82.58	34.06	57.43	33.24	39.87	27.69	32.76	18.61	4
5	81.84	34.10	56.71	33.14	39.43	27.47	32.68	18.31	5
6	81.13	34.17	55.96	33.04	38.93	27.23	32.64	17.97	6
7	80.40	34.25	55.17	32.92	38.41	26.98	32.66	17.63	7
8	79.64	34.33	54.35	32.81	37.91	26.71	32.73	17.28	8
9	78.83	34.41	53.52	32.67	37.42	26.42	32.85	16.95	9
10	77.96	34.47	52.70	32.49	36.95	26.12	33.02	16.62	10
11	77.05	34.53	51.91	32.29	36.54	25.81	33.23	16.30	11
12	76.12	34.59	51.16	32.10	36.18	25.50	33.48	15.97	12
13	75.17	34.60	50.46	31.90	35.86	25.19	33.75	15.69	13
14	74.24	34.58	49.81	31.70	35.59	24.89	34.01	15.41	14
15	73.34	34.55	49.20	31.49	35.37	24.59	34.24	15.14	15
16	72.47	34.52	48.63	31.27	35.18	24.29	34.46	14.86	16
17	71.65	34.50	48.08	31.09	34.99	24.00	34.65	14.59	17
18	70.86	34.46	47.53	30.92	34.79	23.73	34.82	14.31	18
19	70.09	34.42	46.96	30.74	34.59	23.46	34.98	14.03	19
20	69.34	34.38	46.36	30.56	34.36	23.19	35.16	13.73	20
21	68.61	34.35	45.72	30.38	34.10	22.92	35.37	13.40	21
22	67.86	34.34	45.05	30.20	33.82	22.64	35.65	13.07	22
23	67.07	34.32	44.36	29.99	33.53	22.33	35.99	12.76	23
24	66.24	34.31	43.69	29.75	33.26	22.01	36.40	12.45	24
25	65.37	34.29	43.04	29.48	33.05	21.67	36.86	12.15	25
26	64.46	34.22	42.43	29.20	32.91	21.32	37.36	11.87	26
27	63.55	34.16	41.89	28.92	32.85	20.97	37.83	11.61	27
28	62.64	34.05	41.44	28.66	32.85	20.64	38.26	11.37	28
29	61.76	33.95	41.05	28.40	32.88	20.32	38.65	11.13	29
30	60.94	33.82	40.66	28.15	32.92	20.03	39.02	10.88	30
31	60.18	33.69	40.28	27.92	32.93	19.75	39.37	10.66	31
32	59.47	33.57	39.87	27.69	32.93	19.48	39.74	10.41	32

APPARENT PLACES OF α URSÆ MINORIS, (*Polaris*), FOR THE
UPPER TRANSIT AT WASHINGTON.

Sidereal Day of the Month.	MAY.		JUNE.		JULY.		AUGUST.		Sidereal Day of the Month.
	R.A.	Dec. North.	R.A.	Dec. North.	R.A.	Dec. North.	R.A.	Dec. North.	
	^h 1 ^m 7	88° 34'	^h 1 ^m 7	88° 34'	^h 1 ^m 8	88° 34'	^h 1 ^m 8	88° 34'	
1	39.37	10.66	58.63	4.38	24.46	2.85	51.98	6.46	1
2	39.74	10.41	59.41	4.22	25.45	2.87	52.85	6.69	2
3	40.11	10.15	60.23	4.07	26.46	2.91	53.68	6.93	3
4	40.52	9.87	61.09	3.93	27.45	2.96	54.44	7.16	4
5	40.97	9.59	61.99	3.79	28.41	3.03	55.14	7.39	5
6	41.48	9.30	62.88	3.69	29.35	3.12	55.83	7.63	6
7	42.04	9.01	63.82	3.60	30.25	3.20	56.51	7.86	7
8	42.67	8.75	64.71	3.53	31.12	3.30	57.22	8.06	8
9	43.32	8.51	65.56	3.46	31.94	3.41	57.97	8.25	9
10	43.98	8.29	66.38	3.42	32.73	3.51	58.75	8.46	10
11	44.62	8.08	67.15	3.35	33.51	3.59	59.58	8.67	11
12	45.24	7.88	67.92	3.30	34.32	3.65	60.44	8.88	12
13	45.84	7.68	68.66	3.23	35.18	3.69	61.30	9.12	13
14	46.41	7.51	69.41	3.17	36.10	3.75	62.12	9.38	14
15	46.95	7.32	70.20	3.09	37.07	3.84	62.90	9.68	15
16	47.47	7.12	71.05	3.01	38.08	3.95	63.63	9.97	16
17	48.01	6.91	71.97	2.92	39.07	4.08	64.31	10.27	17
18	48.56	6.69	72.94	2.84	40.05	4.21	64.93	10.55	18
19	49.16	6.47	73.94	2.79	40.99	4.37	65.53	10.83	19
20	49.84	6.24	74.94	2.76	41.85	4.54	66.12	11.11	20
21	50.60	6.01	75.90	2.75	42.65	4.73	66.72	11.35	21
22	51.41	5.81	76.81	2.75	43.42	4.89	67.35	11.59	22
23	52.25	5.64	77.67	2.79	44.18	5.04	68.00	11.84	23
24	53.06	5.49	78.47	2.82	44.94	5.18	68.68	12.12	24
25	53.81	5.36	79.24	2.85	45.73	5.32	69.39	12.41	25
26	54.51	5.24	80.03	2.86	46.57	5.45	70.13	12.69	26
27	55.20	5.11	80.85	2.87	47.43	5.60	70.87	12.99	27
28	55.88	4.97	81.69	2.85	48.32	5.75	71.59	13.31	28
29	56.54	4.83	82.57	2.83	49.24	5.90	72.26	13.65	29
30	57.20	4.69	83.49	2.83	50.16	6.08	72.89	13.99	30
31	57.89	4.54	84.46	2.85	51.08	6.26	73.46	14.33	31
32	58.63	4.38	85.45	2.87	51.98	6.46	73.96	14.67	32

APPARENT PLACES OF α URSÆ MINORIS, (*Polaris*), FOR THE
UPPER TRANSIT AT WASHINGTON.

Sidereal Day of the Month.	SEPTEMBER.		OCTOBER.		NOVEMBER.		DECEMBER.		Sidereal Day of the Month.
	R.A.	Dec. North.	R.A.	Dec. North.	R.A.	Dec. North.	R.A.	Dec. North.	
	^h 1 ^m 9	88° 34'	^h 1 ^m 9	88° 34'	^h 1 ^m 9	88° 34'	^h 1 ^m 8	88° 34'	
1	13.96	14.67	26.03	25.24	26.81	36.86	75.68	46.64	1
2	14.43	14.99	26.17	25.59	26.72	37.21	75.20	46.92	2
3	14.88	15.31	26.34	25.94	26.64	37.57	74.65	47.22	3
4	15.33	15.63	26.57	26.29	26.54	37.95	74.02	47.52	4
5	15.80	15.92	26.86	26.63	26.37	38.35	73.32	47.81	5
6	16.33	16.22	27.16	27.00	26.12	38.74	72.58	48.07	6
7	16.91	16.50	27.43	27.39	25.79	39.13	71.86	48.30	7
8	17.51	16.81	27.67	27.80	25.42	39.50	71.15	48.53	8
9	18.11	17.14	27.83	28.22	25.03	39.86	70.45	48.75	9
10	18.69	17.50	27.93	28.64	24.64	40.20	69.78	48.94	10
11	19.24	17.89	27.99	29.05	24.27	40.53	69.15	49.13	11
12	19.74	18.27	27.99	29.44	23.92	40.85	68.57	49.34	12
13	20.17	18.65	27.96	29.83	23.59	41.15	67.96	49.55	13
14	20.53	19.02	27.94	30.20	23.28	41.45	67.36	49.76	14
15	20.85	19.38	27.94	30.55	22.98	41.76	66.74	49.98	15
16	21.18	19.73	27.96	30.91	22.69	42.09	66.09	50.20	16
17	21.52	20.07	27.99	31.27	22.40	42.41	65.40	50.42	17
18	21.87	20.41	28.04	31.62	22.08	42.75	64.67	50.63	18
19	22.23	20.75	28.10	31.98	21.72	43.10	63.88	50.85	19
20	22.63	21.07	28.19	32.34	21.29	43.46	63.05	51.05	20
21	23.07	21.40	28.26	32.72	20.82	43.81	62.19	51.21	21
22	23.52	21.75	28.29	33.11	20.30	44.14	61.35	51.36	22
23	23.95	22.10	28.28	33.52	19.74	44.46	60.51	51.50	23
24	24.36	22.47	28.24	33.94	19.16	44.77	59.71	51.63	24
25	24.73	22.88	28.14	34.36	18.58	45.05	58.96	51.74	25
26	25.06	23.29	27.97	34.75	18.02	45.30	58.25	51.85	26
27	25.35	23.70	27.75	35.14	17.50	45.56	57.57	51.97	27
28	25.59	24.11	27.51	35.50	17.01	45.82	56.88	52.11	28
29	25.77	24.51	27.29	35.85	16.55	46.09	56.17	52.25	29
30	25.91	24.88	27.11	36.20	16.13	46.37	55.42	52.39	30
31	26.03	25.24	26.95	36.54	15.68	46.64	54.61	52.51	31
32	26.17	25.59	26.81	36.86	15.20	46.92	53.77	52.62	32

APPARENT PLACES OF δ URSÆ MINORIS, FOR THE
UPPER TRANSIT AT WASHINGTON.

Sidereal Day of the Month.	JANUARY.		FEBRUARY.		MARCH.		APRIL.		Sidereal Day of the Month.
	R.A.	Dec. North.	R.A.	Dec. North.	R.A.	Dec. North.	R.A.	Dec. North.	
	^h 18 ^m 16	^o 86 ['] 35	^h 18 ^m 16	^o 86 ['] 35	^h 18 ^m 16	^o 86 ['] 35	^h 18 ^m 17	^o 86 ['] 35	
1	41.74	63.05	44.88	53.47	52.53	47.78	3.35	46.84	1
2	41.77	62.69	45.10	53.24	52.85	47.69	3.66	46.91	2
3	41.79	62.36	45.29	53.01	53.18	47.60	3.99	46.95	3
4	41.82	62.06	45.49	52.78	53.48	47.50	4.33	46.98	4
5	41.85	61.76	45.68	52.53	53.78	47.37	4.69	47.02	5
6	41.87	61.47	45.87	52.27	54.10	47.23	5.05	47.10	6
7	41.89	61.18	46.07	51.99	54.42	47.12	5.42	47.19	7
8	41.90	60.87	46.28	51.71	54.75	47.00	5.79	47.30	8
9	41.90	60.55	46.54	51.42	55.11	46.88	6.16	47.42	9
10	41.91	60.20	46.80	51.16	55.49	46.78	6.52	47.57	10
11	41.95	59.85	47.07	50.91	55.87	46.71	6.86	47.72	11
12	42.00	59.50	47.36	50.67	56.25	46.64	7.18	47.88	12
13	42.09	59.19	47.67	50.46	56.64	46.59	7.49	48.03	13
14	42.18	58.91	47.96	50.25	57.01	46.56	7.79	48.18	14
15	42.28	58.61	48.25	50.06	57.38	46.54	8.08	48.34	15
16	42.40	58.30	48.54	49.90	57.73	46.53	8.36	48.48	16
17	42.55	57.97	48.83	49.74	58.08	46.53	8.66	48.63	17
18	42.68	57.63	49.09	49.57	58.41	46.53	8.95	48.77	18
19	42.81	57.29	49.36	49.41	58.74	46.52	9.26	48.90	19
20	42.93	56.99	49.62	49.22	59.06	46.50	9.57	49.03	20
21	43.04	56.71	49.88	49.03	59.40	46.46	9.90	49.17	21
22	43.15	56.43	50.17	48.83	59.74	46.43	10.23	49.35	22
23	43.26	56.15	50.47	48.64	60.11	46.39	10.56	49.54	23
24	43.37	55.84	50.79	48.44	60.49	46.37	10.87	49.77	24
25	43.49	55.52	51.13	48.26	60.88	46.37	11.15	50.02	25
26	43.63	55.18	51.49	48.10	61.27	46.40	11.42	50.27	26
27	43.80	54.87	51.85	47.97	61.66	46.45	11.67	50.51	27
28	43.99	54.54	52.20	47.86	62.03	46.53	11.91	50.72	28
29	44.21	54.26	52.53	47.78	62.38	46.60	12.14	50.92	29
30	44.44	53.97	52.85	47.69	62.72	46.70	12.39	51.10	30
31	44.66	53.71	53.16	47.60	63.04	46.79	12.63	51.30	31
32	44.88	53.47	53.48	47.50	63.35	46.84	12.89	51.49	32

APPARENT PLACES OF δ URSÆ MINORIS, FOR THE
UPPER TRANSIT AT WASHINGTON.

Sidereal Day of the Month.	MAY.		JUNE.		JULY.		AUGUST.		Sidereal Day of the Month.
	R.A.	Dec. North.	R.A.	Dec. North.	R.A.	Dec. North.	R.A.	Dec. North.	
	18 ^h 17 ^m	86° 35'	18 ^h 17 ^m	86° 35'	18 ^h 17 ^m	86° 36'	18 ^h 17 ^m	86° 36'	
1	12.63	51.30	18.03	59.88	17.61	9.79	11.41	19.09	1
2	12.89	51.49	18.13	60.21	17.51	10.14	11.09	19.36	2
3	13.15	51.69	18.22	60.54	17.40	10.49	10.76	19.60	3
4	13.42	51.91	18.31	60.90	17.27	10.85	10.44	19.83	4
5	13.69	52.14	18.39	61.27	17.11	11.19	10.12	20.04	5
6	13.96	52.40	18.43	61.63	16.95	11.52	9.83	20.24	6
7	14.22	52.67	18.45	61.98	16.77	11.83	9.53	20.44	7
8	14.46	52.95	18.45	62.34	16.58	12.12	9.25	20.64	8
9	14.68	53.25	18.45	62.66	16.40	12.40	8.96	20.86	9
10	14.89	53.55	18.45	62.97	16.25	12.67	8.68	21.10	10
11	15.07	53.83	18.45	63.27	16.09	12.94	8.38	21.37	11
12	15.24	54.12	18.45	63.57	15.94	13.23	8.09	21.63	12
13	15.39	54.38	18.46	63.86	15.80	13.54	7.75	21.89	13
14	15.55	54.65	18.48	64.15	15.65	13.86	7.39	22.13	14
15	15.72	54.90	18.51	64.45	15.50	14.20	7.02	22.37	15
16	15.90	55.15	18.54	64.80	15.32	14.54	6.63	22.56	16
17	16.09	55.40	18.56	65.16	15.09	14.87	6.25	22.74	17
18	16.27	55.66	18.55	65.52	14.85	15.21	5.87	22.91	18
19	16.47	55.93	18.52	65.89	14.60	15.52	5.52	23.07	19
20	16.67	56.23	18.47	66.26	14.34	15.80	5.17	23.22	20
21	16.85	56.55	18.39	66.61	14.08	16.06	4.83	23.38	21
22	17.01	56.88	18.30	66.94	13.84	16.32	4.50	23.54	22
23	17.13	57.21	18.20	67.26	13.63	16.56	4.16	23.73	23
24	17.23	57.55	18.12	67.56	13.40	16.80	3.82	23.92	24
25	17.33	57.87	18.05	67.85	13.19	17.06	3.47	24.12	25
26	17.42	58.17	17.96	68.14	12.97	17.33	3.10	24.32	26
27	17.51	58.46	17.89	68.44	12.75	17.61	2.70	24.51	27
28	17.59	58.74	17.83	68.75	12.51	17.90	2.30	24.69	28
29	17.70	59.01	17.77	69.09	12.27	18.20	1.89	24.86	29
30	17.81	59.28	17.69	69.43	11.99	18.51	1.47	25.01	30
31	17.92	59.58	17.61	69.79	11.71	18.81	1.05	25.14	31
32	18.03	59.88	17.51	70.14	11.41	19.09	0.64	25.24	32

APPARENT PLACES OF δ URSÆ MINORIS, FOR THE
UPPER TRANSIT AT WASHINGTON.

Sidereal Day of the Month.	SEPTEMBER.		OCTOBER.		NOVEMBER.		DECEMBER.		Sidereal Day of the Month.
	R.A.	Dec. North.	R.A.	Dec. North.	R.A.	Dec. North.	R.A.	Dec. North.	
	^h 18 ^m 16	^o 86 ['] 36	^h 18 ^m 16	^o 18 ['] 36	^h 18 ^m 16	^o 88 ['] 36	^h 18 ^m 16	^o 88 ['] 36	
1	60.64	25.24	48.07	27.10	35.50	24.46	26.16	17.82	1
2	60.22	25.33	47.66	27.06	35.14	24.34	25.90	17.56	2
3	59.83	25.42	47.25	27.06	34.77	24.22	25.64	17.27	3
4	59.46	25.51	46.87	27.05	34.37	24.08	25.37	16.96	4
5	59.09	25.61	46.47	27.05	33.97	23.91	25.14	16.65	5
6	58.73	25.73	46.04	27.05	33.56	23.72	24.92	16.34	6
7	58.35	25.87	45.60	27.05	33.18	23.51	24.74	16.02	7
8	57.96	26.02	45.14	27.05	32.81	23.28	24.58	15.69	8
9	57.55	26.17	44.67	27.00	32.47	23.04	24.42	15.36	9
10	57:11	26.31	44.22	26.94	32.13	22.80	24.28	15.04	10
11	56.66	26.42	43.79	26.86	31.83	22.59	24.14	14.75	11
12	56.21	26.50	43.35	26.77	31.53	22.37	23.98	14.47	12
13	55.76	26.57	42.94	26.67	31.23	22.17	23.83	14.20	13
14	55.32	26.62	42.53	26.57	30.92	21.99	23.68	13.91	14
15	54.89	26.67	42.14	26.47	30.60	21.80	23.51	13.63	15
16	54.47	26.69	41.76	26.39	30.30	21.60	23.36	13.32	16
17	54.07	26.72	41.37	26.31	29.98	21.41	23.20	13.01	17
18	53.67	26.76	40.99	26.25	29.65	21.21	23.04	12.68	18
19	53.27	26.82	40.60	26.18	29.31	20.99	22.89	12.33	19
20	52.88	26.88	40.19	26.11	28.98	20.74	22.77	11.98	20
21	52.47	26.95	39.77	26.04	28.67	20.49	22.67	11.62	21
22	52.06	27.02	39.35	25.96	28.37	20.21	22.57	11.25	22
23	51.64	27.09	38.92	25.86	28.07	19.92	22.51	10.90	23
24	51.20	27.16	38.49	25.73	27.79	19.63	22.45	10.56	24
25	50.74	27.21	38.06	25.59	27.55	19.33	22.42	10.25	25
26	50.28	27.23	37.64	25.43	27.32	19.04	22.39	9.95	26
27	49.82	27.23	37.24	25.26	27.09	18.78	22.35	9.66	27
28	49.36	27.21	36.86	25.08	26.88	18.53	22.29	9.37	28
29	48.91	27.18	36.51	24.92	26.65	18.30	22.21	9.07	29
30	48.49	27.14	36.16	24.76	26.41	18.06	22.13	8.76	30
31	48.07	27.10	35.82	24.62	26.16	17.82	22.05	8.43	31
32	47.66	27.06	35.50	24.46	25.90	17.56	21.98	8.09	32

APPARENT PLACES OF THE PRINCIPAL FIXED STARS, FOR THE UPPER TRANSIT AT WASHINGTON.

Sidereal Day of the Month.	α ANDROMEDÆ.			γ PEGASI. (Algenib.)			β Hydra.		
	Right Ascension.		Dec. North.	Right Ascension.		Dec. North.	Right Ascension.		Dec. South.
	h	m	28° 19'	h	m	14° 24'	h	m	78° 1'
Jan. 1	13.09	0.13	37.2 1.0	5.57	0.11	47.8 0.9	24.49	0.95	90.0 1.2
11	12.96	0.12	36.2 1.2	5.46	0.10	46.9 0.9	23.54	0.85	88.8 1.7
21	12.84	0.10	35.0 1.4	5.36	0.08	46.0 0.9	22.69	0.76	87.1 2.4
31	12.74	0.08	33.6 1.5	5.28	0.07	45.1 1.0	21.93	0.64	84.7 2.8
Feb. 10	12.66	0.06	32.1 1.6	5.21	0.06	44.1 1.0	21.29	0.53	81.9 3.1
20	12.60	0.04	30.5 1.7	5.15	0.04	43.1 0.9	20.76	0.42	78.8 3.4
March 2	12.56	0.01	28.8 1.6	5.11	0.00	42.2 0.8	20.34	0.27	75.4 3.7
12	12.57	0.05	27.2 1.3	5.11	0.05	41.4 0.5	20.07	0.08	71.7 3.8
22	12.62	0.09	25.9 1.0	5.16	0.08	40.9 0.3	19.99	0.08	67.9 3.9
April 1	12.71	0.15	24.9 0.7	5.24	0.13	40.6 0.0	20.07	0.24	64.0 3.8
11	12.86	0.19	24.2 0.4	5.37	0.17	40.6 0.3	20.31	0.38	60.2 3.7
21	13.05	0.21	23.8 0.2	5.54	0.20	40.9 0.6	20.69	0.53	56.5 3.6
May 1	13.26	0.26	23.6 0.2	5.74	0.25	41.5 0.8	21.22	0.67	52.9 3.3
11	13.52	0.30	23.8 0.6	5.99	0.28	42.3 1.2	21.89	0.80	49.6 2.9
21	13.82	0.34	24.4 1.2	6.27	0.30	43.5 1.5	22.69	0.92	46.7 2.4
31	14.16	0.34	25.6 1.5	6.57	0.31	45.0 1.7	23.61	1.00	44.3 2.0
June 10	14.50	0.35	27.1 1.7	6.88	0.32	46.7 2.0	24.61	1.06	42.3 1.6
20	14.85	0.35	28.8 2.0	7.20	0.33	48.7 2.0	25.67	1.10	40.7 1.2
30	15.20	0.34	30.8 2.2	7.53	0.33	50.7 2.2	26.77	1.10	39.5 0.4
July 10	15.54	0.33	33.0 2.4	7.86	0.30	52.9 2.2	27.87	1.08	39.1 0.2
20	15.87	0.29	35.4 2.5	8.16	0.27	55.1 2.1	28.95	1.01	39.3 0.6
30	16.16	0.26	37.9 2.6	8.43	0.25	57.2 2.1	29.96	0.93	39.9 1.2
Aug. 9	16.42	0.22	40.5 2.5	8.68	0.22	59.3 2.0	30.89	0.80	41.1 1.7
19	16.64	0.18	43.0 2.4	8.90	0.19	61.3 1.8	31.69	0.66	42.8 2.3
29	16.82	0.14	45.4 2.3	9.09	0.14	63.1 1.6	32.35	0.51	45.1 2.6
Sept. 8	16.96	0.11	47.7 2.3	9.23	0.11	64.7 1.5	32.86	0.31	47.7 2.8
18	17.07	0.07	50.0 2.2	9.34	0.06	66.2 1.4	33.17	0.14	50.5 3.0
28	17.14	0.03	52.2 1.9	9.40	0.03	67.6 1.0	33.31	0.06	53.5 3.0
Oct. 8	17.17	0.02	54.1 1.5	9.43	0.00	68.6 0.8	33.25	0.25	56.5 3.0
18	17.15	0.04	55.6 1.2	9.43	0.03	69.4 0.5	33.00	0.45	59.5 3.0
28	17.11	0.07	56.8 0.9	9.40	0.05	69.9 0.3	32.55	0.60	62.5 2.5
Nov. 7	17.04	0.09	57.7 0.7	9.35	0.07	70.2 0.1	31.95	0.74	65.0 2.0
17	16.95	0.10	58.4 0.5	9.28	0.09	70.3 0.0	31.21	0.84	67.0 1.7
27	16.85	0.12	58.9 0.1	9.19	0.11	70.3 0.2	30.37	0.93	68.7 1.1
Dec. 7	16.73	0.13	59.0 0.2	9.08	0.11	70.1 0.4	29.44	0.96	69.8 0.4
17	16.60	0.14	58.8 0.6	8.97	0.11	69.7 0.8	28.48	0.98	70.2 0.2
27	16.46	0.13	58.2 0.8	8.86	0.11	68.9 0.8	27.50	0.95	70.0 1.0
37	16.33		57.4	8.75		68.1	26.55		69.0

after the 23d of March it begins at the Sidereal Oh. before the Mean Noon.

APPARENT PLACES OF THE PRINCIPAL FIXED STARS, FOR THE UPPER TRANSIT AT WASHINGTON.

Sidereal Day of the Month.	α CASSIOPEÆ.		β Ceti.		δ¹ Ceti.	
	Right Ascension.	Dec. North.	Right Ascension.	Dec. South.	Right Ascension.	Dec. South.
	h ^h m ^m 0 32	55° 46'	h ^h m ^m 0 36	18° 44'	h ^h m ^m 1 17	8° 53'
Jan. 1	39.11 0.28	50.9 0.6	37.56 0.12	62.4 0.4	5.80 0.12	63.9 0.7
11	38.88 0.26	50.3 1.0	37.44 0.12	62.8 0.1	5.68 0.12	64.6 0.5
21	38.57 0.25	49.3 1.4	37.32 0.11	62.9 0.1	5.56 0.12	65.1 0.3
31	38.32 0.23	47.9 1.8	37.21 0.10	62.8 0.3	5.44 0.11	65.4 0.1
Feb. 10	38.09 0.19	46.1 2.2	37.11 0.08	62.5 0.7	5.33 0.10	65.5 0.1
20	37.90 0.14	43.9 2.4	37.03 0.05	61.8 0.9	5.23 0.09	65.4 0.3
March 2	37.76 0.07	41.5 2.5	36.98 0.02	60.9 1.2	5.14 0.06	65.1 0.5
12	37.69 0.00	39.0 2.5	36.96 0.01	59.7 1.4	5.06 0.03	64.6 0.8
22	37.69 0.07	36.5 2.5	36.97 0.05	58.3 1.7	5.05 0.01	63.8 1.0
April 1	37.76 0.14	34.0 2.2	37.02 0.08	56.6 1.9	5.06 0.04	62.8 1.3
11	37.90 0.21	31.8 1.9	37.10 0.13	54.7 2.1	5.10 0.09	61.5 1.5
21	38.11 0.28	29.9 1.7	37.23 0.17	52.6 2.2	5.19 0.14	60.0 1.7
May 1	38.39 0.34	28.2 1.1	37.40 0.20	50.4 2.3	5.33 0.18	58.3 1.9
11	38.73 0.41	27.1 0.6	37.60 0.25	48.1 2.4	5.51 0.21	56.4 2.0
21	39.14 0.45	26.5 0.2	37.85 0.28	45.7 2.4	5.72 0.24	54.4 2.2
31	39.59 0.47	26.3 0.3	38.13 0.31	43.3 2.3	5.96 0.28	52.2 2.2
June 10	40.06 0.49	26.6 0.8	38.44 0.31	41.0 2.2	6.24 0.29	50.0 2.2
20	40.55 0.49	27.4 1.3	38.75 0.32	38.8 2.1	6.53 0.30	47.8 2.1
30	41.04 0.48	28.7 1.7	39.07 0.33	36.7 1.9	6.83 0.32	45.7 2.0
July 10	41.52 0.47	30.4 2.1	39.40 0.31	34.8 1.6	7.15 0.31	43.7 1.8
20	41.99 0.44	32.5 2.5	39.71 0.31	33.2 1.2	7.46 0.31	41.9 1.6
30	42.43 0.40	35.0 2.7	40.02 0.28	32.0 0.9	7.77 0.30	40.3 1.3
Aug. 9	42.83 0.34	37.7 3.0	40.30 0.24	31.1 0.5	8.07 0.26	39.0 1.0
19	43.17 0.30	40.7 3.1	40.54 0.20	30.6 0.3	8.33 0.22	38.0 0.8
29	43.47 0.25	43.8 3.2	40.74 0.17	30.3 0.1	8.55 0.19	37.2 0.4
Sept. 8	43.72 0.19	47.0 3.3	40.91 0.14	30.4 0.4	8.74 0.17	36.8 0.1
18	43.91 0.14	50.3 3.2	41.05 0.10	30.8 0.8	8.91 0.15	36.7 0.2
28	44.05 0.07	53.5 3.1	41.15 0.06	31.6 1.0	9.06 0.11	36.9 0.4
Oct. 8	44.12 0.01	56.6 2.9	41.21 0.02	32.6 1.2	9.17 0.06	37.3 0.7
18	44.13 0.03	59.5 2.8	41.23 0.02	33.8 1.3	9.23 0.03	38.0 0.9
28	44.10 0.09	62.3 2.6	41.21 0.05	35.1 1.4	9.26 0.00	38.9 1.0
Nov. 7	44.01 0.13	64.9 2.1	41.16 0.06	36.5 1.3	9.26 0.02	39.9 1.1
17	43.88 0.17	67.0 1.7	41.10 0.08	37.8 1.3	9.24 0.05	41.0 1.1
27	43.71 0.21	68.7 1.2	41.02 0.10	39.1 1.2	9.19 0.06	42.1 1.1
Dec. 7	43.50 0.22	69.9 0.8	40.92 0.12	40.3 1.0	9.13 0.09	43.2 1.0
17	43.28 0.26	70.7 0.3	40.80 0.12	41.3 0.7	9.04 0.10	44.2 0.9
27	43.02 0.27	71.0 0.2	40.68 0.12	42.0 0.6	8.94 0.12	45.1 0.7
37	42.75	70.8	40.56	42.6	8.82	45.8

NOTE.— Before the 23d of March the Sidereal day of the Month begins at the Sidereal Oh. after the Mean Noon;

APPARENT PLACES OF THE PRINCIPAL FIXED STARS, FOR THE UPPER TRANSIT AT WASHINGTON.

Sidereal Day of the Month.	α Eridani. (<i>Achernar</i> .)		α ARIETIS.		γ Ceti.	
	Right Ascension.	Dec. South.	Right Ascension.	Dec. North.	Right Ascension.	Dec. North.
	^h ^m 1 32	[°] ['] 57 56	^h ^m 1 59	[°] ['] 22 48	^h ^m 2 36	[°] ['] 2 38
Jan. 1	33.50 0.34	47.8 0.3	22.12 0.12	25.1 0.4	7.67 0.10	58.3 0.7
11	33.16 0.33	48.1 0.3	22.00 0.13	24.7 0.5	7.57 0.12	57.6 0.7
21	32.83 0.33	47.8 0.8	21.87 0.14	24.2 0.6	7.45 0.13	56.9 0.6
31	32.50 0.32	47.0 1.4	21.73 0.15	23.6 0.8	7.32 0.14	56.3 0.5
Feb. 10	32.18 0.29	45.6 1.8	21.58 0.14	22.8 0.9	7.18 0.14	55.8 0.4
20	31.89 0.25	43.8 2.3	21.44 0.12	21.9 1.0	7.04 0.13	55.4 0.2
March 2	31.64 0.22	41.5 2.7	21.32 0.10	20.9 1.0	6.91 0.12	55.2 0.1
12	31.42 0.15	38.8 3.0	21.22 0.07	19.9 0.9	6.79 0.10	55.1 0.1
22	31.27 0.09	35.8 3.3	21.15 0.02	19.0 0.8	6.69 0.06	55.2 0.3
April 1	31.18 0.03	32.5 3.4	21.13 0.02	18.2 0.6	6.63 0.03	55.5 0.5
11	31.15 0.04	29.1 3.5	21.15 0.06	17.6 0.4	6.60 0.02	56.0 0.7
21	31.19 0.13	25.6 3.6	21.21 0.10	17.2 0.3	6.62 0.06	56.7 0.8
May 1	31.32 0.19	22.0 3.6	21.31 0.16	16.9 0.0	6.68 0.11	57.5 1.1
11	31.51 0.24	18.4 3.4	21.47 0.21	16.9 0.4	6.79 0.15	58.6 1.3
21	31.75 0.31	15.0 3.3	21.68 0.24	17.3 0.8	6.94 0.19	59.9 1.5
31	32.06 0.36	11.7 3.0	21.92 0.27	18.1 0.9	7.13 0.23	61.4 1.7
June 10	32.42 0.41	8.7 2.6	22.19 0.30	19.0 1.0	7.36 0.26	63.1 1.7
20	32.83 0.45	6.1 2.2	22.49 0.32	20.0 1.1	7.62 0.29	64.8 1.8
30	33.28 0.46	3.9 1.7	22.81 0.34	21.1 1.4	7.91 0.30	66.6 1.8
July 10	33.74 0.47	2.2 1.3	23.15 0.35	22.5 1.7	8.21 0.31	68.4 1.7
20	34.21 0.48	0.9 0.6	23.50 0.35	24.2 1.8	8.52 0.31	70.1 1.7
30	34.69 0.46	0.3 0.0	23.85 0.32	26.0 1.8	8.83 0.31	71.8 1.5
Aug. 9	35.15 0.42	0.3 0.4	24.17 0.30	27.8 1.8	9.14 0.29	73.3 1.3
19	35.57 0.38	0.7 1.1	24.47 0.28	29.6 1.7	9.43 0.27	74.6 1.2
29	35.95 0.33	1.8 1.5	24.75 0.25	31.3 1.7	9.70 0.26	75.8 0.9
Sept. 8	36.28 0.27	3.3 2.0	25.00 0.22	33.0 1.6	9.96 0.23	76.7 0.6
18	36.55 0.22	5.3 2.4	25.22 0.19	34.6 1.4	10.19 0.20	77.3 0.3
28	36.77 0.14	7.7 2.7	25.41 0.16	36.0 1.3	10.39 0.18	77.6 0.1
Oct. 8	36.91 0.06	10.4 2.8	25.57 0.13	37.3 1.1	10.57 0.14	77.7 0.1
18	36.97 0.02	13.2 3.1	25.70 0.10	38.4 1.0	10.71 0.12	77.6 0.4
28	36.95 0.08	16.3 3.0	25.80 0.06	39.4 0.8	10.83 0.09	77.2 0.5
Nov. 7	36.87 0.13	19.3 2.8	25.86 0.03	40.2 0.7	10.92 0.07	76.7 0.7
17	36.74 0.19	22.1 2.4	25.89 0.00	40.9 0.4	10.99 0.02	76.0 0.7
27	36.55 0.25	24.5 2.1	25.89 0.03	41.3 0.3	11.01 0.00	75.3 0.8
Dec. 7	36.30 0.28	26.6 1.7	25.86 0.06	41.6 0.1	11.01 0.02	74.5 0.8
17	36.02 0.31	28.3 1.2	25.80 0.08	41.7 0.1	10.99 0.06	73.7 0.8
27	35.71 0.33	29.5 0.6	25.72 0.10	41.6 0.3	10.93 0.08	72.9 0.8
37	35.38	30.1	25.62	41.3	10.85	72.1

after the 22d of March it begins at the Sidereal Oh. before the Mean Noon.

APPARENT PLACES OF THE PRINCIPAL FIXED STARS, FOR THE UPPER TRANSIT AT WASHINGTON.

Sidereal Day of the Month.	α CETI.		α PERSEI.		γ TAURI.	
	Right Ascension.	Dec. North.	Right Ascension.	Dec. North.	Right Ascension.	Dec. North.
	^h 2 ^m 55	[°] 3 32'	^h 3 14	49° 21'	^h 3 39	23° 40'
Jan. 1	2.67 0.09	36.6 0.7	27.45 0.14	64.2 0.9	15.73 0.07	31.0 0.0
11	2.58 0.11	35.9 0.7	27.31 0.18	65.1 0.5	15.66 0.10	31.0 0.1
21	2.47 0.13	35.2 0.6	27.13 0.22	65.6 0.2	15.56 0.13	30.9 0.3
31	2.34 0.14	34.6 0.5	26.91 0.24	65.8 0.2	15.43 0.15	30.6 0.3
Feb. 10	2.20 0.15	34.1 0.4	26.67 0.25	65.6 0.6	15.28 0.17	30.3 0.5
20	2.05 0.15	33.7 0.3	26.42 0.25	65.0 1.0	15.11 0.18	29.8 0.5
March 2	1.90 0.13	33.4 0.2	26.17 0.23	64.0 1.3	14.93 0.16	29.3 0.6
12	1.77 0.10	33.2 0.1	25.94 0.19	62.7 1.5	14.77 0.14	28.7 0.6
22	1.67 0.08	33.3 0.2	25.75 0.15	61.2 1.6	14.63 0.12	28.1 0.7
April 1	1.59 0.04	33.5 0.4	25.60 0.10	59.6 1.8	14.51 0.08	27.4 0.6
11	1.55 0.00	33.9 0.6	25.50 0.03	57.8 1.8	14.43 0.03	26.8 0.5
21	1.55 0.05	34.5 0.8	25.47 0.03	56.0 1.8	14.40 0.01	26.3 0.5
May 1	1.60 0.08	35.3 1.0	25.50 0.11	54.2 1.7	14.41 0.05	25.8 0.3
11	1.68 0.13	36.3 1.2	25.61 0.18	52.5 1.5	14.46 0.11	25.5 0.1
21	1.81 0.18	37.5 1.3	25.79 0.23	51.0 1.3	14.57 0.16	25.4 0.1
31	1.99 0.22	38.8 1.5	26.02 0.30	49.7 1.0	14.73 0.21	25.5 0.2
June 10	2.21 0.24	40.3 1.6	26.32 0.34	48.7 0.6	14.94 0.24	25.7 0.5
20	2.45 0.27	41.9 1.8	26.66 0.38	48.1 0.3	15.18 0.27	26.2 0.7
30	2.72 0.29	43.7 1.8	27.04 0.42	47.8 0.0	15.45 0.30	26.9 0.7
July 10	3.01 0.30	45.5 1.7	27.46 0.43	47.8 0.3	15.75 0.31	27.6 0.9
20	3.31 0.31	47.2 1.6	27.89 0.44	48.1 0.6	16.06 0.33	28.5 1.1
30	3.62 0.32	48.8 1.5	28.33 0.45	48.7 1.0	16.39 0.34	29.6 1.1
Aug. 9	3.94 0.30	50.3 1.3	28.78 0.44	49.7 1.2	16.73 0.33	30.7 1.1
19	4.24 0.28	51.6 1.0	29.22 0.43	50.9 1.4	17.06 0.32	31.8 1.1
29	4.52 0.26	52.6 0.9	29.65 0.41	52.3 1.6	17.38 0.30	32.9 1.1
Sept. 8	4.78 0.25	53.5 0.6	30.06 0.39	53.9 1.8	17.68 0.28	34.0 1.0
18	5.03 0.23	54.1 0.4	30.45 0.35	55.7 1.9	17.96 0.27	35.0 1.0
28	5.26 0.20	54.5 0.1	30.80 0.31	57.6 2.1	18.23 0.26	36.0 0.9
Oct. 8	5.46 0.16	54.6 0.2	31.11 0.28	59.7 2.1	18.49 0.24	36.9 0.8
18	5.62 0.13	54.4 0.3	31.39 0.24	61.8 2.2	18.73 0.22	37.7 0.6
28	5.75 0.10	54.1 0.4	31.63 0.19	64.0 2.1	18.95 0.18	38.3 0.6
Nov. 7	5.85 0.08	53.7 0.6	31.82 0.15	66.1 2.0	19.13 0.14	38.9 0.5
17	5.93 0.06	53.1 0.6	31.97 0.11	68.1 2.0	19.27 0.10	39.4 0.4
27	5.99 0.01	52.5 0.8	32.08 0.04	70.1 1.8	19.37 0.07	39.8 0.3
Dec. 7	6.00 0.01	51.7 0.9	32.12 0.01	71.9 1.7	19.44 0.03	40.1 0.2
17	5.99 0.04	50.8 0.9	32.11 0.07	73.6 1.4	19.47 0.01	40.3 0.1
27	5.95 0.08	49.9 0.8	32.04 0.12	75.0 1.0	19.46 0.05	40.4 0.1
37	5.87	49.1	31.92	76.0	19.41	40.5

NOTE. — Before the 22d of March the Sidereal day of the Month begins at the Sidereal Oh. after the Mean Noon;

APPARENT PLACES OF THE PRINCIPAL FIXED STARS, FOR THE UPPER TRANSIT AT WASHINGTON.

Sidereal Day of the Month.	γ ¹ Eridani.		α TAURI. (Aldbaran.)		α AURIGÆ. (Capella.)	
	Right Ascension.	Dec. South.	Right Ascension.	Dec. North.	Right Ascension.	Dec. North.
	h m	° ' "	h m	° ' "	h m	° ' "
	3 51	13° 53'	4 27	16° 13'	5 6	45° 51'
Jan. 1	34.62 0.08	82.6 1.4	59.14 0.03	42.6 0.3	28.75 0.01	17.0 1.3
11	34.54 0.10	84.0 1.2	59.11 0.07	42.3 0.3	28.74 0.07	18.3 1.1
21	34.44 0.13	85.2 1.0	59.04 0.10	42.0 0.3	28.67 0.12	19.4 0.9
31	34.31 0.16	86.2 0.7	58.94 0.13	41.7 0.3	28.55 0.17	20.3 0.7
Feb. 10	34.15 0.17	86.9 0.3	58.81 0.16	41.4 0.4	28.38 0.21	21.0 0.4
20	33.98 0.18	87.2 0.1	58.65 0.17	41.0 0.3	28.17 0.24	21.4 0.1
March 2	33.80 0.17	87.3 0.2	58.48 0.16	40.7 0.3	27.93 0.25	21.5 0.2
12	33.63 0.15	87.1 0.5	58.32 0.16	40.4 0.3	27.68 0.24	21.3 0.5
22	33.48 0.13	86.6 0.8	58.16 0.15	40.1 0.3	27.44 0.23	20.8 0.9
April 1	33.35 0.10	85.8 1.1	58.01 0.12	39.8 0.2	27.21 0.19	19.9 1.0
11	33.25 0.06	84.7 1.3	57.89 0.07	39.6 0.1	27.02 0.14	18.9 1.2
21	33.19 0.03	83.4 1.6	57.82 0.03	39.5 0.1	26.88 0.10	17.7 1.2
May 1	33.16 0.02	81.8 1.8	57.79 0.02	39.4 0.1	26.78 0.05	16.5 1.4
11	33.18 0.06	80.0 2.0	57.81 0.05	39.5 0.2	26.73 0.02	15.1 1.5
21	33.24 0.12	78.0 2.2	57.86 0.10	39.7 0.4	26.75 0.09	13.6 1.5
31	33.36 0.16	75.8 2.3	57.96 0.15	40.1 0.5	26.84 0.15	12.1 1.4
June 10	33.52 0.19	73.5 2.2	58.11 0.19	40.6 0.6	26.99 0.20	10.7 1.2
20	33.71 0.23	71.3 2.2	58.30 0.22	41.2 0.8	27.19 0.25	9.5 1.2
30	33.94 0.26	69.1 2.1	58.52 0.24	42.0 0.8	27.44 0.29	8.3 0.9
July 10	34.20 0.28	67.0 2.0	58.76 0.28	42.8 0.9	27.73 0.33	7.4 0.7
20	34.48 0.29	65.0 1.8	59.04 0.30	43.7 1.0	28.06 0.36	6.7 0.5
30	34.77 0.30	63.2 1.5	59.34 0.31	44.7 0.9	28.42 0.38	6.2 0.3
Aug. 9	35.07 0.30	61.7 1.2	59.65 0.31	45.6 0.9	28.80 0.41	5.9 0.1
19	35.37 0.29	60.5 1.0	59.96 0.31	46.5 0.8	29.21 0.42	5.8 0.1
29	35.66 0.29	59.5 0.5	60.27 0.31	47.3 0.7	29.63 0.42	5.9 0.2
Sept. 8	35.95 0.27	59.0 0.1	60.58 0.30	48.0 0.6	30.05 0.42	6.1 0.4
18	36.22 0.25	58.9 0.4	60.88 0.29	48.6 0.4	30.47 0.41	6.5 0.6
28	36.47 0.23	59.3 0.7	61.17 0.28	49.0 0.3	30.88 0.40	7.1 0.8
Oct. 8	36.70 0.21	60.0 1.1	61.45 0.25	49.3 0.2	31.28 0.38	7.9 0.9
18	36.91 0.19	61.1 1.4	61.70 0.23	49.5 0.0	31.66 0.36	8.8 0.9
28	37.10 0.16	62.5 1.6	61.98 0.20	49.5 0.1	32.02 0.33	9.7 1.1
Nov. 7	37.26 0.12	64.1 1.8	62.13 0.19	49.4 0.2	32.35 0.29	10.8 1.3
17	37.38 0.08	65.9 1.8	62.32 0.16	49.2 0.3	32.64 0.26	12.1 1.4
27	37.46 0.06	67.7 1.9	62.48 0.12	48.9 0.3	32.90 0.20	13.5 1.5
Dec. 7	37.52 0.01	69.6 1.8	62.60 0.07	48.6 0.3	33.10 0.15	15.0 1.4
17	37.53 0.02	71.4 1.8	62.67 0.04	48.3 0.3	33.25 0.09	16.4 1.3
27	37.51 0.06	73.2 1.6	62.71 0.01	48.0 0.3	33.34 0.03	17.7 1.3
37	37.45	74.8	62.70	47.7	33.37	19.0

after the 23d of March it begins at the Sidereal Oh. before the Mean Noon.

APPARENT PLACES OF THE PRINCIPAL FIXED STARS, FOR THE UPPER TRANSIT AT WASHINGTON.

Sidereal Day of the Month.	β ORIONIS. (Rigel.)			β TAURI.			δ ORIONIS.		
	Right Ascension.	Dec. South.		Right Ascension.	Dec. North.		Right Ascension.	Dec. South.	
	^h 5 ^m 7	^o 8 ['] 21		^h 5 ^m 17	^o 28 ['] 29		^h 5 ^m 24	^o 0 ['] 24	
Jan. 1	53.70 0.02	54.1 1.5	33.06 0.01	15.3 0.4	56.68 0.01	17.0 1.2			
11	53.68 0.05	55.6 1.4	33.07 0.03	15.7 0.3	56.69 0.03	18.2 1.1			
21	53.63 0.09	57.0 1.2	33.04 0.08	16.0 0.2	56.66 0.07	19.3 1.0			
31	53.54 0.13	58.2 1.0	32.96 0.12	16.2 0.2	56.59 0.10	20.3 0.8			
Feb. 10	53.41 0.15	59.2 0.7	32.84 0.16	16.4 0.1	56.49 0.14	21.1 0.6			
20	53.26 0.17	59.9 0.5	32.68 0.18	16.5 0.0	56.35 0.17	21.7 0.4			
March 2	53.09 0.18	60.4 0.2	32.50 0.19	16.5 0.1	56.18 0.18	22.1 0.2			
12	52.91 0.18	60.6 0.1	32.31 0.19	16.4 0.3	56.00 0.17	22.3 0.1			
22	52.73 0.16	60.5 0.3	32.12 0.18	16.1 0.5	55.83 0.16	22.4 0.1			
April 1	52.57 0.14	60.2 0.6	31.94 0.15	15.6 0.5	55.67 0.15	22.3 0.4			
11	52.43 0.12	59.6 0.8	31.79 0.12	15.1 0.5	55.52 0.12	21.9 0.5			
21	52.31 0.08	58.8 1.0	31.67 0.08	14.6 0.6	55.40 0.08	21.4 0.6			
May 1	52.23 0.03	57.8 1.3	31.59 0.03	14.0 0.6	55.32 0.05	20.8 0.8			
11	52.20 0.01	56.5 1.4	31.56 0.01	13.4 0.5	55.27 0.00	20.0 0.9			
21	52.21 0.04	55.1 1.6	31.57 0.05	12.9 0.5	55.27 0.04	19.1 1.1			
31	52.25 0.08	53.5 1.8	31.62 0.11	12.4 0.4	55.31 0.08	18.0 1.3			
June 10	52.33 0.13	51.7 1.8	31.73 0.16	12.0 0.3	55.39 0.12	16.7 1.4			
20	52.46 0.17	49.9 1.9	31.89 0.21	11.7 0.1	55.51 0.16	15.3 1.5			
30	52.63 0.20	48.0 1.9	32.10 0.24	11.6 0.1	55.67 0.19	13.8 1.5			
July 10	52.83 0.23	46.1 1.8	32.34 0.26	11.5 0.0	55.86 0.22	12.3 1.4			
20	53.06 0.25	44.3 1.6	32.60 0.29	11.5 0.2	56.08 0.24	10.9 1.3			
30	53.31 0.26	42.7 1.5	32.89 0.30	11.7 0.2	56.32 0.25	9.6 1.2			
Aug. 9	53.57 0.28	41.2 1.2	33.19 0.32	11.9 0.2	56.57 0.28	8.4 1.0			
19	53.85 0.28	40.0 0.9	33.51 0.34	12.1 0.3	56.85 0.29	7.4 0.8			
29	54.13 0.29	39.1 0.7	33.85 0.34	12.4 0.3	57.14 0.29	6.6 0.5			
Sept. 8	54.42 0.29	38.4 0.2	34.19 0.34	12.7 0.3	57.43 0.29	6.1 0.2			
18	54.71 0.29	38.2 0.2	34.53 0.33	13.0 0.3	57.72 0.29	5.9 0.0			
28	55.00 0.28	38.4 0.4	34.86 0.32	13.3 0.3	58.01 0.28	5.9 0.3			
Oct. 8	55.28 0.26	38.8 0.9	35.18 0.31	13.6 0.3	58.29 0.27	6.2 0.5			
18	55.54 0.24	39.7 1.2	35.49 0.30	13.9 0.2	58.56 0.26	6.7 1.0			
28	55.78 0.22	40.9 1.4	35.79 0.27	14.1 0.3	58.82 0.24	7.7 1.2			
Nov. 7	56.00 0.20	42.3 1.6	36.06 0.25	14.4 0.2	59.06 0.21	8.9 1.3			
17	56.20 0.17	43.9 1.8	36.31 0.22	14.6 0.3	59.27 0.19	10.2 1.4			
27	56.37 0.13	45.7 1.9	36.53 0.19	14.9 0.3	59.46 0.17	11.6 1.5			
Dec. 7	56.50 0.09	47.6 1.8	36.72 0.14	15.2 0.3	59.63 0.12	13.1 1.5			
17	56.59 0.06	49.4 1.8	36.86 0.09	15.5 0.4	59.75 0.07	14.6 1.4			
27	56.65 0.01	51.2 1.7	36.95 0.05	15.9 0.3	59.82 0.04	16.0 1.3			
37	56.66	52.9	37.00	16.2	59.86	17.3			

NOTE. — Before the 23d of March the Sidereal day of the Month begins at the Sidereal Oh. after the Mean Noon;

APPARENT PLACES OF THE PRINCIPAL FIXED STARS, FOR THE UPPER TRANSIT AT WASHINGTON.

Sidereal Day of the Month.	α Leporis.		• ORIONIS.		α Columbae.	
	Right Ascension.	Dec. South.	Right Ascension.	Dec. South.	Right Ascension.	Dec. South.
	h m	° ' "	h m	° ' "	h m	° ' "
	5 26	17 55	5 29	1 17	5 34	34 8
Jan. 1	38.28 0.00	28.0 2.1	11.94 0.01	35.9 1.3	39.28 0.03	61.0 2.8
11	38.28 0.06	30.1 1.8	11.95 0.03	37.2 1.2	39.25 0.08	63.8 2.4
21	38.22 0.10	31.9 1.6	11.92 0.07	38.4 1.0	39.27 0.13	66.2 2.1
31	38.12 0.13	33.5 1.3	11.85 0.11	39.4 0.8	39.14 0.17	68.3 1.7
Feb. 10	37.99 0.16	34.8 1.0	11.74 0.14	40.2 0.6	38.97 0.20	70.0 1.3
20	37.83 0.18	35.8 0.6	11.60 0.16	40.8 0.5	38.77 0.23	71.3 0.8
March 2	37.65 0.19	36.4 0.3	11.44 0.17	41.3 0.3	38.54 0.23	72.1 0.3
12	37.46 0.20	36.7 0.1	11.27 0.17	41.6 0.0	38.31 0.24	72.4 0.0
22	37.26 0.18	36.6 0.4	11.10 0.17	41.6 0.1	38.07 0.23	72.4 0.5
April 1	37.08 0.17	36.2 0.7	10.93 0.15	41.5 0.3	37.84 0.21	71.9 0.9
11	36.91 0.14	35.5 1.0	10.78 0.12	41.2 0.5	37.63 0.19	71.0 1.4
21	36.77 0.10	34.5 1.3	10.66 0.09	40.7 0.8	37.44 0.16	69.6 1.7
May 1	36.67 0.06	33.2 1.5	10.57 0.05	39.9 0.9	37.28 0.11	67.9 2.0
11	36.61 0.02	31.7 1.9	10.52 0.01	39.0 1.0	37.17 0.06	65.9 2.3
21	36.59 0.01	29.9 1.9	10.51 0.04	38.0 1.1	37.11 0.01	63.6 2.5
31	36.60 0.05	28.0 2.1	10.55 0.08	36.9 1.3	37.10 0.03	61.1 2.7
June 10	36.65 0.10	25.9 2.2	10.63 0.11	35.6 1.4	37.13 0.08	58.4 2.8
20	36.75 0.15	23.7 2.4	10.74 0.15	34.2 1.4	37.21 0.12	55.6 2.9
30	36.90 0.18	21.3 2.2	10.89 0.18	32.8 1.5	37.33 0.16	52.7 2.8
July 10	37.08 0.21	19.1 2.1	11.07 0.21	31.3 1.5	37.49 0.20	49.9 2.7
20	37.29 0.23	17.0 2.0	11.28 0.25	29.8 1.4	37.69 0.24	47.2 2.4
30	37.52 0.26	15.0 1.8	11.53 0.26	28.4 1.2	37.93 0.27	44.8 2.1
Aug. 9	37.78 0.28	13.2 1.4	11.79 0.27	27.2 1.0	38.20 0.29	42.7 1.8
19	38.06 0.28	11.8 1.1	12.06 0.28	26.2 0.8	38.49 0.31	40.9 1.4
29	38.34 0.29	10.7 0.8	12.34 0.29	25.4 0.5	38.80 0.32	39.5 0.9
Sept. 8	38.63 0.30	9.9 0.3	12.63 0.29	24.9 0.2	39.12 0.32	38.6 0.3
18	38.93 0.29	9.6 0.3	12.92 0.29	24.7 0.0	39.44 0.32	38.3 0.3
28	39.22 0.29	9.9 0.7	13.21 0.28	24.7 0.3	39.76 0.32	38.6 0.9
Oct. 8	39.51 0.27	10.6 1.1	13.49 0.27	25.0 0.6	40.08 0.30	39.5 1.5
18	39.78 0.26	11.7 1.5	13.76 0.27	25.6 1.0	40.38 0.27	41.0 1.9
28	40.04 0.24	13.2 1.8	14.03 0.25	26.6 1.3	40.65 0.25	42.9 2.2
Nov. 7	40.28 0.21	15.0 2.0	14.28 0.22	27.9 1.4	40.90 0.22	45.1 2.6
17	40.49 0.18	17.0 2.3	14.50 0.19	29.3 1.5	41.12 0.19	47.7 2.9
27	40.67 0.15	19.3 2.4	14.69 0.15	30.8 1.5	41.31 0.15	50.6 3.1
Dec. 7	40.82 0.11	21.7 2.4	14.84 0.12	32.3 1.5	41.46 0.10	53.7 3.1
17	40.93 0.06	24.1 2.4	14.96 0.08	33.8 1.5	41.56 0.05	56.8 3.0
27	40.99 0.01	26.5 2.2	15.04 0.05	35.3 1.3	41.61 0.01	59.8 2.9
37	41.00	28.7	15.09	36.6	41.60	62.7

after the 24 of March it begins at the Sidereal (h. before the Mean Noon.

APPARENT PLACES OF THE PRINCIPAL FIXED STARS, FOR THE UPPER TRANSIT AT WASHINGTON.							
Sidereal Day of the Month.	α ORIONIS		μ Geminorum		α Argus. (Canopus.)		
	Right Ascension.	Dec. North.	Right Ascension.	Dec. North.	Right Ascension.	Dec. South.	
	^h ^m 5 47	[°] ['] 7 22	^h ^m 6 14	[°] ['] 22 34	^h ^m 6 20	[°] ['] 52 36	
Jan. 1	41.19 0.03	41.6 0.9	35.73 0.07	53.8 0.0	54.74 0.04	75.5 3.5	
11	41.22 0.01	40.7 0.8	35.80 0.02	53.8 0.0	54.70 0.10	79.0 3.2	
21	41.21 0.05	39.9 0.6	35.82 0.03	53.8 0.1	54.60 0.17	82.2 2.8	
31	41.16 0.10	39.3 0.5	35.79 0.08	53.9 0.1	54.43 0.23	85.0 2.5	
Feb. 10	41.06 0.13	38.8 0.4	35.71 0.12	54.0 0.1	54.20 0.28	87.5 2.0	
20	40.93 0.15	38.4 0.4	35.59 0.15	54.1 0.1	53.92 0.32	89.5 1.6	
March 2	40.78 0.17	38.0 0.2	35.44 0.17	54.2 0.0	53.60 0.35	91.1 1.1	
12	40.61 0.17	37.8 0.1	35.27 0.18	54.2 0.0	53.25 0.35	92.2 0.5	
22	40.44 0.17	37.7 0.0	35.09 0.18	54.2 0.0	52.90 0.36	92.7 0.1	
April 1	40.27 0.15	37.7 0.1	34.91 0.17	54.2 0.1	52.54 0.35	92.6 0.5	
11	40.12 0.13	37.8 0.2	34.74 0.15	54.1 0.2	52.19 0.32	92.1 1.0	
21	39.99 0.09	38.0 0.3	34.59 0.11	53.9 0.2	51.87 0.28	91.1 1.5	
May 1	39.90 0.06	38.3 0.5	34.48 0.08	53.7 0.3	51.59 0.24	89.6 1.9	
11	39.84 0.02	38.8 0.6	34.40 0.04	53.4 0.2	51.35 0.20	87.7 2.2	
21	39.82 0.02	39.4 0.6	34.36 0.01	53.2 0.1	51.15 0.14	85.5 2.6	
31	39.84 0.07	40.0 0.8	34.37 0.05	53.1 0.1	51.01 0.08	82.9 2.9	
June 10	39.91 0.11	40.8 0.8	34.42 0.09	53.0 0.1	50.93 0.01	80.0 3.0	
20	40.02 0.14	41.6 0.9	34.51 0.14	52.9 0.1	50.92 0.05	77.0 3.3	
30	40.16 0.18	42.5 1.0	34.65 0.18	52.8 0.0	50.97 0.10	73.7 3.2	
July 10	40.34 0.21	43.5 1.0	34.83 0.20	52.8 0.0	51.07 0.16	70.5 3.0	
20	40.55 0.24	44.5 0.9	35.03 0.23	52.8 0.0	51.23 0.22	67.5 2.9	
30	40.79 0.25	45.4 0.8	35.26 0.26	52.8 0.1	51.45 0.27	64.6 2.6	
Aug. 9	41.04 0.27	46.2 0.7	35.52 0.28	52.9 0.0	51.72 0.30	62.0 2.3	
19	41.31 0.28	46.9 0.6	35.80 0.29	52.9 0.0	52.02 0.34	59.7 1.9	
29	41.59 0.29	47.5 0.4	36.09 0.30	52.9 0.1	52.36 0.36	57.8 1.4	
Sept. 8	41.88 0.29	47.9 0.2	36.39 0.32	52.8 0.1	52.72 0.39	56.4 0.8	
18	42.17 0.30	48.1 0.1	36.71 0.32	52.7 0.2	53.11 0.42	55.6 0.0	
28	42.47 0.30	48.0 0.3	37.03 0.33	52.5 0.3	53.53 0.42	55.6 0.6	
Oct. 8	42.77 0.29	47.7 0.5	37.36 0.32	52.2 0.3	53.95 0.40	56.2 1.2	
18	43.06 0.27	47.2 0.8	37.68 0.31	51.9 0.4	54.35 0.38	57.4 1.8	
28	43.33 0.26	46.4 0.9	37.99 0.30	51.5 0.4	54.73 0.35	59.2 2.3	
Nov. 7	43.59 0.24	45.5 1.0	38.29 0.28	51.1 0.4	55.08 0.32	61.5 2.8	
17	43.83 0.22	44.5 1.0	38.57 0.27	50.7 0.4	55.40 0.28	64.3 3.2	
27	44.05 0.19	43.5 1.1	38.84 0.24	50.3 0.3	55.68 0.21	67.5 3.4	
Dec. 7	44.24 0.15	42.4 1.0	39.08 0.19	50.0 0.3	55.89 0.15	70.9 3.6	
17	44.39 0.10	41.4 1.0	39.27 0.14	49.7 0.2	56.04 0.08	74.5 3.7	
27	44.49 0.06	40.4 1.0	39.41 0.10	49.5 0.1	56.12 0.01	78.2 3.5	
37	44.55	39.4	39.51	49.4	56.13	81.7	

NOTE. — Before the 23d of March the Sidereal day of the Month begins at the Sidereal Oh. 4/10r the Mean Noon;

APPARENT PLACES OF THE PRINCIPAL FIXED STARS, FOR THE UPPER TRANSIT AT WASHINGTON.

Sidereal Day of the Month.	51 (Hev.) Cephei.		α CANIS MAJORIS. (Sirius.)		ε Canis Majoris.	
	Right Ascension.	Dec. North.	Right Ascension.	Dec. South.	Right Ascension.	Dec. South.
	^h 6 ^m 34	87° 14'	^h 6 ^m 39	16° 31'	^h 6 ^m 53	28° 46'
Jan. 1	47.78 0.34	53.5 3.2	3.78 0.06	40.2 2.4	12.10 0.06	67.7 3.0
11	48.12 0.60	56.7 3.0	3.84 0.01	42.6 2.2	12.16 0.01	70.7 2.8
21	47.52 1.48	59.7 2.9	3.85 0.03	44.8 1.9	12.17 0.04	73.5 2.5
31	46.04 2.28	62.6 2.6	3.82 0.08	46.7 1.7	12.13 0.09	76.0 2.2
Feb. 10	43.76 2.99	65.2 2.1	3.74 0.12	48.4 1.4	12.04 0.14	78.2 1.8
20	40.77 3.56	67.3 1.7	3.62 0.15	49.8 1.1	11.90 0.17	80.0 1.5
March 2	37.21 3.97	69.0 1.1	3.47 0.18	50.9 0.8	11.73 0.19	81.5 1.0
12	33.24 4.22	70.1 0.5	3.29 0.19	51.7 0.4	11.54 0.21	82.5 0.7
22	29.02 4.28	70.6 0.2	3.10 0.19	52.1 0.1	11.33 0.22	83.2 0.3
April 1	24.74 4.17	70.4 0.7	2.91 0.18	52.2 0.3	11.11 0.21	83.5 0.2
11	20.57 3.89	69.7 1.1	2.73 0.17	51.9 0.5	10.90 0.20	83.3 0.6
21	16.68 3.46	68.6 1.6	2.56 0.15	51.4 0.8	10.70 0.18	82.7 0.9
May 1	13.22 2.92	67.0 2.1	2.41 0.11	50.6 1.1	10.52 0.15	81.8 1.3
11	10.30 2.27	64.9 2.6	2.30 0.07	49.5 1.3	10.37 0.11	80.5 1.5
21	8.03 1.56	62.3 3.0	2.23 0.04	48.2 1.5	10.26 0.06	79.0 1.9
31	6.47 0.80	59.3 3.1	2.19 0.00	46.7 1.8	10.20 0.03	77.1 2.2
June 10	5.67 0.02	56.2 3.2	2.19 0.03	44.9 1.9	10.17 0.00	74.9 2.3
20	5.65 0.76	53.0 3.2	2.22 0.07	43.0 1.9	10.17 0.05	72.6 2.4
30	6.41 1.53	49.8 3.2	2.29 0.11	41.1 2.0	10.22 0.09	70.2 2.5
July 10	7.94 2.27	46.6 3.0	2.40 0.15	39.1 1.9	10.31 0.13	67.7 2.4
20	10.21 2.94	43.6 2.8	2.55 0.18	37.2 1.9	10.44 0.16	65.3 2.4
30	13.15 3.54	40.8 2.6	2.73 0.20	35.3 1.7	10.60 0.19	62.9 2.2
Aug. 9	16.69 4.08	38.2 2.3	2.93 0.23	33.6 1.4	10.79 0.22	60.7 1.9
19	20.77 4.53	35.9 2.0	3.16 0.25	32.2 1.3	11.01 0.25	58.8 1.6
29	25.30 4.90	33.9 1.5	3.41 0.27	30.9 0.8	11.26 0.28	57.2 1.3
Sept. 8	30.20 5.19	32.4 1.2	3.68 0.28	30.1 0.4	11.54 0.29	55.9 0.7
18	35.39 5.36	31.2 0.6	3.96 0.29	29.7 0.1	11.83 0.31	55.2 0.1
28	40.75 5.42	30.6 0.1	4.25 0.30	29.8 0.5	12.14 0.32	55.1 0.4
Oct. 8	46.17 5.38	30.5 0.3	4.55 0.29	30.3 0.8	12.46 0.31	55.5 0.9
18	51.55 5.22	30.8 0.7	4.84 0.29	31.1 1.4	12.77 0.31	56.4 1.4
28	56.77 4.96	31.5 1.1	5.13 0.28	32.5 1.8	13.08 0.30	57.8 1.9
Nov. 7	61.72 4.53	32.6 1.7	5.41 0.27	34.3 2.0	13.38 0.29	59.7 2.3
17	66.25 4.00	34.3 2.2	5.68 0.25	36.3 2.3	13.67 0.26	62.0 2.6
27	70.25 3.35	36.5 2.5	5.93 0.22	38.6 2.5	13.93 0.23	64.6 2.8
Dec. 7	73.60 2.61	39.0 2.8	6.15 0.18	41.1 2.5	14.16 0.19	67.4 3.0
17	76.21 1.78	41.8 3.1	6.33 0.13	43.6 2.6	14.35 0.14	70.4 3.1
27	77.99 0.87	44.9 3.0	6.46 0.08	46.2 2.5	14.49 0.09	73.5 3.0
37	78.86	47.9	6.54	48.7	14.58	76.5

after the 23d of March it begins at the Sidereal Ob. before the Mean Noon.

APPARENT PLACES OF THE PRINCIPAL FIXED STARS, FOR THE UPPER
TRANSIT AT WASHINGTON.

Sidereal Day of the Month.	δ Geminorum.		α^2 GEMINORUM. (Castor.)		α CANIS MINORIS. (Procyon.)	
	Right Ascension.	Dec. North.	Right Ascension.	Dec. North.	Right Ascension.	Dec. North.
	^h 7 ^m 11	22° 13'	^h 7 ^m 25	32° 11'	^h 7 ^m 32	5° 34'
Jan. 1	51.84 0.13	63.4 0.2	46.16 0.16	18.1 0.5	3.79 0.13	41.0 1.3
11	51.97 0.08	63.2 0.1	46.32 0.10	18.6 0.5	3.92 0.08	39.7 1.1
21	52.05 0.02	63.1 0.1	46.42 0.04	19.1 0.6	4.00 0.04	38.6 1.0
31	52.07 0.03	63.2 0.1	46.46 0.02	19.7 0.7	4.04 0.01	37.6 0.8
Feb. 10	52.04 0.07	63.3 0.3	46.44 0.08	20.4 0.7	4.03 0.06	36.8 0.6
20	51.97 0.12	63.6 0.2	46.36 0.12	21.1 0.7	3.97 0.10	36.2 0.5
March 2	51.85 0.15	63.8 0.2	46.24 0.16	21.8 0.6	3.87 0.13	35.7 0.3
12	51.70 0.17	64.0 0.2	46.08 0.18	22.4 0.5	3.74 0.15	35.4 0.2
22	51.53 0.18	64.2 0.2	45.90 0.19	22.9 0.3	3.59 0.17	35.2 0.0
April 1	51.35 0.17	64.4 0.1	45.71 0.19	23.2 0.2	3.42 0.17	35.2 0.1
11	51.18 0.16	64.5 0.1	45.52 0.18	23.4 0.1	3.25 0.15	35.3 0.2
21	51.02 0.15	64.6 0.0	45.34 0.17	23.5 0.2	3.10 0.14	35.5 0.3
May 1	50.87 0.12	64.6 0.0	45.17 0.14	23.3 0.3	2.96 0.12	35.8 0.4
11	50.75 0.08	64.6 0.1	45.03 0.10	23.0 0.4	2.84 0.09	36.2 0.4
21	50.67 0.03	64.5 0.2	44.93 0.05	22.6 0.5	2.75 0.05	36.6 0.5
31	50.64 0.00	64.3 0.1	44.88 0.01	22.1 0.6	2.70 0.02	37.1 0.6
June 10	50.64 0.04	64.2 0.2	44.87 0.03	21.5 0.7	2.68 0.01	37.7 0.7
20	50.68 0.07	64.0 0.2	44.90 0.06	20.8 0.8	2.69 0.05	38.4 0.7
30	50.75 0.12	63.8 0.2	44.96 0.09	20.0 0.8	2.74 0.08	39.1 0.7
July 10	50.87 0.15	63.6 0.2	45.05 0.14	19.2 0.8	2.82 0.11	39.8 0.7
20	51.02 0.18	63.4 0.2	45.19 0.19	18.4 0.9	2.93 0.14	40.5 0.6
30	51.20 0.20	63.2 0.3	45.38 0.22	17.5 0.9	3.07 0.17	41.1 0.5
Aug. 9	51.40 0.23	62.9 0.3	45.60 0.24	16.6 0.9	3.24 0.20	41.6 0.4
19	51.63 0.26	62.6 0.3	45.84 0.26	15.7 0.9	3.44 0.22	42.0 0.3
29	51.89 0.28	62.3 0.5	46.10 0.29	14.8 0.9	3.66 0.23	42.3 0.1
Sept. 8	52.17 0.29	61.8 0.5	46.39 0.31	13.9 0.9	3.89 0.26	42.4 0.2
18	52.46 0.31	61.3 0.6	46.70 0.33	13.0 0.9	4.15 0.28	42.2 0.5
28	52.77 0.31	60.7 0.7	47.03 0.34	12.1 0.9	4.43 0.29	41.7 0.7
Oct. 8	53.08 0.33	60.0 0.8	47.37 0.35	11.2 0.8	4.72 0.30	41.0 0.9
18	53.41 0.33	59.2 0.8	47.72 0.37	10.4 0.8	5.02 0.30	40.1 1.0
28	53.74 0.32	58.4 0.8	48.09 0.36	9.6 0.7	5.32 0.31	39.1 1.2
Nov. 7	54.06 0.31	57.6 0.8	48.45 0.35	8.9 0.6	5.63 0.30	37.9 1.5
17	54.37 0.31	56.8 0.8	48.80 0.34	8.3 0.4	5.93 0.28	36.4 1.6
27	54.68 0.29	56.0 0.7	49.14 0.31	7.9 0.3	6.21 0.27	34.8 1.6
Dec. 7	54.97 0.24	55.3 0.5	49.45 0.28	7.6 0.1	6.48 0.24	33.2 1.6
17	55.21 0.20	54.8 0.5	49.73 0.23	7.5 0.1	6.72 0.20	31.6 1.5
27	55.41 0.16	54.3 0.3	49.96 0.18	7.6 0.3	6.92 0.16	30.1 1.4
37	55.57	54.0	50.14	7.9	7.08	28.7

NOTE. — Before the 23d of March the Sidereal day of the Month begins at the Sidereal Oh. after the Mean Noon ;

APPARENT PLACES OF THE PRINCIPAL FIXED STARS, FOR THE UPPER TRANSIT AT WASHINGTON.

Sidereal Day of the Month.	♌ Geminorum. (Pollux.)		15 Argus.		♉ Hydre.	
	Right Ascension.	Dec. North.	Right Ascension.	Dec. South.	Right Ascension.	Dec. North.
	h m	° ' "	h m	° ' "	h m	° ' "
	7 36	28 21	8 1	23 54	8 39	6 55
Jan. 1	51.09 0.16	26.6 0.1	39.68 0.15	20.3 2.9	27.07 0.20	30.7 1.5
11	51.25 0.11	26.7 0.2	39.83 0.09	23.2 2.8	27.27 0.15	29.2 1.3
21	51.36 0.05	26.9 0.4	39.92 0.04	26.0 2.7	27.42 0.10	27.9 1.0
31	51.41 0.01	27.3 0.5	39.96 0.02	28.7 2.4	27.52 0.05	26.9 0.8
Feb. 10	51.40 0.06	27.8 0.6	39.94 0.07	31.1 2.1	27.57 0.00	26.1 0.6
20	51.34 0.11	28.4 0.6	39.87 0.10	33.2 1.8	27.57 0.05	25.5 0.4
March 2	51.23 0.14	29.0 0.5	39.77 0.13	35.0 1.4	27.52 0.08	25.1 0.2
12	51.09 0.17	29.5 0.5	39.64 0.16	36.4 1.1	27.44 0.11	24.9 0.1
22	50.92 0.18	30.0 0.4	39.48 0.19	37.5 0.7	27.33 0.13	24.8 0.0
April 1	50.74 0.18	30.4 0.2	39.29 0.19	38.2 0.4	27.20 0.15	24.8 0.2
11	50.56 0.18	30.6 0.1	39.10 0.19	38.6 0.0	27.05 0.15	25.0 0.2
21	50.38 0.17	30.7 0.0	38.91 0.18	38.6 0.4	26.90 0.15	25.2 0.4
May 1	50.21 0.14	30.7 0.1	38.73 0.16	38.2 0.7	26.75 0.13	25.6 0.5
11	50.07 0.10	30.6 0.2	38.57 0.13	37.5 1.0	26.62 0.11	26.1 0.4
21	49.97 0.06	30.4 0.4	38.44 0.10	36.5 1.4	26.51 0.09	26.5 0.4
31	49.91 0.02	30.0 0.5	38.34 0.07	35.1 1.5	26.42 0.07	26.9 0.5
June 10	49.89 0.02	29.5 0.5	38.27 0.04	33.6 1.8	26.35 0.03	27.4 0.5
20	49.91 0.05	29.0 0.5	38.23 0.01	31.8 2.0	26.32 0.00	27.9 0.5
30	49.96 0.09	28.5 0.6	38.22 0.02	29.8 2.1	26.32 0.03	28.4 0.5
July 10	50.05 0.12	27.9 0.6	38.24 0.07	27.7 2.1	26.35 0.05	28.9 0.5
20	50.17 0.16	27.3 0.7	38.31 0.10	25.6 2.0	26.40 0.08	29.4 0.4
30	50.33 0.20	26.6 0.7	38.41 0.14	23.6 1.9	26.48 0.11	29.8 0.3
Aug. 9	50.53 0.22	25.9 0.8	38.55 0.16	21.7 1.8	26.59 0.13	30.1 0.2
19	50.75 0.24	25.1 0.8	38.71 0.18	19.9 1.6	26.72 0.17	30.3 0.0
29	50.99 0.27	24.8 0.8	38.89 0.21	18.3 1.3	26.89 0.20	30.3 0.1
Sept. 8	51.26 0.29	23.5 0.9	39.10 0.25	17.0 0.9	27.09 0.22	30.2 0.4
18	51.55 0.31	22.6 0.9	39.35 0.28	16.1 0.4	27.31 0.24	29.8 0.6
28	51.86 0.33	21.7 1.0	39.63 0.30	15.7 0.1	27.55 0.26	29.2 0.8
Oct. 8	52.19 0.34	20.7 1.0	39.93 0.30	15.8 0.6	27.81 0.29	28.4 1.1
18	52.53 0.35	19.7 0.9	40.23 0.31	16.4 1.0	28.10 0.30	27.3 1.3
28	52.88 0.35	18.8 0.9	40.54 0.32	17.4 1.5	28.40 0.32	26.0 1.5
Nov. 7	53.23 0.34	17.9 0.8	40.86 0.31	18.9 1.9	28.72 0.32	24.5 1.6
17	53.57 0.33	17.1 0.7	41.17 0.32	20.8 2.3	29.04 0.31	22.9 1.7
27	53.90 0.30	16.4 0.5	41.49 0.29	23.1 2.6	29.35 0.30	21.2 1.8
Dec. 7	54.20 0.28	15.9 0.3	41.78 0.25	25.7 2.8	29.65 0.29	19.4 1.7
17	54.48 0.24	15.6 0.2	42.08 0.21	28.5 3.0	29.94 0.26	17.7 1.7
27	54.72 0.19	15.4 0.0	42.24 0.17	31.5 2.9	30.20 0.22	16.0 1.5
37	54.91	15.4	42.41	34.4	30.42	14.5

after the 23d of March it begins at the Sidereal On. by/w/s the Mean Noon.

APPARENT PLACES OF THE PRINCIPAL FIXED STARS, FOR THE UPPER TRANSIT AT WASHINGTON.

Sidereal Day of the Month.	♋ Ursæ Majoris.		♌ Argus.		♍ HYDRÆ.	
	Right Ascension.	Dec. North.	Right Ascension.	Dec. South.	Right Ascension.	Dec. South.
	h m	° ′	h m	° ′	h m	° ′
	8 49	48 34	9 13	58 41	9 20	8 3
Jan. 1	43.61 0.29	52.9 0.9	24.44 0.27	25.7 3.8	47.35 0.23	32.3 2.3
11	43.90 0.23	53.8 1.2	24.71 0.19	29.5 3.8	47.58 0.18	34.6 2.2
21	44.13 0.16	55.0 1.5	24.90 0.11	33.3 3.9	47.76 0.13	36.8 2.0
31	44.29 0.08	56.5 1.6	25.01 0.02	37.2 3.8	47.89 0.08	38.8 1.8
Feb. 10	44.37 0.00	58 1 1.7	25.08 0.05	41.0 3.6	47.97 0.04	40.6 1.6
20	44.37 0.08	59.8 1.8	24.98 0.13	44.6 3.4	48.01 0.01	42.2 1.3
March 2	44.29 0.13	61.6 1.7	24.85 0.20	48.0 3.1	48.00 0.05	43.5 1.0
12	44.16 0.17	63.3 1.5	24.65 0.25	51.1 2.7	47.95 0.09	44.5 0.8
22	43.99 0.21	64.8 1.2	24.40 0.30	53.8 2.3	47.86 0.11	45.3 0.6
April 1	43.78 0.24	66.0 1.0	24.10 0.32	56.1 1.8	47.75 0.13	45.9 0.3
11	43.54 0.25	67.0 0.7	23.78 0.34	57.9 1.4	47.62 0.14	46.2 0.0
21	43.29 0.24	67.7 0.4	23.44 0.36	59.3 0.8	47.48 0.14	46.2 0.1
May 1	43.05 0.22	68.1 0.0	23.08 0.35	60.1 0.3	47.34 0.13	46.1 0.3
11	42.83 0.20	68.1 0.4	22.73 0.34	60.4 0.3	47.21 0.12	45.8 0.5
21	42.63 0.18	67.7 0.7	22.39 0.32	60.1 0.7	47.09 0.11	45.3 0.7
31	42.45 0.14	67.0 1.0	22.07 0.29	59.4 1.1	46.98 0.09	44.6 0.9
June 10	42.31 0.09	66.0 1.2	21.78 0.26	58.3 1.6	46.89 0.07	43.7 0.9
20	42.22 0.03	64.8 1.4	21.52 0.22	56.7 2.1	46.82 0.04	42.8 0.9
30	42.19 0.01	63.4 1.7	21.30 0.17	54.6 2.4	46.78 0.02	41.9 1.1
July 10	42.20 0.05	61.7 1.9	21.13 0.11	52.2 2.5	46.76 0.01	40.8 1.1
20	42.25 0.08	59.8 2.0	21.02 0.05	49.7 2.9	46.77 0.04	39.7 1.2
30	42.33 0.13	57.8 2.1	20.97 0.01	46.8 3.0	46.81 0.06	38.5 1.1
Aug. 9	42.46 0.18	55.7 2.1	20.98 0.08	43.8 2.9	46.87 0.09	37.4 1.1
19	42.64 0.22	53.6 2.2	21.06 0.15	40.9 2.9	46.96 0.13	36.3 0.8
29	42.86 0.25	51.4 2.2	21.21 0.21	38.0 2.7	47.09 0.15	35.5 0.5
Sept. 8	43.11 0.30	49.2 2.2	21.42 0.27	35.3 2.3	47.24 0.18	35.0 0.3
18	43.41 0.34	47.0 2.1	21.69 0.34	33.0 1.8	47.42 0.20	34.7 0.0
28	43.75 0.37	44.9 2.0	22.03 0.39	31.2 1.4	47.62 0.23	34.7 0.3
Oct. 8	44.12 0.40	42.9 1.8	22.42 0.44	29.8 0.7	47.85 0.27	35.0 0.6
18	44.52 0.43	41.1 1.6	22.86 0.48	29.1 0.1	48.12 0.29	35.6 1.1
28	44.95 0.44	39.5 1.4	23.34 0.50	29.0 0.5	48.41 0.31	36.7 1.4
Nov. 7	45.39 0.45	38.1 1.1	23.84 0.51	29.5 1.1	48.72 0.32	38.1 1.7
17	45.84 0.45	37.0 0.8	24.35 0.50	30.6 1.8	49.04 0.32	39.8 1.9
27	46.29 0.44	36.2 0.3	24.85 0.47	32.4 2.4	49.36 0.32	41.7 2.2
Dec. 7	46.73 0.41	35.9 0.0	25.32 0.44	34.8 2.9	49.68 0.30	43.9 2.3
17	47.14 0.37	35.9 0.3	25.76 0.38	37.7 3.2	49.98 0.29	46.2 2.3
27	47.51 0.32	36.2 0.7	26.14 0.31	40.9 3.6	50.27 0.25	48.5 2.4
37	47.83	36.9	26.45	44.5	50.52	50.9

NOTE. — Before the 23d of March the Sidereal day of the Month begins at the Sidereal Oh. after the Mean Noon;

APPARENT PLACES OF THE PRINCIPAL FIXED STARS, FOR THE UPPER TRANSIT AT WASHINGTON.

Sidereal Day of the Month.	δ Ursae Majoris		ε Leonis.		α LEONIS. (Regulus.)	
	Right Ascension.	Dec. North.	Right Ascension.	Dec. North.	Right Ascension.	Dec. North.
	h m 9 23	52° 17'	h m 9 37	24° 24'	h m 10 0	12° 38'
Jan. 1	35.56 0.35	75.2 0.9	59.62 0.26	34.0 0.7	59.93 0.28	32.9 1.4
11	35.91 0.28	76.1 1.2	59.88 0.23	33.3 0.4	60.21 0.23	31.5 1.2
21	36.19 0.20	77.3 1.5	60.11 0.18	32.9 0.2	60.44 0.18	30.3 1.1
31	36.39 0.13	78.8 1.8	60.29 0.12	32.7 0.2	60.62 0.13	29.2 0.7
Feb. 10	36.52 0.05	80.6 1.9	60.41 0.06	32.9 0.4	60.75 0.06	28.5 0.3
20	36.57 0.02	82.5 2.0	60.47 0.01	33.3 0.5	60.83 0.04	28.2 0.0
March 2	36.55 0.09	84.5 2.0	60.48 0.03	33.8 0.7	60.87 0.01	28.2 0.1
12	36.46 0.16	86.5 1.8	60.45 0.07	34.5 0.8	60.86 0.05	28.3 0.2
22	36.30 0.21	88.3 1.6	60.38 0.11	35.3 0.9	60.81 0.08	28.5 0.4
April 1	36.09 0.23	89.9 1.4	60.27 0.13	36.2 0.9	60.73 0.10	28.9 0.5
11	35.86 0.25	91.3 1.0	60.14 0.14	37.1 0.7	60.63 0.12	29.4 0.5
21	35.61 0.28	92.3 0.7	60.00 0.16	37.8 0.6	60.51 0.13	29.9 0.6
May 1	35.33 0.26	93.0 0.3	59.84 0.15	38.4 0.5	60.38 0.13	30.5 0.5
11	35.07 0.24	93.3 0.1	59.69 0.14	38.9 0.4	60.25 0.12	31.0 0.5
21	34.83 0.21	93.2 0.5	59.55 0.11	39.3 0.3	60.13 0.11	31.5 0.5
31	34.62 0.18	92.7 0.9	59.44 0.09	39.6 0.2	60.02 0.10	32.0 0.4
June 10	34.44 0.15	91.8 1.2	59.35 0.08	39.8 0.1	59.92 0.08	32.4 0.4
20	34.29 0.10	90.6 1.3	59.27 0.06	39.7 0.3	59.84 0.06	32.8 0.3
30	34.19 0.06	89.3 1.7	59.21 0.02	39.4 0.4	59.78 0.04	33.1 0.2
July 10	34.13 0.01	87.6 2.0	59.19 0.00	39.0 0.5	59.74 0.02	33.3 0.1
20	34.12 0.03	85.6 2.3	59.19 0.03	38.5 0.7	59.72 0.01	33.4 0.1
30	34.15 0.09	83.3 2.4	59.22 0.05	37.8 0.8	59.73 0.04	33.3 0.2
Aug. 9	34.24 0.13	80.9 2.5	59.27 0.09	37.0 0.9	59.77 0.06	33.1 0.3
19	34.37 0.18	78.4 2.5	59.36 0.12	36.1 1.1	59.83 0.08	32.8 0.4
29	34.55 0.22	75.9 2.5	59.48 0.15	35.0 1.3	59.91 0.12	32.4 0.6
Sept. 8	34.77 0.27	73.4 2.5	59.63 0.18	33.7 1.4	60.03 0.15	31.8 0.8
18	35.04 0.31	70.9 2.5	59.81 0.21	32.3 1.6	60.18 0.17	31.0 1.1
28	35.35 0.36	68.4 2.5	60.02 0.25	30.7 1.7	60.35 0.21	29.9 1.3
Oct. 8	35.71 0.40	65.9 2.3	60.27 0.28	29.0 1.8	60.56 0.25	28.6 1.5
18	36.11 0.43	63.6 2.0	60.55 0.30	27.2 1.8	60.81 0.27	27.1 1.6
28	36.54 0.45	61.6 1.8	60.85 0.33	25.4 1.8	61.08 0.30	25.5 1.7
Nov. 7	36.99 0.47	59.8 1.4	61.18 0.34	23.6 1.8	61.38 0.32	23.8 1.7
17	37.46 0.48	58.4 1.1	61.52 0.35	21.8 1.7	61.70 0.33	22.1 1.8
27	37.94 0.47	57.3 0.7	61.87 0.35	20.1 1.6	62.03 0.33	20.3 2.0
Dec. 7	38.41 0.46	56.6 0.3	62.22 0.34	18.5 1.4	62.36 0.33	18.3 2.0
17	38.87 0.43	56.3 0.2	62.56 0.33	17.1 1.2	62.69 0.32	16.3 1.9
27	39.30 0.38	56.5 0.6	62.89 0.29	15.9 0.9	63.01 0.29	14.4 1.6
37	39.68	57.1	63.18	15.0	63.30	12.8

after the 22d of March it begins at the Sidereal Oh. before the Mean Noon.

APPARENT PLACES OF THE PRINCIPAL FIXED STARS, FOR THE UPPER
TRANSIT AT WASHINGTON.

Sidereal Day of the Month.	γ ARGUS.		α URSE MAJORIS		δ LEONIS.	
	Right Ascension.	Dec. South.	Right Ascension.	Dec. North.	Right Ascension.	Dec. North.
	^h 10 ^m 39	58° 57'	^h 10 ^m 55	62° 29'	^h 11 ^m 6	21° 16'
Jan. 1	42.35 0.42	4.9 3.2	10.18 0.55	39.2 0.4	44.44 0.32	51.1 1.3
11	42.77 0.36	8.1 3.5	10.73 0.48	39.6 0.9	44.76 0.29	49.8 1.0
21	43.13 0.28	11.6 3.6	11.21 0.41	40.5 1.4	45.05 0.25	48.8 0.8
31	43.41 0.20	15.2 3.8	11.62 0.32	41.9 1.9	45.30 0.20	48.0 0.3
Feb. 10	43.61 0.13	19.0 3.8	11.94 0.23	43.8 2.2	45.50 0.15	47.7 0.0
20	43.74 0.05	22.8 3.7	12.17 0.13	46.0 2.4	45.65 0.11	47.7 0.4
March 2	43.79 0.02	26.5 3.5	12.30 0.04	48.4 2.6	45.76 0.06	48.1 0.6
12	43.77 0.08	30.0 3.3	12.34 0.06	51.0 2.6	45.82 0.01	48.7 0.8
22	43.69 0.15	33.3 3.1	12.28 0.14	53.6 2.5	45.83 0.03	49.5 0.9
April 1	43.54 0.20	36.4 2.7	12.14 0.21	56.1 2.3	45.80 0.05	50.4 1.0
11	43.34 0.23	39.1 2.2	11.93 0.26	58.4 2.1	45.75 0.08	51.4 1.1
21	43.11 0.27	41.3 1.8	11.67 0.30	60.5 1.7	45.67 0.10	52.5 1.0
May 1	42.84 0.29	43.1 1.4	11.37 0.34	62.2 1.3	45.57 0.11	53.5 0.9
11	42.55 0.30	44.5 0.8	11.03 0.35	63.5 0.9	45.46 0.12	54.4 0.9
21	42.25 0.30	45.3 0.4	10.68 0.36	64.4 0.3	45.34 0.13	55.3 0.7
31	41.95 0.30	45.7 0.1	10.32 0.34	64.7 0.2	45.21 0.12	56.0 0.5
June 10	41.65 0.30	45.6 0.6	9.98 0.32	64.5 0.6	45.09 0.11	56.5 0.4
20	41.35 0.28	45.0 1.1	9.66 0.29	63.9 1.0	44.98 0.09	56.9 0.2
30	41.07 0.25	43.9 1.5	9.37 0.25	62.9 1.5	44.89 0.06	57.1 0.0
July 10	40.82 0.21	42.4 2.0	9.12 0.21	61.4 1.9	44.81 0.07	57.1 0.2
20	40.61 0.18	40.4 2.4	8.91 0.16	59.5 2.3	44.74 0.05	56.9 0.4
30	40.43 0.13	38.0 2.6	8.75 0.11	57.2 2.6	44.69 0.03	56.5 0.6
Aug. 9	40.30 0.06	35.4 2.7	8.64 0.06	54.6 2.8	44.66 0.01	55.9 0.8
19	40.24 0.00	32.7 2.8	8.58 0.00	51.8 3.0	44.65 0.02	55.1 1.0
29	40.24 0.06	29.9 2.8	8.58 0.06	48.8 3.2	44.67 0.05	54.1 1.2
Sept. 8	40.30 0.14	27.1 2.6	8.66 0.14	45.6 3.3	44.72 0.08	52.9 1.4
18	40.44 0.21	24.5 2.4	8.80 0.20	42.3 3.5	44.80 0.12	51.5 1.7
28	40.65 0.28	22.1 2.0	9.00 0.28	38.8 3.4	44.92 0.16	49.8 1.9
Oct. 8	40.93 0.35	20.1 1.6	9.28 0.35	35.4 3.2	45.08 0.20	47.9 2.0
18	41.28 0.42	18.5 1.1	9.63 0.41	32.2 3.0	45.28 0.23	45.9 2.2
28	41.70 0.47	17.4 0.6	10.04 0.47	29.2 2.8	45.51 0.27	43.7 2.3
Nov. 7	42.17 0.50	16.8 0.1	10.51 0.52	26.4 2.4	45.78 0.30	41.4 2.2
17	42.67 0.53	16.9 0.8	11.03 0.56	24.0 2.1	46.08 0.33	39.2 2.2
27	43.20 0.54	17.7 1.4	11.59 0.59	21.9 1.7	46.41 0.35	37.0 2.1
Dec. 7	43.74 0.53	19.1 1.9	12.18 0.60	20.2 1.1	46.76 0.35	34.9 2.0
17	44.27 0.49	21.0 2.5	12.78 0.59	19.1 0.6	47.11 0.35	32.9 1.8
27	44.76 0.45	23.5 3.0	13.37 0.56	18.5 0.1	47.46 0.34	31.1 1.6
37	45.21	26.5	13.93	18.6	47.80	29.5

NOTE. — Before the 23d of March the Sidereal day of the Month begins at the Sidereal Oh. after the Mean Noon;

APPARENT PLACES OF THE PRINCIPAL FIXED STARS, FOR THE UPPER TRANSIT AT WASHINGTON.

Sidereal Day of the Month.	δ Hydre et Crateris.		β LEONIS.		γ URSE MAJORIS.	
	Right Ascension.	Dec. South.	Right Ascension.	Dec. North.	Right Ascension.	Dec. North.
	h ^h m ^m	14° 1'	h ^h m ^m	15° 20'	h ^h m ^m	54° 27'
Jan. 1	25.03 0.31	39.7 2.5	59.45 0.32	43.2 1.7	32.08 0.48	39.6 0.6
11	25.34 0.28	42.2 2.4	59.77 0.30	41.5 1.4	32.56 0.44	39.0 0.1
21	25.62 0.24	44.6 2.3	60.07 0.28	40.1 1.1	33.00 0.41	39.1 0.6
31	25.86 0.19	46.9 2.2	60.35 0.23	39.0 0.8	33.41 0.34	39.7 1.2
Feb. 10	26.05 0.15	49.1 2.0	60.58 0.19	38.2 0.4	33.75 0.26	40.9 1.6
20	26.20 0.11	51.1 1.9	60.77 0.13	37.8 0.1	34.01 0.20	42.5 2.0
March 2	26.31 0.06	53.0 1.6	60.90 0.09	37.7 0.2	34.21 0.12	44.5 2.3
12	26.37 0.02	54.6 1.3	60.99 0.05	37.9 0.5	34.33 0.05	46.8 2.4
22	26.39 0.02	55.9 1.0	61.04 0.01	38.4 0.7	34.38 0.02	49.2 2.5
April 1	26.37 0.04	56.9 0.8	61.05 0.03	39.1 0.8	34.36 0.08	51.7 2.4
11	26.33 0.07	57.7 0.5	61.02 0.05	39.9 0.9	34.28 0.13	54.1 2.3
21	26.26 0.09	58.2 0.3	60.97 0.07	40.8 0.9	34.15 0.18	56.4 2.2
May 1	26.17 0.10	58.5 0.1	60.90 0.09	41.7 0.9	33.97 0.21	58.6 1.8
11	26.07 0.10	58.6 0.1	60.81 0.10	42.6 0.9	33.76 0.24	60.4 1.4
21	25.97 0.11	58.5 0.3	60.71 0.10	43.5 0.9	33.52 0.25	61.8 1.1
31	25.86 0.11	58.2 0.5	60.61 0.11	44.4 0.8	33.27 0.25	62.9 0.6
June 10	25.75 0.10	57.7 0.6	60.50 0.10	45.2 0.6	33.02 0.25	63.5 0.1
20	25.65 0.10	57.1 0.7	60.40 0.10	45.8 0.4	32.77 0.25	63.6 0.3
30	25.55 0.09	56.4 0.9	60.30 0.09	46.2 0.3	32.52 0.23	63.3 0.7
July 10	25.46 0.07	55.5 1.1	60.21 0.09	46.5 0.1	32.29 0.21	62.6 1.1
20	25.39 0.05	54.4 1.3	60.12 0.08	46.6 0.1	32.08 0.18	61.5 1.6
30	25.34 0.04	53.1 1.2	60.04 0.06	46.5 0.2	31.90 0.15	59.9 2.0
Aug. 9	25.30 0.02	51.9 1.0	59.98 0.04	46.3 0.5	31.75 0.11	57.9 2.3
19	25.28 0.01	50.9 0.9	59.94 0.01	45.8 0.7	31.64 0.07	55.6 2.6
29	25.29 0.04	50.0 0.8	59.93 0.01	45.1 0.8	31.57 0.03	53.0 2.8
Sept. 8	25.33 0.07	49.2 0.7	59.94 0.04	44.3 1.1	31.54 0.02	50.2 3.1
18	25.40 0.11	48.5 0.5	59.98 0.08	43.2 1.3	31.56 0.08	47.1 3.2
28	25.51 0.15	48.0 0.2	60.06 0.12	41.9 1.6	31.64 0.15	43.9 3.4
Oct. 8	25.66 0.19	47.8 0.2	60.18 0.16	40.3 1.8	31.79 0.20	40.5 3.4
18	25.85 0.24	48.0 0.6	60.34 0.20	38.5 2.0	31.99 0.26	37.1 3.3
28	26.09 0.27	48.6 1.0	60.54 0.23	36.5 2.1	32.25 0.32	33.8 3.2
Nov. 7	26.36 0.30	49.6 1.3	60.77 0.27	34.4 2.2	32.57 0.37	30.6 2.9
17	26.66 0.31	50.9 1.6	61.04 0.30	32.2 2.2	32.94 0.43	27.7 2.7
27	26.97 0.33	52.5 1.8	61.34 0.33	30.0 2.3	33.37 0.46	25.0 2.3
Dec. 7	27.30 0.35	54.3 2.2	61.67 0.34	27.7 2.2	33.83 0.47	22.7 1.9
17	27.65 0.33	56.5 2.3	62.01 0.34	25.5 2.1	34.30 0.49	20.8 1.4
27	27.98 0.32	58.8 2.5	62.35 0.33	23.4 1.9	34.79 0.49	19.4 0.8
37	28.30	61.3	62.68	21.5	35.28	18.6

after the 22d of March it begins at the Sidereal Oh. before the Mean Noon.

APPARENT PLACES OF THE PRINCIPAL FIXED STARS, FOR THE UPPER TRANSIT AT WASHINGTON.

Sidereal Day of the Month.	β Chamæleonis.		α ¹ Crucis.		β Corvi.	
	Right Ascension.	Dec. South.	Right Ascension.	Dec. South.	Right Ascension.	Dec. South.
	^h 12 ^m 10	78° 32'	^h 12 ^m 18	62° 19'	^h 12 ^m 27	22° 37'
Jan. 1	17.02 1.19	12.8 1.9	54.83 0.59	29.4 2.1	6.39 0.36	40.0 2.3
11	18.21 1.09	14.7 2.4	54.92 0.54	31.5 2.5	6.75 0.33	42.3 2.4
21	19.30 0.99	17.1 2.9	55.46 0.50	34.0 2.9	7.08 0.30	44.7 2.4
31	20.29 0.85	20.0 3.3	55.96 0.43	36.9 3.2	7.38 0.27	47.1 2.4
Feb. 10	21.14 0.68	23.3 3.5	56.39 0.35	40.1 3.4	7.65 0.23	49.5 2.3
20	21.82 0.51	26.8 3.8	56.74 0.28	43.5 3.5	7.88 0.18	51.8 2.2
March 2	22.33 0.36	30.6 3.9	57.02 0.20	47.0 3.6	8.06 0.14	54.0 2.0
12	22.69 0.19	34.5 3.8	57.22 0.13	50.6 3.5	8.20 0.10	56.0 1.8
22	22.88 0.01	38.3 3.8	57.35 0.07	54.1 3.5	8.30 0.07	57.8 1.5
April 1	22.89 0.15	42.1 3.7	57.42 0.00	57.6 3.3	8.37 0.03	59.3 1.3
11	22.74 0.29	45.8 3.4	57.42 0.07	60.9 3.0	8.40 0.00	60.6 1.1
21	22.45 0.43	49.2 3.1	57.35 0.12	63.9 2.6	8.40 0.02	61.7 0.9
May 1	22.02 0.55	52.3 2.8	57.23 0.17	66.5 2.3	8.38 0.05	62.6 0.6
11	21.47 0.66	55.1 2.4	57.06 0.22	68.8 1.9	8.33 0.07	63.2 0.4
21	20.81 0.75	57.5 1.9	56.84 0.26	70.7 1.5	8.26 0.08	63.6 0.2
31	20.06 0.83	59.4 1.4	56.58 0.28	72.2 1.1	8.18 0.10	63.8 0.0
June 10	19.23 0.88	60.8 0.9	56.30 0.30	73.3 0.6	8.08 0.10	63.8 0.3
20	18.35 0.90	61.7 0.3	56.00 0.32	73.9 0.1	7.98 0.11	63.5 0.5
30	17.45 0.91	62.0 0.3	55.68 0.33	74.0 0.4	7.87 0.11	63.0 0.7
July 10	16.54 0.88	61.7 0.8	55.35 0.32	73.6 0.9	7.76 0.11	62.3 0.9
20	15.66 0.83	60.9 1.2	55.03 0.31	72.7 1.3	7.65 0.11	61.4 0.9
30	14.83 0.74	59.7 1.7	54.72 0.28	71.4 1.6	7.54 0.10	60.5 1.1
Aug. 9	14.09 0.63	58.0 2.2	54.44 0.23	69.8 2.1	7.44 0.08	59.4 1.2
19	13.46 0.48	55.8 2.5	54.21 0.18	67.7 2.4	7.36 0.07	58.2 1.3
29	12.98 0.33	53.3 2.8	54.03 0.12	65.3 2.6	7.29 0.04	56.9 1.2
Sept. 8	12.65 0.15	50.5 3.0	53.91 0.05	62.7 2.7	7.25 0.00	55.7 1.1
18	12.50 0.05	47.5 3.1	53.86 0.03	60.0 2.7	7.25 0.04	54.6 0.9
28	12.55 0.27	44.4 3.0	53.89 0.13	57.3 2.6	7.29 0.08	53.7 0.8
Oct. 8	12.82 0.47	41.4 2.7	54.02 0.23	54.7 2.4	7.37 0.13	52.9 0.5
18	13.29 0.67	38.7 2.4	54.25 0.31	52.3 2.1	7.50 0.17	52.4 0.1
28	13.96 0.84	36.3 2.1	54.56 0.39	50.2 1.6	7.67 0.22	52.3 0.2
Nov. 7	14.80 0.99	34.2 1.6	54.95 0.46	48.6 1.1	7.89 0.26	52.5 0.6
17	15.79 1.14	32.6 1.0	55.41 0.53	47.5 0.7	8.15 0.30	53.1 1.0
27	16.93 1.23	31.6 0.4	55.94 0.57	46.8 0.0	8.45 0.34	54.1 1.3
Dec. 7	18.16 1.25	31.2 0.3	56.51 0.60	46.8 0.6	8.79 0.35	55.4 1.7
17	19.41 1.26	31.5 0.9	57.11 0.61	47.4 1.3	9.14 0.34	57.1 1.9
27	20.67 1.23	32.4 1.6	57.72 0.60	48.7 1.8	9.48 0.35	59.0 2.2
37	21.90	34.0	58.32	50.5	9.83	61.2

NOTE. — Before the 22d of March the Sidereal day of the Month begins at the Sidereal Oh. after the Mean Noon;

APPARENT PLACES OF THE PRINCIPAL FIXED STARS, FOR THE UPPER TRANSIT AT WASHINGTON.

Sidereal Day of the Month.	12 Canum Venaticorum.		α VIRGINIS. (Spica.)		γ URSAE MAJORIS.	
	Right Ascension.	Dec. North.	Right Ascension.	Dec. South.	Right Ascension.	Dec. North.
	^h ^m 12 49	^o ['] 39 3	^h ^m 13 17	^o ['] 10 26	^h ^m 13 42	^o ['] 49 59
Jan. 1	32.21 0.40	50.1 1.5	53.20 0.33	10.9 2.0	4.03 0.43	65.7 1.9
11	32.61 0.38	48.6 1.1	53.55 0.33	12.9 2.0	4.46 0.44	63.8 1.3
21	32.99 0.35	47.5 0.6	53.88 0.31	14.9 2.0	4.90 0.43	62.5 0.7
31	33.34 0.32	46.9 0.0	54.19 0.28	16.9 1.9	5.33 0.40	61.8 0.1
Feb. 10	33.66 0.28	46.9 0.5	54.47 0.26	18.8 1.7	5.73 0.37	61.7 0.5
20	33.94 0.23	47.4 1.0	54.73 0.23	20.5 1.4	6.10 0.33	62.2 1.1
March 2	34.17 0.19	48.4 1.4	54.96 0.19	21.9 1.2	6.43 0.27	63.3 1.6
12	34.36 0.13	49.8 1.7	55.15 0.15	23.1 1.0	6.70 0.21	64.9 2.0
22	34.49 0.07	51.5 2.0	55.30 0.11	24.1 0.9	6.91 0.15	66.9 2.4
April 1	34.56 0.02	53.5 2.1	55.41 0.08	25.0 0.6	7.06 0.09	69.3 2.6
11	34.58 0.01	55.6 2.2	55.49 0.05	25.6 0.4	7.15 0.04	71.9 2.7
21	34.57 0.04	57.8 2.2	55.54 0.03	26.0 0.1	7.19 0.02	74.6 2.7
May 1	34.53 0.07	60.0 2.1	55.57 0.00	26.1 0.0	7.17 0.05	77.3 2.6
11	34.46 0.11	62.1 1.8	55.57 0.02	26.1 0.1	7.12 0.09	79.9 2.4
21	34.35 0.15	63.9 1.5	55.55 0.04	26.0 0.3	7.03 0.14	82.3 2.3
31	34.20 0.15	65.4 1.2	55.51 0.06	25.7 0.4	6.89 0.18	84.6 1.9
June 10	34.05 0.16	66.6 1.0	55.45 0.08	25.3 0.4	6.71 0.21	86.5 1.5
20	33.89 0.16	67.6 0.7	55.37 0.09	24.9 0.5	6.50 0.22	88.0 1.0
30	33.73 0.17	68.3 0.3	55.28 0.10	24.4 0.6	6.28 0.24	89.0 0.6
July 10	33.56 0.17	68.6 0.1	55.18 0.11	23.8 0.6	6.04 0.24	89.6 0.2
20	33.39 0.16	68.5 0.6	55.07 0.11	23.2 0.7	5.80 0.25	89.8 0.3
30	33.23 0.15	67.9 1.0	54.96 0.11	22.5 0.7	5.55 0.25	89.5 0.7
Aug. 9	33.08 0.13	66.9 1.3	54.85 0.10	21.8 0.6	5.30 0.23	88.8 1.2
19	32.95 0.12	65.6 1.6	54.75 0.10	21.2 0.6	5.07 0.22	87.6 1.6
29	32.83 0.09	64.0 1.9	54.65 0.08	20.6 0.5	4.85 0.19	86.0 1.9
Sept. 8	32.74 0.05	62.1 2.2	54.57 0.04	20.1 0.4	4.66 0.16	84.1 2.4
18	32.69 0.01	59.9 2.5	54.53 0.01	19.7 0.3	4.50 0.11	81.7 2.8
28	32.68 0.03	57.4 2.7	54.52 0.02	19.4 0.1	4.39 0.06	78.9 3.1
Oct. 8	32.71 0.09	54.7 2.9	54.54 0.06	19.3 0.3	4.33 0.01	75.8 3.2
18	32.80 0.14	51.8 3.1	54.60 0.12	19.6 0.4	4.32 0.05	72.6 3.4
28	32.94 0.19	48.7 3.2	54.72 0.17	20.0 0.8	4.37 0.12	69.2 3.5
Nov. 7	33.13 0.23	45.5 3.1	54.89 0.21	20.8 1.0	4.49 0.19	65.7 3.6
17	33.36 0.29	42.4 3.0	55.10 0.25	21.8 1.3	4.68 0.25	62.1 3.5
27	33.65 0.33	39.4 2.8	55.35 0.28	23.1 1.6	4.93 0.30	58.6 3.3
Dec. 7	33.98 0.35	36.6 2.6	55.63 0.31	24.7 1.7	5.23 0.35	55.3 2.9
17	34.33 0.38	34.0 2.3	55.94 0.33	26.4 1.9	5.58 0.40	52.4 2.6
27	34.71 0.40	31.7 1.8	56.27 0.34	28.3 2.0	5.98 0.43	49.8 2.2
37	35.11	29.9	56.61	30.3	6.41	47.6

after the 23d of March it begins at the Sidereal Oh. before the Mean Noon.

APPARENT PLACES OF THE PRINCIPAL FIXED STARS, FOR THE UPPER TRANSIT AT WASHINGTON.

Sidereal Day of the Month.	γ Bootis.		β Centauri.		α Bootis. (Arcturus).	
	Right Ascension.	Dec. North.	Right Ascension.	Dec. South.	Right Ascension.	Dec. North.
	^h 13 ^m 48	[°] 19 ['] 5	^h 13 ^m 54	[°] 59 ['] 41	^h 14 ^m 9	[°] 19 ['] 53
Jan. 1	4.59 0.34	30.3 2.2	3.07 0.58	51.9 0.8	19.76 0.33	72.5 2.3
11	4.93 0.34	28.1 1.8	3.65 0.58	52.7 1.3	20.09 0.34	70.2 1.9
21	5.27 0.33	26.3 1.5	4.23 0.56	54.0 1.8	20.43 0.33	68.3 1.6
31	5.60 0.31	24.8 1.1	4.79 0.53	55.8 2.1	20.76 0.31	66.7 1.1
Feb. 10	5.91 0.28	23.7 0.6	5.32 0.49	57.9 2.5	21.07 0.28	65.6 0.7
20	6.19 0.24	23.1 0.1	5.81 0.45	60.4 2.7	21.35 0.25	64.9 0.3
March 2	6.43 0.21	23.0 0.2	6.26 0.38	63.1 2.9	21.60 0.23	64.6 0.2
12	6.64 0.18	23.2 0.6	6.64 0.32	66.0 3.0	21.83 0.20	64.8 0.6
22	6.82 0.14	23.8 1.0	6.96 0.27	69.0 3.0	22.03 0.17	65.4 0.9
April 1	6.96 0.11	24.8 1.3	7.23 0.21	72.0 3.0	22.20 0.13	66.3 1.2
11	7.07 0.07	26.1 1.4	7.44 0.14	75.0 2.9	22.33 0.09	67.5 1.4
21	7.14 0.03	27.5 1.5	7.58 0.09	77.9 2.8	22.42 0.04	68.9 1.6
May 1	7.17 0.01	29.0 1.6	7.67 0.03	80.7 2.6	22.46 0.02	70.5 1.6
11	7.18 0.01	30.6 1.5	7.70 0.03	83.3 2.4	22.48 0.00	72.1 1.6
21	7.17 0.05	32.1 1.5	7.67 0.09	85.7 2.1	22.48 0.02	73.7 1.6
31	7.12 0.06	33.6 1.4	7.58 0.14	87.8 1.8	22.46 0.05	75.3 1.5
June 10	7.06 0.08	35.0 1.2	7.44 0.18	89.6 1.4	22.41 0.08	76.8 1.3
20	6.98 0.11	36.2 1.0	7.26 0.21	91.0 1.1	22.33 0.10	78.1 1.2
30	6.87 0.12	37.2 0.8	7.05 0.25	92.1 0.6	22.23 0.12	79.3 0.9
July 10	6.75 0.13	38.0 0.6	6.80 0.28	92.7 0.1	22.11 0.13	80.2 0.6
20	6.62 0.13	38.6 0.3	6.52 0.30	92.8 0.3	21.98 0.14	80.8 0.4
30	6.49 0.14	38.9 0.0	6.22 0.31	92.5 0.8	21.84 0.15	81.2 0.1
Aug. 9	6.35 0.13	38.9 0.2	5.91 0.30	91.7 1.2	21.69 0.15	81.3 0.2
19	6.22 0.12	38.7 0.5	5.61 0.28	90.5 1.6	21.54 0.14	81.1 0.4
29	6.10 0.11	38.2 0.8	5.33 0.24	88.9 1.8	21.40 0.13	80.7 0.7
Sept. 8	5.99 0.09	37.4 1.0	5.09 0.18	87.1 2.1	21.27 0.10	80.0 1.0
18	5.90 0.05	36.4 1.3	4.91 0.13	85.0 2.4	21.17 0.08	79.0 1.5
28	5.85 0.01	35.1 1.6	4.78 0.05	82.6 2.5	21.09 0.04	77.5 1.8
Oct. 8	5.84 0.02	33.5 1.9	4.73 0.03	80.1 2.4	21.05 0.01	75.7 1.9
18	5.86 0.06	31.6 2.2	4.76 0.13	77.7 2.4	21.04 0.04	73.8 2.1
28	5.92 0.11	29.4 2.4	4.89 0.22	75.3 2.2	21.06 0.09	71.7 2.3
Nov. 7	6.08 0.17	27.0 2.5	5.11 0.30	73.1 1.8	21.17 0.15	69.4 2.5
17	6.20 0.22	24.5 2.6	5.41 0.37	71.3 1.3	21.32 0.19	66.9 2.7
27	6.42 0.25	21.9 2.6	5.78 0.44	70.0 1.0	21.51 0.23	64.2 2.8
Dec. 7	6.67 0.29	19.3 2.6	6.22 0.51	69.0 0.6	21.74 0.27	61.4 2.7
17	6.96 0.32	16.7 2.5	6.73 0.55	68.4 0.0	22.01 0.30	58.7 2.6
27	7.28 0.33	14.2 2.3	7.28 0.58	68.4 0.6	22.31 0.33	56.1 2.4
37	7.61	11.9	7.86	69.0	22.64	53.7

NOTE. — Before the 23d of March the Sidereal day of the Month begins at the Sidereal Ob. after the Mean Noon;

APPARENT PLACES OF THE PRINCIPAL FIXED STARS, FOR THE UPPER TRANSIT AT WASHINGTON.

Sidereal Day of the Month.	α Centauri.		β Bootis.		γ Libræ.	
	Right Ascension.	Dec. South.	Right Ascension	Dec. North.	Right Ascension.	Dec. South.
	^h 14 ^m 30	60° 15'	^h 14 ^m 38	27° 39'	^h 14 ^m 43	15° 27'
Jan. 1	11.96 ^s 0.58	16.0 ^s 0.3	55.15 ^s 0.34	26.3 ^s 2.4	11.95 ^s 0.34	46.7 ^s 1.5
11	12.54 0.57	16.3 0.8	55.49 0.34	23.9 2.0	12.29 0.34	48.2 1.6
21	13.11 0.58	17.1 1.2	55.83 0.35	21.9 1.5	12.63 0.34	49.8 1.7
31	13.69 0.56	18.3 1.6	56.18 0.33	20.4 1.1	12.97 0.33	51.5 1.6
Feb. 10	14.25 0.53	19.9 1.9	56.51 0.32	19.3 0.5	13.30 0.31	53.1 1.5
20	14.78 0.49	21.8 2.2	56.83 0.28	18.8 0.1	13.61 0.29	54.6 1.4
March 2	15.27 0.43	24.0 2.5	57.11 0.26	18.7 0.4	13.90 0.26	56.0 1.2
12	15.70 0.38	26.5 2.7	57.37 0.23	19.1 0.9	14.16 0.23	57.2 1.0
22	16.08 0.33	29.2 2.8	57.60 0.19	20.0 1.3	14.39 0.19	58.2 0.8
April 1	16.41 0.27	32.0 2.9	57.79 0.16	21.3 1.6	14.58 0.17	59.0 0.6
11	16.68 0.21	34.9 2.8	57.95 0.12	22.9 1.9	14.75 0.15	59.6 0.5
21	16.89 0.16	37.7 2.7	58.07 0.08	24.8 2.1	14.90 0.12	60.1 0.3
May 1	17.05 0.10	40.4 2.6	58.15 0.05	26.9 2.1	15.02 0.09	60.4 0.2
11	17.15 0.03	43.0 2.5	58.20 0.02	29.0 2.1	15.11 0.06	60.6 0.0
21	17.18 0.04	45.5 2.2	58.22 0.02	31.1 2.1	15.17 0.02	60.6 0.0
31	17.14 0.10	47.7 2.0	58.20 0.04	33.2 1.9	15.19 0.00	60.6 0.1
June 10	17.04 0.15	49.7 1.7	58.16 0.07	35.1 1.7	15.19 0.03	60.5 0.2
20	16.89 0.19	51.4 1.3	58.09 0.11	36.8 1.6	15.16 0.05	60.3 0.3
30	16.70 0.24	52.7 0.9	57.98 0.13	38.4 1.3	15.11 0.08	60.0 0.4
July 10	16.46 0.28	53.6 0.5	57.85 0.15	39.7 0.9	15.03 0.10	59.6 0.4
20	16.18 0.32	54.1 0.1	57.70 0.16	40.6 0.5	14.93 0.12	59.2 0.5
30	15.86 0.33	54.2 0.4	57.54 0.17	41.1 0.2	14.81 0.14	58.7 0.5
Aug. 9	15.53 0.33	53.8 0.8	57.37 0.17	41.3 0.1	14.67 0.14	58.2 0.6
19	15.20 0.32	53.0 1.3	57.20 0.16	41.2 0.4	14.53 0.14	57.6 0.6
29	14.88 0.29	51.7 1.7	57.04 0.15	40.8 0.8	14.39 0.13	57.0 0.6
Sept. 8	14.50 0.26	50.0 1.9	56.89 0.14	40.0 1.1	14.26 0.11	56.4 0.5
18	14.33 0.21	48.1 2.2	56.75 0.12	38.9 1.6	14.15 0.09	55.9 0.5
28	14.12 0.13	45.9 2.3	56.63 0.09	37.3 1.9	14.06 0.06	55.4 0.3
Oct. 8	13.99 0.05	43.6 2.4	56.54 0.04	35.4 2.2	14.00 0.01	55.1 0.2
18	13.94 0.05	41.2 2.4	56.50 0.01	33.2 2.4	13.99 0.03	54.9 0.0
28	13.99 0.14	38.8 2.3	56.51 0.05	30.8 2.5	14.02 0.07	54.9 0.2
Nov. 7	14.13 0.23	36.5 2.0	56.56 0.11	28.3 2.8	14.09 0.13	55.1 0.4
17	14.36 0.31	34.5 1.8	56.67 0.16	25.5 3.0	14.22 0.19	55.5 0.7
27	14.67 0.39	32.7 1.4	56.83 0.21	22.5 2.9	14.41 0.23	56.2 1.0
Dec. 7	15.06 0.47	31.3 0.9	57.04 0.25	19.6 2.9	14.64 0.26	57.2 1.2
17	15.53 0.52	30.4 0.5	57.29 0.29	16.7 2.8	14.90 0.30	58.4 1.3
27	16.05 0.57	29.9 0.0	57.58 0.32	13.9 2.5	15.20 0.33	59.7 1.5
37	16.62	29.9	57.90	11.4	15.53	61.2

after the 23d of March it begins at the Sidereal Oh. before the Mean Noon.

APPARENT PLACES OF THE PRINCIPAL FIXED STARS, FOR THE UPPER
TRANSIT AT WASHINGTON.

Sidereal Day of the Month.	β URSE MINORIS.		β LIBRÆ.		α CORONÆ BORRÆLIS.	
	Right Ascension.	Dec. North.	Right Ascension.	Dec. South.	Right Ascension.	Dec. North.
	^h 14 ^m 51	74° 42'	^h 15 ^m 9	8° 52'	^h 15 ^m 28	27° 10'
Jan. 1	6.73 0.77	59.9 2.3	32.04 0.32	8.6 1.6	48.08 0.31	49.7 2.6
11	7.50 0.84	57.6 1.7	32.36 0.33	10.2 1.6	48.39 0.32	47.1 2.2
21	8.34 0.87	55.9 1.0	32.69 0.33	11.8 1.6	48.71 0.33	44.9 1.7
31	9.21 0.88	54.9 0.3	33.02 0.32	13.4 1.5	49.04 0.34	43.2 1.4
Feb. 10	10.09 0.87	54.6 0.3	33.34 0.30	14.9 1.2	49.38 0.32	41.8 0.9
20	10.96 0.81	54.9 1.0	33.64 0.30	16.1 1.1	49.70 0.31	40.9 0.3
March 2	11.77 0.72	55.9 1.6	33.94 0.27	17.2 0.9	50.01 0.29	40.6 0.2
12	12.49 0.61	57.5 2.2	34.21 0.24	18.1 0.7	50.30 0.26	40.8 0.7
22	13.10 0.48	59.7 2.6	34.45 0.22	18.8 0.4	50.56 0.23	41.5 1.1
April 1	13.58 0.36	62.3 2.9	34.67 0.19	19.2 0.1	50.79 0.21	42.6 1.5
11	13.94 0.21	65.2 3.1	34.86 0.16	19.3 0.0	51.00 0.17	44.1 1.9
21	14.15 0.07	68.3 3.2	35.02 0.14	19.3 0.1	51.17 0.13	46.0 2.1
May 1	14.22 0.07	71.5 3.2	35.16 0.11	19.2 0.3	51.30 0.10	48.1 2.2
11	14.15 0.21	74.7 3.0	35.27 0.08	18.9 0.4	51.40 0.07	50.3 2.3
21	13.94 0.35	77.7 2.9	35.35 0.05	18.5 0.4	51.47 0.03	52.6 2.3
31	13.59 0.46	80.6 2.6	35.40 0.02	18.1 0.5	51.50 0.00	54.9 2.2
June 10	13.13 0.55	83.2 2.1	35.42 0.01	17.6 0.5	51.50 0.03	57.1 2.0
20	12.58 0.63	85.3 1.7	35.41 0.04	17.1 0.6	51.47 0.07	59.1 1.9
30	11.95 0.71	87.0 1.2	35.37 0.07	16.5 0.6	51.40 0.10	61.0 1.6
July 10	11.24 0.76	88.2 0.7	35.30 0.09	15.9 0.6	51.30 0.13	62.6 1.3
20	10.48 0.80	88.9 0.2	35.21 0.11	15.3 0.5	51.17 0.15	63.9 1.0
30	9.68 0.81	89.1 0.3	35.10 0.13	14.8 0.5	51.02 0.17	64.9 0.7
Aug. 9	8.87 0.80	88.8 0.9	34.97 0.14	14.3 0.5	50.85 0.18	65.6 0.2
19	8.07 0.80	87.9 1.4	34.83 0.15	13.8 0.4	50.67 0.19	65.8 0.1
29	7.27 0.76	86.5 1.8	34.68 0.14	13.4 0.3	50.48 0.19	65.7 0.5
Sept. 8	6.51 0.69	84.7 2.3	34.54 0.13	13.1 0.3	50.29 0.17	65.2 0.7
18	5.82 0.61	82.4 2.7	34.41 0.11	12.8 0.2	50.12 0.16	64.5 1.1
28	5.21 0.51	79.7 3.1	34.30 0.08	12.6 0.0	49.96 0.13	63.4 1.5
Oct. 8	4.70 0.40	76.6 3.4	34.22 0.04	12.6 0.2	49.83 0.09	61.9 1.9
18	4.30 0.27	73.2 3.6	34.18 0.01	12.8 0.3	49.74 0.05	60.0 2.3
28	4.03 0.13	69.6 3.8	34.19 0.04	13.1 0.5	49.69 0.00	57.7 2.5
Nov. 7	3.90 0.02	65.8 3.7	34.23 0.10	13.6 0.8	49.69 0.05	55.2 2.6
17	3.92 0.18	62.1 3.8	34.33 0.16	14.4 1.1	49.74 0.10	52.6 2.8
27	4.10 0.32	58.3 3.6	34.49 0.20	15.5 1.2	49.84 0.16	49.8 2.9
Dec. 7	4.42 0.47	54.7 3.4	34.69 0.24	16.7 1.2	50.00 0.21	46.9 2.9
17	4.89 0.60	51.3 3.1	34.93 0.27	17.9 1.5	50.21 0.25	44.0 2.9
27	5.49 0.71	48.2 2.5	35.20 0.30	19.4 1.7	50.46 0.29	41.1 2.7
37	6.20	45.7	35.50	21.1	50.75	38.4

NOTE. — Before the 23d of March the Sidereal day of the Month begins at the Sidereal Oh. after the Mean Noon;

APPARENT PLACES OF THE PRINCIPAL FIXED STARS, FOR THE UPPER TRANSIT AT WASHINGTON.

Sidereal Day of the Month.	α SERPENTIS.		ζ URSAE MINORIS.		β SCORPII.	
	Right Ascension.	Dec. North.	Right Ascension.	Dec. North.	Right Ascension.	Dec. South.
	^h 15 ^m 37	^o 6 ['] 51	^h 15 ^m 48	^o 78 ['] 12	^h 15 ^m 57	^o 19 ['] 25
Jan. 1	25.39 0.30	45.1 2.1	61.13 0.78	52.7 2.8	21.56 0.31	21.5 1.0
11	25.69 0.30	43.0 1.9	61.91 0.91	49.9 2.2	21.87 0.32	22.5 1.1
21	25.99 0.31	41.1 1.6	62.62 1.01	47.7 1.7	22.19 0.34	23.6 1.1
31	26.30 0.31	39.5 1.4	63.83 1.08	46.0 1.0	22.53 0.34	24.7 1.1
Feb. 10	26.61 0.31	38.1 1.1	64.91 1.12	45.0 0.4	22.87 0.33	25.8 1.1
20	26.92 0.30	37.0 0.8	66.02 1.08	44.6 0.3	23.20 0.32	26.9 1.0
March 2	27.22 0.28	36.2 0.4	67.11 1.00	44.9 1.0	23.52 0.31	27.9 0.9
12	27.50 0.25	35.8 0.0	68.11 0.92	45.9 1.6	23.88 0.28	28.8 0.8
22	27.75 0.23	35.8 0.4	69.08 0.84	47.5 2.1	24.11 0.27	29.6 0.6
April 1	27.98 0.21	36.2 0.7	69.87 0.67	49.6 2.6	24.38 0.25	30.2 0.5
11	28.19 0.18	36.9 0.9	70.54 0.50	52.2 2.9	24.63 0.22	30.7 0.4
21	28.37 0.15	37.8 1.0	71.04 0.33	55.1 3.1	24.85 0.19	31.1 0.2
May 1	28.52 0.12	38.8 1.2	71.37 0.14	58.2 3.2	25.04 0.16	31.3 0.2
11	28.64 0.09	40.0 1.3	71.51 0.05	61.4 3.3	25.20 0.13	31.5 0.1
21	28.73 0.07	41.3 1.5	71.46 0.26	64.7 3.2	25.33 0.10	31.6 0.1
31	28.80 0.03	42.8 1.5	71.20 0.42	67.9 2.9	25.48 0.07	31.7 0.0
June 10	28.83 0.00	44.3 1.3	70.78 0.56	70.8 2.7	25.50 0.03	31.7 0.1
20	28.83 0.03	45.6 1.2	70.22 0.70	73.5 2.4	25.53 0.00	31.6 0.1
30	28.80 0.06	46.8 1.1	69.52 0.84	75.9 1.9	25.53 0.03	31.5 0.2
July 10	28.74 0.09	47.9 1.0	68.68 0.94	77.8 1.5	25.50 0.07	31.3 0.2
20	28.65 0.11	48.9 0.8	67.74 1.03	79.3 1.0	25.43 0.10	31.1 0.2
30	28.54 0.13	49.7 0.6	66.71 1.00	80.3 0.5	25.33 0.13	30.9 0.3
Aug. 9	28.41 0.15	50.3 0.5	65.62 1.12	80.8 0.0	25.20 0.15	30.6 0.3
19	28.26 0.16	50.8 0.3	64.50 1.14	80.8 0.6	25.05 0.16	30.3 0.4
29	28.10 0.16	51.1 0.0	63.36 1.12	80.2 1.1	24.89 0.16	29.9 0.4
Sept. 8	27.94 0.14	51.1 0.2	62.24 1.07	79.1 1.5	24.73 0.15	29.5 0.5
18	27.80 0.13	50.9 0.4	61.17 1.02	77.6 2.0	24.58 0.15	29.0 0.5
28	27.67 0.10	50.5 0.7	60.15 0.92	75.6 2.4	24.43 0.12	28.5 0.4
Oct. 8	27.57 0.07	49.8 0.9	59.23 0.79	73.2 2.8	24.31 0.08	28.1 0.4
18	27.50 0.04	48.9 1.1	58.44 0.65	70.4 3.2	24.23 0.04	27.7 0.3
28	27.46 0.01	47.8 1.4	57.79 0.47	67.2 3.5	24.19 0.01	27.4 0.2
Nov. 7	27.47 0.06	46.4 1.6	57.32 0.28	63.7 3.6	24.20 0.05	27.2 0.0
17	27.53 0.11	44.8 1.9	57.04 0.10	60.1 3.7	24.25 0.12	27.2 0.2
27	27.64 0.17	42.9 2.0	56.94 0.10	56.4 3.6	24.37 0.17	27.4 0.4
Dec. 7	27.81 0.20	40.9 2.1	57.04 0.30	52.8 3.5	24.54 0.20	27.8 0.6
17	28.01 0.24	38.8 2.1	57.34 0.50	49.3 3.4	24.74 0.25	28.4 0.7
27	28.25 0.28	36.7 2.2	57.84 0.68	45.9 3.0	24.99 0.30	29.1 0.9
37	28.53	34.5	58.52	42.9	25.29	30.0

after the 23d of March it begins at the Sidereal Oh. before the Mean Noon.

APPARENT PLACES OF THE PRINCIPAL FIXED STARS, FOR THE UPPER TRANSIT AT WASHINGTON.

Sidereal Day of the Month.	δ OPHIUCHI.		α SCORPII. (Antares.)		γ Draconis.	
	Right Ascension.	Dec. South.	Right Ascension.	Dec. South.	Right Ascension.	Dec. North.
	^h ^m 16 7	[°] ['] 3 20	^h ^m 16 20	[°] ['] 26 7	^h ^m 16 22	[°] ['] 61 49
Jan. 1	3.76 0.27	7.1 1.6	53.28 0.30	14.6 0.6	5.46 0.35	30.0 3.2
11	4.03 0.30	8.7 1.6	53.58 0.33	15.2 0.6	5.81 0.42	26.8 2.7
21	4.33 0.31	10.3 1.5	53.91 0.35	15.8 0.7	6.23 0.47	24.1 2.1
31	4.64 0.31	11.8 1.3	54.26 0.35	16.5 0.8	6.70 0.50	22.0 1.6
Feb. 10	4.95 0.31	13.1 1.1	54.61 0.35	17.3 0.8	7.20 0.52	20.4 1.0
20	5.26 0.31	14.2 0.8	54.96 0.34	18.1 0.8	7.72 0.52	19.4 0.3
March 2	5.57 0.29	15.0 0.5	55.30 0.33	18.9 0.8	8.24 0.50	19.1 0.4
12	5.86 0.28	15.5 0.3	55.63 0.31	19.7 0.8	8.74 0.46	19.5 1.1
22	6.14 0.25	15.8 0.1	55.94 0.30	20.5 0.7	9.20 0.43	20.6 1.6
April 1	6.39 0.23	15.9 0.2	56.24 0.28	21.2 0.7	9.63 0.38	22.2 2.2
11	6.62 0.21	15.7 0.5	56.52 0.25	21.9 0.6	10.01 0.33	24.4 2.6
21	6.83 0.18	15.2 0.7	56.77 0.22	22.5 0.5	10.34 0.26	27.0 3.0
May 1	7.01 0.16	14.5 0.8	56.99 0.20	23.0 0.4	10.60 0.18	30.3 3.2
11	7.17 0.13	13.7 0.8	57.19 0.17	23.4 0.4	10.78 0.10	33.2 3.3
21	7.30 0.09	12.9 0.9	57.36 0.13	23.8 0.4	10.88 0.03	36.4 3.3
31	7.39 0.07	12.0 1.0	57.49 0.09	24.2 0.3	10.91 0.04	39.7 3.3
June 10	7.46 0.04	11.0 0.9	57.56 0.06	24.5 0.3	10.87 0.12	42.9 3.0
20	7.50 0.00	10.1 0.9	57.64 0.02	24.8 0.3	10.75 0.20	45.9 2.9
30	7.50 0.04	9.2 0.8	57.66 0.01	25.1 0.2	10.55 0.26	48.8 2.6
July 10	7.46 0.07	8.4 0.8	57.65 0.06	25.3 0.1	10.29 0.31	51.4 2.1
20	7.39 0.09	7.6 0.7	57.59 0.10	25.4 0.0	9.98 0.35	53.5 1.5
30	7.30 0.12	6.9 0.6	57.49 0.13	25.4 0.1	9.68 0.39	55.0 1.0
Aug. 9	7.18 0.14	6.3 0.5	57.36 0.15	25.3 0.2	9.24 0.43	56.0 0.6
19	7.04 0.15	5.8 0.3	57.21 0.17	25.1 0.3	8.81 0.46	56.6 0.2
29	6.89 0.16	5.5 0.2	57.04 0.18	24.8 0.4	8.35 0.47	56.8 0.2
Sept. 8	6.73 0.15	5.3 0.2	56.86 0.17	24.4 0.5	7.88 0.45	56.6 0.8
18	6.58 0.15	5.1 0.0	56.69 0.16	23.9 0.5	7.43 0.44	55.8 1.5
28	6.43 0.12	5.1 0.2	56.53 0.14	23.4 0.6	6.99 0.40	54.3 2.0
Oct. 8	6.31 0.09	5.3 0.4	56.39 0.11	22.8 0.6	6.59 0.35	52.8 2.3
18	6.22 0.05	5.7 0.6	56.28 0.06	22.2 0.7	6.24 0.29	50.0 2.7
28	6.17 0.00	6.3 0.8	56.22 0.01	21.5 0.6	5.95 0.22	47.3 3.0
Nov. 7	6.17 0.04	7.1 0.9	56.21 0.04	20.9 0.4	5.73 0.14	44.3 3.4
17	6.21 0.10	8.0 1.1	56.25 0.09	20.5 0.3	5.59 0.03	40.9 3.6
27	6.31 0.14	9.1 1.3	56.34 0.15	20.2 0.2	5.56 0.06	37.3 3.7
Dec. 7	6.45 0.18	10.4 1.4	56.49 0.20	20.0 0.0	5.62 0.13	33.8 3.7
17	6.63 0.23	11.8 1.6	56.69 0.24	20.0 0.3	5.75 0.22	29.9 3.6
27	6.86 0.26	13.4 1.6	56.93 0.29	20.3 0.5	5.97 0.32	26.3 3.3
37	7.12	15.0	57.22	20.8	6.29	23.0

NOTE. — Before the 23d of March the Sidereal Day of the Month begins at the Sidereal 0h. after the Mean Noon;

APPARENT PLACES OF THE PRINCIPAL FIXED STARS, FOR THE UPPER TRANSIT AT WASHINGTON.

Sidereal Day of the Month.	α Trianguli Australis.		ε Ursæ Minoris.		α HERCŪLIS.	
	Right Ascension.	Dec. South.	Right Ascension.	Dec. North.	Right Ascension.	Dec. North.
	^h 16 ^m 33	68° 45'	^h 17 ^m 0	82° 15'	^h 17 ^m 8	14° 32'
Jan. 1	57.75 0.69	58.4 1.6	9.89 0.69	22.0 3.2	18.22 0.23	56.8 2.2
11	58.37 0.69	51.8 1.3	10.57 0.96	18.8 2.8	18.45 0.25	54.6 2.1
21	59.06 0.75	50.6 0.8	11.52 1.20	16.0 2.3	18.70 0.27	52.5 1.8
31	59.81 0.77	49.8 0.3	12.72 1.40	13.7 1.8	18.97 0.29	50.7 1.6
Feb. 10	60.58 0.78	49.5 0.0	14.12 1.54	11.9 1.2	19.26 0.30	49.1 1.2
20	61.26 0.79	49.5 0.4	15.66 1.61	10.7 0.7	19.56 0.30	47.9 0.8
March 2	62.15 0.77	49.9 0.8	17.27 1.60	10.0 0.0	19.86 0.30	47.1 0.4
12	62.92 0.74	50.7 1.2	18.87 1.55	10.0 0.7	20.16 0.29	46.7 0.1
22	63.66 0.70	51.9 1.6	20.42 1.46	10.7 1.4	20.45 0.28	46.8 0.5
April 1	64.36 0.66	53.5 1.9	21.88 1.32	12.1 1.9	20.73 0.27	47.3 0.9
11	65.02 0.59	55.4 2.0	23.20 1.12	14.0 2.3	21.00 0.24	48.2 1.3
21	65.61 0.52	57.4 2.2	24.32 0.89	16.3 2.8	21.24 0.23	49.5 1.6
May 1	66.13 0.43	59.6 2.4	25.20 0.62	19.1 3.1	21.47 0.20	51.1 1.8
11	66.56 0.36	62.0 2.5	25.82 0.34	22.2 3.2	21.67 0.17	52.9 1.9
21	66.92 0.27	64.5 2.6	26.16 0.05	25.4 3.3	21.84 0.14	54.8 2.0
31	67.19 0.18	67.1 2.6	26.21 0.23	28.7 3.3	21.98 0.11	56.8 2.1
June 10	67.37 0.08	69.7 2.4	25.98 0.50	32.0 3.1	22.09 0.08	58.9 2.0
20	67.45 0.03	72.1 2.3	25.48 0.75	35.1 3.0	22.17 0.03	60.9 2.0
30	67.42 0.13	74.4 2.1	24.73 1.00	38.1 2.7	22.20 0.00	62.9 1.8
July 10	67.29 0.22	76.5 1.9	23.73 1.21	40.8 2.3	22.20 0.05	64.7 1.6
20	67.07 0.30	78.4 1.6	22.52 1.41	43.1 2.0	22.15 0.08	66.3 1.5
30	66.77 0.36	80.0 1.1	21.11 1.58	45.1 1.5	22.07 0.11	67.8 1.2
Aug. 9	66.41 0.43	81.1 0.7	19.53 1.68	46.6 1.0	21.96 0.14	69.0 0.9
19	65.98 0.48	81.8 0.3	17.85 1.77	47.6 0.5	21.82 0.17	69.9 0.6
29	65.50 0.50	82.1 0.2	16.08 1.83	48.1 0.1	21.65 0.18	70.5 0.4
Sept. 8	65.00 0.50	81.9 0.7	14.25 1.83	48.2 0.5	21.47 0.18	70.9 0.1
18	64.50 0.48	81.2 1.2	12.42 1.82	47.7 0.9	21.29 0.19	71.0 0.3
28	64.02 0.41	80.0 1.7	10.60 1.73	46.8 1.4	21.10 0.17	70.7 0.5
Oct. 8	63.61 0.34	78.3 2.0	8.87 1.59	45.4 1.8	20.93 0.14	70.2 0.8
18	63.27 0.25	76.3 2.2	7.28 1.43	43.6 2.5	20.79 0.11	69.4 1.2
28	63.02 0.14	74.1 2.4	5.85 1.22	41.1 2.9	20.68 0.08	68.2 1.4
Nov. 7	62.88 0.01	71.7 2.6	4.63 0.99	38.2 3.0	20.60 0.03	66.8 1.7
17	62.87 0.11	69.1 2.7	3.64 0.75	35.2 3.2	20.57 0.01	65.1 1.9
27	62.98 0.23	66.4 2.6	2.89 0.46	32.0 3.4	20.58 0.05	63.2 2.1
Dec. 7	63.21 0.36	63.8 2.4	2.43 0.11	28.6 3.5	20.63 0.11	61.1 2.2
17	63.57 0.47	61.4 2.1	2.32 0.23	25.1 3.5	20.74 0.17	58.9 2.3
27	64.04 0.58	59.3 1.8	2.55 0.53	21.6 3.3	20.91 0.20	56.6 2.3
37	64.62	57.5	3.08	18.3	21.11	54.3

after the 22d of March it begins at the Sidereal Or. before the Mean Noon.

APPARENT PLACES OF THE PRINCIPAL FIXED STARS, FOR THE UPPER TRANSIT, AT WASHINGTON.

Sidereal Day of the Month.	β DRACONIS.		α OPHIUCHI.		α Octantis.	
	Right Ascension.	Dec. North.	Right Ascension.	Dec. North.	Right Ascension.	Dec. South.
	h ^h m ^m 17 27	52° 28'	h ^h m ^m 17 28	12° 39'	h ^h 17	89° 16'
Jan. 1	15.97 0.21	69.9 3.3	28.56 0.21	43.7 2.2	48 47.63 10.41	39.9 3.0
11	16.18 0.27	66.6 3.1	28.77 0.24	41.5 2.0	48 58.04 13.25	36.9 2.7
21	16.45 0.33	63.5 2.8	29.01 0.26	39.5 1.7	49 11.29 15.65	34.2 2.4
31	16.78 0.36	60.7 2.3	29.27 0.28	37.8 1.5	49 26.94 17.61	31.8 2.0
Feb. 10	17.14 0.39	58.4 1.6	29.55 0.29	36.3 1.2	49 44.55 19.12	29.8 1.4
20	17.53 0.41	56.8 1.0	29.84 0.29	35.1 0.9	50 3.67 20.17	28.4 1.0
March 2	17.94 0.42	55.8 0.4	30.13 0.30	34.2 0.4	50 23.84 20.75	27.4 0.5
12	18.36 0.41	55.4 0.3	30.43 0.30	33.8 0.0	50 44.59 20.84	26.9 0.0
22	18.77 0.39	55.7 0.9	30.73 0.29	33.8 0.4	51 5.43 20.48	26.9 0.4
April 1	19.16 0.36	56.6 1.5	31.02 0.27	34.2 0.8	51 25.91 19.70	27.3 0.9
11	19.52 0.34	58.1 2.0	31.29 0.26	35.0 1.2	51 45.61 18.55	28.2 1.3
21	19.86 0.31	60.1 2.5	31.55 0.23	36.2 1.5	52 4.16 17.00	29.5 1.8
May 1	20.17 0.26	62.6 2.9	31.78 0.21	37.7 1.7	52 21.16 15.10	31.3 2.1
11	20.43 0.20	65.5 3.1	31.99 0.19	39.4 1.9	52 36.26 12.91	33.4 2.4
21	20.63 0.15	68.6 3.3	32.18 0.17	41.3 2.0	52 49.17 10.44	35.8 2.8
31	20.78 0.10	71.9 3.3	32.35 0.14	43.3 2.0	52 59.61 7.73	38.6 3.0
June 10	20.88 0.03	75.2 3.3	32.49 0.09	45.3 2.0	53 7.34 4.85	41.6 3.0
20	20.91 0.03	78.5 3.2	32.58 0.05	47.3 2.0	53 12.19 1.88	44.6 3.0
30	20.88 0.08	81.7 3.0	32.63 0.01	49.3 1.9	53 14.07 1.17	47.6 3.0
July 10	20.80 0.15	84.7 2.7	32.64 0.02	51.2 1.6	53 12.90 4.12	50.6 2.8
20	20.65 0.21	87.4 2.4	32.62 0.07	52.8 1.4	53 8.78 6.92	53.4 2.6
30	20.44 0.25	89.8 2.0	32.55 0.10	54.2 1.2	53 1.86 9.55	56.0 2.3
Aug. 9	20.19 0.28	91.8 1.5	32.45 0.13	55.4 1.0	52 52.31 11.88	58.3 1.9
19	19.91 0.31	93.3 1.0	32.32 0.16	56.4 0.7	52 40.43 13.77	60.2 1.5
29	19.60 0.34	94.3 0.6	32.16 0.18	57.1 0.4	52 26.66 15.17	61.7 0.9
Sept. 8	19.26 0.35	94.9 0.1	31.98 0.18	57.5 0.2	52 11.49 16.00	62.6 0.3
18	18.91 0.36	95.0 0.4	31.80 0.18	57.7 0.1	51 55.49 16.27	62.9 0.3
28	18.55 0.34	94.6 0.9	31.62 0.17	57.6 0.3	51 39.22 15.87	62.6 0.9
Oct. 8	18.21 0.31	93.7 1.4	31.45 0.15	57.3 0.7	51 23.35 14.82	61.7 1.4
18	17.90 0.28	92.3 1.9	31.30 0.13	56.6 1.0	51 8.53 13.14	60.3 2.0
28	17.62 0.23	90.4 2.4	31.17 0.09	55.6 1.2	50 55.39 10.92	58.3 2.4
Nov. 7	17.39 0.16	88.0 2.7	31.08 0.04	54.4 1.5	50 44.47 8.25	55.9 2.9
17	17.23 0.10	85.3 3.0	31.04 0.00	52.9 1.7	50 36.22 5.20	53.0 3.2
27	17.13 0.05	82.3 3.2	31.04 0.04	51.2 2.0	50 31.02 1.85	49.8 3.3
Dec. 7	17.08 0.03	79.1 3.5	31.08 0.09	49.2 2.1	50 29.17 1.59	46.5 3.3
17	17.11 0.11	75.6 3.6	31.17 0.14	47.1 2.2	50 30.76 5.00	43.2 3.3
27	17.22 0.18	72.0 3.4	31.31 0.19	44.9 2.1	50 35.76 8.27	39.9 3.2
37	17.40	68.6	31.50	42.8	50 44.03	36.7

NOTE. — Before the 23d of March the Sidereal day of the Month begins at the Sidereal Or. after the Mean Noon;

APPARENT PLACES OF THE PRINCIPAL FIXED STARS, FOR THE UPPER TRANSIT AT WASHINGTON.

Sidereal Day of the Month.	γ DRACONIS.		μ ¹ Sagittarii.		α LYRÆ. (Vega.)	
	Right Ascension.	Dec. North.	Right Ascension.	Dec. South.	Right Ascension.	Dec. North.
	^h 17 ^m 53	51° 29'	^h 18 ^m 5	21° 5'	^h 18 ^m 32	38° 39'
Jan. 1	21.10 0.17	75.5 3.4	26.68 0.20	32.7 0.2	12.84 0.14	18.0 3.2
11	21.27 0.23	72.1 3.1	26.88 0.24	32.9 0.1	12.98 0.17	14.8 2.9
21	21.50 0.29	69.0 2.9	27.12 0.26	33.0 0.2	13.15 0.21	11.9 2.7
31	21.79 0.33	66.1 2.5	27.38 0.28	33.2 0.2	13.36 0.25	9.2 2.4
Feb. 10	22.12 0.36	63.6 1.9	27.66 0.30	33.4 0.2	13.61 0.29	6.8 1.9
20	22.48 0.40	61.7 1.3	27.96 0.33	33.6 0.0	13.90 0.31	4.9 1.4
March 2	22.88 0.41	60.5 0.6	28.29 0.33	33.6 0.0	14.21 0.33	3.5 0.9
12	23.29 0.40	59.9 0.0	28.62 0.32	33.6 0.1	14.54 0.33	2.6 0.3
22	23.69 0.40	59.9 0.6	28.94 0.31	33.5 0.2	14.87 0.34	2.3 0.2
April 1	24.09 0.38	60.5 1.2	29.25 0.30	33.3 0.3	15.21 0.34	2.5 0.8
11	24.47 0.34	61.7 1.8	29.55 0.31	33.0 0.3	15.55 0.32	3.3 1.4
21	24.81 0.33	63.5 2.4	29.86 0.30	32.7 0.4	15.87 0.31	4.7 2.0
May 1	25.14 0.29	65.9 2.8	30.16 0.28	32.3 0.3	16.18 0.29	6.7 2.4
11	25.43 0.24	68.7 3.0	30.44 0.25	32.0 0.4	16.47 0.26	9.1 2.7
21	25.67 0.19	71.7 3.1	30.69 0.22	31.6 0.4	16.73 0.22	11.8 2.9
31	25.86 0.13	74.8 3.3	30.91 0.19	31.2 0.3	16.95 0.18	14.7 3.0
June 10	25.99 0.07	78.1 3.4	31.10 0.16	30.9 0.3	17.13 0.14	17.7 3.1
20	26.06 0.02	81.5 3.4	31.26 0.12	30.6 0.2	17.27 0.09	20.8 3.2
30	26.08 0.05	84.9 3.1	31.38 0.08	30.4 0.2	17.36 0.04	24.0 3.1
July 10	26.03 0.11	88.0 2.9	31.46 0.03	30.2 0.1	17.40 0.02	27.1 2.9
20	25.92 0.16	90.9 2.6	31.49 0.03	30.1 0.0	17.38 0.06	30.0 2.8
30	25.76 0.22	93.5 2.2	31.46 0.07	30.1 0.0	17.32 0.11	32.8 2.5
Aug. 9	25.54 0.26	95.7 1.8	31.39 0.10	30.1 0.0	17.21 0.15	35.3 2.0
19	25.28 0.30	97.5 1.5	31.29 0.12	30.1 0.0	17.06 0.19	37.3 1.6
29	24.98 0.32	99.0 1.0	31.17 0.15	30.1 0.1	16.87 0.22	38.9 1.2
Sept. 8	24.66 0.34	100.0 0.5	31.02 0.17	30.0 0.0	16.65 0.24	40.1 0.9
18	24.32 0.34	100.5 0.1	30.85 0.19	30.0 0.0	16.41 0.27	41.0 0.5
28	23.98 0.33	100.4 0.6	30.66 0.18	30.0 0.1	16.14 0.27	41.5 0.0
Oct. 8	23.65 0.32	99.8 1.1	30.48 0.16	29.9 0.1	15.87 0.24	41.5 0.5
18	23.33 0.30	98.7 1.6	30.32 0.13	29.8 0.2	15.63 0.22	41.0 1.0
28	23.03 0.25	97.1 2.0	30.19 0.10	29.6 0.1	15.41 0.20	40.0 1.5
Nov. 7	22.78 0.20	95.1 2.5	30.09 0.06	29.5 0.2	15.21 0.16	38.5 1.9
17	22.58 0.14	92.6 2.8	30.03 0.02	29.3 0.1	15.05 0.12	36.6 2.3
27	22.44 0.07	89.8 3.1	30.01 0.04	29.2 0.1	14.93 0.07	34.3 2.6
Dec. 7	22.37 0.00	86.7 3.3	30.05 0.08	29.1 0.0	14.86 0.01	31.7 2.8
17	22.37 0.07	83.4 3.4	30.13 0.13	29.1 0.1	14.85 0.05	28.9 3.0
27	22.44 0.14	80.0 3.5	30.26 0.18	29.2 0.1	14.90 0.09	25.9 3.1
37	22.58	76.5	30.44	29.3	14.99	22.8

after the 23d of March it begins at the Sidereal Oh. before the Mean Noon.

APPARENT PLACES OF THE PRINCIPAL FIXED STARS, FOR THE UPPER TRANSIT AT WASHINGTON.

Sidereal Day of the Month.	β LYRA.		ζ AQUILÆ.		δ AQUILÆ.	
	Right Ascension.	Dec. North.	Right Ascension.	Dec. North.	Right Ascension.	Dec. North.
	^h 18 ^m 44	[°] 33 ['] 11	^h 18 ^m 59	[°] 18 ['] 39	^h 19 ^m 18	[°] 2 ['] 50
Jan. 1	55.90 0.11	68.9 2.9	0.66 0.12	32.4 2.0	28.95 0.10	23.9 1.4
11	56.01 0.16	66.0 2.8	0.78 0.15	30.4 1.9	29.05 0.14	22.5 1.3
21	56.17 0.21	63.2 2.6	0.93 0.19	28.5 1.8	29.19 0.18	21.2 1.1
31	56.38 0.24	60.6 2.3	1.12 0.21	26.7 1.6	29.37 0.21	20.1 0.9
Feb. 10	56.62 0.26	58.3 1.9	1.33 0.24	25.1 1.2	29.58 0.23	19.2 0.8
20	56.88 0.28	56.4 1.3	1.57 0.26	23.9 0.9	29.81 0.24	18.4 0.6
March 2	57.16 0.30	55.1 0.9	1.83 0.28	23.0 0.5	30.05 0.26	17.8 0.3
12	57.46 0.32	54.2 0.4	2.11 0.29	22.5 0.1	30.31 0.28	17.5 0.1
22	57.78 0.33	53.8 0.2	2.40 0.29	22.4 0.2	30.59 0.30	17.6 0.4
April 1	58.11 0.33	54.0 0.8	2.69 0.30	22.6 0.6	30.89 0.30	18.0 0.7
11	58.44 0.32	54.8 1.3	2.99 0.29	23.2 1.1	31.19 0.30	18.7 1.1
21	58.76 0.29	56.1 1.7	3.28 0.28	24.3 1.5	31.49 0.28	19.8 1.3
May 1	59.05 0.28	57.8 2.1	3.56 0.28	25.8 1.8	31.77 0.28	21.1 1.5
11	59.33 0.26	59.9 2.5	3.84 0.26	27.6 2.0	32.05 0.27	22.6 1.6
21	59.59 0.24	62.4 2.9	4.10 0.23	29.6 2.1	32.32 0.26	24.2 1.8
31	59.83 0.20	65.3 3.0	4.33 0.21	31.7 2.3	32.58 0.23	26.0 1.9
June 10	60.03 0.15	68.3 3.0	4.54 0.18	34.0 2.3	32.81 0.20	27.9 1.8
20	60.18 0.11	71.3 3.0	4.72 0.14	36.3 2.3	33.01 0.16	29.7 1.8
30	60.29 0.06	74.3 2.9	4.86 0.10	38.6 2.2	33.17 0.12	31.5 1.7
July 10	60.35 0.01	77.2 2.8	4.96 0.05	40.8 2.0	33.29 0.08	33.2 1.6
20	60.36 0.04	80.0 2.6	5.01 0.00	42.8 1.9	33.37 0.04	34.8 1.4
30	60.32 0.09	82.6 2.3	5.01 0.04	44.7 1.7	33.41 0.00	36.2 1.2
Aug. 9	60.23 0.13	84.9 2.0	4.97 0.08	46.4 1.4	33.41 0.05	37.4 1.0
19	60.10 0.16	86.9 1.7	4.89 0.11	47.8 1.2	33.36 0.10	38.4 0.9
29	59.94 0.19	88.6 1.3	4.78 0.14	49.0 0.9	33.26 0.12	39.3 0.7
Sept. 8	59.75 0.21	89.9 0.9	4.64 0.16	49.9 0.7	33.14 0.14	40.0 0.5
18	59.54 0.23	90.8 0.5	4.48 0.19	50.6 0.4	33.00 0.16	40.5 0.2
28	59.31 0.23	91.3 0.1	4.29 0.19	51.0 0.1	32.84 0.17	40.7 0.0
Oct. 8	59.08 0.23	91.4 0.4	4.10 0.18	51.1 0.3	32.67 0.17	40.7 0.2
18	58.85 0.21	91.0 0.9	3.92 0.15	50.8 0.6	32.50 0.16	40.5 0.3
28	58.64 0.18	90.1 1.3	3.77 0.13	50.2 0.9	32.34 0.14	40.2 0.5
Nov. 7	58.46 0.15	88.8 1.6	3.64 0.11	49.3 1.1	32.20 0.11	39.7 0.7
17	58.31 0.11	87.2 1.9	3.53 0.09	48.2 1.3	32.09 0.07	39.0 0.9
27	58.20 0.07	85.3 2.3	3.44 0.04	46.9 1.5	32.02 0.03	38.1 1.1
Dec. 7	58.13 0.01	83.0 2.6	3.40 0.01	45.4 1.7	31.99 0.00	37.0 1.1
17	58.12 0.04	80.4 2.9	3.41 0.05	43.7 1.9	31.99 0.04	35.9 1.2
27	58.16 0.10	77.5 2.9	3.46 0.10	41.8 2.0	32.03 0.08	34.7 1.3
37	58.26	74.6	3.56	39.8	32.11	33.4

NOTE. — Before the 23d of March the Sidereal-day of the Month begins at the Sidereal Oh. after the Mean Noon;

APPARENT PLACES OF THE PRINCIPAL FIXED STARS, FOR THE UPPER TRANSIT AT WASHINGTON.

Sidereal Day of the Month.	γ AQUILÆ.		α AQUILÆ. (Altaïr.)		β AQUILÆ.	
	Right Ascension.	Dec. North.	Right Ascension.	Dec. North.	Right Ascension.	Dec. North.
	h ^h m ^m s ^s	° ' "	h ^h m ^m s ^s	° ' "	h ^h m ^m s ^s	° ' "
	19 39	10 16	19 43	8 30	19 48	6 3
Jan. 1	36.60 0.08	36.6 1.7	59.64 0.08	12.7 1.6	28.70 0.07	42.1 1.4
11	36.68 0.12	34.9 1.6	59.72 0.11	11.1 1.5	28.77 0.11	40.7 1.4
21	36.80 0.15	33.3 1.6	59.83 0.15	9.6 1.5	28.88 0.14	39.3 1.3
31	36.95 0.18	31.7 1.4	59.98 0.18	8.1 1.3	29.02 0.17	38.0 1.2
Feb. 10	39.13 0.20	30.3 1.1	60.16 0.20	6.8 0.9	29.19 0.20	36.8 0.9
20	39.33 0.23	29.2 0.8	60.36 0.23	5.9 0.7	29.39 0.23	35.9 0.6
March 2	39.56 0.25	28.4 0.5	60.59 0.25	5.2 0.4	29.62 0.25	35.3 0.3
12	39.81 0.27	27.9 0.1	60.84 0.27	4.8 0.1	29.87 0.27	35.0 0.0
22	40.06 0.29	27.8 0.3	61.11 0.28	4.7 0.3	30.14 0.28	35.0 0.3
April 1	40.37 0.30	28.1 0.7	61.39 0.30	5.0 0.7	30.42 0.29	35.3 0.7
11	40.67 0.30	28.8 1.0	61.69 0.30	5.7 1.0	30.71 0.30	36.0 1.0
21	40.97 0.29	29.8 1.3	61.99 0.30	6.7 1.4	31.01 0.30	37.0 1.3
May 1	41.26 0.29	31.1 1.6	62.29 0.30	8.1 1.7	31.31 0.30	38.3 1.6
11	41.55 0.28	32.7 1.9	62.59 0.28	9.8 1.8	31.61 0.28	39.9 1.8
21	41.83 0.27	34.6 2.1	62.87 0.26	11.6 2.0	31.89 0.26	41.7 1.9
31	42.10 0.24	36.7 2.2	63.13 0.24	13.6 2.1	32.15 0.25	43.6 2.0
June 10	42.34 0.21	38.9 2.2	63.37 0.22	15.7 2.2	32.40 0.22	45.6 2.0
20	42.55 0.18	41.1 2.2	63.59 0.18	17.9 2.1	32.62 0.19	47.6 2.0
30	42.73 0.13	43.3 2.1	63.77 0.14	20.0 2.1	32.81 0.15	49.6 1.9
July 10	42.86 0.09	45.4 2.0	63.91 0.10	22.1 1.9	32.96 0.10	51.5 1.8
20	42.95 0.05	47.4 1.9	64.01 0.06	24.0 1.8	33.06 0.06	53.3 1.7
30	43.00 0.00	49.3 1.7	64.07 0.02	25.8 1.6	33.12 0.02	55.0 1.5
Aug. 9	43.00 0.04	51.0 1.5	64.09 0.04	27.4 1.4	33.14 0.03	56.5 1.3
19	42.96 0.07	52.5 1.3	64.05 0.09	28.8 1.2	33.11 0.07	57.8 1.1
29	42.89 0.11	53.8 1.0	63.96 0.11	30.0 1.0	33.04 0.11	58.9 0.8
Sept. 8	42.78 0.14	54.8 0.7	63.85 0.13	31.0 0.7	32.98 0.13	59.7 0.6
18	42.64 0.17	55.5 0.4	63.72 0.16	31.7 0.4	32.80 0.15	60.3 0.4
28	42.47 0.17	55.9 0.1	63.56 0.17	32.1 0.2	32.65 0.16	60.7 0.2
Oct. 8	42.30 0.17	56.0 0.0	63.39 0.17	32.3 0.0	32.49 0.17	60.9 0.1
18	42.13 0.17	56.0 0.3	63.22 0.16	32.3 0.3	32.32 0.17	60.8 0.3
28	41.96 0.15	55.7 0.5	63.06 0.15	32.0 0.5	32.15 0.15	60.5 0.5
Nov. 7	41.81 0.12	55.2 0.8	62.91 0.12	31.5 0.8	32.00 0.12	60.0 0.8
17	41.69 0.10	54.4 1.1	62.79 0.09	30.7 1.0	31.88 0.09	59.2 1.0
27	41.59 0.07	53.3 1.3	62.70 0.06	29.7 1.2	31.79 0.06	58.2 1.1
Dec. 7	41.52 0.02	52.0 1.4	62.64 0.02	28.5 1.3	31.73 0.03	57.1 1.2
17	41.50 0.02	50.6 1.5	62.62 0.01	27.2 1.4	31.70 0.01	55.9 1.3
27	41.52 0.06	49.1 1.7	62.63 0.06	25.8 1.5	31.71 0.06	54.6 1.4
37	41.58	47.4	62.69	24.3	31.77	53.2

after the 22d of March it begins at the Sidereal Oh. before the Mean Noon.

APPARENT PLACES OF THE PRINCIPAL FIXED STARS, FOR THE UPPER
TRANSIT AT WASHINGTON.

Sidereal Day of the Month.	♌ URSAE MINORIS.		♈ CAPRICORNI.		♎ PAVONIS.	
	Right Ascension.	Dec. North.	Right Ascension.	Dec. South.	Right Ascension.	Dec. South.
	h 20	88° 53'	h m 20 10	12° 58'	h m 20 14	57° 10'
Jan. 1	^m 1 27.17 4.48	^u 42.0 3.0	^s 20.16 0.07	^u 26.0 0.2	^s 37.43 0.07	^u 40.1 2.4
11	1 22.69 2.27	39.0 3.1	20.23 0.10	26.2 0.2	37.50 0.14	37.7 2.4
21	1 20.42 0.03	35.9 3.2	20.33 0.13	26.4 0.2	37.64 0.20	35.3 2.5
31	1 20.39 2.23	32.7 3.1	20.46 0.16	26.6 0.0	37.84 0.26	32.8 2.5
Feb. 10	1 22.62 4.37	29.6 2.8	20.62 0.20	26.6 0.2	38.10 0.32	30.3 2.4
20	1 26.99 6.31	26.8 2.6	20.82 0.22	26.4 0.3	38.42 0.37	27.9 2.4
March 2	1 33.30 7.96	24.2 2.1	21.04 0.25	26.1 0.5	38.79 0.41	25.5 2.2
12	1 41.26 9.25	22.1 1.6	21.29 0.27	25.6 0.7	39.20 0.44	23.3 1.9
22	1 50.51 10.18	20.5 1.1	21.56 0.28	24.9 0.8	39.64 0.47	21.4 1.7
April 1	2 0.69 10.72	19.4 0.5	21.84 0.30	24.1 1.0	40.11 0.51	19.7 1.6
11	2 11.41 10.85	18.9 0.1	22.14 0.30	23.1 1.1	40.62 0.51	18.2 1.3
21	2 22.26 10.55	19.0 0.7	22.44 0.31	22.0 1.3	41.13 0.51	17.0 0.9
May 1	2 32.81 9.87	19.7 1.3	22.75 0.31	20.7 1.3	41.64 0.52	16.1 0.6
11	2 42.68 8.89	21.0 1.8	23.06 0.30	19.4 1.4	42.16 0.50	15.5 0.2
21	2 51.57 7.66	22.8 2.4	23.36 0.30	18.0 1.4	42.66 0.49	15.3 0.1
31	2 59.23 6.17	25.2 2.8	23.66 0.28	16.6 1.3	43.15 0.46	15.4 0.4
June 10	3 5.40 4.50	28.0 3.0	23.94 0.25	15.3 1.3	43.61 0.41	15.8 0.8
20	3 9.90 2.71	31.0 3.2	24.19 0.22	14.0 1.2	44.02 0.35	16.6 1.2
30	3 12.61 0.86	34.2 3.4	24.41 0.18	12.8 1.0	44.37 0.29	17.8 1.5
July 10	3 13.47 1.00	37.6 3.4	24.59 0.14	11.8 0.8	44.66 0.22	19.3 1.6
20	3 12.47 2.83	41.0 3.5	24.73 0.10	11.0 0.6	44.88 0.15	20.9 1.8
30	3 9.64 4.61	44.5 3.4	24.83 0.05	10.4 0.5	45.03 0.07	22.7 1.9
Aug. 9	3 5.03 6.28	47.9 3.2	24.88 0.00	9.9 0.3	45.10 0.02	24.6 1.9
19	2 58.75 7.81	51.1 3.0	24.88 0.05	9.6 0.2	45.06 0.11	26.5 1.9
29	2 50.94 9.20	54.1 2.7	24.83 0.09	9.4 0.0	44.97 0.17	28.4 1.8
Sept. 8	2 41.74 10.43	56.8 2.4	24.74 0.11	9.4 0.1	44.80 0.22	30.2 1.6
18	2 31.31 11.42	59.2 2.0	24.63 0.14	9.5 0.1	44.58 0.26	31.8 1.3
28	2 19.89 12.18	61.2 1.6	24.49 0.15	9.6 0.2	44.32 0.31	33.1 1.0
Oct. 8	2 7.71 12.68	62.8 1.1	24.34 0.16	9.8 0.3	44.01 0.33	34.1 0.6
18	1 55.03 12.93	63.9 0.6	24.18 0.17	10.1 0.3	43.68 0.33	34.7 0.1
28	1 42.10 12.84	64.5 0.0	24.01 0.15	10.4 0.3	43.35 0.31	34.8 0.3
Nov. 7	1 29.26 12.44	64.5 0.6	23.86 0.12	10.7 0.3	43.04 0.27	34.5 0.7
17	1 16.82 11.74	63.9 1.0	23.74 0.10	11.0 0.3	42.77 0.23	33.8 1.0
27	1 5.08 10.68	62.9 1.6	23.64 0.06	11.3 0.3	42.54 0.18	32.8 1.4
Dec. 7	0 54.40 9.30	61.3 2.0	23.58 0.03	11.6 0.3	42.36 0.14	31.4 1.7
17	0 45.10 7.63	59.3 2.5	23.55 0.00	11.9 0.3	42.24 0.05	29.7 2.1
27	0 37.47 5.69	56.8 2.9	23.55 0.04	12.2 0.3	42.19 0.03	27.6 2.3
37	0 31.78	53.9	23.59	12.5	42.22	25.3

NOTE. — Before the 22d of March the Sidereal day of the Month begins at the Sidereal Oh. after the Mean Noon;

APPARENT PLACES OF THE PRINCIPAL FIXED STARS, FOR THE UPPER TRANSIT AT WASHINGTON.

Sidereal Day of the Month.	α CYGNI.		β ¹ CYGNI.		γ Cygni.	
	Right Ascension.	Dec. North.	Right Ascension.	Dec. North.	Right Ascension.	Dec. North.
	h ^h m ^m	° ′	h ^h m ^m	° ′	h ^h m ^m	° ′
	20 ^h 36 ^m	44° 46′	21 ^h 0 ^m	38° 3′	21 ^h 7 ^m	29° 39′
Jan. 1	40.46 0.05	73.4 2.8	39.11 0.03	72.2 2.3	0.70 0.04	37.6 2.1
11	40.41 0.01	70.6 2.9	39.08 0.00	69.9 2.5	0.66 0.01	35.5 2.3
21	40.42 0.08	67.7 2.9	39.06 0.06	67.4 2.6	0.67 0.05	33.2 2.4
31	40.50 0.13	64.8 2.8	39.14 0.11	64.8 2.5	0.72 0.09	30.8 2.2
Feb. 10	40.63 0.16	62.0 2.6	39.25 0.14	62.3 2.3	0.81 0.13	28.6 2.0
20	40.79 0.20	59.4 2.3	39.39 0.17	60.0 2.1	0.94 0.16	26.6 1.8
March 2	40.99 0.25	57.1 1.9	39.56 0.22	57.9 1.7	1.10 0.20	24.8 1.4
12	41.24 0.30	55.2 1.3	39.78 0.27	56.2 1.1	1.30 0.23	23.4 1.0
22	41.54 0.33	53.9 0.8	40.05 0.30	55.1 0.7	1.53 0.26	22.4 0.6
April 1	41.87 0.36	53.1 0.3	40.35 0.32	54.4 0.2	1.79 0.29	21.8 0.1
11	42.23 0.36	52.8 0.4	40.67 0.35	54.2 0.4	2.08 0.31	21.7 0.4
21	42.59 0.37	53.2 0.9	41.02 0.36	54.6 0.9	2.39 0.32	22.1 0.9
May 1	42.96 0.37	54.1 1.5	41.38 0.36	55.5 1.4	2.71 0.33	23.0 1.4
11	43.33 0.37	55.6 2.0	41.74 0.36	56.9 1.9	3.04 0.33	24.4 1.8
21	43.70 0.36	57.6 2.4	42.10 0.35	58.8 2.3	3.37 0.33	26.2 2.2
31	44.06 0.32	60.0 2.8	42.45 0.33	61.1 2.7	3.70 0.31	28.4 2.5
June 10	44.38 0.28	62.8 3.0	42.78 0.30	63.8 3.0	4.01 0.28	30.9 2.7
20	44.66 0.24	65.8 3.3	43.08 0.27	66.8 3.2	4.29 0.25	33.6 2.9
30	44.90 0.19	69.1 3.4	43.35 0.23	70.0 3.3	4.54 0.22	36.5 3.0
July 10	45.09 0.13	72.5 3.4	43.58 0.17	73.3 3.3	4.76 0.17	39.5 3.0
20	45.22 0.08	75.9 3.4	43.75 0.12	76.6 3.3	4.93 0.12	42.5 2.9
30	45.30 0.02	79.3 3.3	43.87 0.07	79.9 3.2	5.05 0.07	45.4 2.8
Aug. 9	45.32 0.03	82.6 3.1	43.94 0.02	83.1 3.0	5.12 0.03	48.2 2.6
19	45.29 0.09	85.7 2.8	43.96 0.04	86.1 2.9	5.15 0.02	50.8 2.5
29	45.20 0.14	88.5 2.5	43.92 0.08	89.0 2.6	5.13 0.06	53.3 2.2
Sept. 8	45.06 0.18	91.0 2.2	43.84 0.11	91.6 2.3	5.07 0.10	55.5 1.9
18	44.88 0.21	93.2 1.9	43.73 0.15	93.9 1.9	4.97 0.14	57.4 1.6
28	44.67 0.24	95.1 1.4	43.58 0.18	95.8 1.6	4.83 0.16	59.0 1.2
Oct. 8	44.43 0.25	96.5 0.9	43.40 0.20	97.4 1.1	4.67 0.17	60.2 0.8
18	44.18 0.27	97.4 0.4	43.20 0.22	98.5 0.6	4.50 0.19	61.0 0.4
28	43.91 0.26	97.8 0.0	42.98 0.21	99.1 0.1	4.31 0.19	61.4 0.0
Nov. 7	43.65 0.24	97.8 0.6	42.77 0.20	99.2 0.3	4.12 0.18	61.4 0.4
17	43.41 0.22	97.2 1.1	42.57 0.17	98.9 0.7	3.94 0.16	61.0 0.7
27	43.19 0.19	96.1 1.5	42.40 0.16	98.2 1.0	3.78 0.14	60.3 1.1
Dec. 7	43.00 0.15	94.6 2.0	42.24 0.13	97.2 1.6	3.64 0.11	59.2 1.5
17	42.85 0.11	92.6 2.3	42.11 0.10	95.6 2.0	3.53 0.09	57.7 1.8
27	42.74 0.08	90.3 2.6	42.01 0.05	93.6 2.3	3.44 0.05	55.9 2.1
37	42.66	87.7	41.96	91.3	3.39	53.8

after the 23d of March it begins at the Sidereal (h. before the Mean Noon.

APPARENT PLACES OF THE PRINCIPAL FIXED STARS, FOR THE UPPER TRANSIT AT WASHINGTON.						
Sidereal Day of the Month.	α CEPHEI.		β AQUILÆ.		γ CEPHEI.	
	Right Ascension.	Dec. North.	Right Ascension.	Dec. South.	Right Ascension.	Dec. North.
	^h ^m 21 15	[°] ['] 61 59	^h ^m 21 24	[°] ['] 6 10	^h ^m 21 26	[°] ['] 69 56
Jan. 1	13.38 0.18	63.4 2.7	14.27 0.01	50.2 0.5	47.97 0.33	77.8 2.5
11	13.20 0.12	60.7 2.9	14.26 0.02	50.7 0.4	47.64 0.24	75.3 2.8
21	13.08 0.04	57.8 3.1	14.28 0.06	51.1 0.4	47.40 0.13	72.5 3.2
31	13.04 0.05	54.7 3.1	14.34 0.09	51.5 0.2	47.27 0.01	69.3 3.3
Feb. 10	13.09 0.13	51.6 3.1	14.43 0.12	51.7 0.1	47.26 0.11	66.0 3.2
20	13.22 0.20	48.5 3.0	14.55 0.14	51.8 0.2	47.37 0.23	62.8 3.0
March 2	13.42 0.27	45.5 2.6	14.69 0.17	51.6 0.4	47.60 0.33	59.8 2.7
12	13.69 0.35	42.9 2.1	14.86 0.21	51.2 0.6	47.93 0.43	57.1 2.4
22	14.04 0.42	40.8 1.5	15.07 0.23	50.6 0.8	48.36 0.52	54.7 1.9
April 1	14.46 0.47	39.3 0.8	15.30 0.25	49.8 1.1	48.88 0.59	52.8 1.2
11	14.93 0.49	38.5 0.4	15.55 0.28	48.7 1.3	49.47 0.64	51.6 0.7
21	15.42 0.52	38.1 0.1	15.83 0.30	47.4 1.4	50.11 0.69	50.9 0.1
May 1	15.94 0.53	38.2 0.7	16.13 0.31	46.0 1.6	50.80 0.70	50.8 0.5
11	16.47 0.52	38.9 1.4	16.44 0.31	44.4 1.7	51.50 0.69	51.3 1.2
21	16.99 0.52	40.3 2.1	16.75 0.32	42.7 1.9	52.19 0.66	52.5 1.7
31	17.51 0.48	42.4 2.5	17.07 0.31	40.8 1.9	52.85 0.62	54.2 2.2
June 10	17.99 0.42	44.9 2.8	17.38 0.29	38.9 1.8	53.47 0.55	56.4 2.7
20	18.41 0.34	47.7 3.2	17.67 0.26	37 1 1.7	54.02 0.47	59.1 3.1
30	18.75 0.29	50.9 3.5	17.93 0.23	35.4 1.6	54.49 0.39	62.2 3.4
July 10	19.04 0.22	54.4 3.6	18.16 0.20	33.8 1.4	54.88 0.29	65.6 3.6
20	19.26 0.15	58.0 3.7	18.36 0.16	32.4 1.2	55.17 0.19	69.2 3.7
30	19.41 0.07	61.7 3.7	18.52 0.11	31.2 1.0	55.36 0.08	72.9 3.8
Aug. 9	19.48 0.02	65.4 3.6	18.63 0.06	30.2 0.8	55.44 0.03	76.7 3.7
19	19.46 0.11	69.0 3.5	18.69 0.02	29.4 0.7	55.41 0.13	80.4 3.7
29	19.35 0.18	72.5 3.3	18.71 0.02	28.7 0.4	55.28 0.22	84.1 3.5
Sept. 8	19.17 0.24	75.8 3.0	18.69 0.05	28.3 0.3	55.06 0.32	87.6 3.2
18	18.93 0.28	78.8 2.6	18.64 0.09	28.0 0.1	54.74 0.40	90.8 2.9
28	18.65 0.34	81.4 2.2	18.55 0.12	27.9 0.1	54.34 0.48	93.7 2.5
Oct. 8	18.31 0.38	83.6 1.8	18.43 0.13	28.0 0.3	53.86 0.53	96.2 2.0
18	17.98 0.41	85.4 1.2	18.30 0.14	28.3 0.4	53.33 0.56	98.2 1.6
28	17.52 0.42	86.6 0.7	18.16 0.14	28.7 0.5	52.77 0.59	99.8 1.0
Nov. 7	17.10 0.41	87.3 0.1	18.02 0.13	29.2 0.5	52.18 0.60	100.8 0.4
17	16.69 0.40	87.4 0.5	17.89 0.13	29.7 0.5	51.58 0.59	101.2 0.1
27	16.29 0.37	86.9 1.1	17.76 0.11	30.2 0.5	50.99 0.57	101.1 0.7
Dec. 7	15.92 0.33	85.8 1.4	17.65 0.08	30.7 0.6	50.42 0.52	100.4 1.3
17	15.59 0.29	84.4 2.0	17.57 0.05	31.3 0.6	49.90 0.45	99.1 1.4
27	15.30 0.23	82.4 2.5	17.52 0.02	31.9 0.5	49.45 0.37	97.2 2.3
37	15.07	79.9	17.50	32.4	49.08	94.9

NOTE. — Before the 22d of March the Sidereal day of the Month begins at the Sidereal Oh. after the Mean Noon;

APPARENT PLACES OF THE PRINCIPAL FIXED STARS, FOR THE UPPER TRANSIT AT WASHINGTON.

Sidereal Day of the Month.	♌ Pegasi.		♒ AQUARI.		♐ Gruis.	
	Right Ascension.	Dec. North.	Right Ascension.	Dec. South.	Right Ascension.	Dec. South.
	^h 21 ^m 37	[°] 9 ['] 14	^h 21 ^m 58	[°] 0 ['] 59	^h 21 ^m 59	[°] 47 ['] 37
Jan. 1	21.45 0.03	25.9 1.2	38.67 0.03	35.9 0.8	27.43 0.07	63.0 1.6
11	21.42 0.00	24.7 1.3	38.64 0.01	36.7 0.7	27.36 0.03	61.4 1.8
21	21.42 0.04	23.4 1.2	38.63 0.02	37.4 0.5	27.33 0.00	59.6 2.1
31	21.46 0.07	22.2 1.1	38.65 0.04	37.9 0.4	27.33 0.05	57.5 2.3
Feb. 10	21.53 0.10	21.1 0.8	38.69 0.06	38.3 0.3	27.38 0.11	55.2 2.4
20	21.63 0.13	20.3 0.8	38.77 0.12	38.6 0.2	27.49 0.15	52.8 2.6
March 2	21.76 0.16	19.5 0.5	38.89 0.14	38.8 0.1	27.64 0.20	50.2 2.7
12	21.92 0.19	19.0 0.2	39.03 0.17	38.7 0.4	27.84 0.24	47.5 2.6
22	22.11 0.22	18.8 0.2	39.20 0.21	38.3 0.6	28.06 0.27	44.9 2.6
April 1	22.33 0.25	19.0 0.5	39.41 0.24	37.7 0.9	28.35 0.31	42.3 2.5
11	22.58 0.27	19.5 0.9	39.65 0.26	36.8 1.2	28.66 0.35	39.8 2.4
21	22.85 0.29	20.4 1.2	39.91 0.28	35.6 1.5	29.01 0.39	37.4 2.2
May 1	23.14 0.31	21.6 1.5	40.19 0.30	34.1 1.6	29.40 0.41	35.2 1.9
11	23.45 0.31	23.1 1.7	40.49 0.31	32.5 1.8	29.81 0.42	33.3 1.7
21	23.76 0.32	24.8 2.0	40.80 0.31	30.7 1.9	30.23 0.43	31.6 1.3
31	24.08 0.31	26.8 2.2	41.11 0.31	28.8 2.0	30.66 0.43	30.3 1.0
June 10	24.39 0.28	29.0 2.2	41.42 0.30	26.8 2.0	31.09 0.41	29.3 0.6
20	24.67 0.26	31.2 2.3	41.72 0.28	24.8 2.1	31.50 0.38	28.7 0.2
30	24.93 0.23	33.5 2.2	42.00 0.26	22.7 1.9	31.88 0.35	28.5 0.1
July 10	25.16 0.20	35.7 2.2	42.26 0.22	20.8 1.7	32.23 0.30	28.6 0.5
20	25.36 0.17	37.9 2.1	42.48 0.18	19.1 1.5	32.53 0.26	29.1 1.0
30	25.53 0.13	40.0 1.9	42.66 0.14	17.6 1.4	32.79 0.20	30.1 1.3
Aug. 9	25.66 0.07	41.9 1.7	42.80 0.10	16.2 1.2	32.99 0.13	31.4 1.5
19	25.73 0.02	43.6 1.5	42.90 0.05	15.0 0.9	33.12 0.06	32.9 1.6
29	25.75 0.01	45.1 1.3	42.95 0.01	14.1 0.7	33.18 0.00	34.5 1.8
Sept. 8	25.74 0.05	46.4 1.0	42.96 0.03	13.4 0.5	33.18 0.06	36.3 1.9
18	25.69 0.09	47.4 0.8	42.93 0.06	12.9 0.3	33.12 0.10	38.2 1.9
28	25.60 0.11	48.2 0.6	42.87 0.09	12.6 0.1	33.02 0.15	40.1 1.8
Oct. 8	25.49 0.12	48.8 0.3	42.78 0.11	12.5 0.0	32.87 0.20	41.9 1.5
18	25.37 0.14	49.1 0.0	42.67 0.13	12.5 0.2	32.67 0.22	43.4 1.2
28	25.23 0.14	49.1 0.1	42.54 0.13	12.7 0.3	32.45 0.23	44.6 0.9
Nov. 7	25.09 0.14	49.0 0.4	42.41 0.13	13.0 0.5	32.22 0.23	45.5 0.6
17	24.95 0.13	48.6 0.6	42.28 0.12	13.5 0.6	31.99 0.23	46.1 0.3
27	24.82 0.11	48.0 0.8	42.16 0.11	14.1 0.7	31.76 0.21	46.4 0.1
Dec. 7	24.71 0.09	47.2 1.0	42.05 0.09	14.8 0.7	31.55 0.17	46.3 0.6
17	24.62 0.07	46.2 1.1	41.96 0.08	15.5 0.7	31.38 0.14	45.7 1.1
27	24.55 0.05	45.1 1.2	41.88 0.05	16.2 0.7	31.24 0.10	44.6 1.4
37	24.50	43.9	41.83	16.9	31.14	43.2

after the 23d of March it begins at the Sidereal Oh. before the Mean Noon.

APPARENT PLACES OF THE PRINCIPAL FIXED STARS, FOR THE UPPER
TRANSIT AT WASHINGTON.

Sidereal Day of the Month.	ζ Pegasi.		α PISCIS AUSTRALIS. (Fomalhaut.)		α PEGASUS (Markab.)	
	Right Ascension.	Dec. North.	Right Ascension.	Dec. South.	Right Ascension.	Dec. North.
	^h 22 ^m 34	10° 6'	^h 22 ^m 49	30° 21'	^h 22 ^m 57	14° 27'
Jan. 1	31.84 0.07	31.1 1.1	58.15 0.09	36.8 0.5	50.60 0.09	37.8 1.1
11	31.77 0.04	30.0 1.2	58.06 0.06	36.3 0.8	50.51 0.06	36.7 1.1
21	31.73 0.02	28.8 1.1	58.00 0.03	35.5 1.1	50.45 0.04	35.6 1.2
31	31.71 0.01	27.7 1.0	57.97 0.00	34.4 1.3	50.41 0.02	34.4 1.2
Feb. 10	31.72 0.04	26.7 0.8	57.97 0.03	33.1 1.5	50.39 0.01	33.2 1.2
20	31.76 0.08	25.9 0.7	58.00 0.07	31.6 1.8	50.40 0.05	32.0 1.1
March 2	31.84 0.10	25.2 0.5	58.07 0.09	29.8 1.9	50.45 0.09	30.9 0.8
12	31.94 0.14	24.7 0.3	58.16 0.14	27.9 2.0	50.54 0.12	30.1 0.4
22	32.08 0.17	24.4 0.0	58.30 0.17	25.9 2.2	50.66 0.15	29.7 0.4
April 1	32.25 0.21	24.4 0.4	58.47 0.21	23.7 2.3	50.81 0.19	29.5 0.2
11	32.46 0.24	24.8 0.8	58.68 0.25	21.4 2.4	51.00 0.22	29.7 0.5
21	32.70 0.27	25.6 1.1	58.93 0.28	19.0 2.4	51.22 0.26	30.2 0.8
May 1	32.97 0.30	26.7 1.4	59.21 0.31	16.6 2.3	51.48 0.29	31.0 1.1
11	33.27 0.31	28.1 1.6	59.52 0.33	14.3 2.0	51.77 0.31	32.1 1.5
21	33.58 0.31	29.7 1.9	59.85 0.35	12.3 1.9	52.08 0.32	33.6 1.8
31	33.89 0.32	31.6 2.1	60.20 0.35	10.4 1.7	52.40 0.33	35.4 2.0
June 10	34.21 0.31	33.7 2.2	60.55 0.35	8.7 1.6	52.73 0.32	37.4 2.2
20	34.52 0.30	35.9 2.2	60.90 0.35	7.1 1.4	53.05 0.31	39.6 2.3
30	34.82 0.27	38.1 2.3	61.25 0.33	5.7 1.0	53.36 0.28	41.9 2.4
July 10	35.09 0.24	40.4 2.2	61.58 0.29	4.7 0.6	53.64 0.26	44.3 2.3
20	35.33 0.21	42.6 2.1	61.87 0.24	4.1 0.2	53.90 0.23	46.6 2.2
30	35.54 0.17	44.7 2.0	62.11 0.20	3.9 0.1	54.13 0.19	48.8 2.2
Aug. 9	35.71 0.13	46.7 1.8	62.31 0.16	4.0 0.4	54.32 0.15	51.0 2.1
19	35.84 0.09	48.5 1.7	62.47 0.13	4.4 0.8	54.47 0.12	53.1 1.9
29	35.93 0.04	50.2 1.5	62.60 0.08	5.2 1.0	54.59 0.08	55.0 1.7
Sept. 8	35.97 0.01	51.7 1.2	62.68 0.02	6.2 1.1	54.67 0.02	56.7 1.4
18	35.98 0.03	52.9 0.8	62.70 0.03	7.3 1.3	54.69 0.02	58.1 1.2
28	35.95 0.06	53.7 0.6	62.67 0.06	8.6 1.3	54.67 0.04	59.3 0.9
Oct. 8	35.89 0.09	54.3 0.5	62.61 0.10	9.9 1.4	54.63 0.07	60.2 0.7
18	35.80 0.11	54.8 0.3	62.51 0.13	11.3 1.4	54.56 0.09	60.9 0.5
28	35.69 0.12	55.1 0.0	62.38 0.14	12.7 1.2	54.47 0.11	61.4 0.2
Nov. 7	35.57 0.12	55.1 0.2	62.24 0.14	13.9 1.0	54.36 0.12	61.6 0.0
17	35.45 0.13	54.9 0.5	62.10 0.15	14.9 0.8	54.24 0.12	61.6 0.3
27	35.32 0.12	54.4 0.6	61.95 0.16	15.7 0.5	54.12 0.12	61.3 0.6
Dec. 7	35.20 0.11	53.8 0.8	61.79 0.14	16.2 0.3	54.00 0.11	60.7 0.7
17	35.09 0.09	53.0 0.9	61.65 0.12	16.5 0.0	53.89 0.11	60.0 0.2
27	35.00 0.08	52.1 1.0	61.53 0.10	16.5 0.4	53.78 0.09	59.1 1.0
37	34.92	51.1	61.43	16.1	53.69	58.1

NOTE. — Before the 22d of March the Sidereal day of the Month begins at the Sidereal Oh. after the Mean Noon;

APPARENT PLACES OF THE PRINCIPAL FIXED STARS, FOR THE UPPER TRANSIT AT WASHINGTON.

Sidereal Day of the Month.	♌ Pleiades.			γ Cephei.		
	Right Ascension.		Dec. North.	Right Ascension.		Dec. North.
	h	m	°	h	m	°
	23	32	4	23	33	76
Jan. 1	48.68	0.09	52 29.8 0.8	38.32	0.80	51 48.7 1.1
11	48.59	0.06	52 29.0 0.8	37.52	0.74	51 47.6 1.5
21	48.51	0.06	52 28.2 0.7	36.78	0.65	51 46.1 2.0
31	48.45	0.04	52 27.5 0.7	36.13	0.59	51 44.1 2.5
Feb. 10	48.41	0.02	52 26.8 0.5	35.61	0.36	51 41.6 2.8
20	48.39	0.04	52 26.3 0.4	35.25	0.21	51 38.8 3.0
March 2	48.40	0.04	52 25.9 0.2	35.04	0.05	51 35.8 3.1
12	48.44	0.09	52 25.7 0.0	34.99	0.15	51 32.7 3.0
22	48.53	0.13	52 25.7 0.3	35.14	0.34	51 29.7 2.9
April 1	48.66	0.16	52 26.0 0.6	35.48	0.51	51 26.8 2.6
11	48.82	0.19	52 26.6 0.9	35.99	0.65	51 24.2 2.2
21	49.01	0.23	52 27.5 1.1	36.64	0.78	51 22.0 1.7
May 1	49.24	0.27	52 28.6 1.4	37.42	0.89	51 20.3 1.1
11	49.51	0.29	52 30.0 1.6	38.31	0.97	51 19.2 0.6
21	49.80	0.30	52 31.6 1.8	39.28	1.03	51 18.6 0.1
31	50.10	0.32	52 33.4 2.0	40.31	1.05	51 18.5 0.5
June 10	50.42	0.32	52 35.4 2.1	41.36	1.03	51 19.0 1.1
20	50.74	0.38	52 37.5 2.1	42.39	0.99	51 20.1 1.7
30	51.06	0.39	52 39.6 2.1	43.38	0.92	51 21.8 2.2
July 10	51.36	0.28	52 41.7 2.0	44.30	0.85	51 24.0 2.5
20	51.64	0.25	52 43.7 1.9	45.15	0.76	51 26.5 2.9
30	51.89	0.22	52 45.6 1.8	45.91	0.63	51 29.4 3.3
Aug. 9	52.11	0.18	52 47.4 1.6	46.54	0.49	51 32.7 3.5
19	52.29	0.15	52 49.0 1.3	47.03	0.35	51 36.2 3.7
29	52.44	0.11	52 50.3 1.1	47.38	0.22	51 39.9 3.8
Sept. 8	52.55	0.07	52 51.4 0.9	47.60	0.09	51 43.7 3.8
18	52.62	0.02	52 52.3 0.6	47.69	0.05	51 47.5 3.9
28	52.64	0.09	52 52.9 0.4	47.64	0.20	51 51.4 3.7
Oct. 8	52.64	0.03	52 53.3 0.2	47.44	0.34	51 55.1 3.4
18	52.61	0.06	52 53.5 0.1	47.10	0.46	51 58.5 3.0
28	52.55	0.08	52 53.6 0.2	46.64	0.57	52 1.5 2.7
Nov. 7	52.47	0.09	52 53.4 0.3	46.07	0.66	52 4.2 2.3
17	52.38	0.11	52 53.1 0.5	45.41	0.74	52 6.5 1.8
27	52.27	0.11	52 52.6 0.6	44.67	0.81	52 8.3 1.2
Dec. 7	52.16	0.11	52 52.0 0.6	43.86	0.84	52 9.5 0.6
17	52.05	0.10	52 51.4 0.7	43.02	0.86	52 10.1 0.0
27	51.95	0.09	52 50.7 0.8	42.16	0.83	52 10.1 0.6
37	51.86		52 49.9	41.33		52 9.5

after the 23d of March it begins at the Sidereal Oh. before the Mean Noon.

TABLE GIVING THE CORRECTION OF THREE OF THE POLAR STARS
FOR TERMS OF NUTATION INVOLVING 2 C.

D or D - 180°	51 Cephei.		σ Octanis.		λ Urs. Min.		D or D - 180°	D or D - 180°	51 Cephei.		σ Octanis.		λ Urs. Min.		D or D - 180°
	R.A.	Dec.	R.A.	Dec.	R.A.	Dec.			R.A.	Dec.	R.A.	Dec.	R.A.	Dec.	
0	.018	+	.025	-	.159	-	0	45	.122	+	.436	+	.224	-	0
1	.014	.09	.040	.09	.151	.08	90	46	.123	.00	.435	.01	.229	.04	136
2	.009	.09	.055	.09	.143	.08	92	47	.124	.00	.438	.02	.234	.04	137
3	.005	.09	.070	.09	.135	.08	93	48	.124	+.00	.431	.02	.239	.04	138
4	+.001	.09	.085	.09	.127	.08	94	49	.124	-.01	.428	.02	.244	.04	139
5	-.003	+.09	-.100	-.09	-.118	-.08	95	50	-.124	-.01	-.425	+.02	+.249	-.03	140
6	.008	.09	.115	.08	.109	.08	96	51	.123	.01	.421	.03	.253	.03	141
7	.012	.09	.130	.08	.100	.08	97	52	.123	.02	.417	.03	.256	.03	142
8	.017	.09	.144	.08	.091	.08	98	53	.122	.02	.412	.03	.259	.02	143
9	.021	.09	.158	.08	.082	.08	99	54	.122	.02	.407	.04	.252	.02	144
10	-.025	+.09	-.172	-.08	-.073	-.09	100	55	-.121	-.02	-.401	+.04	+.255	-.02	145
11	.029	.09	.186	.08	.064	.09	101	56	.121	.03	.395	.04	.267	.02	146
12	.033	.09	.200	.08	.055	.09	102	57	.120	.03	.389	.04	.269	.01	147
13	.037	.08	.213	.08	.046	.09	103	58	.119	.03	.382	.05	.271	.01	148
14	.041	.08	.226	.08	.036	.09	104	59	.117	.04	.374	.05	.273	-.01	149
15	-.045	+.08	-.239	-.08	-.036	-.09	105	60	-.115	-.04	-.365	+.05	+.274	+.00	150
16	.049	.08	.251	.07	.017	.09	106	61	.114	.04	.356	.05	.275	.00	151
17	.053	.08	.263	.07	-.008	.09	107	62	.112	.04	.347	.06	.275	.00	152
18	.056	.08	.275	.07	+.002	.09	108	63	.110	.05	.338	.06	.275	.01	153
19	.060	.08	.287	.07	.012	.09	109	64	.108	.05	.328	.06	.275	.01	154
20	-.065	+.08	-.299	-.07	+.022	-.09	110	65	-.106	-.05	-.318	+.06	+.275	+.01	155
21	.069	.07	.310	.07	.032	.09	111	66	.102	.06	.307	.07	.274	.02	156
22	.073	.07	.320	.06	.041	.09	112	67	.100	.06	.296	.07	.272	.02	157
23	.076	.07	.330	.06	.050	.08	113	68	.098	.06	.284	.07	.270	.02	158
24	.079	.07	.340	.06	.060	.08	114	69	.095	.06	.272	.07	.268	.02	159
25	-.082	+.07	-.350	-.06	+.070	-.08	115	70	-.093	-.06	-.261	+.07	+.266	+.03	160
26	.085	.06	.359	.05	.079	.08	116	71	.090	.07	.249	.08	.263	.03	161
27	.088	.06	.368	.05	.088	.08	117	72	.087	.07	.237	.08	.260	.03	162
28	.091	.06	.376	.05	.097	.08	118	73	.084	.07	.224	.08	.257	.04	163
29	.094	.05	.383	.04	.106	.08	119	74	.080	.07	.211	.08	.254	.04	164
30	-.097	+.05	-.390	-.04	+.115	-.08	120	75	-.077	-.07	-.197	+.08	+.250	+.04	165
31	.100	.05	.396	.04	.124	.08	121	76	.074	.08	.183	.09	.246	.04	166
32	.103	.05	.402	.03	.133	.08	122	77	.070	.08	.169	.09	.242	.05	167
33	.105	.04	.408	.03	.142	.07	123	78	.066	.08	.155	.09	.237	.05	168
34	.107	.04	.413	.03	.150	.07	124	79	.062	.08	.141	.09	.232	.05	169
35	-.109	+.04	-.418	-.02	+.158	-.07	125	80	-.059	-.08	-.126	+.09	+.227	+.06	170
36	.111	.04	.423	.02	.165	.07	126	81	.055	.08	.111	.09	.221	.06	171
37	.113	.03	.427	.02	.172	.06	127	82	.050	.08	.096	.09	.215	.06	172
38	.115	.03	.430	-.01	.179	.06	128	83	.047	.09	.081	.09	.209	.06	173
39	.116	.03	.432	+.01	.186	.06	129	84	.043	.09	.066	.09	.203	.06	174
40	-.117	+.03	-.434	+.01	+.193	-.06	130	85	-.039	-.09	-.051	+.09	+.196	+.07	175
41	.118	.02	.435	.00	.199	.05	131	86	.035	.09	.036	.09	.189	.07	176
42	.119	.02	.436	.00	.206	.05	132	87	.030	.09	.021	.09	.182	.07	177
43	.120	.01	.436	.00	.212	.05	133	88	.026	.09	-.006	.09	.175	.07	178
44	.121	.01	.436	.00	.218	.05	134	89	.022	.09	+.009	.09	.167	.07	179
45	.122	.01	.436	+.01	+.224	-.04	135	90	-.018	-.09	+.025	+.09	+.159	+.08	180

NOTE. — When the Argument is on the right-hand side of the Table, the sign of the correction is to be reversed.

SOLAR EPHEMERIS, 1861. 299

AT WASHINGTON MEAN AND APPARENT NOON.

Date.	APPARENT RIGHT ASCENSION.		APPARENT DECLINATION.		HOURLY MOTION.		Equation of Time for Apparent Noon.	Semi-diameter at Apparent Noon.	Sideral Time of Semi-d. passing Merid.	Sideral Time of Mean Noon.
	Mean Noon.	Ap- parent Noon.	Mean Noon.	Ap- parent Noon.	Right Ascension.	Declination.				
Jan. 1	18 49 23.55	24.31	22 58 20.8	19.9	11.030	13.00	+ 4 4.18	16 18.42	11.07	18 45 19.45
2	18 53 48.11	48.95	22 52 54.9	53.9	11.016	14.15	4 32.18	18.41	11.01	18 49 15.99
3	18 58 12.31	13.23	22 47 1.6	0.4	11.001	15.29	4 59.83	18.39	10.96	18 53 12.55
4	19 2 36.14	37.14	22 40 41.0	39.6	10.984	16.42	5 27.11	18.37	10.91	18 57 9.11
5	19 6 59.56	60.64	22 33 53.4	51.8	10.967	17.54	5 53.98	18.33	10.86	19 1 5.67
6	19 11 22.53	23.69	22 26 39.0	37.2	10.948	18.65	6 20.40	18.30	10.78	19 5 2.22
7	19 15 45.03	46.27	22 18 58.0	55.9	10.928	19.75	6 46.35	18.26	10.71	19 8 58.78
8	19 20 7.04	8.36	22 10 57.0	48.3	10.906	20.85	7 11.80	18.22	10.64	19 12 55.34
9	19 24 28.52	29.90	22 2 17.3	14.6	10.884	21.93	7 36.74	18.18	10.57	19 16 51.89
10	19 28 49.44	50.89	21 53 17.9	14.9	10.860	23.00	8 1.12	18.14	10.50	19 20 48.46
11	19 33 9.78	11.30	21 43 52.9	49.6	10.835	24.06	8 24.91	18.09	10.41	19 24 45.02
12	19 37 29.51	31.10	21 23 52.6	59.0	10.809	25.10	8 48.07	18.03	10.33	19 28 41.57
13	19 41 48.60	50.25	21 23 47.4	43.5	10.782	26.14	9 10.60	17.97	10.24	19 32 38.13
14	19 46 7.03	8.74	21 13 7.4	3.2	10.754	27.16	9 32.47	17.91	10.15	19 36 34.69
15	19 50 24.78	26.55	21 1 63.0	58.4	10.725	28.17	9 53.67	17.84	10.06	19 40 31.25
16	19 54 41.83	43.66	20 50 34.7	29.8	10.695	29.17	10 14.17	17.76	9.96	19 44 27.80
17	19 58 58.15	60.03	20 38 42.7	37.5	10.665	30.15	10 33.93	17.68	9.86	19 48 24.36
18	20 3 13.73	15.66	20 26 27.3	21.8	10.633	31.12	10 52.95	17.60	9.76	19 52 20.92
19	20 7 28.56	30.54	20 13 48.8	3.0	10.602	32.07	11 11.24	17.52	9.66	19 56 17.47
20	20 11 42.62	44.64	20 0 47.7	41.5	10.570	33.01	11 28.74	17.43	9.56	20 0 14.03
21	20 15 55.89	57.95	19 47 24.3	17.7	10.537	33.93	11 45.45	17.33	9.45	20 4 10.59
22	20 20 8.37	10.47	19 33 38.9	31.9	10.503	34.84	12 1.37	17.23	9.34	20 8 7.15
23	20 24 20.05	22.19	19 19 31.8	24.5	10.470	35.74	12 16.50	17.13	9.23	20 12 3.70
24	20 28 30.93	33.11	19 4 63.5	55.9	10.436	36.61	12 30.81	17.01	9.12	20 16 0.26
25	20 32 41.01	43.22	18 50 14.4	6.5	10.403	37.47	12 44.31	16.89	9.01	20 19 56.82
26	20 36 50.30	52.54	18 34 64.7	56.5	10.370	38.33	12 57.05	16.76	8.90	20 23 53.37
27	20 40 58.79	61.05	18 19 34.7	26.2	10.336	39.17	13 8.98	16.63	8.79	20 27 49.93
28	20 45 6.45	8.73	18 3 44.9	36.1	10.302	39.98	13 20.08	16.50	8.67	20 31 46.49
29	20 49 13.29	15.59	17 47 35.7	26.6	10.269	40.78	13 30.36	16.37	8.55	20 35 43.04
30	20 53 19.33	21.65	17 30 67.4	58.0	10.235	41.57	13 39.82	16.22	8.43	20 39 39.60
31	20 57 24.56	26.90	17 14 20.4	10.7	10.201	42.34	13 48.50	16.06	8.33	20 43 36.15
Feb. 1	21 1 28.99	31.35	16 57 15.1	5.1	10.168	43.10	13 56.36	15.90	8.22	20 47 32.71
2	21 5 32.62	34.99	16 39 51.9	41.6	10.135	43.83	14 3.42	15.74	8.10	20 51 29.27
3	21 9 35.45	37.83	16 22 11.2	0.7	10.101	44.55	14 9.68	15.58	7.98	20 55 25.83
4	21 13 37.47	39.86	16 4 13.4	2.7	10.068	45.25	14 15.14	15.41	7.86	20 59 22.38
5	21 17 38.69	41.09	15 45 58.9	48.0	10.034	45.93	14 19.80	15.24	7.74	21 3 18.93
6	21 21 39.11	41.51	15 27 28.2	17.1	10.001	46.60	14 23.66	15.06	7.63	21 7 15.49
7	21 25 38.75	41.15	15 8 41.7	30.4	9.968	47.24	14 26.73	14.88	7.52	21 11 12.05
8	21 29 37.60	40.00	14 49 39.8	28.3	9.935	47.88	14 29.02	14.70	7.41	21 15 8.60
9	21 33 35.66	38.06	14 30 23.0	11.3	9.903	48.50	14 30.50	14.52	7.30	21 19 5.16
10	21 37 32.93	35.33	14 10 51.7	39.8	9.870	49.09	14 31.22	14.33	7.19	21 23 1.71
11	21 41 29.43	31.82	13 50 56.3	54.3	9.837	49.68	14 31.14	14.14	7.08	21 26 58.27
12	21 45 25.16	27.54	13 30 57.3	55.2	9.806	50.24	14 30.31	13.95	6.97	21 30 54.82
13	21 49 20.12	22.49	13 10 55.1	42.9	9.774	50.77	14 28.71	13.76	6.86	21 34 51.38
14	21 53 14.33	16.68	12 50 30.3	18.0	9.743	51.29	14 26.36	13.57	6.75	21 38 47.93
15	21 57 7.78	10.11	12 29 53.1	40.7	9.712	51.79	14 23.27	13.37	6.64	21 42 44.48
16	22 1 0.49	2.80	12 8 64.0	51.5	9.681	52.28	14 19.42	13.17	6.54	21 46 41.04
17	22 4 52.47	54.76	11 47 53.5	50.9	9.651	52.75	14 14.84	12.96	6.44	21 50 37.59
18	22 8 43.74	46.01	11 26 52.0	39.4	9.622	53.21	14 9.54	12.75	6.34	21 54 34.15
19	22 12 34.33	36.58	11 5 29.8	17.2	9.594	53.65	14 3.57	12.53	6.24	21 58 30.70
20	22 16 24.26	26.49	10 43 57.4	44.8	9.566	54.07	13 56.94	12.31	6.15	22 2 27.26
21	22 20 13.51	15.71	10 22 15.2	2.6	9.538	54.45	13 49.64	12.09	6.06	22 6 23.81
22	22 24 2.10	4.27	10 0 23.6	11.0	9.511	54.84	13 41.66	11.87	5.97	22 10 20.37
23	22 27 50.05	52.19	9 38 22.9	10.4	9.484	55.21	13 33.05	11.65	5.88	22 14 16.92
24	22 31 37.38	39.49	9 16 13.4	1.0	9.459	55.56	13 23.83	11.42	5.79	22 18 13.47
25	22 35 24.10	26.18	8 53 55.6	43.3	9.434	55.91	13 13.99	11.18	5.71	22 22 10.03
26	22 39 10.25	12.30	8 31 29.9	17.7	9.411	56.23	13 3.59	10.94	5.63	22 26 6.58
27	22 42 55.86	57.88	8 8 56.6	44.5	9.390	56.53	12 52.65	10.70	5.55	22 30 3.13
28	22 46 40.96	42.94	7 46 16.1	4.1	9.369	56.83	12 41.19	10.46	5.47	22 33 59.69
29	22 50 25.56	27.50	7 23 28.8	16.9	9.348	57.11	12 29.22	10.21	5.40	22 37 56.24
30	22 54 9.67	11.58	7 0 35.1	23.3	9.328	57.36	12 16.77	9.95	5.33	22 41 52.80
31	22 57 53.32	55.20	6 37 35.4	23.7	9.308	57.60	+12 3.86	16 9.69	5.26	22 45 49.35

NOTE. — For Mean Interval of Semidiameter passing the Meridian, subtract 0.18 from the Sideral Interval.

300 SOLAR EPHEMERIS, 1861.

AT WASHINGTON MEAN AND APPARENT NOON.

Date.	APPARENT RIGHT ASCENSION.		APPARENT DECLINATION.		HOURLY MOTION.		Equation of Time for Apparent Noon.	Semi-diameter at Apparent Noon.	Sidereal Time of Semi-d. passing Merid.	Sidereal Time of Mean Noon.
	Mean Noon.	Ap- parent Noon.	Mean Noon.	Ap- parent Noon.	Right Ascension.	Declination.				
Mar. 1	22 50 25.56	27.50	7 23 28.8	16.9	9.348	57.11	+12 29.29	16' 10.21	5.40	22 37 56.94
2	22 54 9.67	11.58	7 0 35.1	23.3	9.328	57.36	12 16.77	9.95	5.33	22 41 52.80
3	22 57 53.32	55.30	6 37 35.4	23.7	9.308	57.60	12 3.86	9.69	5.26	22 45 49.35
4	23 1 36.53	38.37	6 14 30.1	18.6	9.291	57.83	11 50.52	9.43	5.19	22 49 45.90
5	23 5 19.30	21.10	5 51 19.4	8.1	9.274	58.05	11 36.73	9.17	5.12	22 53 42.46
6	23 9 1.67	3.43	5 27 63.8	52.7	9.257	58.24	11 22.55	8.91	5.06	22 57 39.01
7	23 12 43.64	45.36	5 4 43.8	32.9	9.241	58.42	11 7.98	8.65	5.00	23 1 35.56
8	23 16 25.23	26.91	4 41 19.7	9.0	9.225	58.58	10 53.00	8.39	4.94	23 5 32.12
9	23 20 6.47	8.11	4 17 52.0	41.5	9.211	58.73	10 37.69	8.13	4.89	23 9 28.67
10	23 23 47.38	48.98	3 54 21.0	10.7	9.197	58.85	10 22.05	7.86	4.84	23 13 25.22
11	23 27 27.96	29.52	3 30 47.2	37.2	9.184	58.96	10 16.06	7.59	4.79	23 17 21.78
12	23 31 8.24	9.76	3 7 10.9	1.1	9.171	59.05	9 49.79	7.33	4.75	23 21 18.33
13	23 34 48.22	49.70	2 43 32.6	23.1	9.160	59.13	9 33.22	7.07	4.71	23 25 14.88
14	23 38 27.93	29.36	2 19 52.7	43.5	9.149	59.19	9 16.38	6.80	4.67	23 29 11.43
15	23 42 7.39	8.77	1 56 11.5	2.6	9.139	59.23	8 59.29	6.53	4.63	23 33 7.99
16	23 45 46.61	47.94	1 32 29.5	20.9	9.129	59.25	8 41.97	6.26	4.60	23 37 4.54
17	23 49 25.61	26.90	1 8 47.0	38.6	9.120	59.27	8 24.42	6.00	4.58	23 41 1.09
18	23 53 4.41	5.65	0 44 64.4	56.3	9.113	59.27	8 6.66	5.73	4.56	23 44 57.65
19	23 56 43.02	44.21	0 21 22.0	14.2	9.106	59.24	7 48.72	5.46	4.54	23 48 54.20
20	0 0 21.48	22.62	+ 0 2 19.8	27.3	9.100	59.21	7 30.63	5.19	4.52	23 52 50.75
21	0 3 59.80	60.89	0 26 0.6	7.8	9.094	59.17	7 12.41	4.93	4.50	23 56 47.31
22	0 7 38.01	39.05	0 49 40.1	47.0	9.089	59.12	6 54.07	4.66	4.49	0 0 43.86
23	0 11 16.11	17.10	1 13 18.0	24.6	9.086	59.05	6 35.62	4.39	4.48	0 4 40.41
24	0 14 54.14	56.08	1 36 53.9	60.2	9.084	58.96	6 17.10	4.12	4.47	0 8 36.97
25	0 18 32.13	32.03	2 0 27.5	33.5	9.082	58.84	5 58.54	3.84	4.46	0 12 33.51
26	0 22 10.10	10.96	2 23 58.5	64.1	9.082	58.72	5 39.97	3.56	4.46	0 16 30.07
27	0 25 48.06	48.87	2 47 26.6	31.8	9.082	58.60	5 21.30	3.28	4.46	0 20 26.62
28	0 29 26.04	26.80	3 10 51.5	56.4	9.083	58.46	5 2.82	3.00	4.46	0 24 23.18
29	0 33 4.08	4.79	3 34 12.7	17.3	9.086	58.30	4 44.30	2.72	4.47	0 28 19.73
30	0 36 42.18	42.85	3 57 30.0	34.3	9.089	58.13	4 25.86	2.44	4.48	0 32 16.28
31	0 40 20.38	21.01	4 20 43.0	47.0	9.093	57.95	4 7.51	2.15	4.49	0 36 12.84
Apr. 1	0 43 58.69	59.27	4 43 51.4	55.1	9.098	57.75	3 49.27	1.86	4.51	0 40 9.30
2	0 47 37.13	37.66	5 6 54.8	58.2	9.104	57.53	3 31.16	1.57	4.53	0 44 5.94
3	0 51 15.73	16.21	5 29 52.9	56.0	9.112	57.30	3 13.21	1.29	4.55	0 48 2.50
4	0 54 54.50	54.94	5 52 45.4	48.2	9.120	57.06	2 55.44	1.01	4.57	0 51 59.05
5	0 58 33.46	33.86	6 15 31.9	34.5	9.128	56.81	2 37.86	0.73	4.60	0 55 55.60
6	1 2 12.62	12.97	6 38 12.0	14.3	9.136	56.54	2 20.45	0.45	4.63	0 59 52.16
7	1 5 52.00	52.31	7 0 45.3	47.3	9.145	56.25	2 3.28	0.17	4.66	1 3 48.71
8	1 9 31.62	31.89	7 23 11.5	13.2	9.155	55.93	1 46.35	15 59.89	4.69	1 7 45.26
9	1 13 11.50	11.73	7 45 30.2	31.6	9.166	55.61	1 29.66	59.62	4.73	1 11 41.82
10	1 16 51.64	51.83	8 7 41.1	42.3	9.178	55.29	1 13.26	59.35	4.77	1 15 38.37
11	1 20 32.06	32.21	8 29 43.8	44.7	9.190	54.93	0 57.14	59.08	4.81	1 19 34.92
12	1 24 12.77	12.88	8 51 37.9	38.5	9.202	54.57	0 41.30	58.81	4.86	1 23 31.48
13	1 27 53.78	53.85	9 13 23.1	23.5	9.215	54.19	0 25.75	58.54	4.91	1 27 28.03
14	1 31 35.11	35.14	9 34 59.0	59.2	9.229	53.79	+ 0 10.52	58.28	4.96	1 31 24.59
15	1 35 16.77	16.76	9 56 25.3	25.3	9.243	53.38	- 0 4.37	58.02	5.01	1 35 21.14
16	1 38 58.77	58.72	10 17 41.7	41.5	9.257	52.97	0 18.93	57.76	5.06	1 39 17.69
17	1 42 41.13	41.04	10 38 47.9	47.5	9.273	52.53	0 33.13	57.50	5.12	1 43 14.25
18	1 46 23.87	23.74	10 59 43.4	42.8	9.289	52.08	0 46.94	57.24	5.18	1 47 10.80
19	1 50 6.99	6.83	11 20 28.0	27.2	9.305	51.62	1 0.38	56.98	5.24	1 51 7.36
20	1 53 50.51	50.32	11 41 1.3	0.3	9.322	51.15	1 13.40	56.73	5.30	1 55 3.91
21	1 57 34.45	34.22	12 1 23.1	21.9	9.340	50.66	1 26.02	56.48	5.36	1 59 0.47
22	2 1 18.82	18.56	12 21 33.1	31.7	9.358	50.16	1 38.19	56.23	5.42	2 2 57.02
23	2 5 3.63	3.34	12 41 30.9	29.3	9.376	49.65	1 49.93	55.98	5.49	2 6 53.57
24	2 8 48.90	48.58	13 1 16.3	14.6	9.396	49.12	2 1.21	55.73	5.56	2 10 50.13
25	2 12 34.65	34.30	13 20 48.9	47.1	9.416	48.58	2 12.01	55.48	5.63	2 14 46.68
26	2 16 20.88	20.50	13 40 8.4	26.5	9.436	48.03	2 22.33	55.23	5.70	2 18 43.24
27	2 20 7.62	7.21	13 59 14.5	12.5	9.458	47.47	2 32.14	54.99	5.77	2 22 39.79
28	2 23 54.88	54.45	14 18 6.9	4.8	9.480	46.90	2 41.44	54.75	5.85	2 26 36.35
29	2 27 42.67	42.22	14 36 45.3	43.1	9.503	46.30	2 50.20	54.51	5.93	2 30 32.90
30	2 31 31.02	30.55	14 55 9.4	7.1	9.526	45.70	2 58.42	54.27	6.01	2 34 29.46
31	2 35 19.91	19.42	+15 13 18.9	16.5	9.549	45.08	- 3 6.09	15 54.03	1 6.09	2 38 26.01

NOTE. — For Mean Interval of Semi-diameter passing the Meridian, subtract 0.16 from the Sidereal Interval.

302 SOLAR EPHEMERIS, 1861.

AT WASHINGTON MEAN AND APPARENT NOON.

Date.	APPARENT RIGHT ASCENSION.		APPARENT DECLINATION.		HOURLY MOTION.		Equation of Time for Apparent Noon.	Semi-diameter at Apparent Noon.	Sidereal Time of Semid. passing Merid.	Sidereal Time of Mean Noon.
	Mean Noon.	Apparent Noon.	Mean Noon.	Apparent Noon.	Right Ascension.	Declination.				
	^h ^m ^s	^s	[°] ['] ^{"/> <th>^{"/> <th>^{"/> <th>^{"/> <th>^m ^s ^s</th> <th>^m ^s</th> <th>^m ^s</th> <th>^h ^m ^s</th>}</th>}</th>}</th>}	^{"/> <th>^{"/> <th>^{"/> <th>^m ^s ^s</th> <th>^m ^s</th> <th>^m ^s</th> <th>^h ^m ^s</th>}</th>}</th>}	^{"/> <th>^{"/> <th>^m ^s ^s</th> <th>^m ^s</th> <th>^m ^s</th> <th>^h ^m ^s</th>}</th>}	^{"/> <th>^m ^s ^s</th> <th>^m ^s</th> <th>^m ^s</th> <th>^h ^m ^s</th>}	^m ^s ^s	^m ^s	^m ^s	^h ^m ^s
July 1	6 42 27.26	27.87	+23 5 56.2	55.6	10.336	10.48	+ 3 31.26	15' 46.14	1 8.77	6 38 56.01
2	6 46 35.22	35.86	23 1 32.4	31.7	10.326	11.49	3 42.66	46.13	8.73	6 42 52.57
3	6 50 42.92	43.59	22 56 44.4	43.6	10.314	11.50	3 53.82	46.12	8.69	6 46 49.12
4	6 54 50.34	51.04	22 51 32.4	31.5	10.302	13.50	4 4.69	46.12	8.65	6 50 45.68
5	6 58 57.44	58.17	22 45 56.5	55.5	10.289	14.49	4 15.23	46.13	8.60	6 54 42.24
6	7 3 4.20	4.96	22 39 56.8	55.7	10.275	15.48	4 25.43	46.15	8.55	6 58 38.80
7	7 7 10.61	11.40	22 33 33.5	32.3	10.260	16.46	4 35.28	46.17	8.50	7 2 35.36
8	7 11 16.64	17.46	22 26 46.7	45.4	10.242	17.44	4 44.76	46.20	8.45	7 6 31.91
9	7 15 22.27	23.11	22 19 36.7	35.2	10.225	18.40	4 53.83	46.23	8.39	7 10 28.47
10	7 19 27.47	28.34	22 12 3.6	1.9	10.207	19.35	5 2.46	46.27	8.33	7 14 25.03
11	7 23 32.23	33.12	22 4 7.6	5.7	10.188	20.30	5 10.65	46.31	8.27	7 18 21.59
12	7 27 36.54	37.45	21 55 48.8	46.8	10.170	21.24	5 18.41	46.35	8.21	7 22 18.14
13	7 31 40.37	41.29	21 47 7.6	5.5	10.150	22.18	5 26.69	46.40	8.15	7 26 14.70
14	7 35 43.70	44.65	21 38 4.2	2.0	10.128	23.10	5 32.46	46.46	8.08	7 30 11.26
15	7 39 46.51	47.47	21 28 38.7	36.4	10.107	24.02	5 38.71	46.52	8.01	7 34 7.82
16	7 43 48.80	49.77	21 18 51.3	48.9	10.084	24.92	5 44.44	46.59	7.94	7 38 4.38
17	7 47 50.56	51.54	21 8 42.3	39.8	10.062	25.82	5 49.66	46.66	7.86	7 42 0.93
18	7 51 51.78	52.77	20 58 11.8	9.2	10.039	26.71	5 54.32	46.74	7.78	7 45 57.49
19	7 55 52.45	53.45	20 47 20.1	17.4	10.016	27.59	5 58.42	46.82	7.70	7 49 54.05
20	7 59 52.56	53.56	20 36 7.4	4.5	9.993	28.46	6 1.95	46.90	7.62	7 53 50.60
21	8 3 52.10	53.10	20 24 33.9	30.9	9.969	29.32	6 4.93	47.09	7.54	7 57 47.16
22	8 7 51.08	52.08	20 12 39.9	36.8	9.945	30.16	6 7.35	47.18	7.46	8 1 43.72
23	8 11 49.49	50.50	20 0 25.7	22.5	9.922	31.01	6 9.90	47.27	7.38	8 5 40.28
24	8 15 47.32	48.34	19 47 51.4	48.1	9.898	31.84	6 10.48	47.26	7.30	8 9 36.83
25	8 19 44.57	45.58	19 34 57.2	53.8	9.874	32.67	6 11.18	47.36	7.22	8 13 33.39
26	8 23 41.24	42.35	19 21 43.4	39.9	9.850	33.48	6 11.30	47.46	7.14	8 17 29.95
27	8 27 37.34	38.34	19 8 10.4	6.8	9.826	34.29	6 10.84	47.56	7.05	8 21 26.50
28	8 31 32.86	33.85	18 54 18.3	14.7	9.802	35.06	6 9.79	47.66	6.96	8 25 23.06
29	8 35 27.80	28.78	18 40 7.4	3.8	9.777	35.83	6 8.18	47.77	6.87	8 29 19.61
30	8 39 22.15	23.12	18 25 38.0	34.3	9.752	36.60	6 5.97	47.89	6.79	8 33 16.17
31	8 43 15.91	16.87	18 10 50.3	46.5	9.728	37.36	6 3.17	48.01	6.71	8 37 12.73
Aug. 1	8 47 9.08	10.03	17 55 44.6	40.8	9.703	38.11	5 59.78	48.13	6.62	8 41 9.28
2	8 51 1.67	2.61	17 40 21.3	17.5	9.679	38.83	5 55.81	48.25	6.53	8 45 5.84
3	8 54 53.67	54.60	17 24 40.7	36.9	9.655	39.54	5 51.24	48.38	6.44	8 49 2.40
4	8 58 45.07	45.99	17 8 43.0	39.2	9.630	40.25	5 46.06	48.51	6.35	8 52 58.95
5	9 2 35.87	36.78	16 52 28.6	24.8	9.605	40.94	5 40.33	48.65	6.26	8 56 55.51
6	9 6 26.09	26.98	16 35 57.8	54.0	9.580	41.61	5 33.99	48.80	6.17	9 0 52.06
7	9 10 15.73	16.60	16 19 10.9	7.1	9.556	42.28	5 27.07	48.95	6.09	9 4 48.62
8	9 14 4.77	5.62	16 2 8.3	4.5	9.531	42.92	5 19.56	49.12	6.01	9 8 45.17
9	9 17 53.22	54.05	15 44 50.3	46.5	9.507	43.56	5 11.46	49.29	5.92	9 12 41.73
10	9 21 41.08	41.88	15 27 17.2	13.4	9.482	44.18	5 2.77	49.46	5.84	9 16 38.28
11	9 25 28.35	29.12	15 9 29.3	25.5	9.458	44.80	4 53.49	49.63	5.76	9 20 34.84
12	9 29 15.05	15.79	14 51 26.9	23.2	9.434	45.39	4 43.63	49.80	5.68	9 23 31.40
13	9 33 1.18	1.89	14 33 10.3	6.8	9.411	45.98	4 33.21	49.98	5.60	9 27 27.95
14	9 36 46.75	47.43	14 14 39.9	36.5	9.387	46.55	4 22.22	50.19	5.52	9 31 24.51
15	9 40 31.77	32.42	13 55 56.1	52.8	9.364	47.10	4 10.68	50.36	5.44	9 35 21.06
16	9 44 16.24	16.86	13 36 59.1	55.9	9.342	47.65	3 58.60	50.55	5.37	9 40 17.61
17	9 48 0.19	0.78	13 17 49.1	46.0	9.321	48.18	3 45.99	50.74	5.30	9 44 14.17
18	9 51 43.62	44.17	12 58 26.5	23.6	9.300	48.70	3 32.87	50.93	5.23	9 48 10.73
19	9 55 26.55	27.07	12 38 51.6	48.8	9.279	49.21	3 19.26	51.12	5.16	9 52 7.28
20	9 59 8.99	9.47	12 19 4.6	2.0	9.259	49.70	3 5.16	51.32	5.09	9 56 3.83
21	10 2 50.97	51.41	11 59 5.9	3.5	9.239	50.19	2 50.57	51.52	5.02	10 0 0.39
22	10 6 32.49	32.89	11 38 55.7	53.5	9.220	50.67	2 35.54	51.72	4.95	10 3 56.94
23	10 10 13.57	13.93	11 18 34.4	32.4	9.202	51.12	2 20.05	51.92	4.89	10 7 53.50
24	10 13 54.23	54.55	10 58 2.2	0.4	9.185	51.55	2 4.15	52.13	4.83	10 11 50.05
25	10 17 34.49	34.77	10 37 19.5	17.9	9.169	51.99	1 47.86	52.34	4.77	10 15 46.60
26	10 21 14.37	14.61	10 16 26.5	25.1	9.153	52.42	1 31.19	52.55	4.71	10 19 43.16
27	10 24 53.88	54.07	9 55 23.6	22.4	9.139	52.82	1 14.15	52.76	4.65	10 23 39.71
28	10 28 33.04	33.18	9 34 11.1	10.2	9.125	53.21	0 56.75	52.98	4.60	10 27 36.27
29	10 32 11.85	11.95	9 12 49.3	48.6	9.110	53.60	0 39.02	53.20	4.55	10 31 32.82
30	10 35 50.33	50.39	8 51 18.6	18.2	9.097	53.96	0 20.96	53.42	4.50	10 35 29.37
31	10 39 29.51	28.52	+ 8 29 39.3	39.2	9.084	54.31	+ 0 2.59	53.64	4.45	10 39 25.93

NOTE.— For Mean Interval of Semidiameter passing the Meridian, subtract 0.18 from the Sidereal Interval.

SOLAR EPHEMERIS, 1861. 303

AT WASHINGTON MEAN AND APPARENT NOON.

Date.	APPARENT RIGHT ASCENSION.		APPARENT DECLINATION.		HOURLY MOTION.		Equation of Time for Apparent Noon.	Semi-diameter at Apparent Noon.	Sidereal Time of Semid. passing Merid.	Sidereal Time of Mean Noon.
	Mean Noon.	Apparent Noon.	Mean Noon.	Apparent Noon.	Right Ascension.	Declination.				
Sept. 1	10 43 6.40	6.36	+ 8 7 51.6	51.8	9.073	54.65	- 0 16.08	15' 53.87	4.40	10 43 22.48
2	10 46 44.02	43.93	7 45 56.0	56.5	9.062	54.98	0 35.02	54.10	4.36	10 47 19.04
3	10 50 21.37	21.94	7 23 52.8	53.6	9.051	55.28	0 54.22	54.34	4.32	10 51 15.59
4	10 53 58.47	58.99	7 1 42.4	43.5	9.041	55.58	1 13.66	54.58	4.28	10 55 12.14
5	10 57 35.34	35.11	6 39 25.1	26.5	9.032	55.86	1 33.36	54.82	4.24	10 59 8.70
6	11 1 11.99	11.71	6 17 1.3	3.0	9.023	56.12	1 53.25	55.06	4.21	11 3 5.25
7	11 4 48.42	48.09	5 54 31.3	33.3	9.014	56.37	2 13.35	55.31	4.19	11 7 1.80
8	11 8 24.66	24.28	5 31 55.5	57.8	9.007	56.61	2 33.67	55.56	4.17	11 10 58.36
9	11 12 0.72	0.29	5 9 14.1	16.7	9.000	56.82	2 54.17	55.82	4.15	11 14 54.91
10	11 15 36.63	36.15	4 46 27.6	30.5	8.993	57.03	3 14.81	56.08	4.13	11 18 51.46
11	11 19 12.40	11.87	4 23 36.3	39.6	8.988	57.23	3 35.58	56.34	4.11	11 22 48.02
12	11 22 48.05	47.46	4 0 40.5	44.2	8.983	57.41	3 56.47	56.60	4.09	11 26 44.57
13	11 26 23.59	23.95	3 37 40.6	44.6	8.979	57.57	4 17.47	56.86	4.08	11 30 41.12
14	11 29 59.05	58.36	3 14 36.8	41.1	8.976	57.73	4 38.56	57.12	4.07	11 34 37.67
15	11 33 34.45	33.71	2 51 29.5	34.1	8.974	57.87	4 59.73	57.39	4.06	11 38 34.22
16	11 37 9.21	9.02	2 28 19.0	24.0	8.973	58.00	5 20.90	57.66	4.06	11 39 30.78
17	11 40 45.15	44.30	2 5 5.6	11.0	8.972	58.11	5 42.10	57.93	4.06	11 36 27.33
18	11 44 20.49	19.59	1 41 49.6	55.4	8.973	58.21	6 3.30	58.19	4.06	11 40 23.89
19	11 47 55.86	54.91	1 18 31.3	37.5	8.975	58.30	6 24.46	58.45	4.07	11 54 20.44
20	11 51 31.29	30.29	0 55 11.0	17.6	8.978	58.37	6 45.60	58.72	4.08	11 58 16.99
21	11 55 6.79	5.73	0 31 49.1	56.0	8.981	58.44	7 6.65	58.99	4.09	12 2 13.55
22	11 58 42.40	42.28	+ 0 8 25.8	33.0	8.986	58.49	7 27.59	59.26	4.11	12 6 10.10
23	12 2 18.13	18.25	- 0 14 58.5	50.9	8.991	58.53	7 48.40	59.52	4.13	12 10 6.65
24	12 5 54.01	53.78	0 38 23.5	15.5	8.998	58.55	8 9.07	15 59.79	4.15	12 14 3.20
25	12 9 30.06	29.78	1 1 48.8	40.5	9.006	58.56	8 29.58	16 0.06	4.18	12 17 59.76
26	12 13 6.30	4.97	1 25 14.1	5.5	9.015	58.55	8 49.89	0.33	4.21	12 21 56.31
27	12 16 42.76	41.38	1 48 39.1	30.2	9.024	58.52	9 9.98	0.60	4.24	12 25 52.26
28	12 20 19.45	18.02	2 11 63.4	54.2	9.034	58.48	9 29.83	0.87	4.27	12 29 49.42
29	12 23 56.40	54.92	2 35 26.6	17.1	9.045	58.43	9 49.43	1.14	4.31	12 33 45.97
30	12 27 33.62	32.09	2 58 48.3	38.5	9.057	58.37	10 8.78	1.41	4.35	12 37 42.52
Oct. 1	12 31 11.13	9.55	3 21 68.2	58.1	9.069	58.29	10 27.79	1.68	4.39	12 41 39.07
2	12 34 48.95	47.32	3 45 26.0	15.6	9.082	58.19	10 46.53	1.96	4.43	12 45 35.63
3	12 38 27.09	25.41	4 8 41.2	30.5	9.096	58.07	11 4.94	2.23	4.48	12 49 32.18
4	12 42 5.58	4.85	4 31 53.4	42.4	9.111	57.94	11 23.01	2.51	4.53	12 53 28.73
5	12 45 44.43	43.65	4 54 62.2	50.9	9.126	57.79	11 40.72	2.79	4.58	12 57 25.29
6	12 49 23.66	21.83	5 17 67.3	55.8	9.142	57.62	11 58.05	3.07	4.64	13 1 21.84
7	12 53 3.27	1.40	5 40 68.3	56.6	9.159	57.45	12 14.99	3.35	4.70	13 5 18.39
8	12 56 43.29	41.37	6 3 64.8	52.9	9.176	57.25	12 31.52	3.64	4.77	13 9 14.95
9	13 0 23.74	21.77	6 26 56.5	44.4	9.194	57.05	12 47.62	3.92	4.84	13 13 11.50
10	13 4 4.64	2.63	6 49 42.9	30.6	9.213	56.82	13 3.28	4.20	4.91	13 17 8.05
11	13 7 45.99	43.94	7 12 23.7	11.2	9.232	56.58	13 18.49	4.48	4.98	13 21 4.61
12	13 11 27.81	27.72	7 34 58.5	45.8	9.253	56.30	13 33.21	4.76	5.05	13 25 1.16
13	13 15 10.13	8.00	7 57 26.9	14.0	9.275	56.03	13 47.44	5.04	5.14	13 28 57.72
14	13 18 52.97	50.80	8 19 48.6	35.5	9.297	55.75	14 1.15	5.32	5.22	13 32 54.27
15	13 22 36.35	34.14	8 41 63.2	50.0	9.319	55.45	14 14.31	5.60	5.30	13 36 50.82
16	13 26 20.28	18.05	9 3 70.4	57.1	9.342	55.13	14 26.94	5.88	5.38	13 40 47.37
17	13 30 4.79	2.50	9 25 69.7	56.3	9.366	54.81	14 39.00	6.16	5.47	13 44 43.93
18	13 33 49.29	47.56	9 47 60.9	47.4	9.392	54.45	14 50.46	6.43	5.56	13 48 40.48
19	13 37 35.61	33.24	10 9 43.6	30.0	9.419	54.09	15 1.30	6.70	5.65	13 52 37.03
20	13 41 21.97	19.57	10 31 17.3	3.6	9.445	53.71	15 11.51	6.97	5.74	13 56 33.59
21	13 45 8.98	6.55	10 52 41.7	28.0	9.473	53.31	15 21.06	7.24	5.83	14 0 30.14
22	13 48 56.67	54.31	11 13 56.4	42.7	9.501	52.90	15 29.94	7.51	5.93	14 4 26.70
23	13 52 45.06	42.57	11 34 61.1	47.4	9.531	52.48	15 38.11	7.76	6.03	14 8 23.25
24	13 56 34.17	31.65	11 55 55.3	41.6	9.562	52.03	15 45.55	8.01	6.13	14 12 19.80
25	14 0 24.01	21.47	12 16 38.7	25.0	9.592	51.57	15 52.26	8.26	6.23	14 16 16.36
26	14 4 14.58	12.02	12 36 70.8	57.1	9.623	51.10	15 58.24	8.51	6.33	14 20 12.91
27	14 8 5.90	3.32	12 57 31.3	17.7	9.654	50.60	16 3.51	8.76	6.45	14 24 9.47
28	14 11 57.99	55.39	13 17 39.7	26.2	9.687	50.09	16 7.99	9.22	6.56	14 28 6.02
29	14 15 50.87	48.25	13 37 35.6	22.2	9.720	49.55	16 11.68	9.27	6.67	14 32 2.58
30	14 19 44.55	41.91	13 57 18.6	5.3	9.753	49.01	16 14.57	9.52	6.78	14 35 59.13
31	14 23 39.02	36.37	14 16 48.2	35.0	9.787	48.44	16 16.66	9.77	6.89	14 39 55.69
32	14 27 34.29	31.63	14 35 64.0	51.0	9.821	47.86	-16 17.94	16 10.01	7.00	14 43 52.24

Note. — For Mean Interval of Semidiameter passing the Meridian, subtract 0.13 from the Sidereal Interval.

MOON CULMINATIONS, 1861. 305

WASHINGTON MERIDIAN.

Mean Solar Date.	Sidereal Date.	Limb and Transit.	Apparent Right Ascension in Time.	Logarithm Variation of Moon's Right Ascension for 1 hour of Longitude.	Sidereal Time of Semi-diameter passing the Meridian.	Declination.	Logarithm Variation of Moon's Declination for 1 hour of Longitude.
Jan. 1	^d 0	II. L.	^{h m s} 10 50 43.25	2.12077	67.15	+ 8 6 49.0	-2.97988
1	1	II. U.	11 17 5.76	2.11966	67.08	0 5 3.9	-2.98276
2	1	II. L.	11 43 28.17	2.12103	67.21	- 3 16 49.1	-2.97966
2	2	II. U.	12 10 0.24	2.12493	67.53	- 6 25 53.3	-2.97046
3	3	II. L.	12 36 50.90	2.13117	68.04	- 9 29 39.0	-2.95477
3	3	II. U.	13 4 8.54	2.13931	68.71	-12 25 26.8	-2.93170
4	4	II. L.	13 32 0.35	2.14897	69.47	-15 10 35.5	-2.90016
4	4	II. U.	14 0 31.93	2.15951	70.33	-17 42 22.6	-2.85796
5	5	II. L.	14 29 46.50	2.17026	71.23	-19 58 5.9	-2.80216
5	5	II. U.	14 59 44.23	2.18053	72.07	-21 55 8.5	-2.72789
6	6	II. L.	15 30 21.71	2.18921	72.80	-23 31 6.1	-2.62682
6	6	II. U.	16 1 31.62	2.19557	73.32	-24 43 54.4	-2.48186
7	7	II. L.	16 33 3.01	2.19901	73.59	-25 32 0.3	-2.24773
7	7	II. U.	17 4 41.82	2.19904	73.56	-25 54 30.4	-1.68115
8	8	II. L.	17 36 12.54	2.19532	73.21	-25 51 16.5	+1.90135
8	8	II. U.	18 7 19.66	2.18814	72.56	-25 22 57.7	+2.30546
9	9	II. L.	18 37 49.18	2.17774	71.65	-24 30 56.0	+2.49995
9	9	II. U.	19 7 30.16	2.16483	70.55	-23 17 8.7	+2.62273
10	10	I. L.	19 33 56.53	2.15017	69.31	-21 43 56.9	+2.70757
11	10	I. U.	20 1 44.37	2.13437	68.03	-19 53 57.6	+2.76900
11	11	I. L.	20 28 32.10	2.11836	66.76	-17 49 48.0	+2.81412
12	11	I. U.	20 54 22.09	2.10275	65.57	-15 34 2.2	+2.84730
12	12	I. L.	21 19 18.82	2.08810	64.44	-13 9 6.6	+2.87142
13	12	I. U.	21 43 28.20	2.07496	63.48	-10 37 12.7	+2.88841
13	13	I. L.	22 6 57.16	2.06382	62.67	- 8 0 21.0	+2.89961
14	13	I. U.	22 29 53.27	2.05473	62.04	- 5 20 17.7	+2.90605
14	14	I. L.	22 52 24.38	2.04813	61.58	- 2 38 37.9	+2.90840
15	14	I. U.	23 14 38.45	2.04403	61.31	+ 0 3 12.8	+2.90713
15	15	I. L.	23 36 43.52	2.04246	61.23	+ 2 43 56.8	+2.90244
16	15	I. U.	23 58 47.55	2.04356	61.33	+ 5 22 21.6	+2.89445
16	16	I. L.	0 20 58.48	2.04719	61.61	+ 7 57 16.6	+2.88307
17	17	I. U.	0 43 24.02	2.05323	62.08	+10 27 31.7	+2.86787
17	17	I. L.	1 6 11.84	2.06156	62.70	+12 51 54.6	+2.84827
18	18	I. U.	1 29 29.29	2.07195	63.48	+15 9 8.1	+2.81685
18	18	I. L.	1 53 23.18	2.08400	64.39	+17 17 48.9	+2.79208
19	19	I. U.	2 17 59.74	2.09743	65.41	+19 16 25.2	+2.75208
19	19	I. L.	2 43 23.98	2.11167	66.51	+21 3 15.4	+2.70060
20	20	I. U.	3 9 39.69	2.12620	67.65	+22 36 31.4	+2.63264
20	20	I. L.	3 36 48.63	2.14029	68.77	+23 54 16.6	+2.54002
21	21	I. U.	4 4 50.04	2.15351	69.83	+24 54 31.0	+2.40498
21	21	I. L.	4 33 40.48	2.16504	70.77	+25 35 17.3	+2.18127
22	22	I. U.	5 3 13.50	2.17421	71.54	+25 54 47.3	+1.62014
22	22	I. L.	5 33 19.88	2.18090	72.07	+25 51 31.4	-1.87622
23	23	I. U.	6 3 48.21	2.18455	72.36	+25 24 26.8	-2.29237
23	23	I. L.	6 34 26.03	2.18520	72.38	+24 33 4.9	-2.50169
24	24	I. U.	7 5 0.95	2.18301	72.16	+23 17 37.0	-2.64013
24	24	I. L.	7 35 21.90	2.17846	71.75	+21 38 54.3	-2.73991
25	25	I. U.	8 5 20.12	2.17208	71.19	+19 38 26.5	-2.81524
26	25	II. L.	8 37 10.94	2.16462	70.55	+17 18 17.0	-2.87276
26	26	II. U.	9 6 8.23	2.15676	69.90	+14 40 56.2	-2.91651

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WASHINGTON MERIDIAN.							
Mean Solar Date.	Sidereal Date.	Limb and Transit.	Apparent Right Ascension in Time.	Logarithm Variation of Moon's Right Ascension for 1 hour of Longitude.	Sidereal Time of Semi-diameter passing the Meridian.	Declination.	Logarithm Variation of Moon's Declination for 1 hour of Longitude.
	^d		^{h m s}		^s	^{° ' "}	
Jan. 27	26	II. L.	9 34 34.81	2.14931	69.28	+11 49 13.3	-2.94921
27	27	II. U.	10 2 33.79	2.14270	68.76	+ 8 46 9.4	-2.97242
28	27	II. L.	10 30 10.29	2.13761	68.36	+ 5 34 54.3	-2.98739
28	28	II. U.	10 57 30.86	2.13440	68.13	+ 2 18 36.8	-2.99493
29	28	II. L.	11 24 43.11	2.13328	68.06	- 0 59 26.2	-2.99554
29	29	II. U.	11 51 55.15	2.13431	68.18	- 4 16 14.0	-2.98932
30	30	II. L.	12 19 15.25	2.13748	68.46	- 7 28 42.2	-2.97613
30	30	II. U.	12 46 51.24	2.14261	68.91	-10 33 52.8	-2.95555
31	31	II. L.	13 14 50.09	2.14900	69.49	-13 28 54.5	-2.92688
31	31	II. U.	13 43 17.63	2.15718	70.16	-16 11 1.1	-2.88963
Feb. 1	32	II. L.	14 12 17.66	2.16563	70.88	-18 37 35.1	-2.83868
1	32	II. U.	14 41 51.72	2.17386	71.60	-20 46 9.0	-2.77388
2	33	II. L.	15 11 58.28	2.18127	72.22	-22 34 29.9	-2.68838
2	33	II. U.	15 42 32.81	2.18704	72.72	-24 0 43.2	-2.57198
3	34	II. L.	16 13 27.48	2.19064	73.03	-25 3 21.6	-2.40821
3	34	II. U.	16 44 31.74	2.19151	73.08	-25 41 28.5	-2.10877
4	35	II. L.	17 15 33.25	2.18932	72.86	-25 54 44.0	-0.64345
4	35	II. U.	17 46 18.95	2.18409	72.38	-25 43 26.6	+2.06685
5	36	II. L.	18 16 36.35	2.17603	71.64	-25 8 30.3	+2.36455
5	36	II. U.	18 46 14.92	2.16545	70.71	-24 11 22.6	+2.52882
6	37	II. L.	19 15 6.56	2.15220	69.63	-22 53 55.9	+2.63797
6	37	II. U.	19 43 6.33	2.13906	68.46	-21 18 19.6	+2.71560
7	38	II. L.	20 10 12.05	2.12457	67.26	-19 26 52.8	+2.77299
7	38	II. U.	20 36 24.28	2.11015	66.09	-17 21 56.7	+2.81591
8	39	II. L.	21 1 45.69	2.09621	64.99	-15 5 49.4	+2.84811
9	39	II. U.	21 26 30.63	2.08325	63.99	-12 40 44.9	+2.87173
9	40	I. L.	21 48 8.37	2.07173	63.12	-10 8 46.9	+2.88860
10	40	I. U.	22 11 29.04	2.06202	62.39	- 7 31 49.9	+2.89984
10	41	I. L.	22 34 21.40	2.05419	61.84	- 4 51 40.1	+2.90633
11	41	I. U.	22 56 52.47	2.04860	61.45	- 2 9 55.2	+2.90854
11	42	I. L.	23 19 9.34	2.04532	61.23	+ 0 31 55.4	+2.90692
12	42	I. U.	23 41 19.17	2.04427	61.18	+ 3 12 26.0	+2.90156
12	43	I. L.	0 3 29.05	2.04555	61.30	+ 5 50 22.7	+2.89256
13	44	I. U.	0 25 46.01	2.04906	61.59	+ 8 24 23.3	+2.87985
13	44	I. L.	0 48 16.93	2.05469	62.04	+10 53 15.1	+2.86302
14	45	I. U.	1 11 8.50	2.06236	62.63	+13 15 40.9	+2.84135
14	45	I. L.	1 34 27.08	2.07181	63.36	+15 30 22.7	+2.81421
15	46	I. U.	1 58 18.57	2.08272	64.22	+17 35 59.0	+2.78025
15	46	I. L.	2 22 48.23	2.09465	65.17	+19 31 2.3	+2.73747
16	47	I. U.	2 48 0.39	2.10738	66.17	+21 13 59.7	+2.68284
16	47	I. L.	3 13 58.03	2.12034	67.21	+22 43 14.2	+2.61173
17	48	I. U.	3 40 42.64	2.13300	68.24	+23 57 3.4	+2.51558
17	48	I. L.	4 8 13.69	2.14495	69.22	+24 53 44.5	+2.37621
18	49	I. U.	4 36 28.40	2.15552	70.08	+25 31 36.6	+2.14470
18	49	I. L.	5 5 21.68	2.16423	70.81	+25 49 6.1	+1.53453
19	50	I. U.	5 34 46.39	2.17085	71.34	+25 44 53.4	-1.58722
19	50	I. L.	6 4 33.58	2.17476	71.67	+25 17 59.2	-2.28416
20	51	I. U.	6 34 33.60	2.17682	71.80	+24 27 49.9	-2.49020
20	51	I. L.	7 4 36.54	2.17632	71.72	+23 14 22.0	-2.62636
21	52	I. U.	7 34 32.47	2.17383	71.47	+21 38 5.9	-2.72979

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Mean Solar Date.	Sidereal Date.	Limb and Transit.	Apparent Right Ascension in Time.	Logarithm Variation of Moon's Right Ascension for 1 hour of Longitude.	Sidereal Time of Semi-diameter passing the Meridian.	Declination.	Logarithm Variation of Moon's Declination for 1 hour of Longitude.
	^d		h m s		^s	^o ['] ["]	
Feb. 21	52	I. L.	8 4 17.19	2.16968	71.10	+19 40 4.8	-2.80763
22	53	I. v.	8 33 42.81	2.16501	70.65	+17 21 53.8	-2.86809
22	53	I. L.	9 2 47.92	2.15984	70.18	+14 45 37.9	-2.91516
23	54	I. v.	9 31 32.60	2.15491	69.75	+11 53 46.6	-2.95113
23	54	I. L.	9 59 59.32	2.15085	69.39	+ 8 49 11.4	-2.97749
24	55	II. v.	10 30 30.63	2.14808	69.16	+ 5 35 0.5	-2.99533
25	55	II. L.	10 58 35.46	2.14700	69.06	+ 2 14 34.7	-3.00512
25	56	II. v.	11 26 39.34	2.14765	69.12	- 1 8 35.8	-3.00724
26	56	II. L.	11 54 49.46	2.15017	69.35	- 4 30 56.7	-3.00156
26	57	II. v.	12 23 13.09	2.15443	69.74	- 7 48 52.0	-2.98791
27	58	II. L.	12 51 56.75	2.16033	70.25	-10 58 43.8	-2.96570
27	58	II. v.	13 21 5.96	2.16717	70.85	-13 57 23.0	-2.93386
28	59	II. L.	13 50 44.48	2.17461	71.53	-16 41 13.2	-2.89095
28	59	II. v.	14 20 53.77	2.18184	72.18	-19 7 36.2	-2.83431
Mar. 1	60	II. L.	14 51 32.55	2.18851	72.78	-21 13 33.9	-2.76006
1	60	II. v.	15 22 36.32	2.19357	73.26	-22 57 15.4	-2.66182
2	61	II. L.	15 53 57.48	2.19651	73.54	-24 16 46.7	-2.52559
2	61	II. v.	16 25 25.86	2.19681	73.59	-25 11 11.0	-2.31850
3	62	II. L.	16 56 49.41	2.19427	73.37	-25 40 5.7	-1.90907
3	62	II. v.	17 27 55.32	2.18868	72.88	-25 43 49.5	+1.63347
4	63	II. L.	17 58 31.49	2.18080	72.15	-25 23 17.9	+2.90699
4	63	II. v.	18 28 27.51	2.16963	71.22	-24 39 57.4	+2.43281
5	64	II. L.	18 57 35.59	2.15688	70.11	-23 35 38.1	+2.56884
5	64	II. v.	19 25 50.80	2.14298	68.93	-22 19 26.3	+2.66225
6	65	II. L.	19 53 11.09	2.12843	67.72	-20 32 35.2	+2.73012
6	65	II. v.	20 19 37.02	2.11384	66.52	-18 38 19.2	+2.78110
7	66	II. L.	20 45 11.25	2.09972	65.38	-16 31 50.1	+2.81912
7	66	II. v.	21 9 57.99	2.08658	64.32	-14 15 14.1	+2.84812
8	67	II. L.	21 34 2.67	2.07486	63.39	-11 50 29.4	+2.86978
8	67	II. v.	21 57 31.36	2.06476	62.61	- 9 19 26.3	+2.88540
9	68	II. L.	22 20 30.59	2.05652	61.97	- 6 43 43.3	+2.88540
9	68	II. v.	22 43 7.10	2.05034	61.48	- 4 5 12.6	+2.90187
10	69	II. L.	23 5 27.72	2.04630	61.19	- 1 25 10.3	+2.90381
11	69	I. v.	23 25 37.09	2.04442	61.05	+ 1 14 51.8	+2.90183
11	70	I. L.	23 47 46.05	2.04470	61.07	+ 3 53 29.7	+2.89623
12	71	I. v.	0 9 53.75	2.04704	61.25	+ 6 29 22.0	+2.88662
12	71	I. L.	0 32 21.55	2.05135	61.57	+ 9 1 8.2	+2.87303
13	72	I. v.	0 55 0.52	2.05759	62.04	+11 27 27.4	+2.85475
13	72	I. L.	1 18 1.39	2.06543	62.65	+13 46 57.8	+2.83137
14	73	I. v.	1 41 29.48	2.07456	63.37	+15 58 15.8	+2.80186
14	73	I. L.	2 5 29.49	2.08486	64.18	+17 59 56.2	+2.76478
15	74	I. v.	2 30 5.28	2.09587	65.06	+19 50 30.2	+2.71798
15	74	I. L.	2 55 19.67	2.10728	65.97	+21 28 26.9	+2.65844
16	75	I. v.	3 21 14.22	2.11857	66.90	+22 52 14.9	+2.58083
16	75	I. L.	3 47 48.97	2.12927	67.80	+24 0 22.1	+2.47560
17	76	I. v.	4 15 2.19	2.13909	68.63	+24 51 20.3	+2.32166
17	76	I. L.	4 42 50.35	2.14749	69.35	+25 23 47.2	+2.05625
18	77	I. v.	5 11 8.32	2.15427	69.93	+25 36 30.0	+1.09482
18	77	I. L.	5 39 49.49	2.15912	70.32	+25 28 30.5	-1.96778
19	78	I. v.	6 8 46.33	2.16197	70.58	+24 59 7.8	-2.30307

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Mar. 19	78	I. L.	6 ^h 37 ^m 51.26 ^s	2.16292	70.65	+24 ^o 5 ['] 2.4 ["]	-2.49107
20	79	I. U.	7 6 56.76	2.16294	70.57	+22 55 17.6	-2.62042
20	79	I. L.	7 35 56.67	2.16014	70.38	+21 21 20.1	-2.71720
21	80	I. U.	8 4 46.51	2.15719	70.10	+19 27 1.5	-2.79273
21	80	I. L.	8 33 23.63	2.15375	69.78	+17 13 35.4	-2.85275
22	81	I. U.	9 1 47.49	2.15051	69.48	+14 42 38.4	-2.90057
22	81	I. L.	9 29 59.58	2.14793	69.23	+11 56 9.1	-2.93623
23	82	I. U.	9 58 3.28	2.14635	69.06	+8 56 27.9	-2.96714
23	82	I. L.	10 26 3.47	2.14625	69.01	+5 46 13.1	-2.98905
24	83	I. U.	10 54 6.30	2.14788	69.11	+2 28 22.6	-3.00121
24	83	I. L.	11 22 18.58	2.15131	69.37	-0 53 45.6	-3.00663
25	84	I. U.	11 50 47.67	2.15652	69.80	-4 16 37.3	-3.00427
26	85	II. L.	12 22 1.47	2.16334	70.38	-7 36 27.4	-2.99301
26	85	II. U.	12 51 26.34	2.17161	71.07	-10 49 22.3	-2.97344
27	86	II. L.	13 21 26.81	2.18079	71.85	-13 51 25.0	-2.94276
27	86	II. U.	13 52 5.72	2.18996	72.67	-16 38 44.1	-2.89963
28	87	II. L.	14 23 22.80	2.19652	73.45	-19 7 43.1	-2.84109
28	87	II. U.	14 55 14.34	2.20562	74.11	-21 15 9.7	-2.76252
29	88	II. L.	15 27 32.71	2.21048	74.58	-22 58 26.3	-2.65556
29	88	II. U.	16 0 6.73	2.21248	74.81	-24 15 40.3	-2.50352
30	89	II. L.	16 32 42.31	2.21115	74.73	-25 5 50.3	-2.26152
30	89	II. U.	17 5 4.01	2.20626	74.33	-25 28 50.2	-1.69006
31	90	II. L.	17 36 56.60	2.19805	73.64	-25 25 23.3	+1.90924
31	90	II. U.	18 8 6.61	2.18682	72.67	-24 56 57.6	+2.30395
Apr. 1	91	II. L.	18 38 23.66	2.17298	71.50	-24 5 34.5	+2.49191
1	91	II. U.	19 7 41.01	2.15788	70.21	-22 53 34.7	+2.61003
2	92	II. L.	19 35 55.51	2.14170	68.86	-21 23 20.0	+2.69114
2	92	II. U.	20 3 7.30	2.12526	67.52	-19 37 48.9	+2.75073
3	93	II. L.	20 29 19.16	2.10931	66.23	-17 38 58.3	+2.79483
3	93	II. U.	20 54 35.85	2.09433	65.03	-15 29 11.9	+2.82778
4	94	II. L.	21 19 3.42	2.08061	63.97	-13 10 33.5	+2.85256
4	94	II. U.	21 42 48.22	2.06904	63.04	-10 44 55.0	+2.87090
5	95	II. L.	22 5 59.37	2.05929	62.28	-8 13 58.5	+2.88383
5	95	II. U.	22 28 42.42	2.05181	61.68	-5 39 17.4	+2.89227
6	96	II. L.	22 51 5.73	2.04687	61.26	-3 2 18.5	+2.89672
6	96	II. U.	23 13 16.39	2.04364	61.01	-0 24 24.0	+2.89738
7	97	II. L.	23 35 21.59	2.04227	60.94	+2 13 5.9	+2.89447
7	97	II. U.	23 57 28.19	2.04454	61.02	+4 48 52.9	+2.88791
8	98	II. L.	0 19 42.81	2.04817	61.27	+7 21 39.5	+2.87749
8	99	II. U.	0 42 11.67	2.05369	61.66	+9 50 4.9	+2.86268
9	99	II. L.	1 5 0.59	2.06097	62.18	+12 12 47.8	+2.84316
10	100	I. U.	1 26 9.37	2.06963	62.82	+14 28 24.0	+2.81804
10	100	I. L.	1 49 52.32	2.07940	63.56	+16 35 24.2	+2.78605
11	101	I. U.	2 14 8.94	2.09002	64.37	+18 32 17.4	+2.74555
11	101	I. L.	2 39 2.00	2.10089	65.23	+20 17 32.1	+2.69402
12	102	I. U.	3 4 32.93	2.11167	66.10	+21 49 33.0	+2.62778
12	102	I. L.	3 30 41.66	2.12189	66.94	+23 6 48.9	+2.54028
13	103	I. U.	3 57 26.46	2.13124	67.73	+24 7 52.1	+2.41891
13	103	I. L.	4 24 43.81	2.13919	68.41	+24 51 21.2	+2.23416
14	104	I. U.	4 52 28.59	2.14548	68.97	+25 16 7.3	+1.87703

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	^d		h m s		^s	^o ['] ["]	
Apr. 14	104	I. L.	5 20 34.37	2.14966	69.37	+25 21 15.7	-1.39058
15	105	I. U.	5 48 53.80	2.15229	69.61	+25 6 9.0	-2.10360
15	105	I. L.	6 17 19.35	2.15284	69.67	+24 30 29.1	-2.36129
16	106	I. U.	6 45 43.87	2.15168	69.59	+23 34 19.9	-2.52072
16	106	I. L.	7 14 1.23	2.14913	69.41	+22 18 1.9	-2.63413
17	107	I. U.	7 42 6.95	2.14576	69.14	+20 42 19.2	-2.72058
17	107	I. L.	8 9 58.35	2.14186	68.83	+18 48 9.7	-2.78880
18	108	I. U.	8 37 34.83	2.13796	68.51	+16 36 47.8	-2.84353
18	108	I. L.	9 4 57.86	2.13484	68.22	+14 9 41.6	-2.88765
19	109	I. U.	9 32 10.62	2.13274	68.02	+11 28 32.4	-2.92308
19	109	I. U.	9 59 18.01	2.13213	67.94	+ 8 35 15.8	-2.95092
20	110	I. L.	10 26 26.28	2.13344	68.01	+ 5 32 2.5	-2.97169
20	110	I. U.	10 53 42.73	2.13669	68.24	+ 2 21 19.5	-2.98569
21	111	I. L.	11 21 15.24	2.14211	68.65	- 0 54 8.7	-2.99309
21	111	I. U.	11 49 12.27	2.14961	69.22	- 4 11 18.4	-2.99322
22	112	I. U.	12 17 41.91	2.15891	69.97	- 7 26 45.9	-2.98538
22	113	I. L.	12 46 51.72	2.16976	70.86	-10 36 48.9	-2.96855
23	113	I. U.	13 16 47.81	2.18153	71.84	-13 37 32.4	-2.94134
23	114	I. L.	13 47 33.85	2.19348	72.87	-16 24 55.1	-2.90128
24	114	II. U.	14 21 38.06	2.20477	73.86	-18 54 56.3	-2.84525
25	115	II. L.	14 54 3.10	2.21426	74.73	-21 3 51.5	-2.76797
25	115	II. U.	15 27 6.04	2.22133	75.38	-22 48 26.9	-2.66051
26	116	II. L.	16 0 33.52	2.22490	75.74	-24 6 15.0	-2.50398
26	116	II. U.	16 34 8.60	2.22458	75.73	-24 55 46.9	-2.24529
27	117	II. L.	17 7 32.17	2.21995	75.36	-25 16 40.3	-1.52647
27	117	II. U.	17 40 25.20	2.21131	74.62	-25 9 37.0	+2.01153
28	118	II. L.	18 12 31.14	2.19904	73.58	-24 36 16.3	+2.35911
28	118	II. U.	18 43 37.28	2.18404	72.31	-23 38 59.4	+2.53357
29	119	II. L.	19 13 35.52	2.16705	70.87	-22 20 33.0	+2.64359
29	119	II. U.	19 42 22.51	2.14903	69.40	-20 43 54.6	+2.71908
30	120	II. L.	20 9 58.74	2.13085	67.92	-18 51 57.7	+2.77329
30	120	II. U.	20 36 27.94	2.11330	66.52	-16 47 26.1	+2.81276
May 1	121	II. L.	21 1 56.06	2.09691	65.24	-14 32 48.8	+2.84171
1	121	II. U.	21 26 30.38	2.08218	64.10	-12 10 17.9	+2.86271
2	122	II. L.	21 50 19.04	2.06956	63.14	- 9 41 49.8	+2.87756
2	122	II. U.	22 13 30.39	2.05926	62.35	- 7 9 6.5	+2.88739
3	123	II. L.	22 36 12.88	2.05150	61.73	- 4 33 39.4	+2.89305
3	123	II. U.	22 58 35.05	2.04630	61.33	- 1 56 50.3	+2.89509
4	124	II. L.	23 20 45.17	2.04356	61.11	+ 0 40 4.5	+2.89363
4	124	II. U.	23 42 50.78	2.04328	61.05	+ 3 15 51.9	+2.88880
5	125	II. L.	0 4 59.21	2.04544	61.17	+ 5 49 20.1	+2.88056
5	126	II. U.	0 27 17.75	2.04984	61.45	+ 8 19 16.2	+2.86849
6	126	II. L.	0 49 53.27	2.05625	61.89	+10 44 24.5	+2.85222
6	127	II. U.	1 12 51.73	2.06438	62.46	+13 3 25.9	+2.83094
7	127	II. L.	1 36 18.66	2.07394	63.14	+15 14 56.6	+2.80936
7	128	II. U.	2 0 18.73	2.08458	63.92	+17 17 27.3	+2.76896
8	128	II. L.	2 24 55.50	2.09577	64.75	+19 9 24.5	+2.72487
8	129	II. U.	2 50 11.25	2.10707	65.62	+20 49 12.2	+2.66828
9	129	I. L.	3 13 53.56	2.11803	66.49	+22 15 12.7	+2.59426
10	130	I. U.	3 40 25.58	2.12814	67.30	+23 25 50.0	+2.49425

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	^d		h m s		^s	° ′ ″	
May 10	130	I. L.	4 7 32.85	2.13694	68.02	+24 19 35.2	+2.35000
11	131	I. v.	4 35 10.48	2.14392	68.62	+24 55 9.4	+2.11568
11	131	I. L.	5 3 11.51	2.14876	69.06	+25 11 28.6	+1.50705
12	132	I. v.	5 31 27.98	2.15165	69.32	+25 7 48.7	-1.83948
12	132	I. L.	5 59 51.28	2.15220	69.40	+24 43 47.5	-2.23325
13	133	I. v.	6 28 12.92	2.15079	69.22	+28 59 25.7	-2.43478
13	133	I. L.	6 56 25.39	2.14746	69.06	+22 55 6.9	-2.56863
14	134	I. v.	7 24 22.31	2.14296	68.74	+21 31 36.5	-2.66650
14	134	I. L.	7 52 0.48	2.13748	68.23	+19 49 54.7	-2.74183
15	135	I. v.	8 19 18.01	2.13188	67.90	+17 51 17.4	-2.80160
15	135	I. L.	8 46 14.79	2.12662	67.49	+15 37 15.6	-2.84888
16	136	I. v.	9 12 53.39	2.12228	67.15	+13 9 24.6	-2.88703
16	136	I. L.	9 39 18.18	2.11926	66.91	+10 29 28.0	-2.91740
17	137	I. v.	10 5 35.01	2.11813	66.82	+ 7 39 17.6	-2.94109
17	137	I. L.	10 31 50.97	2.11906	66.88	+ 4 40 54.1	-2.95856
18	138	I. v.	10 58 14.09	2.12232	67.11	+ 1 36 26.4	-2.97020
18	138	I. L.	11 24 53.28	2.12792	67.55	- 1 31 45.2	-2.97587
19	139	I. v.	11 51 57.62	2.13599	68.17	- 4 41 3.8	-2.97585
19	140	I. L.	12 19 36.16	2.14523	68.97	- 7 48 35.6	-2.96759
20	140	I. v.	12 47 57.57	2.15827	69.93	-10 51 10.4	-2.95171
20	141	I. L.	13 17 9.22	2.17149	71.02	-13 45 21.8	-2.92673
21	141	I. v.	13 47 16.49	2.18523	72.16	-16 27 26.0	-2.88857
21	142	I. L.	14 18 21.60	2.19866	73.30	-18 53 34.0	-2.83498
22	142	I. v.	14 50 22.77	2.21067	74.25	-21 0 1.8	-2.76127
22	143	I. L.	15 23 13.14	2.22029	75.20	-22 43 21.6	-2.65690
23	143	I. v.	15 56 40.63	2.22650	75.77	-24 0 42.3	-2.50243
24	144	II. L.	16 33 0.19	2.22863	75.97	-24 50 3.9	-2.24202
24	144	II. v.	17 6 47.63	2.22616	75.78	-25 10 34.1	-1.83344
25	145	II. L.	17 40 13.31	2.21924	75.18	-25 2 28.4	+2.04202
25	145	II. v.	18 12 57.83	2.20825	74.22	-24 27 9.1	+2.32940
26	146	II. L.	18 44 45.63	2.19393	72.99	-23 26 52.2	+2.55540
26	146	II. v.	19 15 25.95	2.17716	71.57	-22 4 29.0	+2.66463
27	147	II. L.	19 44 53.28	2.15894	70.07	-20 23 9.0	+2.73225
27	147	II. v.	20 13 6.81	2.14022	68.56	-18 26 4.0	+2.79220
28	148	II. L.	20 40 9.39	2.12186	67.12	-16 16 15.5	+2.82299
28	148	II. v.	21 6 6.81	2.10469	65.78	-13 56 30.2	+2.85696
29	149	II. L.	21 31 6.32	2.08913	64.59	-11 29 15.2	+2.87583
29	149	II. v.	21 55 16.32	2.07559	63.58	- 8 56 39.1	+2.88633
30	150	II. L.	22 18 45.68	2.06446	62.74	- 6 20 32.6	+2.89571
30	150	II. v.	22 41 43.45	2.05591	62.11	- 3 42 32.2	+2.89897
31	151	II. L.	23 4 18.45	2.05003	61.67	- 1 4 3.2	+2.89642
31	151	II. v.	23 26 39.27	2.04629	61.42	+ 1 33 36.6	+2.89459
June 1	152	II. L.	23 48 54.43	2.04630	61.36	+ 4 9 21.8	+2.88741
1	153	II. v.	0 11 11.85	2.04822	61.43	+ 6 41 58.0	+2.87696
2	153	II. L.	0 33 39.11	2.05261	61.75	+ 9 10 18.3	+2.86280
2	154	II. v.	0 56 23.45	2.05918	62.21	+11 33 12.2	+2.84438
3	154	II. L.	1 19 31.62	2.06755	62.21	+13 49 24.6	+2.82090
3	155	II. v.	1 43 9.42	2.07744	63.52	+15 57 35.6	+2.79131
4	155	II. L.	2 7 21.96	2.08856	64.31	+17 56 19.1	+2.75383
4	156	II. v.	2 32 13.18	2.10020	65.18	+19 44 2.1	+2.70629

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	^d		h m s		^s	° ′ ″	
June 5	156	II. L.	9 57 45.30	2.11200	66.08	+21 19 9.5	+2.64478
5	157	II. v.	3 23 59.34	2.12346	66.96	+23 40 1.7	+2.56340
6	157	II. L.	3 50 53.66	2.13389	67.78	+23 45 1.1	+2.45119
6	158	II. v.	4 18 24.57	2.14282	68.49	+24 32 35.3	+2.28322
7	158	II. L.	4 46 26.04	2.14986	69.06	+25 1 23.7	+1.98764
8	159	I. v.	5 12 31.71	2.15458	69.45	+25 10 21.9	-0.78533
8	159	I. L.	5 41 9.80	2.15688	69.65	+24 58 47.9	-2.04040
9	160	I. v.	6 9 52.45	2.15670	69.66	+24 26 24.7	-2.33023
9	160	I. L.	6 36 30.24	2.15430	69.48	+23 33 23.0	-2.49954
10	161	I. v.	7 6 54.82	2.14992	69.14	+23 20 19.0	-2.61683
10	161	I. L.	7 34 59.69	2.14414	68.70	+20 48 13.3	-2.70398
11	162	I. v.	8 2 40.62	2.13754	68.19	+18 58 25.7	-2.77140
11	162	I. L.	8 29 55.77	2.13069	67.66	+16 52 31.0	-2.82413
12	163	I. v.	8 56 45.68	2.12418	67.19	+14 32 15.8	-2.86565
12	163	I. L.	9 23 13.13	2.11860	66.75	+11 59 32.8	-2.89843
13	164	I. v.	9 49 22.57	2.11448	66.45	+ 9 16 19.9	-2.92369
13	164	I. L.	10 15 20.06	2.11217	66.29	+ 6 24 39.8	-2.94254
14	165	I. v.	10 41 12.96	2.11210	66.29	+ 3 26 37.5	-2.95543
14	165	I. L.	11 7 9.31	2.11435	66.47	+ 0 24 23.7	-2.96273
15	166	I. v.	11 33 17.98	2.11916	66.85	- 2 39 44.3	-2.96447
15	166	I. L.	11 59 48.18	2.12643	67.42	- 5 43 22.3	-2.96029
16	167	I. v.	12 26 49.01	2.13590	68.18	- 8 43 54.6	-2.94955
16	168	I. L.	12 54 29.23	2.14731	69.09	-11 38 32.6	-2.93121
17	168	I. v.	13 22 56.50	2.16014	70.13	-14 24 16.5	-2.90367
17	169	I. L.	13 52 16.74	2.17377	71.25	-16 57 53.1	-2.86463
18	169	I. v.	14 22 33.33	2.18730	72.38	-19 16 4.4	-2.81078
18	170	I. L.	14 53 45.85	2.19990	73.46	-21 15 33.4	-2.73657
19	170	I. v.	15 25 49.56	2.21037	74.36	-22 53 8.9	-2.63161
19	171	I. L.	15 58 34.56	2.21798	75.02	-24 6 2.0	-2.47560
20	171	I. v.	16 31 46.72	2.22184	75.35	-24 52 13.5	-2.20960
20	172	I. L.	17 5 7.60	2.22138	75.31	-25 10 38.6	-1.34635
21	172	I. v.	17 38 17.32	2.21666	74.86	-25 1 10.9	+2.06405
22	173	II. L.	18 13 24.91	2.20787	74.09	-24 24 44.0	+2.39229
22	173	II. v.	18 45 15.42	2.19549	73.02	-23 23 13.2	+2.56367
23	174	II. L.	19 16 6.19	2.18041	71.74	-21 59 12.6	+2.67340
23	174	II. v.	19 45 49.93	2.16361	70.33	-20 15 41.8	+2.74898
24	175	II. L.	20 14 24.02	2.14598	68.89	-18 15 51.0	+2.80261
24	175	II. v.	20 41 49.66	2.12837	67.48	-16 2 47.0	+2.84099
25	176	II. L.	21 8 11.12	2.11150	66.17	-13 39 25.3	+2.86810
25	176	II. v.	21 33 34.75	2.09611	65.00	-11 8 24.2	+2.88660
26	177	II. L.	21 56 8.24	2.08254	63.98	- 8 32 4.3	+2.89637
26	177	II. v.	22 21 59.94	2.07119	63.16	- 5 52 28.8	+2.90470
27	178	II. L.	22 45 18.44	2.06225	62.51	- 3 11 24.3	+2.90655
27	178	II. v.	23 8 12.51	2.05584	62.06	- 0 30 23.9	+2.90444
28	179	II. L.	23 30 50.75	2.05215	61.80	+ 2 9 9.9	+2.89873
28	179	II. v.	23 53 21.42	2.05100	61.72	+ 4 46 2.7	+2.88959
29	180	II. L.	0 15 52.56	2.05242	61.83	+ 7 19 3.2	+2.87701
29	181	II. v.	0 38 31.96	2.05625	62.11	+ 9 47 3.2	+2.86071
30	181	II. L.	1 1 26.95	2.06226	62.55	+12 8 54.0	+2.84003
30	182	II. v.	1 24 44.33	2.07023	63.12	+14 23 23.9	+2.81432

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Mean Solar Date.	Sidereal Date.	Limb and Transit.	Apparent Right Ascension in Time.	Logarithm Variation of Moon's Right Ascension for 1 hour of Longitude.	Sidereal Time of Semi-diameter passing the Meridian.	Declination.	Logarithm Variation of Moon's Declination for 1 hour of Longitude.
	^d		^{h m s}		^s		
July 1	182	II. L.	1 48 30.32	2.07983	63.82	+16 29' 17.2	+2.72222
1	183	II. U.	2 12 50.24	2.09061	64.62	+18 25 12.6	+2.74213
2	183	II. L.	2 37 48.39	2.10216	65.49	+20 9 43.3	+2.69156
2	184	II. U.	3 3 27.54	2.11397	66.38	+21 41 16.8	+2.63615
3	184	II. L.	3 29 48.83	2.12548	67.27	+22 58 17.9	+2.53909
3	185	II. U.	3 56 51.29	2.13618	68.10	+23 59 10.7	+2.41734
4	185	II. L.	4 24 31.69	2.14554	68.83	+24 42 23.5	+2.22922
4	186	II. U.	4 52 44.58	2.15299	69.42	+25 6 33.6	+1.85412
5	186	II. L.	5 21 22.45	2.15821	69.82	+25 10 35.2	-1.50065
5	187	II. U.	5 50 16.27	2.16104	70.04	+24 53 42.2	-2.13830
6	187	II. L.	6 19 16.22	2.16128	70.04	+24 15 34.0	-2.26294
6	189	II. U.	6 43 12.64	2.15927	69.86	+23 16 19.2	-2.54175
7	188	I. L.	7 14 37.83	2.15528	69.53	+21 56 37.5	-2.65127
8	189	I. U.	7 43 3.88	2.14971	69.08	+20 17 31.0	-2.73373
8	189	I. L.	8 11 6.30	2.14314	68.55	+18 20 27.8	-2.79739
9	190	I. U.	8 38 42.70	2.13625	68.00	+16 7 14.7	-2.84705
9	190	I. L.	9 5 53.16	2.12959	67.48	+13 39 51.7	-2.88579
10	191	I. U.	9 32 40.02	2.12372	67.04	+11 0 28.4	-2.91547
10	191	I. L.	9 59 7.44	2.11923	66.70	+ 8 11 21.6	-2.93757
11	192	I. U.	10 25 21.10	2.11638	66.51	+ 5 14 51.0	-2.95285
11	192	I. L.	10 51 27.92	2.11561	66.47	+ 2 13 19.3	-2.96196
12	193	I. U.	11 17 35.64	2.11711	66.62	- 0 50 48.1	-2.95823
12	193	I. L.	11 43 52.58	2.12090	66.95	- 3 55 3.8	-2.93861
13	194	I. U.	12 10 27.30	2.12700	67.44	- 6 56 56.5	-2.95378
13	195	I. L.	12 37 28.21	2.13519	68.11	- 9 53 49.7	-2.93829
14	195	I. U.	13 5 3.22	2.14514	68.94	-12 43 1.8	-2.91494
14	196	I. L.	13 33 19.20	2.15640	69.87	-15 21 45.4	-2.88230
15	196	I. U.	14 2 21.12	2.16832	70.86	-17 47 8.5	-2.83801
15	197	I. L.	14 32 11.83	2.18021	71.85	-19 56 17.7	-2.77839
16	197	I. U.	15 2 50.71	2.19120	72.78	-21 46 24.5	-2.69763
16	198	I. L.	15 34 13.43	2.20047	73.57	-23 14 52.5	-2.58479
17	198	I. U.	16 6 11.46	2.20705	74.13	-24 19 28.8	-2.41539
17	199	I. L.	16 38 32.44	2.21035	74.40	-24 58 35.2	-2.11354
18	199	I. U.	17 11 1.02	2.21005	74.35	-25 11 17.5	+0.46835
18	200	I. L.	17 43 20.44	2.20597	73.96	-24 57 33.9	+2.12594
19	200	I. U.	18 15 14.04	2.19822	73.26	-24 18 12.9	+2.41229
19	201	I. L.	18 46 27.58	2.18745	72.29	-23 14 51.4	+2.57201
20	201	I. U.	19 16 50.02	2.17412	71.14	-21 49 43.0	+2.67767
20	202	I. L.	19 46 14.15	2.15912	69.88	-20 5 27.0	+2.75166
21	202	II. U.	20 16 53.97	2.14333	68.57	-18 4 55.1	+2.80509
22	203	II. L.	20 44 12.85	2.12746	67.29	-15 51 1.7	+2.84390
22	203	II. U.	21 10 33.73	2.11213	66.09	-13 26 35.0	+2.87164
23	204	II. L.	21 36 1.80	2.09802	65.00	-10 54 12.0	+2.89075
23	204	II. U.	22 0 43.54	2.08547	64.06	- 8 16 16.1	+2.90303
24	205	II. L.	22 24 46.31	2.07489	63.28	- 5 34 55.8	+2.90853
24	205	II. U.	22 48 17.84	2.06652	62.69	- 2 52 5.2	+2.91115
25	206	II. L.	23 11 26.02	2.06043	62.27	- 0 9 26.0	+2.90662
25	206	II. U.	23 34 18.72	2.05675	62.02	+ 2 31 30.9	+2.90809
26	207	II. L.	23 57 3.72	2.05553	61.96	+ 5 9 23.1	+2.89179
26	208	II. U.	0 19 48.49	2.05660	62.06	+ 7 42 53.9	+2.87774

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	^d		^{h m s}		^s	^{° ′ ″}	
July 27	208	II. L.	0 42 40.96	2.05994	62.33	+10 10 50.7	+2.85963
27	209	II. v.	1 5 45.95	2.06543	62.74	+12 32 2.4	+2.83702
28	209	II. L.	1 29 12.00	2.07258	63.29	+14 45 17.5	+2.80905
28	210	II. v.	1 53 4.24	2.08131	63.96	+16 49 22.2	+2.77471
29	210	II. L.	2 17 27.83	2.09132	64.73	+18 42 58.9	+2.73216
29	211	II. v.	2 42 26.81	2.10202	65.56	+20 24 46.6	+2.67861
30	211	II. L.	3 8 4.13	2.11311	66.42	+21 53 20.9	+2.60991
30	212	II. v.	3 34 21.04	2.12401	67.27	+23 7 12.9	+2.51871
31	212	II. L.	4 1 17.07	2.13430	68.07	+24 4 54.9	+2.39035
31	213	II. v.	4 26 49.74	2.14342	68.79	+24 45 2.3	+2.18893
Aug. 1	213	II. L.	4 56 54.54	2.15097	69.39	+25 6 17.4	+1.76747
1	214	II. v.	5 25 25.10	2.15658	69.82	+25 7 33.9	-1.65302
2	214	II. L.	5 54 13.56	2.16002	70.07	+24 48 5.6	-2.17644
2	215	II. v.	6 23 11.35	2.16125	70.15	+24 7 27.1	-2.40907
3	215	II. L.	6 52 9.78	2.16038	70.04	+23 5 39.0	-2.55780
3	216	II. v.	7 21 0.84	2.15764	69.78	+21 43 9.0	-2.66544
4	216	II. L.	7 49 38.06	2.15348	69.41	+20 0 58.8	-2.74719
4	217	II. v.	8 17 56.82	2.14833	68.97	+18 0 9.9	-2.81078
5	217	II. L.	8 45 54.65	2.14276	68.51	+15 42 43.2	-2.86074
6	218	I. v.	9 11 15.22	2.13742	68.07	+13 10 33.7	-2.89975
6	218	I. L.	9 38 33.37	2.13268	67.68	+10 25 57.9	-2.92944
7	219	I. v.	10 5 35.60	2.12911	67.41	+ 7 31 23.2	-2.95109
7	219	I. L.	10 32 27.03	2.12704	67.25	+ 4 29 26.3	-2.96552
8	220	I. v.	10 59 13.79	2.12681	67.24	+ 1 22 49.4	-2.97314
8	220	I. L.	11 26 2.84	2.12850	67.41	- 1 45 39.8	-2.97424
9	221	I. v.	11 53 1.69	2.13220	67.73	- 4 53 11.1	-2.96869
9	222	I. L.	12 20 17.88	2.13777	68.22	- 7 56 52.6	-2.95621
10	222	I. v.	12 47 58.61	2.14526	68.85	-10 53 50.8	-2.93611
10	223	I. L.	13 16 10.36	2.15403	69.60	-13 41 11.5	-2.90737
11	223	I. v.	13 44 58.31	2.16361	70.42	-16 16 2.4	-2.86824
11	224	I. L.	14 14 25.63	2.17345	71.28	-18 35 35.4	-2.81626
12	224	I. v.	14 44 33.06	2.18293	72.10	-20 37 10.3	-2.74693
12	225	I. L.	15 15 18.19	2.19117	72.82	-22 18 20.5	-2.65432
13	225	I. v.	15 46 35.22	2.19753	73.38	-23 37 0.1	-2.52401
13	226	I. L.	16 18 15.05	2.20137	73.70	-24 31 32.0	-2.32296
14	226	I. v.	16 50 5.68	2.20216	73.77	-25 0 54.9	-1.92028
14	227	I. L.	17 21 53.45	2.19984	73.53	-25 4 48.9	+1.64197
15	227	I. v.	17 53 24.13	2.19415	73.02	-24 43 37.8	+2.22290
15	228	I. L.	18 24 24.57	2.18551	72.24	-23 58 26.2	+2.45242
16	228	I. v.	18 54 43.86	2.17455	71.26	-22 50 53.8	+2.59121
16	229	I. L.	19 24 13.99	2.16170	70.15	-21 23 7.5	+2.68623
17	229	I. v.	19 52 50.32	2.14777	68.96	-19 37 32.2	+2.75451
17	230	I. L.	20 20 31.30	2.13328	67.75	-17 36 40.7	+2.80489
18	230	I. v.	20 47 18.07	2.11902	66.59	-15 23 8.1	+2.84213
18	231	I. L.	21 13 13.97	2.10544	65.51	-12 59 24.9	+2.86919
19	231	I. v.	21 38 23.77	2.09311	64.54	-10 27 54.5	+2.88830
20	232	II. L.	22 5 0.96	2.08228	63.71	- 7 50 50.3	+2.90079
20	232	II. v.	22 28 55.82	2.07328	63.00	- 5 10 15.5	+2.90763
21	233	II. L.	22 52 24.45	2.06629	62.52	- 2 28 3.3	+2.90960
21	233	II. v.	23 15 33.88	2.06138	62.17	+ 0 14 2.9	+2.90723

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			h m s		s	° ' "		
Aug. 22	234	II. L.	23 38 31.12	2.05869	61.99	+ 2° 54' 23.1	+2.90058	
	22	235	II. v.	0 1 23.09	2.05805	+ 5 31 43.9	+2.89896	
	23	235	II. L.	0 24 16.46	2.05953	+ 8 4 27.7	+2.87513	
	23	236	II. v.	0 47 17.62	2.06296	+10 31 21.0	+2.85590	
	24	236	II. L.	1 10 32.63	2.06815	+12 51 6.5	+2.83177	
	24	237	II. v.	1 34 7.00	2.07489	+15 2 29.2	+2.80195	
	25	237	II. L.	1 58 5.76	2.08289	+17 4 13.7	+2.76527	
	25	238	II. v.	2 22 33.12	2.09184	+18 55 3.6	+2.71991	
	26	238	II. L.	2 47 32.34	2.10147	+20 33 40.8	+2.66309	
	26	239	II. v.	3 13 5.58	2.11133	+21 58 46.6	+2.59044	
27	239	II. L.	3 39 13.68	2.12097	67.02	+23 9 2.3	+2.49428	
	27	240	II. v.	4 5 55.90	2.12998	+24 3 10.7	+2.35854	
	28	240	II. L.	4 33 9.97	2.13799	+24 39 58.5	+2.14908	
	28	241	II. v.	5 0 51.96	2.14467	+24 58 19.6	+1.64414	
	28	241	II. L.	5 28 56.58	2.14971	+24 57 18.8	-1.73767	
	29	242	II. v.	5 57 17.50	2.15299	+24 36 15.4	-2.19882	
	30	242	II. L.	6 26 47.84	2.15452	+23 54 46.1	-2.41273	
	30	243	II. v.	6 54 20.81	2.15436	+22 52 48.5	-2.55718	
	31	243	II. L.	7 22 50.23	2.15278	+21 30 41.6	-2.66273	
	31	244	II. v.	7 51 11.18	2.15011	+19 49 6.9	-2.74419	
Sept. 1	244	II. L.	8 19 20.25	2.14675	68.92	+17 49 8.2	-2.80658	
	1	245	II. v.	8 47 15.85	2.14323	+15 32 11.1	-2.85994	
	2	245	II. L.	9 14 58.30	2.13997	+13 0 0.7	-2.90066	
	2	246	II. v.	9 42 29.57	2.13748	+10 14 40.3	-2.93237	
	3	246	II. L.	10 9 53.28	2.13602	+ 7 18 31.1	-2.95596	
	3	247	II. v.	10 37 14.22	2.13596	+ 4 14 9.3	-2.97205	
	4	247	I. L.	11 2 22.22	2.13767	+ 1 4 24.9	-2.98089	
	5	248	I. v.	11 29 55.41	2.14117	- 2 7 40.6	-2.98276	
	5	248	I. L.	11 57 44.66	2.14631	- 5 18 55.3	-2.97708	
	6	249	I. v.	12 25 56.95	2.15302	- 8 26 1.0	-2.96351	
6	250	I. L.	12 54 37.99	2.16107	70.02	-11 25 35.3	-2.94122	
	7	250	I. v.	13 23 52.80	2.16991	70.79	-14 14 16.9	-2.90684
	7	251	I. L.	13 53 44.48	2.17903	71.61	-16 48 48.9	-2.85451
	8	251	I. v.	14 24 13.76	2.18777	72.40	-19 6 6.9	-2.80512
	8	252	I. L.	14 55 18.44	2.19543	73.08	-21 3 21.1	-2.73592
	9	252	I. v.	15 26 52.87	2.20132	73.64	-22 38 10.5	-2.61727
	9	253	I. L.	15 58 48.41	2.20477	73.96	-23 48 47.5	-2.46277
	10	253	I. v.	16 30 53.39	2.20520	74.03	-24 34 3.1	-2.29823
	10	254	I. L.	17 2 54.51	2.20265	73.83	-24 53 31.7	-1.59009
	11	254	I. v.	17 34 37.99	2.19703	73.33	-24 47 33.0	+1.96407
11	255	I. L.	18 5 50.78	2.18845	72.57	-24 17 7.8	+2.32375	
	12	255	I. v.	18 36 22.13	2.17742	71.61	-23 23 50.9	+2.50562
	12	256	I. L.	19 6 4.05	2.16462	70.50	-22 9 43.1	+2.62214
	13	256	I. v.	19 34 51.83	2.15070	69.30	-20 37 1.0	+2.70400
	13	257	I. L.	20 2 43.76	2.13609	68.09	-18 48 10.8	+2.76380
	14	257	I. v.	20 29 40.91	2.12172	66.90	-16 45 36.9	+2.80626
	14	258	I. L.	20 55 46.39	2.10606	65.78	-14 31 41.6	+2.84148
	15	258	I. v.	21 21 4.94	2.09548	64.77	-12 8 40.0	+2.86563
	15	259	I. L.	21 45 42.34	2.08433	63.89	- 9 38 39.2	+2.88319
	16	259	I. v.	22 9 45.00	2.07500	63.15	- 7 3 37.6	+2.89458

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Sept. 16	^d 260	I. L.	^{h m s} 22 33 19.66	2.06759	^s 62.57	- 4° 25' 25.8"	+2.90086
17	260	I. v.	22 56 33.21	2.06302	62.15	- 1 45 46.8	+2.90263
17	261	I. L.	23 19 32.45	2.05877	61.90	+ 0 53 42.3	+2.90000
18	261	II. v.	23 44 27.57	2.05751	61.78	+ 3 31 29.0	+2.89330
19	262	II. L.	0 7 17.93	2.05816	61.84	+ 6 6 6.1	+2.88242
19	263	II. v.	0 30 13.38	2.06070	62.03	+ 8 36 8.6	+2.86712
20	263	II. L.	0 53 19.60	2.06491	62.34	+11 0 13.5	+2.84712
20	264	II. v.	1 16 41.81	2.07059	62.78	+13 17 0.1	+2.82175
21	264	II. L.	1 40 24.66	2.07751	63.33	+15 25 7.7	+2.79014
21	265	II. v.	2 4 31.98	2.08536	63.96	+17 23 16.8	+2.75092
22	265	II. L.	2 29 6.87	2.09384	64.64	+19 10 8.1	+2.70230
22	266	II. v.	2 54 11.36	2.10257	65.35	+20 44 23.6	+2.64114
23	266	II. L.	3 19 46.96	2.11123	66.06	+22 4 47.5	+2.56267
23	267	II. v.	3 45 51.19	2.11932	66.73	+23 10 6.7	+2.45785
24	267	II. L.	4 12 24.38	2.12665	67.34	+23 59 13.0	+2.30803
24	268	II. v.	4 39 22.75	2.13290	67.88	+24 31 6.5	+2.06021
25	268	II. L.	5 6 42.08	2.13783	68.31	+24 44 56.0	+1.35660
25	269	II. v.	5 34 17.21	2.14126	68.60	+24 40 1.3	-1.85854
26	269	II. L.	6 2 2.61	2.14314	68.77	+24 15 56.7	-2.22704
26	270	II. v.	6 29 52.63	2.14370	68.82	+23 32 32.4	-2.42387
27	270	II. L.	6 57 42.11	2.14392	68.75	+22 29 52.8	-2.55759
27	271	II. v.	7 25 26.82	2.14114	68.60	+21 8 19.3	-2.65703
28	271	II. L.	7 53 3.76	2.13890	68.39	+19 28 30.1	-2.94789
28	272	II. v.	8 20 31.47	2.13650	68.16	+17 31 18.4	-2.79767
29	272	II. L.	8 47 50.05	2.13421	67.94	+15 17 53.2	-2.84848
29	273	II. v.	9 15 1.21	2.13258	67.77	+12 49 39.8	-2.88954
30	273	II. L.	9 42 8.20	2.13200	67.70	+10 8 18.5	-2.92245
30	274	II. v.	10 9 15.51	2.13290	67.73	+ 7 15 46.4	-2.94789
Oct. 1	274	II. L.	10 36 28.71	2.13536	67.89	+ 4 14 19.3	-2.96632
1	275	II. v.	11 3 54.28	2.13941	68.18	+ 1 6 31.1	-2.97783
2	275	II. L.	11 31 39.32	2.14538	68.64	- 2 4 46.0	-2.98226
2	276	II. v.	11 59 50.93	2.15311	69.26	- 5 16 21.5	-2.97909
3	277	II. L.	12 28 35.91	2.16230	70.01	- 8 24 46.5	-2.96759
4	277	I. v.	12 55 38.48	2.17263	70.88	-11 26 19.2	-2.94660
4	278	I. L.	13 25 44.68	2.18344	71.81	-14 17 13.3	-2.91454
5	278	I. v.	13 56 36.55	2.19418	72.75	-16 53 38.4	-2.86899
5	279	I. L.	14 28 13.01	2.20393	73.65	-19 11 53.9	-2.80626
6	279	I. v.	15 0 29.27	2.21189	74.39	-21 8 42.4	-2.72066
6	280	I. L.	15 33 16.34	2.21733	74.92	-22 41 20.4	-2.60076
7	280	I. v.	16 6 21.58	2.21956	75.16	-23 47 50.1	-2.42326
7	281	I. L.	16 39 29.42	2.21817	75.07	-24 27 8.5	-2.10738
8	281	I. v.	17 12 23.16	2.21307	74.65	-24 39 10.7	+0.85300
8	282	I. L.	17 44 46.62	2.20453	73.92	-24 24 46.4	+2.13354
9	282	I. v.	18 16 25.92	2.19293	72.93	-23 45 32.3	+2.40627
9	283	I. L.	18 47 10.59	2.17906	71.74	-22 43 38.8	+2.55855
10	283	I. v.	19 16 54.08	2.16364	70.43	-21 21 38.2	+2.65884
10	284	I. L.	19 45 33.76	2.14746	69.08	-19 42 11.2	+2.72956
11	284	I. v.	20 13 10.42	2.13127	67.75	-17 47 56.1	+2.78089
11	285	I. L.	20 39 47.36	2.11571	66.49	-15 41 26.6	+2.81886
12	285	I. v.	21 5 29.75	2.10130	65.33	-13 25 5.2	+2.84683

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WASHINGTON MERIDIAN.							
Mean Solar Date.	Sidereal Date.	Limb and Transit.	Apparent	Logarithm	Sidereal	Declination.	Logarithm
			Right Ascension in Time.	Variation of Moon's Right Ascension for 1 hour of Longitude.	Time of Semi-diameter passing the Meridian.		Variation of Moon's Declination for 1 hour of Longitude.
			h m s		s	° ' "	
Oct. 12	286 ^d	I. L.	21 30 24.17	2.08842	64.31	-11 1 0.5	+2.86706
13	286	I. U.	21 54 37.85	2.07737	63.44	- 8 31 10.4	+2.88110
13	287	I. L.	22 18 18.31	2.06856	62.74	- 5 57 22.4	+2.88991
14	287	I. U.	22 41 33.19	2.06187	62.20	- 3 21 15.4	+2.89419
14	288	I. L.	23 4 29.94	2.05744	61.84	- 0 44 20.8	+2.89439
15	288	I. U.	23 27 15.84	2.05519	61.64	+ 1 51 54.7	+2.89055
15	289	I. L.	23 49 57.81	2.05507	61.59	+ 4 26 7.3	+2.88288
16	290	I. U.	0 12 42.35	2.05606	61.71	+ 6 56 55.6	+2.87114
16	290	I. L.	0 35 35.53	2.06081	61.97	+ 9 22 58.2	+2.85497
17	291	I. U.	0 58 43.05	2.06606	62.33	+11 42 54.0	+2.83379
17	291	I. L.	1 22 9.65	2.07269	62.82	+13 55 20.7	+2.80698
18	292	II. U.	1 48 6.37	2.08034	63.41	+15 58 55.8	+2.77337
19	292	II. L.	2 12 24.14	2.08870	64.05	+17 52 16.4	+2.73138
19	293	II. U.	2 37 10.73	2.09733	64.72	+19 33 59.4	+2.67869
20	293	II. L.	3 2 26.98	2.10582	65.40	+21 2 44.3	+2.61189
20	294	II. U.	3 28 12.50	2.11384	66.05	+22 17 14.2	+2.52467
21	294	II. L.	3 54 25.40	2.12100	66.65	+23 16 16.8	+2.40613
21	295	II. U.	4 21 2.38	2.12701	67.16	+23 58 50.3	+2.23076
22	295	II. L.	4 47 59.01	2.13159	67.57	+24 24 3.1	+1.91089
22	296	II. U.	5 15 9.89	2.13459	67.86	+24 31 15.6	-0.99520
23	296	II. L.	5 42 29.11	2.13605	68.01	+24 20 3.6	-2.01038
23	297	II. U.	6 9 50.76	2.13506	68.04	+23 50 18.6	-2.29008
24	297	II. L.	6 37 9.43	2.13466	67.95	+23 2 7.9	-2.45708
24	298	II. U.	7 4 20.57	2.13220	67.78	+21 55 52.7	-2.57462
25	298	II. L.	7 31 21.02	2.12895	67.54	+20 32 7.6	-2.66389
25	299	II. U.	7 58 9.17	2.12545	67.28	+18 51 39.8	-2.73444
26	299	II. L.	8 24 44.90	2.12225	67.02	+16 55 26.6	-2.79149
26	300	II. U.	8 51 9.83	2.11978	66.81	+14 44 34.8	-2.63512
27	300	II. L.	9 17 27.12	2.11830	66.66	+12 20 20.4	-2.87637
27	301	II. U.	9 43 41.31	2.11793	66.63	+ 9 44 8.7	-2.90744
28	301	II. L.	10 9 58.15	2.11959	66.72	+ 6 57 37.6	-2.93209
28	302	II. U.	10 36 24.50	2.12320	66.98	+ 4 2 37.4	-2.95075
29	302	II. L.	11 3 7.90	2.12888	67.40	+ 1 1 14.4	-2.96331
29	303	II. U.	11 30 16.55	2.13672	67.99	- 2 4 6.9	-2.96953
30	303	II. L.	11 57 58.79	2.14659	68.76	- 5 10 40.7	-2.96882
30	304	II. U.	12 26 22.78	2.15821	69.69	- 8 15 19.4	-2.96032
31	305	II. L.	12 55 35.80	2.17114	70.74	-11 14 33.6	-2.94268
31	305	II. U.	13 25 43.63	2.18483	71.89	-14 4 34.7	-2.91403
Nov. 1	306	II. L.	13 56 49.42	2.19844	73.06	-16 41 21.7	-2.87155
1	306	I. U.	14 26 24.37	2.21104	74.17	-19 0 51.0	-2.81128
2	307	I. L.	14 59 18.18	2.22168	75.13	-20 59 11.6	-2.72668
3	307	I. U.	15 32 55.04	2.22935	75.84	-22 33 1.6	-2.60545
3	308	I. L.	16 6 59.73	2.23320	76.22	-23 39 46.6	-2.41986
4	308	I. U.	16 41 13.41	2.23274	76.22	-24 17 56.0	-2.07243
4	309	I. L.	17 15 15.27	2.22784	75.81	-24 27 10.5	+1.40226
5	309	I. U.	17 48 44.99	2.21872	75.03	-24 8 19.3	+2.20844
5	310	I. L.	18 21 25.10	2.20593	73.92	-22 23 14.9	+2.45747
6	310	I. U.	18 53 2.61	2.19044	72.61	-22 14 34.4	+2.59922
6	311	I. L.	19 23 29.71	2.17207	71.15	-20 45 19.8	+2.69227
7	311	I. U.	19 52 43.53	2.15494	69.64	-18 58 41.0	+2.75705

MOON CULMINATIONS, 1861. 317

WASHINGTON MERIDIAN.

Mean Solar Date.	Sidereal Date.	Limb and Transit.	Apparent Right Ascension in Time.	Logarithm Variation of Moon's Right Ascension for 1 hour of Longitude.	Sidereal Time of Semi-diameter passing the Meridian.	Declination.	Logarithm Variation of Moon's Declination for 1 hour of Longitude.
	^d		h m s		^s	^o ['] ["]	
Nov. 7	312	I. L.	20 20 45.33	2.13675	68.18	-16 57 44.2	+2.80316
8	312	I. U.	20 47 39.56	2.11945	66.80	-14 45 22.4	+2.83625
8	313	I. L.	21 13 32.80	2.10356	65.54	-12 24 11.5	+2.85976
9	313	I. U.	21 38 32.88	2.08945	64.44	-9 56 29.1	+2.87588
9	314	I. L.	22 2 48.31	2.07748	63.52	-7 24 16.0	+2.88612
10	314	I. U.	22 26 27.82	2.06796	62.79	-4 49 18.0	+2.89154
10	315	I. L.	22 49 40.05	2.06089	62.24	-2 13 9.3	+2.89279
11	315	I. U.	23 12 33.37	2.05633	61.87	+0 22 45.0	+2.89020
11	316	I. L.	23 35 15.82	2.05415	61.68	+2 57 5.6	+2.88405
12	316	I. U.	23 57 55.03	2.05434	61.66	+5 28 38.3	+2.87428
12	317	I. L.	0 20 38.11	2.05679	61.80	+7 56 9.5	+2.86060
13	318	I. U.	0 43 31.64	2.06119	62.08	+10 18 24.0	+2.84259
13	318	I. L.	1 6 41.56	2.06722	62.48	+12 34 6.7	+2.81966
14	319	I. U.	1 30 13.06	2.07463	63.01	+14 41 59.6	+2.79081
14	319	I. L.	1 54 10.46	2.08304	63.61	+16 40 42.4	+2.75460
15	320	I. U.	2 18 36.98	2.09202	64.27	+18 28 52.1	+2.70933
15	320	I. L.	2 43 34.60	2.10123	64.95	+20 5 5.2	+2.65220
16	321	I. U.	3 9 3.76	2.11008	65.64	+21 27 59.3	+2.57863
16	321	II. L.	3 37 15.94	2.11817	66.28	+22 36 14.6	+2.48084
17	322	II. U.	4 3 44.37	2.12512	66.84	+23 28 38.8	+2.34363
18	322	II. L.	4 30 35.88	2.13066	67.29	+24 4 9.7	+2.12650
18	323	II. U.	4 57 44.74	2.13443	67.61	+24 21 58.0	+1.63939
19	323	II. L.	5 25 4.27	2.13631	67.80	+24 21 31.6	-1.68413
19	324	II. U.	5 52 27.37	2.13637	67.83	+24 2 36.2	-2.14863
20	324	II. L.	6 19 47.21	2.13462	67.73	+23 25 15.5	-2.36611
20	325	II. U.	6 46 57.70	2.13146	67.52	+22 29 51.3	-2.50672
21	325	II. L.	7 13 54.09	2.12714	67.21	+21 17 3.0	-2.60868
21	326	II. U.	7 40 33.23	2.12218	66.86	+19 47 42.0	-2.68703
22	326	II. L.	8 6 53.68	2.11704	66.48	+18 2 51.1	-2.74908
22	327	II. U.	8 32 55.94	2.11224	66.13	+16 3 41.0	-2.79903
23	327	II. L.	8 58 42.18	2.10816	65.83	+13 51 29.3	-2.83967
23	328	II. U.	9 24 16.18	2.10541	65.62	+11 27 38.2	-2.87275
24	328	II. L.	9 49 43.16	2.10425	65.54	+8 53 34.8	-2.89938
24	329	II. U.	10 15 9.51	2.10507	65.60	+6 10 52.2	-2.92033
25	329	II. L.	10 40 42.59	2.10813	65.83	+3 21 10.3	-2.93596
25	330	II. U.	11 6 30.63	2.11354	66.24	+0 26 19.2	-2.94635
26	330	II. L.	11 32 42.47	2.12136	66.84	-2 31 38.9	-2.95129
26	331	II. U.	11 59 27.25	2.13149	67.62	-5 30 26.1	-2.95022
27	332	II. L.	12 26 54.18	2.14367	68.58	-8 27 25.3	-2.94231
27	332	II. U.	12 55 11.91	2.15776	69.71	-11 19 38.7	-2.92625
28	333	II. L.	13 24 27.86	2.17295	70.95	-14 3 47.6	-2.90009
28	333	II. U.	13 54 47.35	2.18845	72.24	-16 36 12.8	-2.86117
29	334	II. L.	14 26 12.53	2.20358	73.53	-18 53 4.6	-2.80540
29	334	II. U.	14 58 41.08	2.21706	74.70	-20 50 30.6	-2.72602
30	335	II. L.	15 32 5.33	2.22794	75.67	-22 24 49.2	-2.61079
30	335	II. U.	16 6 11.89	2.23507	76.32	-23 32 59.2	-2.43350
Dec. 1	336	I. L.	16 38 9.06	2.23782	76.58	-24 12 49.3	-2.10054
2	336	I. U.	17 12 41.57	2.23581	76.41	-24 23 19.0	+1.32098
2	337	I. L.	17 46 53.95	2.22907	75.81	-24 4 44.6	+2.21341
3	337	I. U.	18 20 25.17	2.21801	74.85	-23 18 35.2	+2.47132

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WASHINGTON MERIDIAN.							
Mean Solar Date.	Sidereal Date.	Limb and Transit.	Apparent Right Ascension in Time.	Logarithm Variation of Moon's Right Ascension for 1 hour of Longitude.	Sidereal Time of Semi-diameter passing the Meridian.	Declination.	Logarithm Variation of Moon's Declination for 1 hour of Longitude.
	^d		h m s		^s	° ′ ″	
Dec. 3	338	I. L.	18 52 58.43	2.20350	73.59	-22 7 20.4	+2.61682
4	338	I. v.	19 24 22.26	2.18656	72.14	-20 34 8.9	+2.71182
4	339	I. L.	19 54 30.97	2.16817	70.62	-18 42 27.9	+2.77721
5	339	I. v.	20 23 23.87	2.14931	69.10	-16 35 47.5	+2.82290
5	340	I. L.	20 51 4.21	2.13114	67.64	-14 17 25.8	+2.85486
6	340	I. v.	21 17 38.10	2.11398	66.29	-11 50 22.0	+2.87659
6	341	I. L.	21 43 13.37	2.09668	65.12	- 9 17 13.4	+2.89046
7	341	I. v.	22 7 58.77	2.08572	64.14	- 6 40 17.3	+2.89802
7	342	I. L.	22 32 3.56	2.07500	63.34	- 4 1 30.5	+2.90069
8	342	I. v.	22 55 36.91	2.06685	62.73	- 1 22 33.6	+2.89908
8	343	I. L.	23 18 47.79	2.06130	62.31	+ 1 15 5.0	+2.89362
9	343	I. v.	23 41 44.80	2.05835	62.08	+ 3 50 7.3	+2.88457
9	344	I. L.	0 4 36.10	2.05703	62.04	+ 6 21 20.5	+2.87196
10	345	I. v.	0 27 29.39	2.05983	62.15	+ 8 47 35.6	+2.85550
10	345	I. L.	0 50 31.75	2.06378	62.42	+11 7 44.9	+2.83480
11	346	I. v.	1 13 49.66	2.06959	62.82	+13 20 38.9	+2.80913
11	346	I. L.	1 37 28.80	2.07693	63.33	+15 25 6.5	+2.77754
12	347	I. v.	2 1 33.97	2.08536	63.93	+17 19 53.2	+2.73839
12	347	I. L.	2 26 8.78	2.09458	64.59	+19 3 41.2	+2.68967
13	348	I. v.	2 51 15.60	2.10401	65.28	+20 35 10.6	+2.62777
13	348	I. L.	3 16 55.20	2.11314	65.97	+21 53 1.2	+2.54759
14	349	I. v.	3 43 6.65	2.12163	66.61	+22 55 54.6	+2.43943
14	349	I. L.	4 9 47.15	2.12888	67.15	+23 42 37.7	+2.29815
15	350	I. v.	4 36 52.06	2.13459	67.61	+24 12 7.2	+2.01242
15	350	I. L.	5 4 15.38	2.13849	67.90	+24 23 33.4	+1.03862
16	351	I. v.	5 31 49.94	2.14035	68.05	+24 16 23.7	-1.91814
17	351	II. L.	6 1 44.06	2.13913	68.04	+23 50 25.8	-2.24741
17	352	II. v.	6 29 17.67	2.13792	67.88	+23 5 47.8	-2.43001
18	352	II. L.	6 56 40.07	2.13411	67.60	+22 2 58.4	-2.55420
18	353	II. v.	7 23 45.85	2.12927	67.22	+20 42 46.2	-2.64613
19	353	II. L.	7 50 31.25	2.12343	66.78	+19 6 15.6	-2.71704
19	354	II. v.	8 16 54.51	2.11727	66.33	+17 14 43.3	-2.77300
20	354	II. L.	8 42 55.76	2.11140	65.90	+15 9 34.7	-2.81771
20	355	II. v.	9 8 36.94	2.10616	65.52	+12 52 23.1	-2.85338
21	355	II. L.	9 34 1.71	2.10212	65.25	+10 24 45.4	-2.88165
21	356	II. v.	9 59 15.07	2.09972	65.07	+ 7 48 21.8	-2.90361
22	356	II. L.	10 24 23.24	2.09934	65.06	+ 5 4 55.5	-2.92004
22	357	II. v.	10 49 33.41	2.10096	65.21	+ 2 16 13.1	-2.93130
23	357	II. L.	11 14 53.55	2.10490	65.53	- 0 35 54.2	-2.93743
23	358	II. v.	11 40 32.21	2.11140	66.05	- 3 29 27.7	-2.93646
24	359	II. L.	12 6 38.31	2.12028	66.75	- 6 22 19.2	-2.93389
24	360	II. v.	12 33 20.79	2.13133	67.62	- 9 12 9.3	-2.92304
25	360	II. L.	13 0 48.29	2.14423	68.66	-11 56 24.2	-2.90451
25	360	II. v.	13 29 8.52	2.15857	69.82	-14 32 14.6	-2.87680
26	361	II. L.	13 58 27.62	2.17365	71.07	-16 56 35.7	-2.83732
26	361	II. v.	14 23 49.04	2.18868	72.32	-19 6 11.4	-2.78905
27	362	II. L.	15 0 12.72	2.20268	73.52	-20 57 39.7	-2.70469
27	362	II. v.	15 32 34.00	2.21468	74.56	-22 27 45.0	-2.59321
28	363	II. L.	16 5 43.18	2.22370	75.34	-23 33 31.6	-2.42159
28	363	II. v.	16 39 25.41	2.22691	75.79	-24 12 42.9	-2.10295

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Mean Solar Date.	Sidereal Date.	Limb and Transit.	Apparent Right Ascension in Time.	Logarithm Variation of Moon's Right Ascension for 1 hour of Longitude.	Sidereal Time of Semi-diameter passing the Meridian.	Declination.	Logarithm Variation of Moon's Declination for 1 hour of Longitude.
Dec. 29	^d 364	II. L.	h m s 17 13 21.94	2.22976	^s 75.84	-24° 23' 55.7"	+1.17173
29	364	II. U.	17 47 11.93	2.22611	75.50	-24 6 52.3	+2.19066
30	365	II. L.	18 20 34.96	2.21822	74.78	-23 22 24.0	+2.45951
31	365	I. U.	18 50 45.82	2.20661	73.75	-22 12 24.4	+2.61240
31	366	I. L.	19 22 28.64	2.19223	72.51	-20 39 34.9	+2.71256

320 MOON-CULMINATING STARS.

Sidereal Date.	Name and R.A. of Star.	Name and R.A. of Star.	Name and R.A. of Star.	Name and R.A. of Star.	Name and R.A. of Star.	Name and R.A. of Star.	Daily Change.
	35 Piscium.	d Piscium.	44 Piscium.	13 Ceti.	δ Piscium.	20 Ceti.	
	0 ^a 7 ^m	0 ^a 13 ^m	0 ^a 19 ^m	0 ^a 28 ^m	0 ^a 41 ^m	0 ^a 45 ^m	
d	°	°	°	°	°	°	
16	49.91	27.66	17.45	5.81	29.26	55.94	-.009
44	49.69	27.42	17.21	5.56	28.98	54.96	-.001
126	50.38	28.07	17.81	6.07	29.40	55.34	+.018
153	51.12	29.80	18.52	6.76	30.09	56.01	.029
180	51.98	29.66	19.37	7.61	30.94	56.84	.032
208	52.81	30.50	20.21	8.46	31.80	57.69	.028
235	53.42	31.13	20.84	9.12	32.48	58.38	.019
262	53.79	31.50	21.23	9.53	32.92	58.83	.011
289	53.88	31.61	21.35	9.68	33.11	59.02	+.003
317	53.76	31.50	21.25	9.59	33.07	58.99	-.005
344	53.51	31.26	21.01	9.36	32.87	58.79	-.011
Dec. =	+ 8° 3'	+ 7° 25'	+ 1° 10'	- 4° 22'	+ 6° 50'	- 1° 54'	
Mag. =	6	6.5	6	6.5	4.5	5.6	
	ε Piscium.	e Piscium.	ζ¹ Piscium.	40 Ceti.	μ Piscium.	η Piscium.	
	0 ^a 55 ^m	1 ^a 1 ^m	1 ^a 6 ^m	1 ^a 9 ^m	1 ^a 22 ^m	1 ^a 24 ^m	
	°	°	°	°	°	°	
18	45.10	13.61	29.40	53.04	55.35	4.18	-.028
45	44.80	13.31	29.10	52.74	55.03	3.84	-.009
127	45.15	13.61	29.36	52.95	55.17	3.98	+.019
154	45.82	14.27	30.02	53.59	55.79	4.62	.028
181	46.67	15.10	30.85	54.41	56.61	5.46	.031
209	47.53	15.96	31.73	55.27	57.49	6.36	.029
236	48.23	16.66	32.44	55.98	58.22	7.11	.023
263	48.70	17.14	32.94	56.48	58.75	7.67	.013
290	48.92	17.37	33.19	56.74	59.05	7.97	+.005
318	48.91	17.37	33.20	56.75	59.11	8.04	-.002
345	48.73	17.21	33.05	56.59	58.99	7.92	-.010
Dec. =	+ 7° 9'	+ 4° 55'	+ 6° 50'	- 3° 0'	+ 5° 26'	+ 14° 38'	
Mag. =	4	6.5	5.4	6	5	4.3	
	π Piscium.	ν Piscium.	ο Piscium.	ι Arietis.	ξ¹ Ceti.	θ Arietis.	
	1 ^a 29 ^m	1 ^a 34 ^m	1 ^a 38 ^m	1 ^a 49 ^m	2 ^a 5 ^m	2 ^a 10 ^m	
	°	°	°	°	°	°	
18	45.15	13.19	4.62	47.11	39.50	25.50	-.014
46	44.81	12.85	4.27	46.74	39.13	25.12	.011
73	44.59	12.62	4.04	46.47	38.84	24.79	-.006
155	45.57	13.54	4.94	47.33	39.54	25.51	+.026
182	46.39	14.34	5.75	48.15	40.31	26.32	.031
209	47.25	15.19	6.61	49.04	41.16	27.21	.031
237	48.02	15.97	7.39	49.86	41.98	28.06	.025
264	48.56	16.49	7.94	50.46	42.59	28.71	.018
291	48.87	16.81	8.27	50.84	42.99	29.14	.010
319	48.96	16.90	8.38	50.99	43.17	29.36	+.001
346	48.85	16.80	8.29	50.92	43.14	29.36	-.007
Dec. =	+ 11° 26'	+ 4° 47'	+ 8° 27'	+ 17° 8'	+ 8° 12'	+ 19° 15'	
Mag. =	6	5.4	4	6	4.5	6.5	
	ξ² Ceti.	38 Arietis.	π Arietis.	ρ² Arietis.	σ Arietis.	53 Arietis.	
	2 ^a 20 ^m	2 ^a 37 ^m	2 ^a 41 ^m	2 ^a 48 ^m	2 ^a 51 ^m	2 ^a 59 ^m	
	°	°	°	°	°	°	
19	47.78	25.00	34.01	37.03	17.85	37.97	-.014
47	47.40	24.62	33.62	36.63	17.44	37.58	.013
74	47.09	24.28	33.26	36.27	17.06	37.19	-.010
156	47.73	24.81	33.79	36.75	17.52	37.58	+.006
183	48.47	25.54	34.52	37.48	18.26	38.29	.030
210	49.32	26.39	35.39	38.35	19.15	39.15	.032
238	50.14	27.24	36.26	39.22	20.04	40.03	.029
265	50.77	27.90	36.95	39.93	20.76	40.76	.023
292	51.21	28.40	37.47	40.46	21.32	41.32	.015
320	51.41	28.65	37.75	40.77	21.63	41.65	+.006
347	51.41	28.69	37.80	40.84	21.71	41.75	.000
Dec. =	+ 7° 50'	+ 11° 52'	+ 16° 53'	+ 17° 29'	+ 20° 47'	+ 17° 29'	
Mag. =	4	5	6.5	6	4.5	6	

MOON-CULMINATING STARS. 321

Sidereal Date.	Name and R.A. of Star.	Name and R.A. of Star.	Name and R.A. of Star.	Name and R.A. of Star.	Name and R.A. of Star.	Name and R.A. of Star.	Daily Change.
	δ Arietis.	ζ Arietis.	τ^1 Arietis.	θ Tauri.	17 Tauri.	γ Tauri.	
	$3^{\circ} 3^{\circ}$	$3^{\circ} 6^{\circ}$	$3^{\circ} 13^{\circ}$	$3^{\circ} 28^{\circ}$	$3^{\circ} 36^{\circ}$	$3^{\circ} 39^{\circ}$	
d	■	■	■	■	■	■	
20	42.87	56.79	14.13	49.74	39.53	15.60	-.017
48	42.47	56.38	13.69	49.32	39.12	15.19	.016
75	42.06	55.96	13.31	48.89	38.67	14.74	.013
102	41.88	55.78	13.09	48.63	38.39	14.46	-.003
184	43.20	57.09	14.35	49.80	39.52	15.56	+.030
211	44.07	57.96	15.22	50.67	40.36	16.43	.033
239	44.98	58.84	16.11	51.58	41.20	17.34	.031
266	45.69	59.60	16.88	52.37	42.11	18.16	.026
293	46.26	60.15	17.47	53.01	42.77	18.85	.019
320	46.60	60.53	17.84	53.44	43.22	19.28	+.010
348	46.71	60.65	17.98	53.62	43.43	19.49	.000
Dec. =	+ 19° 12'	+ 20° 32'	+ 20° 30'	+ 22° 45'	+ 23° 40'	+ 23° 40'	
Mag. =	4.5	4.5	5	6	4	3	
	Δ^1 Tauri.	α^2 Tauri.	β^2 Tauri.	ρ^1 Tauri.	ϵ Tauri.	α Tauri.	
	$3^{\circ} 56^{\circ}$	$4^{\circ} 9^{\circ}$	$4^{\circ} 14^{\circ}$	$4^{\circ} 18^{\circ}$	$4^{\circ} 20^{\circ}$	$4^{\circ} 27^{\circ}$	
	■	■	■	■	■	■	
21	30.95	9.40	57.40	1.74	32.31	59.08	-.015
49	30.54	9.01	57.02	1.35	31.93	58.71	.016
76	30.09	8.56	56.57	0.89	31.46	58.26	.015
103	29.79	8.23	56.24	0.54	31.13	57.91	-.007
185	30.78	9.12	57.07	1.40	31.93	58.64	+.026
212	31.62	9.93	57.86	2.20	32.72	59.40	.031
240	32.53	10.83	58.74	3.11	33.61	60.27	.032
267	33.35	11.65	59.55	3.95	34.43	61.09	.029
294	34.02	12.34	60.24	4.67	35.14	61.80	.023
321	34.51	12.86	60.77	5.22	35.68	62.35	.015
349	34.76	13.14	61.06	5.54	35.99	62.68	+.006
Dec. =	+ 21° 42'	+ 20° 14'	+ 17° 13'	+ 22° 30'	+ 18° 52'	+ 16° 14'	
Mag. =	5.4	6.5	4	5.4	4.3	1	
	τ Tauri.	i Tauri.	ϵ Aurigae.	ι Tauri.	11 Orionis.	α Tauri.	
	$4^{\circ} 33^{\circ}$	$4^{\circ} 43^{\circ}$	$4^{\circ} 47^{\circ}$	$4^{\circ} 54^{\circ}$	$4^{\circ} 56^{\circ}$	$5^{\circ} 10^{\circ}$	
	■	■	■	■	■	■	
22	56.60	16.97	59.30	49.65	39.96	58.18	-.009
49	56.24	16.63	58.91	49.52	39.66	57.87	.016
77	55.75	16.15	58.36	48.96	39.19	57.38	.016
104	55.39	15.78	57.93	48.64	38.80	56.96	-.009
186	56.16	16.45	58.66	49.24	39.36	57.45	+.023
213	56.93	17.19	59.47	49.98	40.06	58.16	.030
240	57.81	18.04	60.42	50.83	40.88	59.00	.032
268	58.68	18.90	61.40	51.72	41.74	59.90	.031
295	59.44	19.64	62.25	52.49	42.49	60.69	.026
322	60.02	20.23	62.92	53.12	43.09	61.36	.019
349	60.37	20.59	63.34	53.52	43.48	61.81	+.011
Dec. =	+ 22° 39'	+ 18° 36'	+ 32° 57'	+ 21° 29'	+ 15° 13'	+ 21° 57'	
Mag. =	4.5	5.6	3	5	5	6	
	β Tauri.	\circ Tauri.	ζ Tauri.	129 Tauri.	136 Tauri.	1 Geminorum.	
	$5^{\circ} 17^{\circ}$	$5^{\circ} 19^{\circ}$	$5^{\circ} 29^{\circ}$	$5^{\circ} 38^{\circ}$	$5^{\circ} 44^{\circ}$	$5^{\circ} 55^{\circ}$	
	■	■	■	■	■	■	
23	33.09	19.84	22.95	48.54	38.28	43.07	-.006
50	32.76	19.53	22.65	48.27	38.00	42.82	.015
77	32.26	19.06	22.18	47.81	37.51	42.35	.017
105	31.86	18.62	21.74	47.37	37.03	41.88	.012
132	31.62	18.45	21.54	47.16	36.79	41.63	-.002
214	33.05	19.76	22.80	48.30	38.00	42.71	+.025
241	33.92	20.62	23.61	49.08	38.83	43.50	.031
269	34.87	21.51	24.51	49.94	39.77	44.43	.032
296	35.72	22.32	25.32	50.74	40.65	45.26	.029
323	36.44	23.00	26.03	51.44	41.42	46.03	.023
350	36.92	23.47	26.51	51.93	41.97	46.59	+.015
Dec. =	+ 28° 29'	+ 21° 49'	+ 21° 3'	+ 15° 45'	+ 27° 34'	+ 23° 16'	
Mag. =	2	6	3	5	5	5	

322 MOON-CULMINATING STARS.

Sidereal Date.	Name and R.A. of Star.	Name and R.A. of Star.	Name and R.A. of Star.	Name and R.A. of Star.	Name and R.A. of Star.	Name and R.A. of Star.	Daily Change.
	γ Geminorum.	κ Aurigæ.	μ Geminorum.	ν Geminorum.	49 Aurigæ.	δ Geminorum.	
	$6^{\circ} 6^m$	$6^{\circ} 6^m$	$6^{\circ} 14^m$	$6^{\circ} 20^m$	$6^{\circ} 26^m$	$6^{\circ} 35^m$	
d	"	"	"	"	"	"	
23	32.11	34.00	35.85	44.31	29.07	25.71	.000
51	31.80	33.74	35.62	44.09	28.85	25.52	-.013
78	31.43	33.25	35.17	43.65	28.39	25.08	.018
105	30.92	32.77	34.71	43.19	27.90	24.60	.015
133	30.60	32.47	34.42	42.90	27.59	24.27	-.006
215	31.63	33.55	35.38	43.81	28.49	25.09	+.027
242	32.41	34.38	36.15	44.55	29.27	25.84	.030
269	33.26	35.29	37.01	45.39	30.16	26.70	.032
297	34.15	36.23	37.90	46.27	31.10	27.61	.031
324	34.93	37.05	38.69	47.06	31.95	28.46	.027
351	35.50	37.66	39.29	47.66	32.60	29.12	+.021
Dec. =	+ 22° 33'	+ 29° 33'	+ 22° 35'	+ 20° 18'	+ 28° 8'	+ 25° 16'	
Mag. =	4	5.4	3	5.4	6.5	3.4	
	ω Geminorum.	ζ Geminorum.	τ Geminorum.	δ Geminorum.	ϵ Geminorum.	α^3 Geminorum.	
	$6^{\circ} 53^m$	$6^{\circ} 55^m$	$7^{\circ} 2^m$	$7^{\circ} 11^m$	$7^{\circ} 17^m$	$7^{\circ} 25^m$	
	"	"	"	"	"	"	
24	59.33	54.66	20.48	52.10	8.53	46.96	.000
52	59.18	54.51	20.33	51.99	8.44	46.86	-.010
79	58.76	54.11	19.90	51.60	8.03	46.47	.017
106	58.28	53.64	19.39	51.13	7.53	45.95	.016
134	57.93	53.30	19.01	50.77	7.15	45.53	-.009
215	58.63	53.96	19.66	51.32	7.68	46.00	+.022
243	59.35	54.66	20.40	51.99	8.36	46.69	.028
270	60.18	55.47	21.32	52.88	9.19	47.54	.031
298	61.11	56.36	22.24	53.69	10.14	48.52	.032
325	61.96	57.20	23.15	54.55	11.05	49.47	.030
352	62.64	57.87	23.89	55.27	11.80	50.31	+.027
Dec. =	+ 24° 25'	+ 20° 46'	+ 30° 28'	+ 22° 14'	+ 28° 4'	+ 32° 11'	
Mag. =	6	4	5.4	3.4	4	2.1	
	β Geminorum.	φ Geminorum.	6 Cancri.	12 Cancri.	ζ^1 Cancri.	1 Cancri.	
	$7^{\circ} 36^m$	$7^{\circ} 45^m$	$7^{\circ} 55^m$	$8^{\circ} 0^m$	$8^{\circ} 4^m$	$8^{\circ} 12^m$	
	"	"	"	"	"	"	
25	51.43	2.34	1.73	58.90	17.12	18.92	.000
52	51.37	2.28	1.72	58.91	17.14	18.96	-.006
80	50.98	1.92	1.37	58.60	16.83	18.65	.015
107	50.48	1.44	0.89	58.18	16.40	18.21	.015
134	50.09	1.04	0.48	57.81	16.02	17.80	.010
162	49.93	0.87	0.29	57.63	15.84	17.59	-.002
244	51.12	2.00	1.34	58.53	16.74	18.47	+.025
271	51.92	2.77	2.11	59.22	17.44	19.18	.030
298	52.82	3.67	3.00	60.03	18.26	20.03	.033
326	53.78	4.63	3.98	60.83	19.17	20.99	.032
353	54.57	5.43	4.80	61.69	19.97	21.83	+.027
Dec. =	+ 28° 22'	+ 27° 7'	+ 28° 11'	+ 14° 3'	+ 18° 4'	+ 24° 27'	
Mag. =	1.2	5	5	6	5.4	6	
	δ Cancri.	γ Cancri.	δ Cancri.	ϵ^2 Cancri.	α Cancri.	κ Cancri.	
	$8^{\circ} 23^m$	$8^{\circ} 35^m$	$8^{\circ} 36^m$	$8^{\circ} 47^m$	$8^{\circ} 50^m$	$9^{\circ} 0^m$	
	"	"	"	"	"	"	
26	42.93	17.23	49.80	22.71	55.71	15.80	+.006
53	42.96	17.32	49.90	22.84	55.83	15.94	-.003
81	42.71	17.06	49.65	22.59	55.62	15.75	.012
108	42.29	16.64	49.24	22.16	55.24	15.39	.015
135	41.91	16.25	48.85	21.73	54.87	15.02	.012
162	41.70	16.02	48.62	21.46	54.63	14.77	-.006
244	42.46	16.70	49.29	22.08	55.17	15.94	+.021
272	43.14	17.38	49.94	22.76	55.77	15.82	.027
299	43.97	18.20	50.76	23.61	56.53	16.58	.032
327	44.89	19.15	51.69	24.60	57.45	17.50	.032
354	45.70	20.00	52.53	25.51	58.28	18.32	+.030
Dec. =	+ 18° 34'	+ 21° 58'	+ 18° 40'	+ 28° 27'	+ 12° 24'	+ 11° 14'	
Mag. =	6	4.5	4	6	4	5	

MOON-CULMINATING STARS. 323

Sidereal Date.	Name and R.A. of Star.	Name and R.A. of Star.	Name and R.A. of Star.	Name and R.A. of Star.	Name and R.A. of Star.	Name and R.A. of Star.	Daily Change.
	ξ Cancri.	83 Cancri.	λ Leonis.	ξ Leonis.	ο Leonis.	ρ Leonis.	
	9 ^h 1 ^m	9 ^h 11 ^m	9 ^h 23 ^m	9 ^h 24 ^m	9 ^h 33 ^m	9 ^h 38 ^m	
d	"	"	"	"	"	"	
27	24.63	15.93	50.03	29.84	46.65	1.35	+ .006
54	24.85	16.10	50.25	30.04	46.87	1.60	+ .001
81	24.66	15.93	50.10	29.91	46.77	1.49	- .009
109	24.25	15.55	49.73	29.56	46.44	1.14	- .013
136	23.95	15.17	49.33	29.20	46.08	0.74	- .012
163	23.59	14.91	49.04	28.93	45.81	0.44	- .007
191	23.54	14.83	48.93	28.83	45.70	0.30	+ .001
273	24.73	15.91	49.95	29.78	46.57	1.20	.024
300	25.53	16.68	50.72	30.51	47.28	1.95	.030
327	26.45	17.58	51.64	31.37	48.15	2.86	.033
355	27.37	18.48	52.59	32.28	49.11	3.83	+ .034
Dec. =	+ 23° 36'	+ 18° 18'	+ 23° 35'	+ 11° 55'	+ 11° 31'	+ 24° 25'	
Mag. =	5.6	6	5.4	6	4.3	3	
	ν Leonis.	η Leonis.	α Leonis.	γ ¹ Leonis.	45 Leonis.	ε Leonis.	
	9 ^h 50 ^m	9 ^h 59 ^m	10 ^h 1 ^m	10 ^h 12 ^m	10 ^h 20 ^m	10 ^h 25 ^m	
27	47.29	47.87	0.84	20.99	20.96	32.03	+ .011
55	47.57	48.18	1.15	21.34	21.34	32.41	+ .005
82	47.49	48.13	1.09	21.32	21.34	32.42	- .006
110	47.19	47.83	0.81	21.03	21.10	32.19	- .012
137	46.84	47.47	0.46	20.68	20.78	31.87	- .012
164	46.56	47.18	0.18	20.37	20.49	31.58	.008
191	46.42	47.02	0.02	20.19	20.31	31.40	- .003
274	47.20	47.74	0.71	20.82	20.85	31.89	+ .022
301	47.88	48.42	1.38	21.48	21.48	32.51	.028
323	48.74	49.29	2.23	22.35	22.30	33.34	.032
356	49.66	50.23	3.15	23.31	23.23	34.26	+ .034
Dec. =	+ 13° 6'	+ 17° 26'	+ 12° 39'	+ 20° 33'	+ 10° 29'	+ 10° 1'	
Mag. =	5	3.4	1.2	2	6	4	
	37 Sextantis.	ι Leonis.	ε Leonis.	χ Leonis.	η Leonis.	σ Leonis.	
	10 ^h 38 ^m	10 ^h 41 ^m	10 ^h 53 ^m	10 ^h 57 ^m	11 ^h 8 ^m	11 ^h 13 ^m	
1	53.26	58.67	34.36	52.55	37.17	59.70	+ .029
28	53.95	59.38	35.07	53.28	37.93	60.45	.022
56	54.34	59.78	35.50	53.72	38.42	60.94	+ .009
83	54.37	59.91	35.58	53.80	38.54	61.07	- .002
111	54.17	59.63	35.41	53.64	38.39	60.95	.008
138	53.87	59.32	35.13	53.36	38.11	60.69	.011
165	53.58	59.03	34.84	53.07	37.82	60.41	- .010
192	53.39	58.83	34.63	52.85	37.58	60.18	- .006
220	53.32	58.76	34.53	52.74	37.45	60.04	.000
329	55.21	60.64	36.30	54.46	39.09	61.61	+ .032
357	56.13	61.56	37.21	55.39	40.02	62.55	+ .032
Dec. =	+ 7° 6'	+ 11° 17'	+ 6° 51'	+ 8° 5'	+ 14° 4'	+ 6° 47'	
Mag. =	6	5	5	5	6	4	
	ι Leonis.	τ Leonis.	ν Virginis.	β Virginis.	π Virginis.	ο Virginis.	
	11 ^h 16 ^m	11 ^h 20 ^m	11 ^h 38 ^m	11 ^h 43 ^m	11 ^h 53 ^m	11 ^h 58 ^m	
2	42.34	49.04	44.46	28.80	46.47	9.21	+ .030
29	43.10	49.78	45.25	29.58	47.28	10.00	.024
56	43.57	50.26	45.77	30.11	47.83	10.58	.013
84	43.71	50.41	45.97	30.33	48.08	10.85	+ .002
111	43.59	50.30	45.91	30.28	48.05	10.82	- .005
139	43.32	50.06	45.68	30.06	47.85	10.63	.009
166	43.03	49.78	45.41	29.82	47.59	10.37	.010
193	42.80	49.55	45.17	29.58	47.33	10.10	.008
221	42.66	49.41	44.99	29.40	47.13	9.89	- .003
330	44.25	50.95	46.37	30.74	48.36	11.06	+ .029
357	45.16	51.84	47.26	31.63	49.24	11.96	+ .031
Dec. =	+ 11° 18'	+ 3° 37'	+ 7° 19'	+ 2° 33'	+ 7° 23'	+ 9° 30'	
Mag. =	4	5	4.5	3.4	4.5	4	

324 MOON-CULMINATING STARS.

Sidereal Date.	Name and R.A. of Star.	Name and R.A. of Star.	Name and R.A. of Star.	Name and R.A. of Star.	Name and R.A. of Star.	Name and R.A. of Star.	Daily Change.
	Piazzi xii. 6.	13 Virginis.	γ Virginis.	c Virginis.	q Virginis.	γ Virginis.	
	12 ^h 4 ^m	12 ^h 11 ^m	12 ^h 19 ^m	12 ^h 19 ^m	12 ^h 26 ^m	12 ^h 34 ^m	
d	°	°	°	°	°	°	
3	34.61	34.09	48.89	18.89	37.74	38.32	+ .032
30	35.42	34.90	49.71	19.64	38.57	39.16	.027
57	35.98	35.48	50.29	20.23	39.19	39.78	.017
85	36.24	35.76	50.57	20.51	39.52	40.13	+ .006
112	36.24	35.78	50.60	20.53	39.58	40.21	— .002
140	36.06	35.62	50.44	20.36	39.46	40.09	.007
167	35.81	35.38	50.20	20.12	39.23	39.87	.010
194	35.55	35.13	49.94	19.86	38.97	39.61	.009
221	35.34	34.91	49.73	19.63	38.72	39.35	— .006
331	36.50	36.00	50.80	20.70	39.69	40.22	+ .027
358	37.36	36.87	51.66	21.56	40.56	41.07	+ .032
Dec. =	+ 4° 50'	— 0° 1'	+ 0° 6'	+ 4° 5'	— 8° 41'	— 0° 41'	
Mag. =	6.7	6	3.4	5	6	3.2	
	38 Virginis.	ψ Virginis.	δ Virginis.	δ Virginis.	α Virginis.	ζ Virginis.	
	12 ^h 46 ^m	12 ^h 47 ^m	12 ^h 48 ^m	13 ^h 2 ^m	13 ^h 17 ^m	13 ^h 27 ^m	
	°	°	°	°	°	°	
4	5.52	8.96	37.35	46.43	53.40	37.78	+ .033
31	6.37	9.82	38.20	47.30	54.25	38.66	.029
58	7.00	10.45	38.83	47.96	54.99	39.36	.020
86	7.37	10.83	39.21	48.39	55.46	39.84	.010
113	7.47	10.95	39.32	48.54	55.65	40.05	+ .002
140	7.39	10.87	39.24	48.49	55.65	40.06	— .004
168	7.18	10.66	39.02	48.30	55.48	39.90	.009
195	6.91	10.40	38.75	48.04	55.22	39.65	.010
222	6.65	10.13	38.48	47.76	54.93	39.35	— .007
332	7.45	10.95	39.25	48.42	55.46	39.74	+ .026
359	8.32	11.82	40.11	49.27	56.30	40.56	+ .032
Dec. =	— 2° 49'	— 8° 47'	+ 4° 9'	— 4° 48'	— 10° 26'	+ 0° 7'	
Mag. =	6	5	3	4.5	1	3.4	
	π Virginis.	86 Virginis.	89 Virginis.	94 Virginis.	κ Virginis.	ι Virginis.	
	13 ^h 34 ^m	13 ^h 38 ^m	13 ^h 42 ^m	13 ^h 58 ^m	14 ^h 5 ^m	14 ^h 11 ^m	
	°	°	°	°	°	°	
4	20.11	33.01	19.29	57.10	29.94	36.37	+ .033
32	21.03	33.95	20.24	58.03	30.88	37.27	.031
59	21.75	34.63	21.00	58.78	31.64	38.10	.025
86	22.24	35.18	21.52	59.32	32.20	38.68	.015
114	22.48	35.44	21.80	59.64	32.54	39.03	+ .006
141	22.51	35.48	21.85	59.73	32.64	39.16	.000
169	22.37	35.35	21.72	59.63	32.56	39.10	— .007
196	22.12	35.10	21.47	59.39	32.34	38.88	.011
223	21.81	34.78	21.14	59.08	32.01	38.55	.012
250	21.54	34.50	20.84	58.77	31.70	38.22	— .006
360	23.04	35.99	22.34	60.05	32.92	39.41	+ .031
Dec. =	— 8° 0'	— 11° 44'	— 17° 26'	— 8° 14'	— 9° 38'	— 12° 44'	
Mag. =	6	6	5	6	4.5	5.4	
	μ Virginis.	5 Libræ.	μ Libræ.	α Libræ.	ξ Libræ.	20 Libræ.	
	14 ^h 35 ^m	14 ^h 38 ^m	14 ^h 41 ^m	14 ^h 43 ^m	14 ^h 49 ^m	14 ^h 55 ^m	
	°	°	°	°	°	°	
5	44.91	18.80	42.93	12.24	14.36	55.18	+ .033
33	45.83	19.75	43.87	13.19	15.29	56.18	.032
60	46.62	20.57	44.69	14.01	16.10	57.06	.028
87	47.23	21.20	45.33	14.67	16.75	57.73	.020
115	47.63	21.63	45.76	15.11	17.20	58.28	.012
142	47.80	21.82	45.96	15.31	17.42	58.54	+ .004
169	47.78	21.81	45.96	15.31	17.43	58.57	— .003
197	47.57	21.60	45.76	15.11	17.23	58.38	.010
224	47.24	21.27	45.42	14.77	16.91	58.02	.013
251	46.89	20.91	45.06	14.41	16.54	57.62	— .009
361	47.86	21.91	46.02	15.37	17.42	58.51	+ .020
Dec. =	— 5° 3'	— 14° 52'	— 13° 34'	— 15° 29'	— 10° 51'	— 24° 44'	
Mag. =	4	6	6	2.3	6	3.4	

MOON-CULMINATING STARS. 325

Sidereal Date.	Name and R.A. of Star.	Name and R.A. of Star.	Name and R.A. of Star.	Name and R.A. of Star.	Name and R.A. of Star.	Name and R.A. of Star.	Daily Change.
	ϵ^1 Librae.	ζ^1 Librae.	γ Librae.	κ Librae.	ν Librae.	λ Librae.	
	15 ^h 4 ^m	15 ^h 20 ^m	15 ^h 27 ^m	15 ^h 33 ^m	15 ^h 36 ^m	15 ^h 45 ^m	
d	18.75	25.69	45.53	56.98	16.02	16.53	+ .033
6	19.68	26.60	46.43	57.89	16.91	17.43	.032
33	20.54	27.46	47.28	58.78	17.78	18.32	.030
60	21.26	28.20	48.04	59.56	18.54	19.12	.024
88	21.75	28.72	48.56	60.12	19.10	19.71	.016
115	22.03	29.04	48.89	60.48	19.46	20.11	+ .008
143	22.07	29.12	48.90	60.60	19.58	20.27	-.001
170	21.90	28.98	48.85	60.47	19.46	20.15	.009
197	21.55	28.64	48.52	60.14	19.13	19.82	.014
225	21.16	28.24	48.12	59.73	18.73	19.40	-.013
252	21.97	28.88	48.69	60.26	19.22	19.83	+ .028
362							
Dec. =	- 19° 16'	- 16° 14'	- 14° 19'	- 19° 13'	- 15° 14'	- 19° 45'	
Mag. =	5.4	4	4.5	5	6	6	
	ϵ Scorpii.	δ Scorpii.	ρ^1 Scorpii.	σ Scorpii.	α Scorpii.	τ Scorpii.	
	15 ^h 48 ^m	15 ^h 52 ^m	15 ^h 57 ^m	16 ^h 12 ^m	16 ^h 20 ^m	16 ^h 27 ^m	
7	18.99	7.46	21.75	44.88	53.57	14.35	+ .033
34	19.95	8.37	22.64	45.78	54.48	15.26	.034
61	20.91	9.28	23.54	46.71	55.43	16.21	.033
88	21.73	10.06	24.31	47.55	56.36	17.08	.028
116	22.40	10.71	24.96	48.25	57.00	17.83	.021
143	22.81	11.11	25.36	48.72	57.49	18.35	.013
171	22.97	11.28	25.54	48.95	57.78	18.62	+ .002
198	22.86	11.18	25.45	48.89	57.70	18.60	-.007
225	22.51	10.86	25.14	48.58	57.40	18.30	.013
252	22.05	10.43	24.72	48.14	56.95	17.85	-.012
362	22.49	10.81	25.04	48.33	57.07	17.91	+ .014
Dec. =	- 28° 48'	- 22° 13'	- 19° 25'	- 25° 15'	- 26° 7'	- 27° 55'	
Mag. =	5.4	2.3	2	3.4	1.2	3.4	
	σ^4 Scorpii.	ρ^2 Ophiuchi.	ν Ophiuchi.	λ Ophiuchi.	ξ Ophiuchi.	δ Ophiuchi.	
	16 ^h 33 ^m	16 ^h 49 ^m	17 ^h 2 ^m	17 ^h 6 ^m	17 ^h 12 ^m	17 ^h 13 ^m	
35	33.19	9.67	25.38	49.23	41.32	29.41	+ .033
62	34.08	10.52	26.24	50.15	42.26	30.32	.032
89	34.88	13.31	27.06	51.04	43.11	31.20	.029
117	35.59	12.00	27.81	51.85	43.91	32.02	.024
144	36.07	12.49	28.36	52.46	44.51	32.64	.017
171	36.33	12.75	28.69	52.82	44.87	33.02	+ .007
199	36.32	12.75	28.74	52.89	44.96	33.10	-.004
226	36.04	12.50	28.50	52.64	44.74	32.88	.012
253	35.61	12.08	28.09	52.19	44.31	32.44	.016
281	35.18	11.65	27.63	51.70	43.84	31.94	-.014
363	35.65	12.03	27.88	51.94	44.03	32.14	+ .012
Dec. =	- 17° 29'	- 10° 33'	- 15° 33'	- 26° 23'	- 20° 58'	- 24° 51'	
Mag. =	5	5	2.3	5	5	3.4	
	δ Ophiuchi.	ϵ^2 Ophiuchi.	σ Serpentina.	λ Sagittarii.	ρ Sagittarii.	γ Sagittarii.	
	17 ^h 17 ^m	17 ^h 22 ^m	17 ^h 33 ^m	17 ^h 51 ^m	17 ^h 55 ^m	17 ^h 56 ^m	
35	53.98	57.18	36.94	19.21	21.71	53.63	+ .032
63	54.82	58.11	37.80	20.10	22.60	54.57	.033
90	55.70	58.99	38.63	20.99	23.49	55.51	.034
117	56.48	59.78	39.38	21.82	24.33	56.40	.029
145	57.12	60.43	39.96	22.52	25.05	57.16	.020
172	57.50	60.83	40.39	23.00	25.53	57.67	+ .011
200	57.58	60.92	40.50	23.16	25.74	57.86	-.001
227	57.36	60.71	40.31	23.01	25.61	57.70	.011
254	56.92	60.28	39.91	22.60	25.15	57.27	.017
281	56.45	59.80	39.45	22.11	24.65	56.75	-.015
364	56.63	59.94	39.49	22.04	24.67	56.64	+ .014
Dec. =	- 24° 3'	- 23° 51'	- 12° 48'	- 23° 48'	- 24° 29'	- 30° 25'	
Mag. =	5	5	5.4	5	5.4	3.4	

326 MOON-CULMINATING STARS.

Sidereal Date.	Name and R.A. of Star.	Name and R.A. of Star.	Name and R.A. of Star.	Name and R.A. of Star.	Name and R.A. of Star.	Name and R.A. of Star.	Daily Change.
	μ^1 Sagittarii.	δ Sagittarii.	λ Sagittarii.	Bradley 2333.	ϕ Sagittarii.	29 Sagittarii.	
	$18^{\circ} 5^{\circ}$	$18^{\circ} 12^{\circ}$	$18^{\circ} 19^{\circ}$	$18^{\circ} 30^{\circ}$	$18^{\circ} 36^{\circ}$	$18^{\circ} 41^{\circ}$	
d	27.67	6.32	24.12	3.90	58.98	25.66	+.027
63	28.50	7.20	24.96	4.71	59.80	26.43	.031
91	29.40	8.17	25.89	5.62	60.74	27.32	.033
118	30.23	9.06	26.75	6.48	61.67	28.16	.029
146	30.95	9.85	27.53	7.27	62.44	28.95	.024
173	31.43	10.39	28.06	7.82	63.03	29.52	.014
200	31.62	10.60	28.29	8.07	63.32	29.80	+.003
228	31.48	10.47	28.19	7.96	63.24	29.74	-.009
255	31.09	10.05	27.78	7.61	62.87	29.39	.016
282	30.61	9.54	27.29	7.13	62.38	28.92	.017
364	30.48	9.34	27.06	6.84	62.02	28.56	-.009
Dec. =	$-21^{\circ} 6'$	$-29^{\circ} 53'$	$-25^{\circ} 30'$	$-23^{\circ} 37'$	$-27^{\circ} 8'$	$-20^{\circ} 29'$	
Mag. =	4	3.4	3	5	4.3	6	
	ν^1 Sagittarii.	σ Sagittarii.	ζ Sagittarii.	τ Sagittarii.	χ^1 Sagittarii.	λ^2 Sagittarii.	
	$18^{\circ} 45^{\circ}$	$18^{\circ} 46^{\circ}$	$18^{\circ} 53^{\circ}$	$18^{\circ} 58^{\circ}$	$19^{\circ} 16^{\circ}$	$19^{\circ} 28^{\circ}$	
64	47.98	40.19	47.54	17.00	49.92	15.90	+.031
92	48.83	41.11	48.49	17.93	50.80	16.78	.033
119	49.70	42.00	49.41	18.84	51.69	17.67	.032
146	50.47	42.80	50.24	19.66	52.52	18.51	.026
174	51.07	43.42	50.90	20.32	53.21	19.29	.018
201	51.36	43.71	51.22	20.65	53.57	19.62	+.006
228	51.30	43.66	51.18	20.62	53.60	19.67	-.006
256	50.94	43.29	50.81	20.26	53.28	19.38	.015
283	50.46	42.80	50.30	19.77	52.81	18.92	.017
310	50.05	42.37	49.85	19.32	52.37	18.47	.012
365	50.09	42.41	49.85	19.30	52.26	18.30	-.000
Dec. =	$-22^{\circ} 55'$	$-26^{\circ} 28'$	$-30^{\circ} 5'$	$-27^{\circ} 52'$	$-24^{\circ} 46'$	$-25^{\circ} 11'$	
Mag. =	5	2.3	3.4	4.3	6	5.4	
	ϵ^2 Sagittarii.	ζ^2 Sagittarii.	η Sagittarii.	A Sagittarii.	c Sagittarii.	Piazzi xix.366.	
	$19^{\circ} 33^{\circ}$	$19^{\circ} 38^{\circ}$	$19^{\circ} 48^{\circ}$	$19^{\circ} 50^{\circ}$	$19^{\circ} 54^{\circ}$	$19^{\circ} 55^{\circ}$	
65	35.08	16.12	25.92	29.88	7.44	32.00	+.025
92	35.87	16.92	26.76	30.71	8.27	32.86	.031
119	36.72	17.79	27.66	31.61	9.18	33.81	.033
147	37.56	18.65	28.58	32.53	10.11	34.78	.030
174	38.21	19.32	29.31	33.26	10.85	35.56	.022
202	38.61	19.75	29.78	33.72	11.34	36.06	+.010
229	38.65	19.80	29.87	33.82	11.45	36.18	-.003
256	38.40	19.55	29.62	33.58	11.20	35.93	.013
283	37.97	19.11	29.16	33.13	10.75	35.46	.017
311	37.53	18.66	28.68	32.64	10.26	34.94	.014
338	37.31	18.42	28.41	32.37	9.98	34.64	-.006
Dec. =	$-16^{\circ} 27'$	$-20^{\circ} 5'$	$-27^{\circ} 32'$	$-26^{\circ} 34'$	$-28^{\circ} 6'$	$-32^{\circ} 27'$	
Mag. =	5	5	5	5	5	5	
	α^2 Capricorni.	π Capricorni.	ρ Capricorni.	ν Capricorni.	ψ Capricorni.	ω Capricorni.	
	$20^{\circ} 10^{\circ}$	$20^{\circ} 19^{\circ}$	$20^{\circ} 20^{\circ}$	$20^{\circ} 32^{\circ}$	$20^{\circ} 37^{\circ}$	$20^{\circ} 43^{\circ}$	
66	21.19	22.59	56.60	8.87	52.56	31.04	+.024
93	21.92	23.33	57.34	9.59	53.30	31.78	.029
120	22.76	24.18	58.18	10.43	54.18	32.66	.031
148	23.61	25.06	59.06	11.32	55.11	33.60	.030
175	24.31	25.80	59.81	12.08	55.92	34.43	.024
202	24.77	26.30	60.28	12.60	56.48	35.01	+.013
230	24.90	26.46	60.47	12.79	56.70	35.25	.000
257	24.71	26.28	60.30	12.65	56.56	35.11	-.010
284	24.32	25.89	59.91	12.27	56.17	34.73	.015
312	23.88	25.44	59.45	11.82	55.69	34.24	.014
339	23.61	25.15	59.17	11.52	55.36	33.90	-.010
Dec. =	$-12^{\circ} 58'$	$-18^{\circ} 40'$	$-18^{\circ} 16'$	$-18^{\circ} 37'$	$-25^{\circ} 46'$	$-27^{\circ} 26'$	
Mag. =	3.4	5	5	6.5	4.5	4.5	

MOON-CULMINATING STARS. 327

Sidereal Date.	Name and R.A. of Star.	Name and R.A. of Star.	Name and R.A. of Star.	Name and R.A. of Star.	Name and R.A. of Star.	Name and R.A. of Star.	Daily Change.
	♈ Aquarii.	♐ Capricorni.	♐ Capricorni.	♐ Capricorni.	♐ Capricorni.	♐ Capricorni.	
	21 ^h 2 ^m	21 ^h 14 ^m	21 ^h 18 ^m	21 ^h 29 ^m	21 ^h 32 ^m	21 ^h 39 ^m	
d	°	°	°	°	°	°	
67	1.82	31.04	44.27	18.32	23.92	22.49	+.016
94	2.47	31.68	44.91	18.93	24.51	23.07	.026
121	3.26	32.47	45.73	19.72	25.29	23.83	.030
149	4.14	33.38	46.66	20.64	26.20	24.74	.031
176	4.91	34.18	47.49	21.46	27.01	25.56	.027
203	5.47	34.79	48.13	22.11	27.65	26.22	.017
231	5.72	35.08	48.44	22.45	27.99	26.58	+.005
258	5.63	35.02	48.39	22.43	27.99	26.59	-.006
285	5.31	34.71	48.08	22.14	27.71	26.33	.013
313	4.89	34.28	47.63	21.72	27.30	25.92	.014
340	4.58	33.95	47.28	21.37	26.96	25.58	-.013
Dec. =	- 11° 56'	- 17° 25'	- 23° 1'	- 20° 5'	- 17° 17'	- 16° 45'	
Mag. =	4.5	4.5	4	5.4	4.3	3	
	♐ Capricorni.	♈ Aquarii.	♈ Aquarii.	♈ Aquarii.	♈ Aquarii.	♈ Aquarii.	
	21 ^h 45 ^m	21 ^h 58 ^m	22 ^h 9 ^m	22 ^h 12 ^m	22 ^h 19 ^m	22 ^h 23 ^m	
13	43.03	55.83	30.03	53.19	1.78	16.59	+.005
95	44.05	56.74	30.84	53.97	2.54	17.29	.023
122	44.81	57.48	31.55	54.67	3.25	17.98	.029
150	45.71	58.37	32.42	55.54	4.14	18.85	.031
177	46.62	59.20	33.25	56.36	5.00	19.69	.028
204	47.17	59.87	33.92	57.04	5.71	20.39	.020
232	47.53	60.26	34.33	57.46	6.16	20.84	+.009
259	47.55	60.31	34.41	57.54	6.26	20.96	-.002
286	47.29	60.08	34.21	57.36	6.08	20.78	.010
314	46.91	59.71	33.86	57.01	5.72	20.45	.013
341	46.57	59.37	33.53	56.68	5.37	20.12	-.010
Dec. =	- 14° 12'	- 14° 33'	- 8° 28'	- 8° 31'	- 17° 27'	- 11° 23'	
Mag. =	5	4	4.5	5.6	6	5.4	
	♈ Aquarii.	♈ Aquarii.	♈ Aquarii.	♈ Aquarii.	♈ Aquarii.	♈ Aquarii.	
	22 ^h 30 ^m	22 ^h 42 ^m	22 ^h 47 ^m	23 ^h 7 ^m	23 ^h 8 ^m	23 ^h 11 ^m	
14	33.73	14.11	16.57	7.86	36.84	44.22	-.007
96	34.39	14.69	17.12	8.23	37.21	44.56	+.015
123	35.06	15.35	17.78	8.84	37.82	45.16	.027
151	35.92	16.22	18.64	9.66	38.65	45.99	.031
178	36.76	17.08	19.52	10.52	39.51	46.84	.030
205	37.44	17.81	20.26	11.27	40.27	47.60	.023
233	37.89	18.29	20.76	11.79	40.81	48.15	.012
260	38.00	18.44	20.88	12.01	41.03	48.38	+.002
287	37.85	18.31	20.80	11.95	40.97	48.33	-.007
315	37.53	17.99	20.49	11.69	40.71	48.07	.011
342	37.21	17.66	20.15	11.39	40.41	47.76	-.013
Dec. =	- 4° 57'	- 14° 19'	- 16° 34'	- 6° 48'	- 9° 51'	- 10° 22'	
Mag. =	5	4	3	4.5	5.4	5	
	♈ Piscium.	♈ Piscium.	♈ Piscium.	♈ Piscium.	♈ Piscium.	♈ Piscium.	
	23 ^h 19 ^m	23 ^h 34 ^m	23 ^h 40 ^m	23 ^h 51 ^m	23 ^h 54 ^m	23 ^h 58 ^m	
15	48.93	57.98	48.29	33.97	59.59	13.98	-.010
43	48.82	57.83	48.13	33.80	50.41	13.79	-.003
125	49.86	58.75	49.00	34.59	51.17	14.52	+.025
152	50.65	59.53	49.77	35.34	51.92	15.27	.031
179	51.50	60.38	50.66	36.19	52.77	16.12	.031
207	52.28	61.17	51.43	37.01	53.60	16.95	.025
234	52.80	61.73	52.00	37.60	54.19	17.55	.016
261	53.03	61.99	52.28	37.91	54.52	17.89	+.006
288	53.00	62.00	52.30	37.96	54.57	17.95	-.003
316	52.77	61.80	52.12	37.79	54.41	17.80	.009
343	52.47	61.52	51.83	37.53	54.14	17.53	-.012
Dec. =	+ 0° 30'	+ 1° 1'	- 3° 32'	- 4° 20'	- 6° 47'	- 6° 29'	
Mag. =	5.4	5	6	5.6	5	5	

FOR WASHINGTON MEAN NOON AND MIDNIGHT.										
JANUARY.						FEBRUARY.				
Date.	Semi-diameter.	Horizontal Parallax.	Hourly D ^{ist} .	Meridian Transit.	Hourly D ^{ist} .	Semi-diameter.	Horizontal Parallax.	Hourly D ^{ist} .	Meridian Transit.	Hourly D ^{ist} .
d			"	h m	m	d		"	h m	m
1.0	16 9.7	59 18.4	+0.26	L. 4 3.7	2.02	16 9.8	59 18.8	-1.13	L. 5 22.7	2.26
1.5	16 10.3	59 14.8	0.14	U. 16 27.9	2.02	16 6.1	58 58.9	1.18	U. 17 59.1	2.30
2.0	16 10.6	59 15.7	+0.02	L. 4 52.2	2.03	16 2.1	58 44.3	1.23	L. 6 18.1	2.35
2.5	16 10.5	59 15.4	-0.08	U. 17 16.7	2.05	15 58.0	58 29.2	1.27	U. 18 46.6	2.39
3.0	16 10.2	59 13.9	0.17	L. 5 41.5	2.06	15 53.8	58 13.9	1.28	U. 7 15.4	2.41
3.5	16 9.4	59 11.3	0.26	U. 18 6.8	2.13	15 49.6	57 58.5	1.28	U. 19 44.4	2.42
4.0	16 8.4	59 7.6	0.35	L. 6 32.6	2.18	15 45.5	57 43.1	1.28	L. 8 13.4	2.41
4.5	16 7.2	59 2.9	0.43	U. 18 59.1	2.24	15 41.3	57 27.8	1.28	U. 20 42.2	2.38
5.0	16 5.6	58 57.2	0.52	L. 7 26.3	2.29	15 37.1	57 12.5	1.27	L. 9 10.5	2.33
5.5	16 3.7	58 50.5	0.60	U. 19 54.2	2.34	15 33.0	56 57.4	1.25	U. 21 38.2	2.27
6.0	16 1.6	58 42.7	0.69	L. 8 22.7	2.39	15 28.9	56 42.5	1.24	L. 10 5.1	2.20
6.5	15 59.2	58 33.9	0.78	U. 20 51.7	2.43	15 24.9	56 27.7	1.23	U. 22 31.0	2.12
7.0	15 56.5	58 23.9	0.88	L. 9 21.1	2.46	15 20.9	56 13.1	1.21	L. 10 56.1	2.05
7.5	15 53.4	58 12.7	0.97	U. 21 50.7	2.47	15 17.0	55 58.8	1.18	U. 23 20.3	1.98
8.0	15 50.1	58 0.4	1.07	L. 10 20.2	2.45	15 13.2	55 44.8	1.15	L. 11 43.7	1.91
8.5	15 46.5	57 47.0	1.16	U. 22 49.3	2.41	15 9.5	55 31.2	1.12		
9.0	15 42.5	57 32.6	1.23	L. 11 17.8	2.35	15 5.9	55 18.1	1.07	U. 0 6.2	1.85
9.5	15 38.4	57 17.3	1.30	U. 23 45.5	2.27	15 2.5	55 5.6	1.02	L. 12 29.1	1.80
10.0	15 34.0	57 1.3	1.36			14 59.3	54 53.7	0.96	U. 0 49.4	1.75
10.5	15 29.5	56 44.7	1.40	L. 12 12.2	2.19	14 56.3	54 42.7	0.88	L. 13 10.1	1.71
11.0	15 24.9	56 27.6	1.42	U. 0 38.0	2.11	14 53.6	54 32.8	0.78	U. 1 30.5	1.69
11.5	15 20.2	56 10.5	1.42	L. 13 2.8	2.02	14 51.2	54 24.1	0.67	L. 13 50.8	1.69
12.0	15 15.5	55 53.5	1.40	U. 1 26.6	1.94	14 49.2	54 16.8	0.55	U. 2 11.1	1.68
12.5	15 11.0	55 36.9	1.36	L. 13 49.4	1.87	14 47.6	54 10.9	0.42	L. 14 31.3	1.68
13.0	15 6.7	55 20.9	1.29	U. 2 11.5	1.82	14 46.5	54 6.7	0.27	U. 2 51.5	1.69
13.5	15 2.6	55 6.0	1.18	L. 14 33.0	1.77	14 45.9	54 4.5	-0.10	L. 15 11.9	1.72
14.0	14 59.0	54 52.5	1.07	U. 2 53.9	1.73	14 45.9	54 4.4	+0.06	U. 3 32.7	1.75
14.5	14 55.7	54 40.5	0.93	L. 15 14.4	1.70	14 46.5	54 6.5	0.27	L. 15 54.0	1.80
15.0	14 52.9	54 30.2	0.77	U. 3 34.6	1.68	14 47.7	54 11.0	0.47	U. 4 15.9	1.85
15.5	14 50.7	54 22.0	0.59	L. 15 54.7	1.67	14 49.5	54 17.9	0.68	L. 16 38.4	1.90
16.0	14 49.0	54 16.0	0.41	U. 4 14.7	1.67	14 52.1	54 27.3	0.88	U. 5 1.6	1.96
16.5	14 48.0	54 12.3	-0.21	L. 16 34.9	1.69	14 55.3	54 39.2	1.09	L. 17 25.6	2.03
17.0	14 47.7	54 11.1	0.00	U. 4 55.3	1.71	14 59.3	54 53.6	1.30	U. 5 50.3	2.09
17.5	14 48.1	54 12.5	+0.22	L. 17 16.0	1.75	15 3.9	55 10.5	1.51	L. 18 15.8	2.15
18.0	14 49.2	54 16.5	0.44	U. 5 37.3	1.80	15 9.1	55 29.8	1.70	U. 6 42.0	2.21
18.5	14 51.0	54 23.2	0.67	L. 17 59.2	1.86	15 15.0	55 51.3	1.88	L. 19 8.8	2.25
19.0	14 53.5	54 32.5	0.88	U. 6 21.8	1.92	15 21.4	56 15.0	2.04	U. 7 36.1	2.29
19.5	14 56.8	54 44.4	1.09	L. 18 45.2	1.98	15 28.3	56 40.4	2.17	L. 20 3.8	2.32
20.0	15 0.6	54 58.7	1.29	U. 7 9.4	2.05	15 35.6	57 7.1	2.27	U. 8 31.8	2.33
20.5	15 5.2	55 15.4	1.47	L. 19 34.5	2.13	15 43.2	57 34.9	2.33	L. 20 59.9	2.33
21.0	15 10.3	55 34.2	1.64	U. 8 0.5	2.20	15 50.9	58 3.2	2.34	U. 9 27.8	2.32
21.5	15 15.9	55 54.8	1.78	L. 20 27.3	2.26	15 58.5	58 31.1	2.30	L. 21 55.5	2.30
22.0	15 22.0	56 17.1	1.90	U. 8 54.8	2.31	16 5.9	58 58.3	2.21	U. 10 22.9	2.27
22.5	15 28.4	56 40.5	1.98	L. 21 22.8	2.35	16 12.9	59 24.1	2.07	L. 22 49.9	2.24
23.0	15 35.0	57 4.6	2.02	U. 9 51.2	2.37	16 19.4	59 47.8	1.87	U. 11 16.6	2.21
23.5	15 41.6	57 29.0	2.02	L. 22 19.8	2.38	16 25.1	60 8.8	1.62	L. 23 43.1	2.19
24.0	15 48.1	57 53.1	1.98	U. 10 48.4	2.37	16 29.9	60 26.6	1.32		
24.5	15 54.5	58 16.5	1.90	L. 23 16.8	2.35	16 33.7	60 40.5	0.98	U. 12 9.3	2.18
25.0	16 0.5	58 38.6	1.77	U. 11 44.7	2.31	16 36.4	60 50.2	0.63	L. 0 35.3	2.17
25.5	16 6.1	58 58.9	1.60			16 37.8	60 55.6	+0.26	U. 13 1.4	2.17
26.0	16 11.0	59 17.0	1.39	L. 0 12.1	2.26	16 38.0	60 56.4	-0.12	L. 1 27.5	2.18
26.5	16 15.2	59 32.5	1.17	U. 12 39.1	2.22	16 37.1	60 52.8	0.47	U. 13 53.8	2.20
27.0	16 18.7	59 45.2	0.93	L. 1 5.4	2.18	16 35.0	60 45.1	0.79	L. 2 20.4	2.24
27.5	16 21.3	59 54.8	0.67	U. 13 31.4	2.15	16 31.9	60 33.8	1.07	U. 14 47.5	2.28
28.0	16 23.0	60 1.1	0.39	L. 1 57.0	2.12	16 27.9	60 19.2	1.33	L. 3 15.1	2.32
28.5	16 23.8	60 4.1	+0.13	U. 14 22.3	2.10	16 23.2	60 1.8	1.53	U. 15 43.2	2.36
29.0	16 23.8	60 4.0	-0.12	L. 2 47.5	2.10	16 17.9	59 42.5	1.70	L. 4 11.9	2.39
29.5	16 23.0	60 1.0	0.36	U. 15 12.6	2.10	16 12.2	59 21.3	1.81	U. 16 40.8	2.43
30.0	16 21.4	59 55.4	0.57	L. 3 37.8	2.11	16 6.1	58 59.2	1.87	L. 5 10.0	2.44
30.5	16 19.2	59 47.4	0.75	U. 16 3.4	2.14	16 0.0	58 36.6	1.90	U. 17 39.5	2.45
31.0	16 16.5	59 37.4	0.90	L. 4 29.4	2.18	15 53.9	58 13.8	1.90	L. 6 8.8	2.43
31.5	16 13.3	59 25.7	-1.02	U. 16 55.8	2.22	15 47.7	57 51.3	-1.86	U. 18 37.9	2.41

FOR WASHINGTON MEAN NOON AND MIDNIGHT.

MARCH.

APRIL.

Date.	Semi-diameter.	Horizontal Parallax.	Hourly Diff.	Meridian Transkt.			Semi-diameter.	Horizontal Parallax.	Hourly Diff.	Meridian Transkt.			Hourly Diff.
				h	m	m				h	m	m	
1.0	16 17.9	59 42.5	-1.70	L. 4	12.0	2.39	15 43.8	57 37.3	-2.23	L. 5	56.1	2.32	
1.5	16 12.2	59 21.3	1.81	U. 16	40.8	2.43	15 36.6	57 11.1	2.14	U. 18	23.3	2.24	
2.0	16 6.1	58 59.2	1.87	L. 5	10.0	2.44	15 29.8	56 46.1	2.03	L. 6	49.6	2.14	
2.5	16 0.0	58 36.6	1.90	U. 17	39.5	2.45	15 23.4	56 22.6	1.89	U. 19	14.7	2.05	
3.0	15 53.9	58 13.8	1.90	L. 6	8.8	2.43	15 17.5	56 0.7	1.75	L. 7	39.0	1.98	
3.5	15 47.7	57 51.3	1.86	U. 18	37.9	2.41	15 12.1	55 40.6	1.60	U. 20	2.2	1.91	
4.0	15 41.6	57 29.3	1.81	L. 7	6.5	2.36	15 7.1	55 22.3	1.45	L. 8	24.6	1.84	
4.5	15 35.8	57 8.1	1.73	U. 19	34.4	2.29	15 2.6	55 5.9	1.30	U. 20	46.3	1.79	
5.0	15 30.3	56 47.9	1.64	L. 8	1.4	2.22	14 58.6	54 51.4	1.14	L. 9	7.5	1.74	
5.5	15 25.1	56 28.7	1.55	U. 20	27.6	2.15	14 55.1	54 38.6	0.99	U. 21	28.2	1.72	
6.0	15 20.2	56 10.6	1.46	L. 8	52.9	2.08	14 52.2	54 27.6	0.84	L. 9	48.6	1.70	
6.5	15 15.7	55 53.7	1.36	U. 21	17.4	2.00	14 49.6	54 18.4	0.69	U. 22	8.7	1.68	
7.0	15 11.4	55 37.9	1.27	L. 9	40.9	1.93	14 47.5	54 10.8	0.57	L. 10	28.8	1.68	
7.5	15 7.4	55 23.3	1.17	U. 22	3.7	1.87	14 45.9	54 4.8	0.44	U. 22	48.9	1.68	
8.0	15 3.7	55 9.9	1.07	L. 10	25.8	1.83	14 44.7	54 0.3	0.32	L. 11	9.1	1.69	
8.5	15 0.4	54 57.5	0.98	U. 22	47.2	1.77	14 43.9	53 57.2	0.20	U. 23	29.6	1.71	
9.0	14 57.3	54 46.3	0.89	L. 11	8.2	1.73	14 43.4	53 55.4	-0.09	L. 11	50.4	1.74	
9.5	14 54.5	54 36.3	0.79	U. 23	28.8	1.70	14 43.3	53 54.9	+0.02				
10.0	14 52.1	54 27.3	0.70	L. 11	49.1	1.68	14 43.5	53 55.8	0.13	U. 0	11.5	1.79	
10.5	14 49.9	54 19.4	0.61				14 44.0	53 58.0	0.24	L. 12	33.3	1.83	
11.0	14 48.1	54 12.6	0.52	U. 0	9.2	1.68	14 45.0	54 1.6	0.35	U. 0	55.5	1.88	
11.5	14 46.5	54 7.0	0.42	L. 12	29.3	1.68	14 46.4	54 6.5	0.47	L. 13	18.4	1.93	
12.0	14 45.3	54 2.6	0.32	U. 0	49.6	1.69	14 48.2	54 12.9	0.59	U. 1	41.8	1.98	
12.5	14 44.5	53 59.5	0.20	L. 13	9.1	1.71	14 50.3	54 20.8	0.73	L. 14	6.0	2.04	
13.0	14 44.0	53 57.8	-0.07	U. 1	30.5	1.73	14 52.9	54 30.3	0.86	U. 2	30.7	2.08	
13.5	14 44.0	53 57.6	+0.06	L. 13	51.5	1.76	14 55.9	54 41.4	1.00	L. 14	56.0	2.13	
14.0	14 44.4	53 59.1	0.19	U. 2	12.9	1.81	14 59.4	54 54.2	1.14	U. 3	21.7	2.16	
14.5	14 45.3	54 2.4	0.34	L. 14	34.9	1.86	15 3.4	55 8.8	1.29	L. 15	47.8	2.19	
15.0	14 46.7	54 7.5	0.51	U. 2	57.6	1.91	15 7.8	55 25.1	1.43	U. 4	14.0	2.19	
15.5	14 48.6	54 14.7	0.68	L. 15	20.8	1.96	15 12.7	55 43.2	1.58	L. 16	40.4	2.20	
16.0	14 51.1	54 23.9	0.85	U. 3	44.7	2.01	15 18.1	56 3.1	1.73	U. 5	6.7	2.19	
16.5	14 54.1	54 35.3	1.04	L. 16	9.3	2.07	15 24.0	56 24.7	1.87	L. 17	33.0	2.18	
17.0	14 57.9	54 48.9	1.23	U. 4	34.4	2.12	15 30.3	56 47.9	2.00	U. 5	59.0	2.16	
17.5	15 2.3	55 4.8	1.42	L. 17	0.2	2.17	15 37.1	57 12.5	2.10	L. 18	24.8	2.14	
18.0	15 7.2	55 22.9	1.60	U. 5	26.5	2.20	15 44.1	57 38.3	2.20	U. 6	50.4	2.12	
18.5	15 12.8	55 43.2	1.79	L. 17	53.1	2.23	15 51.4	58 5.1	2.27	L. 19	15.8	2.11	
19.0	15 18.8	56 5.7	1.96	U. 6	20.0	2.25	15 58.8	58 32.4	2.29	U. 7	41.0	2.10	
19.5	15 25.5	56 30.1	2.12	L. 18	47.1	2.25	16 6.3	58 59.7	2.27	L. 20	6.0	2.09	
20.0	15 32.7	56 56.3	2.26	U. 7	14.1	2.25	16 13.5	59 26.4	2.20	U. 8	31.1	2.10	
20.5	15 40.2	57 24.0	2.36	L. 19	41.0	2.24	16 20.4	59 51.9	2.06	L. 20	56.3	2.12	
21.0	15 48.0	57 52.8	2.44	U. 8	7.8	2.22	16 26.9	60 15.5	1.88	U. 9	21.9	2.14	
21.5	15 56.0	58 22.1	2.46	L. 20	34.4	2.20	16 32.7	60 36.5	1.63	L. 21	47.9	2.19	
22.0	16 4.0	58 51.5	2.44	U. 9	0.7	2.18	16 37.5	60 54.3	1.33	U. 10	14.3	2.23	
22.5	16 12.0	59 20.3	2.37	L. 21	26.9	2.18	16 41.3	61 8.2	0.99	L. 22	41.4	2.28	
23.0	16 19.4	59 47.7	2.22	U. 9	52.9	2.17	16 44.0	61 17.7	0.60	U. 11	9.2	2.35	
23.5	16 26.2	60 13.0	2.01	L. 22	18.9	2.17	16 45.2	61 22.4	+0.18	L. 23	38.0	2.43	
24.0	16 32.4	60 35.5	1.74	U. 10	45.0	2.18	16 45.1	61 22.2	-0.23				
24.5	16 37.6	60 54.4	1.42	L. 23	11.0	2.20	16 43.8	61 16.9	0.65	U. 12	7.5	2.50	
25.0	16 41.6	61 9.2	1.05	U. 11	27.4	2.22	16 41.0	61 6.7	1.05	L. 0	37.8	2.55	
25.5	16 44.4	61 19.4	0.65				16 37.0	60 52.1	1.40	U. 13	9.0	2.61	
26.0	16 45.8	61 24.7	+0.23	L. 0	4.3	2.25	16 31.9	60 33.4	1.72	L. 1	40.4	2.63	
26.5	16 45.9	61 24.8	-0.20	U. 12	31.7	2.30	16 25.8	60 11.1	1.99	U. 14	11.9	2.62	
27.0	16 44.6	61 20.0	0.62	L. 0	59.6	2.35	16 19.0	59 46.1	2.19	L. 2	43.1	2.59	
27.5	16 42.0	61 10.3	1.01	U. 13	28.2	2.41	16 11.5	59 19.1	2.33	U. 15	14.1	2.55	
28.0	16 38.1	60 56.1	1.36	L. 1	57.5	2.46	16 3.8	58 50.6	2.41	L. 3	44.1	2.47	
28.5	16 33.2	60 38.1	1.66	U. 14	27.3	2.51	15 56.0	58 21.5	2.44	U. 16	13.2	2.37	
29.0	16 27.3	60 16.8	1.90	L. 2	57.5	2.54	15 48.0	57 52.4	2.42	L. 4	41.1	2.28	
29.5	16 20.8	59 52.8	2.10	U. 15	28.0	2.54	15 40.2	57 23.8	2.35	U. 17	7.9	2.18	
30.0	16 13.8	59 26.9	2.22	L. 3	58.5	2.54	15 32.6	56 56.2	2.26	L. 5	33.5	2.08	
30.5	16 6.3	58 59.8	2.30	U. 16	28.8	2.51	15 25.5	56 30.0	2.12	U. 17	57.9	2.00	
31.0	15 58.8	58 32.2	2.32	L. 4	58.8	2.46	15 18.8	56 5.5	1.96	L. 6	21.5	1.92	
31.5	15 51.3	58 4.5	-2.30	U. 17	27.9	2.30	15 12.6	55 42.9	-1.79	U. 18	44.0	1.85	

FOR WASHINGTON MEAN NOON AND MIDNIGHT.										
MAY.						JUNE.				
Date.	Semi-diameter.	Horizontal Parallax.	Hourly Diff.	Meridian Transit.	Hourly Diff.	Semi-diameter.	Horizontal Parallax.	Hourly Diff.	Meridian Transit.	Hourly Diff.
d	h m	h m	"	h m	m	h m	h m	"	h m	m
1.0	15 18.8	56 5.5	-1.96	L. 6 21.5	1.92	14 52.0	54 27.0	-0.86	L. 7 6.2	1.69
1.5	15 12.6	55 42.9	1.79	U. 18 44.0	1.85	14 49.5	54 17.9	0.65	U. 19 26.4	1.69
2.0	15 7.1	55 22.5	1.61	L. 7 5.7	1.79	14 47.7	54 11.2	0.45	L. 7 46.7	1.70
2.5	15 2.1	55 4.3	1.42	U. 19 26.9	1.74	14 46.5	54 7.0	0.25	U. 20 7.5	1.74
3.0	14 57.8	54 48.3	1.24	L. 7 48.6	1.72	14 46.0	54 5.1	-0.07	L. 8 28.6	1.77
3.5	14 54.0	54 34.6	1.05	U. 20 8.1	1.69	14 46.0	54 5.3	+0.11	U. 20 50.1	1.82
4.0	14 50.9	54 23.1	0.86	L. 8 28.1	1.68	14 46.7	54 7.6	0.27	L. 9 12.2	1.87
4.5	14 48.5	54 13.9	0.67	U. 20 48.2	1.67	14 47.8	54 11.8	0.43	U. 21 35.1	1.92
5.0	14 46.5	54 6.9	0.50	L. 9 8.2	1.67	14 49.5	54 17.8	0.57	U. 9 58.6	1.98
5.5	14 45.1	54 1.9	0.33	U. 21 28.5	1.70	14 51.6	54 25.6	0.71	U. 22 22.7	2.04
6.0	14 44.3	53 58.8	0.18	L. 9 49.1	1.73	14 54.1	54 34.8	0.82	L. 10 47.6	2.10
6.5	14 44.0	53 57.6	-0.03	U. 22 10.0	1.77	14 56.9	54 45.1	0.90	U. 23 13.1	2.15
7.0	14 44.2	53 58.2	+0.11	L. 10 31.4	1.81	15 0.0	54 56.3	0.97	L. 11 39.1	2.18
7.5	14 44.7	54 0.2	0.22	U. 22 53.4	1.86	15 3.3	55 8.5	1.05		
8.0	14 45.6	54 3.6	0.34	L. 11 16.0	1.91	15 6.8	55 21.5	1.11	U. 0 5.4	2.21
8.5	14 46.8	54 8.4	0.46	U. 23 39.2	1.96	15 10.6	55 35.1	1.16	L. 12 32.0	2.22
9.0	14 48.5	54 14.5	0.55	L. 12 3.1	2.01	15 14.4	55 49.3	1.20	U. 0 58.7	2.22
9.5	14 50.5	54 21.7	0.65	U. 0 27.5	2.06	15 18.4	56 3.8	1.23	L. 13 25.2	2.21
10.0	14 52.8	54 30.1	0.75	L. 12 52.6	2.11	15 22.4	56 18.6	1.25	U. 1 51.6	2.20
10.5	14 55.4	54 39.6	0.84	U. 1 18.2	2.14	15 26.5	56 33.8	1.27	L. 14 17.7	2.17
11.0	14 58.3	54 50.2	0.93	L. 13 44.1	2.17	15 30.7	56 49.2	1.29	U. 2 43.3	2.13
11.5	15 1.5	55 1.9	1.02	U. 2 10.3	2.19	15 34.9	57 4.8	1.31	L. 15 8.5	2.08
12.0	15 5.0	55 14.7	1.11	L. 14 36.8	2.20	15 39.2	57 20.5	1.31	U. 3 33.2	2.05
12.5	15 8.7	55 28.6	1.20	U. 3 3.2	2.20	15 43.5	57 36.2	1.31	L. 15 57.6	2.02
13.0	15 12.8	55 43.5	1.29	L. 15 29.3	2.17	15 47.8	57 51.9	1.31	U. 4 21.8	2.01
13.5	15 17.2	55 59.6	1.39	U. 3 55.2	2.14	15 52.1	58 7.6	1.30	L. 16 45.8	2.00
14.0	15 21.9	56 16.8	1.48	L. 16 20.8	2.12	15 56.3	58 23.1	1.28	U. 5 9.6	1.99
14.5	15 26.8	56 35.0	1.56	U. 4 46.0	2.09	16 0.5	58 38.4	1.26	L. 17 33.6	2.00
15.0	15 32.0	56 54.2	1.65	L. 17 10.9	2.06	16 4.5	58 53.2	1.21	U. 5 57.6	2.01
15.5	15 37.5	57 14.4	1.72	U. 5 35.5	2.04	16 8.8	59 7.2	1.14	L. 18 22.1	2.04
16.0	15 43.2	57 35.4	1.78	L. 17 59.9	2.02	16 11.9	59 20.4	1.06	U. 6 47.0	2.09
16.5	15 49.1	57 57.0	1.83	U. 6 24.2	2.02	16 15.2	59 32.4	0.95	L. 19 12.6	2.16
17.0	15 55.2	58 19.0	1.85	L. 18 48.4	2.02	16 18.1	59 43.0	0.81	U. 7 39.1	2.24
17.5	16 1.2	58 41.1	1.85	U. 7 12.7	2.03	16 20.5	59 51.7	0.65	L. 20 6.6	2.32
18.0	16 7.1	59 3.1	1.81	L. 19 37.4	2.06	16 22.2	59 58.2	0.44	U. 8 34.8	2.39
18.5	16 12.9	59 24.3	1.74	U. 8 2.4	2.11	16 23.3	60 2.3	+0.22	L. 21 4.0	2.47
19.0	16 18.4	59 44.3	1.62	L. 20 28.0	2.16	16 23.3	60 2.2	-0.01	U. 9 34.1	2.52
19.5	16 23.5	60 2.8	1.46	U. 8 54.3	2.22	16 23.3	60 2.2	0.25	L. 22 4.7	2.57
20.0	16 28.0	60 19.1	1.25	L. 21 21.6	2.30	16 22.0	59 57.6	0.51	U. 10 35.7	2.60
20.5	16 31.6	60 32.5	1.00	U. 9 49.6	2.38	16 20.1	59 49.7	0.78	L. 23 7.0	2.60
21.0	16 34.4	60 42.7	0.70	L. 22 18.7	2.45	16 17.0	59 38.9	1.02	U. 11 38.2	2.58
21.5	16 36.2	60 49.2	0.38	U. 10 48.6	2.53	16 13.3	59 25.2	1.26		
22.0	16 36.8	60 51.7	+0.03	L. 23 19.4	2.59	16 8.8	59 8.7	1.48	L. 0 8.7	2.52
22.5	16 36.4	60 50.0	-0.32	U. 11 50.8	2.64	16 3.7	58 50.0	1.66	U. 12 39.5	2.45
23.0	16 34.8	60 44.1	0.68	L. 0 22.6	2.66	15 58.1	58 29.2	1.80	L. 1 7.3	2.35
23.5	16 32.0	60 33.8	1.03	U. 12 54.3	2.63	15 52.0	58 6.9	1.91	U. 13 35.0	2.26
24.0	16 28.1	60 19.7	1.33	L. 1 25.8	2.59	15 45.6	57 43.7	1.98	L. 2 1.5	2.16
24.5	16 23.3	60 2.0	1.63	U. 13 56.4	2.52	15 39.2	57 19.9	2.00	U. 14 26.9	2.07
25.0	16 17.6	59 41.1	1.86	L. 2 26.1	2.44	15 32.7	56 56.1	1.98	L. 2 51.3	1.98
25.5	16 11.2	59 17.6	2.06	U. 14 54.7	2.34	15 26.3	56 32.7	1.92	U. 15 14.8	1.92
26.0	16 4.2	58 52.1	2.20	L. 3 22.2	2.24	15 20.1	56 10.1	1.83	L. 3 37.3	1.85
26.5	15 56.9	58 25.2	2.28	U. 15 48.5	2.14	15 14.2	55 48.8	1.72	U. 15 59.1	1.80
27.0	15 49.4	57 57.8	2.30	L. 4 13.5	2.04	15 8.9	55 29.1	1.57	L. 4 20.4	1.76
27.5	15 41.9	57 30.3	2.28	U. 16 37.4	1.96	15 4.1	55 11.3	1.41	U. 16 41.3	1.73
28.0	15 34.6	57 3.3	2.22	L. 5 0.5	1.88	14 59.8	54 55.5	1.22	L. 5 1.9	1.72
28.5	15 27.5	56 37.2	2.13	U. 17 22.6	1.82	14 56.0	54 42.1	1.02	U. 17 22.4	1.71
29.0	15 20.7	56 12.4	1.99	L. 5 44.0	1.77	14 53.1	54 31.1	0.81	L. 5 42.9	1.71
29.5	15 14.4	55 49.4	1.84	U. 18 5.0	1.73	14 50.7	54 22.6	0.60	U. 18 3.6	1.72
30.0	15 8.7	55 28.3	1.66	L. 6 25.6	1.70	14 49.1	54 16.6	0.39	L. 6 24.6	1.76
30.5	15 3.5	55 9.4	1.47	U. 18 45.9	1.70	14 48.2	54 13.3	-0.17	U. 18 45.9	1.79
31.0	14 59.0	54 52.8	1.28	L. 6 25.6	1.70	14 48.1	54 12.5	+0.04	L. 7 7.3	1.83
31.5	14 55.2	54 38.7	-1.07	U. 18 45.9	1.70	14 48.6	54 14.2	+0.24	U. 19 29.6	1.88

FOR WASHINGTON MEAN NOON AND MIDNIGHT.

JULY.						AUGUST.				
Date.	Semi-diameter.	Horizontal Parallax.	Hourly Diff.	Meridian Transit.	Hourly Diff.	Semi-diameter.	Horizontal Parallax.	Hourly Diff.	Meridian Transit.	Hourly Diff.
d	' "	' "	"	h m	m	' "	' "	"	h m	m
1.0	14 48.1	54 12.5	+0.04	L. 7 7.3	1.83	15 3.7	55 10.0	+1.32	L. 8 13.2	2.19
1.5	14 48.6	54 14.2	0.24	U. 19 29.6	1.88	15 8.3	55 26.8	1.47	U. 20 39.7	2.22
2.0	14 49.7	54 18.3	0.44	L. 7 52.5	1.94	15 13.3	55 45.1	1.59	L. 9 6.5	2.24
2.5	14 51.4	54 24.7	0.62	U. 20 16.1	1.99	15 18.7	56 4.8	1.68	U. 21 33.4	2.24
3.0	14 53.7	54 33.2	0.79	L. 8 40.4	2.05	15 24.3	56 25.5	1.75	L. 10 0.3	2.23
3.5	14 56.6	54 43.7	0.94	U. 21 5.4	2.11	15 30.1	56 46.8	1.78	U. 22 27.1	2.22
4.0	14 59.9	54 55.9	1.08	L. 9 31.1	2.16	15 35.9	57 8.2	1.78	L. 10 53.7	2.20
4.5	15 3.6	55 9.5	1.19	U. 21 57.2	2.20	15 41.7	57 29.4	1.74	U. 23 20.0	2.17
5.0	15 7.6	55 24.4	1.28	L. 10 23.8	2.23	15 47.3	57 50.0	1.67	L. 11 45.9	2.14
5.5	15 11.9	55 40.2	1.35	U. 22 50.6	2.24	15 52.6	58 9.5	1.57		
6.0	15 16.4	55 56.7	1.40	L. 11 17.6	2.24	15 57.6	58 27.7	1.44	U. 0 11.5	2.12
6.5	15 21.1	56 13.7	1.42	U. 23 44.5	2.23	16 2.1	58 44.2	1.29	L. 12 36.7	2.09
7.0	15 25.8	56 30.9	1.42			16 6.0	58 58.6	1.11	U. 1 1.7	2.08
7.5	15 30.4	56 47.9	1.41	L. 12 11.2	2.21	16 9.3	59 10.9	0.92	L. 13 26.5	2.06
8.0	15 34.9	57 4.6	1.37	U. 0 37.6	2.18	16 12.0	59 20.8	0.73	U. 1 51.3	2.06
8.5	15 39.3	57 20.9	1.32	L. 13 3.6	2.15	16 14.1	59 28.3	0.53	L. 14 16.1	2.07
9.0	15 43.6	57 36.4	1.26	U. 1 29.1	2.11	16 15.5	59 33.5	0.33	U. 2 41.0	2.09
9.5	15 47.6	57 51.0	1.18	L. 13 54.3	2.08	16 16.2	59 36.3	+0.14	L. 15 6.3	2.12
10.0	15 51.3	58 4.8	1.10	U. 2 19.0	2.05	16 16.4	59 36.9	-0.04	U. 3 31.9	2.16
10.5	15 54.8	58 17.5	1.01	L. 14 43.4	2.03	16 16.0	59 35.4	0.20	L. 15 58.1	2.21
11.0	15 57.9	58 29.1	0.92	U. 3 7.6	2.01	16 15.1	59 32.1	0.34	U. 4 24.8	2.26
11.5	16 0.8	58 39.6	0.83	L. 15 31.7	2.01	16 13.7	59 27.2	0.47	L. 16 52.3	2.31
12.0	16 3.3	58 49.0	0.73	U. 3 55.7	2.02	16 12.0	59 20.8	0.58	U. 5 20.4	2.37
12.5	16 5.6	58 57.2	0.64	L. 16 20.0	2.03	16 9.9	59 13.1	0.68	L. 17 49.1	2.41
13.0	16 7.5	59 4.3	0.54	U. 4 44.5	2.06	16 7.5	59 4.4	0.77	U. 6 18.3	2.45
13.5	16 9.1	59 10.3	0.45	L. 17 9.5	2.10	16 4.9	58 54.7	0.84	L. 18 47.9	2.47
14.0	16 10.4	59 15.1	0.35	U. 5 35.1	2.16	16 2.1	58 44.2	0.91	U. 7 17.7	2.48
14.5	16 11.4	59 18.7	0.25	L. 18 1.3	2.22	15 59.0	58 32.0	0.97	L. 19 47.5	2.47
15.0	16 12.1	59 21.1	0.14	U. 6 28.3	2.28	15 55.7	58 21.0	1.02	U. 8 16.9	2.43
15.5	16 12.4	59 22.2	+0.03	L. 18 56.2	2.35	15 52.3	58 8.4	1.07	L. 20 45.9	2.38
16.0	16 12.3	59 21.8	-0.09	U. 7 24.8	2.41	15 48.7	57 55.2	1.12	U. 9 14.1	2.32
16.5	16 11.8	59 20.0	0.22	L. 19 54.1	2.47	15 45.0	57 41.5	1.17	L. 21 41.5	2.25
17.0	16 10.9	59 16.5	0.36	U. 8 24.0	2.51	15 41.1	57 27.2	1.21	U. 10 8.1	2.17
17.5	16 9.5	59 11.4	0.50	L. 20 54.3	2.53	15 37.1	57 12.5	1.24	L. 22 33.7	2.10
18.0	16 7.6	59 4.5	0.65	U. 9 24.7	2.53	15 33.0	56 57.4	1.27	U. 10 58.4	2.02
18.5	16 5.2	58 55.8	0.80	L. 21 55.0	2.50	15 28.8	56 42.0	1.29	L. 23 22.3	1.96
19.0	16 2.3	58 45.3	0.95	U. 10 24.8	2.46	15 24.5	56 26.4	1.30	U. 11 45.4	1.90
19.5	15 59.0	58 33.0	1.09	L. 22 54.0	2.39	15 20.3	56 10.8	1.30		
20.0	15 55.2	58 19.1	1.23	U. 11 22.3	2.32	15 16.1	55 55.3	1.28	L. 0 7.9	1.85
20.5	15 51.0	58 3.6	1.35	L. 23 49.6	2.24	15 11.9	55 40.1	1.25	U. 12 29.8	1.81
21.0	15 46.4	57 46.8	1.45			15 7.9	55 25.4	1.20	L. 0 51.2	1.78
21.5	15 41.5	57 28.9	1.53	U. 12 16.0	2.15	15 4.1	55 11.3	1.13	U. 13 12.4	1.75
22.0	15 36.4	57 10.1	1.58	L. 0 41.3	2.07	15 0.5	54 58.2	1.05	L. 1 33.3	1.74
22.5	15 31.2	56 50.9	1.61	U. 13 5.6	1.99	14 57.2	54 46.2	0.94	U. 13 54.1	1.74
23.0	15 25.9	56 31.5	1.61	L. 1 29.0	1.92	14 54.3	54 35.6	0.82	L. 2 15.0	1.75
23.5	15 20.7	56 12.2	1.58	U. 13 51.7	1.86	14 51.9	54 26.5	0.68	U. 14 36.0	1.76
24.0	15 15.6	55 53.4	1.53	L. 2 13.7	1.81	14 49.9	54 19.2	0.53	L. 2 57.2	1.78
24.5	15 10.7	55 35.5	1.45	U. 14 35.2	1.78	14 48.4	54 13.9	0.36	U. 15 18.7	1.81
25.0	15 6.1	55 18.7	1.34	L. 2 56.4	1.75	14 47.5	54 10.7	-0.17	L. 3 40.7	1.85
25.5	15 1.9	55 3.4	1.20	U. 15 17.2	1.73	14 47.3	54 9.7	+0.03	U. 16 3.1	1.89
26.0	14 58.2	54 49.8	1.05	L. 3 37.9	1.73	14 47.7	54 11.2	0.23	L. 4 26.0	1.94
26.5	14 55.1	54 38.2	0.88	U. 15 58.7	1.74	14 48.8	54 15.2	0.44	U. 16 49.5	1.98
27.0	14 52.5	54 28.7	0.69	L. 4 19.5	1.75	14 50.6	54 21.7	0.65	L. 5 13.6	2.03
27.5	14 50.6	54 21.6	0.49	U. 16 40.5	1.77	14 53.1	54 30.8	0.86	U. 17 38.2	2.08
28.0	14 49.3	54 16.9	0.29	L. 5 1.9	1.80	14 56.2	54 42.4	1.07	L. 6 3.4	2.12
28.5	14 48.7	54 14.7	-0.07	U. 17 23.8	1.84	15 0.0	54 56.5	1.27	U. 18 29.1	2.15
29.0	14 48.8	54 15.1	+0.14	L. 5 46.1	1.89	15 4.5	55 13.0	1.47	L. 6 55.1	2.18
29.5	14 49.6	54 18.1	0.36	U. 18 9.0	1.94	15 9.6	55 31.7	1.65	U. 19 21.4	2.20
30.0	14 51.1	54 23.7	0.57	L. 6 32.6	1.99	15 15.3	55 52.5	1.81	L. 7 47.9	2.21
30.5	14 53.3	54 31.8	0.78	U. 18 56.8	2.05	15 21.4	56 15.0	1.94	U. 20 14.4	2.21
31.0	14 56.2	54 42.3	0.97	L. 7 21.7	2.10	15 27.9	56 39.0	2.04	L. 8 40.8	2.20
31.5	14 59.7	54 55.1	+1.15	U. 19 47.2	2.15	15 34.8	57 4.0	+2.11	U. 21 7.1	2.18

FOR WASHINGTON MEAN NOON AND MIDNIGHT.

SEPTEMBER.						OCTOBER.				
Date.	Semi-diameter.	Horizontal Parallax.	Hourly D ^{is} .	Meridian Transit.	Hourly D ^{is} .	Semi-diameter.	Horizontal Parallax.	Hourly D ^{is} .	Meridian Transit.	Hourly D ^{is} .
d	'	'	"	h m	m	'	'	"	h m	m
1.0	15 41.8	57 29.7	+2.14	L. 9 33.2	2.17	16 12.5	59 22.7	+2.20	L. 9 52.1	2.11
1.5	15 48.8	57 55.4	2.13	u. 21 59.1	2.15	16 19.5	59 48.2	2.02	u. 22 17.5	2.13
2.0	15 55.7	58 20.7	2.07	L. 10 24.8	2.13	16 25.8	60 11.2	1.79	L. 10 43.2	2.16
2.5	16 2.3	58 45.0	1.96	u. 22 50.3	2.12	16 31.2	60 31.1	1.50	u. 23 9.3	2.20
3.0	16 8.5	59 7.8	1.81	L. 11 15.6	2.11	16 35.6	60 47.3	1.17	L. 11 36.0	2.25
3.5	16 14.1	59 28.5	1.62	u. 23 40.9	2.11	16 38.8	60 59.2	0.81		
4.0	16 19.0	59 46.6	1.38			16 40.8	61 6.7	0.43	u. 0 3.3	2.31
4.5	16 23.1	60 1.6	1.11	L. 12 6.3	2.12	16 41.6	61 9.5	+0.04	L. 12 31.4	2.37
5.0	16 26.3	60 13.3	0.82	u. 0 31.8	2.14	16 41.1	61 7.6	-0.35	u. 1 0.2	2.43
5.5	16 28.5	60 21.4	0.52	L. 12 57.6	2.17	16 39.3	61 1.1	0.72	L. 13 29.8	2.49
6.0	16 29.7	60 25.7	+0.21	u. 1 23.8	2.20	16 36.3	60 50.2	1.06	u. 2 0.0	2.54
6.5	16 29.9	60 26.4	-0.09	L. 13 50.4	2.24	16 32.4	60 35.6	1.35	L. 14 30.8	2.58
7.0	16 29.1	60 23.5	0.38	u. 2 17.7	2.29	16 27.5	60 17.7	1.60	u. 3 1.8	2.59
7.5	16 27.4	60 17.3	0.64	L. 14 45.5	2.35	16 21.9	59 57.1	1.80	L. 15 32.9	2.58
8.0	16 24.9	60 8.1	0.87	u. 3 13.9	2.40	16 15.8	59 34.5	1.94	u. 4 3.7	2.55
8.5	16 21.7	59 56.3	1.07	L. 15 43.0	2.44	16 9.2	59 10.5	2.03	L. 16 34.0	2.50
9.0	16 17.9	59 42.4	1.23	u. 4 12.5	2.47	16 2.5	58 45.7	2.07	u. 5 3.6	2.43
9.5	16 13.6	59 26.8	1.35	L. 16 42.4	2.49	15 55.7	58 20.7	2.07	L. 17 32.3	2.35
10.0	16 9.0	59 9.9	1.44	u. 5 12.4	2.50	15 48.9	57 55.9	2.04	u. 6 0.0	2.26
10.5	16 4.2	58 52.2	1.50	L. 17 42.4	2.48	15 42.3	57 31.7	1.98	L. 18 26.5	2.17
11.0	15 59.2	58 33.9	1.53	u. 6 12.0	2.45	15 36.0	57 8.4	1.89	u. 6 52.1	2.09
11.5	15 54.2	58 15.4	1.54	L. 18 41.2	2.40	15 29.9	56 46.3	1.79	L. 19 16.7	2.01
12.0	15 49.2	57 57.0	1.53	u. 7 9.7	2.34	15 24.2	56 25.4	1.68	u. 7 40.3	1.94
12.5	15 44.3	57 38.8	1.50	L. 19 37.3	2.26	15 18.9	56 5.9	1.56	L. 20 3.2	1.87
13.0	15 39.4	57 20.9	1.47	u. 8 4.0	2.19	15 14.0	55 47.9	1.44	u. 8 25.3	1.82
13.5	15 34.6	57 3.4	1.43	L. 20 29.8	2.11	15 9.5	55 31.2	1.32	L. 20 47.0	1.78
14.0	15 30.0	56 46.5	1.39	u. 8 54.7	2.04	15 5.4	55 16.1	1.21	u. 9 8.2	1.75
14.5	15 25.6	56 30.2	1.34	L. 21 18.7	1.97	15 1.6	55 2.3	1.09	L. 21 29.1	1.73
15.0	15 21.3	56 14.4	1.28	u. 9 42.0	1.91	14 58.3	54 50.0	0.97	u. 9 49.8	1.72
15.5	15 17.2	55 59.4	1.23	L. 22 4.6	1.86	14 55.3	54 39.0	0.86	L. 22 10.5	1.72
16.0	15 13.2	55 44.9	1.17	u. 10 26.6	1.81	14 52.7	54 29.4	0.75	u. 10 31.2	1.73
16.5	15 9.4	55 31.2	1.12	L. 22 48.1	1.78	14 50.4	54 21.1	0.64	L. 22 52.1	1.75
17.0	15 5.9	55 18.1	1.06	u. 11 9.3	1.76	14 48.5	54 14.0	0.54	u. 11 13.2	1.77
17.5	15 2.6	55 5.8	0.99	L. 23 30.3	1.75	14 46.9	54 8.1	0.44	L. 23 34.6	1.80
18.0	14 59.4	54 54.3	0.92	u. 11 51.1	1.74	14 45.6	54 3.5	0.33	u. 11 56.4	1.83
18.5	14 56.5	54 43.6	0.85			14 44.7	54 0.1	0.23		
19.0	14 53.9	54 33.9	0.76	L. 0 11.9	1.74	14 44.1	53 58.0	0.12	L. 0 18.7	1.87
19.5	14 51.5	54 25.3	0.67	u. 12 32.8	1.75	14 43.9	53 57.2	-0.01	u. 12 41.4	1.91
20.0	14 49.5	54 17.8	0.57	L. 0 53.9	1.77	14 44.1	53 57.8	+0.11	L. 1 4.6	1.96
20.5	14 47.8	54 11.6	0.46	u. 13 15.2	1.79	14 44.7	53 59.9	0.24	u. 13 28.3	2.00
21.0	14 46.5	54 6.8	0.33	L. 1 36.9	1.82	14 45.6	54 3.6	0.37	L. 1 52.5	2.03
21.5	14 45.7	54 3.6	0.19	u. 13 59.0	1.86	14 47.1	54 8.9	0.52	u. 14 17.1	2.06
22.0	14 45.3	54 2.1	-0.04	L. 2 21.5	1.90	14 49.0	54 16.0	0.67	L. 2 42.0	2.09
22.5	14 45.4	54 2.6	+0.12	u. 14 44.5	1.94	14 51.5	54 25.0	0.83	u. 15 7.1	2.10
23.0	14 46.0	54 5.0	0.29	L. 3 8.0	1.98	14 54.5	54 36.0	1.00	L. 3 32.4	2.11
23.5	14 47.3	54 9.6	0.48	u. 15 32.1	2.02	14 58.0	54 49.0	1.17	u. 15 57.7	2.11
24.0	14 49.2	54 16.5	0.67	L. 3 56.6	2.06	15 2.1	55 4.0	1.34	L. 4 23.0	2.10
24.5	14 51.7	54 25.7	0.87	u. 16 21.5	2.09	15 6.8	55 21.2	1.52	u. 16 48.1	2.09
25.0	14 54.8	54 37.3	1.07	L. 4 46.8	2.12	15 12.0	55 40.4	1.69	L. 5 13.1	2.07
25.5	14 58.6	54 51.3	1.27	u. 17 12.3	2.14	15 17.8	56 1.7	1.85	u. 17 37.9	2.06
26.0	15 3.1	55 7.8	1.47	L. 5 38.0	2.15	15 24.1	56 24.9	2.01	L. 6 2.4	2.04
26.5	15 8.2	55 26.6	1.66	u. 18 3.8	2.15	15 30.9	56 49.8	2.14	u. 18 26.8	2.03
27.0	15 14.0	55 47.6	1.84	L. 6 29.6	2.15	15 38.1	57 16.3	2.26	L. 6 51.1	2.02
27.5	15 20.3	56 10.7	2.00	u. 18 55.3	2.14	15 45.7	57 44.1	2.35	u. 19 15.3	2.02
28.0	15 27.1	56 35.7	2.15	L. 7 20.9	2.13	15 53.4	58 12.6	2.39	L. 7 39.5	2.02
28.5	15 34.3	57 2.3	2.26	u. 19 46.3	2.11	16 1.3	58 41.5	2.40	u. 20 3.9	2.04
29.0	15 41.9	57 30.1	2.34	L. 8 11.6	2.10	16 9.1	59 10.1	2.34	L. 8 26.6	2.07
29.5	15 49.6	57 58.5	2.38	u. 20 36.7	2.09	16 16.6	59 37.7	2.24	u. 20 53.7	2.11
30.0	15 57.4	58 27.2	2.37	L. 9 1.8	2.09	16 23.7	60 3.8	2.07	L. 9 19.3	2.16
30.5	16 5.1	58 55.5	2.31	u. 21 26.9	2.10	16 30.2	60 27.5	1.84	u. 21 45.7	2.23
31.0	16 12.5	59 22.7	2.20	L. 9 52.1	2.11	16 35.8	60 48.0	1.55	L. 10 12.8	2.30
31.5	16 19.5	59 48.2	+2.03	u. 22 17.5	2.13	16 40.3	61 4.8	+1.21	u. 22 40.9	2.38

FOR WASHINGTON MEAN NOON AND MIDNIGHT.

NOVEMBER.						DECEMBER.				
Date.	Semi-diameter.	Horizontal Parallax.	Hourly Diff.	Meridian Transitt.	Hourly Diff.	Semi-diameter.	Horizontal Parallax.	Hourly Diff.	Meridian Transitt.	Hourly Diff.
d	'	"	"	h m	m	'	"	"	h m	m
1.0	16 43.7	61 17.2	+0.84	L. 11 9.9	2.46	16 41.7	61 9.9	-0.40	L. 11 55.3	2.71
1.5	16 45.8	61 24.9	+0.43	U. 23 39.9	2.54	16 39.8	61 2.7	0.80		
2.0	16 46.5	61 27.5	0.00			16 36.5	60 50.8	1.17	U. 0 27.8	2.70
2.5	16 45.8	61 24.9	-0.43	L. 12 10.7	2.60	16 32.1	60 34.6	1.51	L. 12 59.9	2.65
3.0	16 43.7	61 17.2	0.84	U. 0 42.3	2.65	16 26.7	60 14.6	1.80	U. 1 31.4	2.58
3.5	16 40.3	61 4.7	1.22	L. 13 14.3	2.68	16 20.4	59 51.4	2.04	L. 14 1.9	2.49
4.0	16 35.7	60 47.8	1.56	U. 1 46.5	2.68	16 13.3	59 25.6	2.22	U. 2 31.2	2.39
4.5	16 30.1	60 27.2	1.85	L. 14 18.5	2.65	16 5.8	58 58.0	2.35	L. 14 59.3	2.29
5.0	16 23.6	60 3.5	2.08	U. 2 49.9	2.59	15 58.0	58 29.3	2.41	U. 3 26.1	2.18
5.5	16 16.5	59 37.3	2.25	L. 15 20.5	2.51	15 50.0	58 0.1	2.42	L. 15 51.7	2.09
6.0	16 9.0	59 9.6	2.35	U. 3 50.0	2.42	15 42.2	57 31.2	2.37	U. 4 16.2	2.00
6.5	16 1.2	58 40.9	2.40	L. 16 18.4	2.31	15 34.5	57 3.1	2.29	L. 16 39.7	1.93
7.0	15 53.3	58 12.1	2.39	U. 4 45.6	2.21	15 27.2	56 36.2	2.17	U. 5 2.4	1.86
7.5	15 45.5	57 43.6	2.34	L. 17 11.5	2.12	15 20.3	56 11.0	2.02	L. 17 24.4	1.81
8.0	15 38.0	57 15.9	2.25	U. 5 36.4	2.03	15 14.0	55 47.6	1.85	U. 5 46.0	1.78
8.5	15 30.8	56 49.5	2.13	L. 18 0.2	1.95	15 8.2	55 26.5	1.66	L. 18 7.1	1.75
9.0	15 24.1	56 24.7	1.99	U. 6 23.2	1.88	15 3.1	55 7.7	1.47	U. 6 28.0	1.74
9.5	15 17.8	55 1.7	1.83	L. 18 45.4	1.83	14 58.6	54 51.2	1.27	L. 18 48.9	1.74
10.0	15 12.1	55 40.7	1.67	U. 7 7.0	1.78	14 54.8	54 37.2	1.07	U. 7 9.7	1.74
10.5	15 6.9	55 21.6	1.50	L. 19 28.2	1.75	14 51.6	54 25.6	0.87	L. 19 30.7	1.76
11.0	15 2.3	55 4.6	1.33	U. 7 49.0	1.73	14 49.1	54 16.4	0.67	U. 7 52.0	1.79
11.5	14 58.2	54 49.6	1.16	L. 20 9.7	1.72	14 47.3	54 9.6	0.48	L. 20 13.6	1.82
12.0	14 54.7	54 36.8	0.99	U. 8 30.3	1.72	14 46.0	54 4.9	0.30	U. 8 35.7	1.86
12.5	14 51.7	54 25.8	0.83	L. 20 51.0	1.73	14 45.3	54 2.5	-0.12	L. 20 58.3	1.90
13.0	14 49.2	54 16.8	0.67	U. 9 11.9	1.75	14 45.2	54 2.0	+0.04	U. 9 21.4	1.95
13.5	14 47.3	54 9.7	0.52	L. 21 33.0	1.78	14 45.6	54 3.4	0.19	L. 21 45.0	1.99
14.0	14 45.8	54 4.2	0.39	U. 9 54.5	1.81	14 46.4	54 6.5	0.32	U. 10 9.1	2.03
14.5	14 44.8	54 0.4	0.25	L. 22 16.4	1.85	14 47.7	54 11.1	0.44	L. 22 33.8	2.07
15.0	14 44.2	53 58.2	0.12	U. 10 38.9	1.89	14 49.3	54 17.1	0.55	U. 10 58.8	2.10
15.5	14 44.0	53 57.4	-0.01	L. 23 1.8	1.93	14 51.3	54 24.4	0.65	L. 23 24.2	2.12
16.0	14 44.1	53 57.9	+0.10	U. 11 25.3	1.98	14 53.6	54 32.8	0.74	U. 11 49.7	2.13
16.5	14 44.6	53 59.8	0.21	L. 23 49.2	2.02	14 56.1	54 42.1	0.82		
17.0	14 45.5	54 2.9	0.31			14 58.9	54 52.4	0.89	L. 0 15.3	2.13
17.5	14 46.6	54 7.2	0.41	U. 12 13.7	2.05	15 2.0	55 3.5	0.96	U. 12 40.8	2.12
18.0	14 48.1	54 12.7	0.51	L. 0 38.5	2.08	15 5.2	55 15.4	1.02	L. 1 6.2	2.10
18.5	14 50.0	54 19.5	0.62	U. 13 3.6	2.10	15 8.6	55 28.0	1.07	U. 13 31.3	2.07
19.0	14 52.2	54 27.5	0.73	L. 1 28.9	2.11	15 12.2	55 41.2	1.13	L. 1 56.0	2.04
19.5	14 54.7	54 36.9	0.84	U. 13 54.2	2.11	15 16.0	55 55.1	1.19	U. 14 20.3	2.01
20.0	14 57.6	54 47.6	0.95	L. 2 19.5	2.10	15 20.0	56 9.7	1.24	L. 2 44.3	1.98
20.5	15 0.9	54 59.6	1.06	U. 14 44.6	2.09	15 24.1	56 24.9	1.29	U. 15 8.0	1.96
21.0	15 4.6	55 13.1	1.19	L. 3 9.5	2.06	15 28.4	56 40.7	1.35	L. 3 31.4	1.94
21.5	15 8.7	55 28.1	1.32	U. 15 34.2	2.04	15 32.9	56 57.2	1.40	U. 15 54.6	1.93
22.0	15 13.2	55 44.7	1.44	L. 3 58.5	2.01	15 37.6	57 14.2	1.45	L. 4 17.7	1.93
22.5	15 18.1	56 2.7	1.56	U. 16 22.5	1.99	15 42.4	57 31.9	1.49	U. 16 40.8	1.93
23.0	15 23.4	56 22.2	1.69	L. 4 46.2	1.97	15 47.3	57 50.0	1.52	L. 5 4.1	1.95
23.5	15 29.1	56 43.2	1.80	U. 17 9.7	1.96	15 52.3	58 8.4	1.54	U. 17 27.7	1.98
24.0	15 35.2	57 5.5	1.91	L. 5 33.2	1.95	15 57.4	58 27.0	1.55	L. 5 51.7	2.03
24.5	15 41.6	57 29.0	2.00	U. 17 56.6	1.95	16 2.4	58 45.5	1.53	U. 18 16.4	2.08
25.0	15 48.2	57 53.4	2.06	L. 6 20.1	1.97	16 7.4	59 3.8	1.49	L. 6 41.8	2.15
25.5	15 55.1	58 18.5	2.10	U. 18 43.8	1.99	16 12.1	59 21.3	1.41	U. 19 8.1	2.23
26.0	16 2.0	58 43.9	2.11	L. 7 8.0	2.03	16 16.6	59 37.7	1.30	L. 7 35.3	2.31
26.5	16 8.8	59 9.1	2.07	U. 19 32.7	2.08	16 20.6	59 52.5	1.15	U. 20 3.6	2.40
27.0	16 15.5	59 33.6	1.98	L. 7 58.1	2.15	16 24.1	60 5.3	0.97	L. 8 32.9	2.48
27.5	16 21.8	59 56.7	1.84	U. 20 24.3	2.22	16 27.0	60 15.7	0.74	U. 21 3.2	2.56
28.0	16 27.5	60 17.8	1.65	L. 8 51.5	2.31	16 29.0	60 23.1	0.48	L. 9 34.3	2.62
28.5	16 32.5	60 36.3	1.40	U. 21 19.8	2.40	16 30.1	60 27.2	+0.19	U. 22 5.9	2.65
29.0	16 36.7	60 51.5	1.11	L. 9 49.1	2.49	16 30.3	60 27.7	-0.11	L. 10 37.8	2.66
29.5	16 39.8	61 2.9	0.77	U. 22 19.5	2.57	16 29.4	60 24.5	0.43	U. 23 9.6	2.64
30.0	16 41.7	61 9.9	+0.39	L. 10 50.8	2.64	16 27.4	60 17.4	0.75	L. 11 40.9	2.58
30.5	16 42.4	61 12.3	0.00	U. 23 22.9	2.69	16 24.5	60 6.7	1.05		
31.0	16 41.7	61 9.9	-0.40	L. 11 55.3	2.71	16 20.5	59 52.3	1.33	U. 0 11.5	2.51
31.5	16 39.8	61 2.7	-0.80			16 15.9	59 34.7	-1.58	L. 12 41.2	2.43

WASHINGTON MEAN TIME.

PHASES.

Month.	Last Quarter.			New Moon.			First Quarter.			Full Moon.			Last Quarter.			New Moon.					
	d	h	m	d	h	m	d	h	m	d	h	m	d	h	m	d	h	m			
January	3	8	46.7	10	10	19.2	18	10	51.8	25	23	57.5									
February	1	16	51.7	9	2	56.4	17	7	11.4	24	11	35.2									
March	3	2	8.2	10	20	28.7	19	0	23.8	25	21	7.2									
April	1	13	15.9	9	13	47.5	17	13	37.3	24	5	15.4									
May	1	2	23.8	9	5	59.3	16	22	55.1	23	12	58.0				d	h	m			
June				7	20	30.1	15	5	8.1	21	21	15.0	30	17	17.1						
July				7	9	4.3	14	9	39.6	21	6	57.8	29	9	32.5						
August				5	19	46.3	12	14	7.6	19	18	43.3	27	20	15.0						
September				4	5	4.7	10	20	8.1	18	8	53.6	26	13	18.3						
October				3	13	49.3	10	5	1.2	18	1	30.2	26	4	46.5						
November				1	22	56.2	8	17	36.4	16	19	58.8	24	17	59.2						
December				1	9	9.2	8	10	1.5	16	14	59.8	24	4	43.8				d	h	m
																30	20	46.4			

APOGEE, PERIGEE, AND GREATEST LIBRATION.

Month.	Perigee.		Apogee.		Perigee.		GREATEST LIBRATION.											
	d	h	d	h	d	h	d	h	m	d	h	m	d	h	m			
January	2	2.9	17	0.5	28	17.7	10	3	53 s.w.	22	23	37 s.e.						
February			13	18.3	25	20.4	5	7	3 s.w.	20	1	9 s.e.						
March			13	6.9	26	6.8	4	10	14 s.w.	20	7	12 s.e.						
April			9	10.2	23	17.4	1	10	54 s.w.	17	12	15 s.e.	29	16	52 s.w.			
May			6	14.5	22	0.9				15	9	29 s.e.	27	21	25 s.w.			
June			3	4.9	18	22.9				11	10	39 s.e.	24	20	9 s.w.			
July	15	15.2	30	21.9						7	18	20 s.e.	22	7	32 s.w.			
August	9	21.5	28	16.1			3	19	37 s.e.	17	23	12 s.w.	31	13	13 s.e.			
September	6	8.1	25	10.7						13	9	32 s.w.	28	15	58 s.e.			
October	4	13.1	22	3.5						10	22	5 s.w.	26	22	46 s.e.			
November	2	0.0	19	13.0	30	12.0				8	1	4 s.w.	24	3	50 s.e.			
December			15	13.3						6	8	15 s.w.	21	19	35 s.e.			
			12	20.9	28	19.8												

MOON'S EQUATOR.

The moon's libration in latitude and longitude, at any time, may be found by means of the following formulas and tables.

I = the inclination of the moon's equator $1^\circ 28'.8$,

Ω = mean longitude of moon's ascending node (see page 250),

C = the angle which the mean meridian of the moon's disc makes with the circle of declination reckoned from north to west on the apparent disc.

λ, β, α' and δ' the apparent longitude, latitude, right ascension, and declination of the moon affected with parallax.

$$\Delta \lambda = 0'.57 \sin 2 (\lambda - \Omega),$$

$$\alpha = \cos (\Omega - \lambda) \sin I,$$

$$\tan \beta = \sin (\Omega - \lambda) \tan I.$$

In these formulas, the tables p. 8 of the Appendix may be substituted.

The libration in latitude = $b = B - \beta$.

The libration in longitude = $l = \lambda + \Delta \lambda + \alpha b - C$.

$$\sin C = \sin i \frac{\cos (C + l - \Omega + \Delta)}{\cos \delta'} = - \sin i \frac{\cos (\alpha' - \Omega')}{\cos b}.$$

WASHINGTON MEAN TIME.

MOON'S EQUATOR.

Sidereal Date Ob.	i Inclination to the Earth's Equator.	Δ Ascending Node on Earth's Equator to Ascending Node on Elliptic.	Ω' Ascending Node on Earth's Equator.	☾ Moon's Mean Longitude.
^d 0	22° 54.2	110° 13.6	3° 29.3	151° 33.7
10	22 55.0	109 41.3	3 30.0	202 57.9
20	22 55.8	109 9.0	3 30.7	54 22.2
30	22 56.7	108 36.7	3 31.3	185 46.4
40	22 57.5	108 4.4	3 32.0	317 10.7
50	22 58.3	107 32.1	3 32.6	88 34.9
60	22 59.1	106 59.9	3 33.2	219 59.2
70	22 59.9	106 27.6	3 33.8	351 23.4
80	23 0.7	105 55.4	3 34.4	122 47.7
90	23 1.5	105 23.2	3 34.9	254 11.9
100	23 2.3	104 51.0	3 35.5	25 36.2
110	23 3.1	104 18.9	3 36.0	157 0.4
120	23 3.9	103 46.7	3 36.5	288 24.7
130	23 4.7	103 14.6	3 37.0	59 48.9
140	23 5.5	102 42.5	3 37.5	191 13.2
150	23 6.3	102 10.4	3 38.0	322 37.4
160	23 7.1	101 38.4	3 38.4	94 1.6
170	23 7.9	101 6.3	3 38.8	225 25.9
180	23 8.7	100 34.3	3 39.2	356 50.1
190	23 9.5	100 2.3	3 39.6	128 14.4
200	23 10.3	99 30.3	3 40.0	259 38.6
210	23 11.1	98 58.4	3 40.3	31 2.9
220	23 11.9	98 26.4	3 40.6	162 27.1
230	23 12.7	97 54.5	3 40.9	293 51.4
240	23 13.5	97 22.5	3 41.2	65 15.6
250	23 14.3	96 50.6	3 41.5	196 39.9
260	23 15.1	96 18.7	3 41.7	328 4.1
270	23 15.9	95 46.9	3 41.9	99 28.4
280	23 16.8	95 15.0	3 42.1	230 52.6
290	23 17.6	94 43.2	3 42.3	2 16.9
300	23 18.4	94 11.3	3 42.5	133 41.1
310	23 19.2	93 39.5	3 42.6	265 5.3
320	23 20.0	93 7.8	3 42.7	36 29.6
330	23 20.9	92 36.0	3 42.8	167 53.8
340	23 21.7	92 4.3	3 42.8	299 18.1
350	23 22.5	91 32.5	3 42.9	70 42.3
360	23 23.3	91 0.8	3 42.9	202 6.6
370	23 24.1	90 29.2	3 42.9	333 30.8

FOR WASHINGTON MEAN NOON AND MERIDIAN TRANSIT.													
Day of Month.	Apparent Right Ascension.		Apparent Declination.		Log Coefficient of t.		Log Coefficient of t ² .		Mean Solar Time of Meridian Transit.	Sidereal Date of Transit.			
	At Mean Noon.	At Transit.	At Mean Noon.	At Transit.	In R.A.	In Dec.	In R.A.	In Dec.					
	h m s	m s	° ′ ″	′ ″					d h m	d			
May 1	1 20 29.45	20 9.66	+ 5 48 36.2	46 22.1	+9.40415	+0.2353	+4.25	+5.07	0 22 41.9	121			
2	1 26 38.22	26 18.60	6 30 16.3	28 3.3	9.41290	0.2437	4.26	5.03	1 22 44.1	122			
3	1 32 54.52	32 35.11	7 12 43.1	10 31.9	9.42172	0.2514	4.27	5.00	2 22 46.5	123			
4	1 39 18.57	38 59.42	7 55 53.3	53 44.4	9.43061	0.2584	4.29	4.97	3 22 48.9	124			
5	1 45 50.61	45 31.77	8 39 43.2	37 37.2	9.43959	0.2646	4.30	4.93	4 22 51.5	125			
6	1 52 30.87	52 12.40	9 24 8.8	22 6.3	9.44865	0.2701	4.31	4.88	5 22 54.2	126			
7	1 59 19.61	59 1.57	10 9 5.7	7 7.3	9.45779	0.2747	4.32	4.80	6 22 57.1	127			
8	2 6 17.08	5 59.54	10 54 29.1	52 35.4	9.46701	0.2784	4.34	4.70	7 23 0.1	128			
9	2 13 23.54	13 6.57	11 40 13.6	38 25.2	9.47629	0.2812	4.35	4.56	8 23 3.3	129			
10	2 20 39.22	20 22.89	12 26 13.2	24 30.7	9.48559	0.2831	4.36	4.32	9 23 6.6	130			
11	2 28 4.34	27 48.74	13 12 21.6	10 45.6	9.49488	0.2839	4.36	+3.49	10 23 10.1	131			
12	2 35 39.07	35 24.30	13 58 31.3	57 2.5	9.50413	0.2836	4.37	-4.19	11 23 13.7	132			
13	2 43 23.55	43 9.71	14 44 34.7	43 13.4	9.51327	0.2819	4.37	4.56	12 23 17.5	133			
14	2 51 17.85	51 5.04	15 30 22.8	29 9.6	9.52223	0.2787	4.37	4.77	13 23 21.5	134			
15	2 59 21.94	59 10.27	16 15 46.2	14 41.6	9.53096	0.2739	4.37	4.93	14 23 25.6	135			
16	3 7 35.70	7 25.29	16 60 34.6	59 38.9	9.53937	0.2673	4.36	5.05	15 23 29.9	136			
17	3 15 58.92	15 49.90	17 44 36.8	43 50.3	9.54737	0.2589	4.34	5.14	16 23 34.4	137			
18	3 24 31.27	24 23.74	18 27 41.4	27 4.2	9.55488	0.2481	4.32	5.22	17 23 39.0	138			
19	3 33 12.21	33 6.29	19 9 36.2	9 8.3	9.56179	0.2349	4.28	5.29	18 23 43.7	139			
20	3 42 1.09	41 56.89	19 50 8.8	49 50.0	9.56797	0.2190	4.23	5.36	19 23 48.6	140			
21	3 50 57.12	50 54.74	20 29 6.8	28 56.7	9.57336	0.2003	4.17	5.41	20 23 53.6	141			
22	3 59 59.33	59 58.86	21 6 17.9	6 16.0	9.57788	0.1784	4.09	5.46	21 23 58.8	142			
23	4 9 6.64	9 8.15	21 41 30.3	41 35.9	9.58141	0.1528	3.97	5.50	22 0 4.0	143			
24	4 18 17.84	18 21.36	22 14 33.3	14 45.5	9.58393	0.1232	3.79	5.53	24 0 9.2	144			
25	4 27 31.56	27 37.15	22 45 17.0	45 34.8	9.58541	0.0893	+3.45	5.55	25 0 14.5	145			
26	4 36 46.50	36 54.14	23 13 33.2	13 55.5	9.58579	0.0506	-2.72	5.57	26 0 19.8	146			
27	4 46 1.24	46 10.91	23 39 15.1	39 40.7	9.58506	0.0063	3.59	5.58	27 0 25.1	147			
28	4 55 14.36	55 26.02	24 2 47.8	2 45.3	9.58323	0.9656	3.86	5.59	28 0 30.4	148			
29	5 4 24.47	4 38.06	24 22 37.8	23 5.9	9.58033	0.9872	4.02	5.60	29 0 35.7	149			
30	5 13 30.27	13 45.69	24 40 13.5	40 41.0	9.57640	0.9894	4.12	5.60	30 0 40.9	150			
31	5 22 30.53	22 47.67	24 55 4.9	55 30.6	9.57148	0.9749	4.20	5.59	31 0 46.0	151			
June 1	5 31 24.11	31 42.84	25 7 13.5	7 36.3	9.56561	0.9528	4.27	5.58	1 0 50.9	152			
2	5 40 9.97	40 30.16	25 16 42.0	17 1.0	9.55885	0.9313	4.32	5.57	2 0 55.8	153			
3	5 48 47.21	48 8.72	25 23 34.5	23 48.6	9.55126	0.9376	4.36	5.56	3 1 0.5	154			
4	5 57 15.00	57 37.67	25 27 55.6	28 4.0	9.54284	0.9142	4.39	5.54	4 1 5.0	155			
5	6 5 32.61	5 56.30	25 29 51.1	29 53.1	9.53369	+8.4934	4.41	5.52	5 1 9.3	156			
6	6 13 39.46	14 4.00	25 29 27.2	29 22.3	9.52334	-8.8019	4.43	5.50	6 1 13.5	157			
7	6 21 35.00	22 0.24	25 26 50.3	26 38.2	9.51331	0.91853	4.45	5.48	7 1 17.5	158			
8	6 29 18.78	29 44.58	25 22 7.5	21 47.9	9.50212	0.93768	4.46	5.46	8 1 21.3	159			
9	6 36 50.42	37 16.64	25 15 25.9	14 58.7	9.49030	0.95026	4.47	5.43	9 1 24.9	160			
10	6 44 9.62	44 36.12	25 6 52.7	6 17.8	9.47786	0.95946	4.48	5.40	10 1 28.2	161			
11	6 51 16.11	51 42.74	24 56 34.9	55 52.4	9.46479	0.96558	4.49	5.37	11 1 31.4	162			
12	6 58 9.66	58 36.29	24 44 39.8	43 49.8	9.45108	0.97228	4.50	5.34	12 1 34.3	163			
13	7 4 50.07	5 16.57	24 31 14.6	30 17.3	9.43672	0.97697	4.51	5.30	13 1 37.0	164			
14	7 11 17.15	11 43.40	24 16 26.3	15 22.0	9.42167	0.98086	4.51	5.26	14 1 39.5	165			
15	7 17 30.74	17 56.63	23 60 21.8	59 10.9	9.40590	0.98414	4.51	5.22	15 1 41.8	166			
16	7 23 30.71	23 56.13	23 43 8.1	41 51.1	9.38936	0.9691	4.51	5.17	16 1 43.9	167			
17	7 29 16.89	29 41.74	23 24 51.9	23 20.3	9.37198	0.96225	4.51	5.12	17 1 45.7	168			
18	7 34 49.14	35 13.32	23 5 39.8	4 12.0	9.35367	0.9124	4.52	5.07	18 1 47.3	169			
19	7 40 7.32	40 30.73	22 45 38.1	44 5.7	9.33433	0.9292	4.53	5.01	19 1 48.6	170			
20	7 45 11.26	45 33.82	22 24 53.3	23 16.9	9.31385	0.9431	4.53	4.94	20 1 49.7	171			
21	7 50 0.78	50 22.41	22 3 31.7	1 52.0	9.29208	0.9645	4.54	4.86	21 1 50.6	172			
22	7 54 35.71	54 56.33	21 41 39.7	39 57.4	9.26886	0.9636	4.54	4.76	22 1 51.2	173			
23	7 58 55.86	59 15.39	21 19 23.5	17 39.2	9.24397	0.9705	4.55	4.64	23 1 51.6	174			
24	8 3 0.99	3 19.36	20 56 49.2	55 3.6	9.21712	0.9753	4.56	4.62	24 1 51.7	175			
25	8 6 50.85	7 8.00	20 34 3.0	32 16.9	9.18801	0.9781	4.57	-4.12	25 1 51.6	176			
26	8 10 25.19	10 41.07	20 11 11.2	9 25.3	9.15624	0.9789	4.58	+3.16	26 1 51.2	177			
27	8 13 43.73	13 58.29	19 48 20.0	46 35.0	9.12131	0.9776	4.58	4.21	27 1 50.5	178			
28	8 16 46.17	16 59.38	19 25 35.5	23 52.2	9.08256	0.9744	4.59	4.50	28 1 49.6	179			
29	8 19 32.21	19 44.02	19 3 4.1	1 23.3	9.03910	0.9692	4.60	4.67	29 1 48.4	180			
30	8 22 1.48	22 11.88	18 40 52.2	39 14.4	8.98973	0.9617	4.61	4.80	30 1 46.9	181			
31	8 24 13.64	24 22.61	+18 19 6.4	17 32.4	+8.93292	-0.9519	-4.62	+4.89	31 1 45.1	182			

FOR WASHINGTON MEAN NOON AND MERIDIAN TRANSIT.

Table with columns for Day of Month, Apparent Right Ascension, Apparent Declination, Log Coefficient of t, Log Coefficient of t^2, Mean Solar Time of Meridian Transit, and Sidereal Date of Transit. Rows are listed for July and August.

FOR WASHINGTON MEAN NOON AND MERIDIAN TRANSIT.

Day of Month.	Apparent Right Ascension.		Apparent Declination.		Log Coefficient of t.		Log Coefficient of t ² .		Mean Solar Time of Meridian Transit.	Sidereal Date of Transit.	
	At Mean Noon.	At Transit.	At Mean Noon.	At Transit.	In R.A.	In Dec.	In R.A.	In Dec.			
Sept.	d	h m s	m s	° ' "	' "	+	-	-	d h m	d	
	1	10 34 7.62	34 4.78	+10 56 3.5	56 20.5	+9.48600	-0.3625	-4.11	-5.12	0 23 50.7	244
	2	10 41 25.88	41 24.10	10 11 41.0	11 52.1	9.48057	0.2708	4.13	5.04	1 23 54.1	245
	3	10 48 38.54	48 37.76	9 26 32.5	26 37.5	9.47487	0.2775	4.14	4.96	2 23 57.4	246
	4	10 55 45.45	55 45.61	8 40 45.8	40 44.8	9.46898	0.2829	4.15	4.87	4 0 0.6	247
	5	11 2 46.55	2 47.60	7 54 28.2	54 21.5	9.46298	0.2872	4.15	4.76	5 0 3.6	248
	6	11 9 41.82	9 43.72	7 7 46.4	7 33.5	9.45692	0.2905	4.14	4.63	6 0 6.6	249
	7	11 16 31.34	16 34.03	6 20 46.6	20 28.0	9.45087	0.2928	4.13	4.47	7 0 9.5	250
	8	11 23 15.22	23 18.65	5 33 34.3	33 10.1	9.44487	0.2943	4.12	4.26	8 0 12.3	251
	9	11 29 53.59	29 57.71	4 46 14.4	45 44.8	9.43896	0.2951	4.11	-3.84	9 0 15.0	252
	10	11 36 26.62	36 31.39	3 58 51.5	58 16.7	9.43317	0.2953	4.10	+3.42	10 0 17.6	253
	11	11 42 54.50	42 59.89	3 11 29.7	10 50.0	9.42752	0.2949	4.08	4.07	11 0 20.1	254
	12	11 49 17.44	49 23.41	2 24 12.8	23 28.4	9.42203	0.2939	4.06	4.29	12 0 22.6	255
	13	11 55 35.64	55 42.15	1 37 4.0	36 15.1	9.41670	0.2924	4.04	4.43	13 0 24.9	256
	14	12 1 49.31	1 56.33	0 50 6.4	49 13.2	9.41157	0.2904	4.02	4.53	14 0 27.2	257
15	12 7 58.67	8 6.18	+0 3 22.8	2 25.5	9.40664	0.2880	4.00	4.60	15 0 29.5	258	
16	12 14 3.95	14 11.92	-0 43 4.4	44 5.4	9.40191	0.2853	3.98	4.66	16 0 31.6	259	
17	12 20 5.34	20 13.75	1 29 12.7	30 17.2	9.39737	0.2823	3.96	4.70	17 0 33.7	260	
18	12 26 3.06	26 11.89	2 15 0.1	16 7.9	9.39304	0.2788	3.92	4.74	18 0 35.7	261	
19	12 31 57.33	32 6.55	3 0 24.8	1 35.7	9.38891	0.2749	3.89	4.77	19 0 37.7	262	
20	12 37 48.31	37 57.91	3 45 24.6	46 38.4	9.38495	0.2707	3.86	4.80	20 0 39.6	263	
21	12 43 36.17	43 46.13	4 29 57.8	31 14.3	9.38117	0.2663	3.84	4.83	21 0 41.4	264	
22	12 49 21.09	49 31.40	5 14 2.8	15 21.8	9.37759	0.2616	3.82	4.85	22 0 43.2	265	
23	12 55 3.27	55 13.92	5 57 38.2	58 59.4	9.37419	0.2566	3.79	4.87	23 0 45.0	266	
24	13 0 42.85	0 53.82	6 40 42.6	42 5.8	9.37094	0.2512	3.77	4.89	24 0 46.7	267	
25	13 6 19.94	6 31.22	7 23 14.5	24 39.6	9.36782	0.2455	3.75	4.91	25 0 48.4	268	
26	13 11 54.66	12 6.25	8 5 12.4	6 39.2	9.36483	0.2395	3.73	4.92	26 0 50.0	269	
27	13 17 27.13	17 39.01	8 46 35.0	48 3.3	9.36195	0.2332	3.71	4.94	27 0 51.6	270	
28	13 22 57.45	23 9.61	9 27 20.9	28 50.5	9.35918	0.2266	3.70	4.96	28 0 53.2	271	
29	13 28 25.71	28 38.14	10 7 28.7	8 59.4	9.35648	0.2196	3.69	4.97	29 0 54.7	272	
30	13 33 51.95	34 4.65	10 46 57.0	48 28.7	9.35382	0.2123	3.68	4.99	30 0 56.2	273	
Oct.	1	13 39 16.21	39 29.17	11 25 44.7	27 17.1	9.35119	0.2045	3.67	5.00	1 0 57.7	274
	2	13 44 38.53	44 51.72	12 3 50.1	5 23.0	9.34855	0.1963	3.67	5.02	2 0 59.1	275
	3	13 49 58.88	50 12.30	12 41 11.7	42 44.9	9.34587	0.1877	3.68	5.03	3 1 0.5	276
	4	13 55 17.24	55 30.88	13 17 48.2	19 21.5	9.34313	0.1786	3.69	5.05	4 1 1.9	277
	5	14 0 33.59	0 47.43	13 53 38.0	55 11.2	9.34029	0.1690	3.71	5.06	5 1 3.2	278
	6	14 5 47.83	6 1.85	14 28 39.4	30 12.3	9.33730	0.1589	3.73	5.08	6 1 4.5	279
	7	14 10 59.84	11 14.03	15 2 50.7	4 23.1	9.33412	0.1481	3.75	5.09	7 1 5.7	280
	8	14 16 9.49	16 23.83	15 36 10.2	37 41.8	9.33067	0.1366	3.78	5.11	8 1 6.9	281
	9	14 21 16.61	21 31.07	16 8 36.0	10 6.6	9.32691	0.1243	3.82	5.12	9 1 8.1	282
	10	14 26 20.97	26 35.53	16 40 6.1	41 35.5	9.32279	0.1112	3.86	5.14	10 1 9.3	283
	11	14 31 22.31	31 36.95	17 10 38.4	12 6.3	9.31822	0.0973	3.90	5.16	11 1 10.4	284
	12	14 36 20.32	36 35.00	17 40 10.8	41 36.9	9.31309	0.0823	3.95	5.18	12 1 11.4	285
	13	14 41 14.62	41 29.29	18 8 40.7	10 4.8	9.30730	0.0661	4.00	5.20	13 1 12.3	286
	14	14 46 4.79	46 19.41	18 36 5.6	37 27.4	9.30073	0.0486	4.05	5.22	14 1 13.2	287
	15	14 50 50.33	51 4.86	19 2 22.8	3 41.9	9.29324	0.0295	4.10	5.23	15 1 14.0	288
16	14 55 30.67	55 45.06	19 27 29.4	28 45.5	9.28465	0.0086	4.15	5.25	16 1 14.8	289	
17	15 0 5.13	0 19.32	19 51 22.1	52 34.9	9.27472	0.9856	4.20	5.27	17 1 15.4	290	
18	15 4 32.95	4 46.86	20 13 57.3	15 6.5	9.26324	0.9602	4.25	5.29	18 1 15.9	291	
19	15 8 53.28	9 6.83	20 35 11.4	36 16.4	9.24989	0.9317	4.30	5.31	19 1 16.3	292	
20	15 13 5.12	13 18.23	20 54 59.7	56 0.4	9.23427	0.8996	4.35	5.33	20 1 16.5	293	
21	15 17 7.36	17 19.94	21 13 18.1	14 13.9	9.21588	0.8628	4.41	5.35	21 1 16.6	294	
22	15 20 58.73	21 10.68	21 30 1.3	30 51.8	9.19409	0.8204	4.47	5.38	22 1 16.5	295	
23	15 24 37.83	24 49.04	21 45 3.8	45 48.6	9.16810	0.7702	4.52	5.41	23 1 16.2	296	
24	15 28 3.06	28 13.41	21 58 19.4	58 58.1	9.13676	0.7096	4.57	5.44	24 1 15.7	297	
25	15 31 12.64	31 22.01	22 9 40.9	10 13.0	9.09853	0.6339	4.62	5.47	25 1 14.9	298	
26	15 34 4.63	34 12.90	22 19 0.6	19 25.7	9.05115	0.5352	4.67	5.50	26 1 13.8	299	
27	15 36 36.87	36 43.93	22 26 10.1	26 27.9	8.99112	0.3963	4.72	5.53	27 1 12.4	300	
28	15 38 47.05	38 52.79	22 30 59.5	31 9.7	8.91270	0.1706	4.77	5.56	28 1 10.6	301	
29	15 40 32.69	40 37.02	22 33 18.3	33 20.7	8.80504	-8.5956	4.81	5.59	29 1 8.4	302	
30	15 41 51.17	41 54.03	22 32 54.6	32 49.3	8.64384	+8.8907	4.85	5.62	30 1 5.7	303	
31	15 42 39.82	42 41.19	22 29 36.0	29 23.0	+8.35044	9.3093	4.89	5.65	31 1 2.6	304	
32	15 42 56.05	42 55.95	-22 23 9.0	22 48.8	-6.98152	+9.5309	-4.92	+5.69	32 0 58.9	305	

FOR WASHINGTON MEAN NOON AND MERIDIAN TRANSIT.

Table with columns: Day of Month, Apparent Right Ascension, Apparent Declination, Log Factor 1, Log Factor 2, Mean Solar Time of Meridian Transit, and Sidereal Date of Transit. It lists data for the days of September and October 1861, including specific time and location details.

FOR WASHINGTON SIDEREAL NOON AND MERIDIAN TRANSIT.

Mean Solar Time of Meridian Transit.				Sideral Date.	Apparent Right Ascension.		Apparent Declination.		Log. Coefficient of t in Sideral Minutes.		Log. Coefficient of t ² .	
d	h	m	s		At Sideral Oh.	At Transit.	At Sideral Oh.	At Transit.	In R.A.	In Dec.	In R.A.	In Dec.
Mar. 1	3	44.2	61	2 22 31.46	22 37.09	+14 40 10.0	50 31.7	+9.03911	+9.7566	-2.80	-4.26	
2	3	42.9	62	2 25 9.16	25 25.09	15 2 48.4	4 10.9	9.03961	9.7526	2.80	4.26	
3	3	41.6	63	2 27 47.11	28 3.36	15 16 19.4	17 42.7	9.04051	9.7486	2.80	4.26	
4	3	40.3	64	2 30 25.32	30 41.89	15 29 43.0	31 7.0	9.04122	9.7446	2.80	4.26	
5	3	39.0	65	2 33 3.79	33 20.69	15 42 59.0	44 23.6	9.04194	9.7404	2.80	4.27	
6	3	37.8	66	2 35 42.52	35 59.73	15 56 7.3	57 32.5	9.04267	9.7362	2.81	4.27	
7	3	36.5	67	2 38 21.52	38 39.06	16 9 7.8	10 33.6	9.04342	9.7318	2.82	4.28	
8	3	35.2	68	2 41 0.80	41 18.66	16 22 0.4	23 26.7	9.04417	9.7273	2.83	4.28	
9	3	33.9	69	2 43 40.35	43 58.54	16 34 45.0	36 11.8	9.04492	9.7228	2.83	4.29	
10	3	32.6	70	2 46 20.18	46 38.69	16 47 21.5	48 48.8	9.04568	9.7181	2.83	4.29	
11	3	31.4	71	2 49 0.20	49 19.12	16 59 49.7	1 17.5	9.04642	9.7132	2.82	4.30	
12	3	30.1	72	2 51 40.67	51 59.82	17 12 9.6	13 37.8	9.04714	9.7083	2.81	4.30	
13	3	28.8	73	2 54 21.31	54 40.79	17 24 21.1	25 49.6	9.04786	9.7033	2.80	4.31	
14	3	27.6	74	2 57 2.22	57 22.03	17 36 24.1	37 52.9	9.04857	9.6982	2.80	4.32	
15	3	26.4	75	2 59 43.30	0 3.54	17 48 18.5	49 47.5	9.04927	9.6929	2.80	4.32	
16	3	25.1	76	3 2 24.82	2 45.31	18 0 4.1	1 33.3	9.04997	9.6874	2.80	4.33	
17	3	23.9	77	3 5 6.51	5 27.34	18 11 40.8	13 10.2	9.05067	9.6819	2.80	4.33	
18	3	22.6	78	3 7 48.46	8 9.63	18 23 8.5	24 38.1	9.05137	9.6762	2.80	4.33	
19	3	21.4	79	3 10 30.67	10 52.18	18 34 27.2	35 56.8	9.05205	9.6704	2.79	4.34	
20	3	20.2	80	3 13 13.13	13 34.98	18 45 36.7	47 6.4	9.05273	9.6644	2.78	4.35	
21	3	19.0	81	3 15 55.85	16 18.04	18 56 37.0	58 6.7	9.05340	9.6583	2.76	4.35	
22	3	17.8	82	3 18 38.81	19 1.34	19 7 28.0	8 57.6	9.05404	9.6521	2.76	4.35	
23	3	16.5	83	3 21 22.01	21 44.89	19 18 9.6	19 39.1	9.05469	9.6456	2.76	4.36	
24	3	15.3	84	3 24 5.46	24 28.69	19 28 41.7	30 11.1	9.05534	9.6391	2.76	4.36	
25	3	14.1	85	3 26 49.15	27 12.71	19 39 4.2	40 33.5	9.05598	9.6324	2.76	4.36	
26	3	12.9	86	3 29 33.08	29 56.99	19 49 17.1	50 46.1	9.05661	9.6255	2.76	4.37	
27	3	11.7	87	3 32 17.25	32 41.51	19 59 20.3	0 48.9	9.05725	9.6185	2.76	4.37	
28	3	10.5	88	3 35 1.66	35 26.27	20 9 13.6	10 41.9	9.05790	9.6113	2.76	4.38	
29	3	9.3	89	3 37 46.32	38 11.28	20 18 57.0	20 24.9	9.05853	9.6038	2.76	4.38	
30	3	8.2	90	3 40 31.21	40 56.52	20 28 30.4	29 57.9	9.05916	9.5963	2.76	4.38	
31	3	7.0	91	3 43 16.35	43 42.01	20 37 53.8	39 20.9	9.05978	9.5886	2.75	4.38	
Apr. 1	3	5.8	92	3 46 1.72	46 27.73	20 47 7.2	48 33.8	9.06041	9.5807	2.75	4.39	
2	3	4.6	93	3 48 47.33	49 13.69	20 56 10.4	57 36.4	9.06102	9.5725	2.74	4.39	
3	3	3.5	94	3 51 33.17	51 59.89	21 5 3.4	6 28.7	9.06163	9.5641	2.74	4.40	
4	3	2.3	95	3 54 19.24	54 46.32	21 13 46.0	15 10.7	9.06223	9.5555	2.74	4.40	
5	3	1.1	96	3 57 5.54	57 32.98	21 22 18.3	23 42.1	9.06283	9.5466	2.74	4.40	
6	3	0.0	97	3 59 52.07	0 19.87	21 30 40.0	32 3.1	9.06343	9.5375	2.74	4.40	
7	2	58.8	98	4 2 38.83	3 6.90	21 38 51.2	46 13.5	9.06402	9.5282	2.72	4.41	
8	2	57.7	99	4 5 25.81	5 54.33	21 46 51.8	48 13.3	9.06466	9.5186	2.70	4.41	
9	2	56.5	100	4 8 12.99	8 41.88	21 54 41.8	56 2.3	9.06510	9.5087	2.70	4.41	
10	2	55.4	101	4 11 0.38	11 29.63	22 2 21.0	3 40.5	9.06563	9.4984	2.68	4.42	
11	2	54.2	102	4 13 47.97	14 17.58	22 9 49.3	11 7.9	9.06614	9.4879	2.65	4.42	
12	2	53.1	103	4 16 35.76	17 5.73	22 17 6.8	18 24.3	9.06664	9.4771	2.63	4.42	
13	2	52.0	104	4 19 23.73	19 54.06	22 24 13.4	25 20.7	9.06710	9.4660	2.61	4.42	
14	2	50.8	105	4 22 11.88	22 42.57	22 31 9.0	32 24.1	9.06755	9.4545	2.59	4.42	
15	2	49.7	106	4 25 0.20	25 31.25	22 37 53.6	39 7.4	9.06799	9.4426	2.57	4.42	
16	2	48.6	107	4 27 48.69	28 20.09	22 44 27.0	45 39.5	9.06842	9.4303	2.55	4.43	
17	2	47.4	108	4 30 37.34	31 9.09	22 50 49.3	52 0.4	9.06880	9.4176	2.54	4.43	
18	2	46.3	109	4 33 26.13	33 58.24	22 57 0.3	58 10.0	9.06918	9.4044	2.52	4.43	
19	2	45.2	110	4 36 15.07	36 47.54	23 3 0.1	4 8.4	9.06954	9.3908	2.51	4.43	
20	2	44.1	111	4 39 4.14	39 36.98	23 8 48.6	9 55.4	9.06987	9.3767	2.49	4.43	
21	2	43.0	112	4 41 53.34	42 26.54	23 14 25.8	15 31.1	9.07020	9.3622	2.48	4.44	
22	2	41.9	113	4 44 42.67	45 16.23	23 19 51.7	20 55.4	9.07053	9.3471	2.47	4.44	
23	2	40.8	114	4 47 32.12	48 6.03	23 25 6.2	26 8.3	9.07081	9.3313	2.46	4.44	
24	2	39.7	115	4 50 21.67	50 55.93	23 30 9.3	31 9.7	9.07106	9.3149	2.44	4.44	
25	2	38.6	116	4 53 11.22	53 45.94	23 35 0.9	35 59.5	9.07133	9.2978	2.41	4.44	
26	2	37.5	117	4 56 1.08	56 36.05	23 39 41.0	40 37.8	9.07159	9.2799	2.39	4.44	
27	2	36.4	118	4 58 50.93	59 26.26	23 44 9.6	45 4.5	9.07182	9.2613	2.36	4.44	
28	2	35.3	119	5 1 40.87	2 16.56	23 48 26.6	49 19.6	9.07205	9.2417	2.33	4.44	
29	2	34.2	120	5 4 30.90	5 6.94	23 52 32.0	53 23.0	9.07227	9.2210	2.28	4.45	
30	2	33.1	121	5 7 21.01	7 57.40	23 56 25.7	57 14.7	9.07247	9.1993	2.26	4.45	
31	2	32.0	122	5 10 11.20	10 47.95	+24 0 7.7	0 54.6	+9.07268	+9.1764	-2.23	-4.45	

REMARKS. — The Sideral dates on this page are too great by one day.

FOR WASHINGTON SIDEREAL NOON AND MERIDIAN TRANSIT.										
Mean Solar Time of Meridian Transit.	Sidereal Date.	Apparent Right Ascension.		Apparent Declination.		Log Coefficient of <i>t</i> in Sidereal Minutes.		Log Coefficient of <i>t</i> ² .		
		At Sidereal Oh.	At Transit.	At Sidereal Oh.	At Transit.	In R.A.	In Dec.	In R.A.	In Dec.	
May	d h m	d	h m s	m s	° ′ ″	′ ″	+9.07268	+9.1764	-2.23	-4.45
1	2 32.0	122	5 10 11.20	10 47.95	+24 0 7.7	0 54.6				
2	2 30.9	123	5 13 1.47	13 38.57	24 3 38.0	4 22.8	9.07265	9.1522	2.19	4.45
3	2 27.8	124	5 15 51.80	16 29.25	24 6 56.6	7 39.2	9.07301	9.1266	2.15	4.45
4	2 28.7	125	5 18 42.19	19 19.98	24 10 3.5	10 43.9	9.07315	9.0994	2.10	4.45
5	2 27.6	126	5 21 32.62	22 10.76	24 12 58.7	13 36.8	9.07326	9.0704	-2.04	4.45
6	2 26.5	127	5 24 23.10	25 1.58	24 15 42.2	16 18.0	9.07334	9.0393		4.45
7	2 25.4	128	5 27 13.60	27 52.43	24 18 14.0	18 47.5	9.07340	9.0058		4.45
8	2 24.3	129	5 30 4.13	30 43.30	24 20 34.1	21 5.1	9.07346	8.9694		4.45
9	2 23.2	130	5 32 54.68	33 34.19	24 22 42.4	23 10.9	9.07349	8.9296		4.45
10	2 22.1	131	5 35 45.23	36 25.06	24 24 39.0	25 5.0	9.07349	8.8856		4.45
11	2 21.0	132	5 38 35.78	39 15.96	24 26 23.7	26 47.3	9.07348	8.8366		4.45
12	2 19.9	133	5 41 26.32	42 6.83	24 27 56.7	28 17.7	9.07344	8.7819		4.45
13	2 18.8	134	5 44 16.84	44 57.68	24 29 18.0	29 36.3	9.07338	8.7190		4.45
14	2 17.7	135	5 47 7.33	47 48.49	24 30 27.5	30 43.1	9.07326	8.6454		4.45
15	2 16.6	136	5 49 57.77	50 39.26	24 31 25.3	31 38.1	9.07313	8.5568		4.45
16	2 15.5	137	5 52 48.17	53 29.98	24 32 11.3	32 21.3	9.07301	8.4448	+2.08	4.45
17	2 14.5	138	5 55 38.50	56 20.64	24 32 45.5	32 52.8	9.07283	8.2950	2.15	4.44
18	2 13.4	139	5 58 28.75	59 11.22	24 33 8.1	33 12.5	9.07264	8.0656	2.22	4.44
19	2 12.3	140	6 1 18.93	2 1.71	24 33 19.0	33 20.4	9.07243	+7.5449	2.28	4.44
20	2 11.2	141	6 4 9.02	4 52.12	24 33 18.2	33 16.7	9.07220	-7.5612	2.33	4.44
21	2 10.1	142	6 6 59.02	7 42.43	24 33 5.8	33 1.3	9.07196	8.1017	2.38	4.44
22	2 9.0	143	6 9 48.92	10 32.64	24 32 41.8	32 34.3	9.07169	8.3159	2.42	4.44
23	2 7.9	144	6 12 38.71	13 22.73	24 32 6.1	31 55.6	9.07141	8.4581	2.44	4.44
24	2 6.7	145	6 15 28.39	16 12.71	24 31 19.0	31 5.3	9.07112	8.5647	2.46	4.44
25	2 5.6	146	6 18 17.95	19 2.57	24 30 20.4	30 3.5	9.07081	8.6505	2.48	4.44
26	2 4.5	147	6 21 7.39	21 52.30	24 29 10.2	28 50.1	9.07048	8.7222	2.50	4.44
27	2 3.4	148	6 23 56.69	24 41.90	24 27 48.5	27 25.2	9.07012	8.7834	2.52	4.44
28	2 2.3	149	6 26 45.85	27 31.36	24 26 15.3	25 48.8	9.06976	8.8371	2.54	4.44
29	2 1.2	150	6 29 34.87	30 20.67	24 24 30.6	24 0.9	9.06938	8.8846	2.56	4.43
30	2 0.1	151	6 32 23.74	33 9.83	24 22 34.5	22 1.5	9.06901	8.9271	2.58	4.43
31	1 58.9	152	6 35 12.47	35 58.84	24 20 27.1	19 50.7	9.06862	8.9656	2.60	4.43
June	d h m	d	h m s	m s	° ′ ″	′ ″				
1	1 57.8	153	6 38 1.04	38 47.69	24 18 8.4	17 28.6	9.06819	9.0011	2.62	4.43
2	1 56.7	154	6 40 49.43	41 36.37	24 15 38.4	14 55.2	9.06773	9.0336	2.63	4.43
3	1 55.6	155	6 43 37.65	44 24.88	24 12 57.2	12 10.5	9.06728	9.0638	2.65	4.43
4	1 54.4	156	6 46 25.69	47 13.20	24 10 4.8	9 14.5	9.06782	9.0920	2.67	4.43
5	1 53.3	157	6 49 13.55	50 1.32	24 7 1.2	6 7.4	9.06633	9.1185	2.69	4.43
6	1 52.2	158	6 52 1.21	52 49.25	24 3 46.5	2 49.2	9.06581	9.1431	2.70	4.43
7	1 51.0	159	6 54 48.67	55 36.97	24 0 20.8	59 19.9	9.06528	9.1663	2.72	4.42
8	1 49.9	160	6 57 35.92	58 24.48	23 56 44.1	55 39.6	9.06473	9.1883	2.74	4.42
9	1 48.7	161	7 0 22.96	1 11.78	23 52 56.5	51 48.3	9.06416	9.2091	2.75	4.42
10	1 47.6	162	7 3 9.77	3 58.85	23 48 58.0	47 46.1	9.06358	9.2289	2.76	4.42
11	1 46.4	163	7 5 56.36	6 45.69	23 44 48.7	43 33.1	9.06297	9.2477	2.77	4.41
12	1 45.2	164	7 8 42.71	9 32.30	23 40 28.6	39 9.4	9.06235	9.2655	2.78	4.41
13	1 44.1	165	7 11 28.82	12 18.66	23 35 57.9	34 35.0	9.06171	9.2826	2.79	4.41
14	1 42.9	166	7 14 14.68	15 4.76	23 31 16.5	29 49.9	9.06105	9.2990	2.80	4.41
15	1 41.7	167	7 17 0.29	17 50.60	23 26 24.6	24 54.2	9.06037	9.3145	2.81	4.40
16	1 40.5	168	7 19 45.63	20 36.18	23 21 22.3	19 48.1	9.05967	9.3296	2.82	4.40
17	1 39.3	169	7 22 30.71	23 21.49	23 16 9.5	14 31.6	9.05898	9.3440	2.83	4.40
18	1 38.1	170	7 25 15.52	26 6.53	23 10 46.4	9 4.7	9.05825	9.3578	2.84	4.39
19	1 37.0	171	7 28 0.05	28 51.29	23 5 13.1	3 27.5	9.05753	9.3711	2.84	4.39
20	1 35.8	172	7 30 44.31	31 35.77	22 50 29.6	57 40.2	9.05679	9.3840	2.84	4.39
21	1 34.6	173	7 33 28.28	34 19.96	22 53 35.9	51 42.7	9.05603	9.3964	2.84	4.38
22	1 33.4	174	7 36 11.96	37 3.86	22 47 32.2	45 35.1	9.05525	9.4083	2.84	4.38
23	1 32.2	175	7 38 55.35	39 47.47	22 41 18.5	39 17.5	9.05447	9.4199	2.84	4.38
24	1 30.9	176	7 41 38.44	42 30.77	22 34 54.9	32 49.9	9.05368	9.4311	2.84	4.38
25	1 29.7	177	7 44 21.23	45 13.78	22 28 21.4	26 12.5	9.05289	9.4419	2.85	4.37
26	1 28.5	178	7 47 3.74	47 56.49	22 21 38.2	19 25.4	9.05210	9.4523	2.85	4.37
27	1 27.3	179	7 49 45.94	50 38.90	22 14 45.3	12 28.6	9.05130	9.4626	2.85	4.36
28	1 26.0	180	7 52 27.84	53 21.00	22 7 42.7	5 22.1	9.05048	9.4724	2.85	4.36
29	1 24.8	181	7 55 9.44	56 2.80	22 0 30.6	58 6.0	9.04967	9.4820	2.86	4.35
30	1 23.5	182	7 57 50.74	58 44.30	21 53 9.0	50 40.4	9.04886	9.4913	2.86	4.35
31	1 22.3	183	8 0 31.73	1 25.50	+21 45 37.9	43 5.4	+9.04803	-9.5004	+2.86	-4.34

ERRATUM. — The Sidereal dates on this page are too great by one day.

FOR WASHINGTON SIDEREAL NOON AND MERIDIAN TRANSIT.											
Mean Solar Time of Meridian Transit	Sidereal Date.	Apparent Right Ascension.		Apparent Declination.		Log Coefficient of t in Sidereal Minutes.		Log Coefficient of t^2 .			
		At Sidereal Oh.	At Transit.	At Sidereal Oh.	At Transit.	In R.A.	In Dec.	In R.A.	In Dec.		
										h	m	s	h	m	s
Sept. 1 23 53.1	246	10 39 21.07	40 24.79	+ 9 41 19.0	34 54.5	+8.99791	-9.7780	+2.60	-3.94		
2 23 51.6	247	10 41 44.30	42 48.19	9 26 53.5	20 26.0	8.99744	9.7798	2.59	3.92		
3 23 50.0	248	10 44 7.38	45 11.44	9 12 24.5	5 54.1	8.99700	9.7815	2.57	3.91		
4 23 48.4	249	10 46 30.32	47 34.55	8 57 52.1	51 18.7	8.99656	9.7832	2.56	3.90		
5 23 46.9	250	10 48 53.11	49 57.52	8 43 16.4	36 40.1	8.99613	9.7848	2.54	3.89		
6 23 45.3	251	10 51 15.76	52 20.34	8 28 37.5	21 58.3	8.99571	9.7864	2.54	3.88		
7 23 43.8	252	10 53 38.22	54 43.03	8 13 55.5	7 13.4	8.99530	9.7879	2.53	3.87		
8 23 42.2	253	10 56 0.66	57 5.58	7 59 10.4	52 26.6	8.99489	9.7893	2.52	3.86		
9 23 40.6	254	10 58 22.90	59 27.98	7 44 22.4	37 34.8	8.99448	9.7908	2.51	3.84		
10 23 39.1	255	11 0 45.00	1 50.25	7 29 31.6	22 41.2	8.99407	9.7921	2.50	3.83		
11 23 37.5	256	11 3 6.98	4 12.41	7 14 38.0	7 44.9	8.99368	9.7934	2.49	3.81		
12 23 35.9	257	11 5 28.84	6 34.45	6 59 41.8	52 46.0	8.99331	9.7947	2.48	3.80		
13 23 34.3	258	11 7 50.58	8 56.38	6 44 43.0	37 44.6	8.99298	9.7959	2.42	3.78		
14 23 32.8	259	11 10 12.22	11 18.90	6 29 41.7	22 40.7	8.99266	9.7971	2.37	3.77		
15 23 31.2	260	11 12 33.75	13 39.92	6 14 38.0	7 34.4	8.99235	9.7982	2.32	3.74		
16 23 29.6	261	11 14 55.19	16 1.55	5 59 32.1	52 25.9	8.99207	9.7993	2.27	3.73		
17 23 28.0	262	11 17 16.54	18 23.10	5 44 23.9	37 15.2	8.99184	9.8003	2.22	3.71		
18 23 26.4	263	11 19 37.82	20 44.58	5 29 13.6	22 2.4	8.99164	9.8013	2.18	3.70		
19 23 24.8	264	11 21 59.05	23 6.01	5 14 1.2	6 47.6	8.99147	9.8023	2.14	3.68		
20 23 23.3	265	11 24 20.22	25 27.39	4 58 46.8	51 30.8	8.99131	9.8032	2.10	3.66		
21 23 21.7	266	11 26 41.35	27 48.72	4 43 30.5	36 12.1	8.99115	9.8041	2.06	3.64		
22 23 20.1	267	11 29 2.41	30 10.00	4 38 12.3	30 51.6	8.99100	9.8050	+2.00	3.62		
23 23 18.5	268	11 31 23.44	32 31.94	4 12 52.4	5 29.3	8.99089	9.8058		3.60		
24 23 16.9	269	11 33 44.43	34 52.45	3 57 30.8	50 5.5	8.99079	9.8066		3.58		
25 23 15.3	270	11 36 5.40	37 13.64	3 42 7.6	34 40.1	8.99072	9.8073		3.56		
26 23 13.7	271	11 38 26.34	39 34.80	3 26 49.9	19 13.2	8.99066	9.8080		3.52		
27 23 12.1	272	11 40 47.27	41 55.95	3 11 16.9	3 45.1	8.99064	9.8086		3.49		
28 23 10.5	273	11 43 8.20	44 17.10	2 55 49.6	48 15.7	8.99064	9.8091		3.42		
29 23 9.0	274	11 45 29.13	46 38.27	2 40 21.2	32 45.2	8.99065	9.8096		3.40		
30 23 7.4	275	11 47 50.06	48 59.44	2 24 51.7	17 13.6	8.99066	9.8092		3.38		
Oct. 1 23 5.8	276	11 50 11.00	51 20.61	2 9 21.1	1 41.1	8.99069	9.8106		3.35		
2 23 4.2	277	11 52 31.95	53 41.79	1 53 49.6	46 7.7	8.99072	9.8110		3.28		
3 23 2.6	278	11 54 52.91	56 2.99	1 38 17.3	30 35.5	8.99078	9.8113		3.22		
4 23 1.0	279	11 57 13.89	58 24.22	1 22 44.3	14 68.6	8.99087	9.8117		3.16		
5 22 59.4	280	11 59 34.91	0 45.49	1 7 10.7	59 23.2	8.99098	9.8119		3.08		
6 22 57.8	281	12 1 55.97	3 6.79	0 51 36.5	43 47.3	8.99107	9.8122		-3.00		
7 22 56.2	282	12 4 17.05	5 28.13	0 36 2.0	28 11.2	8.99118	9.8123				
8 22 54.7	283	12 6 38.18	7 49.52	0 20 27.2	12 34.7	8.99132	9.8124				
9 22 53.1	284	12 8 59.35	10 10.85	+ 0 4 52.3	3 1.9	8.99147	9.8124				
10 22 51.5	285	12 11 20.58	12 32.43	- 0 10 42.7	18 28.4	8.99164	9.8125	-2.03			
11 22 49.9	286	12 13 41.86	14 53.97	0 26 17.7	34 14.9	8.99183	9.8124	2.16			
12 22 48.3	287	12 16 3.21	17 15.59	0 41 52.7	49 51.2	8.99204	9.8124	2.22			
13 22 46.8	288	12 18 24.63	19 37.30	0 57 27.5	5 27.4	8.99227	9.8123	2.26			
14 22 45.2	289	12 20 46.13	21 59.09	1 13 2.0	21 3.3	8.99253	9.8123	2.30			
15 22 43.6	290	12 23 7.72	24 20.97	1 28 36.2	36 38.8	8.99284	9.8120	2.34	+3.00		
16 22 42.0	291	12 25 29.42	26 42.95	1 44 10.0	52 13.8	8.99316	9.8118	2.38	3.08		
17 22 40.5	292	12 27 51.23	29 5.04	1 59 43.3	7 48.3	8.99350	9.8115	2.43	3.16		
18 22 38.9	293	12 30 13.15	31 27.24	2 15 16.0	23 22.2	8.99385	9.8112	2.45	3.23		
19 22 37.3	294	12 32 35.18	33 49.56	2 30 48.0	38 55.4	8.99420	9.8109	2.49	3.27		
20 22 35.8	295	12 34 57.33	36 12.01	2 46 19.2	54 27.8	8.99457	9.8105	2.50	3.30		
21 22 34.2	296	12 37 19.60	38 34.60	3 1 49.6	9 59.3	8.99498	9.8101	2.52	3.33		
22 22 32.6	297	12 39 42.02	40 57.34	3 17 19.1	25 29.7	8.99544	9.8097	2.55	3.38		
23 22 31.1	298	12 42 4.59	43 20.23	3 32 47.6	40 59.1	8.99591	9.8091	2.57	3.42		
24 22 29.5	299	12 44 27.32	45 43.28	3 48 14.9	56 27.3	8.99640	9.8086	2.59	3.46		
25 22 28.0	300	12 46 50.21	48 6.49	4 3 41.0	11 54.2	8.99690	9.8080	2.61	3.49		
26 22 26.4	301	12 49 13.27	50 29.87	4 19 5.8	27 19.7	8.99741	9.8073	2.63	3.56		
27 22 24.8	302	12 51 36.50	52 53.43	4 34 29.1	42 43.7	8.99794	9.8066	2.64	3.58		
28 22 23.3	303	12 53 59.91	55 17.18	4 49 50.8	58 6.1	8.99849	9.8058	2.65	3.60		
29 22 21.8	304	12 56 23.50	57 41.11	5 5 10.8	13 26.7	8.99904	9.8050	2.66	3.62		
30 22 20.2	305	12 58 47.27	0 5.22	5 20 29.1	28 45.5	8.99959	9.8042	2.67	3.64		
31 22 18.7	306	13 1 11.23	2 29.53	5 35 45.5	44 2.4	9.00018	9.8033	2.68	3.66		
32 22 17.2	307	13 3 35.39	4 54.04	- 5 51 0.9	59 17.2	+9.00078	-9.8023	-2.69	+3.68		

REMARKS. — The Sidereal dates on this page are increased by one day.

FOR WASHINGTON SIDEREAL NOON AND MERIDIAN TRANSIT.

Main data table with columns: Mean Solar Time of Meridian Transit, Side-real Date, Apparent Right Ascension (At Sidereal Oh., At Transit), Apparent Declination (At Sidereal Oh., At Transit), Log Coefficient of t in Sidereal Minutes (In R.A., In Dec.), and Log Coefficient of P (In R.A., In Dec.).

REMARKS. — The Sidereal dates on this page are too great by one day.

FOR WASHINGTON SIDEREAL NOON AND MERIDIAN TRANSIT.

Mean Solar Time of Meridian Transit.	Side- real Date.	Apparent Right Ascension.		Apparent Declination.		Log Coefficient of <i>t</i> in Sidereal Minutes.		Log Coefficient of <i>t</i> ² .	
		At Sidereal Oh	At Transit	At Sidereal Oh	At Transit.	In R.A.	In Dec.	In R.A.	In Dec.
Mar. 1 10 49.7	60	9 29 41.15	29 30.41	+15 59 51.9	0 43.5	-8.2768	+8.9589	+2.97	-3.78
2 10 45.3	61	9 29 14.11	29 3.54	16 2 1.7	2 52.3	8.2704	8.9505	2.99	3.79
3 10 41.0	62	9 28 47.48	28 37.09	16 4 9.0	4 58.6	8.2635	8.9420	3.01	3.80
4 10 36.6	63	9 28 21.28	28 11.07	16 6 13.8	7 2.3	8.2563	8.9336	3.02	3.81
5 10 32.2	64	9 27 55.52	27 45.49	16 8 16.1	9 3.5	8.2488	8.9244	3.04	3.82
6 10 27.9	65	9 27 30.21	27 20.37	16 10 15.7	11 1.9	8.2409	8.9143	3.06	3.83
7 10 23.6	66	9 27 5.38	26 55.74	16 12 12.5	12 57.6	8.2322	8.9040	3.08	3.84
8 10 19.2	67	9 26 41.05	26 31.69	16 14 6.5	14 50.5	8.2232	8.8929	3.10	3.85
9 10 14.9	68	9 26 17.23	26 8.01	16 15 57.6	16 40.5	8.2136	8.8819	3.11	3.86
10 10 10.6	69	9 25 53.94	25 44.93	16 17 45.8	18 27.5	8.2038	8.8698	3.12	3.86
11 10 6.3	70	9 25 31.19	25 22.40	16 19 31.0	20 11.5	8.1932	8.8575	3.13	3.87
12 10 2.0	71	9 25 9.00	25 0.44	16 21 13.2	21 52.5	8.1822	8.8445	3.14	3.88
13 9 57.7	72	9 24 47.39	24 39.05	16 22 52.3	23 30.3	8.1705	8.8306	3.15	3.88
14 9 53.4	73	9 24 26.35	24 18.26	16 24 26.2	25 5.0	8.1584	8.8161	3.16	3.89
15 9 49.2	74	9 24 5.92	23 58.08	16 26 0.9	26 36.5	8.1452	8.8011	3.17	3.89
16 9 44.9	75	9 23 46.11	23 38.52	16 27 30.4	28 4.7	8.1316	8.7858	3.17	3.89
17 9 40.6	76	9 23 26.92	23 19.58	16 28 56.7	29 29.7	8.1177	8.7696	3.18	3.90
18 9 36.4	77	9 23 8.36	23 1.28	16 30 19.7	30 51.3	8.1028	8.7515	3.19	3.90
19 9 32.2	78	9 22 50.45	22 43.63	16 31 39.3	32 9.6	8.0868	8.7334	3.19	3.90
20 9 28.0	79	9 22 33.19	22 26.63	16 32 55.6	33 24.6	8.0700	8.7149	3.20	3.91
21 9 23.8	80	9 22 16.60	22 10.30	16 34 8.6	34 36.2	8.0524	8.6946	3.21	3.91
22 9 19.6	81	9 22 0.69	21 54.65	16 35 18.2	35 44.4	8.0344	8.6728	3.21	3.91
23 9 15.4	82	9 21 45.43	21 39.68	16 36 24.3	36 49.2	8.0148	8.6505	3.22	3.92
24 9 11.2	83	9 21 30.87	21 25.39	16 37 37.0	37 50.6	7.9945	8.6269	3.22	3.92
25 9 7.0	84	9 21 17.00	21 11.80	16 38 26.3	38 48.5	7.9725	8.6013	3.22	3.92
26 9 2.9	85	9 21 3.83	20 58.90	16 39 22.1	39 43.0	7.9495	8.5756	3.23	3.93
27 8 58.8	86	9 20 51.36	20 46.70	16 40 14.6	40 34.1	7.9249	8.5475	3.23	3.93
28 8 54.7	87	9 20 39.60	20 35.21	16 41 3.7	41 21.8	7.8987	8.5174	3.23	3.93
29 8 50.6	88	9 20 28.55	20 24.44	16 41 49.3	42 6.0	7.8710	8.4825	3.23	3.93
30 8 46.5	89	9 20 18.21	20 14.38	16 42 31.3	42 46.7	7.8407	8.4458	3.24	3.93
31 8 42.4	90	9 20 8.59	20 5.05	16 43 9.8	43 23.9	7.8087	8.4080	3.24	3.94
Apr. 1 8 38.3	91	9 19 59.69	19 56.44	16 43 44.9	43 57.6	7.7725	8.3640	3.24	3.94
2 8 34.2	92	9 19 51.53	19 48.56	16 44 16.5	44 27.9	7.7331	8.3187	3.25	3.94
3 8 30.2	93	9 19 44.11	19 41.42	16 44 44.7	44 54.7	7.6904	8.2632	3.25	3.94
4 8 26.2	94	9 19 37.42	19 35.02	16 45 9.3	45 17.9	7.6423	8.2003	3.25	3.94
5 8 22.2	95	9 19 31.47	19 29.36	16 45 30.3	45 37.5	7.5886	8.1249	3.25	3.94
6 8 18.2	96	9 19 26.26	19 24.44	16 45 47.8	45 53.7	7.5299	8.0417	3.25	3.94
7 8 14.2	97	9 19 21.80	19 20.27	16 46 1.9	46 6.4	7.4523	7.9350	3.26	3.93
8 8 10.2	98	9 19 18.09	19 16.84	16 46 12.5	46 15.6	7.3659	7.7836	3.26	3.93
9 8 6.2	99	9 19 15.12	19 14.16	16 46 19.5	46 21.2	7.2658	7.5618	3.26	3.93
10 8 2.2	100	9 19 12.90	19 12.23	16 46 23.0	46 23.4	7.1074	+7.0846	3.26	3.93
11 7 58.3	101	9 19 11.43	19 11.04	16 46 23.0	46 22.1	6.8849	-7.0846	3.26	3.93
12 7 54.4	102	9 19 10.70	19 10.60	16 46 19.5	46 17.2	-6.3918	7.5618	3.26	3.93
13 7 50.5	103	9 19 10.72	19 10.91	16 46 12.5	46 8.8	+6.4437	7.7836	3.26	3.92
14 7 46.6	104	9 19 11.49	19 11.97	16 46 2.0	45 57.0	6.8985	7.9332	3.25	3.92
15 7 42.7	105	9 19 13.00	19 13.77	16 45 48.0	45 41.7	7.1170	8.0347	3.25	3.92
16 7 38.8	106	9 19 15.25	19 16.30	16 45 30.7	45 23.0	7.2582	8.1193	3.25	3.92
17 7 34.9	107	9 19 18.23	19 19.58	16 45 10.0	45 0.9	7.3672	8.1938	3.25	3.91
18 7 31.0	108	9 19 21.95	19 23.59	16 44 45.8	44 35.4	7.4533	8.2549	3.24	3.91
19 7 27.2	109	9 19 26.40	19 28.32	16 44 18.2	44 6.5	7.5237	8.3086	3.24	3.91
20 7 23.4	110	9 19 31.57	19 33.77	16 43 47.2	43 34.2	7.5843	8.3575	3.24	3.91
21 7 19.5	111	9 19 37.46	19 39.94	16 43 12.8	42 58.6	7.6375	8.3973	3.24	3.91
22 7 15.7	112	9 19 44.07	19 46.83	16 42 35.2	42 19.7	7.6855	8.4354	3.23	3.90
23 7 11.9	113	9 19 51.40	19 54.43	16 41 54.3	41 37.5	7.7270	8.4710	3.23	3.90
24 7 8.1	114	9 19 59.43	20 2.74	16 41 10.1	40 52.1	7.7648	8.5020	3.23	3.90
25 7 4.3	115	9 20 8.16	20 11.75	16 40 22.7	40 3.4	7.7997	8.5320	3.23	3.90
26 7 0.5	116	9 20 17.59	20 21.46	16 39 32.0	39 11.5	7.8324	8.5601	3.22	3.90
27 6 56.7	117	9 20 27.72	20 31.86	16 38 38.1	38 16.3	7.8613	8.5859	3.22	3.89
28 6 53.0	118	9 20 38.53	20 42.94	16 37 41.0	37 18.0	7.8892	8.6106	3.21	3.89
29 6 49.2	119	9 20 50.03	20 54.70	16 36 40.7	36 16.5	7.9150	8.6326	3.21	3.89
30 6 45.5	120	9 21 2.21	21 7.15	16 35 37.3	35 11.9	7.9395	8.6545	3.21	3.88
31 6 41.8	121	9 21 15.07	21 20.27	+16 34 30.7	34 4.0	+7.9618	-8.6757	+3.21	-3.88

JUPITER, 1861.

FOR WASHINGTON SIDEREAL NOON AND MERIDIAN TRANSIT.

Mean Solar Time of Meridian Transit.			Sidereal Date.	Apparent Right Ascension.		Apparent Declination.		Log Coefficient of t in Sidereal Minutes.		Log Coefficient of t ² .	
				At Sidereal Oh.	At Transit.	At Sidereal Oh.	At Transit.	In R.A.	In Dec.	In R.A.	In Dec.
July	d	h m	d	h m s	m s	+ ^o ['] ["]	^o ['] ["]				
	1	3 12.2	182	9 51 20.29	51 37.48	+14 0 44.0	59 13.1	+8.4626	-9.1855	+2.82	-3.64
	2	3 8.9	183	9 52 2.22	52 19.55	13 57 2.3	55 30.5	8.4655	9.1891	2.80	3.64
	3	3 5.7	184	9 52 44.42	53 1.87	13 53 18.7	51 46.1	8.4682	9.1928	2.79	3.63
	4	3 2.5	185	9 53 26.88	53 44.46	13 49 33.3	47 59.9	8.4710	9.1963	2.77	3.63
	5	2 59.3	186	9 54 9.60	54 27.31	13 45 46.1	44 11.8	8.4736	9.1997	2.76	3.62
	6	2 56.0	187	9 54 52.57	55 10.41	13 41 57.1	40 21.9	8.4761	9.2031	2.75	3.62
	7	2 52.8	188	9 55 35.79	55 53.74	13 38 6.3	36 30.3	8.4785	9.2064	2.74	3.61
	8	2 49.6	189	9 56 19.24	56 37.31	13 34 13.8	32 37.0	8.4808	9.2096	2.73	3.60
	9	2 46.4	190	9 57 2.92	57 21.12	13 30 19.6	28 42.1	8.4831	9.2127	2.72	3.60
	10	2 43.2	191	9 57 46.83	58 5.14	13 26 23.8	24 45.5	8.4855	9.2157	2.71	3.59
	11	2 40.0	192	9 58 30.97	58 49.38	13 22 26.4	20 47.2	8.4875	9.2187	2.70	3.59
	12	2 36.8	193	9 59 15.32	59 33.84	13 18 27.4	16 47.3	8.4896	9.2217	2.69	3.58
	13	2 33.6	194	9 59 59.88	0 18.50	13 14 26.7	12 45.8	8.4915	9.2246	2.68	3.57
	14	2 30.4	195	10 0 44.64	1 3.37	13 10 24.4	8 42.8	8.4934	9.2273	2.67	3.56
	15	2 27.2	196	10 1 29.59	1 48.43	13 6 20.6	4 38.3	8.4952	9.2300	2.66	3.56
	16	2 24.0	197	10 2 14.73	2 33.68	13 2 15.3	0 32.2	8.4971	9.2327	2.65	3.55
	17	2 20.9	198	10 3 0.06	3 19.11	12 58 8.5	56 24.7	8.4989	9.2353	2.64	3.55
	18	2 17.7	199	10 3 45.57	4 4.72	12 54 0.3	52 15.7	8.5006	9.2378	2.62	3.54
	19	2 14.5	200	10 4 31.26	4 50.50	12 49 50.6	48 5.3	8.5023	9.2403	2.61	3.53
	20	2 11.3	201	10 5 17.12	5 36.45	12 45 39.5	43 53.5	8.5038	9.2426	2.59	3.52
	21	2 8.2	202	10 6 3.14	6 22.57	12 41 27.1	39 40.3	8.5053	9.2449	2.58	3.52
	22	2 5.0	203	10 6 49.32	7 8.85	12 37 13.3	35 25.8	8.5068	9.2473	2.57	3.51
	23	2 1.9	204	10 7 35.66	7 55.27	12 32 58.1	31 9.9	8.5083	9.2496	2.56	3.50
	24	1 58.7	205	10 8 22.15	8 41.85	12 28 41.5	26 52.7	8.5098	9.2518	2.55	3.49
	25	1 55.6	206	10 9 8.79	9 28.58	12 24 23.7	22 34.2	8.5111	9.2540	2.54	3.49
	26	1 52.4	207	10 9 55.58	10 15.45	12 20 4.6	18 14.4	8.5123	9.2562	2.53	3.48
	27	1 49.3	208	10 10 42.50	11 2.46	12 15 44.2	13 53.3	8.5136	9.2582	2.51	3.47
	28	1 46.1	209	10 11 29.56	11 49.61	12 11 22.5	9 30.9	8.5149	9.2602	2.49	3.47
	29	1 43.0	210	10 12 16.76	12 36.89	12 6 59.5	5 7.3	8.5161	9.2623	2.48	3.46
	30	1 39.8	211	10 13 4.09	13 24.29	12 2 35.4	0 42.5	8.5173	9.2643	2.47	3.45
	31	1 36.7	212	10 13 51.54	14 11.81	11 58 10.1	56 16.6	8.5184	9.2662	2.46	3.44
Aug.	1	1 33.5	213	10 14 39.10	14 59.45	11 53 43.6	51 49.6	8.5194	9.2681	2.44	3.43
	2	1 30.4	214	10 15 26.78	15 47.21	11 49 16.0	47 21.4	8.5204	9.2700	2.42	3.42
	3	1 27.2	215	10 16 14.57	16 35.06	11 44 47.3	42 52.1	8.5214	9.2718	2.40	3.41
	4	1 24.1	216	10 17 2.46	17 23.12	11 40 17.5	38 21.7	8.5224	9.2736	2.38	3.40
	5	1 21.0	217	10 17 50.46	18 11.08	11 35 46.6	33 50.2	8.5232	9.2752	2.36	3.38
	6	1 17.9	218	10 18 38.54	18 59.24	11 31 14.7	29 17.8	8.5240	9.2768	2.34	3.37
	7	1 14.7	219	10 19 26.71	19 47.47	11 26 41.8	24 44.3	8.5248	9.2784	2.32	3.36
	8	1 11.6	220	10 20 14.97	20 35.80	11 22 7.9	20 9.8	8.5255	9.2799	2.29	3.35
	9	1 8.5	221	10 21 3.31	21 24.19	11 17 33.1	15 34.5	8.5261	9.2814	2.26	3.34
	10	1 5.4	222	10 21 51.72	22 12.66	11 12 57.4	10 58.4	8.5268	9.2827	2.23	3.33
	11	1 2.2	223	10 22 40.20	23 1.20	11 8 20.9	6 21.4	8.5275	9.2839	2.20	3.32
	12	0 59.1	224	10 23 28.75	23 49.80	11 3 43.6	1 43.5	8.5281	9.2854	2.16	3.30
	13	0 56.0	225	10 24 17.36	24 38.46	10 59 5.4	57 4.8	8.5286	9.2865	2.12	3.28
	14	0 52.9	226	10 25 6.02	25 27.17	10 54 26.4	52 25.3	8.5290	9.2877	2.08	3.26
	15	0 49.7	227	10 25 54.72	26 15.92	10 49 46.6	47 45.1	8.5294	9.2888	2.03	3.27
	16	0 46.6	228	10 26 43.47	27 4.71	10 45 6.2	43 4.2	8.5298	9.2899	1.98	3.25
	17	0 43.5	229	10 27 32.26	27 53.55	10 40 25.1	38 22.6	8.5302	9.2910	1.92	3.23
	18	0 40.4	230	10 28 21.10	28 42.43	10 35 43.3	33 40.3	8.5305	9.2920	1.86	3.22
	19	0 37.2	231	10 29 9.97	29 31.34	10 31 0.8	28 57.3	8.5308	9.2930	1.80	3.20
	20	0 34.1	232	10 29 58.87	30 20.28	10 26 17.7	24 13.8	8.5311	9.2940	1.74	3.18
	21	0 31.0	233	10 30 47.80	31 9.24	10 21 34.0	19 29.7	8.5313	9.2950	+1.68	3.16
	22	0 27.9	234	10 31 36.75	31 58.22	10 16 49.7	14 45.0	8.5314	9.2957		3.14
	23	0 24.7	235	10 32 25.71	32 47.22	10 12 4.9	9 59.7	8.5316	9.2966		3.11
	24	0 21.6	236	10 33 14.69	33 36.24	10 7 19.5	5 13.9	8.5317	9.2974		3.08
	25	0 18.5	237	10 34 3.68	34 25.27	10 2 33.6	0 27.6	8.5318	9.2982		3.05
	26	0 15.4	238	10 34 52.68	35 14.30	9 57 47.2	55 40.8	8.5319	9.2990		3.02
	27	0 12.2	239	10 35 41.69	36 3.34	9 53 0.4	50 53.6	8.5319	9.2997		2.98
	28	0 9.1	240	10 36 30.70	36 52.37	9 48 13.1	46 5.9	8.5318	9.3003		2.94
	29	0 6.0	241	10 37 19.70	37 41.40	9 43 25.4	41 17.8	8.5318	9.3009		2.89
	30	0 2.9	242	10 38 8.70	38 30.49	9 38 37.3	36 29.4	8.5318	9.3015		2.83
	30	23 59.7	243	10 38 57.69	39 19.42	9 33 48.9	31 40.7	8.5316	9.3020	-1.68	2.76
	31	23 56.6	244	10 39 46.65	40 8.41	+ 9 29 0.1	26 51.7	+8.5314	-9.3024	-1.74	-2.68

FOR WASHINGTON SIDEREAL NOON AND MERIDIAN TRANSIT.

Mean Solar Time of Meridian Transit.	Side- real Date.	Apparent Right Ascension.		Apparent Declination.		Log Coefficient of t in Sidereal Minutes.		Log Coefficient of t^2 .	
		At Sidereal Oh.	At Transit.	At Sidereal Oh.	At Transit.	In R.A.	In Dec.	In R.A.	In Dec.
		h m s	m s	$^{\circ}$ $'$ $''$	$^{\circ}$ $'$ $''$				
Nov. 1 20 39.7	306	11 26 41.05	26 59.50	+ 4 44 51.0	42 58.0	+8.4302	-0.2168	-2.91	+3.70
2 20 36.4	307	11 27 19.67	27 37.96	4 40 54.8	39 2.8	8.4265	9.2130	2.91	3.72
3 20 33.1	308	11 27 57.95	28 16.12	4 37 0.8	35 9.7	8.4226	9.2090	2.92	3.73
4 20 29.8	309	11 28 35.89	28 53.91	4 33 8.9	31 18.7	8.4187	9.2049	2.93	3.74
5 20 26.5	310	11 29 13.49	29 31.36	4 29 19.2	27 30.0	8.4148	9.2006	2.94	3.75
6 20 23.2	311	11 29 50.74	30 8.45	4 25 31.8	23 43.6	8.4107	9.1962	2.95	3.76
7 20 19.9	312	11 30 27.63	30 45.18	4 21 46.7	19 59.6	8.4063	9.1916	2.95	3.76
8 20 16.6	313	11 31 4.15	31 21.54	4 18 4.0	16 18.0	8.4019	9.1870	2.96	3.77
9 20 13.2	314	11 31 40.30	31 57.54	4 14 23.7	12 38.8	8.3974	9.1823	2.96	3.78
10 20 9.9	315	11 32 16.08	32 33.16	4 10 45.8	9 2.0	8.3929	9.1774	2.97	3.78
11 20 6.5	316	11 32 51.49	33 8.40	4 7 10.4	5 27.7	8.3883	9.1723	2.97	3.79
12 20 3.2	317	11 33 26.52	33 43.25	4 3 37.5	1 55.9	8.3836	9.1673	2.98	3.80
13 19 59.8	318	11 34 1.16	34 17.71	4 0 7.1	58 26.7	8.3787	9.1620	2.98	3.81
14 19 56.5	319	11 34 35.40	34 51.76	3 56 39.3	55 0.1	8.3735	9.1564	2.99	3.82
15 19 53.1	320	11 35 9.23	35 25.41	3 53 14.2	51 36.2	8.3683	9.1508	2.99	3.83
16 19 49.7	321	11 35 42.65	35 58.66	3 49 51.8	48 15.0	8.3630	9.1446	3.00	3.83
17 19 46.3	322	11 36 15.67	36 31.49	3 46 32.2	44 56.6	8.3576	9.1382	3.00	3.84
18 19 42.9	323	11 36 48.37	37 3.90	3 43 15.3	41 41.0	8.3519	9.1328	3.01	3.84
19 19 39.5	324	11 37 20.44	37 35.98	3 40 1.2	36 28.2	8.3462	9.1262	3.01	3.85
20 19 36.1	325	11 37 52.18	38 7.42	3 36 50.0	35 18.3	8.3402	9.1197	3.02	3.86
21 19 32.6	326	11 38 23.48	38 38.52	3 33 41.6	32 11.3	8.3341	9.1131	3.03	3.87
22 19 29.2	327	11 38 54.34	39 9.17	3 30 36.1	29 7.2	8.3279	9.1061	3.03	3.88
23 19 25.8	328	11 39 24.75	39 39.37	3 27 33.7	26 6.2	8.3213	9.0990	3.04	3.89
24 19 22.4	329	11 39 54.70	40 9.10	3 24 34.3	23 8.3	8.3146	9.0914	3.05	3.89
25 19 18.9	330	11 40 24.18	40 38.36	3 21 38.1	20 13.5	8.3077	9.0838	3.05	3.90
26 19 15.5	331	11 40 53.19	41 7.15	3 18 45.0	17 21.9	8.3006	9.0759	3.06	3.90
27 19 12.0	332	11 41 21.72	41 35.45	3 15 55.1	14 33.6	8.2933	9.0675	3.06	3.91
28 19 8.6	333	11 41 49.77	42 3.26	3 13 8.5	11 48.5	8.2857	9.0590	3.07	3.91
29 19 5.1	334	11 42 17.32	42 30.57	3 10 26.2	9 6.8	8.2778	9.0502	3.08	3.91
30 19 1.6	335	11 42 44.36	42 57.38	3 7 45.3	6 28.4	8.2697	9.0411	3.09	3.92
Dec. 1 18 58.1	336	11 43 10.90	43 23.67	3 5 8.7	3 53.4	8.2612	9.0319	3.10	3.92
2 18 54.6	337	11 43 36.92	43 49.44	3 2 35.5	1 21.8	8.2524	9.0215	3.11	3.93
3 18 51.1	338	11 44 2.41	44 14.68	3 0 5.9	58 53.7	8.2433	9.0114	3.11	3.93
4 18 47.6	339	11 44 27.37	44 39.40	2 57 39.8	56 29.2	8.2341	9.0013	3.12	3.94
5 18 44.1	340	11 44 51.80	45 3.58	2 55 17.2	54 8.4	8.2247	8.9906	3.12	3.94
6 18 40.6	341	11 45 15.69	45 27.21	2 52 58.3	51 51.3	8.2149	8.9796	3.13	3.95
7 18 37.0	342	11 45 39.03	45 50.92	2 50 43.0	49 37.9	8.2046	8.9674	3.13	3.95
8 18 33.4	343	11 46 1.81	46 12.79	2 48 31.3	47 26.1	8.1940	8.9550	3.14	3.96
9 18 29.9	344	11 46 24.04	46 34.74	2 46 23.4	45 22.0	8.1828	8.9422	3.14	3.96
10 18 26.3	345	11 46 45.79	46 56.12	2 44 19.3	43 19.7	8.1713	8.9290	3.15	3.96
11 18 22.7	346	11 47 6.79	47 16.93	2 42 18.9	41 21.2	8.1596	8.9156	3.15	3.97
12 18 19.1	347	11 47 27.30	47 37.17	2 40 22.3	39 26.5	8.1477	8.9011	3.15	3.97
13 18 15.5	348	11 47 47.24	47 56.83	2 38 29.6	37 35.7	8.1355	8.8854	3.16	3.97
14 18 11.9	349	11 48 6.59	48 15.90	2 36 40.9	35 48.9	8.1216	8.8700	3.16	3.98
15 18 8.3	350	11 48 25.34	48 34.36	2 34 56.1	34 6.0	8.1078	8.8539	3.16	3.98
16 18 4.6	351	11 48 43.50	48 52.23	2 33 15.2	32 27.0	8.0932	8.8366	3.17	3.98
17 18 1.0	352	11 49 1.05	49 9.49	2 31 38.3	30 52.1	8.0783	8.8184	3.17	3.99
18 17 57.4	353	11 49 18.00	49 26.14	2 30 5.5	29 21.3	8.0630	8.7999	3.18	3.99
19 17 53.7	354	11 49 34.34	49 42.17	2 28 36.7	27 54.5	8.0468	8.7801	3.18	3.99
20 17 50.0	355	11 49 50.05	49 57.57	2 27 12.0	26 31.9	8.0291	8.7589	3.18	4.00
21 17 46.3	356	11 50 5.14	50 12.35	2 25 51.5	25 13.5	8.0116	8.7354	3.19	4.00
22 17 42.6	357	11 50 19.61	50 26.50	2 24 35.3	23 59.2	7.9923	8.7114	3.19	4.00
23 17 38.9	358	11 50 33.44	50 40.02	2 23 23.3	22 49.2	7.9722	8.6864	3.19	4.01
24 17 35.2	359	11 50 46.62	50 52.88	2 22 15.5	21 43.6	7.9507	8.6592	3.20	4.01
25 17 31.5	360	11 50 59.14	51 5.08	2 21 12.0	20 42.2	7.9272	8.6272	3.20	4.02
26 17 27.8	361	11 51 10.99	51 16.61	2 20 12.9	19 45.3	7.9031	8.5945	3.20	4.02
27 17 24.0	362	11 51 22.18	51 27.48	2 19 18.1	18 52.7	7.8775	8.5606	3.21	4.02
28 17 20.2	363	11 51 32.71	51 37.69	2 18 27.7	18 4.5	7.8504	8.5250	3.21	4.02
29 17 16.4	364	11 51 42.58	51 47.22	2 17 41.7	17 20.8	7.8211	8.4821	3.21	4.03
30 17 12.6	365	11 51 51.78	51 56.08	2 17 0.2	16 41.6	7.7890	8.4365	3.21	4.03
31 17 8.8	366	11 52 0.30	52 4.26	2 16 23.1	16 6.9	7.7547	8.3838	3.22	4.03
32 17 5.0	367	11 52 8.14	52 11.76	+ 2 15 50.5	15 36.7	+7.7164	-8.3237	-3.22	+4.03

FOR WASHINGTON SIDEREAL NOON AND MERIDIAN TRANSIT.												
Mean Solar Time of Meridian Transit.	Side-real Date.	Apparent Right Ascension.			Apparent Declination.			Log Coefficient of t in Sidereal Minutes.		Log Coefficient of t^2 .		
		At Sidereal Oh.	At Transit.		At Sidereal Oh.	At Transit.		In R.A.	In Dec.	In R.A.	In Dec.	
Jan. 0 16 2.5	0	10 46 35.84	46 33.76	+ 9 40 48.3	41 8.0	-7.5001	+8.480	-2.99	+3.75			
1 15 58.5	1	10 46 31.08	46 28.82	9 41 32.9	41 53.7	7.5371	8.503	2.99	3.75			
2 15 54.5	2	10 46 25.92	46 23.48	9 42 19.9	42 41.8	7.5708	8.524	2.99	3.75			
3 15 50.5	3	10 46 20.36	46 17.74	9 43 9.2	43 32.1	7.6017	8.544	2.98	3.75			
4 15 46.4	4	10 46 14.41	46 11.61	9 44 0.8	44 24.7	7.6302	8.564	2.97	3.74			
5 15 42.4	5	10 46 8.07	46 5.09	9 44 54.7	45 19.6	7.6572	8.582	2.97	3.74			
6 15 38.3	6	10 46 1.33	45 58.18	9 45 50.9	46 16.8	7.6827	8.600	2.96	3.73			
7 15 34.3	7	10 45 54.20	45 50.88	9 46 49.3	47 16.2	7.7064	8.616	2.96	3.72			
8 15 30.2	8	10 45 46.68	45 43.19	9 47 49.9	48 17.8	7.7284	8.632	2.96	3.71			
9 15 26.1	9	10 45 38.79	45 35.13	9 48 52.7	49 21.5	7.7498	8.647	2.95	3.70			
10 15 22.1	10	10 45 30.53	45 26.70	9 49 57.6	50 27.3	7.7685	8.661	2.95	3.70			
11 15 18.0	11	10 45 21.89	45 17.90	9 51 4.6	51 35.2	7.7874	8.674	2.94	3.69			
12 15 13.9	12	10 45 12.88	45 8.73	9 52 13.6	52 45.2	7.8050	8.687	2.93	3.68			
13 15 9.8	13	10 45 3.51	44 59.20	9 53 24.7	53 57.2	7.8217	8.700	2.93	3.67			
14 15 5.7	14	10 44 53.78	44 49.31	9 54 37.8	55 11.1	7.8377	8.711	2.92	3.66			
15 15 1.6	15	10 44 43.69	44 39.07	9 55 52.8	56 26.9	7.8528	8.722	2.92	3.65			
16 14 57.5	16	10 44 33.26	44 28.48	9 57 9.7	57 44.6	7.8670	8.733	2.91	3.64			
17 14 53.4	17	10 44 22.49	44 17.56	9 58 28.5	59 4.2	7.8805	8.743	2.90	3.63			
18 14 49.3	18	10 44 11.39	44 6.31	9 59 49.2	60 25.7	7.8934	8.753	2.90	3.62			
19 14 45.2	19	10 43 59.96	43 54.74	10 1 11.6	1 48.9	7.9059	8.762	2.89	3.61			
20 14 41.1	20	10 43 48.20	43 42.85	10 2 35.7	3 13.7	7.9177	8.771	2.88	3.60			
21 14 37.0	21	10 43 36.13	43 30.64	10 4 1.5	4 40.2	7.9289	8.779	2.88	3.58			
22 14 32.8	22	10 43 23.75	43 18.12	10 5 29.0	6 8.4	7.9396	8.788	2.87	3.57			
23 14 28.7	23	10 43 11.07	43 5.31	10 6 58.1	7 36.2	7.9497	8.795	2.86	3.56			
24 14 24.5	24	10 42 58.10	42 52.21	10 8 28.7	9 9.5	7.9594	8.802	2.85	3.54			
25 14 20.4	25	10 42 44.84	42 38.83	10 10 0.8	10 42.2	7.9689	8.809	2.84	3.53			
26 14 16.2	26	10 42 31.29	42 25.16	10 11 34.3	12 16.3	7.9781	8.816	2.83	3.51			
27 14 12.1	27	10 42 17.46	42 11.21	10 13 9.2	13 51.8	7.9867	8.822	2.81	3.50			
28 14 7.9	28	10 42 3.36	41 56.99	10 14 45.5	15 28.7	7.9949	8.828	2.80	3.48			
29 14 4.7	29	10 41 49.00	41 42.51	10 16 23.1	17 6.9	8.0027	8.834	2.78	3.46			
30 13 59.6	30	10 41 34.38	41 27.78	10 18 2.0	18 46.3	8.0103	8.839	2.77	3.44			
31 13 55.4	31	10 41 19.51	41 12.81	10 19 42.1	20 26.9	8.0173	8.845	2.75	3.42			
Feb. 1 13 51.2	32	10 41 4.41	40 57.61	10 21 23.4	22 8.7	8.0239	8.850	2.73	3.40			
2 13 47.0	33	10 40 49.08	40 42.18	10 23 5.8	23 51.6	8.0303	8.854	2.72	3.38			
3 13 42.8	34	10 40 33.53	40 26.54	10 24 49.3	25 35.6	8.0364	8.859	2.70	3.35			
4 13 38.6	35	10 40 17.76	40 10.68	10 26 33.8	27 20.5	8.0424	8.863	2.68	3.33			
5 13 34.4	36	10 40 1.78	39 54.61	10 28 19.2	29 6.3	8.0479	8.866	2.66	3.30			
6 13 30.2	37	10 39 45.60	39 38.35	10 30 5.5	30 53.0	8.0530	8.870	2.64	3.27			
7 13 26.0	38	10 39 29.24	39 21.91	10 31 52.6	32 40.4	8.0578	8.873	2.62	3.24			
8 13 21.8	39	10 39 12.70	39 5.29	10 33 40.4	34 28.5	8.0625	8.876	2.60	3.21			
9 13 17.6	40	10 38 55.98	38 48.51	10 35 28.9	36 17.3	8.0670	8.878	2.57	3.17			
10 13 13.4	41	10 38 39.10	38 31.57	10 37 18.1	38 6.7	8.0708	8.881	2.54	3.11			
11 13 9.2	42	10 38 22.08	38 14.49	10 39 7.8	39 56.6	8.0744	8.883	2.51	3.04			
12 13 5.0	43	10 38 4.92	37 57.27	10 40 58.0	41 47.0	8.0778	8.885	2.48	2.96			
13 13 0.7	44	10 37 47.63	37 39.92	10 42 48.6	43 37.7	8.0811	8.886	2.44	2.87			
14 12 56.5	45	10 37 30.21	37 22.46	10 44 39.6	45 28.8	8.0839	8.887	2.40	2.78			
15 12 52.3	46	10 37 12.69	37 4.90	10 46 30.9	47 20.2	8.0864	8.888	2.36	+2.68			
16 12 48.1	47	10 36 55.07	36 47.24	10 48 22.4	49 11.8	8.0888	8.889	2.31				
17 12 43.9	48	10 36 37.36	36 29.50	10 50 14.1	51 3.5	8.0907	8.890	2.26				
18 12 39.6	49	10 36 19.58	36 11.69	10 52 5.9	52 55.3	8.0924	8.890	2.20				
19 12 35.4	50	10 36 1.73	35 53.82	10 53 57.8	54 47.2	8.0941	8.890	2.12				
20 12 31.2	51	10 35 43.81	35 35.89	10 55 49.7	56 39.1	8.0955	8.890	2.01				
21 12 26.9	52	10 35 25.85	35 17.92	10 57 41.5	58 30.8	8.0964	8.890	1.87	-2.68			
22 12 22.7	53	10 35 7.85	34 59.91	10 59 33.1	60 22.3	8.0973	8.889	-1.68	2.78			
23 12 18.4	54	10 34 49.82	34 41.87	11 1 24.6	2 13.7	8.0979	8.888		2.86			
24 12 14.2	55	10 34 31.77	34 23.82	11 3 15.9	4 4.9	8.0982	8.888		2.93			
25 12 10.0	56	10 34 13.71	34 5.76	11 5 6.9	5 55.7	8.0984	8.886		2.99			
26 12 5.7	57	10 33 55.65	33 47.71	11 6 57.5	7 46.1	8.0982	8.885	+1.63	3.05			
27 12 1.5	58	10 33 37.60	33 29.67	11 8 47.7	9 36.1	8.0979	8.883	1.86	3.11			
28 11 57.2	59	10 33 19.57	33 11.65	11 10 37.5	11 25.6	8.0973	8.881	1.98	3.16			
29 11 53.0	60	10 33 1.57	32 53.67	11 12 26.8	13 14.6	8.0964	8.879	2.03	3.20			
30 11 48.7	61	10 32 43.61	32 35.73	+11 14 15.4	15 3.0	-8.0955	+8.876	+2.16	-3.24			

FOR WASHINGTON SIDEREAL NOON AND MERIDIAN TRANSIT.

Mean Solar Time of Meridian Transit.	Side-real Date.	Apparent Right Ascension.		Apparent Declination.		Log Coefficient of <i>t</i> in Sidereal Minutes.		Log Coefficient of <i>t</i> ² .	
		At Sidereal Oh.	At Transit.	At Sidereal Oh.	At Transit.	In R.A.	In Dec.	In R.A.	In Dec.
Mar. 1 11 53.0	60	10 33 1.57	32 53.67	+11 12 26.8	13 14.6	-8.0964	+8.879	+2.08	-3.20
2 11 48.7	61	10 32 43.61	32 35.73	11 14 15.4	15 3.0	8.0955	8.876	2.16	3.24
3 11 44.5	62	10 32 25.69	32 17.84	11 16 3.4	16 50.7	8.0943	8.874	2.22	3.27
4 11 40.3	63	10 32 7.83	32 0.02	11 17 50.7	18 37.6	8.0926	8.871	2.28	3.30
5 11 36.1	64	10 31 50.05	31 42.27	11 19 37.2	20 23.7	8.0906	8.867	2.33	3.33
6 11 31.9	65	10 31 32.35	31 24.61	11 21 22.8	22 8.9	8.0886	8.864	2.38	3.36
7 11 27.7	66	10 31 14.73	31 7.04	11 23 7.6	23 53.3	8.0864	8.860	2.42	3.39
8 11 23.4	67	10 30 57.21	30 49.57	11 24 51.5	25 36.8	8.0837	8.856	2.46	3.42
9 11 19.2	68	10 30 39.81	30 32.22	11 26 34.4	27 19.2	8.0807	8.852	2.50	3.44
10 11 15.0	69	10 30 22.53	30 14.99	11 28 16.3	29 0.6	8.0777	8.848	2.53	3.46
11 11 10.8	70	10 30 5.37	29 57.90	11 29 57.2	30 41.0	8.0744	8.843	2.56	3.48
12 11 6.5	71	10 29 48.35	29 40.95	11 31 36.9	32 20.2	8.0707	8.837	2.59	3.49
13 11 2.3	72	10 29 31.48	29 24.15	11 33 15.3	33 58.0	8.0667	8.832	2.61	3.50
14 10 58.1	73	10 29 14.77	29 7.52	11 34 52.4	35 34.5	8.0623	8.826	2.63	3.51
15 10 53.9	74	10 28 58.24	28 51.07	11 36 28.2	37 9.7	8.0577	8.820	2.65	3.53
16 10 49.7	75	10 28 41.88	28 34.79	11 38 2.6	38 43.5	8.0530	8.813	2.67	3.54
17 10 45.5	76	10 28 25.70	28 18.70	11 39 35.6	40 15.9	8.0479	8.807	2.68	3.56
18 10 41.3	77	10 28 9.72	28 2.81	11 41 7.2	41 46.8	8.0424	8.800	2.70	3.57
19 10 37.1	78	10 27 53.95	27 47.13	11 42 37.3	43 16.2	8.0364	8.793	2.72	3.58
20 10 32.9	79	10 27 38.40	27 31.67	-11 44 5.9	44 44.1	8.0304	8.785	2.73	3.59
21 10 28.7	80	10 27 23.06	27 16.44	11 45 33.0	46 10.5	8.0242	8.777	2.75	3.60
22 10 24.5	81	10 27 7.95	27 1.44	11 46 58.4	47 35.2	8.0176	8.769	2.76	3.61
23 10 20.3	82	10 26 53.07	26 46.67	11 48 22.1	48 58.2	8.0107	8.760	2.77	3.62
24 10 16.1	83	10 26 38.43	26 32.14	11 49 44.1	50 19.5	8.0035	8.751	2.79	3.63
25 10 12.0	84	10 26 24.04	26 17.86	11 51 4.5	51 39.1	7.9959	8.742	2.80	3.64
26 10 7.8	85	10 26 9.90	26 3.84	11 52 23.2	52 56.9	7.9879	8.732	2.81	3.65
27 10 3.6	86	10 25 56.03	25 50.09	11 53 40.0	54 12.9	7.9795	8.722	2.83	3.65
28 9 59.5	87	10 25 42.43	25 36.61	11 54 55.0	55 27.1	7.9708	8.711	2.84	3.66
29 9 55.3	88	10 25 29.10	25 23.40	11 56 8.1	56 39.4	7.9619	8.700	2.85	3.66
30 9 51.2	89	10 25 16.05	25 10.48	11 57 19.4	57 49.8	7.9524	8.689	2.86	3.67
31 9 47.1	90	10 25 3.20	24 57.85	11 58 28.8	58 58.3	7.9424	8.677	2.87	3.67
Apr. 1 9 42.9	91	10 24 50.83	24 45.52	11 59 36.2	60 4.8	7.9319	8.664	2.88	3.68
2 9 38.8	92	10 24 38.67	24 33.50	12 0 41.6	1 9.4	7.9210	8.650	2.89	3.69
3 9 34.7	93	10 24 26.82	24 21.79	12 1 45.1	2 12.0	7.9095	8.637	2.90	3.69
4 9 30.6	94	10 24 15.29	24 10.40	12 2 46.6	3 12.6	7.8976	8.623	2.90	3.70
5 9 26.5	95	10 24 4.07	23 59.33	12 3 46.0	4 11.1	7.8852	8.608	2.91	3.70
6 9 22.4	96	10 23 53.18	23 48.58	12 4 43.4	5 7.5	7.8718	8.592	2.92	3.70
7 9 18.3	97	10 23 42.63	23 38.17	12 5 38.6	6 1.8	7.8580	8.575	2.93	3.71
8 9 14.2	98	10 23 32.41	23 28.10	12 6 31.7	6 54.0	7.8440	8.558	2.93	3.71
9 9 10.1	99	10 23 22.52	23 18.36	12 7 22.6	7 44.0	7.8291	8.539	2.94	3.72
10 9 6.0	100	10 23 12.98	23 8.97	12 8 11.4	8 31.8	7.8129	8.520	2.94	3.72
11 9 1.9	101	10 23 3.80	22 59.94	12 8 58.0	9 17.4	7.7959	8.500	2.94	3.72
12 8 57.8	102	10 22 54.98	22 51.98	13 9 42.4	10 0.8	7.7781	8.478	2.94	3.73
13 8 53.7	103	10 22 46.52	22 42.98	13 10 24.5	10 42.0	7.7597	8.454	2.95	3.73
14 8 49.7	104	10 22 38.42	22 35.04	13 11 4.4	11 20.9	7.7404	8.430	2.95	3.73
15 8 45.6	105	10 22 30.68	22 27.46	13 11 42.0	11 57.6	7.7199	8.404	2.95	3.73
16 8 41.6	106	10 22 23.31	22 20.25	13 12 17.4	12 32.0	7.6978	8.376	2.95	3.73
17 8 37.6	107	10 22 16.32	22 13.42	13 12 50.5	13 4.1	7.6741	8.346	2.95	3.74
18 8 33.5	108	10 22 9.71	22 6.97	13 13 21.3	13 33.9	7.6492	8.314	2.96	3.74
19 8 29.5	109	10 22 3.48	22 0.91	13 13 49.8	14 1.4	7.6227	8.279	2.96	3.74
20 8 25.5	110	10 21 57.63	21 55.22	13 14 16.0	14 26.6	7.5945	8.240	2.96	3.74
21 8 21.4	111	10 21 52.16	21 49.92	13 14 39.9	14 49.6	7.5639	8.200	2.96	3.74
22 8 17.4	112	10 21 47.08	21 45.00	13 15 1.6	15 10.3	7.5309	8.154	2.96	3.74
23 8 13.4	113	10 21 42.38	21 40.47	13 15 21.0	15 28.7	7.4953	8.103	2.97	3.74
24 8 9.4	114	10 21 38.07	21 36.33	13 15 38.1	15 44.8	7.4560	8.044	2.97	3.74
25 8 5.4	115	10 21 34.15	21 32.58	13 15 52.9	15 58.6	7.4128	7.975	2.97	3.74
26 8 1.4	116	10 21 30.62	21 29.22	13 16 5.3	16 10.0	7.3641	7.893	2.97	3.74
27 7 57.4	117	10 21 27.49	21 26.26	13 16 15.4	16 19.1	7.3092	7.793	2.97	3.74
28 7 53.5	118	10 21 24.75	21 23.69	13 16 23.2	16 25.9	7.2473	7.664	2.98	3.74
29 7 49.5	119	10 21 22.40	21 21.51	13 16 28.7	16 30.4	7.1741	7.475	2.98	3.74
30 7 45.5	120	10 21 20.45	21 19.73	13 16 31.8	16 32.6	7.0859	+7.132	2.98	3.74
31 7 41.6	121	10 21 18.89	21 18.35	+12 16 32.6	16 32.4	-6.9752	-6.319	+2.98	-3.74

FOR WASHINGTON SIDEREAL NOON AND MERIDIAN TRANSIT.													
Mean Solar Time of Meridian Transit.	Side- real Date.	Apparent Right Ascension.				Apparent Declination.				Log Coefficient of t in Sidereal Minutes.		Log Coefficient of t^2 .	
		At Sidereal Oh.		At Transit.		At Sidereal Oh.		At Transit.		In R.A.	In Dec.	In R.A.	In Dec.
		d	h	m	s	m	s	°	'	°	'		
May 1	7 41.6	121	10 21	18.89	21 18.35	+12 16	32.6	16 32.4	-6.9752	-6.319	+2.98	-3.74	
2	7 37.6	122	10 21	17.73	21 17.36	12 16	31.2	16 29.9	6.8239	7.257	2.98	3.74	
3	7 33.7	123	10 21	16.97	21 16.77	12 16	27.4	16 25.1	6.5898	7.536	2.99	3.74	
4	7 29.7	124	10 21	16.61	21 16.58	12 16	21.3	16 18.0	-6.0458	7.702	2.99	3.74	
5	7 25.8	125	10 21	16.65	21 16.79	12 16	12.9	16 8.6	+6.2219	7.824	2.99	3.74	
6	7 21.9	126	10 21	17.09	21 17.40	12 16	2.1	15 56.8	6.6478	7.921	2.99	3.74	
7	7 18.0	127	10 21	17.93	21 18.42	12 15	48.9	15 42.6	6.8587	7.998	2.99	3.74	
8	7 14.1	128	10 21	19.17	21 19.83	12 15	33.4	15 26.1	7.0000	8.062	2.99	3.74	
9	7 10.2	129	10 21	20.81	21 21.64	12 15	15.7	15 7.4	7.1065	8.117	2.99	3.74	
10	7 6.3	130	10 21	22.85	21 23.85	12 14	55.7	14 46.4	7.1919	8.167	2.99	3.74	
11	7 2.4	131	10 21	25.29	21 26.46	12 14	33.4	14 23.1	7.2632	8.212	2.99	3.74	
12	6 58.5	132	10 21	28.13	21 29.48	12 14	8.8	13 57.5	7.3245	8.252	2.99	3.73	
13	6 54.6	133	10 21	31.37	21 32.89	12 13	41.9	13 29.6	7.3782	8.290	2.99	3.73	
14	6 50.8	134	10 21	35.01	21 36.70	12 13	12.7	13 59.4	7.4260	8.324	2.98	3.73	
15	6 46.9	135	10 21	39.05	21 40.91	12 12	41.2	12 26.9	7.4680	8.356	2.98	3.73	
16	6 43.1	136	10 21	43.47	21 45.51	12 12	7.4	11 52.2	7.5058	8.384	2.98	3.73	
17	6 39.3	137	10 21	48.28	21 50.49	12 11	31.4	11 15.3	7.5411	8.410	2.98	3.72	
18	6 35.4	138	10 21	53.48	21 55.85	12 10	53.3	10 36.2	7.5736	8.435	2.97	3.72	
19	6 31.6	139	10 21	59.07	22 1.60	12 10	13.0	9 55.0	7.6039	8.459	2.97	3.72	
20	6 27.8	140	10 22	5.05	22 7.74	12 9	30.5	9 11.6	7.6319	8.481	2.97	3.72	
21	6 23.9	141	10 22	11.41	22 14.27	12 8	45.8	8 26.0	7.6579	8.502	2.96	3.71	
22	6 20.1	142	10 22	18.15	22 21.18	12 7	58.9	7 38.2	7.6824	8.522	2.96	3.71	
23	6 16.3	143	10 22	25.27	22 28.46	12 7	9.9	6 48.2	7.7056	8.541	2.96	3.71	
24	6 12.5	144	10 22	32.77	22 36.12	12 6	18.7	5 56.1	7.7273	8.560	2.95	3.70	
25	6 8.7	145	10 22	40.64	22 44.15	12 5	25.4	5 1.9	7.7477	8.577	2.95	3.70	
26	6 4.9	146	10 22	48.88	22 52.55	12 4	30.0	4 5.5	7.7672	8.593	2.95	3.70	
27	6 1.1	147	10 22	57.49	23 1.32	12 3	32.5	3 7.0	7.7859	8.609	2.95	3.69	
28	5 57.3	148	10 23	6.47	23 10.46	12 2	32.9	2 6.5	7.8038	8.624	2.94	3.69	
29	5 53.5	149	10 23	15.82	23 19.97	12 1	31.3	1 4.0	7.8207	8.638	2.94	3.69	
30	5 49.7	150	10 23	26.53	23 29.84	11 60	27.6	59 59.4	7.8368	8.653	2.94	3.69	
31	5 45.9	151	10 23	35.60	23 40.06	11 59	21.8	58 52.7	7.8524	8.666	2.94	3.68	
June 1	5 42.2	152	10 23	46.03	23 50.64	11 58	14.0	57 44.0	7.8672	8.679	2.93	3.68	
2	5 38.4	153	10 23	56.81	24 1.58	11 57	4.3	56 33.3	7.8813	8.691	2.93	3.68	
3	5 34.7	154	10 24	7.94	24 12.87	11 55	52.5	55 20.6	7.8949	8.704	2.93	3.68	
4	5 30.9	155	10 24	19.42	24 24.51	11 54	38.7	54 5.9	7.9083	8.716	2.93	3.67	
5	5 27.2	156	10 24	31.26	24 36.50	11 53	22.9	52 49.3	7.9214	8.727	2.92	3.67	
6	5 23.5	157	10 24	43.45	24 48.84	11 52	5.1	51 30.7	7.9337	8.738	2.92	3.67	
7	5 19.8	158	10 24	55.98	25 1.52	11 50	45.4	50 10.1	7.9454	8.748	2.92	3.66	
8	5 16.1	159	10 25	8.85	25 14.54	11 49	23.7	48 47.6	7.9568	8.759	2.91	3.66	
9	5 12.4	160	10 25	22.05	25 27.89	11 48	0.1	47 23.2	7.9678	8.768	2.91	3.66	
10	5 8.7	161	10 25	35.59	25 41.57	11 46	34.7	45 57.0	7.9785	8.778	2.91	3.65	
11	5 5.0	162	10 25	49.46	25 55.58	11 45	7.5	44 28.9	7.9889	8.787	2.90	3.65	
12	5 1.3	163	10 26	3.66	26 9.92	11 43	38.4	42 50.0	7.9986	8.796	2.90	3.64	
13	4 57.6	164	10 26	18.17	26 24.58	11 42	7.5	41 27.3	8.0081	8.805	2.89	3.64	
14	4 53.9	165	10 26	33.00	26 39.55	11 40	34.7	39 53.7	8.0173	8.813	2.89	3.63	
15	4 50.2	166	10 26	48.14	26 54.84	11 39	0.1	38 18.3	8.0263	8.822	2.88	3.63	
16	4 46.5	167	10 27	3.60	27 10.44	11 37	23.7	36 41.1	8.0352	8.829	2.88	3.62	
17	4 42.8	168	10 27	19.37	27 26.34	11 35	45.6	35 2.2	8.0436	8.837	2.87	3.62	
18	4 39.2	169	10 27	35.44	27 42.54	11 34	5.8	33 21.6	8.0517	8.845	2.86	3.61	
19	4 35.5	170	10 27	51.81	27 59.04	11 32	24.2	31 39.3	8.0597	8.852	2.86	3.61	
20	4 31.9	171	10 28	8.48	28 15.84	11 30	40.9	29 55.3	8.0673	8.859	2.85	3.60	
21	4 28.3	172	10 28	25.44	28 32.93	11 28	56.0	28 9.6	8.0748	8.865	2.85	3.60	
22	4 24.6	173	10 28	42.69	28 50.31	11 27	9.4	26 22.3	8.0819	8.873	2.84	3.59	
23	4 21.0	174	10 29	0.22	29 7.97	11 25	21.2	24 33.4	8.0890	8.879	2.83	3.59	
24	4 17.4	175	10 29	18.04	29 25.92	11 23	31.4	22 42.9	8.0959	8.885	2.83	3.58	
25	4 13.7	176	10 29	36.14	29 44.15	11 21	40.0	20 50.8	8.1025	8.892	2.82	3.58	
26	4 10.1	177	10 29	54.51	30 2.65	11 19	47.0	18 57.1	8.1090	8.898	2.82	3.57	
27	4 6.5	178	10 30	13.16	30 21.41	11 17	52.5	17 1.9	8.1153	8.903	2.81	3.57	
28	4 2.9	179	10 30	32.07	30 40.44	11 15	56.4	15 5.1	8.1213	8.909	2.80	3.56	
29	3 59.2	180	10 30	51.24	30 59.73	11 13	58.8	13 6.8	8.1272	8.915	2.80	3.56	
30	3 55.6	181	10 31	10.67	31 19.28	11 11	59.7	11 7.0	8.1330	8.920	2.79	3.55	
31	3 52.0	182	10 31	30.36	31 39.09	+11 9	59.1	9 5.7	+8.1387	-8.926	+2.78	-3.55	

FOR WASHINGTON SIDEREAL NOON AND MERIDIAN TRANSIT.

Table with columns: Mean Solar Time of Meridian Transit, Sidereal Date, Apparent Right Ascension (At Sidereal Oh., At Transit), Apparent Declination (At Sidereal Oh., At Transit), Log Coefficient of t in Sidereal Minutes (In R.A., In Dec.), and Log Coefficient of t² (In R.A., In Dec.). Rows are numbered by month (July and Aug.) and day.

FOR WASHINGTON SIDEREAL NOON AND MERIDIAN TRANSIT.

Mean Solar Time of Meridian Transit.	Sidereal Date.	Apparent Right Ascension.		Apparent Declination.		Log Coefficient of t in Sidereal Minutes.		Log Coefficient of t^2 .	
		At Sidereal Oh.	At Transit.	At Sidereal Oh.	At Transit.	In R.A.	In Dec.	In R.A.	In Dec.
		h m s	m s	$^{\circ}$ $'$ $''$	$'$ $''$				
Nov. 1 20 37.5	306	11 24 29.09	24 39.21	+ 5 50 44.7	49 46.0	+8.1712	-8.933	-2.76	+3.60
2 20 33.9	307	11 24 50.33	25 0.34	5 48 42.0	47 44.1	8.1662	8.928	2.77	3.61
3 20 30.3	308	11 25 11.32	25 21.22	5 46 40.9	45 43.8	8.1611	8.922	2.78	3.61
4 20 26.7	309	11 25 32.06	25 41.85	5 44 41.4	43 45.1	8.1568	8.916	2.78	3.62
5 20 23.1	310	11 25 52.55	26 2.22	5 42 43.6	41 48.1	8.1505	8.909	2.79	3.63
6 20 19.5	311	11 26 12.79	26 22.34	5 40 47.6	39 52.9	8.1451	8.903	2.80	3.63
7 20 15.9	312	11 26 32.77	26 42.20	5 38 53.4	37 59.5	8.1394	8.896	2.80	3.64
8 20 12.3	313	11 26 52.49	27 1.80	5 37 1.0	36 7.9	8.1336	8.889	2.81	3.64
9 20 8.7	314	11 27 11.94	27 21.13	5 35 10.4	34 18.2	8.1275	8.882	2.81	3.65
10 20 5.1	315	11 27 31.12	27 40.18	5 33 21.7	32 30.3	8.1213	8.874	2.82	3.66
11 20 1.5	316	11 27 50.02	27 58.95	5 31 34.8	30 44.3	8.1150	8.867	2.83	3.66
12 19 57.9	317	11 28 8.65	28 17.45	5 29 49.7	28 0.1	8.1086	8.859	2.84	3.67
13 19 54.2	318	11 28 27.00	28 35.67	5 28 6.5	27 17.8	8.1018	8.851	2.84	3.67
14 19 50.6	319	11 28 45.06	28 53.60	5 26 25.3	25 37.5	8.0949	8.843	2.85	3.68
15 19 46.9	320	11 29 2.83	29 11.23	5 24 46.0	23 59.1	8.0878	8.834	2.85	3.68
16 19 43.3	321	11 29 20.31	29 28.57	5 23 8.7	22 22.7	8.0806	8.825	2.86	3.69
17 19 39.6	322	11 29 37.50	29 45.62	5 21 33.5	20 48.4	8.0731	8.816	2.86	3.69
18 19 35.9	323	11 29 54.39	30 2.37	5 20 0.3	19 16.2	8.0653	8.806	2.87	3.69
19 19 32.3	324	11 30 10.97	30 18.81	5 18 29.1	17 46.1	8.0573	8.797	2.87	3.70
20 19 28.6	325	11 30 27.25	30 34.94	5 17 0.0	16 18.0	8.0491	8.786	2.88	3.70
21 19 24.9	326	11 30 43.22	30 50.76	5 15 33.0	14 52.0	8.0407	8.776	2.88	3.71
22 19 21.3	327	11 30 58.88	31 6.27	5 14 8.1	13 28.1	8.0320	8.765	2.89	3.71
23 19 17.6	328	11 31 14.22	31 21.46	5 12 45.3	12 6.3	8.0228	8.754	2.89	3.71
24 19 13.9	329	11 31 29.23	31 36.32	5 11 24.7	10 46.7	8.0132	8.742	2.90	3.72
25 19 10.2	330	11 31 43.91	31 50.84	5 10 6.3	9 29.4	8.0035	8.729	2.90	3.72
26 19 6.5	331	11 31 58.26	32 5.03	5 8 50.2	8 14.4	7.9935	8.717	2.91	3.73
27 19 2.8	332	11 32 12.28	32 18.89	5 7 36.3	7 1.6	7.9831	8.703	2.92	3.73
28 18 59.1	333	11 32 25.96	32 32.41	5 6 24.7	5 51.1	7.9723	8.689	2.92	3.73
29 18 55.4	334	11 32 39.30	32 45.59	5 5 15.4	4 42.9	7.9611	8.675	2.93	3.74
30 18 51.7	335	11 32 52.29	32 58.42	5 4 8.4	3 37.0	7.9494	8.660	2.93	3.74
Dec. 1 18 48.0	336	11 33 4.93	33 10.89	5 3 3.7	2 33.4	7.9373	8.644	2.94	3.75
2 18 44.3	337	11 33 17.22	33 23.01	5 2 1.4	1 32.2	7.9250	8.628	2.94	3.75
3 18 40.5	338	11 33 29.16	33 34.78	5 1 1.5	0 33.4	7.9121	8.610	2.94	3.75
4 18 36.8	339	11 33 40.74	33 46.19	4 60 4.0	59 37.0	7.8985	8.592	2.95	3.76
5 18 33.0	340	11 33 51.96	33 57.24	4 59 8.8	58 43.0	7.8844	8.574	2.95	3.76
6 18 29.3	341	11 34 2.81	34 7.92	4 58 16.1	57 51.5	7.8698	8.553	2.95	3.77
7 18 25.5	342	11 34 13.30	34 18.23	4 57 25.9	57 2.5	7.8545	8.532	2.96	3.77
8 18 21.7	343	11 34 23.41	34 28.16	4 56 38.1	56 15.9	7.8384	8.510	2.96	3.77
9 18 18.0	344	11 34 33.15	34 37.72	4 55 52.8	55 31.8	7.8216	8.486	2.96	3.78
10 18 14.2	345	11 34 42.51	34 46.90	4 55 9.9	54 50.1	7.8042	8.461	2.96	3.78
11 18 10.4	346	11 34 51.50	34 55.71	4 54 29.5	54 10.9	7.7864	8.434	2.97	3.78
12 18 6.6	347	11 35 0.12	35 4.15	4 53 51.6	53 34.2	7.7675	8.406	2.97	3.78
13 18 2.8	348	11 35 8.36	35 12.21	4 53 16.2	53 0.1	7.7474	8.374	2.97	3.79
14 17 59.0	349	11 35 16.22	35 19.88	4 52 43.4	52 28.5	7.7262	8.341	2.97	3.79
15 17 55.2	350	11 35 23.69	35 27.17	4 52 13.1	51 59.4	7.7038	8.305	2.97	3.79
16 17 51.4	351	11 35 30.78	35 34.07	4 51 45.3	51 32.8	7.6802	8.266	2.98	3.79
17 17 47.6	352	11 35 37.48	35 40.58	4 51 20.0	51 8.7	7.6549	8.222	2.98	3.80
18 17 43.7	353	11 35 43.79	35 46.70	4 50 57.3	50 47.2	7.6280	8.173	2.98	3.80
19 17 39.9	354	11 35 49.71	35 52.43	4 50 37.1	50 28.3	7.5990	8.118	2.98	3.80
20 17 36.0	355	11 35 55.23	35 57.76	4 50 19.5	50 12.0	7.5680	8.052	2.98	3.80
21 17 32.2	356	11 36 0.36	36 2.70	4 50 4.6	49 58.3	7.5345	7.977	2.99	3.80
22 17 28.3	357	11 36 5.09	36 7.24	4 49 52.2	49 47.1	7.4977	7.887	2.99	3.80
23 17 24.4	358	11 36 9.42	36 11.38	4 49 42.4	49 38.5	7.4576	7.771	2.99	3.80
24 17 20.6	359	11 36 13.35	36 15.11	4 49 35.2	49 32.5	7.4128	7.612	2.99	3.80
25 17 16.7	360	11 36 16.87	36 18.44	4 49 30.6	49 29.2	7.3628	7.353	2.99	3.80
26 17 12.8	361	11 36 19.99	36 21.37	4 49 28.7	49 28.6	7.3070	-6.796	2.99	3.80
27 17 9.0	362	11 36 22.71	36 23.89	4 49 29.4	49 30.6	7.2422	+7.143	2.99	3.80
28 17 5.1	363	11 36 25.02	36 26.01	4 49 32.7	49 35.1	7.1659	7.509	2.99	3.80
29 17 1.2	364	11 36 26.93	36 27.72	4 49 38.5	49 42.2	7.0734	7.702	2.99	3.80
30 16 57.3	365	11 36 28.43	36 29.03	4 49 47.0	49 51.9	6.9556	7.833	2.99	3.80
31 16 53.4	366	11 36 29.53	36 29.93	4 49 58.1	50 4.3	6.7935	7.935	2.99	3.80
32 16 49.4	367	11 36 30.22	36 30.42	+ 4 50 11.8	50 19.3	+6.5274	+8.016	-2.99	+3.79

FOR WASHINGTON SIDEREAL NOON AND MERIDIAN TRANSIT.

Mean Solar Time of Meridian Transit.			Side-real Date.	Apparent Right Ascension.		Apparent Declination.		Log Coefficient of t in Sidereal Minutes.		Log Coefficient of t ² .	
				At Sidereal Oh.	At Transit.	At Sidereal Oh.	At Transit.	In R.A.	In Dec.	In R.A.	In Dec.
Mar.	d	h m	d	h m s	m s	° ' "	' "				
	1	5 46.4	60	4 25 19.00	25 19.66	+21 38 38.8	38 40.4	+7.3782	+7.771	+2.67	+3.01
	2	5 42.5	61	4 25 22.55	25 23.24	21 38 47.5	38 49.2	7.4063	7.797	2.67	3.01
	3	5 38.6	62	4 25 26.32	25 27.05	21 38 56.7	38 58.5	7.4324	7.820	2.67	3.00
	4	5 34.8	63	4 25 30.31	25 31.08	21 39 6.4	39 8.3	7.4565	7.842	2.67	2.99
	5	5 30.9	64	4 25 34.51	25 35.33	21 39 16.6	39 18.6	7.4796	7.861	2.66	2.99
	6	5 27.0	65	4 25 38.95	25 39.80	21 39 27.2	39 29.2	7.4987	7.879	2.66	2.98
	7	5 23.2	66	4 25 43.59	25 44.48	21 39 38.3	39 40.4	7.5178	7.896	2.66	2.98
	8	5 19.3	67	4 25 48.44	25 49.37	21 39 49.9	39 52.1	7.5363	7.913	2.66	2.98
	9	5 15.5	68	4 25 53.50	25 54.47	21 40 2.0	40 4.3	7.5542	7.930	2.66	2.97
	10	5 11.6	69	4 25 58.77	25 59.78	21 40 14.5	40 17.0	7.5715	7.946	2.65	2.97
	11	5 7.8	70	4 26 4.24	26 5.29	21 40 27.6	40 30.1	7.5883	7.962	2.65	2.97
	12	5 3.9	71	4 26 9.92	26 11.00	21 40 41.1	40 43.6	7.6044	7.977	2.65	2.96
	13	5 0.1	72	4 26 15.80	26 16.92	21 40 55.0	40 57.5	7.6200	7.991	2.65	2.96
	14	4 56.3	73	4 26 21.89	26 23.05	21 41 9.3	41 11.9	7.6351	8.004	2.65	2.96
	15	4 52.5	74	4 26 28.19	26 29.39	21 41 24.0	41 26.7	7.6497	8.017	2.64	2.95
	16	4 48.7	75	4 26 34.71	26 35.95	21 41 39.0	41 41.9	7.6639	8.029	2.64	2.95
	17	4 44.9	76	4 26 41.45	26 42.71	21 41 54.4	41 57.5	7.6772	8.040	2.64	2.94
	18	4 41.1	77	4 26 48.39	26 49.67	21 42 10.3	42 13.5	7.6897	8.051	2.64	2.94
	19	4 37.3	78	4 26 55.50	26 56.83	21 42 26.7	42 29.9	7.7014	8.062	2.64	2.93
	20	4 33.4	79	4 27 2.81	27 4.19	21 42 43.5	42 46.8	7.7123	8.073	2.63	2.93
	21	4 29.6	80	4 27 10.31	27 11.73	21 43 0.8	43 4.1	7.7225	8.082	2.63	2.92
	22	4 25.8	81	4 27 18.01	27 19.46	21 43 18.4	43 21.8	7.7326	8.092	2.63	2.91
	23	4 22.0	82	4 27 25.91	27 27.39	21 43 36.4	43 39.9	7.7426	8.101	2.63	2.90
	24	4 18.2	83	4 27 33.99	27 35.49	21 43 54.8	43 58.4	7.7525	8.109	2.62	2.90
	25	4 14.4	84	4 27 42.25	27 43.79	21 44 13.7	44 17.3	7.7622	8.118	2.62	2.89
	26	4 10.6	85	4 27 50.67	27 52.28	21 44 33.0	44 36.7	7.7721	8.126	2.62	2.88
	27	4 6.8	86	4 27 59.28	28 0.94	21 44 52.7	44 56.4	7.7815	8.135	2.61	2.87
	28	4 3.0	87	4 28 8.07	28 9.77	21 45 12.7	45 16.4	7.7905	8.143	2.61	2.86
	29	3 59.2	88	4 28 17.04	28 18.77	21 45 33.0	45 36.7	7.7992	8.151	2.61	2.86
	30	3 55.4	89	4 28 26.19	28 27.94	21 45 53.6	45 57.4	7.8076	8.158	2.60	2.85
	31	3 51.7	90	4 28 35.53	28 37.30	21 46 14.5	46 18.4	7.8157	8.166	2.60	2.84
Apr.	1	3 48.0	91	4 28 45.04	28 46.85	21 46 35.6	46 39.8	7.8232	8.173	2.59	2.83
	2	3 44.2	92	4 28 54.71	28 56.56	21 46 57.2	47 1.5	7.8304	8.180	2.59	2.81
	3	3 40.4	93	4 29 4.54	29 6.43	21 47 19.1	47 23.5	7.8373	8.187	2.58	2.80
	4	3 36.7	94	4 29 14.53	29 16.46	21 47 41.4	47 45.8	7.8439	8.194	2.58	2.79
	5	3 33.0	95	4 29 24.69	29 26.65	21 48 4.0	48 8.3	7.8500	8.198	2.57	2.78
	6	3 29.2	96	4 29 35.03	29 37.01	21 48 26.8	48 31.2	7.8564	8.204	2.57	2.77
	7	3 25.4	97	4 29 45.52	29 47.52	21 48 49.9	48 54.4	7.8628	8.210	2.56	2.76
	8	3 21.7	98	4 29 56.16	29 58.18	21 49 13.3	49 17.9	7.8692	8.216	2.55	2.75
	9	3 17.9	99	4 30 8.95	30 8.99	21 49 37.0	49 41.7	7.8756	8.222	2.55	2.74
	10	3 14.1	100	4 30 17.88	30 19.96	21 50 1.1	50 5.7	7.8820	8.227	2.54	2.73
	11	3 10.4	101	4 30 29.01	30 31.10	21 50 25.5	50 29.9	7.8882	8.232	2.53	2.72
	12	3 6.7	102	4 30 40.27	30 42.36	21 50 50.1	50 54.4	7.8942	8.237	2.52	2.71
	13	3 2.9	103	4 30 51.66	30 53.78	21 51 14.9	51 19.2	7.9000	8.242	2.51	2.70
	14	2 59.2	104	4 31 3.17	31 5.34	21 51 39.9	51 44.4	7.9056	8.247	2.50	2.69
	15	2 55.5	105	4 31 14.81	31 17.04	21 52 5.1	52 9.9	7.9108	8.250	2.49	2.67
	16	2 51.7	106	4 31 26.61	31 28.86	21 52 30.6	52 35.5	7.9160	8.253	2.48	2.65
	17	2 48.0	107	4 31 38.54	31 40.81	21 52 56.3	53 1.3	7.9210	8.256	2.47	2.64
	18	2 44.2	108	4 31 50.60	31 52.89	21 53 22.2	53 27.3	7.9258	8.259	2.46	2.62
	19	2 40.5	109	4 32 2.79	32 5.10	21 53 48.4	53 53.5	7.9304	8.262	2.45	2.60
	20	2 36.7	110	4 32 15.09	32 17.44	21 54 14.8	54 19.8	7.9346	8.266	2.44	2.59
	21	2 33.0	111	4 32 27.54	32 29.91	21 54 41.5	54 46.4	7.9388	8.269	2.42	2.57
	22	2 29.2	112	4 32 40.11	32 42.50	21 55 8.3	55 13.2	7.9430	8.272	2.41	2.55
	23	2 25.5	113	4 32 52.79	32 55.21	21 55 35.2	55 40.2	7.9471	8.275	2.40	2.53
	24	2 21.8	114	4 33 5.58	33 8.04	21 56 2.2	56 7.4	7.9511	8.278	2.39	2.51
	25	2 18.1	115	4 33 18.50	33 20.97	21 56 29.5	56 34.7	7.9552	8.280	2.38	2.49
	26	2 14.4	116	4 33 31.52	33 34.00	21 56 56.9	57 2.1	7.9593	8.282	2.36	2.47
	27	2 10.7	117	4 33 34.64	33 47.13	21 57 24.5	57 29.7	7.9634	8.284	2.35	2.44
	28	2 7.0	118	4 33 47.86	34 0.37	21 57 52.3	57 57.5	7.9674	8.286	2.33	2.42
	29	2 3.3	119	4 34 1.18	34 13.71	21 58 20.3	58 25.6	7.9713	8.288	2.32	2.39
	30	1 59.6	120	4 34 24.59	34 27.17	21 58 48.4	58 53.7	7.9752	8.290	2.31	+2.37
	31	1 55.9	121	4 34 38.12	34 40.72	+21 59 16.6	59 21.9	+7.9748	+8.292	+2.30	

FOR WASHINGTON SIDEREAL NOON AND MERIDIAN TRANSIT.											
Mean Solar Time of Meridian Transit.	Side- real Date.	Apparent Right Ascension.		Apparent Declination.		Log Coefficient of t in Sidereal Minutes.		Log Coefficient of t^2 .			
		At Sidereal Oh.	At Transit.	At Sidereal Oh.	At Transit.	In R.A.	In Dec.	In R.A.	In Dec.		
May	d h m	d	h m s	m s	$^{\circ}$ $'$ $''$	$^{\circ}$ $'$ $''$					
1	1 55.9	121	4 34 38.12	34 40.72	+21 59 16.6	59 21.9	+7.9748	+8.292	+2.30		
2	1 52.2	122	4 34 51.74	34 54.36	21 59 44.9	59 50.2	7.9781	8.294	2.29		
3	1 48.5	123	4 35 5.45	35 8.09	22 0 13.3	0 18.6	7.9811	8.296	2.28		
4	1 44.8	124	4 35 19.25	35 21.91	22 0 41.8	0 47.0	7.9838	8.297	2.27		
5	1 41.1	125	4 35 33.16	35 35.84	22 1 10.2	1 15.5	7.9864	8.298	2.26		
6	1 37.4	126	4 35 47.15	35 49.85	22 1 38.8	1 44.1	7.9888	8.299	2.24		
7	1 33.7	127	4 36 1.21	36 3.93	22 2 7.5	2 12.8	7.9911	8.300	2.22		
8	1 30.0	128	4 36 15.34	36 18.08	22 2 36.3	2 41.6	7.9933	8.301	2.20		
9	1 26.3	129	4 36 29.54	36 32.30	22 3 5.2	3 10.5	7.9954	8.302	2.18		
10	1 22.6	130	4 36 43.81	36 46.57	22 3 34.1	3 39.5	7.9972	8.304	2.17		
11	1 19.0	131	4 36 58.15	37 0.91	22 4 3.1	4 8.6	7.9991	8.305	2.15		
12	1 15.3	132	4 37 12.55	37 15.31	22 4 32.2	4 37.7	8.0010	8.305	2.13		
13	1 11.6	133	4 37 27.00	37 29.77	22 5 1.3	5 6.8	8.0028	8.306	2.11		
14	1 7.9	134	4 37 41.51	37 44.30	22 5 30.4	5 35.9	8.0045	8.307	2.09		
15	1 4.2	135	4 37 56.07	37 58.89	22 5 59.5	6 4.9	8.0060	8.307	2.07		
16	1 0.5	136	4 38 10.70	38 13.53	22 6 28.7	6 34.0	8.0077	8.307	2.04		
17	0 56.8	137	4 38 25.38	38 28.22	22 6 57.9	7 3.2	8.0093	8.307	2.01		
18	0 53.1	138	4 38 40.11	38 42.96	22 7 27.1	7 32.4	8.0108	8.307	1.98		
19	0 49.4	139	4 38 54.89	38 57.76	22 7 56.3	8 1.6	8.0122	8.306	1.94		
20	0 45.7	140	4 39 9.72	39 12.61	22 8 25.5	8 30.9	8.0133	8.306	+1.90		
21	0 42.1	141	4 39 24.59	39 27.49	22 8 54.6	9 0.1	8.0144	8.306			
22	0 38.4	142	4 39 39.49	39 42.40	22 9 23.7	9 29.3	8.0154	8.305			
23	0 34.7	143	4 39 54.42	39 57.34	22 9 52.8	9 58.4	8.0163	8.305			
24	0 31.0	144	4 40 9.38	40 12.31	22 10 21.9	10 27.5	8.0171	8.304			
25	0 27.3	145	4 40 24.37	40 27.29	22 10 51.1	10 56.5	8.0177	8.304			
26	0 23.7	146	4 40 39.38	40 42.30	22 11 20.2	11 25.5	8.0186	8.303			
27	0 20.0	147	4 40 54.41	40 57.34	22 11 49.2	11 54.5	8.0194	8.303			
28	0 16.3	148	4 41 9.46	41 12.40	22 12 18.1	12 23.4	8.0201	8.302			
29	0 12.6	149	4 41 24.53	41 27.48	22 12 46.9	12 52.1	8.0208	8.301			
30	0 8.9	150	4 41 39.63	41 42.58	22 13 15.5	13 20.8	8.0211	8.300			
31	0 5.2	151	4 41 54.75	41 57.69	22 13 44.1	13 49.5	8.0211	8.299			
June	d h m	d	h m s	m s	$^{\circ}$ $'$ $''$	$^{\circ}$ $'$ $''$					
1	0 1.5	152	4 42 9.87	42 12.81	22 14 12.7	14 18.1	8.0212	8.298			
2	23 57.9	153	4 42 24.99	42 27.93	22 14 41.3	14 46.7	8.0212	8.297			
3	23 54.2	154	4 42 40.11	42 43.06	22 15 9.9	15 15.2	8.0211	8.296			
4	23 50.5	155	4 42 55.23	42 58.20	22 15 38.4	15 43.7	8.0211	8.294			
5	23 46.8	156	4 43 10.35	43 13.33	22 16 6.8	16 12.0	8.0210	8.292			
6	23 43.1	157	4 43 25.47	43 28.45	22 16 35.1	16 40.2	8.0209	8.290			
7	23 39.4	158	4 43 40.59	43 43.57	22 17 3.2	17 8.3	8.0207	8.288			
8	23 35.7	159	4 43 55.71	43 58.68	22 17 31.1	17 36.3	8.0204	8.286			
9	23 32.0	160	4 44 10.81	44 13.78	22 17 59.0	18 4.2	8.0202	8.285		-2.37	
10	23 28.4	161	4 44 25.89	44 28.86	22 18 26.8	18 32.0	8.0195	8.283		2.39	
11	23 24.7	162	4 44 40.94	44 43.91	22 18 54.4	18 59.6	8.0187	8.281		2.42	
12	23 21.0	163	4 44 55.96	44 58.93	22 19 21.8	19 27.0	8.0178	8.279		2.44	
13	23 17.3	164	4 45 10.95	45 13.92	22 19 49.1	19 54.2	8.0168	8.277		2.47	
14	23 13.6	165	4 45 25.90	45 28.86	22 20 16.2	20 21.3	8.0157	8.275	-1.90	2.49	
15	23 10.0	166	4 45 40.82	45 43.77	22 20 43.2	20 48.3	8.0146	8.273	1.94	2.51	
16	23 6.3	167	4 45 55.71	45 58.65	22 21 10.1	21 15.2	8.0135	8.271	1.98	2.53	
17	23 2.6	168	4 46 10.57	46 13.50	22 21 36.8	21 41.9	8.0123	8.269	2.01	2.55	
18	22 58.9	169	4 46 25.40	46 28.32	22 22 3.3	22 8.4	8.0110	8.266	2.04	2.57	
19	22 55.2	170	4 46 40.19	46 43.10	22 22 29.8	22 34.8	8.0100	8.263	2.07	2.59	
20	22 51.5	171	4 46 54.91	46 57.83	22 22 56.1	23 1.0	8.0087	8.260	2.10	2.61	
21	22 47.8	172	4 47 9.58	47 12.50	22 23 22.2	23 27.1	8.0074	8.257	2.12	2.63	
22	22 44.1	173	4 47 24.20	47 27.11	22 23 48.1	23 53.0	8.0060	8.254	2.14	2.65	
23	22 40.4	174	4 47 38.77	47 41.67	22 24 13.8	24 18.7	8.0045	8.251	2.16	2.66	
24	22 36.8	175	4 47 53.29	47 56.18	22 24 39.4	24 44.2	8.0030	8.248	2.17	2.67	
25	22 33.1	176	4 48 7.76	48 10.64	22 25 4.8	25 9.6	8.0013	8.245	2.19	2.67	
26	22 29.4	177	4 48 22.17	48 25.04	22 25 30.0	25 34.8	7.9994	8.242	2.20	2.68	
27	22 25.7	178	4 48 36.52	48 39.38	22 25 55.1	25 59.8	7.9974	8.239	2.21	2.68	
28	22 22.0	179	4 48 50.84	48 53.66	22 26 20.0	26 24.6	7.9953	8.236	2.23	2.69	
29	22 18.3	180	4 49 5.06	49 7.90	22 26 44.7	26 49.3	7.9932	8.233	2.24	2.69	
30	22 14.6	181	4 49 19.23	49 22.01	22 27 9.1	27 13.9	7.9910	8.229	2.25	2.70	
31	22 10.9	182	4 49 33.29	49 36.05	+22 27 33.3	27 38.1	+7.9887	+8.225	-2.27	-2.70	

URANUS, 1861.

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FOR WASHINGTON SIDEREAL NOON AND MERIDIAN TRANSIT.

Mean Solar Time of Meridian Transit.			Sidereal Date.	Apparent Right Ascension.		Apparent Declination.		Log Coefficient of t in Sidereal Minutes.		Log Coefficient of t^2 .	
				At Sidereal Oh.	At Transit.	At Sidereal Oh.	At Transit.	In R.A.	In Dec.	In R.A.	In Dec.
July	1	22 7.2	183	4 49 47.24	49 50.01	+22° 27' 57.3	28' 2.1	+7.9863	+8.221	-2.28	-2.70
	2	22 3.5	184	4 50 1.12	50 3.89	22 28 21.1	28 25.9	7.9838	8.217	2.30	2.71
	3	21 59.8	185	4 50 14.93	50 17.71	22 28 44.7	28 49.4	7.9811	8.211	2.32	2.71
	4	21 56.1	186	4 50 28.67	50 31.44	22 29 8.0	29 12.7	7.9782	8.207	2.33	2.71
	5	21 52.4	187	4 50 42.31	50 45.07	22 29 31.1	29 35.8	7.9752	8.202	2.34	2.72
	6	21 48.7	188	4 50 55.86	50 58.60	22 29 54.0	29 58.6	7.9721	8.198	2.36	2.72
	7	21 45.0	189	4 51 9.31	51 12.03	22 30 16.7	30 21.2	7.9689	8.194	2.37	2.72
	8	21 41.3	190	4 51 22.66	51 25.35	22 30 39.2	30 43.6	7.9658	8.190	2.39	2.73
	9	21 37.6	191	4 51 35.92	51 38.57	22 31 1.4	31 5.8	7.9626	8.186	2.40	2.73
	10	21 33.9	192	4 51 49.07	51 51.69	22 31 23.4	31 27.8	7.9592	8.181	2.41	2.73
	11	21 30.2	193	4 52 2.11	52 4.71	22 31 45.1	31 49.5	7.9556	8.176	2.43	2.74
	12	21 26.4	194	4 52 15.04	52 17.63	22 32 6.6	32 10.9	7.9518	8.171	2.44	2.74
	13	21 22.7	195	4 52 27.87	52 30.47	22 32 27.8	32 32.0	7.9478	8.166	2.45	2.75
	14	21 19.0	196	4 52 40.58	52 43.17	22 32 48.8	32 53.0	7.9438	8.161	2.46	2.75
	15	21 15.2	197	4 52 53.17	52 55.74	22 33 9.6	33 13.8	7.9398	8.156	2.47	2.75
	16	21 11.5	198	4 53 5.64	53 8.18	22 33 30.2	33 34.4	7.9357	8.151	2.49	2.76
	17	21 7.8	199	4 53 17.98	53 20.49	22 33 50.6	33 54.7	7.9315	8.145	2.50	2.76
	18	21 4.1	200	4 53 30.20	53 32.69	22 34 10.6	34 14.6	7.9272	8.140	2.51	2.77
	19	21 0.3	201	4 53 42.32	53 44.77	22 34 30.4	34 34.4	7.9227	8.134	2.52	2.77
	20	20 56.6	202	4 53 54.31	53 56.72	22 34 49.9	34 53.9	7.9181	8.128	2.52	2.77
	21	20 52.9	203	4 54 6.16	54 8.54	22 35 9.1	35 13.0	7.9133	8.122	2.53	2.78
	22	20 49.1	204	4 54 17.87	54 20.23	22 35 28.0	35 32.8	7.9083	8.116	2.53	2.78
	23	20 45.4	205	4 54 29.45	54 31.80	22 35 46.6	35 50.3	7.9032	8.109	2.54	2.78
	24	20 41.6	206	4 54 40.90	54 43.22	22 36 5.0	36 8.7	7.8979	8.104	2.54	2.79
	25	20 37.9	207	4 54 52.20	54 54.49	22 36 23.2	36 26.9	7.8924	8.099	2.55	2.79
	26	20 34.1	208	4 55 3.35	55 5.61	22 36 41.1	36 44.7	7.8868	8.093	2.56	2.79
	27	20 30.4	209	4 55 14.35	55 16.58	22 36 58.7	37 2.2	7.8811	8.088	2.56	2.80
	28	20 26.7	210	4 55 25.22	55 27.41	22 37 16.0	37 19.5	7.8754	8.077	2.57	2.80
	29	20 23.0	211	4 55 35.95	55 38.11	22 37 33.1	37 36.4	7.8693	8.070	2.57	2.80
	30	20 19.2	212	4 55 46.52	55 48.65	22 37 49.9	37 53.4	7.8630	8.063	2.58	2.81
	31	20 15.4	213	4 55 56.93	55 59.03	22 38 6.4	38 9.8	7.8565	8.056	2.59	2.81
Aug.	1	20 11.6	214	4 56 7.18	56 9.25	22 38 22.5	38 25.8	7.8498	8.049	2.59	2.81
	2	20 7.9	215	4 56 17.27	56 19.31	22 38 38.3	38 41.5	7.8431	8.042	2.60	2.82
	3	20 4.1	216	4 56 27.22	56 29.23	22 38 53.9	38 57.1	7.8359	8.034	2.60	2.82
	4	20 0.3	217	4 56 37.00	56 38.98	22 39 9.2	39 12.3	7.8285	8.026	2.61	2.82
	5	19 56.6	218	4 56 46.61	56 48.56	22 39 24.3	39 27.3	7.8209	8.018	2.62	2.82
	6	19 52.8	219	4 56 56.05	56 57.97	22 39 39.1	39 42.1	7.8131	8.010	2.62	2.82
	7	19 49.0	220	4 57 5.32	57 7.21	22 39 53.7	39 56.7	7.8049	8.000	2.63	2.83
	8	19 45.2	221	4 57 14.42	57 16.27	22 40 7.9	40 10.9	7.7963	7.990	2.63	2.83
	9	19 41.4	222	4 57 23.34	57 25.15	22 40 21.8	40 24.7	7.7874	7.980	2.64	2.83
	10	19 37.6	223	4 57 32.08	57 33.85	22 40 35.4	40 38.3	7.7783	7.970	2.64	2.83
	11	19 33.8	224	4 57 40.64	57 42.37	22 40 48.7	40 51.5	7.7690	7.960	2.65	2.83
	12	19 30.0	225	4 57 49.01	57 50.71	22 41 1.6	41 4.3	7.7596	7.949	2.65	2.84
	13	19 26.2	226	4 57 57.20	57 58.86	22 41 14.3	41 16.9	7.7498	7.938	2.65	2.84
	14	19 22.4	227	4 58 5.20	58 6.82	22 41 26.7	41 29.2	7.7397	7.927	2.66	2.84
	15	19 18.6	228	4 58 13.01	58 14.50	22 41 38.8	41 41.3	7.7293	7.916	2.66	2.84
	16	19 14.8	229	4 58 20.62	58 22.17	22 41 50.7	41 53.1	7.7186	7.905	2.66	2.84
	17	19 11.0	230	4 58 28.04	58 29.55	22 42 2.3	42 4.7	7.7078	7.894	2.67	2.85
	18	19 7.2	231	4 58 35.29	58 36.75	22 42 13.5	42 15.9	7.6966	7.882	2.67	2.85
	19	19 3.4	232	4 58 42.35	58 43.77	22 42 24.4	42 26.8	7.6850	7.870	2.68	2.85
	20	18 59.5	233	4 58 49.21	58 50.60	22 42 35.0	42 37.0	7.6730	7.858	2.68	2.85
	21	18 55.7	234	4 58 55.87	58 57.24	22 42 45.3	42 47.3	7.6606	7.846	2.68	2.85
22	18 51.9	235	4 59 2.36	59 3.67	22 42 55.3	42 57.3	7.6478	7.833	2.69	2.86	
23	18 48.1	236	4 59 8.66	59 9.92	22 43 5.0	43 7.0	7.6341	7.818	2.69	2.86	
24	18 44.2	237	4 59 14.75	59 15.96	22 43 14.4	43 16.4	7.6194	7.803	2.69	2.86	
25	18 40.4	238	4 59 20.63	59 21.79	22 43 23.5	43 25.5	7.6037	7.788	2.69	2.86	
26	18 36.6	239	4 59 26.30	59 27.41	22 43 32.3	43 34.2	7.5870	7.773	2.70	2.86	
27	18 32.8	240	4 59 31.75	59 32.84	22 43 40.7	43 42.4	7.5691	7.756	2.70	2.87	
28	18 29.0	241	4 59 36.99	59 38.04	22 43 48.8	43 50.4	7.5516	7.739	2.70	2.87	
29	18 25.1	242	4 59 42.02	59 43.03	22 43 52.6	43 58.1	7.5336	7.722	2.70	2.87	
30	18 21.3	243	4 59 46.84	59 47.81	22 44 4.1	44 5.5	7.5150	7.704	2.70	2.87	
31	18 17.4	244	4 59 51.45	59 52.38	+22 44 11.3	44 12.7	+7.4959	+7.686	-2.71	-2.87	

FOR WASHINGTON SIDEREAL NOON AND MERIDIAN TRANSIT.									
Mean Solar Time of Meridian Transit.	Sidereal Date.	Apparent Right Ascension.		Apparent Declination.		Log Coefficient of <i>t</i> in Sidereal Minutes.		Log Coefficient of <i>t</i> of τ .	
		At Sidereal Oh.	At Transit.	At Sidereal Oh.	At Transit.	In R.A.	In Dec.	In R.A.	In Dec.
Sept. 1 18 13.6	245	4 59 55.86	59 56.73	+22 44 18.2	44 19.6	+7.4760	+7.668	-2.71	-2.88
2 18 9.7	246	5 0 0.06	0 0.89	22 44 24.8	44 26.2	7.4547	7.644	2.71	2.88
3 18 5.9	247	5 0 4.04	0 4.83	22 44 31.1	44 32.4	7.4314	7.620	2.71	2.88
4 18 2.0	248	5 0 7.90	0 38.55	22 44 37.6	44 38.3	7.4061	7.596	2.71	2.88
5 17 58.1	249	5 0 11.34	0 12.05	22 44 42.8	44 43.8	7.3788	7.572	2.71	2.88
6 17 54.2	250	5 0 14.66	0 15.32	22 44 48.0	44 49.0	7.3494	7.549	2.71	2.89
7 17 50.3	251	5 0 17.77	0 18.38	22 44 53.0	44 53.9	7.3156	7.517	2.71	2.89
8 17 46.4	252	5 0 20.67	0 21.23	22 44 57.7	44 58.5	7.2788	7.485	2.72	2.89
9 17 42.5	253	5 0 23.35	0 23.86	22 45 2.1	45 2.8	7.2188	7.453	2.72	2.89
10 17 38.6	254	5 0 25.81	0 26.27	22 45 6.2	45 6.9	7.1752	7.420	2.72	2.89
11 17 34.7	255	5 0 28.04	0 28.46	22 45 9.9	45 10.6	7.1700	7.386	2.72	2.90
12 17 30.8	256	5 0 30.06	0 30.43	22 45 13.3	45 14.0	7.1152	7.337	2.72	2.90
13 17 26.9	257	5 0 31.86	0 32.18	22 45 16.4	45 17.0	7.0554	7.288	2.72	2.90
14 17 23.0	258	5 0 33.44	0 33.71	22 45 19.2	45 19.7	6.9906	7.239	2.72	2.90
15 17 19.1	259	5 0 34.90	0 35.02	22 45 21.7	45 22.1	6.9208	7.190	2.72	2.90
16 17 15.2	260	5 0 35.92	0 36.11	22 45 23.9	45 24.3	6.8460	7.143	2.72	2.90
17 17 11.3	261	5 0 36.32	0 36.98	22 45 25.7	45 26.1	6.7393	7.063	2.72	2.91
18 17 7.4	262	5 0 37.50	0 37.62	22 45 27.2	45 27.5	6.5974	6.963	2.72	2.91
19 17 3.4	263	5 0 37.96	0 38.03	22 45 28.4	45 28.6	6.3856	6.843	2.71	2.91
20 16 59.5	264	5 0 38.20	0 38.21	22 45 29.3	45 29.4	+5.9955	6.703	2.71	2.91
21 16 55.6	265	5 0 38.22	0 38.16	22 45 30.0	45 30.0	-5.8869	6.540	2.71	2.91
22 16 51.7	266	5 0 38.01	0 37.90	22 45 30.3	45 30.2	6.3467	+6.200	2.71	2.91
23 16 47.8	267	5 0 37.58	0 37.43	22 45 30.2	45 30.1	6.5740	-6.250	2.71	2.91
24 16 43.8	268	5 0 36.93	0 36.75	22 45 29.8	45 29.7	6.7167	6.644	2.71	2.91
25 16 39.9	269	5 0 36.07	0 35.86	22 45 29.1	45 29.0	6.8283	6.735	2.71	2.91
26 16 35.9	270	5 0 34.99	0 34.74	22 45 28.2	45 28.0	6.9205	6.823	2.70	2.90
27 16 32.0	271	5 0 33.63	0 33.39	22 45 26.9	45 26.6	6.9900	7.003	2.70	2.90
28 16 28.0	272	5 0 32.15	0 31.81	22 45 25.3	45 24.9	7.0564	7.105	2.70	2.90
29 16 24.0	273	5 0 30.40	0 30.00	22 45 23.4	45 23.0	7.1087	7.184	2.70	2.89
30 16 20.0	274	5 0 28.43	0 27.96	22 45 21.2	45 20.7	7.1508	7.237	2.70	2.89
Oct. 1 16 16.1	275	5 0 26.22	0 25.71	22 45 18.7	45 18.1	7.2090	7.273	2.69	2.88
2 16 12.1	276	5 0 23.78	0 23.24	22 45 15.8	45 15.1	7.2476	7.315	2.69	2.88
3 16 8.1	277	5 0 21.13	0 20.55	22 45 12.6	45 11.9	7.2832	7.355	2.69	2.88
4 16 4.2	278	5 0 18.27	0 17.65	22 45 9.1	45 8.4	7.3158	7.393	2.69	2.87
5 16 0.2	279	5 0 15.20	0 14.53	22 45 5.4	45 4.6	7.3454	7.429	2.68	2.87
6 15 56.2	280	5 0 11.93	0 11.21	22 45 1.4	45 0.5	7.3718	7.465	2.68	2.86
7 15 52.2	281	5 0 8.44	0 7.69	22 44 57.0	44 56.0	7.3968	7.497	2.68	2.86
8 15 48.2	282	5 0 4.74	0 3.94	22 44 52.3	44 51.2	7.4208	7.527	2.68	2.85
9 15 44.2	283	5 0 0.84	59 59.99	22 44 47.3	44 46.1	7.4438	7.556	2.67	2.85
10 15 40.2	284	4 59 56.73	59 55.83	22 44 42.0	44 40.7	7.4655	7.581	2.67	2.84
11 15 36.2	285	4 59 52.41	59 51.47	22 44 36.3	44 35.1	7.4870	7.606	2.67	2.83
12 15 32.2	286	4 59 47.89	59 46.91	22 44 30.4	44 29.1	7.5074	7.626	2.66	2.83
13 15 28.2	287	4 59 43.17	59 42.15	22 44 24.2	44 22.8	7.5268	7.650	2.66	2.82
14 15 24.2	288	4 59 38.25	59 37.19	22 44 17.7	44 16.2	7.5452	7.671	2.65	2.82
15 15 20.2	289	4 59 33.13	59 32.03	22 44 10.9	44 9.3	7.5626	7.691	2.65	2.81
16 15 16.2	290	4 59 27.80	59 26.65	22 44 3.6	44 2.1	7.5788	7.711	2.64	2.80
17 15 12.1	291	4 59 22.25	59 21.08	22 43 56.1	43 54.6	7.5939	7.730	2.64	2.80
18 15 8.1	292	4 59 16.52	59 15.32	22 43 48.4	43 46.9	7.6082	7.747	2.63	2.79
19 15 4.0	293	4 59 10.61	59 9.37	22 43 40.4	43 38.9	7.6217	7.762	2.63	2.78
20 15 0.0	294	4 59 4.52	59 3.23	22 43 32.2	43 30.6	7.6344	7.775	2.62	2.77
21 14 55.9	295	4 58 58.25	58 56.90	22 43 23.7	43 21.9	7.6464	7.786	2.61	2.76
22 14 51.9	296	4 58 51.79	58 50.40	22 43 14.9	43 13.0	7.6581	7.798	2.61	2.75
23 14 47.8	297	4 58 45.15	58 43.73	22 43 5.8	43 3.9	7.6696	7.810	2.60	2.74
24 14 43.8	298	4 58 38.34	58 36.89	22 42 56.4	42 54.5	7.6809	7.822	2.59	2.73
25 14 39.8	299	4 58 31.36	58 29.88	22 42 46.8	42 44.8	7.6920	7.834	2.58	2.72
26 14 35.8	300	4 58 24.21	58 22.68	22 42 36.9	42 34.8	7.7031	7.846	2.57	2.71
27 14 31.7	301	4 58 16.86	58 15.32	22 42 26.7	42 24.6	7.7134	7.858	2.57	2.70
28 14 27.6	302	4 58 9.35	58 7.80	22 42 16.2	42 14.1	7.7232	7.870	2.56	2.69
29 14 23.6	303	4 58 1.68	58 0.09	22 42 5.4	42 3.3	7.7325	7.881	2.55	2.68
30 14 19.5	304	4 57 53.86	57 52.20	22 41 54.3	41 52.1	7.7413	7.892	2.55	2.67
31 14 15.4	305	4 57 45.85	57 44.16	22 41 43.0	41 40.6	7.7495	7.903	2.54	2.65
32 14 11.4	306	4 57 37.69	57 35.98	+22 41 31.4	41 28.9	-7.7574	-7.913	-2.53	-2.64

FOR WASHINGTON SIDEREAL NOON AND MERIDIAN TRANSIT.

Mean Solar Time of Meridian Transit.	Side- real Date.	Apparent Right Ascension.		Apparent Declination.		Log. Coefficient of t in Sidereal Minutes.		Log. Coefficient of t^2 .	
		At Sidereal Oh.	At Transit.	At Sidereal Oh.	At Transit.	In R.A.	In Dec.	In R.A.	In Dec.
Mar. 1 1 18.1	60	23 56 12.50	56 12.48	- 1° 49' 36.8	49 36.9	+7.7455	+8.562		
2 1 14.3	61	23 56 20.53	56 20.51	1 48 44.2	48 44.3	7.7472	8.563		
3 1 10.5	62	23 56 28.59	56 28.57	1 47 51.4	47 51.5	7.7488	8.565		
4 1 6.7	63	23 56 36.68	56 36.66	1 46 58.4	46 58.5	7.7504	8.566		
5 1 2.9	64	23 56 44.80	56 44.78	1 46 5.3	46 5.3	7.7520	8.567		
6 0 59.1	65	23 56 52.95	56 52.93	1 45 12.1	45 12.1	7.7536	8.568		
7 0 55.3	66	23 57 1.13	57 1.11	1 44 18.7	44 18.7	7.7552	8.569		
8 0 51.5	67	23 57 9.34	57 9.32	1 43 25.2	43 25.2	7.7565	8.570		
9 0 47.7	68	23 57 17.57	57 17.55	1 42 31.7	42 31.7	7.7575	8.571		
10 0 43.9	69	23 57 25.82	57 25.80	1 41 38.1	41 38.1	7.7584	8.572		
11 0 40.1	70	23 57 34.08	57 34.06	1 40 44.4	40 44.4	7.7593	8.573		
12 0 36.3	71	23 57 42.36	57 42.34	1 39 50.6	39 50.6	7.7602	8.573		
13 0 32.5	72	23 57 50.66	57 50.64	1 38 56.7	38 56.7	7.7610	8.573		
14 0 28.7	73	23 57 58.97	57 58.95	1 38 2.8	38 2.8	7.7612	8.573		
15 0 24.9	74	23 58 7.28	58 7.27	1 37 8.9	37 8.9	7.7615	8.574		
16 0 21.1	75	23 58 15.60	58 15.59	1 36 14.9	36 14.9	7.7617	8.574		
17 0 17.3	76	23 58 23.92	58 23.91	1 35 20.9	35 20.9	7.7620	8.573		
18 0 13.5	77	23 58 32.25	58 32.24	1 34 27.0	34 27.0	7.7624	8.573		
19 0 9.7	78	23 58 40.59	58 40.58	1 33 33.1	33 33.1	7.7628	8.573		
20 0 5.9	79	23 58 48.93	58 48.92	1 32 39.3	32 39.3	7.7631	8.572		
21 0 2.1	80	23 58 57.28	58 57.27	1 31 45.5	31 45.5	7.7631	8.572		
21 23 58.3	81	23 59 5.62	59 5.61	1 30 51.8	30 51.8	7.7625	8.571		
22 23 54.5	82	23 59 13.95	59 13.94	1 29 58.2	29 58.2	7.7620	8.570		
23 23 50.7	83	23 59 22.27	59 22.26	1 29 4.7	29 4.7	7.7617	8.570		
24 23 47.0	84	23 59 30.59	59 30.58	1 28 11.2	28 11.2	7.7612	8.569	-1.73	-2.70
25 23 43.2	85	23 59 38.89	59 38.88	1 27 17.8	27 17.8	7.7605	8.568	1.77	2.73
26 23 39.4	86	23 59 47.18	59 47.17	1 26 24.6	26 24.6	7.7599	8.567	1.80	2.75
27 23 35.6	87	23 59 55.46	59 55.46	1 25 31.5	25 31.5	7.7591	8.566	1.82	2.77
28 23 31.8	88	0 0 3.72	0 3.72	1 24 38.5	24 38.5	7.7584	8.565	1.84	2.78
29 23 28.0	89	0 0 11.97	0 11.97	1 23 45.7	23 45.7	7.7575	8.564	1.87	2.80
30 23 24.2	90	0 0 20.20	0 20.20	1 22 53.1	22 53.1	7.7565	8.562	1.89	2.82
31 23 20.4	91	0 0 28.41	0 28.41	1 22 0.6	22 0.6	7.7552	8.561	1.92	2.84
Apr. 1 23 16.6	92	0 0 36.59	0 36.59	1 21 8.3	21 8.3	7.7538	8.559	1.94	2.85
2 23 12.8	93	0 0 44.75	0 44.75	1 20 16.2	20 16.2	7.7525	8.557	1.97	2.87
3 23 9.0	94	0 0 52.88	0 52.88	1 19 24.4	19 24.4	7.7512	8.555	1.99	2.89
4 23 5.2	95	0 1 0.98	1 0.98	1 18 32.8	18 32.8	7.7498	8.553	2.01	2.90
5 23 1.4	96	0 1 9.07	1 9.07	1 17 41.4	17 41.4	7.7484	8.551	2.03	2.91
6 22 57.6	97	0 1 17.13	1 17.13	1 16 50.3	16 50.3	7.7469	8.549	2.05	2.93
7 22 53.8	98	0 1 25.15	1 25.15	1 15 59.4	15 59.4	7.7444	8.547	2.07	2.94
8 22 50.0	99	0 1 33.13	1 33.13	1 15 8.8	15 8.8	7.7428	8.545	2.09	2.95
9 22 46.2	100	0 1 41.08	1 41.08	1 14 18.5	14 18.5	7.7409	8.543	2.10	2.96
10 22 42.4	101	0 1 48.99	1 48.99	1 13 28.5	13 28.5	7.7387	8.540	2.12	2.97
11 22 38.6	102	0 1 56.86	1 56.87	1 12 38.8	12 38.8	7.7364	8.537	2.13	2.98
12 22 34.8	103	0 2 4.68	2 4.69	1 11 49.4	11 49.4	7.7340	8.534	2.14	2.99
13 22 31.0	104	0 2 12.46	2 12.47	1 11 0.3	11 0.3	7.7315	8.531	2.15	3.00
14 22 27.2	105	0 2 20.20	2 20.21	1 10 11.5	10 11.5	7.7290	8.528	2.16	3.01
15 22 23.4	106	0 2 27.89	2 27.90	1 9 23.1	9 23.1	7.7262	8.525	2.17	3.02
16 22 19.6	107	0 2 35.53	2 35.54	1 8 35.1	8 35.0	7.7233	8.522	2.18	3.03
17 22 15.8	108	0 2 43.12	2 43.13	1 7 47.5	7 47.4	7.7204	8.519	2.19	3.04
18 22 12.0	109	0 2 50.66	2 50.67	1 7 0.2	7 0.1	7.7172	8.515	2.20	3.05
19 22 8.2	110	0 2 58.14	2 58.15	1 6 13.3	6 13.2	7.7141	8.511	2.21	3.06
20 22 4.4	111	0 3 5.57	3 5.58	1 5 26.8	5 26.7	7.7108	8.507	2.22	3.07
21 22 0.6	112	0 3 12.94	3 12.95	1 4 40.7	4 40.6	7.7073	8.503	2.23	3.08
22 21 56.8	113	0 3 20.25	3 20.26	1 3 55.1	3 55.0	7.7037	8.499	2.24	3.09
23 21 53.0	114	0 3 27.50	3 27.51	1 3 9.9	3 9.8	7.7001	8.495	2.25	3.10
24 21 49.2	115	0 3 34.69	3 34.70	1 2 25.1	2 25.0	7.6965	8.491	2.26	3.11
25 21 45.4	116	0 3 41.83	3 41.84	1 1 40.8	1 40.7	7.6928	8.487	2.27	3.11
26 21 41.6	117	0 3 48.90	3 48.91	1 0 56.9	0 56.8	7.6889	8.482	2.28	3.12
27 21 37.8	118	0 3 55.90	3 55.91	1 0 13.5	0 13.4	7.6847	8.477	2.29	3.13
28 21 34.0	119	0 4 2.83	4 2.85	0 59 30.6	59 30.5	7.6805	8.472	2.30	3.14
29 21 30.1	120	0 4 9.70	4 9.72	0 58 48.1	58 48.0	7.6763	8.467	2.30	3.14
30 21 26.3	121	0 4 16.50	4 16.52	- 0 58 6.1	58 6.0	+7.6718	+8.462	-2.31	-3.15

NEPTUNE, 1861.

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FOR WASHINGTON SIDEREAL NOON AND MERIDIAN TRANSIT.

Mean Solar Time of Meridian Transit.			Sidereal Date.	Apparent Right Ascension.		Apparent Declination.		Log Coefficient of t in Sidereal Minutes.		Log Coefficient of t^2 .	
				At Sidereal Oh.	At Transit.	At Sidereal Oh.	At Transit.	In R.A.	In Dec.	In R.A.	In Dec.
Nov. 1	9 14.1	306	23 59 25.47	59 25.47	- 1 35 40.7	35 40.7	-7.4776	-8.265	+2.38	+3.22	
2	9 10.1	307	23 59 21.19	59 21.19	1 36 6.9	36 6.9	7.4684	8.255	2.39	3.23	
3	9 6.1	308	23 59 16.99	59 16.99	1 36 32.4	36 32.4	7.4591	8.245	2.39	3.23	
4	9 2.1	309	23 59 12.89	59 12.89	1 36 57.4	36 57.4	7.4496	8.234	2.40	3.24	
5	8 58.1	310	23 59 8.88	59 8.88	1 37 21.7	37 21.7	7.4398	8.222	2.40	3.24	
6	8 54.1	311	23 59 4.96	59 4.96	1 37 45.3	37 45.3	7.4293	8.210	2.41	3.25	
7	8 50.1	312	23 59 1.14	59 1.14	1 38 8.3	38 8.3	7.4179	8.197	2.41	3.25	
8	8 46.1	313	23 58 57.42	58 57.42	1 38 30.6	38 30.6	7.4063	8.183	2.42	3.26	
9	8 42.1	314	23 58 53.80	58 53.80	1 38 52.2	38 52.2	7.3943	8.169	2.42	3.26	
10	8 38.1	315	23 58 50.27	58 50.27	1 39 13.1	39 13.1	7.3819	8.155	2.43	3.27	
11	8 34.1	316	23 58 46.84	58 46.84	1 39 33.4	39 33.4	7.3692	8.140	2.43	3.27	
12	8 30.2	317	23 58 43.52	58 43.52	1 39 53.0	39 53.0	7.3555	8.125	2.44	3.27	
13	8 26.2	318	23 58 40.31	58 40.31	1 40 11.9	40 11.9	7.3413	8.109	2.44	3.28	
14	8 22.2	319	23 58 37.20	58 37.20	1 40 30.1	40 30.1	7.3273	8.092	2.44	3.28	
15	8 18.2	320	23 58 34.19	58 34.19	1 40 47.5	40 47.5	7.3121	8.073	2.45	3.28	
16	8 14.2	321	23 58 31.29	58 31.29	1 41 4.2	41 4.2	7.2957	8.054	2.45	3.28	
17	8 10.2	322	23 58 28.50	58 28.50	1 41 20.1	41 20.1	7.2786	8.034	2.45	3.29	
18	8 6.3	323	23 58 25.82	58 25.82	1 41 35.3	41 35.3	7.2599	8.013	2.46	3.29	
19	8 2.3	324	23 58 23.26	58 23.26	1 41 49.8	41 49.8	7.2404	7.991	2.46	3.29	
20	7 58.3	325	23 58 20.81	58 20.81	1 42 3.5	42 3.5	7.2209	7.966	2.46	3.29	
21	7 54.3	326	23 58 18.47	58 18.47	1 42 16.4	42 16.4	7.2005	7.940	2.46	3.29	
22	7 50.4	327	23 58 16.24	58 16.24	1 42 28.6	42 28.6	7.1791	7.913	2.47	3.30	
23	7 46.4	328	23 58 14.13	58 14.13	1 42 40.0	42 40.0	7.1555	7.883	2.47	3.30	
24	7 42.4	329	23 58 12.13	58 12.13	1 42 50.6	42 50.6	7.1288	7.850	2.47	3.30	
25	7 38.5	330	23 58 10.25	58 10.25	1 43 0.4	43 0.4	7.1017	7.815	2.47	3.30	
26	7 34.5	331	23 58 8.49	58 8.49	1 43 9.4	43 9.4	7.0720	7.776	2.48	3.30	
27	7 30.5	332	23 58 6.85	58 6.85	1 43 17.6	43 17.6	7.0403	7.734	2.48	3.30	
28	7 26.6	333	23 58 5.33	58 5.33	1 43 25.0	43 25.0	7.0060	7.687	2.48	3.30	
29	7 22.6	334	23 58 3.93	58 3.93	1 43 31.6	43 31.6	6.9687	7.634	2.48	3.30	
30	7 18.6	335	23 58 2.65	58 2.65	1 43 37.4	43 37.4	6.9280	7.574	2.48	3.30	
Dec. 1	7 14.7	336	23 58 1.49	58 1.49	1 43 42.3	43 42.3	6.8819	7.504	2.48	3.30	
2	7 10.7	337	23 58 0.46	58 0.46	1 43 46.5	43 46.5	6.8293	7.416	2.48	3.30	
3	7 6.8	338	23 57 59.55	57 59.55	1 43 49.8	43 49.8	6.7695	7.304	2.49	3.30	
4	7 2.8	339	23 57 58.77	57 58.77	1 43 52.3	43 52.3	6.7001	7.164	2.49	3.30	
5	6 58.9	340	23 57 58.11	57 58.11	1 43 54.0	43 54.0	6.6161	6.955	2.49	3.30	
6	6 54.9	341	23 57 57.57	57 57.57	1 43 54.9	43 54.9	6.5109	-6.495	2.49	3.30	
7	6 51.0	342	23 57 57.17	57 57.17	1 43 54.9	43 54.9	6.3756	+6.444	2.49	3.30	
8	6 47.1	343	23 57 56.89	57 56.89	1 43 54.1	43 54.1	6.1781	6.938	2.49	3.30	
9	6 43.2	344	23 57 56.74	57 56.74	1 43 52.4	43 52.4	-5.8054	7.164	2.49	3.30	
10	6 39.2	345	23 57 56.71	57 56.71	1 43 49.9	43 49.9	+5.3857	7.304	2.49	3.30	
11	6 35.3	346	23 57 56.81	57 56.81	1 43 46.6	43 46.6	6.0591	7.416	2.49	3.30	
12	6 31.4	347	23 57 57.04	57 57.04	1 43 42.4	43 42.4	6.3114	7.504	2.49	3.29	
13	6 27.4	348	23 57 57.40	57 57.40	1 43 37.4	43 37.4	6.4700	7.574	2.48	3.29	
14	6 23.5	349	23 57 57.89	57 57.89	1 43 31.6	43 31.6	6.5859	7.637	2.48	3.29	
15	6 19.6	350	23 57 58.50	57 58.50	1 43 24.9	43 24.9	6.6741	7.693	2.48	3.29	
16	6 15.7	351	23 57 59.24	57 59.24	1 43 17.4	43 17.4	6.7447	7.739	2.48	3.29	
17	6 11.8	352	23 58 0.10	58 0.10	1 43 9.1	43 9.1	6.8077	7.781	2.48	3.29	
18	6 7.9	353	23 58 1.09	58 1.09	1 43 0.0	43 0.0	6.8649	7.819	2.48	3.29	
19	6 4.0	354	23 58 2.21	58 2.21	1 42 50.1	42 50.1	6.9154	7.856	2.48	3.29	
20	6 0.1	355	23 58 3.45	58 3.45	1 42 39.3	42 39.3	6.9589	7.891	2.48	3.29	
21	5 56.1	356	23 58 4.83	58 4.83	1 42 27.7	42 27.7	7.0000	7.921	2.48	3.29	
22	5 52.2	357	23 58 6.33	58 6.33	1 42 15.3	42 15.3	7.0347	7.949	2.48	3.28	
23	5 48.3	358	23 58 7.95	58 7.95	1 42 2.1	42 2.1	7.0682	7.975	2.48	3.28	
24	5 44.4	359	23 58 9.70	58 9.70	1 41 48.1	41 48.1	7.0993	8.000	2.48	3.28	
25	5 40.5	360	23 58 11.57	58 11.57	1 41 33.2	41 33.2	7.1283	8.023	2.48	3.28	
26	5 36.6	361	23 58 13.57	58 13.57	1 41 17.6	41 17.6	7.1555	8.046	2.48	3.28	
27	5 32.7	362	23 58 15.69	58 15.69	1 41 1.2	41 1.2	7.1811	8.067	2.48	3.28	
28	5 28.8	363	23 58 17.94	58 17.94	1 41 43.9	41 43.9	7.2061	8.088	2.47	3.27	
29	5 24.9	364	23 58 20.32	58 20.32	1 40 25.8	40 25.8	7.2290	8.108	2.47	3.27	
30	5 21.0	365	23 58 22.82	58 22.82	1 40 6.9	40 6.9	7.2507	8.127	2.47	3.27	
31	5 17.1	366	23 58 25.45	58 25.45	1 39 47.2	39 47.2	7.2714	8.145	2.47	3.27	
32	5 13.2	367	23 58 28.20	58 28.20	- 1 39 26.7	39 26.7	+7.2911	+8.161	+2.47	+3.27	

HORIZONTAL PARALLAXES AND SEMIDIAMETERS.

0h. Sidereal Date.	HORIZONTAL PARALLAXES.			VERTICAL SEMIDIAMETER.			SID. TIME OF SEMIDIAMETER PASSING THE MERIDIAN.		
	♂	♀	♂	♂	♀	♂	♂	♀	♂
1	6.65	6.37	6.50	2.59	6.34	3.85	0.19	0.45	0.26
6	6.39	6.26	6.30	2.49	6.22	3.72	0.18	0.45	0.25
11	6.22	6.14	6.12	2.42	6.11	3.61	0.18	0.44	0.24
16	6.11	6.03	5.94	2.38	6.00	3.51	0.17	0.43	0.23
21	6.06	5.93	5.77	2.36	5.90	3.41	0.17	0.43	0.23
26	6.06	5.84	5.61	2.36	5.81	3.31	0.17	0.42	0.22
31	6.13	5.75	5.46	2.38	5.72	3.22	0.17	0.41	0.21
36	6.29	5.67	5.31	2.44	5.64	3.14	0.17	0.40	0.21
41	6.55	5.60	5.18	2.55	5.57	3.06	0.17	0.40	0.21
46	6.99	5.53	5.06	2.72	5.50	2.98	0.18	0.39	0.20
51	7.69	5.46	4.92	2.98	5.44	2.91	0.20	0.38	0.20
56	8.72	5.40	4.81	3.38	5.38	2.83	0.23	0.37	0.19
61	10.14	5.34	4.71	3.94	5.32	2.77	0.26	0.37	0.19
66	11.81	5.29	4.61	4.59	5.26	2.71	0.31	0.36	0.18
71	13.33	5.25	4.51	5.19	5.22	2.66	0.35	0.36	0.18
76	14.14	5.20	4.41	5.50	5.17	2.60	0.36	0.35	0.18
81	14.01	5.15	4.32	5.45	5.13	2.55	0.36	0.34	0.18
86	13.20	5.12	4.24	5.14	5.09	2.50	0.34	0.34	0.18
91	12.15	5.08	4.16	4.73	5.06	2.45	0.32	0.34	0.17
96	11.11	5.06	4.09	4.32	5.03	2.41	0.29	0.34	0.17
101	10.17	5.03	4.02	3.95	5.01	2.37	0.26	0.33	0.17
106	9.35	5.01	3.95	3.63	4.99	2.33	0.24	0.34	0.17
111	8.64	4.99	3.89	3.36	4.97	2.29	0.22	0.34	0.17
116	8.04	4.98	3.83	3.12	4.96	2.26	0.21	0.34	0.16
121	7.53	4.97	3.77	2.93	4.94	2.22	0.20	0.34	0.16
126	7.10	4.96	3.72	2.76	4.93	2.19	0.19	0.34	0.16
131	6.78	4.96	3.67	2.63	4.93	2.16	0.18	0.35	0.16
136	6.57	4.96	3.62	2.55	4.93	2.14	0.18	0.35	0.16
141	6.49	4.96	3.58	2.53	4.94	2.11	0.18	0.35	0.15
146	6.60	4.97	3.54	2.57	4.95	2.08	0.19	0.36	0.15
151	6.87	4.98	3.50	2.68	4.96	2.06	0.20	0.36	0.15
156	7.31	4.99	3.47	2.85	4.98	2.04	0.21	0.36	0.15
161	7.90	5.02	3.44	3.08	5.00	2.02	0.23	0.36	0.15
166	8.63	5.06	3.41	3.36	5.03	2.00	0.25	0.37	0.14
171	9.47	5.09	3.38	3.68	5.06	1.99	0.27	0.37	0.14
176	10.43	5.12	3.35	4.06	5.10	1.97	0.29	0.37	0.14
181	11.49	5.17	3.33	4.48	5.14	1.96	0.32	0.37	0.14
186	12.62	5.22	3.31	4.92	5.19	1.95	0.34	0.37	0.14
191	13.70	5.27	3.29	5.34	5.24	1.94	0.37	0.37	0.14
196	14.50	5.32	3.27	5.64	5.29	1.93	0.39	0.37	0.14
201	14.76	5.38	3.25	5.74	5.36	1.92	0.40	0.37	0.13
206	14.25	5.45	3.24	5.54	5.43	1.91	0.38	0.37	0.13
211	13.07	5.53	3.23	5.08	5.50	1.90	0.35	0.38	0.13
216	11.54	5.61	3.22	4.49	5.58	1.90	0.31	0.38	0.13
221	10.02	5.70	3.22	3.89	5.66	1.89	0.27	0.38	0.13
226	8.70	5.79	3.21	3.38	5.76	1.89	0.24	0.39	0.13
231	7.69	5.89	3.21	2.99	5.87	1.89	0.21	0.39	0.13
236	6.99	5.99	3.21	2.72	5.98	1.89	0.19	0.40	0.13
241	6.55	6.11	3.21	2.55	6.09	1.89	0.18	0.41	0.13
246	6.30	6.24	3.21	2.46	6.21	1.89	0.17	0.42	0.13
251	6.19	6.38	3.22	2.41	6.35	1.89	0.16	0.43	0.13
256	6.17	6.53	3.22	2.40	6.49	1.89	0.16	0.44	0.13
261	6.22	6.68	3.23	2.43	6.64	1.90	0.16	0.45	0.13
266	6.34	6.83	3.24	2.47	6.80	1.91	0.17	0.47	0.13
271	6.51	7.01	3.25	2.53	6.98	1.92	0.17	0.49	0.13
276	6.75	7.20	3.27	2.63	7.17	1.92	0.18	0.51	0.13
281	7.07	7.41	3.29	2.76	7.37	1.94	0.19	0.53	0.13
286	7.50	7.63	3.31	2.92	7.58	1.95	0.21	0.54	0.13
291	8.06	7.85	3.33	3.14	7.81	1.96	0.22	0.57	0.13
296	8.80	8.10	3.35	3.43	8.06	1.98	0.25	0.59	0.13

HORIZONTAL PARALLAXES AND SEMIDIAMETERS.

0 ^h . Sidereal Date.	HORIZONTAL PARALLAXES.			VERTICAL SEMIDIAMETER.			SID. TIME OF SEMIDIAMETER PASSING THE MERIDIAN.		
	♂	♀	♁	♂	♀	♁	♂	♀	♁
301 ^d	9.77	8.37	3.38	3.81	8.34	1.97	0.28	0.61	0.13
306	10.98	8.66	3.41	4.28	8.62	2.01	0.31	0.64	0.13
311	12.17	8.96	3.44	4.74	8.94	2.03	0.34	0.66	0.14
316	12.61	9.35	3.48	4.91	9.30	2.05	0.34	0.69	0.14
321	11.84	9.73	3.52	4.60	9.69	2.07	0.31	0.72	0.14
326	10.40	10.15	3.56	4.05	10.10	2.09	0.27	0.74	0.14
331	9.05	10.60	3.60	3.53	10.55	2.12	0.24	0.77	0.14
336	8.04	11.11	3.64	3.13	11.05	2.15	0.21	0.80	0.15
341	7.33	11.68	3.69	2.85	11.61	2.18	0.20	0.83	0.15
346	6.85	12.29	3.74	2.66	12.23	2.20	0.19	0.86	0.15
351	6.50	12.97	3.79	2.53	12.92	2.24	0.18	0.91	0.16
356	6.26	13.75	3.85	2.43	13.69	2.28	0.18	0.96	0.16
361	6.10	14.61	3.91	2.38	14.53	2.31	0.17	1.01	0.16
366	6.01	15.55	3.98	2.33	15.44	2.35	0.17	1.06	0.17
0 ^h . Sidereal Date.	♃	♄	♅	♃	♄	♅	♃	♄	♅
1 ^d	1.86	0.98	0.46	20.89	8.94	1.81	1.49	0.60	0.13
11	1.90	1.00	0.46	21.35	9.09	1.80	1.52	0.61	0.13
21	1.93	1.01	0.46	21.72	9.21	1.78	1.55	0.62	0.13
31	1.95	1.02	0.45	21.94	9.30	1.77	1.57	0.63	0.13
41	1.96	1.03	0.45	22.02	9.36	1.75	1.58	0.63	0.13
51	1.96	1.03	0.45	21.93	9.39	1.74	1.57	0.64	0.12
61	1.94	1.03	0.44	21.70	9.39	1.72	1.56	0.64	0.12
71	1.91	1.03	0.44	21.33	9.36	1.71	1.54	0.64	0.12
81	1.87	1.02	0.44	20.86	9.29	1.70	1.51	0.63	0.12
91	1.82	1.01	0.44	20.33	9.19	1.68	1.47	0.63	0.12
101	1.77	1.00	0.43	19.76	9.07	1.67	1.43	0.62	0.12
111	1.71	0.99	0.43	19.17	8.93	1.66	1.39	0.61	0.12
121	1.66	0.97	0.43	18.60	8.78	1.66	1.34	0.60	0.12
131	1.61	0.96	0.42	18.05	8.62	1.65	1.30	0.59	0.12
141	1.56	0.93	0.42	17.53	8.46	1.65	1.26	0.58	0.12
151	1.52	0.92	0.42	17.06	8.31	1.65	1.22	0.57	0.12
161	1.48	0.90	0.43	16.63	8.17	1.66	1.19	0.56	0.12
171	1.45	0.89	0.43	16.25	8.04	1.66	1.16	0.55	0.12
181	1.42	0.87	0.43	15.92	7.92	1.67	1.13	0.54	0.12
191	1.40	0.86	0.43	15.64	7.82	1.68	1.11	0.53	0.12
201	1.38	0.85	0.44	15.41	7.73	1.69	1.09	0.53	0.12
211	1.36	0.84	0.44	15.24	7.66	1.70	1.08	0.52	0.13
221	1.35	0.84	0.44	15.11	7.61	1.71	1.07	0.52	0.13
231	1.34	0.83	0.44	15.03	7.57	1.72	1.06	0.51	0.13
241	1.34	0.83	0.45	14.99	7.55	1.73	1.05	0.51	0.13
251	1.34	0.83	0.45	15.01	7.54	1.74	1.05	0.51	0.13
261	1.35	0.83	0.45	15.08	7.55	1.76	1.05	0.51	0.13
271	1.36	0.84	0.45	15.19	7.58	1.78	1.06	0.51	0.13
281	1.37	0.84	0.46	15.35	7.63	1.79	1.07	0.51	0.13
291	1.39	0.85	0.46	15.57	7.70	1.80	1.08	0.52	0.13
301	1.41	0.85	0.46	15.84	7.78	1.81	1.10	0.52	0.13
311	1.44	0.86	0.47	16.16	7.88	1.82	1.12	0.53	0.13
321	1.48	0.87	0.47	16.53	8.00	1.83	1.15	0.53	0.13
331	1.52	0.88	0.47	16.96	8.13	1.83	1.18	0.54	0.13
341	1.56	0.90	0.47	17.43	8.26	1.83	1.21	0.55	0.13
351	1.60	0.92	0.47	17.95	8.40	1.83	1.24	0.56	0.13
361	1.65	0.94	0.47	18.50	8.55	1.82	1.28	0.57	0.13
371	1.71	0.96	0.47	19.09	8.71	1.82	1.32	0.58	0.13

NOTE. — For Neptune the Horizontal Parallax = 0".28 (before 1804.)
 " " " " = 0".29 (between 1804. and 227d. and after 304d.)
 " " " " = 0".30 (between 227d. and 304d.)

380 SUN'S COÖRDINATES, 1861.

Date. 1861.	RECTANGULAR EQUATORIAL.						POLAR ECLIPTIC.			
	X.	X'.	Y.	Y'.	Z.	Z'.	$\lambda = \odot$'s True Longitude.	λ'	$\delta = \odot$'s Latitude.	Log. Rad. Vect. = r .
Jan. 1.0	+ .1936821	6054	-.8842791	2990	-.3837299	7223	281 21 39.3	22.9	-0.69	926483
1.5	.2022496	1727	.8826686	6892	.3830314	0240	281 51 74.0	57.5	0.73	926508
2.0	.2108017	7245	.8809895	:0109	.3823030	2960	282 22 48.7	32.1	0.77	926539
2.5	.2193379	2605	.8792419	2640	.3815448	5381	282 53 23.5	6.8	0.80	926576
3.0	.2278573	7796	.8774259	4488	.3807569	7506	283 23 58.3	41.5	0.82	926610
3.5	+.2363594	2815	-.8755416	5652	-.3799393	9333	283 54 33.2	16.3	-0.83	926668
4.0	.2448434	7632	.8735890	6134	.3790921	0665	284 24 68.1	51.1	0.84	926722
4.5	.2533087	2303	.8715683	5934	.3782153	2100	284 55 43.0	26.0	0.83	926782
5.0	.2617547	6761	.8694797	5056	.3773089	3040	285 26 18.0	0.9	0.82	926847
5.5	.2701806	1018	.8673233	3499	.3763729	3683	285 56 53.0	35.8	0.80	926917
6.0	+.2785859	5069	-.8650991	1264	-.3754073	4031	286 27 28.0	10.7	-0.78	926992
6.5	.2869698	8907	.8628073	8353	.3744124	4085	286 57 63.0	45.6	0.75	927072
7.0	.2953315	2522	.8604482	4770	.3733886	3851	287 28 38.0	20.5	0.71	927157
7.5	.3036705	5911	.8580218	0513	.3723356	3324	287 58 73.0	55.4	0.67	927247
8.0	.3119859	9063	.8555282	5585	.3712534	2506	288 29 48.0	30.3	0.62	927340
8.5	+.3202773	1976	-.8529677	9987	-.3701421	1397	289 0 23.0	5.2	-0.56	927438
9.0	.3285437	4638	.8503405	3723	.3690017	:9997	289 30 57.9	40.0	0.50	927540
9.5	.3367846	7046	.8476467	6792	.3678324	8308	290 1 32.8	14.8	0.44	927647
10.0	.3449991	9193	.8448867	9200	.3666344	6332	290 31 67.6	49.6	0.38	927757
10.5	.3531872	1070	.8420606	0946	.3654077	4069	291 2 42.3	24.2	0.31	927872
11.0	+.3613476	2673	-.8391687	2035	-.3641525	1521	291 32 76.9	58.7	-0.24	927991
11.5	.3694797	3993	.8362112	2467	.3628638	8688	292 3 51.4	33.1	0.17	928115
12.0	.3775827	5022	.8331824	2247	.3615567	5571	292 34 25.7	7.3	0.11	928242
12.5	.3856522	5756	.8301005	1375	.3602165	2173	293 4 59.9	41.4	-0.05	928373
13.0	.3936994	6187	.8269478	9855	.3588481	8493	293 35 34.0	15.4	+0.01	928510
13.5	+.4017117	6310	-.8237305	7689	-.3574517	4533	294 5 68.0	49.3	+0.07	928650
14.0	.4096924	6116	.8204491	4883	.3560274	0294	294 36 41.8	23.0	0.12	928793
14.5	.4176409	5601	.8171037	1437	.3545754	5778	295 6 75.5	56.6	0.17	928941
15.0	.4255566	4757	.8136946	7354	.3530958	0986	295 37 49.0	30.1	0.21	929092
15.5	.4334389	3580	.8102221	2636	.3515887	5919	296 8 22.2	3.3	0.25	929248
16.0	+.4412870	2061	-.8066865	7288	-.3500543	0579	296 38 55.2	36.2	+0.28	929409
16.5	.4491005	0196	.8030882	1313	.3484928	4968	297 9 28.0	8.8	0.30	929575
17.0	.4568786	7977	.7994276	4715	.3469043	9087	297 39 60.6	41.3	0.31	929746
17.5	.4646208	5399	.7957049	7496	.3452889	2937	298 10 32.9	13.5	0.32	929922
18.0	.4723265	2457	.7919207	9662	.3436468	6520	298 40 65.0	45.5	0.32	930103
18.5	+.4799951	9143	-.7880751	1212	-.3419781	9837	299 11 36.9	17.3	+0.31	930289
19.0	.4876261	5454	.7841686	2157	.3402830	2890	299 41 68.5	48.9	0.29	930481
19.5	.4952189	1382	.7802016	2495	.3385616	5680	300 12 39.9	20.2	0.27	930679
20.0	.5027731	6924	.7761742	2229	.3368141	8210	300 42 71.0	51.3	0.25	930883
20.5	.5102880	2074	.7720869	1364	.3350406	0479	301 13 41.9	22.1	0.21	931092
21.0	+.5177632	6827	-.7679401	9905	-.3332413	2490	301 43 72.5	52.6	+0.17	931307
21.5	.5251981	1177	.7637341	7853	.3314164	4245	302 14 42.9	22.9	0.12	931529
22.0	.5325922	5119	.7594691	5212	.3295660	5745	302 44 73.0	52.9	0.07	931757
22.5	.5399450	8648	.7551456	1985	.3276902	6991	303 15 42.8	22.6	+0.01	931992
23.0	.5472556	1756	.7507640	8177	.3257891	7984	303 45 72.4	52.1	-0.05	932232
23.5	+.5545238	4440	-.7463245	3790	-.3238630	8727	304 16 41.7	21.4	-0.11	932479
24.0	.5617490	6693	.7418274	8828	.3219119	9221	304 46 70.8	50.4	0.18	932732
24.5	.5689307	8512	.7372731	3294	.3199359	9465	305 17 39.7	19.3	0.24	932992
25.0	.5760686	:9892	.7326621	7193	.3179354	9465	305 47 68.3	47.8	0.31	933258
25.5	.5831621	0829	.7279947	:0528	.3159104	9219	306 18 36.7	16.1	0.38	933531
26.0	+.5902108	1318	-.7232712	3302	-.3138610	8729	306 48 64.8	44.1	-0.45	933810
26.5	.5972142	1354	.7184919	5517	.3117874	7997	307 19 32.7	11.9	0.51	934097
27.0	.6041715	0929	.7136571	7178	.3096898	7026	307 49 60.4	39.5	0.57	934389
27.5	.6110823	0040	.7087675	8290	.3075683	5815	308 20 27.9	6.9	0.62	934689
28.0	.6179462	8681	.7038232	8856	.3054230	4367	308 50 55.1	34.0	0.67	934995
28.5	+.6247627	6849	-.6988246	8878	-.3032542	2683	309 21 22.1	1.0	-0.71	935308
29.0	.6315313	4537	.6937721	8362	.3010619	0765	309 51 48.9	27.7	0.74	935626
29.5	.6382513	1740	.6886660	7309	.2988462	8612	310 21 75.5	54.3	0.77	935950
30.0	.6449225	8455	.6835067	5725	.2966074	6229	310 52 41.9	20.6	0.79	936280
30.5	.6515443	4677	.6782945	3611	.2943456	3615	311 22 68.1	46.7	0.80	936615
31.0	+.6581158	0395	-.6730298	0973	-.2920611	0774	311 53 34.0	12.5	-0.81	936956

Note. — The accented letters correspond to the mean equinox and equator of January (d.0).

SUN'S COÖRDINATES, 1861. 381

Date. 1861.	RECTANGULAR EQUATORIAL.						POLAR ECLIPTIC.			
	X.	X'.	Y.	Y'.	Z.	Z'.	$\lambda = \odot$'s True Longitude.	λ'	$\delta = \odot$'s Latitude.	Log. Rad. Vect. = ρ .
Jan. 31.5	+6646368	5608	-6677129	7813	-2897540	7707	312 23 59.8	38.2	-0.81	937302
Feb. 1.0	6711070	0313	.6623443	4134	2874243	4414	312 54 25.3	3.6	0.81	937654
1.5	6775256	4502	.6569243	9943	2850723	1798	313 24 50.7	29.0	0.79	938011
2.0	6838924	8174	.6514534	5242	2826982	7162	313 54 75.8	54.0	0.77	938372
2.5	6902066	1320	.6459319	:0036	2803020	3204	314 25 40.7	18.9	0.74	938739
3.0	+6964679	3937	-.6403601	4326	-2778841	9030	314 55 65.3	43.4	-0.71	939109
3.5	7026759	6022	.6347387	8120	2754445	4638	315 26 29.8	7.9	0.66	939484
4.0	7088298	7565	.6290680	1421	2729635	:0033	315 56 54.0	32.0	0.61	939863
4.5	7149291	8563	.6233496	4236	2705012	5214	316 26 78.0	55.9	0.56	940247
5.0	7209732	9008	.6175808	6566	2679980	:0186	316 57 41.7	19.5	0.50	940634
5.5	+7269619	8900	-.6117651	8417	-2654739	4949	317 27 65.1	42.8	-0.44	941025
6.0	7329346	8232	.6059020	9794	2629293	9507	317 58 28.3	5.9	0.38	941420
6.5	7387708	6999	.5999017	:0699	2603642	3860	318 28 51.2	28.8	0.32	941817
7.0	7445900	5196	.5940349	1138	2577790	8013	318 58 73.8	51.3	0.25	942218
7.5	7503517	2818	.5880320	1117	2551737	1964	319 29 36.1	13.6	0.18	942622
8.0	+7560553	:9859	-.5819833	:0638	-2525487	5719	319 59 58.1	35.5	-0.11	943028
8.5	7617003	6314	.5758894	9707	2499041	9277	320 29 79.9	57.3	+0.05	943437
9.0	7672365	2181	.5697510	8331	2472401	2642	321 0 41.3	18.6	0.02	943848
9.5	7728134	7455	.5635685	6514	2445570	5815	321 30 62.9	35.0	0.08	944262
10.0	7782907	2134	.5573424	4260	2418550	8800	322 1 22.9	0.0	0.13	944679
10.5	+7836880	6213	-.5510733	1577	-2391343	1597	322 31 43.2	20.2	+0.18	945099
11.0	7890347	:9686	.5447618	8469	2363952	4211	323 1 63.2	40.1	0.23	945521
11.5	7943204	2549	.5384083	4942	2336379	6642	323 31 82.8	59.7	0.27	945947
12.0	7995446	4798	.5320134	1000	2308626	8894	324 2 41.9	18.7	0.30	946374
12.5	8047069	6427	.5255776	6650	2280696	0968	324 32 60.7	37.5	0.33	946804
13.0	+8098070	7435	-.5191015	1896	-2252593	2870	325 2 79.0	55.7	+0.35	947238
13.5	8148445	7816	.5128587	6746	2224317	4598	325 33 36.9	13.5	0.36	947674
14.0	8198191	7569	.5060306	1202	2195871	6156	326 3 54.4	31.0	0.37	948114
14.5	8247305	6690	.4994368	5271	2167257	7546	326 33 71.4	47.9	0.36	948556
15.0	8295785	5177	.4929049	8959	2138480	8774	327 4 28.0	4.4	0.35	949002
15.5	+8343627	3026	-.4861354	2271	-2109540	9838	327 34 44.1	20.5	+0.32	949451
16.0	8390826	0232	.4794289	5212	2080439	0741	328 4 59.8	36.1	0.29	949904
16.5	8437380	6793	.4726860	7790	2051180	1486	328 34 75.0	51.2	0.26	950360
17.0	8483226	2706	.4659071	:0008	2021766	2076	329 5 29.8	6.0	0.22	950820
17.5	8528542	7969	.4590929	1873	1992199	2513	329 35 44.1	20.2	0.18	951283
18.0	+8573141	2575	-.4522439	3389	-1962481	2799	330 5 57.9	34.0	+0.13	951750
18.5	8617083	6524	.4453607	4564	1932615	2937	330 35 71.2	47.2	0.08	952221
19.0	8660365	:9813	.4384438	5401	1902603	2929	331 6 24.1	0.1	+0.02	952695
19.5	8702284	2439	.4314938	5907	1872448	2778	331 36 36.5	12.4	-0.04	953174
20.0	8744938	4400	.4245113	6089	1842151	2486	332 6 48.4	24.2	0.11	953657
20.5	+8786226	5695	-.4174968	5950	-1811715	2054	332 36 59.8	35.6	-0.17	954145
21.0	8826844	6321	.4104507	5495	1781143	1486	333 6 70.7	46.4	0.24	954637
21.5	8866791	6275	.4033737	4731	1750436	0783	333 36 81.2	56.9	0.30	955134
22.0	8906062	5554	.3962662	3662	1719597	9948	334 7 31.2	6.8	0.37	955635
22.5	8944657	4156	.3891287	2292	1688627	8082	334 37 40.7	16.3	0.43	956141
23.0	+8982572	2079	-.3819619	:0629	-1657530	7889	335 7 49.8	25.3	-0.48	956651
23.5	9019806	9321	.3747682	8678	1626307	6670	335 37 58.4	33.9	0.53	957166
24.0	9056356	5879	.3675421	6442	1594961	5328	336 7 66.6	42.0	0.58	957686
24.5	9092221	1752	.3602902	3928	1563494	3865	336 37 74.4	49.8	0.62	958211
25.0	9127398	6937	.3530111	1142	1531908	2283	337 7 81.8	57.1	0.66	958740
25.5	+9161885	1432	-.3457051	8087	-1500205	0584	337 38 28.8	4.1	-0.69	959274
26.0	9196799	5235	.3383727	4768	1468389	8772	338 8 35.3	10.5	0.72	959812
26.5	9228778	8342	.3310146	1191	1436460	6847	338 38 41.4	16.6	0.74	960355
27.0	9261179	0752	.3236313	7363	1404421	4812	339 8 47.1	22.2	0.75	960901
27.5	9292880	2461	.3162233	3288	1372275	2670	339 38 52.4	27.5	0.75	961452
28.0	+9323879	3469	-.3087912	8972	-1340023	0421	340 8 57.3	32.3	-0.74	962006
28.5	9354174	3773	.3013355	4420	1307668	8070	340 38 61.8	36.8	0.73	962565
Mar. 1.0	9383760	3367	.2938567	9636	1275214	5619	341 8 65.9	40.8	0.71	963127
1.5	9412638	2254	.2863554	4628	1242661	3070	341 38 69.6	44.4	0.68	963693
2.0	9440804	0429	.2788321	9399	1210012	0424	342 8 72.9	47.6	0.64	964261
2.5	+9468256	7890	-.2712873	3956	-1177270	7686	342 38 75.8	50.5	-0.60	964832

382 SUN'S COÖRDINATES, 1861.

Date. 1861.	RECTANGULAR EQUATORIAL.						POLAR ECLIPTIC.			
	X.	X'.	Y.	Y'.	Z.	Z'.	$\lambda = \odot$'s True Longitude.	λ'	$\delta = \odot$'s Latitude.	Log. Rad. Vect. = r .
Mar. 3.0	+ .9494993	4637	- .2637218	8305	- .1144437	4856	343 8 75.3	52.9	-0.55	965406
3.5	.9521012	0665	.2561360	2451	.1111516	1939	343 38 80.4	55.0	0.50	965983
4.0	.9546310	5972	.2485304	6399	.1078509	8935	344 8 82.1	56.6	0.44	966562
4.5	.9570886	0557	.2409056	-0156	.1045418	5848	344 38 83.4	57.9	0.38	967144
5.0	.9594737	4418	.2332623	3727	.1012247	2680	345 8 84.3	58.7	0.32	967727
5.5	+ .9617863	7554	- .2256009	7118	- .0978997	9434	345 38 84.8	59.2	-0.26	968312
6.0	.9640261	:9962	.2179221	:0334	.0945672	6112	346 8 84.9	59.2	0.19	968899
6.5	.9661930	1641	.2101264	2381	.0912273	2717	346 38 84.6	58.9	0.13	969487
7.0	.9682267	2588	.2025145	6266	.0878804	9251	347 8 83.9	58.1	0.06	970077
7.5	.9703071	2802	.1947869	8994	.0845266	5716	347 38 82.8	57.0	-0.00	970667
8.0	+ .9722541	2283	- .1870444	1573	- .0811664	2117	348 8 81.3	55.4	+0.07	971259
8.5	.9741274	1026	.1792874	4006	.0777999	8455	348 38 79.3	53.4	0.13	971852
9.0	.9759269	8032	.1715165	6301	.0744275	4734	349 8 76.8	50.8	0.19	972445
9.5	.9776525	6298	.1637325	8465	.0710494	0956	349 38 73.8	47.8	0.24	973039
10.0	.9793039	2823	.1559361	-0505	.0676660	7125	350 8 70.4	44.3	0.29	973633
10.5	+ .9808811	8605	- .1481279	2427	- .0642775	3243	350 38 66.5	40.4	+0.33	974227
11.0	.9823840	3645	.1403085	4236	.0608841	9312	351 8 62.1	35.9	0.38	974822
11.5	.9838126	7941	.1324785	5940	.0574861	5335	351 38 57.2	30.9	0.41	975417
12.0	.9851668	1494	.1246386	7544	.0540839	1316	352 8 51.8	25.5	0.44	976012
12.5	.9864466	4303	.1167894	9066	.0506777	7257	352 38 45.9	19.5	0.45	976607
13.0	+ .9876519	6367	- .1089314	:0479	- .0472678	3161	353 8 39.4	13.0	+0.46	977203
13.5	.9887826	7685	.1010652	1820	.0438543	9029	353 38 32.5	6.0	0.45	977799
14.0	.9898336	8256	.0931917	3088	.0404377	4866	354 7 85.0	58.5	0.44	978395
14.5	.9908198	8079	.0853112	4285	.0370181	0673	354 37 77.0	50.4	0.43	978991
15.0	.9917262	7154	.0774246	5422	.0335957	6452	355 7 68.5	41.9	0.41	979587
15.5	+ .9925580	5483	- .0695323	6502	- .0301709	2207	355 37 59.4	32.7	+0.38	980184
16.0	.9933150	3064	.0616351	7533	.0267441	7941	356 7 49.8	23.1	0.34	980782
16.5	.9939973	9898	.0537335	8520	.0233154	3657	356 37 39.6	12.9	0.30	981380
17.0	.9946950	5986	.0458283	9470	.0198852	9358	357 7 28.7	1.9	0.25	981978
17.5	.9951381	1328	.0379200	-0390	.0164537	5046	357 36 77.3	50.4	0.20	982577
18.0	+ .9955966	5924	- .0300092	1284	- .0130212	0723	358 6 65.3	38.4	+0.14	983177
18.5	.9959805	9774	.0220965	2160	.0095879	6393	358 36 52.7	25.7	0.09	983778
19.0	.9962900	2880	.0141825	3022	.0061541	2057	359 6 39.5	12.5	+0.03	984381
19.5	.9965250	5241	- .0062678	3878	- .0027200	7719	359 35 85.8	58.7	-0.03	984985
20.0	.9966356	6358	+ .0016470	5268	+ .0007142	6621	0 5 71.5	44.4	0.09	985590
20.5	+ .9967719	7732	+ .0095613	4409	+ .0041482	0958	0 35 56.7	29.6	-0.16	986196
21.0	.9967840	7865	.0174745	3539	.0075817	5291	1 5 41.2	14.0	0.22	986804
21.5	.9967219	7255	.0253860	2652	.0110146	:9617	1 34 85.2	57.9	0.28	987413
22.0	.9965857	5905	.0332955	1745	.0144465	3934	2 4 68.6	41.3	0.34	988024
22.5	.9963754	3813	.0412022	0810	.0178773	8240	2 34 51.5	24.2	0.39	988636
23.0	+ .9960911	0982	+ .0491056	-9843	+ .0213067	2532	3 4 33.8	6.4	-0.44	989252
23.5	.9957330	7412	.0570052	:8837	.0247345	6808	3 33 75.6	48.1	0.48	989869
24.0	.9953011	3105	.0649003	7787	.0281604	1065	4 3 56.8	29.3	0.52	990488
24.5	.9947954	8059	.0727905	6687	.0315842	5301	4 33 37.5	9.9	0.56	991109
25.0	.9942160	2277	.0806753	5534	.0350056	:9513	5 2 77.6	50.0	0.59	991731
25.5	+ .9935630	5759	+ .0885540	4320	+ .0384245	3700	5 32 57.3	29.6	-0.61	992355
26.0	.9928366	8507	.0964261	3041	.0418405	7858	6 2 36.4	8.7	0.63	992981
26.5	.9920363	0521	.1042910	1689	.0452533	1984	6 31 75.0	47.2	0.63	993610
27.0	.9911637	1802	.1121483	0262	.0486628	6077	7 1 53.0	25.2	0.63	994240
27.5	.9902174	2351	.1190973	8751	.0520689	0136	7 31 30.6	2.7	0.61	994872
28.0	+ .9891979	2168	+ .1278376	7154	+ .0554712	4158	8 0 67.7	39.8	-0.60	995506
28.5	.9881054	1255	.1356686	5463	.0588696	8140	8 30 44.3	16.4	0.57	996141
29.0	.9869339	9612	.1434897	3674	.0622637	2080	8 59 80.5	52.5	0.54	996777
29.5	.9857016	7241	.1513005	1782	.0656534	5975	9 29 66.2	28.2	0.50	997415
30.0	.9843905	4142	.1591005	-9782	.0690383	:9823	9 59 31.4	3.3	0.45	998053
30.5	+ .9830066	0315	+ .1668890	7667	+ .0724183	3621	10 28 66.2	38.1	-0.40	998693
31.0	.9815500	5762	.1746655	5433	.0757931	7368	10 58 40.5	12.3	0.35	999333
31.5	.9800209	0483	.1824294	3072	.0791625	1060	11 27 74.4	46.2	0.29	999973
Apr. 1.0	.9784191	4477	.1901802	0581	.0825262	4696	11 57 47.9	19.6	0.22	000613
1.5	.9767450	7748	.1979173	7953	.0858841	8274	12 26 80.9	52.5	0.16	001254
2.0	+ .9749936	:0296	+ .2056402	5192	+ .0892358	1790	12 56 53.5	25.1	-0.09	001894

☉ The first figures of this and the following logarithms are 0.0.

SUN'S COÖRDINATES, 1861. 389

Date. 1861.	RECTANGULAR EQUATORIAL.						POLAR ECLIPTIC.				
	X.	Y.	Z.	X.	Y.	Z.	$\lambda = \odot$'s		$\delta = \odot$'s	Log. Rad. Vect. = ρ .	
							True Longitude.	Latitude.			
Oct. 2.5	-9847890	8345	-1588557	6179	-0689356	8316	189 ^o 57'	83.2	28.7	-0.53	999558
3.0	9831209	1686	.1666013	3637	.0722967	1923	190 27	58.5	4.0	0.54	989334
3.5	9813796	4286	.1743346	0972	.0756525	5487	190 56	94.3	39.7	0.53	988308
4.0	9796652	6174	.1820549	-8177	.0790025	8988	191 26	70.7	16.1	0.52	907681
4.5	9776779	7324	.1807616	5946	.0823466	2430	191 55	107.5	52.8	0.51	987053
5.0	-9757176	7743	-1974541	2174	-0866345	5810	192 25	84.9	30.2	-0.49	996423
5.5	9736847	7437	.2051318	-8954	.0890160	9126	192 55	62.8	8.0	0.46	995792
6.0	9715790	6403	.2197941	5578	.0923407	2374	193 24	101.1	46.3	0.42	995160
6.5	9694008	4644	.2204404	2045	.0956584	5553	193 54	79.9	25.0	0.38	994526
7.0	9671504	2163	.2280609	-8347	.0989688	8658	194 24	59.1	2.2	0.34	993892
7.5	-9648279	8961	-2366321	4473	-1022718	1689	194 53	98.9	43.9	-0.29	993256
8.0	9624336	5041	.2432705	0421	.1055669	4642	195 23	79.0	24.0	0.23	992620
8.5	9599675	-0403	.2508525	6185	.1088541	7516	195 53	59.7	4.6	0.18	991984
9.0	9574301	5051	.2584054	1758	.1121330	0307	196 22	100.7	45.6	0.12	991348
9.5	9548213	8987	.2659468	7136	.1154033	3012	196 52	82.3	27.1	-0.05	990711
10.0	-9521416	2213	-2734640	2313	-1186648	5629	197 22	64.2	9.0	+0.01	990074
10.5	9499309	4720	.2809606	7933	.1219174	8157	197 51	106.7	51.4	0.07	989437
11.0	9465697	6539	.2884357	2039	.1251608	0503	198 21	89.5	34.2	0.13	988801
11.5	9436779	7644	.2968889	6576	.1283948	2935	198 51	72.8	17.4	0.20	988165
12.0	9407160	8047	.3033197	0800	.1316189	5178	199 21	56.5	1.1	0.26	987530
12.5	-9376842	7752	-3107275	4973	-1348331	7322	199 50	100.7	45.2	+0.31	986896
13.0	9345826	6758	.3181118	-8821	.1380371	9365	200 20	85.2	29.7	0.36	986264
13.5	9314115	5070	.3254721	2430	.1412308	1304	200 50	70.3	14.7	0.40	985633
14.0	9281711	2688	.3328080	5795	.1444138	3137	201 20	55.7	0.1	0.44	985004
14.5	9248615	9615	.3401189	-8910	.1475860	4861	201 49	101.7	46.0	0.47	984377
15.0	-9214832	5854	-3474042	1769	-1507472	6476	202 19	88.1	32.4	+0.50	983752
15.5	9180362	1407	.3546634	4867	.1539372	7973	202 49	75.0	19.2	0.51	983129
16.0	9145210	6277	.3618959	6899	.1570356	9365	203 19	62.4	6.6	0.52	982508
16.5	9109376	-0466	.3691011	-8758	.1601623	0634	203 48	110.3	54.4	0.52	981890
17.0	9072865	3977	.3762786	0641	.1632771	1785	204 18	98.5	42.6	0.52	981274
17.5	-9035676	6810	-3834278	2040	-1663798	2815	204 48	87.3	31.3	+0.51	980661
18.0	8997816	8972	.3905484	3253	.1694699	3719	205 18	76.5	20.5	0.49	980051
18.5	8959284	-0462	.3976400	4176	.1725474	4497	205 48	66.2	10.1	0.47	979444
19.0	8920084	1284	.4047019	4803	.1756119	5146	206 18	56.4	0.3	0.44	978839
19.5	8880217	1439	.4117338	5130	.1786633	5663	206 47	107.1	50.9	0.40	978238
20.0	-8839637	-0931	-4187350	5150	-1817014	6048	207 17	98.3	42.1	+0.35	977639
20.5	8798495	9761	.4257050	4858	.1847260	6387	207 47	90.1	33.8	0.30	977044
21.0	8756645	7933	.4326433	4949	.1877363	6409	208 17	82.4	26.1	0.24	976451
21.5	8714138	5448	.4395493	3317	.1907337	6381	208 47	75.3	18.9	0.18	975861
22.0	8670978	2310	.4464226	2069	.1937163	6211	209 17	68.7	12.2	0.11	975274
22.5	-8627166	8520	-4532627	0463	-1966846	5898	209 47	62.6	6.0	+0.04	974690
23.0	8582706	4081	.4600639	-8539	.1996383	5439	210 17	57.1	0.5	-0.03	974108
23.5	8537600	8997	.4668409	8863	.2025772	4832	210 46	112.1	55.4	0.10	973529
24.0	8491850	3968	.4735780	3648	.2055010	4075	211 16	107.7	51.0	0.17	972953
24.5	8345459	6899	.4802798	0675	.2084095	3164	211 46	103.8	47.0	0.24	972379
25.0	-8398430	9891	-4869457	7243	-2113084	2093	212 16	100.5	43.7	-0.31	971807
25.5	8350766	2249	.4935752	3648	.2141795	0873	212 46	97.8	40.9	0.37	971237
26.0	8302468	3072	.5001680	-9856	.2170405	9488	213 16	95.6	38.7	0.43	970669
26.5	8253541	5066	.5067231	5147	.2198853	7941	213 46	93.9	36.9	0.49	970103
27.0	8203986	5538	.5132402	0330	.2227135	6223	214 16	92.8	35.7	0.54	969539
27.5	-8153809	5376	-5197188	5126	-2255360	4348	214 46	92.2	35.0	-0.59	968976
28.0	8103012	4600	.5261534	-9332	.2283195	2298	215 16	92.2	35.0	0.63	968416
28.5	8051598	3207	.5325533	3541	.2310968	0075	215 46	92.7	35.4	0.66	967857
29.0	7999573	-1202	.5389122	7151	.2338566	7678	216 16	93.8	36.5	0.69	967300
29.5	7946939	8689	.5452374	0354	.2365968	5106	216 46	95.4	38.0	0.71	966743
30.0	-7893699	5369	-5515154	3145	-2393290	2354	217 16	97.5	40.1	-0.72	966189
30.5	7839259	1550	.5577517	5520	.2420290	9419	217 46	100.2	42.7	0.72	965635
31.0	7785420	7131	.5639456	7471	.2447166	6301	218 16	103.3	45.8	0.72	965083
31.5	7730382	2119	.5700968	-8995	.2473857	2997	218 46	106.9	49.3	0.71	964531
Nov. 1.0	7674766	6514	.5762047	0088	.2500359	9605	219 16	111.0	53.3	0.69	963982
1.5	-7618552	-0325	-5822637	0740	-2526671	5822	219 46	115.6	57.8	-0.67	963432

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Date. 1861.	RECTANGULAR EQUATORIAL.						POLAR ECLIPTIC.				
	X.	X'.	Y.	Y'.	Z.	Z'.	$\lambda = \odot$'s		λ'	$\delta = \odot$'s	Log. Rad. Vect. = ρ .
							True Longitude.	λ''			
Nov. 2.0	-7561760	3553	-5882885	0951	-2552790	1947	220 ^o 17'	60.7	2.9	-0.64	968885
2.5	7504391	6104	5942634	0712	2578715	7878	220 47	66.3	8.4	0.60	962338
3.0	7446450	8283	6001928	0819	2604442	3611	221 17	72.3	14.4	0.55	961793
3.5	7387939	9692	6060764	8867	2629969	9144	221 47	78.7	20.7	0.50	961248
4.0	7328867	10740	6119136	7252	2655295	4476	222 17	85.5	27.5	0.45	960706
4.5	7269235	1128	-6177039	5168	-2680418	9605	222 47	92.8	34.7	-0.50	960164
5.0	7209049	0962	6234468	2610	2705335	4528	223 17	100.4	42.2	0.34	959624
5.5	7148314	0247	6291420	9586	2730045	9244	223 47	108.5	50.2	0.28	959085
6.0	7087034	8087	6347889	6059	2754544	3749	224 17	116.9	58.5	0.22	958549
6.5	7025215	7188	6403870	2054	2778832	8043	224 48	65.8	7.3	0.15	958015
7.0	-6962261	4853	-6459360	7558	-2802906	2123	225 18	75.0	16.5	-0.09	957483
7.5	6899979	1901	6514356	2567	2826765	5988	225 48	84.6	26.0	-0.03	956953
8.0	6836571	8692	6568850	7076	2850408	9638	226 18	94.5	35.9	+0.03	956426
8.5	6772645	4696	6622840	1080	2873332	3068	226 48	104.8	46.1	0.09	955901
9.0	6708204	0274	6676322	4576	2897036	6279	227 18	115.5	56.8	0.14	955380
9.5	-6643256	5345	-6729291	7559	-2920018	9267	227 49	66.5	7.7	+0.18	954861
10.0	6577801	9909	6781744	0027	2942776	2032	228 19	77.8	18.9	0.22	954346
10.5	6511848	3975	6833677	1975	2965309	4571	228 49	89.5	30.5	0.26	953833
11.0	6445402	7548	6885085	3400	2987615	6884	229 19	101.5	42.4	0.29	953325
11.5	6378467	0631	6936966	4296	3009693	8969	229 49	113.8	54.6	0.31	952820
12.0	-6311048	3231	-6986316	4662	-3031540	9623	230 20	66.5	7.3	+0.33	952320
12.5	6243150	5352	7036131	4492	3053156	2446	230 50	79.6	20.3	0.33	951824
13.0	6174779	6999	7085408	3785	3074539	3636	231 20	93.0	33.7	0.32	951332
13.5	6105939	8178	7134142	2635	3095685	4990	231 50	106.7	47.3	0.31	950845
14.0	6036638	8896	7182332	0741	3116596	5909	232 21	60.8	1.3	0.30	950363
14.5	-5966877	9150	-7229973	8398	-3137269	6589	232 51	75.2	15.6	+0.28	949886
15.0	5896665	8958	7277061	5502	3157703	7031	233 21	90.0	30.3	0.24	949414
15.5	5826004	8315	7323594	2052	3177896	7231	233 51	105.2	45.4	0.20	948947
16.0	5754899	7223	7369668	8043	3197847	7190	234 22	69.7	0.8	0.16	948486
16.5	5683356	5703	7414980	3472	3217554	6905	234 52	76.6	16.6	0.11	948030
17.0	-5611379	3744	-7459826	8335	-3237017	6376	235 22	92.9	32.9	+0.05	947580
17.5	5538974	1357	7504103	2629	3256233	5600	235 52	109.6	49.5	-0.01	947134
18.0	5466145	8546	7547808	6351	3275200	4576	236 23	66.7	6.6	0.07	946695
18.5	5392899	5318	7590937	9497	3293918	3302	236 53	84.1	23.9	0.13	946260
19.0	5319237	1673	7633486	2063	3312384	1777	237 23	101.9	41.6	0.20	945831
19.5	-5245168	7621	-7674451	4047	-3330597	9998	237 53	120.1	59.7	-0.27	945407
20.0	5170695	3165	7716830	5444	3348556	7966	238 24	78.7	18.2	0.34	944988
20.5	5095296	8312	7757620	6252	3366259	5678	238 54	97.7	37.1	0.41	944574
21.0	5020564	3066	7797817	6469	3383704	3132	239 24	117.1	56.4	0.47	944166
21.5	4944915	7433	7837418	6088	3400890	0326	239 55	76.9	16.1	0.54	943762
22.0	-4868885	1419	-7876421	5110	-3417817	7263	240 25	97.1	36.3	-0.60	943365
22.5	4792478	5028	7914822	3529	3434483	3938	240 55	117.8	56.9	0.66	942972
23.0	4715699	8265	7952616	1342	3450885	0350	241 26	78.8	17.9	0.71	942584
23.5	4638554	1136	7989801	8546	3467022	6496	241 56	100.2	39.2	0.75	942201
24.0	4561048	3645	8026374	5138	3482893	2377	242 27	62.0	0.9	0.80	941822
24.5	-4483186	5798	-8062331	1114	-3498496	7989	242 57	84.3	23.1	-0.84	941448
25.0	4404976	7603	8097668	6471	3513831	3334	243 27	106.9	45.6	0.87	941079
25.5	4326423	9065	8132381	1204	3528895	8407	243 58	70.0	8.6	0.89	940713
26.0	4247520	0189	8166469	5313	3543686	3208	244 28	93.4	31.9	0.90	940352
26.5	4168312	0982	8199928	8792	3558204	7735	244 58	117.2	55.6	0.90	939994
27.0	-4088766	1450	-8232755	1639	-3572448	1989	245 29	81.4	19.8	-0.90	939641
27.5	4008900	1598	8264946	3850	3586414	5964	245 59	105.9	44.2	0.89	939291
28.0	3928720	1432	8296497	5421	3600106	9666	246 30	70.8	9.1	0.88	938945
28.5	3848233	0959	8327408	6352	3613518	3088	247 0	86.1	34.3	0.85	938602
29.0	3767445	0185	8357674	6639	3626649	6229	247 30	121.7	59.8	0.82	938263
29.5	-3686361	9115	-8387293	6279	-3639499	9089	248 1	87.6	25.6	-0.79	937926
30.0	3604990	7757	8416262	5269	3652067	1667	248 31	113.9	51.8	0.75	937594
30.5	3523336	6116	8444578	3606	3664352	3062	249 2	80.5	18.3	0.70	937264
31.0	3441409	4201	8472239	1287	3676351	5971	249 32	107.4	45.1	0.64	936938
Dec. 1.0	3359213	2018	8499240	8310	3688065	7695	250 3	74.6	19.2	0.59	936615
2.0	-3276757	9574	-8525580	4671	-3699492	9132	250 33	102.0	39.6	-0.53	936295

SUN'S COÖRDINATES, 1861. 391

Date. 1861.	RECTANGULAR EQUATORIAL.						POLAR ECLIPTIC.				
	X.	Y.	Z.	X.	Y.	Z.	$\lambda = \odot$'s		$\delta = \odot$'s	Log. Rad. Vect. = ρ .	
							True Longitude.	λ'			Latitude.
Dec. 2.5	—3194046	6875	—8551258	0371	—3710631	0281	251 ⁰ 4' 69.7	7.2	—0.47	935978	
3.0	3111069	3930	8576271	5405	3721480	1140	251 34 97.6	35.0	0.41	935665	
3.5	3027891	:0744	8600617	:9773	3732040	1710	252 5 65.8	3.1	0.35	935355	
4.0	2944459	7324	8624294	3472	3742309	1989	252 35 94.2	31.4	0.28	935049	
4.5	2860798	3675	8647300	6500	3752288	1978	253 6 62.8	0.0	0.22	934746	
5.0	—2776920	9808	—8669634	8857	—3761975	1676	253 36 91.6	28.6	—0.16	934448	
5.5	2692828	5727	8691294	0639	3771370	1081	254 6 120.6	57.5	0.10	934153	
6.0	2608530	:1440	8712277	1545	3780472	0194	254 37 89.8	26.6	0.05	933863	
6.5	2524032	6953	8732553	1873	3789281	9013	255 8 119.2	55.9	—0.00	933576	
7.0	2439349	:2874	8752210	1623	3797794	7637	255 38 88.7	25.4	+0.05	933284	
7.5	—2354465	7408	—8771157	0492	—3806013	5766	256 8 118.4	55.0	+0.09	933017	
8.0	2269410	:2363	8789422	8780	3813936	3700	256 30 88.2	24.7	0.12	932744	
8.5	2184182	7144	8807003	6384	3821564	1339	257 9 118.2	54.6	0.15	932475	
9.0	2098790	:1763	8823839	3303	3828894	8679	257 40 88.3	24.6	0.17	932213	
9.5	2013238	6221	8840110	:9537	3835927	5722	258 10 118.5	54.7	0.18	931955	
10.0	—1927534	:0526	—8855633	5084	—3842663	2469	258 41 88.9	25.0	+0.18	931702	
10.5	1841683	4634	8870470	:0944	3849101	8918	259 11 119.4	55.4	0.17	931455	
11.0	1755695	8704	8884619	4117	3855242	5070	259 42 90.1	26.0	0.15	931213	
11.5	1669574	:2592	8898080	7601	3861085	0924	260 12 120.8	56.6	0.13	930977	
12.0	1583328	6354	8910852	0397	3866628	6477	260 43 91.7	27.5	0.11	930747	
12.5	—1496962	9996	—8922035	2504	—3871872	1732	261 13 122.7	58.4	+0.08	930523	
13.0	1410485	3528	8934337	3920	3876816	6687	261 44 93.8	29.4	+0.04	930306	
13.5	1323301	6952	8945027	4644	3881461	1343	262 15 65.0	0.5	—0.00	930095	
14.0	1237218	:0277	8955035	4676	3885806	5699	262 45 96.4	31.8	0.05	929890	
14.5	1150441	3508	8964351	4016	3889851	9755	263 16 67.9	3.2	0.11	929693	
15.0	—1063576	6651	—8972974	2664	—3893596	3511	263 46 90.5	34.7	—0.18	929502	
15.5	0976630	9712	8980904	0618	3897041	6967	264 17 71.2	6.3	0.24	929318	
16.0	0889510	:2698	8988140	7879	3900184	0121	264 47 103.1	38.1	0.31	929141	
16.5	0802521	5616	8994632	4446	3903025	2974	265 18 75.1	10.0	0.37	928972	
17.0	0715370	8471	9000529	0319	3905564	5523	265 48 107.3	42.1	0.44	928809	
17.5	—0628163	:1271	—9005680	5495	—3907301	7771	266 19 79.6	14.3	—0.50	928654	
18.0	0540906	4020	9010134	:9974	3909737	9718	266 49 112.1	46.7	0.57	928505	
18.5	0453605	6725	9013891	3756	3911371	1363	267 20 84.7	19.2	0.63	928363	
19.0	0366269	9395	9016950	6840	3912701	2705	267 50 117.5	51.9	0.69	928228	
19.5	0278901	:2032	9019312	9227	3913729	3744	268 21 90.4	24.7	0.75	928100	
20.0	—0191510	4646	—9020976	0916	—3914453	4480	268 51 123.5	57.7	—0.80	927978	
20.5	0104101	7242	9021941	1906	3914875	4913	269 22 96.8	30.9	0.85	927863	
21.0	—0016680	9625	—9022206	2197	—3914992	5042	269 53 70.2	4.2	0.90	927754	
21.5	+0070747	:7598	9021772	1789	3914805	4866	270 23 103.8	37.7	0.93	927652	
22.0	0158171	5018	9020639	0681	3914315	4388	270 54 77.5	11.3	0.96	927556	
22.5	+0245587	2430	—9018806	8874	—3913520	3604	271 24 111.4	45.1	—0.98	927466	
23.0	0332968	:9628	9016272	6366	3912421	2517	271 55 85.5	19.1	0.99	927382	
23.5	0420367	7203	9013037	3157	3911017	1124	272 25 119.7	53.2	0.99	927304	
24.0	0507716	4549	9009103	9249	3909309	9428	272 56 94.1	27.5	0.99	927232	
24.5	0595030	1860	9004468	4640	3907297	7427	273 27 68.6	1.9	0.99	927165	
25.0	+0632300	:9127	—8999131	9329	—3904980	5122	273 47 103.2	36.4	—0.98	927105	
25.5	0769522	6347	8993093	3317	3902358	2511	274 28 77.9	11.0	0.96	927050	
26.0	0856687	3510	8986354	6605	3899432	9597	274 58 112.8	45.9	0.94	926999	
26.5	0943790	0611	8978913	9190	3896202	6378	275 29 87.8	20.8	0.90	926953	
27.0	1030822	:7642	8970771	1074	3892667	2855	275 59 122.9	56.8	0.86	926912	
27.5	+1117777	4596	—8961923	2257	—3888827	9026	276 30 96.1	30.9	—0.81	926876	
28.0	1204648	1466	8952385	2740	3884684	4895	277 1 73.4	6.1	0.76	926844	
28.5	1291427	:8244	8942142	2523	3880237	0459	277 31 106.8	41.4	0.70	926817	
29.0	1378108	4924	8931200	1608	3875486	5720	278 2 84.2	16.7	0.64	926794	
29.5	1464682	1497	8919559	9993	3870432	0677	278 32 119.7	52.1	0.58	926775	
30.0	+1551144	:7960	—8907220	7681	—3865075	5332	279 3 95.2	27.5	—0.52	926761	
30.5	1637487	4301	8894185	4672	3859415	9683	279 34 70.8	3.0	0.46	926751	
31.0	1723703	0517	8880454	0968	3853453	3733	280 4 106.4	36.6	0.40	926745	
31.5	1809784	6598	8866028	6568	3847190	7481	280 35 82.1	14.2	0.34	926743	
32.0	+1895724	2536	—8850908	1475	—3840624	0929	281 5 117.8	49.8	—0.28	926745	

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MERCURY.								
Days from Epoch.	x .	y .	z .	Log Radius Vector.	Longitude in Orbit.	$-\frac{x^2}{r^3} x$.	$-\frac{x^2}{r^3} y$.	$-\frac{x^2}{r^3} z$.
780	-0.2719	-0.3690	-0.0068	9.6612	233 40.0	+2.75	+ 3.73	+0.07
785	0.1776	0.4299	0.0204	9.6680	247 41.4	1.71	4.14	0.20
790	-0.0704	0.4595	0.0324	9.6684	261 29.1	+0.68	4.43	0.31
795	+0.0419	0.4555	0.0422	9.6622	275 28.1	-0.41	4.47	0.41
800	0.1510	0.4169	0.0486	9.6494	290 4.7	1.66	4.57	0.53
805	0.2473	0.3437	0.0511	9.6298	305 49.1	3.11	4.32	0.64
810	0.3199	0.2379	0.0486	9.6038	323 18.5	4.81	3.57	0.72
815	0.3558	-0.1055	0.0407	9.5721	343 18.1	6.65	+ 1.97	0.76
820	0.3414	+0.0409	0.0270	9.5377	6 37.5	8.09	- 0.97	0.64
825	0.2666	0.1792	-0.0067	9.5068	33 48.9	7.83	5.25	+0.26
830	+0.1342	0.2775	+0.0114	9.4892	64 19.3	-4.45	9.20	-0.28
835	-0.0306	0.3080	0.0287	9.4926	95 52.7	+0.99	9.98	0.93
840	0.1887	0.2651	0.0392	9.5154	125 31.2	5.22	7.23	1.08
845	0.3088	0.1669	0.0416	9.5483	151 30.3	6.81	3.68	0.92
850	0.3783	+0.0403	0.0372	9.5824	173 42.9	6.59	- 0.70	0.65
855	0.3983	-0.0923	0.0276	9.6125	192 50.8	5.64	+ 1.31	0.39
860	0.3755	0.2154	0.0154	9.6366	209 43.3	4.50	2.58	0.18
865	0.3184	0.3192	+0.0015	9.6540	225 3.2	3.38	3.39	-0.02
870	0.2357	0.3974	-0.0125	9.6648	239 25.1	2.36	3.92	+0.12
875	0.1352	0.4459	0.0255	9.6690	253 17.9	1.29	4.27	0.24
880	-0.0250	0.4620	0.0367	9.6666	267 7.1	+0.24	4.50	0.37
885	+0.0871	0.4440	0.0452	9.6578	281 18.0	-0.90	4.59	0.47
890	0.1922	0.3912	0.0501	9.6422	296 18.2	2.21	4.51	0.58
895	0.2803	0.3044	0.0507	9.6200	312 40.3	3.77	4.09	0.68
900	0.3397	0.1868	0.0461	9.5915	331 4.8	5.56	3.06	0.75
905	0.3568	-0.0468	0.0358	9.5582	352 19.8	7.35	+ 0.96	0.74
910	0.3185	+0.0997	0.0200	9.5242	17 12.0	8.30	- 2.59	0.52
915	0.2188	0.2257	-0.0005	9.4975	45 53.9	6.86	7.06	+0.02
920	+0.0690	0.2991	+0.0190	9.4879	77 11.4	-2.31	10.00	-0.64
925	-0.0977	0.2988	0.0339	9.5000	108 17.5	+3.01	9.20	1.05
930	0.2431	0.2303	0.0411	9.5282	136 33.2	6.15	5.83	1.04
935	0.3434	+0.0175	0.0406	9.5624	160 57.1	6.87	- 2.35	0.81
940	0.3921	-0.0139	0.0339	9.5953	181 48.7	6.25	+ 0.22	0.54
945	0.3937	0.1441	0.0230	9.6231	199 55.8	5.18	1.90	0.30
950	0.3559	0.2602	+0.0098	9.6445	216 6.0	4.04	2.95	-0.11
955	0.2875	0.3542	-0.0042	9.6592	230 58.5	2.94	3.63	+0.04
960	0.1965	0.4208	0.0179	9.6673	245 5.4	1.91	4.07	0.17
965	-0.0912	0.4564	0.0303	9.6688	258 53.7	+0.88	4.38	0.29
970	+0.0208	0.4589	0.0405	9.6638	272 48.7	-0.21	4.55	0.40
975	0.1311	0.4268	0.0477	9.6523	287 16.1	1.41	4.59	0.51
980	0.2307	0.3599	0.0509	9.6340	302 45.2	2.81	4.39	0.62
985	0.3086	0.2600	0.0495	9.6091	319 51.7	4.47	3.77	0.72
990	0.3525	-0.1319	0.0426	9.5784	339 19.4	6.31	+ 2.26	0.76
995	0.3485	+0.0133	0.0300	9.5441	1 57.9	7.91	- 0.30	0.68
1000	0.2853	0.1552	-0.0124	9.5119	28 25.5	8.09	4.41	+0.25
1005	0.1626	0.2636	+0.0077	9.4910	58 25.9	5.32	8.63	-0.25
1010	+0.0010	0.3082	0.0259	9.4903	90 1.5	-0.03	10.14	0.85
1015	-0.1612	0.2781	0.0378	9.5101	120 12.8	+4.62	7.98	1.09
1020	0.2899	0.1883	0.0418	9.5418	146 55.9	6.68	4.34	0.96
1025	0.3693	+0.0651	0.0385	9.5762	169 48.6	6.71	- 1.18	0.70
1030	-0.3980	-0.0678	+0.0298	9.6073	189 27.3	+5.83	+ 0.99	-0.44

NOTE. — The Epoch is the 2400,000th day of the Julian Period = 1858, November 16.

HELIOCENTRIC COÖRDINATES. 393

MERCURY.

Days from Epoch.	x .	y .	z .	Log Radius Vector.	Longitude in Orbit.	$-\frac{x^2}{r^3} x$.	$-\frac{x^2}{r^3} y$.	$-\frac{x^2}{r^3} z$.
1035	-0.3825	-0.1935	+0.0178	9.6326	206 41.6	+4.71	+ 2.38	-0.22
1040	0.3313	0.3015	+0.0042	9.6513	222 16.0	3.59	3.27	-0.05
1045	0.2528	0.3849	-0.0099	9.6633	236 46.5	2.52	3.84	+0.10
1050	0.1551	0.4391	0.0232	9.6687	250 42.7	1.49	4.22	0.22
1055	-0.0460	0.4615	0.0348	9.6676	264 30.7	+0.44	4.47	0.34
1060	+0.0663	0.4501	0.0439	9.6599	278 35.6	-0.68	4.59	0.45
1065	0.1735	0.4037	0.0495	9.6457	293 24.2	1.95	4.54	0.56
1070	0.2657	0.3231	0.0510	9.6247	309 28.2	3.45	4.21	0.66
1075	0.3313	0.2110	0.0474	9.5973	327 26.3	5.21	3.31	0.74
1080	0.3575	-0.0741	0.0382	9.5647	348 5.4	7.03	+ 1.46	0.75
1085	0.3304	+0.0728	0.0234	9.5303	12 14.2	8.24	- 1.82	0.58
1090	0.2420	0.2052	-0.0043	9.5015	40 15.3	7.36	6.25	+0.13
1095	+0.0996	0.2906	+0.0156	9.4880	71 14.2	-3.33	9.73	-0.52
1100	-0.0670	0.3046	0.0317	9.4962	102 36.6	+2.12	9.62	1.00
1105	0.2189	0.2474	0.0404	9.5221	131 32.2	5.78	6.53	1.07
1110	0.3284	0.1408	0.0412	9.5559	156 39.7	6.87	2.94	0.86
1115	0.3968	+0.0112	0.0355	9.5894	178 7.8	6.41	- 0.19	0.59
1120	0.3967	-0.1204	0.0253	9.6183	196 42.0	5.40	+ 1.64	0.34
1125	0.3656	0.2400	+0.0124	9.6410	213 10.8	4.25	2.79	-0.14
1130	0.3023	0.3386	-0.0016	9.6569	228 15.4	3.15	3.52	+0.02
1135	0.2149	0.4106	0.0154	9.6663	242 28.7	2.11	4.01	0.15
1140	-0.1117	-0.4520	-0.0282	9.6690	256 18.5	+1.07	+ 4.33	+0.27

VENUS.

Days from Epoch.	x .	y .	z .	Log Radius Vector.	Longitude in Orbit.	$-\frac{x^2}{r^3} x$.	$-\frac{x^2}{r^3} y$.	$-\frac{x^2}{r^3} z$.
780	-0.6312	-0.3499	+0.0310	9.8586	208 57.0	+20.34	+11.18	-1.00
785	0.5767	0.4351	0.0267	9.8591	216 58.9	18.53	13.98	0.86
790	0.5112	0.5118	0.0217	9.8595	224 59.7	16.38	16.40	0.70
795	0.4357	0.5785	0.0163	9.8600	232 59.4	13.92	18.47	0.52
800	0.3516	0.6340	0.0106	9.8604	240 58.2	11.20	20.19	0.33
805	0.2607	0.6772	+0.0048	9.8607	248 56.2	8.28	21.52	-0.15
810	0.1648	0.7073	-0.0010	9.8611	256 53.4	5.22	22.42	+0.03
815	-0.0658	0.7238	0.0070	9.8614	264 49.8	+ 2.08	22.89	0.22
820	+0.0345	0.7263	0.0129	9.8616	272 45.5	- 1.09	22.92	0.41
825	0.1342	0.7140	0.0184	9.8619	280 40.8	4.23	22.53	0.58
830	0.2313	0.6890	0.0235	9.8620	288 35.6	7.29	21.72	0.73
835	0.3239	0.6516	0.0283	9.8622	296 30.0	10.19	20.49	0.89
840	0.4104	0.6008	0.0326	9.8623	304 24.2	12.90	18.88	1.03
845	0.4891	0.5385	0.0361	9.8623	312 18.4	15.37	16.92	1.14
850	0.5583	0.4658	0.0390	9.8623	320 12.6	17.55	14.64	1.23
855	0.6168	0.3842	0.0412	9.8621	328 6.9	19.40	12.08	1.30
860	0.6636	0.2954	0.0425	9.8620	336 1.5	20.90	9.30	1.34
865	0.6977	0.2010	0.0430	9.8618	343 56.5	22.01	6.34	1.36
870	0.7184	0.1026	0.0428	9.8616	351 51.8	22.70	3.24	1.35
875	0.7253	-0.0022	0.0417	9.8612	359 47.9	22.97	+ 0.07	1.32
880	0.7182	+0.0981	0.0398	9.8609	7 44.7	22.80	- 3.12	1.26
885	+0.6972	+0.1965	-0.0372	9.8605	15 42.2	-22.19	- 6.25	+1.18

NOTE. — The Epoch is the 2400,000th day of the Julian Period = 1858, November 16.

394 HELIOCENTRIC COÖRDINATES.

VENUS.								
Days from Epoch.	<i>x</i> .	<i>y</i> .	<i>z</i> .	Log Radius Vector.	Longitude in Orbit.	$-\frac{x^2}{r^2}$.	$-\frac{y^2}{r^2}$.	$-\frac{z^2}{r^2}$.
890	+0.6627	+0.2912	-0.0338	9.8602	23 40.6	-21.14	- 9.29	+1.08
895	0.6154	0.3802	0.0297	9.8598	31 39.9	19.68	12.16	0.95
900	0.5561	0.4618	0.0250	9.8594	39 40.1	17.84	14.81	0.80
905	0.4859	0.5345	0.0198	9.8589	47 41.3	15.64	17.20	0.64
910	0.4062	0.5967	0.0143	9.8585	55 43.4	13.12	19.26	0.46
915	0.3185	0.6471	0.0085	9.8581	63 46.4	10.31	20.94	0.27
920	0.2245	0.6848	-0.0026	9.8577	71 50.2	7.28	22.22	+0.08
925	0.1262	0.7089	+0.0033	9.8574	79 54.8	4.11	23.05	-0.11
930	+0.0255	0.7190	0.0093	9.8571	88 0.0	-0.83	23.42	0.30
935	-0.0758	0.7150	0.0150	9.8569	96 5.9	+2.48	23.33	0.49
940	0.1757	0.6969	0.0204	9.8566	104 12.4	5.75	22.77	0.67
945	0.2721	0.6649	0.0255	9.8565	112 19.2	8.90	21.75	0.83
950	0.3631	0.6194	0.0301	9.8564	120 26.3	11.87	20.28	0.98
955	0.4467	0.5616	0.0341	9.8564	128 33.4	14.62	18.39	1.12
960	0.5214	0.4927	0.0374	9.8564	136 40.8	17.07	16.13	1.23
965	0.5859	0.4140	0.0399	9.8565	144 48.2	19.17	13.54	1.31
970	0.6387	0.3271	0.0416	9.8566	152 55.2	20.88	10.69	1.36
975	0.6787	0.2336	0.0424	9.8568	161 1.4	22.16	7.63	1.39
980	0.7053	0.1355	0.0424	9.8570	169 7.0	23.00	4.42	1.38
985	0.7179	+0.0347	0.0417	9.8573	177 12.3	23.36	- 1.13	1.36
990	0.7164	-0.0667	0.0401	9.8576	185 17.0	23.26	+ 2.17	1.30
995	0.7006	0.1668	0.0377	9.8580	193 21.0	22.70	5.41	1.22
1000	0.6710	0.2636	0.0345	9.8583	201 24.2	21.68	8.52	1.12
1005	0.6282	0.3553	0.0307	9.8588	209 26.5	20.23	11.44	0.99
1010	0.5731	0.4400	0.0264	9.8592	217 27.9	18.40	14.13	0.85
1015	0.5070	0.5161	0.0214	9.8596	225 28.4	16.24	16.53	0.69
1020	0.4309	0.5822	0.0161	9.8600	233 28.0	13.76	18.59	0.51
1025	0.3463	0.6370	0.0104	9.8604	241 26.8	11.03	20.28	0.33
1030	0.2551	0.6794	+0.0045	9.8607	249 24.7	8.11	21.59	-0.14
1035	0.1589	0.7087	-0.0015	9.8611	257 21.8	5.04	22.48	+0.04
1040	-0.0597	0.7243	0.0073	9.8614	265 18.2	+1.89	22.91	0.23
1045	+0.0406	0.7259	0.0130	9.8617	273 14.0	-1.28	22.91	0.41
1050	0.1401	0.7137	0.0186	9.8619	281 9.2	4.42	22.49	0.59
1055	0.2370	0.6879	0.0239	9.8621	289 4.0	7.46	21.65	0.75
1060	0.3293	0.6488	0.0287	9.8622	296 58.4	10.36	20.40	0.90
1065	0.4154	0.5972	0.0328	9.8623	304 52.6	13.06	18.77	1.02
1070	0.4935	0.5343	0.0363	9.8623	312 46.8	15.51	16.79	1.14
1075	0.5621	0.4611	0.0392	9.8622	320 41.0	17.68	14.50	1.24
1080	0.6200	0.3791	0.0413	9.8622	328 35.3	19.51	11.93	1.30
1085	0.6661	0.2898	0.0426	9.8620	336 29.8	20.98	9.13	1.34
1090	0.6994	0.1950	0.0431	9.8618	344 24.9	22.06	6.15	1.36
1095	0.7192	-0.0966	0.0427	9.8615	352 20.4	22.73	+ 3.05	1.35
1100	0.7252	+0.0037	0.0415	9.8612	0 16.5	22.97	- 0.12	1.31
1105	0.7172	0.1040	0.0396	9.8609	8 13.3	22.76	3.30	1.25
1110	0.6953	0.2023	0.0369	9.8605	16 10.9	22.13	6.44	1.17
1115	0.6601	0.2968	0.0334	9.8601	24 9.4	21.06	9.47	1.07
1120	0.6121	0.3854	0.0293	9.8597	32 8.7	19.59	12.34	0.94
1125	0.5521	0.4665	0.0247	9.8593	40 9.0	17.72	14.97	0.79
1130	0.4813	0.5385	0.0196	9.8589	48 10.2	15.49	17.33	0.63
1135	0.4011	0.6001	0.0141	9.8585	56 12.4	12.94	19.36	0.45
1140	+0.3130	+0.6497	-0.0081	9.8581	64 15.4	-10.13	-21.02	+0.26

NOTE. — The Epoch is the 2400,000th day of the Julian Period = 1858, November 16.

HELIOCENTRIC COÖRDINATES. 395

THE EARTH.

Days from Epoch.	x .	y .	z .	Log Radius Vector.	Longitude in Orbit.	$-\frac{x^2}{r^3} x$.	$-\frac{x^2}{r^3} y$.	$-\frac{x^2}{r^3} z$.
780	-0.2443	+0.9525	0.0000	9.9927	104 23.1	+ 3.43	-13.36	0.00
790	0.4092	0.8946		9.9929	114 34.6	5.74	12.54	
800	0.5612	0.8091		9.9933	124 45.0	7.85	11.30	
810	0.6961	0.6986		9.9939	134 53.9	9.70	9.72	
820	0.8004	0.5665		9.9947	145 1.1	11.21	7.85	
830	0.8980	0.4170		9.9957	155 5.6	12.35	5.72	
840	0.9593	0.2549		9.9968	165 7.2	13.09	3.47	
850	0.9916	+0.0850		9.9980	175 6.0	13.41	- 1.14	
860	0.9943	-0.0674		9.9992	185 1.0	13.32	+ 1.18	
870	0.9675	0.2572		0.0004	194 52.6	12.85	3.43	
880	0.9121	0.4194		0.0017	204 41.3	12.02	5.54	
890	0.8301	0.5694		0.0028	214 26.4	10.86	7.46	
900	0.7242	0.7029		0.0039	224 8.3	9.40	9.14	
910	0.5974	0.8161		0.0049	233 47.8	7.70	10.53	
920	0.4535	0.9062		0.0057	243 24.7	5.81	11.63	
930	0.2969	0.9704		0.0064	252 59.6	3.78	12.39	
940	-0.1317	1.0073		0.0069	262 33.2	+ 1.67	12.82	
950	+0.0371	1.0160		0.0071	272 5.5	- 0.48	12.90	
960	0.2049	0.9960		0.0072	281 37.5	2.61	12.64	
970	0.3670	0.9480		0.0071	291 9.7	4.67	12.04	
980	0.5187	0.8733		0.0068	300 42.3	6.61	11.11	
990	0.6557	0.7741		0.0063	310 16.0	8.39	9.88	
1000	0.7743	0.6530		0.0055	319 51.6	9.95	8.37	
1010	0.8708	0.5133		0.0047	329 29.0	11.25	6.62	
1020	0.9425	0.3590		0.0037	339 9.0	12.26	4.66	
1030	0.9869	0.1944		0.0026	348 51.9	12.94	2.54	
1040	1.0029	-0.0241		0.0014	358 37.7	13.25	+ 0.30	
1050	0.9895	+0.1470		0.0001	8 27.0	13.19	- 1.97	
1060	0.9469	0.3137		9.9989	18 19.8	12.73	4.23	
1070	0.8761	0.4709		9.9976	28 15.6	11.88	6.40	
1080	0.7790	0.6141		9.9965	38 15.0	10.64	8.40	
1090	0.6584	0.7389		9.9954	48 17.5	9.06	10.18	
1100	0.5178	0.8409		9.9945	58 22.5	7.17	11.66	
1110	0.3613	0.9171		9.9938	68 30.1	5.02	12.78	
1120	0.1936	0.9651		9.9932	78 39.6	2.70	13.50	
1130	+0.0200	0.9834		9.9928	88 50.2	- 0.28	13.79	
1140	-0.1543	+0.9716	0.0000	9.9927	99 1.7	+ 2.18	-13.63	0.00

M A R S.

Days from Epoch.	x .	y .	z .	Log Radius Vector.	Longitude in Orbit.	$-\frac{x^2}{r^3} x$.	$-\frac{x^2}{r^3} y$.	$-\frac{x^2}{r^3} z$.
780	+1.1057	+0.9498	-0.0064	0.1637	40 39.4	-0.63	-0.54	0.00
790	1.0155	1.0629	-0.0017	0.1673	46 18.6	0.56	0.59	0.00
800	0.9155	1.1662	+0.0028	0.1710	51 52.0	0.50	0.63	0.00
810	0.8074	1.2588	0.0075	0.1748	57 19.8	0.43	0.66	0.00
820	0.6921	1.3404	0.0120	0.1786	62 41.9	0.35	0.69	-0.01
830	0.5708	1.4105	0.0164	0.1823	67 58.5	0.27	0.70	0.01
840	+0.4448	+1.4687	+0.0207	0.1860	73 9.7	-0.20	-0.72	-0.01

NOTE. — The Epoch is the 2400,000th day of the Julian Period = 1858, November 16.

396 HELIOCENTRIC COÖRDINATES.

M A R S.								
Days from Epoch.	x .	y .	z .	Log Radius Vector.	Longitude in Orbit.	$-\frac{x^2}{r^2}x$.	$-\frac{x^2}{r^2}y$.	$-\frac{x^2}{r^2}z$.
850	+0.3151	+1.5148	+0.0249	0.1896	78 15.8	-0.15	-0.72	-0.01
860	0.1829	1.5489	0.0288	0.1931	83 16.8	0.08	0.72	0.01
870	+0.0492	1.5708	0.0325	0.1964	88 13.2	-0.02	0.71	0.01
880	-0.0848	1.5809	0.0359	0.1996	93 5.2	+0.04	0.70	0.02
890	0.2182	1.5791	0.0391	0.2027	97 53.0	0.09	0.69	0.02
900	0.3500	1.5659	0.0420	0.2055	102 36.9	0.15	0.67	0.02
910	0.4793	1.5414	0.0446	0.2081	107 17.2	0.20	0.65	0.02
920	0.6052	1.5062	0.0469	0.2106	111 54.4	0.25	0.62	0.02
930	0.7270	1.4605	0.0489	0.2128	116 28.6	0.30	0.59	0.02
940	0.8439	1.4048	0.0505	0.2147	121 0.1	0.34	0.56	0.02
950	0.9550	1.3398	0.0518	0.2165	125 29.4	0.38	0.54	0.02
960	1.0599	1.2658	0.0528	0.2180	129 56.6	0.42	0.50	0.02
970	1.1578	1.1836	0.0534	0.2192	134 22.2	0.45	0.46	0.02
980	1.2481	1.0937	0.0536	0.2202	138 46.4	0.49	0.42	0.02
990	1.3304	0.9967	0.0535	0.2209	143 9.6	0.51	0.38	0.02
1000	1.4042	0.8932	0.0531	0.2214	147 32.0	0.54	0.34	0.02
1010	1.4688	0.7841	0.0523	0.2217	151 54.0	0.56	0.30	0.02
1020	1.5242	0.6699	0.0512	0.2216	156 15.9	0.58	0.26	0.02
1030	1.5698	0.5515	0.0498	0.2213	160 37.9	0.60	0.21	0.02
1040	1.6053	0.4295	0.0480	0.2208	165 0.5	0.61	0.16	0.02
1050	1.6305	0.3047	0.0459	0.2200	169 24.0	0.63	0.11	0.02
1060	1.6452	0.1780	0.0436	0.2189	173 48.5	0.64	0.07	0.02
1070	1.6491	+0.0501	0.0410	0.2176	178 14.6	0.65	-0.02	0.02
1080	1.6422	-0.0781	0.0381	0.2160	182 42.3	0.66	+0.03	0.02
1090	1.6243	0.2057	0.0349	0.2142	187 12.2	0.66	0.08	0.01
1100	1.5955	0.3320	0.0315	0.2122	191 44.5	0.65	0.13	0.01
1110	1.5558	0.4561	0.0278	0.2099	196 19.4	0.65	0.19	0.01
1120	1.5053	0.5770	0.0240	0.2074	200 57.4	0.64	0.24	0.01
1130	1.4442	0.6937	0.0200	0.2047	205 38.8	0.62	0.30	0.01
1140	-1.3726	-0.8055	+0.0159	0.2018	210 22.7	+0.60	+0.35	-0.01

J U P I T E R.								
Days from Epoch.	x .	y .	z .	Log Radius Vector.	Longitude in Orbit.	$-\frac{x^2}{r^2}x$.	$-\frac{x^2}{r^2}y$.	$-\frac{x^2}{r^2}z$.
780	-4.03920	+3.49848	+0.07892	0.72788	139 6 38	+119.57	-103.56	-2.34
790	4.08903	3.44458	0.08024	0.72812	139 53 49	120.85	101.80	2.37
800	4.13806	3.39002	0.08154	0.72835	140 40 56	122.10	100.03	2.41
810	4.18629	3.33480	0.08282	0.72858	141 28 0	123.33	98.24	2.44
820	4.23371	3.27894	0.08409	0.72881	142 15 1	124.53	96.44	2.48
830	4.28032	3.22245	0.08535	0.72904	143 2 0	125.70	94.63	2.51
840	4.32611	3.16533	0.08659	0.72926	143 48 55	126.85	92.81	2.54
850	4.37107	3.10761	0.08781	0.72948	144 35 48	127.97	90.98	2.57
860	4.41519	3.04920	0.08902	0.72970	145 22 38	129.07	89.14	2.60
870	4.45846	2.99038	0.09021	0.72991	146 9 25	130.14	87.29	2.63
880	4.50087	2.93090	0.09138	0.73012	146 56 9	131.19	85.43	2.66
890	4.54242	2.87087	0.09253	0.73033	147 42 50	132.21	83.56	2.69
900	4.58311	2.81029	0.09366	0.73054	148 29 30	133.20	81.68	2.72
910	-4.62293	+2.74917	+0.09478	0.73074	149 16 6	+134.17	-79.79	-2.75

NOTE. — The Epoch is the 2400,000th day of the Julian Period = 1858, November 16.

HELIOCENTRIC COÖRDINATES. 397

J U P I T E R.

Days from Epoch.	<i>x</i> .	<i>y</i> .	<i>z</i> .	Log Radius Vector.	Longitude in Orbit.	$-\frac{x^2}{r^3} x$.	$-\frac{x^2}{r^3} y$.	$-\frac{x^2}{r^3} z$.
920	-4.66188	+2.68753	+0.09568	0.73094	150 2 40	+135.11	-77.89	-2.78
930	4.69994	2.62538	0.09696	0.73114	150 49 11	136.03	75.99	2.81
940	4.73711	2.56273	0.09803	0.73133	151 35 39	136.92	74.08	2.83
950	4.77338	2.49960	0.09908	0.73152	152 22 6	137.79	72.16	2.86
960	4.80874	2.43600	0.10010	0.73171	153 8 29	138.63	70.23	2.89
970	4.84320	2.37195	0.10110	0.73189	153 54 51	139.45	68.30	2.91
980	4.87674	2.30744	0.10209	0.73207	154 41 10	140.24	66.36	2.94
990	4.90937	2.24249	0.10306	0.73225	155 27 27	141.01	64.41	2.96
1000	4.94108	2.17711	0.10401	0.73243	156 13 41	141.75	62.46	2.98
1010	4.97186	2.11132	0.10494	0.73260	156 59 53	142.46	60.50	3.00
1020	5.00170	2.04514	0.10585	0.73277	157 46 3	143.15	58.53	3.03
1030	5.03061	1.97858	0.10674	0.73294	158 32 11	143.81	56.56	3.05
1040	5.05858	1.91165	0.10761	0.73310	159 18 17	144.44	54.59	3.07
1050	5.08560	1.84436	0.10846	0.73326	160 4 21	145.05	52.61	3.09
1060	5.11167	1.77673	0.10929	0.73342	160 50 23	145.64	50.62	3.11
1070	5.13678	1.70876	0.11010	0.73357	161 36 23	146.20	48.63	3.13
1080	5.16094	1.64048	0.11089	0.73372	162 22 21	146.74	46.64	3.15
1090	5.18413	1.57189	0.11166	0.73387	163 8 17	147.25	44.65	3.17
1100	5.20635	1.50300	0.11240	0.73401	163 54 11	147.73	42.65	3.19
1110	5.22761	1.43383	0.11313	0.73415	164 40 4	148.19	40.65	3.21
1120	5.24790	1.36439	0.11384	0.73428	165 25 55	148.62	38.64	3.22
1130	5.26722	1.29471	0.11452	0.73442	166 11 44	149.03	36.63	3.24
1140	-5.28557	+1.22479	+0.11518	0.73455	166 57 31	+149.42	-34.62	-3.26

S A T U R N.

Days from Epoch.	<i>x</i> .	<i>y</i> .	<i>z</i> .	Log Radius Vector.	Longitude in Orbit.	$-\frac{x^2}{r^3} x$.	$-\frac{x^2}{r^3} y$.	$-\frac{x^2}{r^3} z$.
780	-8.36824	+4.02697	+0.26922	0.96804	154 19 45	+14.11	-6.79	-0.45
790	8.39534	3.97651	0.27115	0.96818	154 40 55	14.14	6.70	0.46
800	8.42213	3.92591	0.27306	0.96831	155 2 5	14.17	6.61	0.46
810	8.44800	3.87516	0.27496	0.96844	155 23 14	14.21	6.52	0.46
820	8.47415	3.82427	0.27686	0.96857	155 44 22	14.24	6.43	0.47
830	8.50059	3.77324	0.27874	0.96870	156 5 29	14.27	6.33	0.47
840	8.52611	3.72207	0.28061	0.96883	156 26 36	14.30	6.24	0.47
850	8.55131	3.67076	0.28247	0.96896	156 47 42	14.32	6.15	0.47
860	8.57620	3.61932	0.28432	0.96909	157 8 47	14.35	6.06	0.48
870	8.60077	3.56775	0.28616	0.96922	157 29 51	14.38	5.97	0.48
880	8.62503	3.51604	0.28799	0.96935	157 50 55	14.41	5.88	0.48
890	8.64897	3.46420	0.28981	0.96949	158 11 58	14.43	5.78	0.48
900	8.67259	3.41224	0.29162	0.96962	158 33 0	14.46	5.69	0.49
910	8.69590	3.36015	0.29342	0.96975	158 54 1	14.49	5.60	0.49
920	8.71889	3.30794	0.29521	0.96988	159 15 2	14.51	5.51	0.49
930	8.74156	3.25560	0.29699	0.97001	159 36 1	14.54	5.42	0.49
940	8.76391	3.20315	0.29876	0.97015	159 57 0	14.56	5.32	0.50
950	8.78593	3.15058	0.30052	0.97028	160 17 58	14.58	5.23	0.50
960	8.80763	3.09790	0.30226	0.97041	160 38 55	14.61	5.14	0.50
970	8.82900	3.04510	0.30399	0.97055	160 59 51	14.63	5.05	0.50
980	-8.85005	+2.99220	+0.30571	0.97068	161 20 47	+14.65	-4.95	-0.51

NOTE. — The Epoch is the 2400,000th day of the Julian Period = 1858, November 16.

398 HELIOCENTRIC COÖRDINATES.

SATURN.								
Days from Epoch.	<i>x</i> .	<i>y</i> .	<i>z</i> .	Log Radius Vector.	Longitude in Orbit.	$-\frac{x^2}{r^2} x$.	$-\frac{x^2}{r^2} y$.	$-\frac{x^2}{r^2} z$.
990	-8.87078	+2.93919	+0.30742	0.97082	161 41 42	+14.67	-4.86	-0.51
1000	8.89118	2.88607	0.30912	0.97095	162 2 36	14.69	4.77	0.51
1010	8.91126	2.83284	0.31081	0.97109	162 23 29	14.71	4.68	0.51
1020	8.93101	2.77951	0.31249	0.97122	162 44 22	14.73	4.58	0.51
1030	8.95044	2.72608	0.31416	0.97136	163 5 14	14.75	4.49	0.52
1040	8.96954	2.67255	0.31581	0.97149	163 26 5	14.77	4.40	0.52
1050	8.98831	2.61892	0.31746	0.97162	163 46 55	14.78	4.31	0.52
1060	9.00676	2.56520	0.31909	0.97176	164 7 45	14.80	4.22	0.52
1070	9.02488	2.51138	0.32071	0.97190	164 28 33	14.81	4.12	0.53
1080	9.04268	2.45748	0.32232	0.97203	164 49 21	14.83	4.03	0.53
1090	9.06015	2.40349	0.32391	0.97217	165 10 8	14.85	3.94	0.53
1100	9.07730	2.34941	0.32550	0.97230	165 30 54	14.86	3.85	0.53
1110	9.09411	2.29524	0.32707	0.97243	165 51 39	14.87	3.75	0.53
1120	9.11060	2.24099	0.32863	0.97257	166 12 24	14.89	3.66	0.54
1130	9.12676	2.18667	0.33018	0.97270	166 33 8	14.90	3.57	0.54
1140	-9.14259	+2.13226	+0.33172	0.97284	166 53 52	+14.91	-3.48	-0.54

URANUS.								
Days from Epoch.	<i>x</i> .	<i>y</i> .	<i>z</i> .	Log Radius Vector.	Longitude in Orbit.	$-\frac{x^2}{r^2} x$.	$-\frac{x^2}{r^2} y$.	$-\frac{x^2}{r^2} z$.
800	+6.41231	+18.18675	-0.01201	1.28520	70 34 41	-0.17	-0.48	0.00
840	6.26197	18.23100	0.00991	1.28503	71 2 36	0.17	0.48	0.00
880	6.11125	18.27404	0.00780	1.28486	71 30 31	0.16	0.49	0.00
920	5.96011	18.31584	0.00567	1.28468	71 58 29	0.16	0.49	0.00
960	5.80862	18.35650	0.00354	1.28451	72 26 27	0.15	0.49	0.00
1000	5.65676	18.39580	-0.00140	1.28434	72 54 26	0.15	0.49	0.00
1040	5.50451	18.43390	+0.00073	1.28416	73 22 26	0.15	0.49	0.00
1080	5.35192	18.47079	0.00285	1.28399	73 50 28	0.14	0.49	0.00
1120	+5.19899	+18.50644	+0.00498	1.28382	74 18 31	-0.14	-0.50	0.00

NEPTUNE.								
Days from Epoch.	<i>x</i> .	<i>y</i> .	<i>z</i> .	Log Radius Vector.	Longitude in Orbit.	$-\frac{x^2}{r^2} x$.	$-\frac{x^2}{r^2} y$.	$-\frac{x^2}{r^2} z$.
800	+29.8553	-0.6658	-0.6960	1.47524	358 44.0	-0.28	+0.01	+0.01
840	29.8565	0.5398	0.6986	1.47523	358 58.5	0.28	+0.01	0.01
880	29.8574	0.4140	0.7012	1.47521	359 13.0	0.28	0.00	0.01
920	29.8579	0.2878	0.7037	1.47520	359 27.5	0.28	0.00	0.01
960	29.8578	0.1619	0.7063	1.47519	359 42.0	0.28	0.00	0.01
1000	29.8578	-0.0360	0.7088	1.47517	359 56.5	0.28	0.00	0.01
1040	29.8561	+0.0900	0.7113	1.47516	0 11.0	0.28	0.00	0.01
1080	29.8545	0.2167	0.7138	1.47514	0 25.6	0.28	0.00	0.01
1120	+29.8523	+0.3409	-0.7162	1.47513	0 40.0	-0.28	0.00	+0.01

NOTE. — The Epoch is the 2400,000th day of the Julian Period = 1858, November 16.

HELIOCENTRIC COÖRDINATES. 399

INCLINATIONS AND NODES.

Planets.	Inclination.	Increase in 100 Days.	Longitude of Ascending Node.	Increase in 100 Days.
Mercury	7° 0' 8.8"	+0.01959	46° 39' 20"	11.639
Venus	3 23 36.3	+0.01195	75 25 35	9.001
Mars	1 51 2.1	-0.00586	48 27 42	7.579
Jupiter	1 18 39.5	-0.05689	99 1 38	9.993
Saturn	2 29 21.2	-0.03824	112 24 8	8.570
Uranus	0 46 29.8	+0.00634	73 16 44	4.898
Neptune	1 46 29.0		130 12 8	

LOGARITHMS OF MASSES.

Sun's = 1.

Mercury, 93.3129	The Earth, 94.44985	Jupiter, 96.979689	Uranus, 95.60371
Venus, 94.4089	Mars, 93.57176	Saturn, 96.45573	Neptune, 95.72630

ECLIPSES IN 1861.

In the year 1861 there will be four Eclipses; three of the Sun and one of the Moon, and a transit of Mercury over the Sun's disc.

I. An Annular Eclipse of the Sun, January 10, 1861, invisible at Washington, with the following elements:—

Washington Mean Time of δ in Right Ascension, January 10 ^d 10 ^h 16 ^m 4.6 ^s .			
Sun's and Moon's R.A.	19 ^h 30 ^m 40.91 ^s	Hourly Motions	10.85 and 137.15
Sun's Declination	—21° 49' 19.1"	Hourly Motion	+ 0' 23.5"
Moon's Declination	—21 59 38.2	" "	+ 7 59.3
Sun's Equa. Hor. Par.	8.7	True Semidiameter	16 15.9
Moon's Equa. Hor. Par.	56 47.0	" "	15 27.6

From these elements may be deduced the following results:—

Eclipse begins on the Earth, January 10^d 7^h 27^m.1, Washington mean time, in longitude 207° 51'.8 West from Washington, and in latitude 19° 32'.4 South.

Central Eclipse begins 8^h 30^m.7, in longitude 225° 19'.2 West from Washington, and in latitude 22° 56'.2 South.

Central Eclipse at noon, 10^h 16^m.1, in longitude 151° 58'.3 West from Washington, and in latitude 32° 30'.1 South.

Central Eclipse ends 12^h 11^m.8, in longitude 92° 33'.0, West from Washington, and in latitude 4° 7'.6 North.

Eclipse ends on the Earth 13^h 15^m.5, in longitude 109° 50'.2 West from Washington, and in latitude 7° 34'.2 North.

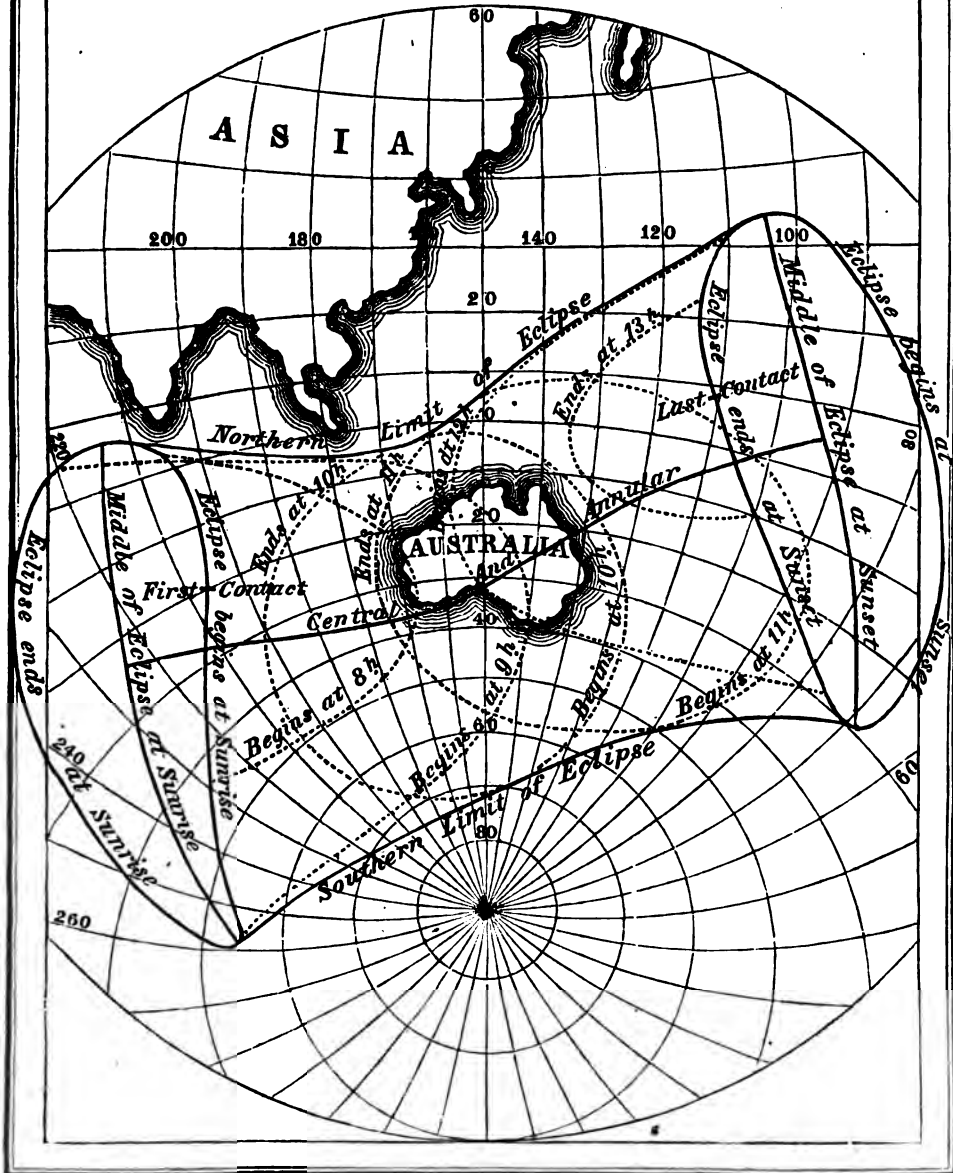
DATA FOR COMPUTING THE ECLIPSE FOR ANY PLACE, FOR PENUMBRA.

Wash. M. Time.	A.	B.	C.	log E.	log F.	log G.	log H.	μ
h m				9.96	9.96	—9.57	—9.56	
7 25	—1.47417	—0.00351	—1.12291	6828	8483	5667	5362	109° 12' 40.0
7 30	1.43108	+0.00761	1.11182	6829	8485	5658	5352	110 27 39.2
7 35	1.38799	0.01873	1.10073	6830	8486	5649	5342	111 42 38.3
7 40	1.34490	0.02985	1.08964	6832	8487	5639	5332	112 57 37.5
7 45	1.30181	0.04097	1.07855	6834	8489	5629	5322	114 12 36.7
7 50	1.25872	0.05209	1.06746	6835	8490	5620	5313	115 27 35.8
7 55	1.21563	0.06321	1.05636	6837	8492	5610	5303	116 42 35.0
8 0	1.17255	0.07434	1.04526	6839	8494	5600	5293	117 57 34.2
8 5	1.12946	0.08547	1.03416	6840	8495	5591	5283	119 12 33.3
8 10	1.08637	0.09660	1.02306	6841	8496	5582	5273	120 27 32.5
8 15	1.04328	0.10773	1.01195	6843	8498	5572	5264	121 42 31.7
8 20	1.00019	0.11886	1.00084	6844	8499	5563	5254	122 57 30.8
8 25	0.95710	0.13000	0.98973	6846	8501	5553	5244	124 12 30.0
8 30	0.91402	0.14114	0.97862	6848	8503	5543	5234	125 27 29.2
8 35	0.87093	0.15228	0.96751	6849	8504	5534	5224	126 42 28.3
8 40	0.82785	0.16342	0.95639	6851	8505	5524	5215	127 57 27.5
8 45	—0.78476	+0.17457	—0.94527	6853	8507	5514	5205	129 12 26.7

ANNULAR ECLIPSE

OF

JAN. 10, 1861.



DATA FOR COMPUTING THE ECLIPSE FOR ANY PLACE, FOR PENUMBRA.								
Wash. M. Time.	A.	B.	C.	log E.	log F.	log G.	log H.	μ
				9.96	9.96	-9.57	-9.56	
h m								
8 50	-0.74167	+0.18572	-0.93415	6854	8508	5505	5195	130° 27' 25.8
8 55	0.69859	0.19687	0.92303	6856	8510	5495	5185	131 42 25.0
9 0	0.65550	0.20802	0.91190	6858	8512	5485	5175	132 57 24.2
9 5	0.61241	0.21917	0.90077	6859	8513	5476	5166	134 12 23.3
9 10	0.56933	0.23033	0.88964	6860	8515	5467	5156	135 27 22.5
9 15	0.52625	0.24149	0.87851	6862	8517	5457	5146	136 42 21.7
9 20	0.48316	0.25265	0.86738	6863	8518	5448	5136	137 57 20.8
9 25	0.44008	0.26381	0.85624	6865	8520	5438	5126	139 12 20.0
9 30	0.39700	0.27497	0.84510	6867	8522	5428	5116	140 27 19.2
9 35	0.35391	0.28613	0.83396	6868	8523	5419	5106	141 42 18.3
9 40	0.31083	0.29730	0.82281	6870	8524	5409	5096	142 57 17.5
9 45	0.26775	0.30847	0.81166	6872	8526	5399	5086	144 12 16.7
9 50	0.22467	0.31964	0.80051	6873	8527	5390	5076	145 27 15.8
9 55	0.18159	0.33081	0.78936	6875	8529	5380	5066	146 42 14.9
10 0	0.13851	0.34199	0.77821	6877	8531	5370	5056	147 57 14.1
10 5	0.09543	0.35317	0.76706	6878	8532	5361	5047	149 12 13.2
10 10	0.05235	0.36435	0.75590	6879	8534	5351	5037	150 27 12.4
10 15	-0.00928	0.37553	0.74474	6881	8536	5341	5027	151 42 11.6
10 20	+0.03380	0.38671	0.73358	6882	8537	5332	5017	152 57 10.7
10 25	0.07688	0.39789	0.72241	6884	8539	5322	5007	154 12 9.9
10 30	0.11995	0.40908	0.71124	6886	8541	5312	4997	155 27 9.1
10 35	0.16303	0.42027	0.70007	6887	8542	5303	4987	156 42 8.2
10 40	0.20610	0.43146	0.68890	6889	8543	5293	4977	157 57 7.4
10 45	0.24917	0.44265	0.67772	6891	8545	5283	4967	159 12 6.6
10 50	0.29224	0.45385	0.66655	6892	8546	5274	4957	160 27 5.7
10 55	0.33531	0.46505	0.65537	6894	8548	5264	4947	161 42 4.8
11 0	0.37837	0.47625	0.64419	6896	8550	5254	4937	162 57 4.0
11 5	0.42144	0.48745	0.63301	6897	8551	5245	4927	164 12 3.1
11 10	0.46451	0.49865	0.62183	6898	8552	5235	4917	165 27 2.3
11 15	0.50757	0.50986	0.61064	6900	8554	5225	4908	166 42 1.5
11 20	0.55064	0.52106	0.59945	6901	8555	5216	4898	167 57 0.6
11 25	0.59370	0.53227	0.58826	6903	8557	5206	4888	169 11 59.8
11 30	0.63676	0.54348	0.57706	6905	8559	5196	4878	170 26 59.0
11 35	0.67982	0.55469	0.56586	6906	8560	5187	4868	171 41 58.1
11 40	0.72288	0.56590	0.55466	6908	8561	5177	4858	172 56 57.3
11 45	0.76594	0.57712	0.54346	6910	8563	5167	4848	174 11 56.5
11 50	0.80900	0.58834	0.53226	6911	8564	5158	4838	175 26 55.6
11 55	0.85206	0.59956	0.52106	6913	8566	5148	4828	176 41 54.8
12 0	0.89511	0.61078	0.50985	6915	8568	5138	4818	177 56 54.0
12 5	0.93817	0.62200	0.49864	6916	8569	5129	4808	179 11 53.1
12 10	0.98122	0.63322	0.48743	6918	8571	5119	4798	180 26 52.3
12 15	1.02427	0.64445	0.47622	6920	8573	5109	4789	181 41 51.5
12 20	1.06732	0.65568	0.46500	6921	8574	5100	4779	182 56 50.6
12 25	1.11037	0.66691	0.45378	6923	8576	5090	4769	184 11 49.8
12 30	1.15342	0.67814	0.44256	6925	8578	5080	4759	185 26 49.0
12 35	1.19647	0.68937	0.43134	6926	8579	5071	4749	186 41 48.1
12 40	1.23951	0.70060	0.42012	6928	8580	5061	4739	187 56 47.3
12 45	1.28255	0.71184	0.40889	6930	8582	5051	4729	189 11 46.5
12 50	1.32559	0.72308	0.39766	6931	8583	5042	4719	190 26 45.6
12 55	1.36863	0.73432	0.38643	6933	8585	5032	4709	191 41 44.8
13 0	1.41167	0.74556	0.37520	6935	8587	5022	4699	192 56 44.0
13 5	1.45471	0.75680	0.36397	6936	8588	5013	4689	194 11 43.1
13 10	1.49775	0.76804	0.35273	6938	8589	5003	4679	195 26 42.3
13 15	1.54078	0.77929	0.34149	6940	8591	4993	4669	196 41 41.5
13 20	+1.58381	+0.79054	-0.33025	6941	8593	4983	4659	197 56 40.6

FOR SHADOW.

Washington Mean Time.	B.	C.	Washington Mean Time.	B.	C.
^h 8 ^m 25	-0.41593	-0.44380	^h 10 ^m 25	-0.14804	-0.17648
8 30	0.40479	0.43269	10 30	0.13686	0.16531
8 35	0.39365	0.42158	10 35	0.12567	0.15414
8 40	0.38251	0.41046	10 40	0.11448	0.14297
8 45	0.37136	0.39934	10 45	0.10329	0.13179
8 50	0.36021	0.38822	10 50	0.09209	0.12061
8 55	0.34906	0.37710	10 55	0.08089	0.10943
9 0	0.33791	0.36597	11 0	0.06969	0.09825
9 5	0.32676	0.35484	11 5	0.05849	0.08707
9 10	0.31560	0.34371	11 10	0.04729	0.07589
9 15	0.30444	0.33258	11 15	0.03609	0.06470
9 20	0.29328	0.32145	11 20	0.02489	0.05351
9 25	0.28212	0.31031	11 25	0.01368	0.04232
9 30	0.27096	0.29917	11 30	-0.00247	0.03112
9 35	0.25980	0.28803	11 35	+0.00874	0.01992
9 40	0.24863	0.27688	11 40	0.01995	-0.00872
9 45	0.23746	0.26573	11 45	0.03117	+0.00248
9 50	0.22629	0.25458	11 50	0.04239	0.01368
9 55	0.21512	0.24343	11 55	0.05361	0.02488
10 0	0.20394	0.23228	12 0	0.06483	0.03609
10 5	0.19276	0.22113	12 5	0.07605	0.04730
10 10	0.18158	0.20997	12 10	0.08727	0.05851
10 15	0.17040	0.19881	12 15	0.09850	0.06972
10 20	-0.15922	-0.18765	12 20	+0.10973	+0.08094

A and μ are given in the Table for Penumbra, and the values of log E, log F, log G, and log H are obtained from the corresponding values for Penumbra, by numerically increasing log E and decreasing log F by 0.000004, and by numerically decreasing log G and increasing log H by 0.000025.

CHANGES OF THE QUANTITIES IN THE TABLES OF DATA.

Washington Mean Time.	For one Minute.			For one Second.		
	A.	B.	C.	A.	B.	C.
^h 7 ^m 30	+8617.7	+2223.2	+2217.2	+143.63	+37.05	+36.95
7 45	8617.7	2224.4	2218.6	143.63	37.07	36.98
8 0	8617.6	2225.6	2220.0	143.63	37.09	37.00
8 15	8617.6	2226.8	2221.4	143.63	37.11	37.02
8 30	8617.5	2228.0	2222.7	143.63	37.13	37.04
8 45	8617.3	2229.2	2224.1	143.62	37.15	37.07
9 0	8617.0	2230.5	2225.4	143.62	37.17	37.09
9 15	8616.8	2231.7	2226.8	143.61	37.19	37.11
9 30	8616.5	2232.8	2228.2	143.61	37.21	37.14
9 45	8616.2	2234.0	2229.6	143.60	37.23	37.16
10 0	8615.8	2235.2	2231.0	143.60	37.25	37.18
10 15	8615.3	2236.4	2232.4	143.59	37.27	37.21
10 30	8614.7	2237.7	2233.7	143.58	37.29	37.23
10 45	8614.1	2238.9	2235.0	143.57	37.31	37.25
11 0	8613.5	2240.0	2236.3	143.56	37.33	37.27
11 15	8612.9	2241.1	2237.7	143.55	37.35	37.29
11 30	8612.3	2242.2	2239.0	143.54	37.37	37.32
11 45	+8611.7	+2243.2	+2240.3	+143.53	+37.39	+37.34

CHANGES OF THE QUANTITIES IN THE TABLES OF DATA.						
Washington Mean Time.	For one Minute.			For one Second.		
	A.	B.	C.	A.	B.	C.
^h ^m 12 0	+8611.0	+2244.2	+2241.6	+143.52	+37.40	+37.36
12 15	8610.2	2245.2	2242.9	143.50	37.42	37.38
12 30	8609.3	2246.2	2244.2	143.49	37.43	37.40
12 45	8608.4	2247.2	2245.5	143.47	37.45	37.42
13 0	8607.5	2248.3	2246.7	143.46	37.47	37.44
13 15	+8606.6	+2249.4	+2248.0	+143.44	+37.49	+37.47

II. An Annular Eclipse of the Sun, July 7, 1861, invisible at Washington, with the following elements :—

Washington Mean Time of δ in Right Ascension, July 7^d 9^h 7^m 19.9^s.

Sun's and Moon's R.A.	^h ^m ^s 7 8 44.18	Hourly Motions	^s 10.25 and 138.27
Sun's Declination	+22 ^o 31' 1.8"	Hourly Motion	— 0' 16.8"
Moon's Declination	+22 18 6.1	" "	— 6 48.9
Sun's Equa. Hor. Par.	8.4	True Semidiameter	15 44.0
Moon's Equa. Hor. Par.	56 43.8	" "	15 26.8

From these elements may be deduced the following results :—

Eclipse begins on the Earth, July 7^d 6^h 9^m.9, Washington mean time, in longitude 182° 53'.9 West from Washington, and in latitude 3° 49'.8 North.

Central Eclipse begins 7^h 12^m.7, in longitude 196° 49'.2 West from Washington, and in latitude 0° 27'.1 South.

Central Eclipse at noon, 9^h 7^m.3, in longitude 135° 40'.3 West from Washington, and in latitude 9° 22'.3 North.

Central Eclipse ends 10^h 50^m.9, in longitude 81° 50'.8, West from Washington, and in latitude 23° 26'.5 South.

Eclipse ends on the Earth 11^h 53^m.6, in longitude 95° 29'.1 West from Washington, and in latitude 19° 16'.0 South.

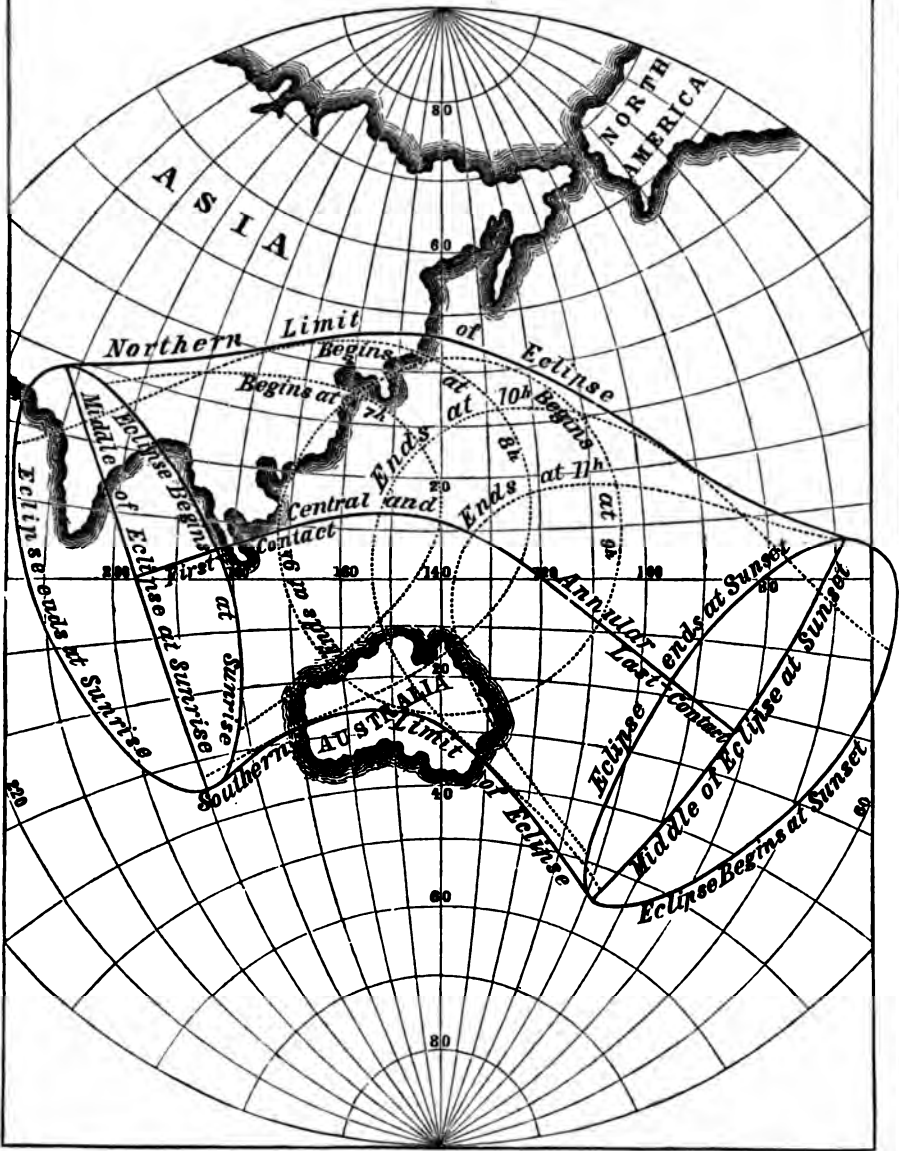
DATA FOR COMPUTING THE ECLIPSE FOR ANY PLACE, FOR PENUMBRA.

Wash. M. Time.	A.	B.	C.	log E.	log F.	log G.	log H.	μ
^h ^m 6 5	-1.59004	+0.67208	-0.43041	9.96	9.96	+9.57	+9.58	90° 5' 20.3"
6 10	1.54644	0.66253	0.43995	6346	4688	8565	8196	91 20 20.2
6 15	1.50285	0.65298	0.44949	6348	4691	8552	8183	92 35 20.1
6 20	1.45925	0.64343	0.45903	6349	4692	8545	8177	93 50 20.0
6 25	1.41565	0.63388	0.46857	6350	4693	8538	8170	95 5 19.9
6 30	1.37205	0.62432	0.47811	6351	4694	8531	8163	96 20 19.8
6 35	1.32845	0.61476	0.48765	6353	4695	8525	8157	97 35 19.7
6 40	1.28485	0.60520	0.49720	6354	4696	8518	8150	98 50 19.6
6 45	1.24125	0.59564	0.50675	6355	4698	8511	8143	100 5 19.5
6 50	1.19765	0.58608	0.51630	6356	4699	8505	8137	101 20 19.3
6 55	1.15405	0.57651	0.52586	6357	4700	8498	8130	102 35 19.2
7 0	1.11045	0.56694	0.53542	6358	4701	8491	8123	103 50 19.1
7 5	1.06685	0.55737	0.54498	6359	4702	8484	8117	105 5 19.0
7 10	1.02325	0.54780	0.55454	6360	4703	8477	8111	106 20 18.9
7 15	0.97964	0.53822	0.56410	6361	4704	8470	8104	107 35 18.8
7 20	0.93604	0.52864	0.57366	6362	4706	8463	8098	108 50 18.7
7 25	-0.89244	+0.51906	-0.58323	6364	4707	8456	8091	110 5 18.6

ANNULAR ECLIPSE

OF

JULY 7, 1861.



DATA FOR COMPUTING THE ECLIPSE FOR ANY PLACE, FOR PENUMBRA.								
Wash. M. Time.	A.	B.	C.	log E.	log F.	log G.	log H.	μ
h m				9.96	9.96	+9.57	+9.58	
7 30	-0.84883	+0.50948	-0.59280	6365	4708	8450	8084	111 20 18.5
7 35	0.80523	0.49990	0.60237	6366	4709	8443	8078	112 35 18.4
7 40	0.76163	0.49031	0.61194	6367	4710	8436	8071	113 50 18.3
7 45	0.71802	0.48072	0.62152	6368	4711	8429	8064	115 5 18.2
7 50	0.67442	0.47113	0.63109	6370	4713	8423	8058	116 20 18.1
7 55	0.63081	0.46154	0.64067	6371	4714	8416	8051	117 35 18.0
8 0	0.58720	0.45195	0.65025	6372	4715	8409	8044	118 50 17.9
8 5	0.54360	0.44236	0.65983	6373	4716	8402	8038	120 5 17.8
8 10	0.50000	0.43276	0.66941	6374	4717	8395	8032	121 20 17.7
8 15	0.45639	0.42316	0.67900	6375	4718	8388	8025	122 35 17.6
8 20	0.41279	0.41356	0.68859	6376	4720	8382	8019	123 50 17.5
8 25	0.36918	0.40395	0.69818	6377	4721	8375	8012	125 5 17.4
8 30	0.32557	0.39434	0.70777	6379	4722	8368	8006	126 20 17.3
8 35	0.28197	0.38473	0.71736	6380	4723	8361	7999	127 35 17.2
8 40	0.23837	0.37512	0.72695	6381	4724	8355	7992	128 50 17.1
8 45	0.19476	0.36550	0.73655	6382	4725	8348	7986	130 5 17.0
8 50	0.15116	0.35589	0.74615	6383	4727	8341	7979	131 20 16.9
8 55	0.10755	0.34627	0.75575	6384	4728	8334	7972	132 35 16.8
9 0	0.06394	0.33665	0.76535	6385	4729	8328	7965	133 50 16.8
9 5	-0.02034	0.32703	0.77495	6386	4730	8321	7959	135 5 16.7
9 10	+0.02326	0.31741	0.78455	6387	4731	8314	7952	136 20 16.6
9 15	0.06687	0.30778	0.79416	6388	4732	8307	7945	137 35 16.5
9 20	0.11047	0.29815	0.80377	6389	4734	8301	7939	138 50 16.4
9 25	0.15407	0.28852	0.81338	6391	4735	8294	7932	140 5 16.3
9 30	0.19768	0.27889	0.82299	6392	4736	8287	7925	141 20 16.2
9 35	0.24128	0.26926	0.83260	6393	4737	8280	7919	142 35 16.1
9 40	0.28488	0.25962	0.84221	6394	4738	8273	7912	143 50 16.0
9 45	0.32849	0.24998	0.85183	6396	4739	8266	7905	145 5 15.9
9 50	0.37209	0.24034	0.86145	6397	4741	8260	7899	146 20 15.8
9 55	0.41569	0.23070	0.87107	6398	4742	8253	7892	147 35 15.7
10 0	0.45930	0.22105	0.88069	6399	4743	8246	7885	148 50 15.6
10 5	0.50290	0.21140	0.89031	6400	4744	8239	7879	150 5 15.5
10 10	0.54650	0.20175	0.89993	6401	4745	8232	7872	151 20 15.4
10 15	0.59010	0.19210	0.90956	6402	4746	8225	7865	152 35 15.3
10 20	0.63370	0.18245	0.91919	6404	4748	8219	7859	153 50 15.2
10 25	0.67730	0.17280	0.92882	6405	4749	8212	7852	155 5 15.1
10 30	0.72090	0.16314	0.93845	6406	4750	8205	7845	156 20 15.0
10 35	0.76450	0.15348	0.94808	6407	4751	8198	7839	157 35 14.9
10 40	0.80810	0.14382	0.95771	6409	4752	8191	7832	158 50 14.8
10 45	0.85169	0.13416	0.96735	6410	4753	8184	7825	160 5 14.7
10 50	0.89529	0.12450	0.97699	6411	4755	8178	7819	161 20 14.6
10 55	0.93889	0.11484	0.98663	6412	4756	8171	7812	162 35 14.5
11 0	0.98248	0.10517	0.99627	6413	4757	8164	7805	163 50 14.4
11 5	1.02608	0.09550	1.00591	6414	4758	8157	7799	165 5 14.3
11 10	1.06967	0.08583	1.01555	6415	4759	8150	7792	166 20 14.2
11 15	1.11326	0.07616	1.02520	6416	4760	8143	7785	167 35 14.1
11 20	1.15685	0.06649	1.03485	6417	4762	8137	7779	168 50 14.0
11 25	1.20044	0.05681	1.04450	6418	4763	8130	7772	170 5 13.9
11 30	1.24403	0.04713	1.05415	6420	4764	8123	7765	171 20 13.8
11 35	1.28762	0.03745	1.06380	6421	4765	8116	7759	172 35 13.7
11 40	1.33121	0.02777	1.07345	6422	4766	8109	7752	173 50 13.6
11 45	1.37479	0.01808	1.08311	6423	4767	8102	7745	175 5 13.5
11 50	1.41838	+0.00840	1.09276	6424	4769	8096	7739	176 20 13.5
11 55	1.46197	-0.00129	1.10242	6425	4770	8089	7732	177 35 13.4
12 0	+1.50555	-0.01098	-1.11208	6426	4771	8082	7725	178 50 13.3

FOR SHADOW.					
Washington Mean Time.	B.	C.	Washington Mean Time.	B.	C.
h m			h m		
7 10	+0.00191	-0.00865	9 5	-0.21886	-0.22906
7 15	-0.00767	0.01821	9 10	0.22848	0.23866
7 20	0.01725	0.02777	9 15	0.23811	0.24827
7 25	0.02683	0.03734	9 20	0.24774	0.25788
7 30	0.03641	0.04691	9 25	0.25737	0.26749
7 35	0.04599	0.05648	9 30	0.26700	0.27710
7 40	0.05558	0.06605	9 35	0.27663	0.28671
7 45	0.06517	0.07563	9 40	0.28627	0.29632
7 50	0.07476	0.08520	9 45	0.29591	0.30594
7 55	0.08435	0.09478	9 50	0.30555	0.31556
8 0	0.09394	0.10436	9 55	0.31519	0.32518
8 5	0.10353	0.11394	10 0	0.32484	0.33480
8 10	0.11313	0.12352	10 5	0.33449	0.34442
8 15	0.12273	0.13311	10 10	0.34414	0.35404
8 20	0.13233	0.14270	10 15	0.35379	0.36367
8 25	0.14194	0.15229	10 20	0.36344	0.37330
8 30	0.15155	0.16188	10 25	0.37309	0.38293
8 35	0.16116	0.17147	10 30	0.38275	0.39256
8 40	0.17077	0.18106	10 35	0.39241	0.40219
8 45	0.18039	0.19066	10 40	0.40207	0.41182
8 50	0.19000	0.20026	10 45	0.41173	0.42146
8 55	0.19962	0.20986	10 50	0.42139	0.43110
9 0	-0.20924	-0.21946	10 55	-0.43105	-0.44074

A and μ are given in the Table for Penumbra, and the values of log E, log F, log G, and log H are obtained from the corresponding values for Penumbra, by numerically decreasing log E and increasing log F by 0.000004, and by numerically increasing log G and decreasing log H by 0.000024.

CHANGES OF THE QUANTITIES IN THE TABLES OF DATA.

Washington Mean Time.	For one Minute.			For one Second.		
	A.	B.	C.	A'.	B'.	C'.
h m						
6 0	+8719.0	-1908.7	-1906.3	+145.32	-31.81	-31.77
6 15	8719.4	1910.0	1907.7	145.32	31.83	31.79
6 30	8719.7	1911.3	1909.0	145.33	31.85	31.82
6 45	8720.0	1912.6	1910.3	145.33	31.88	31.84
7 0	8720.3	1913.9	1911.5	145.34	31.90	31.86
7 15	8720.6	1915.2	1912.7	145.34	31.92	31.88
7 30	8720.8	1916.5	1913.8	145.35	31.94	31.90
7 45	8720.9	1917.8	1915.0	145.35	31.96	31.92
8 0	8721.0	1919.1	1916.1	145.35	31.98	31.93
8 15	8721.0	1920.4	1917.2	145.35	32.01	31.95
8 30	8721.0	1921.7	1918.3	145.35	32.03	31.97
8 45	8721.0	1923.0	1919.3	145.35	32.05	31.99
9 0	8720.9	1924.2	1920.3	145.35	32.07	32.00
9 15	8720.8	1925.5	1921.3	145.35	32.09	32.02
9 30	8720.7	1926.7	1922.3	145.34	32.11	32.04
9 45	8720.5	1927.9	1923.3	145.34	32.13	32.05
10 0	8720.3	1929.1	1924.3	145.34	32.15	32.07
10 15	8720.0	1930.2	1925.3	145.33	32.17	32.09
10 30	8719.7	1931.3	1926.3	145.33	32.19	32.10
10 45	8719.3	1932.4	1927.3	145.32	32.21	32.12
11 0	+8718.8	-1933.5	-1928.3	+145.31	-32.22	-32.14

CHANGES OF THE QUANTITIES IN THE TABLES OF DATA.

Washington Mean Time.	For one Minute.			For one Second.		
	A.	B.	C.	A.	B.	C.
^h ^m 11 15	+8718.3	-1934.7	-1929.3	+145.30	-32.24	-32.15
11 30	8717.8	1935.8	1930.2	145.30	32.26	32.17
11 45	8717.3	1937.0	1931.2	145.29	32.28	32.19
12 0	+8716.8	-1938.1	-1932.1	+145.28	-32.30	-32.20

III. A Partial Eclipse of the Moon, December 16, 1861, visible at Washington, with the following elements:—

Washington mean time of δ in Right Ascension, December 16 ^d 15 ^h 3 ^m 26.1.

Sun's Right Ascension	^h ^m ^s 17 40 8.73	Hourly Motion	11.08
Moon's Right Ascension	5 40 8.73	" "	133.45
Sun's Declination	-23° 22' 43.5"	Hourly Motion	- 0' 5.2"
Moon's Declination	+24 11 27.6	" "	- 1 43.5
Sun's Equa. Hor. Par.	8.7	True Semidiameter	16 17.9
Moon's Equa. Hor. Par.	54 44.7	" "	14 54.3

From these elements may be deduced the following results:—

Moon enters Penumbra, December	^d ^h ^m 16 12 37.6	Washington mean time.
Moon enters Shadow	16 14 19.1	" "
Greatest Eclipse	16 15 10.2	" "
Moon leaves Shadow	16 16 1.3	" "
Moon leaves Penumbra	16 17 42.6	" "

First contact of Shadow with Moon's limb 158° from north point towards the East, when the Moon is vertical in longitude 35° 51' West from Washington, and in latitude 24° 21' North.

Last contact of Shadow with Moon's limb 150° from north point towards the West, when the Moon is vertical in longitude 60° 31' West from Washington, and in latitude 24° 18' North.

Magnitude of Eclipse = 0.185 (Moon's diameter = 1.)

IV. A Total Eclipse of the Sun, December 30, 1861, visible as a partial one at Washington, with the following elements:—

Washington mean time of δ in Right Ascension, December 30 ^d 20 ^h 50 ^m 32.8.

Sun's and Moon's R.A.	^h ^m ^s 18 43 19.89	Hourly Motions	11.05 and 155.71
Sun's Declination	-23° 4' 59.9"	Hourly Motion	+ 0' 11.5"
Moon's Declination	-22 33 31.1	" "	+ 6 3.0
Sun's Equa. Hor. Par.	8.7	True Semidiameter	16 16.1
Moon's Equa. Hor. Par.	59 56.3	" "	16 19.2

From these elements may be deduced the following results:—

Eclipse begins on the Earth, December 30^d 18^h 7^m.0, Washington mean time, in longitude 357° 4'.6 West from Washington, and in latitude 8° 58'.0 North.

Central Eclipse begins 19^h 10^m.5, in longitude 8° 5'.0 West from Washington, and in latitude 19° 39'.2 North.

Central Eclipse at noon, 20^h 50^m.5, in longitude 311° 46'.9 West from Washington, and in latitude 8° 44'.7 North.

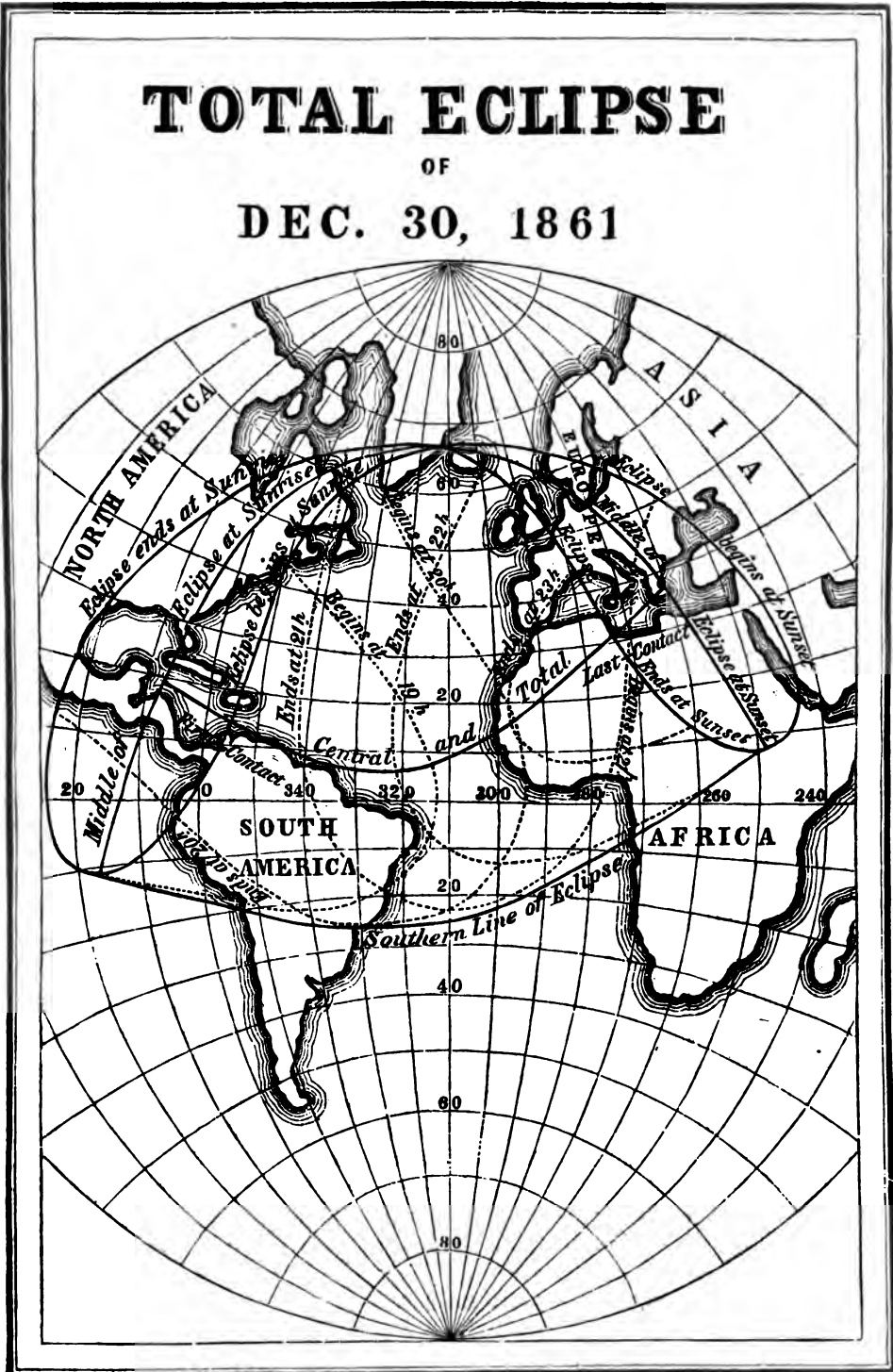
Central Eclipse ends 22^h 11^m.2, in longitude 260° 55'.2, West from Washington, and in latitude 37° 32'.3 North.

Eclipse ends on the Earth 23^h 14^m.8, in longitude 270° 24'.0 West from Washington, and in latitude 27° 12'.0 North.

TOTAL ECLIPSE

OF

DEC. 30, 1861



DATA FOR COMPUTING THE ECLIPSE FOR ANY PLACE, FOR PENUMBRA.

Wash. M. Time.	A.	B.	C.	log E.	log F.	log G.	log H.	μ
h m				9.96	9.96	-9.59	-9.58	
18 0	-1.58790	+0.79326	-0.29604	2845	4606	8350	8662	269° 9' 16.0
18 5	1.54134	0.80139	0.28794	2846	4607	8346	8658	270 24 15.0
18 10	1.49479	0.80952	0.27984	2847	4608	8342	8653	271 39 13.9
18 15	1.44824	0.81765	0.27173	2847	4608	8337	8649	272 54 12.8
18 20	1.40168	0.82578	0.26362	2848	4609	8333	8645	274 9 11.8
18 25	1.35513	0.83391	0.25551	2849	4610	8329	8640	275 24 10.7
18 30	1.30858	0.84205	0.24740	2850	4611	8325	8636	276 39 9.7
18 35	1.26202	0.85019	0.23929	2850	4612	8320	8632	277 54 8.6
18 40	1.21547	0.85833	0.23117	2851	4612	8316	8627	279 9 7.6
18 45	1.16892	0.86647	0.22305	2852	4613	8312	8623	280 24 6.5
18 50	1.12236	0.87461	0.21493	2853	4614	8308	8619	281 39 5.5
18 55	1.07581	0.88276	0.20681	2854	4615	8303	8614	282 54 4.4
19 0	1.02926	0.89091	0.19869	2854	4615	8299	8610	284 9 3.3
19 5	0.98270	0.89906	0.19057	2855	4616	8295	8605	285 24 2.3
19 10	0.93614	0.90721	0.18244	2856	4617	8290	8601	286 39 1.2
19 15	0.88959	0.91537	0.17431	2857	4618	8286	8597	287 54 0.2
19 20	0.84303	0.92352	0.16618	2858	4619	8282	8592	289 8 59.1
19 25	0.79648	0.93168	0.15804	2858	4619	8278	8588	290 23 58.1
19 30	0.74993	0.93984	0.14990	2859	4620	8273	8583	291 38 57.0
19 35	0.70337	0.94800	0.14176	2860	4621	8269	8579	292 53 56.0
19 40	0.65681	0.95616	0.13362	2861	4622	8265	8575	294 8 54.9
19 45	0.61026	0.96433	0.12547	2862	4622	8261	8570	295 23 53.8
19 50	0.56370	0.97249	0.11732	2862	4623	8256	8566	296 38 52.8
19 55	0.51715	0.98066	0.10917	2863	4624	8252	8561	297 53 51.7
20 0	0.47060	0.98883	0.10102	2864	4625	8248	8557	299 8 50.7
20 5	0.42404	0.99700	0.09287	2865	4626	8243	8553	300 23 49.6
20 10	0.37749	1.00517	0.08471	2866	4626	8239	8548	301 38 48.5
20 15	0.33094	1.01335	0.07655	2866	4627	8235	8544	302 53 47.5
20 20	0.28438	1.02153	0.06839	2867	4628	8230	8539	304 8 46.4
20 25	0.23783	1.02971	0.06023	2868	4629	8226	8535	305 23 45.4
20 30	0.19128	1.03789	0.05207	2869	4630	8222	8531	306 38 44.3
20 35	0.14473	1.04607	0.04391	2870	4630	8218	8526	307 53 43.3
20 40	0.09818	1.05425	0.03574	2871	4631	8213	8522	309 8 42.2
20 45	0.05163	1.06244	0.02757	2871	4632	8209	8517	310 23 41.2
20 50	-0.00508	1.07063	0.01940	2872	4633	8205	8513	311 38-40.1
20 55	+0.04147	1.07882	0.01122	2873	4633	8200	8508	312 53 39.0
21 0	0.08801	1.08701	-0.00304	2874	4634	8196	8504	314 8 38.0
21 5	0.13456	1.09520	+0.00514	2874	4635	8192	8500	315 23 36.9
21 10	0.18111	1.10340	0.01332	2875	4636	8188	8495	316 38 35.9
21 15	0.22765	1.11160	0.02151	2876	4637	8183	8491	317 53 34.8
21 20	0.27420	1.11980	0.02969	2877	4637	8179	8486	319 8 33.8
21 25	0.32074	1.12800	0.03788	2878	4638	8174	8482	320 23 32.7
21 30	0.36728	1.13620	0.04607	2879	4639	8170	8478	321 38 31.6
21 35	0.41383	1.14440	0.05426	2879	4640	8166	8473	322 53 30.6
21 40	0.46037	1.15261	0.06245	2880	4640	8161	8469	324 8 29.5
21 45	0.50691	1.16082	0.07065	2881	4641	8157	8464	325 23 28.5
21 50	0.55345	1.16903	0.07885	2882	4642	8153	8460	326 38 27.4
21 55	0.59999	1.17724	0.08705	2883	4643	8148	8455	327 53 26.4
22 0	0.64653	1.18545	0.09525	2883	4644	8144	8451	329 8 25.3
22 5	0.69307	1.19366	0.10345	2884	4645	8140	8446	330 23 24.2
22 10	0.73961	1.20188	0.11166	2885	4645	8135	8442	331 38 23.2
22 15	0.78614	1.21010	0.11987	2886	4646	8131	8437	332 53 22.1
22 20	0.83268	1.21832	0.12808	2887	4647	8127	8433	334 8 21.1
22 25	0.87921	1.22654	0.13629	2887	4648	8122	8429	335 23 20.0
22 30	+0.92574	+1.23476	0.14450	2888	4648	8118	8424	336 38 19.0

DATA FOR COMPUTING THE ECLIPSE FOR ANY PLACE, FOR PENUMBRA.

Wash. M. Time.	A.	B.	C.	log E.	log F.	log G.	log H.	μ
h m				9.96	9.96	-9.59	-9.58	
22 35	+0.97227	+1.24298	+0.15271	2889	4649	8114	8420	337° 53' 17.9
22 40	1.01880	1.25121	0.16093	2890	4650	8110	8415	339 8 16.8
22 45	1.06532	1.25944	0.16915	2891	4651	8105	8411	340 23 15.8
22 50	1.11185	1.26767	0.17737	2892	4652	8101	8406	341 38 14.7
22 55	1.15837	1.27590	0.18560	2892	4652	8096	8402	342 53 13.7
23 0	1.20489	1.28413	0.19383	2893	4653	8092	8397	344 8 12.6
23 5	1.25141	1.29236	0.20206	2894	4654	8088	8393	345 23 11.6
23 10	1.29793	1.30060	0.21029	2895	4655	8083	8388	346 38 10.5
23 15	1.34445	1.30884	0.21852	2896	4655	8079	8384	347 53 9.4
23 20	+1.39097	+1.31708	+0.22675	2896	4656	8075	8379	349 8 8.4

FOR SHADOW.

Washington Mean Time.	B.	C.	Washington Mean Time.	B.	C.
h m			h m		
19 5	+0.35320	+0.35529	20 40	+0.50839	+0.51012
19 10	0.36135	0.36342	20 45	0.51658	0.51829
19 15	0.36951	0.37155	20 50	0.52477	0.52646
19 20	0.37766	0.37968	20 55	0.53296	0.53464
19 25	0.38582	0.38782	21 0	0.54115	0.54282
19 30	0.39398	0.39596	21 5	0.54934	0.55100
19 35	0.40214	0.40410	21 10	0.55754	0.55918
19 40	0.41030	0.41224	21 15	0.56574	0.56737
19 45	0.41847	0.42039	21 20	0.57394	0.57555
19 50	0.42663	0.42854	21 25	0.58214	0.58374
19 55	0.43480	0.43669	21 30	0.59034	0.59193
20 0	0.44297	0.44484	21 35	0.59854	0.60012
20 5	0.45114	0.45299	21 40	0.60675	0.60831
20 10	0.45931	0.46115	21 45	0.61496	0.61651
20 15	0.46749	0.46931	21 50	0.62317	0.62471
20 20	0.47567	0.47747	21 55	0.63138	0.63291
20 25	0.48385	0.48563	22 0	0.63959	0.64111
20 30	0.49203	0.49379	22 5	0.64780	0.64931
20 35	0.50021	0.50195	22 10	0.65602	0.65752
20 40	+0.50839	+0.51012	22 15	+0.66424	+0.66573

A and μ are given in the Table for Penumbra, and the values of log E, log F, log G, and log H are obtained from the corresponding values for Penumbra, by numerically increasing log E and decreasing log F by 0.000004, and by numerically decreasing log G and increasing log H by 0.000024.

CHANGES OF THE QUANTITIES IN THE TABLES OF DATA.

Washington Mean Time.	For one Minute.			For one Second.		
	A.	B.	C.	A.	B.	C.
h m						
18 0	+9310.5	+1625.2	+1620.2	+155.18	+27.09	+27.00
18 15	9310.6	1626.4	1621.3	155.18	27.11	27.02
18 30	9310.7	1627.5	1622.5	155.18	27.13	27.04
18 45	9310.8	1628.7	1623.7	155.18	27.15	27.06
19 0	9310.9	1629.8	1625.0	155.18	27.16	27.08
19 15	9311.0	1630.9	1626.3	155.18	27.18	27.10
19 30	9311.0	1632.0	1627.6	155.18	27.20	27.13
19 45	+9310.9	+1633.1	+1628.9	+155.18	+27.22	+27.15

CHANGES OF THE QUANTITIES IN THE TABLES OF DATA.						
Washington Mean Time.	For one Minute.			For one Second.		
	A.	B.	C.	A'.	B'.	C'.
^h ^m 20 0	+9310.8	+1634.2	+1630.3	+155.18	+27.24	+27.17
20 15	9310.5	1635.3	1631.6	155.17	27.25	27.19
20 30	9310.2	1636.3	1633.0	155.17	27.27	27.22
20 45	9309.8	1637.4	1634.3	155.16	27.29	27.24
21 0	9309.4	1638.5	1635.7	155.16	27.31	27.26
21 15	9309.0	1639.6	1637.0	155.15	27.33	27.28
21 30	9308.6	1640.7	1638.2	155.14	27.35	27.30
21 45	9308.1	1641.7	1639.4	155.14	27.36	27.32
22 0	9307.6	1642.7	1640.6	155.13	27.38	27.34
22 15	9306.9	1643.7	1641.8	155.12	27.39	27.36
22 30	9306.0	1644.7	1643.0	155.10	27.41	27.38
22 45	9305.2	1645.7	1644.2	155.09	27.43	27.40
23 0	9304.3	1646.7	1645.4	155.07	27.45	27.42
23 15	9303.5	1647.7	1646.6	155.06	27.46	27.44
23 30	+9302.6	+1648.8	+1647.8	+155.04	+27.48	+27.46

A Transit of Mercury, November 11, 1861, invisible at Washington, with the following elements:—

Washington mean time of ϕ in Right Ascension, November ^d 11 ^h 14 ^m 59 ^s 43.6.

Sun's and Mercury's R.A. ^h 15 ^m 10 ^s 4.57 Hourly Motions +10.18 and -12.60

Sun's Declination -17° 44' 44.6 Hourly Motion - 0' 40.6

Mercury's Declination -17° 32' 45.1 " " + 1' 43.8

Sun's Equa. Hor. Par. 8.67 True Semidiameter 16 10.3

Mercury's Equa. Hor. Par. 12.68 " " 4.94

From these elements may be deduced the following results, with reference to the centre of the Earth:—

Ingress, November ^d 11 ^h 12 ^m 9 ^s 25

Middle of Transit, 11 14 10 38

Egress, 11 16 11 53

Least distance of centres, 10' 57.8

First contact of Mercury with Sun's limb 72° from north point towards the East, when the Sun is vertical in longitude 186° 4'.1 West from Washington, and in latitude 17° 49'.5 South.

Last contact of Mercury with Sun's limb 24° from north point towards the West, when the Sun is vertical in longitude 246° 40'.8, and in latitude 17° 52'.2 South.

The Washington mean time of Ingress and Egress for any place on the surface of the Earth may be computed from the following formulæ, in which R is the radius of the place, θ its geocentric North latitude, and λ its longitude West from Washington:—

Ingress, $12^{\text{h}} 9^{\text{m}} 25.5 - 16.64 R \sin \theta + 52.30 R \cos \theta \cos (\lambda + 78^{\circ} 24'.0)$.

Egress, $16^{\text{h}} 11^{\text{m}} 53.3 + 47.86 R \sin \theta + 26.68 R \cos \theta \cos (\lambda + 57^{\circ} 40'.8)$.

ELEMENTS FOR FACILITATING THE CALCULATION OF OCCULTATIONS OF PLANETS AND STARS BY THE MOON, FOR THE YEAR 1861.

Date.	Star's Name.	Magnitude.	Limiting Parallels.		Washington Mean Time of δ .	At Washington Mean Time of Conjunction.					
			North-ern.	South-ern.		H	Y	p'	q'	Log $\sin D$	Log $\cos D$
Jan. 1	p° Leonis	5	+63	-23	12 5.1	- 4 14 16	+0.3671	0.5378	-2613	+8.0770	0.0000
1	e Leonis	5	+88	+36	19 53.0	+ 3 18 20	+1.2880	5374	-2612	-8.5919	9.9997
4	69 Virginis	5 $\frac{1}{2}$	+75	+24	1 45.5	+ 7 22 56	+1.1290	5517	-2243	-9.4201	.9644
4	89 Virginis	3 $\frac{1}{2}$	+73	+35	11 35.4	- 7 7 50	+1.2296	5567	-2100	-9.4767	.9796
6	42 Libræ	5 $\frac{1}{2}$	+ 9	-60	9 33.5	-10 52 0	-0.2940	5817	-1126	-9.5983	.9628
6	b Scorpii	5	+65	+49	13 48.1	- 6 47 13	+1.2615	5831	-1019	-9.6312	.9661
6	A Scorpii	5	+65	0	14 51.8	- 5 46 1	+0.7285	5837	-0991	-9.6245	.9676
6	B.A.C. 5314	6	+65	+15	18 43.8	- 2 3 0	+0.9471	5849	-0888	-9.6336	.9555
6	B.A.C. 5347	5	+64	+54	20 36.5	- 0 14 47	+1.2738	5856	-0837	-9.6411	.9638
7	σ Scorpii	3 $\frac{1}{2}$	+29	-33	1 48.4	+ 4 44 53	+0.1612	5871	-0696	-9.6301	.9564
7	α Scorpii	1 $\frac{1}{2}$	+64	+ 8	5 1.9	+ 7 50 50	+0.8406	5876	-0610	-9.6437	.9532
7	22 Scorpii	5	- 8	-79	5 22.8	+ 8 10 55	-0.5337	5876	-0594	-9.6228	.9580
7	A Ophiuchi	5	+44	-14	23 9.9	+ 1 15 50	+0.4881	5885	-0097	-9.6479	.9522
8	θ Ophiuchi	3 $\frac{1}{2}$	+40	-90	1 48.1	+ 3 47 52	-1.1181	5882	-0019	-9.6236	.9578
12	λ Capricor.	5 $\frac{1}{2}$	+78	+ 5	23 21.3	- 2 45 24	+0.8624	5147	+2242	-9.3181	.9904
13	B.A.C. 7620	6	+73	-12	3 2.8	+ 0 49 49	+0.5669	5127	+2268	-9.2792	.9920
13	δ Aquarii	4 $\frac{1}{2}$	+82	- 5	15 20.9	-11 13 24	+0.6974	5065	+2337	-9.1684	.9952
13	ϵ Aquarii	5 $\frac{1}{2}$	+82	+26	17 9.5	- 9 27 52	+1.1682	5054	+2346	-9.1705	.9952
14	κ Aquarii	5	+16	-71	2 42.0	- 0 11 34	-0.4792	5011	+2381	-8.9353	9.9984
15	π Piscium	4 $\frac{1}{2}$	+45	-38	5 53.4	+ 2 15 3	+0.0685	4940	+2403	+7.9375	0.0000
15	9 Piscium	6	+56	-27	6 4.0	+ 2 25 20	+0.2614	4940	+2404	+7.7978	0.0000
15	16 Piscium	6	+66	-19	11 11.3	+ 7 24 19	+0.4160	4934	+2394	+8.2668	9.9999
16	d Piscium	5 $\frac{1}{2}$	+16	-70	11 50.7	+ 7 23 40	-0.4972	4915	+2400	+9.1111	.9964
18	η Piscium	4	+36	-42	2 12.8	- 3 18 33	-0.1080	5068	+2014	+9.4023	.9857
19	δ Arietis	5 $\frac{1}{2}$	+ 2	-71	2 3.1	- 4 10 41	-0.7183	5204	+1732	+9.5183	.9750
19	26 Arietis	6 $\frac{1}{2}$	+63	-13	8 14.0	+ 1 48 46	+0.3470	5246	+1644	+9.5178	.9751
19	μ Arietis	5 $\frac{1}{2}$	+90	+30	13 57.0	+ 7 21 1	+1.0610	5284	+1564	+9.5218	.9746
19	ϵ Arietis	4 $\frac{1}{2}$	+90	+12	21 59.7	- 8 51 45	+0.7628	5340	+1421	+9.5500	.9708
20	66 Arietis	6 $\frac{1}{2}$	+90	+19	11 34.3	+ 4 16 2	+0.8410	5438	+1168	+9.5797	.9661
20	9 Tauri	6	+90	+19	15 26.5	+ 8 0 25	+0.8160	5446	+1090	+9.5874	.9648
20	g Pleiadum	5 $\frac{1}{2}$	+42	-24	18 57.3	+11 24 3	+0.0064	5491	+1020	+9.6068	.9612
20	b Pleiadum	4 $\frac{1}{2}$	+53	-14	18 59.4	+11 26 8	+0.1877	5491	+1019	+9.6037	.9618
20	m Pleiadum	7	+ 6	-58	19 6.0	+11 32 27	-0.5858	5492	+1016	+9.6161	.9594
20	e Pleiadum	5	+32	-34	19 7.8	+11 34 15	-0.1818	5492	+1016	+9.6099	.9606
20	1 Pleiadum	8	+60	- 9	19 14.7	+11 40 51	+0.2968	5493	+1013	+9.6024	.9621
20	2 Pleiadum	8 $\frac{1}{2}$	+33	-33	19 17.6	+11 43 48	-0.1621	5493	+1012	+9.6098	.9606
20	3 Pleiadum	9	+57	-11	19 18.7	+11 44 43	+0.2511	5493	+1012	+9.6032	.9619
20	4 Pleiadum	8	+41	-25	19 19.4	+11 45 24	-0.0209	5494	+1011	+9.6076	.9611
20	5 Pleiadum	9	+23	-42	19 20.0	+11 46 1	-0.3355	5494	+1011	+9.6125	.9601
20	6 Pleiadum	9	+43	-23	19 21.1	+11 47 0	+0.0263	5494	+1011	+9.6068	.9612
20	c Pleiadum	5	+30	-27	19 24.6	+11 50 27	-0.0478	5495	+1009	+9.6082	.9610
20	7 Pleiadum	8	+61	- 8	19 26.0	+11 51 48	+0.3105	5495	+1009	+9.6025	.9621
20	B.A.C. 1155	7	+90	+59	19 26.2	+11 51 59	+1.2761	5495	+1009	+9.5866	.9650
20	k Pleiadum	7 $\frac{1}{2}$	+28	-37	19 26.5	+11 52 16	-0.2462	5495	+1009	+9.6113	.9603
20	l Pleiadum	7 $\frac{1}{2}$	+30	-35	19 30.3	+11 55 58	-0.2111	5496	+1007	+9.6108	.9604
20	8 Pleiadum	8 $\frac{1}{2}$	+51	-16	19 35.7	-11 58 50	+0.1570	5496	+1005	+9.6051	.9616
20	9 Pleiadum	8 $\frac{1}{2}$	+52	-15	19 36.8	-11 57 49	+0.1644	5496	+1005	+9.6051	.9616
20	d Pleiadum	5	+70	- 2	19 38.7	-11 55 56	+0.4282	5496	+1004	+9.6010	.9623
20	10 Pleiadum	8	+48	-19	19 41.7	-11 53 3	+0.1016	5496	+1004	+9.6063	.9613
20	11 Pleiadum	8 $\frac{1}{2}$	+59	-10	19 47.4	-11 47 36	+0.2747	5497	+1002	+9.6037	.9618
20	12 Pleiadum	7 $\frac{1}{2}$	+32	-33	19 55.7	-11 39 30	-0.1632	5497	+0999	+9.6108	.9604
20	13 Pleiadum	8 $\frac{1}{2}$	+68	- 3	19 58.6	-11 36 42	+0.4089	5497	+0998	+9.6019	.9622
20	14 Pleiadum	9	+90	+11	20 1.3	-11 34 8	+0.6610	5497	+0998	+9.5978	.9629
20	15 Pleiadum	8 $\frac{1}{2}$	+59	-10	20 4.0	-11 31 32	+0.2734	5497	+0997	+9.6042	.9617
20	16 Pleiadum	9 $\frac{1}{2}$	+86	+ 8	20 4.5	-11 31 2	+0.6102	0.5497	+0997	+9.5987	9.9628

ELEMENTS FOR FACILITATING THE CALCULATION OF OCCULTATIONS OF PLANETS AND STARS BY THE MOON, FOR THE YEAR 1861.

Date.	Star's Name.	Magnitude.	Limiting Parallels.		Washington Mean Time of δ .	At Washington Mean Time of Conjunction.					
			North-ern.	South-ern.		H	Y	p'	q'	Log sin D	Log cos D
Jan. 20	17 Pleiadum	8	+90	+13	20 5.1	-11 30 29	+0.7103	0.5497	+0.0997	+9.5970	9.9631
20	18 Pleiadum	8	+58	-10	20 5.2	-11 30 21	+0.2635	.5497	+0.0997	+9.6043	.9617
20	p Pleiadum	7½	+60	-9	20 6.0	-11 29 34	+0.2396	.5498	+0.0997	+9.6039	.9618
20	19 Pleiadum	8	+89	+9	20 6.4	-11 29 12	+0.6287	.5498	+0.0996	+9.5984	.9628
20	20 Pleiadum	8	+30	-36	20 6.7	-11 28 56	-0.2202	.5498	+0.0996	+9.6120	.9602
20	22 Pleiadum	8	+76	+3	20 7.7	-11 27 54	+0.5101	.5498	+0.0996	+9.6004	.9625
20	21 Pleiadum	8½	+26	-39	20 7.8	-11 27 53	-0.2925	.5498	+0.0996	+9.6132	.9600
20	23 Pleiadum	8½	+90	+17	20 9.2	-11 26 30	+0.7681	.5498	+0.0996	+9.5963	.9632
20	24 Pleiadum	8	+48	-18	20 9.5	-11 26 11	+0.1086	.5498	+0.0995	+9.6069	.9612
20	γ Tauri	3½	+61	-8	20 9.6	-11 26 8	+0.3067	.5498	+0.0995	+9.6037	.9618
20	25 Pleiadum	8½	+90	+22	20 13.7	-11 22 12	+0.8490	.5498	+0.0995	+9.5950	.9635
20	26 Pleiadum	9	+90	+27	20 16.4	-11 19 36	+0.9255	.5498	+0.0993	+9.5940	.9636
20	27 Pleiadum	8½	+49	-17	20 29.2	-11 7 12	+0.1245	.5499	+0.0989	+9.6071	.9612
20	28 Pleiadum	7	+90	+38	20 33.7	-11 2 49	+1.0832	.5499	+0.0987	+9.5918	.9641
20	29 Pleiadum	8	+47	-19	20 36.6	-11 0 4	+0.0685	.5500	+0.0986	+9.6079	.9610
20	s Pleiadum	7½	+72	0	20 49.1	-10 47 57	+0.4548	.5501	+0.0982	+9.6024	.9621
20	f Pleiadum	4½	+70	-1	20 54.7	-10 42 31	+0.4317	.5502	+0.0980	+9.6028	.9620
20	h Pleiadum	5½	+64	-6	20 55.3	-10 41 59	+0.3431	.5502	+0.0979	+9.6043	.9617
20	30 Pleiadum	5½	+70	-1	20 56.1	-10 41 16	+0.4337	.5502	+0.0979	+9.6028	.9620
20	31 Pleiadum	8	+46	-20	20 57.4	-10 39 57	+0.0655	.5502	+0.0979	+9.6087	.9608
20	32 Pleiadum	8	+47	-19	20 59.6	-10 37 48	+0.0852	.5503	+0.0978	+9.6086	.9609
20	33 Pleiadum	8½	+56	-12	21 1.7	-10 35 48	+0.2324	.5503	+0.0977	+9.6063	.9613
20	34 Pleiadum	7½	+90	+20	21 10.3	-10 27 31	+0.8245	.5504	+0.0974	+9.6370	.9631
20	35 Pleiadum	9	+57	-11	21 10.7	-10 27 7	+0.2536	.5505	+0.0973	+9.6063	.9613
20	36 Pleiadum	9	+60	-9	21 14.7	-10 23 18	+0.2854	.5506	+0.0971	+9.6067	.9615
20	37 Pleiadum	8	+50	-16	21 15.3	-10 22 44	+0.1434	.5506	+0.0971	+9.6080	.9610
20	B.A.C. 1192	6½	-35	-65	21 23.5	-10 14 46	-1.1752	.5507	+0.0968	+9.6285	.9667
20	39 Pleiadum	8	+42	-23	21 28.9	-10 9 35	+0.0063	.5508	+0.0966	+9.6105	.9605
20	40 Pleiadum	7½	+86	+8	21 40.7	-9 58 10	+0.6033	.5509	+0.0961	+9.6014	.9623
21	36 Tauri	0½	+90	+29	3 39.2	-4 12 8	+0.9390	.5565	+0.0632	+9.6045	.9617
21	χ Tauri	5½	+32	-30	11 33.7	+3 25 36	-0.1758	.5628	+0.0652	+9.6306	.9663
21	139 Tauri	5½	+27	-30	3 29.1	-6 7 38	-0.2582	.5777	-0.0378	+9.6408	.9639
23	5 Geminor.	6	+90	+40	9 3.5	-0 45 58	+1.0462	.5786	-0.0525	+9.6169	.9692
23	s Geminor.	3½	0	-65	22 14.6	+11 55 55	-0.7331	.5795	-0.0875	+9.6303	.9663
24	44 Geminor.	6½	+90	+25	7 1.9	-3 37 55	+0.9024	.5789	-1.104	+9.5891	.9646
24	δ Geminor.	3½	+90	+17	13 7.1	+2 13 26	+0.8060	.5780	-1.258	+9.5779	.9664
24	63 Geminor.	5½	+90	+23	16 15.9	+5 15 0	+0.9170	.5768	-1.359	+9.5683	.9680
25	B.A.C. 2683	6	+90	+35	7 39.9	-3 55 42	+1.1264	.5731	-1.692	+9.5177	.9751
25	d ¹ Cancri	6	+54	-22	15 29.6	+3 36 37	+0.1987	.5703	-1.857	+9.5076	.9763
25	d ² Cancri	6	+90	+51	16 34.2	+4 38 54	+1.2918	.5699	-1.878	+9.4781	.9794
26	o ¹ Cancri	6	+58	-21	5 59.4	-6 25 20	+0.2701	.5648	-2.120	+9.4364	.9832
26	o ² Cancri	6	+41	-36	6 8.2	-6 16 47	-0.0220	.5648	-2.123	+9.4432	.9826
27	o Leonis	3½	+90	+39	1 14.7	-11 51 4	+1.2682	.5575	-2.295	+9.2615	.9926
27	B.A.C. 3398	6	+77	-11	8 1.9	-5 18 3	+0.5518	.5547	-2.468	+9.2214	.9939
27	B.A.C. 3407	6	+90	+14	8 47.2	-4 34 20	+0.9602	.5543	-2.475	+9.1930	.9947
27	π Leonis	5	+90	+16	9 43.4	-3 40 4	+1.0141	.5542	-2.485	+9.1801	.9950
27	B.A.C. 3529	6	+58	-28	18 51.2	+5 8 48	+0.2403	.5516	-2.561	+9.0835	.9966
28	34 Sextantis	6	+73	-15	4 52.3	-9 10 39	+0.5129	.5492	-2.620	+8.8753	9.9988
28	p ² Leonis	5	+64	-22	10 4.3	+4 32 32	-0.3787	.5470	-2.656	+8.0760	0.0000
29	e Leonis	5	+88	+36	2 38.2	+11 51 6	+1.2897	.5465	-2.656	-8.5921	9.9997
29	B.A.C. 4006	6	+86	+20	12 6.1	-3 0 9	+1.1092	.5465	-2.628	-8.9006	.9986
31	69 Virginis	5½	+75	+26	7 18.2	-9 17 1	+1.1505	.5562	-2.244	-9.4201	.9844
31	87 Virginis	6	+73	+31	15 57.7	-0 56 0	+1.1954	.5595	-2.111	-9.4700	.9802
31	89 Virginis	5½	+73	+37	17 1.6	+0 5 40	+1.2520	.5502	-2.094	-9.4767	.9796
Feb. 2	42 Libræ	5½	+11	-58	15 1.3	-3 36 46	-0.2627	0.5646	-1.124	-9.5983	9.9628

ELEMENTS FOR FACILITATING THE CALCULATION OF OCCULTATIONS OF PLANETS AND STARS BY THE MOON, FOR THE YEAR 1861.

Date.	Star's Name.	Magnitude.	Limiting Parallels.		Washington Mean Time of δ .	At Washington Mean Time of Conjunction.					
			North-ern.	South-ern.		<i>H</i>	<i>Y</i>	<i>p'</i>	<i>q'</i>	Log sin <i>D</i>	Log cos <i>D</i>
Feb. 2	B.A.C. 5197	6	+49	-17	17 14.9	- 1 28 20	+0.4479	0.5781	-0.1069	-9.6139	9.9598
	A Scorpii	5	+65	+ 2	20 23.0	+ 1 32 32	+0.7633	5795	-0.0980	-9.6244	9.9576
2	3 Scorpii	6	+61	- 6	20 49.0	+ 1 57 37	+0.6404	5797	-0.0973	-9.6232	9.9579
3	19 Scorpii	5½	-61	-90	7 16.8	-11 58 50	-1.2671	5813	-0.0699	-9.6065	9.9613
3	σ Scorpii	3½	+31	-31	7 28.2	-11 47 57	+0.1929	5816	-0.0688	-9.6301	9.9564
3	ε Scorpii	1½	+65	+10	10 44.6	- 8 39 3	+0.8752	5818	-0.0602	-9.6437	9.9532
3	22 Scorpii	5	- 7	-77	11 5.8	- 8 18 43	-0.5062	5817	-0.0593	-9.6223	9.9580
4	A Ophiuchi	5	+46	-12	5 11.6	+ 9 4 59	+0.5189	5816	-0.104	-9.6473	9.9522
4	δ Ophiuchi	3½	-48	-90	7 52.9	+11 40 6	-1.0090	5812	-0.0022	-9.6236	9.9578
5	λ Sagittarii	3	+48	-15	10 49.8	-10 24 30	+0.4838	5727	+0.0693	-9.6338	9.9555
5	B.A.C. 6369	6	+63	- 4	17 54.6	- 3 35 24	+0.6740	5690	+0.0667	-9.6284	9.9567
7	VENUS		+63	-11	2 51.5	+ 4 11 31	+0.5696	4935	+0.1658	-9.5586	9.9695
7	σ Capricor.	5½	+47	-26	12 0.3	-10 57 55	+0.2926	5420	+0.1723	-9.5246	9.9742
7	π Capricor.	5	+32	-42	15 45.1	- 7 20 30	-0.0021	5394	+0.1722	-9.5050	9.9766
7	ε Capricor.	5	+17	-59	16 29.5	- 6 37 34	-0.2903	5389	+0.1795	-9.4963	9.9775
7	ο Capricor.	6	+68	- 8	16 57.7	- 6 10 13	+0.6208	5388	+0.1801	-9.5134	9.9756
10	κ Aquarii	5	+13	-75	10 32.7	+ 9 26 57	-0.5346	5024	+0.231	-9.9362	9.9984
11	κ Piscium	4½	+41	-42	13 33.7	+11 48 6	-0.0086	4964	+0.2406	+7.9371	0.0000
12	d Piscium	5½	+11	-77	19 29.1	- 7 10 13	-0.5964	4966	+0.2314	+9.1113	9.9964
14	η Piscium	4	+30	-48	9 52.1	+ 6 8 30	-0.2242	5070	+0.2015	+9.4023	9.9857
14	101 Piscium	6	+90	+18	12 8.3	+ 8 20 47	+0.9826	5080	+0.1992	+9.3822	9.9870
15	δ Arietis	5½	- 6	-71	9 52.7	+ 5 26 36	-0.8466	5186	+0.1723	+9.5183	9.9750
15	μ Arietis	5½	+90	+21	21 55.2	- 6 52 58	+0.9428	5253	+0.1543	+9.5217	9.9746
16	47 Arietis	6	+90	+60	5 32.0	+ 0 29 25	+1.3077	5301	+0.1417	+9.5362	9.9727
16	ε Arietis	4½	+89	+ 5	6 4.8	+ 1 1 15	+0.6428	5301	+0.1409	+9.5500	9.9708
17	g Pleiadum	5½	+34	-31	3 25.1	- 2 20 18	-0.1304	5433	+0.1007	+9.6063	9.9612
17	b Pleiadum	4½	+46	-21	3 27.3	- 2 18 11	+0.0652	5433	+0.1006	+9.6037	9.9618
17	m Pleiadum	8	+ 1	-66	3 34.1	- 2 11 36	-0.7172	5434	+0.1005	+9.6161	9.9694
17	e Pleiadum	5	+25	-41	3 35.4	- 2 10 20	-0.3080	5434	+0.1004	+9.6098	9.9606
17	1 Pleiadum	8	+52	-15	3 42.9	- 2 3 7	+0.1753	5434	+0.1002	+9.6024	9.9621
17	2 Pleiadum	8½	+26	-40	3 45.9	- 2 0 10	-0.2870	5434	+0.1001	+9.6097	9.9607
17	3 Pleiadum	9	+50	-17	3 47.0	- 1 59 9	+0.1294	5434	+0.1001	+9.6033	9.9619
17	4 Pleiadum	8	+34	-32	3 47.7	- 1 58 28	-0.1445	5434	+0.1001	+9.6076	9.9611
17	5 Pleiadum	9	+16	-50	3 48.3	- 1 57 50	-0.4621	5434	+0.1001	+9.6125	9.9601
17	6 Pleiadum	9	+37	-29	3 49.2	- 1 57 2	-0.0973	5434	+0.1001	+9.6069	9.9612
17	c Pleiadum	5	+32	-33	3 53.0	- 1 53 21	-0.1719	5434	+0.1000	+9.6082	9.9610
17	7 Pleiadum	8	+53	-14	3 54.5	- 1 51 55	+0.1894	5434	+0.0999	+9.6025	9.9621
17	B.A.C. 1155	7	+90	+45	3 54.6	- 1 51 45	+1.1631	5434	+0.0999	+9.5867	9.9650
17	k Pleiadum	7½	+21	-45	3 55.2	- 1 51 10	-0.3714	5434	+0.0999	+9.6113	9.9603
17	l Pleiadum	7½	+23	-43	3 58.9	- 1 47 38	-0.3369	5434	+0.0998	+9.6108	9.9604
17	8 Pleiadum	8½	+44	-22	4 4.3	- 1 42 22	+0.0343	5435	+0.0997	+9.6051	9.9616
17	9 Pleiadum	8½	+44	-22	4 5.4	- 1 41 21	+0.0418	5435	+0.0997	+9.6050	9.9616
17	d Pleiadum	5	+61	- 8	4 7.4	- 1 39 27	+0.3081	5435	+0.0996	+9.6010	9.9623
17	10 Pleiadum	8	+41	-25	4 10.4	- 1 36 28	+0.0214	5436	+0.0995	+9.6063	9.9613
17	11 Pleiadum	8½	+51	-16	4 16.2	- 1 30 55	+0.1530	5437	+0.0994	+9.6037	9.9618
17	12 Pleiadum	7½	+26	-40	4 24.7	- 1 22 39	-0.2885	5437	+0.0988	+9.6107	9.9604
17	13 Pleiadum	8½	+60	- 9	4 27.7	- 1 19 50	+0.2885	5437	+0.0986	+9.6018	9.9622
17	14 Pleiadum	9	+79	+ 4	4 30.4	- 1 17 10	+0.5430	5437	+0.0985	+9.5978	9.9629
17	15 Pleiadum	8½	+51	-16	4 33.2	- 1 14 32	+0.1521	5437	+0.0985	+9.6041	9.9617
17	16 Pleiadum	9½	+75	+ 2	4 33.7	- 1 13 59	+0.4917	5437	+0.0985	+9.5987	9.9628
17	17 Pleiadum	8	+84	+ 7	4 34.3	- 1 13 25	+0.5926	5438	+0.0984	+9.5971	9.9631
17	18 Pleiadum	8	+50	-17	4 34.4	- 1 13 17	+0.1421	5438	+0.0984	+9.6044	9.9617
17	p Pleiadum	7½	+52	-15	4 35.2	- 1 12 36	+0.1684	5438	+0.0984	+9.6039	9.9618
17	19 Pleiadum	8	+76	+ 3	4 35.6	- 1 12 8	+0.5101	5438	+0.0984	+9.5985	9.9628
17	20 Pleiadum	8	+22	-43	4 35.9	- 1 11 52	-0.3458	0.5438	+0.0983	+9.6119	9.9602

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			North-ern.	South-ern.		<i>H</i>	<i>Y</i>	<i>p'</i>	<i>q'</i>	Log sin <i>D</i>	Log cos <i>D</i>
Feb. 17	22 Pleiadum	8	+6	-4	4 37.0	-1 10 50	+0.3909	0.5439	+0.0983	+9.6004	9.9685
17	21 Pleiadum	8 $\frac{1}{2}$	+18	-47	4 37.0	-1 10 46	-0.4187	0.5439	+0.0983	+9.6131	.9600
17	23 Pleiadum	8 $\frac{1}{2}$	+90	+10	4 38.5	-1 9 22	+0.6507	0.5439	+0.0983	+9.5963	.9632
17	24 Pleiadum	8	+41	-25	4 38.8	-1 9 3	-0.0141	0.5439	+0.0982	+9.6069	.9612
17	γ Tauri	3 $\frac{1}{2}$	+53	-14	4 38.9	-1 8 59	+0.1856	0.5439	+0.0982	+9.6037	.9618
17	25 Pleiadum	8 $\frac{1}{2}$	+90	+15	4 43.0	-1 4 58	+0.7325	0.5439	+0.0982	+9.5949	.9635
17	26 Pleiadum	9	+90	+19	4 45.8	-1 2 17	+0.8097	0.5439	+0.0982	+9.5938	.9637
17	27 Pleiadum	8 $\frac{1}{2}$	+42	-24	4 58.9	-0 49 38	+0.0022	0.5441	+0.0977	+9.6071	.9612
17	28 Pleiadum	7	+90	+30	5 3.5	-0 45 9	+0.9692	0.5441	+0.0976	+9.5917	.9641
17	29 Pleiadum	8	+40	-26	5 6.4	-0 42 22	-0.0343	0.5442	+0.0975	+9.6079	.9610
17	<i>s</i> Pleiadum	7 $\frac{1}{2}$	+63	-6	5 19.2	-0 29 59	+0.3349	0.5443	+0.0970	+9.6024	.9621
17	<i>f</i> Pleiadum	4 $\frac{1}{2}$	+61	-8	5 24.9	-0 24 29	+0.3115	0.5444	+0.0968	+9.6028	.9620
17	<i>h</i> Pleiadum	5 $\frac{1}{2}$	+55	-12	5 25.5	-0 23 58	+0.2209	0.5444	+0.0968	+9.6043	.9617
17	30 Pleiadum	8 $\frac{1}{2}$	+61	-8	5 26.1	-0 23 22	+0.3137	0.5444	+0.0968	+9.6029	.9620
17	31 Pleiadum	8	+39	-27	5 27.7	-0 21 52	-0.0577	0.5444	+0.0967	+9.6067	.9608
17	32 Pleiadum	8	+40	-26	5 29.9	-0 19 36	-0.0378	0.5445	+0.0966	+9.6085	.9609
17	33 Pleiadum	8 $\frac{1}{2}$	+48	-18	5 32.1	-0 17 36	+0.1108	0.5445	+0.0966	+9.6063	.9613
17	34 Pleiadum	7 $\frac{1}{2}$	+90	+14	5 40.8	-0 9 6	+0.7061	0.5446	+0.0963	+9.5970	.9631
17	35 Pleiadum	9	+50	-17	5 41.3	-0 8 41	+0.1289	0.5446	+0.0963	+9.6062	.9613
17	36 Pleiadum	9	+52	-15	5 46.3	-0 4 49	+0.1643	0.5447	+0.0961	+9.6057	.9615
17	37 Pleiadum	8	+43	-23	5 45.9	-0 4 14	+0.0212	0.5447	+0.0961	+9.6080	.9610
17	39 Pleiadum	8	+35	-30	6 0.0	+0 9 23	-0.1169	0.5448	+0.0956	+9.6105	.9605
17	40 Pleiadum	7 $\frac{1}{2}$	+74	+2	6 11.9	+0 20 52	+0.4850	0.5448	+0.0953	+9.6014	.9623
17	36 Tauri	6 $\frac{1}{2}$	+90	+22	12 18.4	+6 14 57	+0.8231	0.5484	+0.0825	+9.6046	.9617
17	χ Tauri	5 $\frac{1}{2}$	+25	-37	20 23.1	-9 57 6	-0.2959	0.5535	+0.0625	+9.6308	.9562
18	κ Tauri	6	+90	+34	11 54.9	+5 1 44	+0.9215	0.5611	+0.0277	+9.6232	.9579
19	132 Tauri	5 $\frac{1}{2}$	+90	+62	9 31.2	+1 50 46	+1.2581	0.5697	-0.2771	+9.6180	.9590
19	139 Tauri	5 $\frac{1}{2}$	+21	-38	13 14.6	+5 25 50	-0.3613	0.5702	-0.0362	+9.6408	.9539
20	ϵ Geminor.	3 $\frac{1}{2}$	-6	-65	8 23.6	-0 8 2	-0.8247	0.5731	-0.0681	+9.6303	.9563
20	B.A.C. 2238	6	+71	0	11 47.4	+3 8 10	+0.4362	0.5731	-0.0947	+9.6052	.9616
20	44 Geminor.	6 $\frac{1}{2}$	+90	+20	17 20.1	+8 28 24	+0.8277	0.5731	-1.082	+9.5890	.9646
20	δ Geminor.	3 $\frac{1}{2}$	+90	+13	23 30.9	-9 34 36	+0.7353	0.5727	-1.241	+9.5779	.9664
21	63 Geminor.	5 $\frac{1}{2}$	+90	+19	2 42.2	-6 30 27	+0.8515	0.5725	-1.317	+9.5683	.9680
21	85 Geminor.	6 $\frac{1}{2}$	+90	+6	14 25.0	+4 46 11	+0.6642	0.5709	-1.588	+9.5390	.9723
21	B.A.C. 2683	6	+90	+31	18 15.8	+8 23 24	+1.0735	0.5701	-1.169	+9.5176	.9751
22	54 Cancri.	6 $\frac{1}{2}$	+90	+1	13 58.7	+3 27 58	+0.7879	0.5658	-2.062	+9.4366	.9832
22	α^1 Cancri	6	+56	-22	16 38.1	+6 1 38	+0.2425	0.5652	-2.111	+9.4364	.9832
22	α^2 Cancri	6	+39	-37	16 46.5	+6 9 44	-0.0484	0.5648	-3.111	+9.4432	.9826
23	ξ Leonis	6	+90	+7	7 42.5	-3 27 30	+0.8310	0.5614	-2.242	+9.3146	.9906
23	σ Leonis	3 $\frac{1}{2}$	+90	+28	11 44.6	+0 27 8	+1.2610	0.5603	-2.394	+9.2614	.9926
23	B.A.C. 3398	6	+76	-10	18 26.2	+6 54 23	+0.5603	0.5598	-2.477	+9.2215	.9939
23	B.A.C. 3047	6	+90	+15	19 10.8	+7 37 25	+0.9861	0.5591	-2.480	+9.1929	.9947
23	π Leonis	5	+90	+17	20 6.2	+8 30 50	+1.0205	0.5590	-2.491	+9.1799	.9950
24	34 Sextantis	6	+76	-12	14 51.7	+2 36 52	+0.5518	0.5563	-2.636	+8.8753	.9988
24	36 Sextantis	6	+90	+42	15 59.7	+3 42 29	+1.3295	0.5563	-2.643	+8.7485	.9993
25	p^6 Leonis	5	+68	-19	4 41.3	-8 2 30	+0.4398	0.5562	-2.683	+8.0754	0.0000
25	e Leonis	5	+88	+44	12 1.5	-0 57 37	+1.3487	0.5562	-2.684	-8.5923	9.9997
25	B.A.C. 4006	6	+86	+26	21 11.1	+7 52 43	+1.1811	0.5568	-2.666	-8.9004	.9986
26	q Virginis	6	+60	-24	15 53.8	+1 55 49	+0.3472	0.5605	-2.552	-9.1791	.9950
27	69 Virginis	5 $\frac{1}{2}$	+75	+39	13 51.8	-0 55 59	+1.2729	0.5674	-2.277	-9.4202	.9844
Mar. 1	42 Libræ	5 $\frac{1}{2}$	+20	-47	20 57.5	+4 6 47	-0.0916	0.5849	-1.131	-0.5964	.9628
2	A Scorpii	5	+65	+13	2 12.9	+9 9 52	+0.9239	0.5848	-0.992	-9.6244	.9676
2	19 Scorpii	5 $\frac{1}{2}$	-42	-90	12 56.2	-4 32 8	-1.0892	0.5858	-0.705	-9.6065	.9613
2	σ Scorpii	3 $\frac{1}{2}$	+41	-21	13 7.3	-4 21 26	+0.3599	0.5858	-0.698	-9.6301	.9564
2	α Scorpii	1 $\frac{1}{2}$	+64	+23	16 21.2	-1 15 10	+1.0365	0.5863	-0.609	-9.6438	.9532

OCCULTATIONS, 1861.

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ELEMENTS FOR FACILITATING THE CALCULATION OF OCCULTATIONS OF PLANETS AND STARS BY THE MOON, FOR THE YEAR 1861.

Date.	Star's Name.	Magnitude.	Limiting Parallels.		Wash- ington Mean Time of δ.	At Washington Mean Time of Conjunction.						
			North- ern.	South- ern.		H	Y	p'	q'	Log sin D	Log cos D	
Mar. 2	22 Scorpii	5	+ 2	-63	h m	h m s						
3	A Ophiuchi	5	+59	-2	16 42.1	- 0 55 5	-0.3340	0.5863	-0.0596	-9.6328	9.9580	
3	δ Ophiuchi	3½	-36	-90	10 38.2	- 7 41 7	+0.6767	.5803	-0.0098	-9.6479	.9522	
3	B.A.C. 5909	6½	+38	-27	13 18.7	- 5 6 49	-0.9303	.5820	-0.0029	-9.6236	.9578	
4	λ Sagittarii	3	+59	-5	17 11.2	- 1 23 17	+0.2591	.5808	+0.0078	-9.6443	.9530	
5	ν Sagittarii	5	-47	-90	16 15.9	- 3 11 5	+0.6345	.5706	+0.0681	-9.6339	.9555	
5	ν Sagittarii	5	-52	-90	3 26.5	+ 7 34 50	-1.1795	.5637	+0.0951	-9.5803	.9643	
5	σ Capricor.	5½	+54	-19	3 50.7	+ 6 58 18	-1.2170	.5635	+0.0959	-9.5890	.9646	
6	π Capricor.	5	+37	-36	17 54.5	- 3 16 17	+0.3981	.5378	+0.1702	-9.5246	.9742	
6	ρ Capricor.	5	+22	-53	21 42.1	+ 0 23 57	+0.1000	.5352	+0.1758	-9.5052	.9765	
6	σ Capricor.	5	+22	-53	22 27.0	+ 1 7 21	-0.1929	.5346	+0.1767	-9.4963	.9775	
7	ν Capricor.	5½	+72	+29	3 50.6	+ 6 20 38	+1.1641	.5309	+0.1843	-9.5043	.9767	
8	λ Capricor.	5½	+78	+ 6	13 35.7	- 8 55 38	+0.8734	.5119	+0.2206	-9.3181	.9904	
9	δ Aquarii	4	+81	- 6	5 45.1	+ 6 46 2	+0.6642	.5053	+0.2310	-9.1684	.9952	
9	ε Aquarii	5½	+52	+23	7 34.5	+ 8 32 23	+1.1347	.5046	+0.2318	-9.1705	.9952	
9	κ Aquarii	5	+12	-76	17 9.9	- 6 8 22	-0.5496	.5018	+0.2357	-8.9353	.9984	
12	d Piscium	5½	+ 4	-82	2 11.0	+ 1 19 15	-0.7194	.4983	+0.2304	+9.1111	.9964	
13	γ Piscium	4	+20	-59	16 30.3	- 9 25 48	-0.4066	.5088	+0.2006	+9.4024	.9857	
14	δ Arietis	5½	-21	-71	16 32.2	-10 6 18	-1.0597	.5194	+0.1705	+9.5183	.9750	
15	μ Arietis	5½	+90	+ 8	4 37.9	+ 1 37 13	+0.7269	.5254	+0.1519	+9.5217	.9746	
15	47 Arietis	6	+90	+33	12 17.6	+ 9 2 34	+1.0879	.5290	+0.1409	+9.5363	.9727	
15	ε Arietis	4½	+68	- 7	12 50.7	+ 9 34 38	+0.4189	.5297	+0.1397	+9.5500	.9708	
16	9 Tauri	6	+72	- 1	6 47.2	+ 2 56 34	+0.4671	.5390	+0.1069	+9.5874	.9648	
16	g Pleiadum	5½	+21	-45	10 24.7	+ 6 26 56	-0.3697	.5412	+0.0996	+9.6068	.9612	
16	b Pleiadum	4½	+32	-33	10 27.0	+ 6 29 10	-0.1729	.5412	+0.0995	+9.6038	.9618	
16	m Pleiadum	7	-16	-66	10 33.8	+ 6 35 45	-0.9596	.5412	+0.0993	+9.6161	.9594	
16	e Pleiadum	5	+11	-56	10 35.5	+ 6 37 23	-0.5488	.5412	+0.0993	+9.6098	.9606	
16	1 Pleiadum	8	+38	-28	10 42.8	+ 6 24 23	-0.0622	.5412	+0.0991	+9.6024	.9621	
16	2 Pleiadum	8½	+12	-55	10 45.9	+ 6 47 22	-0.5282	.5412	+0.0990	+9.6098	.9606	
16	3 Pleiadum	9	+35	-30	10 47.0	+ 6 48 26	-0.1084	.5412	+0.0990	+9.6033	.9619	
16	4 Pleiadum	8	+20	-45	10 47.7	+ 6 49 10	-0.3849	.5412	+0.0990	+9.6076	.9611	
16	5 Pleiadum	9	- 1	-65	10 48.4	+ 6 49 47	-0.7381	.5412	+0.0990	+9.6125	.9601	
16	6 Pleiadum	9	+23	-43	10 49.4	+ 6 50 50	-0.3367	.5412	+0.0989	+9.6069	.9612	
16	c Pleiadum	5	+18	-47	10 53.1	+ 6 54 21	-0.4121	.5412	+0.0988	+9.6082	.9610	
16	7 Pleiadum	8	+39	-27	10 54.6	+ 6 55 47	-0.0482	.5412	+0.0988	+9.6025	.9621	
16	B.A.C. 1155	7	+90	+27	10 54.7	+ 6 55 58	+0.9331	.5412	+0.0988	+9.5866	.9650	
16	k Pleiadum	7½	+ 7	-60	10 55.1	+ 6 56 18	-0.6137	.5412	+0.0988	+9.6113	.9603	
16	l Pleiadum	7½	+ 9	-58	10 59.1	+ 7 0 8	-0.5784	.5412	+0.0986	+9.6107	.9604	
16	8 Pleiadum	8½	+30	-35	11 4.6	+ 7 5 30	-0.2043	.5413	+0.0984	+9.6064	.9616	
16	9 Pleiadum	8½	+31	-35	11 5.6	+ 7 6 30	-0.1968	.5413	+0.0984	+9.6051	.9616	
16	d Pleiadum	5	+46	-20	11 7.7	+ 7 8 28	+0.0714	.5413	+0.0983	+9.6010	.9623	
16	10 Pleiadum	8	+27	-38	11 10.8	+ 7 11 27	-0.2608	.5413	+0.0981	+9.6063	.9613	
16	11 Pleiadum	8½	+37	-28	11 16.6	+ 7 17 5	-0.0848	.5413	+0.0979	+9.6037	.9618	
16	12 Pleiadum	7½	+12	-54	11 25.3	+ 7 25 29	-0.5299	.5414	+0.0976	+9.6108	.9604	
16	13 Pleiadum	8½	+45	-21	11 28.3	+ 7 28 23	+0.0515	.5414	+0.0975	+9.6017	.9622	
16	14 Pleiadum	9	+61	- 8	11 31.0	+ 7 31 2	+0.3075	.5415	+0.0974	+9.5978	.9629	
16	15 Pleiadum	8½	+37	-29	11 33.8	+ 7 33 44	-0.0901	.5415	+0.0974	+9.6041	.9618	
16	16 Pleiadum	9	+57	-11	11 34.4	+ 7 34 17	+0.2562	.5415	+0.0974	+9.5987	.9628	
16	17 Pleiadum	8	+64	- 5	11 35.0	+ 7 34 51	+0.3577	.5415	+0.0973	+9.5971	.9631	
16	18 Pleiadum	8	+36	-29	11 35.1	+ 7 34 59	-0.0961	.5415	+0.0973	+9.6043	.9617	
16	p Pleiadum	7½	+38	-28	11 35.9	+ 7 35 47	-0.0697	.5415	+0.0973	+9.6039	.9618	
16	19 Pleiadum	8	+59	-10	11 36.3	+ 7 36 8	+0.2747	.5415	+0.0973	+9.5985	.9628	
16	20 Pleiadum	8	+11	-55	11 36.6	+ 7 36 26	-0.5389	.5415	+0.0973	+9.6120	.9602	
16	22 Pleiadum	8	+51	-16	11 37.7	+ 7 37 30	+0.1545	.5415	+0.0973	+9.6004	.9625	
16	21 Pleiadum	8½	+ 1	-63	11 37.8	+ 7 37 33	-0.6613	.5415	+0.0972	+9.6131	.9600	
16	23 Pleiadum	8½	+69	- 2	11 39.2	+ 7 38 56	+0.4165	.5415	+0.0972	+9.5963	.9632	

ELEMENTS FOR FACILITATING THE CALCULATION OF OCCULTATIONS OF PLANETS AND STARS BY THE MOON, FOR THE YEAR 1861.

Date.	Star's Name.	Magnitude.	Limiting Parallels.		Washington Mean Time of ϕ .	At Washington Mean Time of Conjunction.						
			North-ern.	South-ern.		H	Y	p'	q'	Log sin D	Log cos D	
					h m	h m s						
Mar. 16	24 Pleiadum	8	+27	-38	11 39.5	+ 7 39 14	-0.2536	0.5415	+0.0972	+9.6069	9.9612	
16	γ Tauri	3 $\frac{1}{2}$	+39	-27	11 39.6	+ 7 39 21	-0.0547	.5415	+0.0972	+9.6037	.9618	
16	25 Pleiadum	8 $\frac{1}{2}$	+75	+ 2	11 43.9	+ 7 43 29	+0.4991	.5415	+0.0971	+9.5950	.9635	
16	26 Pleiadum	9	+83	+ 6	11 46.6	+ 7 46 8	+0.5765	.5415	+0.0970	+9.5938	.9637	
16	27 Pleiadum	8 $\frac{1}{2}$	+28	-37	11 59.9	+ 7 59 0	-0.2372	.5416	+0.0966	+9.6071	.9612	
16	28 Pleiadum	7	+90	+15	12 4.6	+ 8 3 32	+0.7370	.5416	+0.0964	+9.5917	.9641	
16	29 Pleiadum	8	+26	-39	12 7.5	+ 8 6 21	-0.2739	.5416	+0.0963	+9.6079	.9610	
16	δ Pleiadum	7 $\frac{1}{2}$	+47	-19	12 20.6	+ 8 18 56	+0.0979	.5417	+0.0969	+9.6024	.9621	
16	f Pleiadum	4 $\frac{1}{2}$	+46	-20	12 26.3	+ 8 24 32	+0.0744	.5417	+0.0957	+9.6029	.9620	
16	λ Pleiadum	5 $\frac{1}{2}$	+41	-24	12 26.9	+ 8 25 5	-0.0155	.5417	+0.0957	+9.6043	.9617	
16	30 Pleiadum	8 $\frac{1}{2}$	+46	-20	12 27.7	+ 8 25 51	+0.0764	.5417	+0.0957	+9.6028	.9620	
16	31 Pleiadum	8	+25	-40	12 29.1	+ 8 27 12	-0.2978	.5417	+0.0957	+9.6087	.9608	
16	32 Pleiadum	8 $\frac{1}{2}$	+24	-39	12 31.4	+ 8 29 27	-0.2776	.5417	+0.0956	+9.6065	.9609	
16	34 Pleiadum	7 $\frac{1}{2}$	+73	+ 1	12 42.5	+ 8 40 8	+0.4740	.5418	+0.0952	+9.5969	.9631	
16	35 Pleiadum	9	+35	-30	12 42.9	+ 8 40 32	-0.1097	.5418	+0.0952	+9.6062	.9613	
16	36 Pleiadum	9	+37	-28	12 47.0	+ 8 44 29	-0.0741	.5419	+0.0951	+9.6057	.9615	
16	37 Pleiadum	8	+29	-36	12 47.6	+ 8 45 4	-0.2186	.5419	+0.0951	+9.6080	.9610	
16	39 Pleiadum	8	+22	-43	13 1.9	+ 8 58 52	-0.3578	.5420	+0.0945	+9.6104	.9605	
16	40 Pleiadum	7 $\frac{1}{2}$	+57	-11	13 13.9	+ 9 10 31	+0.2490	.5421	+0.0941	+9.6013	.9623	
17	χ Tauri	5 $\frac{1}{2}$	+11	-52	3 39.4	- 0 53 10	-0.5429	.5491	+0.0633	+9.6308	.9562	
18	132 Tauri	5 $\frac{1}{2}$	+90	+42	17 40.7	+11 48 1	+1.0457	.5685	-0.0266	+9.6180	.9590	
18	139 Tauri	5 $\frac{1}{2}$	+7	-55	21 30.4	- 8 30 29	-0.6046	.5622	-0.0350	+9.6408	.9539	
19	ϵ Geminor.	3 $\frac{1}{2}$	+25	-65	17 14.2	+10 30 30	-1.0649	.5640	-0.0837	+9.6303	.9563	
20	δ Geminor.	3 $\frac{1}{2}$	+78	+ 2	8 50.1	+ 1 32 32	+0.5292	.5635	-0.1209	+9.5779	.9664	
20	63 Geminor.	5 $\frac{1}{2}$	+90	+ 8	12 7.4	+ 4 42 42	+0.6496	.5632	-0.1280	+9.5683	.9620	
21	d^1 Cancr.	6	+40	-33	12 15.1	+ 3 58 26	-0.0877	.5602	-0.1793	+9.5076	.9763	
21	d^2 Cancr.	6	+90	+29	13 21.7	+ 5 2 39	+1.0807	.5602	-0.1818	+9.4781	.9794	
22	ξ Leonis	6	+90	+ 2	18 30.5	+ 9 9 45	+0.7076	.5560	-0.2290	+9.3146	.9906	
22	σ Leonis	3 $\frac{1}{2}$	+90	+28	22 26.7	-10 52 37	+1.1495	.5556	-0.2353	+9.2613	.9926	
23	π Leonis	5	+90	+11	7 5.3	- 2 43 45	+0.9241	.5552	-0.2449	+9.1797	.9950	
23	B.A.C. 3529	6	+54	-28	16 8.5	+ 6 2 31	+0.2373	.5551	-0.2535	+9.0935	9.9966	
24	p^3 Leonis	5	+66	-20	15 48.1	+ 4 52 36	+0.4205	.5572	-0.2663	+8.0751	0.0000	
24	e Leonis	5	+88	+45	23 5.5	+11 54 41	+1.3459	.5503	-0.2671	-8.5923	9.9997	
29	42 Libræ	5 $\frac{1}{2}$	+31	-34	5 11.9	- 9 50 59	+0.1286	.5962	-0.1144	-9.5964	.9628	
29	A Scorpii	5	+65	+31	10 16.2	- 4 59 6	+1.1314	.5961	-0.1002	-9.6244	.9576	
29	B.A.C. 5253	6	+41	-23	10 23.7	- 4 51 52	+0.3247	.5956	-0.0983	-9.6113	.9603	
29	B.A.C. 5255	6	+65	+38	10 29.7	- 4 46 10	+1.1959	.5966	-0.0992	-9.6258	.9573	
29	3 Scorpii	6	+65	+20	10 40.3	- 4 36 0	+1.0132	.5966	-0.0988	-9.6231	.9579	
29	B.A.C. 5286	6 $\frac{1}{2}$	+50	-15	12 10.8	- 3 9 9	+0.4730	.5965	-0.0948	-9.6165	.9593	
29	19 Scorpii	5 $\frac{1}{2}$	-24	-90	20 37.6	+ 4 56 59	-0.8339	.5958	-0.0703	-9.6065	.9613	
29	σ Scorpii	3 $\frac{1}{2}$	+58	- 8	20 48.4	+ 5 7 20	+0.5876	.5957	-0.0698	-9.6301	.9564	
29	α Scorpii	1 $\frac{1}{2}$	+64	+51	23 55.9	+ 8 7 13	+1.2569	.5962	-0.0610	-9.6437	.9532	
30	22 Scorpii	5	+15	-47	0 16.1	+ 8 26 36	-0.0905	.5961	-0.0603	-9.6227	.9580	
30	A Ophiuchi	5	+64	+14	17 39.2	+ 1 7 33	+0.9206	.5920	-0.0085	-9.6478	.9522	
30	38 Ophiuchi	6 $\frac{1}{2}$	+64	+19	18 31.1	+ 1 57 19	+0.9922	.5915	-0.0069	-9.6490	.9519	
30	δ Ophiuchi	3 $\frac{1}{2}$	-21	-90	20 15.3	+ 3 37 21	-0.6651	.5911	-0.0025	-9.6236	.9578	
31	9 Sagittarii	6 $\frac{1}{2}$	+30	-32	19 57.0	+ 2 23 30	+0.1758	.5780	+0.0621	-9.6254	.9574	
31	λ Sagittarii	3	+65	+11	22 34.5	+ 4 55 0	+0.8868	.5759	+0.0701	-9.6330	.9555	
Apr. 1	ν^1 Sagittarii	5	-26	-90	9 32.9	- 8 31 12	-0.9072	.5678	+0.0954	-9.5903	.9643	
1	ν^2 Sagittarii	5	-28	-90	9 56.7	- 8 8 17	-0.9232	.5678	+0.0944	-9.5890	.9646	
2	f Sagittarii	5	-40	-90	8 23.9	-10 28 55	-1.1588	.5499	+0.1442	-9.5359	.9728	
2	σ Capricor.	5 $\frac{1}{2}$	+66	- 8	23 38.5	+ 4 15 6	+0.6040	.5379	+0.1637	-9.5245	.9742	
3	π Capricor.	5	+51	-23	3 25.3	+ 7 54 32	+0.3398	.5356	+0.1740	-9.5060	.9766	
3	ρ Capricor.	5	+35	-39	4 10.0	+ 8 37 49	+0.0474	.5346	+0.1752	-9.4962	.9775	
4	ι Capricor.	5 $\frac{1}{2}$	+78	+ 9	19 21.3	- 1 22 38	+1.0617	0.5101	+0.2178	-9.3181	9.9904	

ELEMENTS FOR FACILITATING THE CALCULATION OF OCCULTATIONS OF PLANETS AND STARS BY THE MOON, FOR THE YEAR 1861.

Date.	Star's Name.	Magnitude.	Limiting Parallels.		Washington Mean Time of δ .	At Washington Mean Time of Conjunction.					
			North-ern.	South-ern.		H	Y	p'	q'	Log sin D	Log cos D
Apr. 5	δ Aquarii	4 $\frac{1}{2}$	+82	+2	11 35.1	-9 36 38	+0.8306	0.5017	+2272	-9.1684	9.9962
5	ϵ Aquarii	5 $\frac{1}{2}$	+82	+38	13 25.0	-7 49 48	+1.2888	.5025	+2289	-9.1705	.9952
5	κ Aquarii	5 $\frac{1}{2}$	+19	-66	23 3.2	+1 32 19	-0.4163	.4998	+2326	-8.9351	9.9984
7	π Piscium	4 $\frac{1}{2}$	+41	-42	2 21.9	+4 6 18	+0.0029	.4961	+2360	+7.9373	0.0000
10	δ Arietis	5 $\frac{1}{2}$	-35	-71	23 29.8	-2 21 15	-1.2081	.5220	+1.698	+9.5181	9.9750
11	B.A.C. 782	6 $\frac{1}{2}$	+90	+38	6 14.9	+5 9 38	+1.1673	.5258	+1.586	+9.4962	.9775
11	μ Arietis	5 $\frac{1}{2}$	+79	-1	10 33.5	+9 20 19	+0.5572	.5279	+1.511	+9.5217	.9746
11	α Arietis	4 $\frac{1}{2}$	+55	-16	18 45.5	-6 43 7	+0.2353	.5320	+1.384	+9.5500	.9708
12	66 Arietis	6 $\frac{1}{2}$	+59	-11	8 41.6	+6 46 11	+0.2864	.5387	+1.130	+9.5795	.9662
12	9 Tauri	6	+57	-12	12 41.4	+10 38 10	+0.2541	.5407	+1.055	+9.5874	.9648
12	g Pleiadum	5 $\frac{1}{2}$	+8	-59	16 19.2	-9 51 10	-0.5899	.5422	+0.986	+9.6068	.9612
12	b Pleiadum	4 $\frac{1}{2}$	+19	-46	16 21.6	-9 48 53	-0.3922	.5422	+0.985	+9.6037	.9618
12	m Pleiadum	7 $\frac{1}{2}$	-36	-66	16 28.4	-9 42 14	-1.1811	.5423	+0.992	+9.6161	.9594
12	e Pleiadum	5	-3	-66	16 30.2	-9 40 29	-0.7689	.5424	+0.982	+9.6098	.9607
12	1 Pleiadum	8	+26	-39	16 37.4	-9 33 35	-0.2810	.5424	+0.979	+9.6023	.9621
12	2 Pleiadum	8 $\frac{1}{2}$	+2	-66	16 40.5	-9 30 35	-0.7487	.5425	+0.978	+9.6097	.9607
12	3 Pleiadum	9	+23	-42	16 41.6	-9 29 32	-0.3273	.5425	+0.977	+9.6032	.9620
12	4 Pleiadum	8	+7	-60	16 42.3	-9 28 52	-0.6052	.5425	+0.977	+9.6076	.9611
12	5 Pleiadum	9	-13	-66	16 42.9	-9 28 14	-0.9260	.5425	+0.977	+9.6125	.9601
12	6 Pleiadum	9	+11	-66	16 44.0	-9 27 13	-0.5569	.5425	+0.977	+9.6068	.9612
12	c Pleiadum	5	+6	-62	16 47.6	-9 23 39	-0.6327	.5425	+0.976	+9.6082	.9610
12	7 Pleiadum	8	+26	-39	16 49.1	-9 22 15	-0.2677	.5425	+0.975	+9.6024	.9621
12	B.A.C. 1155	7 $\frac{1}{2}$	+90	+14	16 49.3	-9 22 3	+0.7164	.5425	+0.975	+9.5967	.9650
12	k Pleiadum	7 $\frac{1}{2}$	-7	-66	16 49.7	-9 21 42	-0.8350	.5425	+0.975	+9.6113	.9603
12	l Pleiadum	7 $\frac{1}{2}$	-5	-66	16 53.6	-9 17 51	-0.7992	.5426	+0.974	+9.6109	.9604
12	8 Pleiadum	8 $\frac{1}{2}$	+18	-48	16 59.2	-9 12 29	-0.4244	.5426	+0.972	+9.6051	.9616
12	9 Pleiadum	8 $\frac{1}{2}$	+18	-47	17 0.2	-9 11 28	-0.4170	.5426	+0.971	+9.6050	.9616
12	d Pleiadum	5	+33	-32	17 2.3	-9 9 32	-0.1480	.5426	+0.971	+9.6010	.9623
12	10 Pleiadum	8	+14	-51	17 5.3	-9 6 32	-0.4811	.5426	+0.970	+9.6063	.9613
12	11 Pleiadum	8 $\frac{1}{2}$	+24	-41	17 11.2	-9 0 52	-0.3050	.5427	+0.968	+9.6036	.9618
12	12 Pleiadum	7 $\frac{1}{2}$	-2	-66	17 19.9	-8 52 30	-0.7516	.5427	+0.965	+9.6108	.9604
12	13 Pleiadum	8 $\frac{1}{2}$	+32	-33	17 22.9	-8 49 33	-0.1687	.5428	+0.964	+9.6018	.9622
12	14 Pleiadum	9	+47	-19	17 25.7	-8 46 54	+0.0683	.5428	+0.963	+9.5978	.9629
12	15 Pleiadum	8 $\frac{1}{2}$	+24	-41	17 28.5	-8 44 10	-0.3066	.5428	+0.962	+9.6041	.9618
12	16 Pleiadum	9 $\frac{1}{2}$	+44	-22	17 29.0	-8 43 41	+0.0367	.5429	+0.960	+9.5987	.9628
12	17 Pleiadum	8	+50	-17	17 29.6	-8 43 5	+0.1385	.5429	+0.960	+9.5971	.9631
12	18 Pleiadum	8	+24	-41	17 29.7	-8 42 58	-0.3168	.5429	+0.960	+9.6043	.9617
12	p Pleiadum	7 $\frac{1}{2}$	+25	-40	17 30.6	-8 42 9	-0.2903	.5429	+0.959	+9.6039	.9618
12	19 Pleiadum	8	+45	-21	17 30.9	-8 41 47	+0.0552	.5429	+0.959	+9.5965	.9628
12	20 Pleiadum	8	-5	-66	17 31.2	-8 41 31	-0.8098	.5429	+0.959	+9.6120	.9602
12	22 Pleiadum	8	+33	-27	17 32.3	-8 40 26	-0.0654	.5429	+0.959	+9.6004	.9625
12	21 Pleiadum	8	-10	-66	17 32.4	-8 40 24	-0.8837	.5429	+0.959	+9.6131	.9600
12	23 Pleiadum	8 $\frac{1}{2}$	+53	-14	17 33.9	-8 38 57	+0.1973	.5429	+0.959	+9.5962	.9632
12	24 Pleiadum	8	+14	-51	17 34.2	-8 38 38	-0.4746	.5430	+0.958	+9.6069	.9612
12	γ Tauri	3 $\frac{1}{2}$	+26	-39	17 34.3	-8 38 34	-0.2729	.5430	+0.958	+9.6037	.9618
12	25 Pleiadum	8	+59	-9	17 38.5	-8 34 30	+0.2798	.5431	+0.956	+9.5949	.9635
12	26 Pleiadum	9 $\frac{1}{2}$	+64	-5	17 41.3	-8 31 47	+0.3578	.5431	+0.956	+9.5938	.9637
12	27 Pleiadum	8 $\frac{1}{2}$	+16	-50	17 54.6	-8 18 54	-0.4589	.5431	+0.952	+9.6071	.9612
12	28 Pleiadum	7	+77	+3	17 59.3	-8 14 21	+0.5186	.5432	+0.951	+9.5917	.9641
12	29 Pleiadum	8	+14	-52	18 2.2	-8 11 31	-0.4961	.5432	+0.950	+9.6079	.9610
12	s Pleiadum	7 $\frac{1}{2}$	+34	-30	18 15.3	-7 58 56	-0.1231	.5433	+0.946	+9.6024	.9621
12	f Pleiadum	4 $\frac{1}{2}$	+33	-32	18 21.1	-7 53 20	-0.1470	.5433	+0.944	+9.6029	.9620
12	λ Pleiadum	5 $\frac{1}{2}$	+28	-37	18 21.6	-7 52 47	-0.2372	.5433	+0.944	+9.6044	.9617
12	30 Pleiadum	8 $\frac{1}{2}$	+33	-31	18 22.4	-7 51 59	-0.1450	.5434	+0.944	+9.6029	.9620
12	31 Pleiadum	8	+12	-54	18 23.8	-7 50 39	-0.5200	.5434	+0.943	+9.6087	0.9608

ELEMENTS FOR FACILITATING THE CALCULATION OF OCCULTATIONS OF PLANETS AND STARS BY THE MOON, FOR THE YEAR 1861.

Date.	Star's Name.	Magnitude.	Limiting Parallels.		Wash- ington Mean Time of δ.	At Washington Mean Time of Conjunction.					
			North- ern.	South- ern.		H	Y	p'	q'	Log sin D	Log cos D
						h m s	h m s	h m s	h m s		
Apr. 12	32 Pleiadum	8	+13	-53	18 26.2	- 7 48 24	-0.5003	.5434	+0.0942	+9.6085	9.9689
12	33 Pleiadum	8½	+22	-43	18 28.3	- 7 46 19	-0.3499	.5434	+0.0941	+0.6062	.9613
12	34 Pleiadum	7½	+57	-10	18 37.2	- 7 37 46	+0.9535	.5435	+0.0938	+9.5969	.9631
12	35 Pleiadum	9	+23	-42	18 37.7	- 7 37 17	-0.3319	.5435	+0.0938	+9.6062	.9613
12	36 Pleiadum	9	+25	-40	18 41.8	- 7 33 18	-0.2864	.5435	+0.0937	+9.6057	.9615
12	37 Pleiadum	8	+17	-49	18 42.4	- 7 32 44	-0.4412	.5435	+0.0937	+9.6080	.9610
12	39 Pleiadum	8	+ 9	-58	18 56.2	- 7 19 20	-0.5820	.5436	+0.0933	+9.6104	.9605
12	40 Pleiadum	7½	+43	-22	19 8.8	- 7 7 11	+0.0269	.5437	+0.0927	+9.6013	.9623
13	γ Tauri	5½	- 4	-65	9 37.4	+ 6 52 18	-0.7861	.5494	+0.0606	+9.6308	.9662
14	ε Tauri	5½	+70	+ 6	1 36.0	- 1 42 1	+0.4330	.5543	+0.0139	+9.6232	.9579
15	132 Tauri	5½	+90	+24	0 3.0	- 4 2 12	+0.7651	.5584	-0.0267	+9.6180	.9590
15	139 Tauri	5½	-11	-64	3 56.6	- 0 16 48	-0.8884	.5584	-0.0360	+9.6408	.9539
15	5 Geminor.	6	+72	+ 5	9 55.0	+ 5 28 54	+0.4594	.5588	-0.0608	+9.6169	.9592
16	44 Geminor.	6½	+62	- 7	9 32.0	+ 4 15 57	+0.3367	.5572	-0.1050	+9.5890	.9646
16	δ Geminor.	3½	+56	-13	16 5.0	+10 35 3	+0.2473	.5564	-0.1190	+9.5779	.9664
16	63 Geminor.	5½	+65	- 7	19 27.9	-10 9 7	+0.3696	.5558	-0.1267	+9.5683	.9680
17	85 Geminor.	6½	+53	-19	7 54.1	+ 1 51 3	+0.1937	.5537	-0.1521	+9.5391	.9723
17	B.A.C. 2683	6	+85	+ 2	11 59.3	+ 5 47 45	+0.6208	.5529	-0.1601	+9.5177	.9751
17	ζ Cancri	4½	+90	+54	15 20.9	+ 9 2 22	+1.2948	.5522	-0.1663	+9.4914	.9781
18	54 Cancri	6½	+64	-15	8 55.1	+ 2 0 25	+0.3716	.5490	-0.1972	+9.4367	.9631
19	ο Leonis	3½	+90	+12	7 53.6	+ 0 12 14	+0.0966	.5463	-0.2225	+9.9614	.9886
19	B.A.C. 3398	6	+55	-27	14 54.6	+ 6 59 4	+0.2345	.5462	-0.2375	+9.2215	.9939
19	B.A.C. 3407	6	+88	- 4	15 41.2	+ 7 44 7	+0.6732	.5462	-0.2394	+9.1930	.9947
19	π Leonis	5	+90	- 2	16 39.1	+ 8 40 6	+0.7117	.5462	-0.2393	+9.1800	.9950
20	34 Sextantis	6	+60	-24	12 7.8	+ 2 29 23	+0.3174	.5475	-0.2546	+8.8752	.9988
20	36 Sextantis	6	+90	+22	13 17.5	+ 4 36 42	+1.1122	.5479	-0.2554	+8.7480	9.9993
21	ρ Leonis	5	+57	-27	2 17.9	- 6 49 24	+0.2739	.5504	-0.2606	+8.0751	0.0000
21	σ Leonis	5	+88	+31	9 44.9	+ 0 22 17	+1.2269	.5530	-0.2616	-8.5923	9.9987
22	γ Virginis	6	+61	-22	13 35.5	+ 3 14 1	+0.3716	.5654	-0.2519	-9.1792	.9950
23	75 Virginis	6	+53	-25	14 13.4	+ 2 57 8	+0.3104	.5799	-0.2240	-9.4032	.9856
25	42 Libræ	5½	+39	-26	15 30.5	+ 2 15 42	+0.2751	.6047	-0.1126	-9.5984	.9628
25	B.A.C. 5197	6	+66	+15	17 33.7	+ 4 13 49	+0.9519	.6063	-0.1074	-9.6140	.9698
25	A Scorpii	5	+65	+55	20 27.3	+ 7 0 7	+1.2732	.6059	-0.0991	-9.6945	.9576
26	19 Scorpii	5½	-14	-90	6 32.0	- 7 20 32	-0.6445	.6067	-0.0695	-9.6065	.9613
26	ο Scorpii	3½	+65	+ 3	6 42.5	- 7 10 31	+0.7607	.6067	-0.0691	-9.6301	.9564
26	22 Scorpii	5	+25	-36	10 4.3	- 3 57 10	+0.0068	.6066	-0.0593	-9.6228	.9580
26	25 Scorpii	6	+32	-27	16 15.6	+ 1 58 36	+0.2562	.6068	-0.0408	-9.6304	.9563
27	A Ophiuchi	5	+64	+32	2 56.3	-11 47 26	+1.1223	.6027	-0.0669	-9.6479	.9522
27	39 Ophiuchi	5½	-54	-90	3 58.2	-10 48 7	-1.1611	.6025	-0.0662	-9.6116	.9603
27	δ Ophiuchi	3½	- 8	-70	5 27.5	- 9 22 31	-0.4359	.6016	-0.0005	-9.6236	.9578
27	β Ophiuchi	5	-63	-90	7 7.6	- 7 46 28	-1.2637	.6012	+0.0009	-9.6100	.9606
27	4 Sagittarii	5	-57	-90	19 56.2	+ 4 30 45	-1.2204	.5939	+0.0410	-9.6059	.9614
28	2 Sagittarii	3	+65	+31	6 57.9	- 8 53 50	+1.1220	.5862	+0.0708	-9.6339	.9555
28	26 Sagittarii	6	+22	-42	12 34.3	- 3 30 26	-0.0094	.5817	+0.0254	-9.6066	.9609
28	ρ Sagittarii	5	-10	-88	17 36.7	+ 1 20 22	-0.6222	.5773	+0.0976	-9.5903	.9643
28	σ Sagittarii	5	-12	-90	17 59.8	+ 1 42 46	-0.6642	.5772	+0.0963	-9.5889	.9646
28	ο Sagittarii	4	-47	-90	21 58.3	+ 5 32 6	-1.1871	.5738	+0.1075	-9.5724	.9674
29	γ Sagittarii	5	-18	-90	15 50.6	- 1 14 30	-0.8598	.5576	+0.1449	-9.5359	.9728
29	57 Sagittarii	5½	-45	-90	18 25.8	+ 1 15 15	-1.9106	.5550	+0.1499	-9.5212	.9747
30	σ Capricor.	5½	+71	+11	6 44.2	-10 51 38	+0.9224	.5441	+0.1704	-9.5246	.9742
30	π Capricor.	5	+68	- 7	10 26.3	- 7 16 53	+0.6965	.5408	+0.1760	-9.5051	.9766
30	ο Capricor.	5	+51	-23	11 10.1	- 6 34 32	+0.3873	.5404	+0.1768	-9.4962	.9775
May 1	ε Aquarii	6	+63	-17	14 15.1	- 4 20 47	+0.4577	.5196	+0.2069	-9.3672	.9679
2	λ Capricor.	5½	+78	+47	1 46.0	+ 6 49 33	+1.3329	.5123	+0.2178	-9.3189	.9904
2	δ Aquarii	4½	+62	+20	17 51.9	- 1 32 20	+1.0822	.5042	+0.2168	-9.1683	9.9652

OCCULTATIONS, 1861. 421

ELEMENTS FOR FACILITATING THE CALCULATION OF OCCULTATIONS OF PLANETS AND STARS BY THE MOON, FOR THE YEAR 1861.

Date.	Star's Name.	Magnitude.	Limiting Parallels.		Washington Mean Time of δ .	At Washington Mean Time of Conjunction.						
			North-ern.	South-ern.		<i>H</i>	<i>Y</i>	<i>p'</i>	<i>q'</i>	Log sin <i>D</i>	Log cos <i>D</i>	
												<i>h</i>	m	s
May 3	* Aquarii	5	+32	-50	5 16.4	+ 9 32 59	-0.1650	.5001	+2311	-8.9352	9.9984	
	* Piscium	4½	+53	-31	8 31.2	-11 57 0	+0.2006	.4940	+2331	+7.9365	0.0000	
	d Piscium	5½	+11	-76	14 24.4	-6 52 31	-0.5803	.4978	+2255	+9.1111	9.9964	
	45 Piscium	6	+81	- 8	17 13.1	- 4 8 28	+0.6032	.4986	+2242	+9.0812	.9968	
	γ Piscium	4	+17	-61	4 39.2	+ 6 17 58	-0.4496	.5112	+1969	+9.4023	.9657	
	10	χ Tauri	5½	-13	-65	15 20.9	- 9 36 49	-0.9103	.5522	+0609	+9.6308	.9562
	11	103 Tauri	6	+90	+48	11 49.1	+10 0 12	+1.1871	.5581	+0141	+9.6106	.9605
12	132 Tauri	5½	+83	+14	5 37.8	+ 3 16 5	+0.5799	.5603	-0285	+9.6180	.9590	
12	MARS		+85	+14	6 32.8	+ 4 13 4	+0.5971	.5319	-0313	+9.6173	.9591	
12	139 Tauri	5½	-27	-64	9 31.4	+ 7 5 21	-1.0814	.5602	-0377	+9.6408	.9539	
13	B.A.C. 2236	6	+25	-39	9 18.7	+ 6 2 21	-0.2910	.5582	-0293	+9.6052	.9616	
13	δ Geminor.	3½	+42	-25	21 49.1	- 5 53 24	+0.0150	.5550	-1198	+9.5779	.9664	
14	63 Geminor.	5½	+49	-20	1 14.1	- 2 35 33	+0.1357	.5543	-1265	+9.5683	.9680	
14	ξ Cancri	4½	+90	+29	21 23.1	- 7 8 0	+1.0563	.5463	-1661	+9.4913	.9781	
16	ζ Leonis	6	+54	-21	10 30.1	+ 4 44 56	+0.2209	.5395	-2212	+9.3146	.9906	
16	ο Leonis	3½	+90	- 2	14 52.0	+ 8 58 12	+0.6837	.5387	-2259	+9.2615	.9926	
16	π Leonis	5	+70	-14	23 53.1	- 6 18 18	+0.4713	.5380	-2351	+9.1800	.9950	
17	16 Sextantis	6	+90	+51	4 10.9	- 2 8 52	+1.3605	.5379	-2387	+9.0765	.9969	
17	B.A.C. 3529	6	+30	-52	9 31.3	+ 3 1 4	-0.2114	.5379	-2431	+9.0935	9.9966	
18	ρ ¹ Leonis	6	+90	+30	5 53.7	- 1 16 27	+1.2109	.5399	-2534	+8.1125	0.0000	
18	ρ ² Leonis	5	+45	-38	10 38.5	+ 3 18 58	+0.0639	.5416	-2549	+8.0753	0.0000	
18	ε Leonis	5	+88	+17	18 20.7	+10 45 52	+1.0447	.5434	-2556	-8.5923	9.9997	
23	42 Libræ	5½	+41	-24	2 12.3	- 9 14 20	+0.3026	.6054	-1091	-9.5983	.9629	
23	3 Scorpii	6	+65	+39	7 32.5	- 4 7 30	+1.2009	.6071	-0961	-9.6232	.9579	
23	B.A.C. 5286	6½	+64	- 3	8 56.8	- 2 46 53	+0.6778	.6075	-0924	-9.6167	.9593	
23	19 Scorpii	5½	-10	-83	7 11.6	- 4 52 45	-0.5845	.6092	-0689	-8.6064	.9613	
23	σ Scorpii	3½	+65	+ 7	7 22.0	- 4 42 46	+0.8194	.6092	-0675	-8.6302	.9564	
23	22 Scorpii	5	+28	-32	20 42.6	+ 8 29 18	+0.1635	.6096	-0572	-9.6229	.9580	
24	4 Ophiuchi	5	+64	+44	13 24.2	+ 0 28 38	+1.2165	.6078	-0070	-9.6478	.9522	
24	39 Ophiuchi	5½	-45	-90	14 25.2	+ 1 27 8	-1.0529	.6074	-0029	-9.6116	.9603	
24	δ Ophiuchi	3½	- 3	-62	15 53.2	- 2 51 26	-0.3228	.6071	+0009	-9.6236	.9578	
24	β Ophiuchi	5	-52	-90	17 32.0	+ 4 26 3	-1.1384	.6066	+0066	-9.6101	.9606	
25	4 Sagittarii	5	-44	-90	6 7.8	- 7 29 32	-1.0804	.6009	+0430	-9.6059	.9614	
25	B.A.C. 6217	6½	+54	- 9	14 26.9	+ 0 29 19	+0.5657	.5956	+0668	-9.6256	.9573	
25	α Sagittarii	3	+65	+53	16 56.4	+ 2 52 46	+1.2653	.5958	+0732	-9.6338	.9555	
26	ρ ¹ Sagittarii	5	0	-71	3 21.1	-11 7 9	-0.4594	.5861	+0998	-9.5903	.9643	
26	ρ ² Sagittarii	5	- 2	-74	3 43.7	-10 45 29	-0.4925	.5853	+1012	-9.5890	.9646	
26	ο Sagittarii	4	-32	-90	7 36.6	- 7 1 34	-1.0037	.5820	+1106	-9.5724	.9674	
26	B.A.C. 6607	6	+55	-13	14 8.1	- 0 44 59	+0.5018	.5772	+1254	-9.5857	.9651	
26	50 Sagittarii	6	+36	-31	16 30.6	+ 1 32 14	+0.1829	.5738	+1308	-9.5745	.9670	
27	ζ Sagittarii	5	- 6	-90	1 2.7	+ 9 45 30	-0.6554	.5659	+1479	-9.5359	.9728	
27	57 Sagittarii	5½	-27	-90	3 34.0	-11 48 40	-0.9901	.5633	+1529	-9.5212	.9747	
27	ο Capricor.	5½	+71	+27	15 33.8	- 0 14 11	+1.1215	.5521	+1736	-9.5245	.9743	
27	π Capricor.	5	+72	+ 5	19 10.3	+ 3 14 58	+0.8328	.5489	+1787	-9.5051	.9766	
27	ε Capricor.	5	+64	-11	19 53.1	+ 3 56 17	+0.5479	.5483	+1801	-9.4962	.9775	
30	δ Aquarii	4½	+82	+42	1 23.9	+ 7 47 21	+1.3104	.5084	+2229	-9.1682	.9952	
30	* Aquarii	5	+44	-37	12 37.6	- 5 18 11	+0.0716	.5036	+2323	-8.9350	9.9984	
31	B.A.C. 8152	6½	+90	+17	13 40.4	- 4 57 3	+1.0423	.4971	+2338	-7.9132	0.0000	
31	* Piscium	4½	+66	-19	15 33.6	- 3 6 57	+0.4208	.4971	+2337	+7.9393	0.0000	
31	9 Piscium	6	+81	- 9	15 44.1	- 2 56 34	+0.6120	.4971	+2337	+7.8002	0.0000	
June 1	d Piscium	5½	+21	-62	21 15.8	+ 1 46 26	-0.3889	.4977	+2243	+9.1112	9.9964	
	γ Piscium	4	+24	-53	11 25.6	- 9 8 4	-0.3143	.5103	+1950	+9.4023	.9657	
	3 101 Piscium	6	+90	+12	13 31.0	- 7 6 38	+0.8758	.5116	+1928	+9.3823	.9670	
	4 δ Arietis	5	-26	-71	11 17.1	- 9 58 59	-1.1138	.5234	+1667	+9.5183	.9750	
	4 26 Arietis	6½	+37	-35	17 30.2	- 3 57 21	-0.0822	.5263	+1573	+9.5178	9.9751	

ELEMENTS FOR FACILITATING THE CALCULATION OF OCCULTATIONS OF PLANETS AND STARS BY THE MOON, FOR THE YEAR 1861.

Date.	Star's Name.	Magnitude.	Limiting Parallels.		Washington Mean Time of δ .	At Washington Mean Time of Conjunction.					
			North-ern.	South-ern.		H	Y	p'	q'	Log sin D	Log cos D
June 4	μ Arietis	5 $\frac{1}{2}$	+83	+9	23 16.1	+ 1 37 48	+0.5998	5276	+1.488	+9.5218	9.9746
	α Arietis	4 $\frac{1}{2}$	+56	-15	7 23.9	+ 9 30 14	+0.2480	5346	+1.346	+9.5500	9.9706
	γ Pleiadum	5 $\frac{1}{2}$	+ 4	-63	4 44.2	+ 6 8 49	-0.6524	5465	+0.956	+9.6068	9.612
	δ Pleiadum	4 $\frac{1}{2}$	+16	-50	4 46.4	+ 6 10 57	-0.4558	5465	+0.955	+9.6037	9.618
6	m Pleiadum	7	-46	-66	4 53.3	+ 6 17 32	-1.2417	5465	+0.953	+9.6161	9.694
6	e Pleiadum	5	- 7	-66	4 55.2	+ 6 19 22	-0.8320	5465	+0.952	+9.6098	9.607
6	1 Pleiadum	8	+22	-43	5 2.1	+ 6 26 5	-0.3467	5465	+0.950	+9.6023	9.621
6	2 Pleiadum	8 $\frac{1}{2}$	- 6	-66	5 5.2	+ 6 29 3	-0.8124	5466	+0.949	+9.6098	9.607
6	3 Pleiadum	9	+19	-46	5 6.2	+ 6 30 3	-0.3935	5466	+0.949	+9.6031	9.620
6	4 Pleiadum	9	+ 3	-64	5 6.9	+ 6 30 46	-0.6693	5466	+0.948	+9.6076	9.611
6	5 Pleiadum	9	-18	-66	5 7.6	+ 6 31 23	-0.9888	5466	+0.948	+9.6125	9.601
6	6 Pleiadum	9	+ 6	-61	5 8.7	+ 6 32 26	-0.6213	5466	+0.948	+9.6069	9.612
6	c Pleiadum	5	+ 2	-65	5 12.3	+ 6 35 54	-0.6971	5467	+0.946	+9.6081	9.610
6	7 Pleiadum	8	+22	-42	5 13.7	+ 6 37 18	-0.3338	5467	+0.946	+9.6025	9.621
6	B.A.C. 1155	7	+90	+10	5 13.9	+ 6 37 28	+0.6459	5467	+0.946	+9.5866	9.650
6	k Pleiadum	7 $\frac{1}{2}$	-12	-66	5 14.2	+ 6 37 49	-0.8989	5467	+0.946	+9.6113	9.603
6	l Pleiadum	7 $\frac{1}{2}$	- 9	-66	5 18.2	+ 6 41 37	-0.8638	5468	+0.945	+9.6108	9.604
6	8 Pleiadum	8 $\frac{1}{2}$	+14	-52	5 23.6	+ 6 46 53	-0.4908	5468	+0.943	+9.6051	9.616
6	9 Pleiadum	8 $\frac{1}{2}$	+14	-51	5 24.7	+ 6 47 56	-0.4835	5468	+0.943	+9.6050	9.616
6	d Pleiadum	5	+29	-34	5 26.7	+ 6 49 50	-0.2158	5468	+0.942	+9.6009	9.624
6	10 Pleiadum	8	+10	-56	5 29.8	+ 6 52 49	-0.5475	5469	+0.941	+9.6062	9.613
6	11 Pleiadum	8 $\frac{1}{2}$	+20	-44	5 35.5	+ 6 58 25	-0.3724	5470	+0.939	+9.6036	9.618
6	12 Pleiadum	7 $\frac{1}{2}$	- 6	-66	5 44.1	+ 7 6 42	-0.8174	5470	+0.936	+9.6107	9.604
6	13 Pleiadum	8 $\frac{1}{2}$	+28	-36	5 47.1	+ 7 9 36	-0.2370	5470	+0.935	+9.6017	9.622
6	14 Pleiadum	9	+42	-23	5 49.8	+ 7 11 14	+0.0186	5470	+0.934	+9.5978	9.629
6	15 Pleiadum	8 $\frac{1}{2}$	+20	-44	5 52.6	+ 7 14 52	-0.3750	5470	+0.934	+9.6041	9.617
6	16 Pleiadum	9 $\frac{1}{2}$	+39	-25	5 53.1	+ 7 15 25	-0.0331	5470	+0.933	+9.5987	9.628
6	17 Pleiadum	8	+45	-20	5 53.7	+ 7 15 59	+0.0683	5470	+0.933	+9.5971	9.631
6	18 Pleiadum	8	+20	-45	5 53.9	+ 7 16 7	-0.3850	5470	+0.933	+9.6043	9.617
6	p Pleiadum	7 $\frac{1}{2}$	+21	-44	5 54.7	+ 7 16 54	-0.3586	5470	+0.933	+9.6039	9.618
6	19 Pleiadum	8	+40	-24	5 55.1	+ 7 17 17	-0.0148	5470	+0.932	+9.5965	9.628
6	c Pleiadum	8	-10	-66	5 55.4	+ 7 17 34	-0.8762	5470	+0.932	+9.6119	9.602
6	22 Pleiadum	8	+34	-31	5 56.4	+ 7 18 35	-0.1349	5471	+0.932	+9.6004	9.624
6	21 Pleiadum	8 $\frac{1}{2}$	-15	-66	5 56.5	+ 7 18 38	-0.9497	5471	+0.932	+9.6131	9.600
6	23 Pleiadum	8 $\frac{1}{2}$	+49	-17	5 57.9	+ 7 20 3	+0.1266	5471	+0.931	+9.5863	9.632
6	24 Pleiadum	8	+11	-55	5 58.3	+ 7 20 21	-0.5421	5471	+0.931	+9.6068	9.612
6	γ Tauri	3 $\frac{1}{2}$	+22	-42	5 58.4	+ 7 20 27	-0.3415	5471	+0.931	+9.6037	9.618
6	25 Pleiadum	8 $\frac{1}{2}$	+54	-13	6 2.5	+ 7 24 28	+0.2082	5471	+0.930	+9.5850	9.624
6	26 Pleiadum	9	+59	- 9	6 5.3	+ 7 27 9	+0.2857	5471	+0.929	+9.5938	9.637
6	27 Pleiadum	8 $\frac{1}{2}$	+11	-54	6 18.4	+ 7 39 52	-0.5282	5473	+0.924	+9.6071	9.612
6	28 Pleiadum	7	+70	0	6 23.1	+ 7 44 21	+0.4443	5474	+0.922	+9.5917	9.640
6	29 Pleiadum	8	+ 9	-57	6 26.0	+ 7 47 9	-0.5653	5474	+0.921	+9.6079	9.610
6	s Pleiadum	7 $\frac{1}{2}$	+30	-34	6 38.9	+ 7 59 36	-0.1949	5475	+0.917	+9.6024	9.620
6	f Pleiadum	4 $\frac{1}{2}$	+29	-35	6 44.6	+ 8 5 9	-0.2191	5476	+0.915	+9.6029	9.620
6	h Pleiadum	5 $\frac{1}{2}$	+24	-40	6 45.2	+ 8 5 41	-0.3088	5476	+0.915	+9.6043	9.617
6	30 Pleiadum	8 $\frac{1}{2}$	+29	-35	6 45.9	+ 8 6 27	-0.2170	5476	+0.915	+9.6029	9.620
6	31 Pleiadum	8	+ 8	-58	6 47.3	+ 8 7 47	-0.5907	5476	+0.915	+9.6088	9.608
6	32 Pleiadum	8	+ 9	-57	6 49.6	+ 8 10 0	-0.5709	5476	+0.913	+9.6085	9.609
6	33 Pleiadum	8 $\frac{1}{2}$	+18	-47	6 51.8	+ 8 12 5	-0.4215	5477	+0.913	+9.6063	9.613
6	34 Pleiadum	7 $\frac{1}{2}$	+52	-14	7 0.6	+ 8 20 35	+0.1786	5477	+0.911	+9.5969	9.631
6	35 Pleiadum	9	+19	-46	7 1.0	+ 8 21 0	-0.4041	5477	+0.911	+9.6062	9.613
6	36 Pleiadum	9	+20	-44	7 5.0	+ 8 24 53	-0.3689	5478	+0.909	+9.6057	9.614
6	37 Pleiadum	8	+12	-53	7 5.6	+ 8 25 28	-0.5130	5478	+0.909	+9.6080	9.610
6	38 Pleiadum	8	+ 4	-62	7 19.7	+ 8 39 7	-0.6534	5479	+0.904	+9.6105	9.605
6	40 Pleiadum	7 $\frac{1}{2}$	+38	-26	7 31.7	+ 8 50 40	-0.0487	5480	+0.900	+9.6013	9.623

ELEMENTS FOR FACILITATING THE CALCULATION OF OCCULTATIONS OF PLANETS AND STARS BY THE MOON, FOR THE YEAR 1861.

Date.	Star's Name.	Magnitude.	Limiting Parallels.		Washington Mean Time of ϕ .	At Washington Mean Time of Conjunction.					
			North-ern.	South-ern.		H	Y	P'	Q'	Log sin D	Log cos D
June 10	δ Geminor.	3 $\frac{1}{2}$	+36	-31	3 31.4	+ 1 36 16	-0.0887	.5588	-.1218	+9.5779	9.9664
	10 63 Geminor.	5 $\frac{1}{2}$	+43	-25	6 54.6	+ 4 52 19	+0.0278	.5578	-.1288	+9.5684	.9680
	11 ϵ Cancri	4 $\frac{1}{2}$	+90	+20	2 55.4	+ 0 11 44	+0.9268	.5512	-.1676	+9.4915	.9780
	11 d^2 Cancri	6	+69	-9	9 9.6	+ 6 13 12	+0.4383	.5489	-.1781	+9.4783	.9794
	12 α Leonis	3 $\frac{1}{2}$	+75	-10	20 25.2	- 7 41 11	+0.5321	.5378	-.2260	+9.2614	.9926
	13 π Leonis	5	+60	-23	5 30.7	+ 1 6 42	+0.3163	.5359	-.2345	+9.1800	.9950
	13 16 Sextantis	6	+90	+32	9 51.1	+ 5 18 42	+1.2112	.5353	-.2379	+9.0763	.9969
	14 55 Leonis	6	+90	+36	8 9.3	+ 2 53 56	+1.2706	.5347	-.2498	+8.4106	9.9999
	14 p^2 Leonis	6	+90	+18	11 57.2	+ 6 34 35	+1.0659	.5351	-.2510	+8.1132	0.0000
	14 p^2 Leonis	5	+36	-46	16 48.3	+11 16 18	-0.0918	.5356	-.2519	+8.0755	0.0000
	15 α Leonis	5	+88	+ 8	0 40.8	- 5 6 27	+0.9034	.5371	-.2522	-8.5923	9.9997
	15 B.A.C. 4006	6	+86	+ 2	10 27.3	+ 4 20 54	+0.8035	.5401	-.2510	-8.9010	.9986
17 69 Virginis	5 $\frac{1}{2}$	+75	+35	5 55.1	- 1 40 17	+1.2337	.5627	-.2175	-9.4202	.9844	
17 75 Virginis	6	+42	-35	8 14.6	+ 0 34 15	+0.1213	.5643	-.2146	-9.4030	.9856	
17 87 Virginis	6	+73	+60	14 24.3	+ 6 30 28	+1.3490	.5687	-.2042	-9.4700	.9802	
19 42 Libræ	5 $\frac{1}{2}$	+38	-26	11 30.9	+ 1 52 16	+0.2632	.5963	-.1085	-9.5984	.9628	
19 B.A.C. 5197	6	+66	+16	13 36.9	+ 3 53 10	+0.9546	.5992	-.1030	-9.6140	.9598	
20 19 Scorpii	5 $\frac{1}{2}$	-12	-87	2 48.5	- 7 27 50	-0.6130	.6041	-.0660	-9.6065	.9613	
20 α Scorpii	3 $\frac{1}{2}$	+65	+ 6	2 59.1	- 7 17 39	+0.8031	.6041	-.0656	-9.6301	.9563	
20 22 Scorpii	5	+27	-33	6 23.1	- 4 2 8	+0.1458	.6048	-.0560	-9.6227	.9579	
20 25 Scorpii	6	+36	-23	12 37.1	+ 1 56 17	+0.3255	.6056	-.0371	-9.6304	.9563	
20 A Ophiuchi	5	+64	+46	23 18.2	-11 49 20	+1.2246	.6051	-.0057	-9.6480	.9522	
21 39 Ophiuchi	5 $\frac{1}{2}$	-47	-90	0 19.8	-10 50 14	-1.0807	.6051	-.0026	-9.6115	.9603	
21 δ Ophiuchi	3 $\frac{1}{2}$	- 2	-62	1 48.7	- 9 25 3	-0.3262	.6048	+0.022	-9.6236	.9578	
21 δ Ophiuchi	5	-51	-90	3 28.3	- 7 49 33	-1.1374	.6044	+0.074	-9.6101	.9606	
21 4 Sagittarii	5	-42	-90	16 8.8	+ 4 19 32	-1.0632	.6005	+0.040	-9.6059	.9614	
22 26 Sagittarii	6	+33	-31	8 27.1	- 4 1 32	+0.1870	.5910	+0.0892	-9.6086	.9609	
22 γ Sagittarii	5	+ 2	-68	13 21.7	+ 0 41 28	-0.4128	.5880	+0.1012	-9.5903	.9643	
22 γ^2 Sagittarii	5	0	-70	13 44.1	+ 1 3 4	-0.4480	.5875	+0.1025	-9.5890	.9645	
22 B.A.C. 6448	6	+29	-35	14 5.3	+ 1 23 22	+0.1038	.5875	+0.1032	-9.5980	.9629	
22 α Sagittarii	4	-28	-90	17 35.9	+ 4 45 49	-0.9543	.5845	+0.1120	-9.5724	.9674	
23 γ Sagittarii	5	- 2	-82	10 53.3	- 2 35 49	-0.5885	.5703	+0.1499	-9.5359	.9728	
23 57 Sagittarii	5 $\frac{1}{2}$	-21	-90	13 22.9	- 0 11 42	-0.9279	.5678	+0.1551	-9.5212	.9746	
24 α Capricor.	5 $\frac{1}{2}$	+71	+34	1 13.3	+11 13 37	+1.1912	.5572	+0.1756	-9.5245	.9742	
24 π Capricor.	5	+71	+10	4 46.7	- 9 20 35	+0.9076	.5537	+0.1816	-9.5061	.9765	
24 ϵ Capricor.	5	+68	- 7	5 28.8	- 8 39 58	+0.6248	.5533	+0.1826	-9.4961	.9775	
26 α Aquarii	5	+51	-31	21 4.4	+ 4 56 29	+0.1821	.5086	+0.2346	-8.9350	9.9984	
27 α Piscium	4 $\frac{1}{2}$	+74	-13	23 35.3	+ 6 42 28	+0.5670	.5006	+0.2354	+7.9407	0.0000	
29 δ Piscium	5 $\frac{1}{2}$	+28	-56	4 58.5	+11 16 50	-0.2820	.4985	+0.2247	+9.1112	9.9983	
30 γ Piscium	4	+29	-48	18 58.2	+ 0 12 15	-0.2263	.5098	+0.1945	+9.4024	.9857	
July 1	δ Arietis	5 $\frac{1}{2}$	-20	-71	18 49.6	- 0 38 47	-1.0380	.5213	+0.1653	+9.5182	.9750
	2 μ Arietis	5 $\frac{1}{2}$	+90	+ 5	6 49.4	+10 58 49	+0.6640	.5281	+0.1476	+9.5218	.9746
	2 47 Arietis	6	+90	+26	14 25.2	- 5 39 43	+0.9770	.5327	+0.1351	+9.5363	.9727
	2 α Arietis	4 $\frac{1}{2}$	+60	-12	14 58.0	- 5 7 56	+0.3077	.5330	+0.1344	+9.5500	.9708
	3 γ Pleiadum	5 $\frac{1}{2}$	+ 7	-60	12 19.7	- 8 28 3	-0.6047	.5454	+0.0951	+9.6067	.9612
	3 δ Pleiadum	4 $\frac{1}{2}$	+18	-47	12 21.9	- 8 25 55	-0.4092	.5454	+0.0950	+9.6037	.9618
	3 η Pleiadum	7	-38	-66	12 28.7	- 8 19 23	-1.1937	.5455	+0.0948	+9.6160	.9594
	3 ϵ Pleiadum	5	- 4	-66	12 30.5	- 8 17 35	-0.7838	.5455	+0.0947	+9.6098	.9606
	3 1 Pleiadum	8	+24	-40	12 37.5	- 8 10 48	-0.2998	.5456	+0.0944	+9.6024	.9621
	3 2 Pleiadum	8 $\frac{1}{2}$	- 3	-66	12 40.6	- 8 7 53	-0.7649	.5456	+0.0943	+9.6098	.9606
	3 3 Pleiadum	9	+22	-42	12 41.6	- 8 6 50	-0.3465	.5456	+0.0942	+9.6033	.9619
	3 4 Pleiadum	8	+ 6	-61	12 42.4	- 8 6 8	-0.6220	.5456	+0.0942	+9.6076	.9611
	3 5 Pleiadum	9	-15	-66	12 43.0	- 8 5 30	-0.9410	.5456	+0.0942	+9.6126	.9601
	3 6 Pleiadum	9	+ 9	-57	12 44.1	- 8 4 29	-0.5742	.5457	+0.0941	+9.6069	.9612
	3 c Pleiadum	5	+ 4	-62	12 47.7	- 8 0 58	-0.6495	.5457	+0.0940	+9.6082	9.9609

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Date.	Star's Name.	Magnitude.	Limiting Parallels.		Washington Mean Time of δ .	At Washington Mean Time of Conjunction.						
			North-ern.	South-ern.		H	Y	p'	q'	Log sin D	Log cos D	
					h m	h m s						
July 3	7 Pleiadum	8	+25	-39	12 49.1	- 7 59 35	-0.2968	0.5457	+0.0939	+9.6025	9.9620	
3	B.A.C. 1155	7	+90	+13	12 49.3	- 7 59 24	+0.6912	.5457	+0.0939	+9.5867	.9649	
3	k Pleiadum	7½	- 8	-66	12 49.7	- 7 59 5	-0.8505	.5457	+0.0939	+9.6113	.9603	
3	l Pleiadum	7½	- 6	-66	12 53.6	- 7 55 18	-0.8160	.5457	+0.0938	+9.6108	.9604	
3	8 Pleiadum	8½	+16	-49	12 59.1	- 7 49 59	-0.4437	.5458	+0.0935	+9.6052	.9615	
3	9 Pleiadum	8½	+17	-48	13 0.1	- 7 48 57	-0.4364	.5458	+0.0935	+9.6051	.9615	
3	d Pleiadum	5	+32	-33	13 2.1	- 7 47 1	-0.1689	.5458	+0.0934	+9.6009	.9623	
3	10 Pleiadum	8	+13	-52	13 5.2	- 7 44 3	-0.5001	.5458	+0.0934	+9.6062	.9613	
3	11 Pleiadum	8½	+23	-41	13 11.0	- 7 38 27	-0.3256	.5458	+0.0931	+9.6036	.9618	
3	12 Pleiadum	7½	- 4	-66	13 19.6	- 7 30 11	-0.7704	.5458	+0.0929	+9.6108	.9604	
3	13 Pleiadum	8½	+30	-34	13 22.6	- 7 27 17	-0.1910	.5458	+0.0928	+9.6018	.9622	
3	14 Pleiadum	9	+45	-20	13 25.3	- 7 24 39	+0.0645	.5458	+0.0927	+9.5978	.9629	
3	15 Pleiadum	8½	+23	-42	13 26.0	- 7 21 59	-0.3285	.5458	+0.0926	+9.6041	.9617	
3	16 Pleiadum	9½	+42	-23	13 28.6	- 7 21 27	+0.0127	.5459	+0.0926	+9.5987	.9628	
3	17 Pleiadum	8	+48	-17	13 29.2	- 7 20 53	+0.1139	.5459	+0.0925	+9.5971	.9631	
3	18 Pleiadum	8	+22	-42	13 29.3	- 7 20 47	-0.3387	.5459	+0.0925	+9.6043	.9617	
3	p Pleiadum	7½	+24	-41	13 30.1	- 7 19 59	-0.3125	.5459	+0.0925	+9.6039	.9618	
3	19 Pleiadum	8	+43	-22	13 30.5	- 7 19 34	+0.0310	.5459	+0.0925	+9.5965	.9628	
3	20 Pleiadum	8	- 7	-66	13 30.8	- 7 19 18	-0.8288	.5459	+0.0925	+9.6119	.9602	
3	22 Pleiadum	8	+36	-28	13 31.9	- 7 18 17	-0.0891	.5459	+0.0924	+9.6004	.9624	
3	21 Pleiadum	8½	-12	-66	13 31.9	- 7 18 14	-0.9024	.5459	+0.0924	+9.6131	.9609	
3	23 Pleiadum	8½	+51	-14	13 33.4	- 7 16 50	+0.1721	.5459	+0.0924	+9.5963	.9632	
3	24 Pleiadum	8	+13	-52	13 33.7	- 7 16 33	-0.4961	.5459	+0.0924	+9.6069	.9612	
3	γ Tauri	3½	+25	-40	13 33.8	- 7 16 28	-0.2952	.5459	+0.0924	+9.6037	.9618	
3	25 Pleiadum	8½	+57	-13	13 37.9	- 7 12 25	+0.2540	.5459	+0.0922	+9.5950	.9634	
3	26 Pleiadum	9	+62	- 6	13 40.7	- 7 9 45	+0.3310	.5460	+0.0922	+9.5938	.9637	
3	27 Pleiadum	8½	+14	-51	13 53.9	- 6 57 9	-0.4812	.5461	+0.0917	+9.6071	.9612	
3	28 Pleiadum	7	+74	+ 2	13 58.5	- 6 52 31	+0.4898	.5461	+0.0915	+9.5917	.9640	
3	29 Pleiadum	8	+12	-54	14 1.4	- 6 49 43	-0.5188	.5462	+0.0914	+9.6079	.9610	
3	e Pleiadum	7½	+33	-31	14 14.3	- 6 37 15	-0.1494	.5463	+0.0910	+9.6024	.9621	
3	f Pleiadum	4½	+31	-33	14 20.0	- 6 31 43	-0.1733	.5463	+0.0908	+9.6029	.9620	
3	h Pleiadum	5½	+26	-38	14 20.6	- 6 31 10	-0.2628	.5463	+0.0908	+9.6043	.9617	
3	30 Pleiadum	8½	+31	-32	14 21.4	- 6 30 26	-0.1712	.5463	+0.0907	+9.6029	.9620	
3	31 Pleiadum	8	+10	-55	14 22.7	- 6 29 7	-0.5444	.5464	+0.0907	+9.6068	.9608	
3	32 Pleiadum	8	+12	-54	14 25.1	- 6 26 52	-0.5247	.5464	+0.0906	+9.6065	.9609	
3	33 Pleiadum	8	+20	-44	14 27.2	- 6 24 47	-0.3756	.5464	+0.0905	+9.6063	.9613	
3	34 Pleiadum	7½	+55	-12	14 36.0	- 6 16 18	+0.2237	.5465	+0.0902	+9.5969	.9631	
3	35 Pleiadum	9	+21	-43	14 36.5	- 6 15 52	-0.3583	.5465	+0.0902	+9.6062	.9613	
3	36 Pleiadum	9	+23	-41	14 40.5	- 6 11 59	-0.3230	.5465	+0.0901	+9.6057	.9614	
3	37 Pleiadum	8	+15	-50	14 41.1	- 6 11 25	-0.4670	.5465	+0.0901	+9.6060	.9610	
3	39 Pleiadum	8	+ 7	-59	14 55.2	- 5 57 44	-0.6070	.5466	+0.0896	+9.6105	.9605	
3	40 Pleiadum	7	+41	-23	15 7.2	- 5 46 11	-0.0035	.5466	+0.0892	+9.6013	.9623	
3	33 Tauri	6	+90	+40	17 57.9	- 3 1 9	+1.0802	.5483	+0.0833	+9.5877	.9648	
4	γ Tauri	5½	-10	-66	5 24.1	+ 8 1 34	-0.8688	.5540	+0.0584	+9.6308	.9562	
5	132 Tauri	5½	+79	+11	19 9.1	- 3 33 35	+0.5339	.5660	-0.0303	+9.6180	.9589	
5	139 Tauri	5½	-32	-64	22 58.2	+ 0 7 18	-1.1907	.5664	-0.0397	+9.6408	.9539	
10	o Leonis	3½	+73	-12	2 18.3	- 0 0 40	+0.5057	.5430	-0.2281	+9.2614	.9926	
10	B.A.C. 3407	6	+55	-26	10 16.6	+ 7 41 56	+0.2503	.5411	-0.2357	+9.1930	.9946	
10	π Leonis	5	+58	-24	11 16.0	+ 8 39 23	+0.2899	.5406	-0.2365	+9.1800	.9950	
11	34 Sextantis	6	+36	-46	7 24.3	+ 4 8 25	-0.0959	.5375	-0.2496	+8.8755	.9988	
11	36 Sextantis	6	+90	- 3	8 36.9	+ 5 18 38	+0.7183	.5376	-0.2497	+8.7487	.9993	
11	p ^h Leonis	5	+35	-47	22 13.7	- 5 31 1	-0.1180	.5376	-0.2527	+8.0758	0.0000	
12	e Leonis	5	+88	+ 6	6 4.7	+ 2 4 45	+0.8760	.5383	-0.2528	-8.5923	.9997	
14	69 Virginis	5	+75	+34	11 43.9	+ 5 55 53	+1.2226	.5572	-0.2154	-9.4292	.9844	
16	42 Libræ	5½	+38	-27	18 35.6	+10 44 34	+0.2582	0.5892	-0.1069	-9.5984	.9988	

ELEMENTS FOR FACILITATING THE CALCULATION OF OCCULTATIONS OF PLANETS AND STARS BY THE MOON, FOR THE YEAR 1861.

Date.	Star's Name.	Magnitudes.	Limiting Parallels.		Washington Mean Time of δ .	At Washington Mean Time of Conjunction.					
			North-ern.	South-ern.		H	Y	P'	Q'	Log sin D	Log cos D
					h m	h m s					
July 17	19 Scorpii	5½	-13	-88	10 18.5	+ 1 49 50	-0.6273	0.5953	-0.0654	-9.6064	9.9613
17	σ Scorpii	3½	+65	+ 6	10 29.4	+ 2 0 17	+0.8063	.5950	-0.0642	-9.6302	.9563
17	22 Scorpii	5	+27	-33	13 58.9	+ 5 21 22	+0.1408	.5958	-0.0548	-9.6228	.9579
18	A Ophiuchi	5	+64	+48	7 20.4	- 1 59 21	+1.2337	.5973	-0.0055	-9.6480	.9522
18	39 Ophiuchi	5½	-45	-90	8 23.6	- 0 58 43	-1.0732	.5973	-0.0018	-9.6116	.9603
18	θ Ophiuchi	3½	- 3	-62	9 54.6	+ 0 28 38	-0.3349	.5970	+0.0021	-9.6236	.9578
18	δ Ophiuchi	5	-53	-90	11 36.6	+ 2 6 31	-1.1553	.5970	+0.0084	-9.6101	.9606
18	B.A.C. 5909	6½	+64	+22	13 37.7	+ 4 2 41	+1.0205	.5965	+0.0130	-9.6443	.9531
19	4 Sagittarii	5	-44	-90	0 34.1	- 9 27 16	-1.0777	.5939	+0.0440	-9.6059	.9614
19	B.A.C. 6217	6½	+55	- 7	9 4.2	- 1 17 28	+0.5979	.5907	+0.0669	-9.6256	.9573
19	24 Sagittarii	6	+27	-36	13 59.6	+ 3 26 19	+0.0940	.5883	+0.0799	-9.6115	.9603
19	ν Sagittarii	5	+ 2	-68	22 10.0	+11 17 40	-0.4207	.5838	+0.1006	-9.5903	.9643
19	ρ Sagittarii	5	0	-71	22 32.8	+11 39 34	-0.4557	.5831	+0.1019	-9.5890	.9645
20	σ Sagittarii	4	-29	-90	2 27.8	- 8 34 24	-0.9661	.5809	+0.1127	-9.5724	.9673
20	B.A.C. 6607	6	+58	-10	9 1.5	- 2 15 34	+0.5526	.5765	+0.1262	-9.5857	.9651
20	50 Sagittarii	6	+39	-28	11 24.4	+ 0 2 3	+0.2348	.5745	+0.1318	-9.5745	.9670
20	f Sagittarii	5	- 3	-83	19 56.2	+ 8 14 57	-0.5973	.5685	+0.1494	-9.5359	.9727
20	57 Sagittarii	5½	-22	-90	22 26.9	+10 40 32	-0.9385	.5663	+0.1545	-9.5212	.9746
21	σ Capricor.	5½	+71	+33	10 20.8	- 1 51 9	+1.1871	.5576	+0.1754	-9.5244	.9742
21	π Capricor.	5	+71	+10	13 54.7	+ 1 35 22	+0.9010	.5544	+0.1813	-9.5051	.9765
21	ρ Capricor.	5	+68	- 7	14 36.9	+ 2 16 4	+0.6173	.5537	+0.1825	-9.4961	.9775
21	B.A.C. 7043	6½	+45	-29	14 40.5	+ 2 19 35	+0.2318	.5537	+0.1826	-9.4873	.9785
22	18 Aquarii	6	+75	- 1	16 31.9	+ 3 19 45	+0.7499	.5282	+0.2123	-9.3671	.9679
23	B.A.C. 7620	6	+79	+44	7 5.9	- 6 33 33	+1.3198	.5247	+0.2263	-9.2790	.9920
23	θ Aquarii	4½	+82	+56	18 55.0	+ 4 54 14	+1.3829	.5180	+0.2326	-9.1680	.9962
24	κ Aquarii	5	+49	-33	5 49.7	- 8 30 19	+0.1556	.5125	+0.2361	-8.9347	9.9984
25	κ Piscium	4½	+71	-15	8 2.2	- 7 2 48	+0.4940	.5043	+0.2368	+7.9420	0.0000
25	16 Piscium	6	+90	+ 1	13 9.5	- 2 4 8	+0.7934	.5034	+0.2357	+8.3686	9.9999
25	19 Piscium	6	+76	-12	18 34.5	+ 3 15 42	+0.5563	.5027	+0.2341	+8.6766	.9995
26	d Piscium	5½	+22	-58	13 7.3	- 2 46 33	-0.3227	.5023	+0.2257	+9.1113	.9963
26	45 Piscium	6	+90	+ 6	15 52.0	- 0 6 31	+0.8427	.5025	+0.2241	+9.0815	.9968
28	γ Piscium	4	+26	-51	2 54.8	+ 9 56 34	-0.2745	.5101	+0.1944	+9.4025	.9857
29	δ Arietis	5½	-24	-71	2 46.9	+ 9 6 15	-1.0884	.5202	+0.1649	+9.5183	.9750
29	μ Arietis	5½	+85	+ 3	14 49.3	- 3 13 29	+0.6148	.5264	+0.1470	+9.5218	.9746
29	ε Arietis	4½	+56	-14	23 0.5	+ 4 42 20	+0.2580	.5302	+0.1337	+9.5501	.9708
30	66 Arietis	6½	+56	-12	12 54.8	- 5 50 11	+0.2497	.5383	+0.1090	+9.5796	.9662
30	9 Tauri	6	+53	-14	16 53.9	- 2 8 57	+0.2013	.5400	+0.1015	+9.5874	.9648
30	g Pleiadum	5½	+ 4	-57	20 30.9	+ 1 30 56	-0.6536	.5421	+0.0943	+9.6068	.9612
30	b Pleiadum	4½	+15	-50	20 33.1	+ 1 33 6	-0.4569	.5421	+0.0942	+9.6037	.9618
30	m Pleiadum	7	-46	-66	20 40.0	+ 1 39 34	-1.2425	.5422	+0.0940	+9.6161	.9593
30	e Pleiadum	5	- 7	-66	20 41.8	+ 1 41 30	-0.8324	.5422	+0.0939	+9.6098	.9606
30	1 Pleiadum	8	+22	-43	20 48.9	+ 1 48 22	-0.3476	.5422	+0.0937	+9.6024	.9620
30	2 Pleiadum	8½	- 6	-66	20 52.0	+ 1 51 20	-0.8132	.5423	+0.0936	+9.6098	.9606
30	3 Pleiadum	9	+19	-46	20 53.0	+ 1 52 21	-0.3942	.5423	+0.0936	+9.6032	.9619
30	4 Pleiadum	8	+ 3	-64	20 53.8	+ 1 53 4	-0.6702	.5423	+0.0936	+9.6076	.9611
30	5 Pleiadum	9	- 8	-66	20 54.4	+ 1 53 43	-0.9897	.5423	+0.0936	+9.6126	.9601
30	6 Pleiadum	9	+ 6	-61	20 55.5	+ 1 54 44	-0.6224	.5423	+0.0935	+9.6069	.9612
30	c Pleiadum	5	+ 1	-65	20 59.1	+ 1 58 15	-0.6979	.5423	+0.0934	+9.6082	.9610
30	7 Pleiadum	8	+22	-42	21 0.6	+ 1 59 39	-0.3345	.5424	+0.0933	+9.6025	.9621
30	B.A.C. 1155	7	+90	+26	21 0.8	+ 1 59 52	+0.6449	.5424	+0.0933	+9.5868	.9649
30	k Pleiadum	7½	-12	-66	21 1.1	+ 2 0 10	-0.8993	.5424	+0.0933	+9.6113	.9603
30	l Pleiadum	7½	- 9	-66	21 5.1	+ 2 4 0	-0.8642	.5424	+0.0932	+9.6109	.9604
30	8 Pleiadum	8½	+14	-52	21 10.6	+ 2 9 20	-0.4915	.5425	+0.0931	+9.6051	.9616
30	9 Pleiadum	8½	+14	-51	21 11.7	+ 2 10 22	-0.4842	.5425	+0.0930	+9.6051	.9616
30	d Pleiadum	5	+29	-36	21 13.7	+ 2 12 18	-0.2166	0.5425	+0.0929	+9.6010	9.9623

ELEMENTS FOR FACILITATING THE CALCULATION OF OCCULTATIONS OF PLANETS AND STARS BY THE MOON, FOR THE YEAR 1861.

Date.	Star's Name.	Magnitude.	Limiting Parallels.		Washington Mean Time of ϕ .	At Washington Mean Time of Conjunction.					
			North-ern.	South-ern.		H	Y	P'	Q'	Log sin D	Log cos D
July	30 10 Pleiadum	8	+10	-56	21 16.8	+ 2 15 19	-0.5483	0.5425	+0.0928	+9.6062	9.9613
	30 11 Pleiadum	8½	+20	-44	21 22.6	+ 2 20 54	-0.3736	0.5425	+0.0927	+9.6036	9618
	30 12 Pleiadum	7½	- 6	-66	21 31.3	+ 2 29 19	-0.8185	0.5426	+0.0924	+9.6107	9604
	30 13 Pleiadum	8½	+28	-36	21 34.2	+ 2 32 12	-0.2383	0.5426	+0.0923	+9.6018	9622
	30 14 Pleiadum	9	+42	-23	21 37.0	+ 2 34 50	+0.0174	0.5427	+0.0922	+9.5978	9629
	30 15 Pleiadum	8½	+20	-44	21 39.8	+ 2 37 33	-0.3761	0.5427	+0.0920	+9.6042	9617
	30 16 Pleiadum	9½	+39	-25	21 40.3	+ 2 38 6	-0.0344	0.5427	+0.0920	+9.5967	9628
	30 17 Pleiadum	8	+45	-20	21 40.9	+ 2 38 40	+0.0669	0.5427	+0.0920	+9.5970	9631
	30 18 Pleiadum	8	+20	-45	21 41.0	+ 2 38 45	-0.3861	0.5427	+0.0920	+9.6043	9617
	30 p Pleiadum	7½	+21	-43	21 41.9	+ 2 39 34	-0.3598	0.5427	+0.0919	+9.6039	9618
	30 19 Pleiadum	8	+40	-24	21 42.3	+ 2 39 58	-0.0159	0.5427	+0.0919	+9.5984	9628
	30 20 Pleiadum	8	+10	-66	21 42.6	+ 2 40 14	-0.8772	0.5427	+0.0919	+9.6119	9602
	30 21 Pleiadum	8	+33	-31	21 43.6	+ 2 41 16	-0.1360	0.5427	+0.0919	+9.6004	9625
	30 22 Pleiadum	8½	-16	-66	21 43.7	+ 2 41 19	-0.9506	0.5427	+0.0919	+9.6131	9600
	30 23 Pleiadum	8½	+49	-17	21 45.2	+ 2 42 44	+0.1254	0.5427	+0.0918	+9.5962	9633
	30 24 Pleiadum	8	+11	-55	21 45.5	+ 2 43 3	-0.5439	0.5427	+0.0918	+9.6069	9612
	30 γ Tauri	3½	+22	-43	21 45.5	+ 2 43 7	-0.3428	0.5427	+0.0918	+9.6036	9618
	30 25 Pleiadum	8½	+54	-13	21 49.8	+ 2 47 11	+0.2071	0.5427	+0.0917	+9.5949	9635
	30 26 Pleiadum	9	+59	- 9	21 52.6	+ 2 49 55	+0.2843	0.5427	+0.0916	+9.5938	9637
	30 27 Pleiadum	8½	+11	-54	22 5.8	+ 3 2 41	-0.5293	0.5428	+0.0912	+9.6071	9612
	30 28 Pleiadum	7	+70	0	22 10.5	+ 3 7 14	+0.4430	0.5428	+0.0908	+9.5917	9641
	30 29 Pleiadum	8	+ 9	-57	22 13.4	+ 3 10 2	-0.5666	0.5428	+0.0907	+9.6079	9610
	30 e Pleiadum	7½	+30	-34	22 26.4	+ 3 22 26	-0.1965	0.5429	+0.0904	+9.6023	9621
	30 f Pleiadum	4½	+29	-35	22 32.2	+ 3 28 11	-0.2305	0.5430	+0.0903	+9.6027	9620
	30 h Pleiadum	5½	+24	-40	22 32.7	+ 3 28 44	-0.3101	0.5430	+0.0903	+9.6042	9617
	30 30 Pleiadum	8½	+29	-35	22 33.5	+ 3 29 30	-0.2184	0.5430	+0.0903	+9.6028	9620
	30 31 Pleiadum	8	+ 8	-58	22 34.9	+ 3 30 51	-0.5920	0.5431	+0.0902	+9.6067	9608
30 32 Pleiadum	8	+ 9	-57	22 37.2	+ 3 33 5	-0.5723	0.5431	+0.0902	+9.6065	9609	
30 33 Pleiadum	8½	+17	-47	22 39.4	+ 3 35 10	-0.4232	0.5431	+0.0902	+9.6062	9613	
30 34 Pleiadum	7½	+52	-14	22 43.2	+ 3 43 44	+0.1770	0.5432	+0.0900	+9.5969	9631	
30 35 Pleiadum	9	+18	-46	22 48.7	+ 3 44 11	-0.4058	0.5432	+0.0900	+9.6062	9613	
30 36 Pleiadum	9	+20	-44	22 52.8	+ 3 48 9	-0.3704	0.5433	+0.0896	+9.6056	9615	
30 37 Pleiadum	8	+12	-53	22 53.4	+ 3 48 43	-0.5145	0.5433	+0.0896	+9.6060	9610	
30 39 Pleiadum	8	+ 4	-62	23 7.6	+ 4 2 28	-0.6548	0.5435	+0.0892	+9.6106	9605	
30 40 Pleiadum	7½	+38	-26	23 19.7	+ 4 14 7	-0.0507	0.5436	+0.0889	+9.6013	9623	
Aug.	31 γ Tauri	5½	-13	-65	13 43.3	- 7 51 22	-0.0135	0.5509	+0.0585	+9.6308	9562
	2 132 Tauri	5½	+80	+ 9	3 42.3	- 7 12 33	+0.5022	0.5638	-0.0301	+9.6180	9590
	2 139 Tauri	5½	-34	-64	7 32.2	+10 29 5	-1.1492	0.5643	-0.0395	+9.6408	9539
	3 δ Geminor.	3½	+35	-32	18 59.6	- 3 20 3	-0.1057	0.5717	-0.1242	+9.5779	9664
	3 63 Geminor.	5½	+42	-26	22 18.5	- 0 8 21	+0.0117	0.5714	-0.1314	+9.5683	9680
	8 p ¹ Leonis	5	+39	-43	4 47.2	+ 2 50 6	-0.0441	0.5451	-0.2554	+8.0761	0.0000
	8 e Leonis	5	+88	+11	12 27.2	+10 14 43	+0.9471	0.5456	-0.2554	-8.5923	9.9997
	10 69 Virginis	5½	+75	+48	17 10.1	-10 50 32	+1.3219	0.5608	-0.2164	-9.4282	9844
	13 42 Libra	5½	+44	-21	0 4.2	- 5 59 30	+0.2612	0.5859	-0.1069	-9.5984	9628
	13 B.A.C. 5286	6½	+66	+ 2	7 17.8	+ 0 57 11	+0.7487	0.5878	-0.0684	-9.6167	9592
	13 19 Scorpii	5½	- 8	-78	15 59.5	+ 9 18 12	-0.5348	0.5899	-0.0650	-9.0065	9613
	13 σ Scorpii	3½	+65	+13	16 10.5	+ 9 28 48	+0.9074	0.5899	-0.0646	-9.6201	9563
	13 22 Scorpii	5	+32	-27	19 43.3	-11 6 47	+0.2365	0.5903	-0.0546	-9.6228	9579
	14 39 Ophiuchi	5½	-38	-90	14 29.1	+ 6 53 17	-0.9872	0.5903	-0.0246	-9.6116	9603
	14 δ Ophiuchi	3½	+ 1	-57	16 1.3	+ 8 22 44	-0.2531	0.5902	+0.0015	-9.6336	9578
	14 b Ophiuchi	5	-47	-90	17 45.3	+10 2 42	-1.0814	0.5902	+0.0063	-9.6160	9606
	14 c ² Ophiuchi	5	-64	-90	19 44.9	+11 57 31	-1.2610	0.5898	+0.0118	-9.6068	9612
	15 4 Sagittarii	5	-39	-90	6 59.3	- 1 14 32	-1.0125	0.5967	+0.0426	-9.6059	9614
16 γ Sagittarii	5	+ 4	-64	5 3.5	- 4 1 15	-0.3671	0.5769	+0.0988	-9.5943	9643	
16 α Sagittarii	5	+ 2	-67	5 26.8	- 3 38 51	-0.4028	0.5765	+0.0998	-9.5890	9645	

OCCULTATIONS, 1861.

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ELEMENTS FOR FACILITATING THE CALCULATION OF OCCULTATIONS OF PLANETS AND STARS BY THE MOON, FOR THE YEAR 1861.

Date.	Star's Name.	Magnitude.	Limiting Parallels.		Washington Mean Time of δ .	At Washington Mean Time of Conjunction.					
			North- ern.	South- ern.		H	F	p'	q'	Log sin D	Log cos D
Aug. 16	B. A. C. 6485	6½	+20	-46	8 9.2	- 1 2 30	-0.0774	0.5752	+ .1057	-9.5898	9.9644
16	o Sagittarii	4	-26	-90	9 26.8	+ 0 12 12	-0.9206	.5741	+ .1091	-9.5724	.9673
17	f Sagittarii	5	- 1	-90	3 16.2	- 6 37 19	-0.5665	.5631	+ .1467	-9.5359	.9727
17	57 Sagittarii	5½	-21	-90	5 49.7	- 4 9 19	-0.9135	.5610	+ .1517	-9.5212	.9746
17	σ Capricor.	5½	+71	+37	17 55.9	+ 7 31 38	+1.2159	.5528	+ .1730	-9.5244	.9742
17	π Capricor.	5	+72	+12	21 33.2	+11 1 30	+0.9230	.5500	+ .1700	-9.5050	.9765
17	o Capricor.	5	+69	- 6	22 16.0	+11 42 51	+0.6364	.5479	+ .1797	-9.4961	.9775
19	B. A. C. 7620	6	+79	+40	15 9.0	+ 3 17 21	+1.2856	.5242	+ .2247	-9.2790	.9920
20	δ Aquarii	4½	+92	+45	3 0.6	- 9 12 23	+1.3311	.5183	+ .2315	-9.1680	.9952
20	κ Aquarii	5	+45	-36	13 55.8	+ 1 23 33	+0.0852	.5137	+ .2354	-8.9347	9.9984
21	κ Piscium	4½	+64	-21	16 4.5	+ 2 47 15	+0.3881	.5068	+ .2367	+7.9430	0.0000
21	g Piscium	6	+78	-11	16 14.7	+ 2 57 8	+0.5771	.5068	+ .2367	+7.8052	0.0000
22	d Piscium	5½	+17	-67	21 0.6	+ 6 54 27	-0.4623	.5052	+ .2259	+9.1114	9.9963
24	γ Piscium	4	+17	-61	10 38.5	- 4 32 4	-0.4451	.5120	+ .1943	+9.4025	.9857
24	10E Piscium	6	+90	+ 4	12 53.2	- 2 21 18	+0.7399	.5127	+ .1920	+9.3823	.9870
25	δ Arietis	5½	-44	-71	10 30.5	- 5 22 28	-1.2717	.5206	+ .1644	+9.5183	.9750
25	B. A. C. 782	6½	+90	+30	18 16.1	+ 2 8 57	+1.0602	.5236	+ .1534	+9.4962	.9775
25	μ Arietis	5½	+68	- 7	22 35.5	+ 6 20 23	+0.4323	.5258	+ .1465	+9.5218	.9745
26	ε Arietis	4½	+45	-24	6 49.5	- 9 41 0	+0.0740	.5294	+ .1331	+9.5501	.9708
27	g Pleiadum	5½	- 8	-66	4 31.2	+11 19 2	-0.8424	.5392	+ .0937	+9.6068	.9612
27	b Pleiadum	5½	+ 5	-62	4 33.5	+11 21 13	-0.6427	.5392	+ .0936	+9.6038	.9618
27	c Pleiadum	5	-21	-66	4 42.2	+11 29 42	-1.0198	.5392	+ .0934	+9.6098	.9606
27	1 Pleiadum	8	+11	-55	4 49.4	+11 36 39	-0.5329	.5393	+ .0932	+9.6024	.9620
27	2 Pleiadum	8½	-19	-66	4 52.6	+11 39 39	-1.0007	.5393	+ .0931	+9.6098	.9606
27	3 Pleiadum	9	+ 8	-58	4 53.6	+11 40 42	-0.5797	.5393	+ .0930	+9.6033	.9619
27	4 Pleiadum	8	- 9	-66	4 54.4	+11 41 25	-0.8570	.5393	+ .0930	+9.6076	.9611
27	5 Pleiadum	9	-36	-66	4 55.1	+11 42 4	-1.1776	.5393	+ .0930	+9.6126	.9601
27	6 Pleiadum	9	- 6	-66	4 56.1	+11 43 5	-0.8091	.5394	+ .0930	+9.6069	.9612
27	c Pleiadum	5	-11	-66	4 59.8	+11 46 39	-0.8847	.5394	+ .0928	+9.6082	.9609
27	7 Pleiadum	8	+12	-54	5 1.3	+11 48 6	-0.5199	.5394	+ .0928	+9.6025	.9620
27	B. A. C. 1155	7	+66	- 3	5 1.5	+11 48 17	+0.3903	.5394	+ .0928	+9.5867	.9649
27	k Pleiadum	7½	-27	-66	5 1.8	+11 48 36	-1.0872	.5394	+ .0928	+9.6113	.9603
27	l Pleiadum	7½	-24	-66	5 5.8	+11 52 28	-1.0524	.5394	+ .0927	+9.6109	.9604
27	8 Pleiadum	8½	+ 3	-64	5 11.4	+11 57 53	-0.6778	.5394	+ .0925	+9.6052	.9615
27	9 Pleiadum	8½	+ 3	-64	5 12.5	+11 58 55	-0.6705	.5396	+ .0925	+9.6052	.9615
27	d Pleiadum	5	+18	-46	5 19.5	-11 59 8	-0.4014	.5396	+ .0924	+9.6010	.9623
27	10 Pleiadum	8	- 1	-66	5 17.6	-11 56 5	-0.7348	.5396	+ .0923	+9.6063	.9613
27	11 Pleiadum	8½	+10	-56	5 23.5	-11 50 25	-0.5594	.5396	+ .0921	+9.6037	.9618
27	12 Pleiadum	7½	-20	-66	5 32.3	-11 41 56	-1.0058	.5396	+ .0918	+9.6108	.9604
27	13 Pleiadum	8½	+17	-47	5 35.3	-11 39 0	-0.4232	.5396	+ .0917	+9.6018	.9622
27	14 Pleiadum	9	+32	-32	5 38.1	-11 36 20	-0.1665	.5396	+ .0916	+9.5978	.9629
27	15 Pleiadum	8½	+ 9	-56	5 40.9	-11 33 36	-0.5618	.5396	+ .0915	+9.6041	.9617
27	16 Pleiadum	9½	+29	-35	5 41.5	-11 33 3	-0.2183	.5396	+ .0915	+9.5987	.9628
27	17 Pleiadum	8	+34	-30	5 42.1	-11 32 27	-0.1167	.5396	+ .0915	+9.5971	.9631
27	18 Pleiadum	8	+ 9	-67	5 42.7	-11 31 52	-0.5711	.5396	+ .0915	+9.6043	.9617
27	p Pleiadum	7½	+10	-55	5 43.0	-11 31 31	-0.5454	.5396	+ .0915	+9.6039	.9618
27	19 Pleiadum	8	+30	-34	5 43.4	-11 31 9	-0.2000	.5396	+ .0915	+9.5985	.9628
27	20 Pleiadum	8	-25	-66	5 43.7	-11 30 53	-1.0649	.5396	+ .0915	+9.6120	.9602
27	22 Pleiadum	8	+23	-41	5 44.8	-11 29 47	-0.3206	.5396	+ .0915	+9.6004	.9624
27	21 Pleiadum	8½	-32	-66	5 44.9	-11 29 45	-1.1387	.5396	+ .0914	+9.6132	.9599
27	23 Pleiadum	8½	+39	-27	5 46.3	-11 28 22	-0.0581	.5396	+ .0913	+9.5963	.9632
27	24 Pleiadum	8	- 1	-66	5 46.6	-11 28 1	-0.7300	.5396	+ .0913	+9.6069	.9612
27	γ Tauri	3½	+11	-54	5 46.7	-11 27 57	-0.5279	.5396	+ .0913	+9.6037	.9618
27	25 Pleiadum	8½	+43	-22	5 51.0	-11 23 50	+0.0240	.5397	+ .0911	+9.5951	.9634
27	26 Pleiadum	9	+47	-18	5 53.8	-11 21 4	+0.1019	0.5397	+ .0910	+9.5939	9.9636

ELEMENTS FOR FACILITATING THE CALCULATION OF OCCULTATIONS OF PLANETS AND STARS BY THE MOON, FOR THE YEAR 1861.

Date.	Star's Name.	Magnitude.	Limiting Parallels.		Washington Mean Time of δ .	At Washington Mean Time of Conjunction.					
			North-ern.	South-ern.		H	Y	P'	Q'	Log sin D	Log cos D
Aug. 27	27 Pleiadum	8½	0	-66	6 7.2	-11 8 9	-0.7156	0.5398	+0.0909	+0.6072	9.9611
	27 28 Pleiadum	7	+57	-10	6 12.0	-11 3 31	+0.2611	.5398	+0.0904	+0.5918	.9640
	27 29 Pleiadum	8	-2	-66	6 14.9	-11 0 40	-0.7529	.5398	+0.0903	+0.6079	.9610
	27 s Pleiadum	7½	+20	-45	6 23.1	-10 47 58	-0.3312	.5399	+0.0899	+0.6024	.9621
	27 f Pleiadum	4½	+18	-46	6 33.9	-10 43 22	-0.4051	.5400	+0.0897	+0.6029	.9620
	27 A Pleiadum	5½	+13	-52	6 34.5	-10 41 45	-0.4955	.5400	+0.0897	+0.6044	.9617
	27 30 Pleiadum	9½	+18	-46	6 35.3	-10 41 0	-0.4032	.5400	+0.0897	+0.6029	.9620
	27 31 Pleiadum	8	-4	-66	6 36.7	-10 39 37	-0.7785	.5400	+0.0896	+0.6068	.9608
	27 32 Pleiadum	8	-3	-66	6 39.0	-10 37 22	-0.7586	.5400	+0.0896	+0.6085	.9609
	27 33 Pleiadum	8½	+7	-60	6 41.2	-10 36 16	-0.6067	.5400	+0.0895	+0.6063	.9613
27	34 Pleiadum	7½	+41	-24	6 50.1	-10 26 37	-0.0060	.5401	+0.0892	+0.5970	.9631
	27 35 Pleiadum	9	+8	-58	6 50.6	-10 26 9	-0.5913	.5401	+0.0892	+0.6062	.9613
	27 36 Pleiadum	9	+10	-56	6 54.7	-10 22 10	-0.5560	.5401	+0.0891	+0.6058	.9614
	27 37 Pleiadum	8	+1	-66	6 55.3	-10 21 35	-0.7009	.5402	+0.0891	+0.6080	.9610
	27 39 Pleiadum	8	-8	-66	7 9.8	-10 7 38	-0.8418	.5403	+0.0886	+0.6105	.9604
	27 40 Pleiadum	7½	+28	-36	7 21.9	-9 55 52	-0.2349	.5404	+0.0883	+0.6014	.9623
	27 γ Tauri	5½	-35	-65	21 56.6	+4 9 43	-1.1537	.5471	+0.0584	+0.6308	.9662
	28 103 Tauri	6	+90	+38	18 23.6	-0 0 27	+0.9705	.5541	+0.0127	+0.6107	.9604
	29 132 Tauri	5½	+64	+1	12 31.6	-6 35 22	+0.3464	.5586	-0.2292	+0.6180	.9639
	31 δ Geminor.	3½	+28	-38	4 23.4	+7 51 40	-0.2252	.5608	-1.2009	+0.5779	.9664
31	56 Geminor.	5½	+90	+61	5 13.8	+8 40 19	+1.2900	.5603	-1.2222	+0.5484	.9710
	31 63 Geminor.	5½	+35	-32	7 44.4	+11 5 34	-0.1050	.5603	-1.278	+0.5634	.9680
	Sept. 1 ϵ Cancr.	4½	+90	+13	3 23.9	+6 3 33	+0.8162	.5578	-1.692	+0.4914	.9780
	2 α Leonis	3½	+73	-11	19 24.2	-3 19 1	+0.5144	.5522	-2.204	+0.2514	.9926
	9 42 Libra	5½	+57	-9	5 47.1	+1 30 49	+0.5624	.5912	-1.073	-0.5984	.9628
	9 B.A.C. 5197	6	+66	+50	7 56.0	+3 34 36	+1.2598	.5916	-1.018	-0.6140	.9598
	9 B.A.C. 5253	6	+66	+5	11 5.2	+6 36 18	+0.7902	.5921	-0.937	-0.6113	.9603
	9 B.A.C. 5254	6	+35	-28	11 6.8	+6 37 51	+0.2270	.5921	-0.934	-0.6018	.9622
	9 19 Scorpii	5½	+3	-61	21 29.9	-7 23 59	-0.3243	.5932	-0.649	-0.6065	.9613
	9 σ Scorpii	3½	+65	+30	21 40.8	-7 13 30	+1.1089	.5933	-0.646	-0.6301	.9563
9	ρ Ophiuchi	5	-50	-90	23 26.2	-5 32 19	-1.1631	.5932	-0.694	-0.5941	.9636
	10 22 Scorpii	5	+45	-16	1 11.7	+3 51 4	+0.4420	.5932	-0.652	-0.6228	.9679
	10 25 Scorpii	6	+57	-5	7 39.3	+2 21 0	+0.6231	.5928	-0.464	-0.6304	.9563
	10 39 Ophiuchi	5½	-28	-90	19 50.8	-9 56 44	-0.7387	.5909	-0.031	-0.6116	.9603
	10 θ Ophiuchi	3½	+12	-44	21 23.6	-8 27 36	-0.0490	.5905	+0.017	-0.6226	.9578
	10 b Ophiuchi	5	-33	-90	23 7.5	-6 47 35	-0.8760	.5902	+0.058	-0.6101	.9606
	11 c Ophiuchi	5	-45	-90	1 7.0	-4 52 58	-1.0563	.5897	+0.0111	-0.6067	.9612
	11 B.A.C. 6053	6½	+29	-30	10 24.0	+4 2 5	+0.1990	.5861	+0.0368	-0.6226	.9578
	11 4 Sagittarii	5	-26	-90	12 22.8	+5 56 17	-0.8147	.5852	+0.0421	-0.6059	.9614
	12 ν Sagittarii	5	+14	-52	10 36.2	+3 18 49	-0.1855	.5735	+0.0971	-0.5903	.9643
12	ν Sagittarii	5	+12	-54	10 59.7	+3 41 28	-0.2216	.5732	+0.0978	-0.5890	.9645
	12 B.A.C. 6448	6	+42	-22	11 21.8	+4 2 47	+0.3402	.5727	+0.0991	-0.5980	.9629
	12 B.A.C. 6485	6½	+30	-35	13 43.8	+6 19 23	+0.1022	.5714	+0.1042	-0.5896	.9644
	12 α Sagittarii	4	-15	-90	15 2.2	+7 35 0	-0.7449	.5707	+0.1070	-0.5724	.9673
	12 π Sagittarii	3	-53	-90	17 12.6	+9 40 34	-1.2385	.5696	+0.1117	-0.5590	.9684
	13 f Sagittarii	5	+7	-67	9 4.8	+1 3 40	-0.4091	.5688	+0.1441	-0.5359	.9727
	13 57 Sagittarii	5½	-11	-90	11 40.4	+3 23 50	-0.7605	.5567	+0.1492	-0.5212	.9746
	14 π Capricor.	5	+72	+22	3 37.5	-5 6 39	+1.0634	.5455	+0.1756	-0.5080	.9765
	14 ρ Capricor.	5	+72	+2	4 21.0	-4 24 40	+0.7741	.5448	+0.1768	-0.4961	.9775
	14 B.A.C. 7097	6	+32	-42	7 23.8	-1 23 4	-0.0103	.5430	+0.1813	-0.4658	.9806
14	τ Capricor.	5	-61	-90	9 16.4	+0 21 0	-1.3384	.5420	+0.1836	-0.4251	.9840
	14 B.A.C. 7145	6½	+34	-40	9 51.0	+0 54 23	+0.0151	.5414	+0.1846	-0.4562	.9815
	15 18 Aquarii	6	+77	+5	6 58.8	-2 38 8	+0.8412	.5266	+0.2090	-0.3670	.9679
	16 θ Aquarii	4½	+82	+54	9 48.1	-0 37 18	+1.3731	.5158	+0.2332	-0.1680	.9952
	16 κ Aquarii	5	+45	-36	20 49.6	+10 4 52	+0.0964	0.5119	+0.2324	-0.8347	9.9984

ELEMENTS FOR FACILITATING THE CALCULATION OF OCCULTATIONS OF PLANETS AND STARS BY THE MOON, FOR THE YEAR 1861.

Date.	Star's Name.	Magnitude.	Limiting Parallels.		Washington Mean Time of δ .	At Washington Mean Time of Conjunction.					
			North-ern.	South-ern.		H	Y	P'	q'	Log sin D	Log cos D
Sept. 17	α Piscium	4½	+60	-23	23 7.9	+11 38 15	+0.3410	0.5066	+2344	+7.9435	0.0000
18	19 Piscium	6	+62	-21	9 39.2	- 2 8 8	+0.3675	.5059	+2322	+8.6771	9.9995
19	d Piscium	5½	+10	-75	4 6.8	- 8 11 34	-0.5750	.5065	+2245	+9.1113	.9963
19	45 Piscium	6	+79	- 9	6 49.2	- 5 33 56	+0.5838	.5068	+2227	+9.0816	.9968
20	γ Piscium	4	+ 7	-73	17 41.6	+ 4 18 37	-0.6284	.5143	+1935	+9.4026	.9857
20	101 Piscium	6	+77	- 6	19 56.1	+ 6 29 13	+0.5545	.5148	+1910	+9.3823	.9870
22	μ Arietis	5½	+53	-19	5 37.7	- 8 49 50	+0.2019	.5269	+1455	+9.5218	.9745
22	47 Arietis	6	+75	- 1	13 19.5	- 1 22 19	+0.5091	.5298	+1334	+9.5364	.9727
22	ϵ Arietis	4½	+32	-37	13 52.9	- 0 49 59	-0.1658	.5302	+1321	+9.5501	.9708
22	ζ Arietis	4½	+90	+35	21 50.2	+ 6 52 54	+1.0752	.5332	+1190	+9.5450	.9715
23	θ Pleiadum	5½	-28	-66	11 41.8	- 3 42 48	-1.1015	.5386	+0.928	+9.6068	.9612
23	δ Pleiadum	4½	-12	-67	11 44.1	- 3 40 33	-0.9030	.5386	+0.927	+9.6036	.9618
23	ϵ Pleiadum	5	-56	-66	11 52.9	- 3 32 1	-1.2817	.5387	+0.924	+9.6099	.9606
23	1 Pleiadum	8	- 5	-67	12 0.1	- 3 25 4	-0.7930	.5388	+0.922	+9.6024	.9621
23	2 Pleiadum	8½	-50	-56	12 3.2	- 3 22 2	-1.2627	.5388	+0.921	+9.6098	.9606
23	3 Pleiadum	9	- 8	-67	12 4.3	- 3 20 59	-0.8399	.5388	+0.921	+9.6033	.9619
23	4 Pleiadum	8	-30	-66	12 5.1	- 3 20 16	-1.1184	.5388	+0.920	+9.6076	.9610
23	6 Pleiadum	9	-26	-66	12 6.9	- 3 18 30	-1.0700	.5388	+0.920	+9.6069	.9612
23	c Pleiadum	5	-33	-66	12 10.6	- 3 14 56	-1.1466	.5388	+0.919	+9.6082	.9609
23	7 Pleiadum	8	- 4	-67	12 12.1	- 3 13 31	-0.7802	.5388	+0.918	+9.6025	.9620
23	B.A.C. 1155	7	+53	-13	12 12.2	- 3 13 21	+0.2084	.5388	+0.918	+9.5867	.9649
23	8 Pleiadum	8½	-15	-66	12 22.8	- 3 3 10	-0.9378	.5389	+0.915	+9.6053	.9615
23	9 Pleiadum	8½	-14	-66	12 23.4	- 3 2 34	-0.9313	.5389	+0.915	+9.6052	.9615
23	d Pleiadum	5	+ 3	-64	12 25.4	- 3 0 35	-0.6610	.5389	+0.914	+9.6010	.9623
23	10 Pleiadum	8	-19	-66	12 28.6	- 2 57 31	-0.9959	.5389	+0.913	+9.6063	.9613
23	11 Pleiadum	8½	- 7	-67	12 34.5	- 2 51 48	-0.8193	.5389	+0.915	+9.6037	.9618
23	12 Pleiadum	7½	-52	-66	12 43.3	- 2 43 16	-1.2682	.5389	+0.908	+9.6108	.9604
23	13 Pleiadum	8½	+ 2	-65	12 46.3	- 2 40 20	-0.6828	.5388	+0.907	+9.6018	.9622
23	14 Pleiadum	9	+17	-48	12 49.1	- 2 37 38	-0.4250	.5388	+0.906	+9.5978	.9629
23	15 Pleiadum	8½	- 7	-67	12 52.0	- 2 34 54	-0.8222	.5388	+0.905	+9.6042	.9617
23	16 Pleiadum	9½	+14	-51	12 52.5	- 2 34 21	-0.4769	.5388	+0.905	+9.5987	.9626
23	17 Pleiadum	8	+20	-45	12 53.2	- 2 33 44	-0.3749	.5388	+0.905	+9.5971	.9631
23	18 Pleiadum	8	- 8	-67	12 53.3	- 2 33 35	-0.8324	.5389	+0.905	+9.6043	.9617
23	p Pleiadum	7½	- 6	-67	12 54.1	- 2 32 49	-0.8058	.5389	+0.905	+9.6039	.9618
23	19 Pleiadum	8	+15	-50	12 54.5	- 2 32 25	-0.4586	.5389	+0.905	+9.5985	.9628
23	22 Pleiadum	8	+ 8	-58	12 55.9	- 2 31 3	-0.5799	.5389	+0.904	+9.6004	.9624
23	23 Pleiadum	8½	+23	-41	12 57.5	- 2 29 35	-0.3161	.5389	+0.904	+9.5963	.9632
23	24 Pleiadum	8	-19	-66	12 57.8	- 2 29 16	-0.9913	.5389	+0.904	+9.6069	.9612
23	η Tauri	3½	- 5	-67	12 57.9	- 2 29 9	-0.7885	.5389	+0.904	+9.6037	.9618
23	25 Pleiadum	8½	+28	-36	13 2.1	- 2 25 3	-0.2337	.5390	+0.903	+9.5951	.9634
23	26 Pleiadum	9	+32	-32	13 5.0	- 2 22 18	-0.1556	.5390	+0.902	+9.5939	.9636
23	27 Pleiadum	8½	-18	-66	13 19.0	- 2 8 43	-0.9734	.5390	+0.897	+9.6072	.9611
23	28 Pleiadum	7	+41	-23	13 23.3	- 2 4 33	+0.0043	.5390	+0.896	+9.5918	.9640
23	29 Pleiadum	8	-22	-66	13 26.3	- 2 1 39	-1.0151	.5391	+0.895	+9.6079	.9610
23	ν Pleiadum	7½	+ 4	-62	13 39.5	- 1 48 52	-0.6412	.5392	+0.891	+9.6024	.9621
23	f Pleiadum	4½	+ 3	-64	13 45.5	- 1 43 9	-0.6656	.5392	+0.890	+9.6030	.9620
23	h Pleiadum	5½	- 3	-66	13 46.0	- 1 42 36	-0.7561	.5392	+0.889	+9.6043	.9617
23	30 Pleiadum	8½	+ 3	-64	13 46.8	- 1 41 50	-0.6635	.5392	+0.889	+9.6030	.9620
23	31 Pleiadum	8	-23	-66	13 48.2	- 1 40 27	-1.0411	.5392	+0.888	+9.6088	.9608
23	32 Pleiadum	8	-21	-66	13 50.6	- 1 38 10	-1.0207	.5392	+0.888	+9.6056	.9609
23	33 Pleiadum	8½	-10	-66	13 52.8	- 1 36 4	-0.8702	.5393	+0.887	+9.6063	.9613
23	34 Pleiadum	7½	+26	-38	14 1.9	- 1 27 16	-0.2644	.5393	+0.884	+9.5970	.9631
23	35 Pleiadum	9	-10	-66	14 2.3	- 1 26 52	-0.8525	.5393	+0.884	+9.6063	.9613
23	36 Pleiadum	9	- 7	-66	14 6.4	- 1 22 51	-0.8174	.5394	+0.883	+9.6058	.9614
23	37 Pleiadum	8	-17	-66	14 7.1	- 1 22 15	-0.9627	0.5394	+0.882	+9.6081	9.9610

ELEMENTS FOR FACILITATING THE CALCULATION OF OCCULTATIONS OF PLANETS AND STARS BY THE MOON, FOR THE YEAR 1861.

Date.	Star's Name.	Magnitude.	Limiting Parallels.		Washington Mean Time of ϕ .	At Washington Mean Time of Conjunction.							
			North-ern.	South-ern.		H		Y		p'	q'	Log sin D	Log cos D
						h	m	h	m				
Sept. 23	39 Pleiadum	8	-29	-06	14 21.6	- 1	8 12	-1.1048	0.5395	+0.0878	+9.6106	9.9885	
23	40 Pleiadum	7½	+13	-52	14 33.9	- 0	56 19	-0.4945	5396	+0.0874	+9.6014	9623	
23	33 Tauri	6	+85	+ 9	17 29.6	+ 1	53 40	+0.6009	5405	+0.0812	+9.5878	9647	
25	121 Tauri	6	+90	+29	14 27.0	- 2	39 38	+0.8383	5508	-0.0159	+9.6084	9609	
25	132 Tauri	5½	+46	-13	20 32.7	+ 3	8 38	+0.0797	5527	-0.0808	+9.6180	9689	
26	1 Geminor.	5	+90	+54	3 19.6	+ 9	46 20	+1.1921	5534	-0.0436	+9.5966	9632	
27	δ Geminor.	3½	+14	-53	13 21.0	- 5	29 49	-0.4773	5531	-0.1179	+9.5779	9664	
27	56 Geminor.	5½	+90	+34	14 12.7	- 4	39 51	+1.0541	5528	-0.1197	+9.5483	9710	
27	63 Geminor.	5½	+21	-46	16 47.2	- 2	3 45	-0.3526	5527	-0.1252	+9.5684	9680	
28	ζ Cancrī	4½	+82	+ 2	19 56.0	- 6	36 29	+0.6008	5523	-0.1646	+9.4914	9780	
28	d ^s Cancrī	6	+48	-25	19 8.8	- 0	36 16	+0.1325	5514	-0.1750	+9.4781	9794	
30	o Leonis	3½	+62	-18	5 43.0	+ 8	47 50	+0.3637	5480	-0.2255	+9.2614	9926	
30	π Leonis	5	+52	-28	14 28.8	- 6	44 2	+0.1940	5483	-0.2348	+9.1680	9950	
30	16 Sextantis	6	+90	+23	18 38.6	- 2	42 36	+1.0832	5484	-0.2384	+9.0763	9969	
Oct. 2	p ^s Leonis	6	+39	-42	0 2.6	+ 1	41 39	-0.0818	5537	-0.2547	+8.0891	0.0000	
6	42 Libræ	5½	+67	+ 3	13 35.9	+11	7 24	+0.7679	6024	-0.1076	-0.5884	9.9688	
6	δ Scorpī	2½	-43	-00	21 11.6	- 5	35 44	-1.1036	6058	-0.0871	-0.5778	9665	
7	19 Scorpī	5½	+16	-46	4 48.5	+ 1	42 18	-0.0854	6033	-0.0651	-0.6064	9613	
7	o Ophiuchi	5	-30	-09	6 41.3	+ 3	30 26	-0.9085	6038	-0.0586	-0.5941	9636	
7	22 Scorpī	5	+62	- 2	8 23.6	+ 5	8 25	+0.6730	6036	-0.0553	-0.6238	9679	
8	30 Ophiuchi	5½	-11	-77	2 31.0	- 1	28 54	-0.5180	5995	-0.0133	-0.6115	9603	
8	δ Ophiuchi	3½	+26	-29	4 1.4	- 0	2 16	+0.9069	5988	+0.0013	-0.6226	9578	
8	b Ophiuchi	5	-17	-86	5 42.7	+ 1	34 59	-0.6074	5983	+0.0067	-0.6101	9606	
8	c ^s Ophiuchi	4	-27	-90	7 39.2	+ 3	26 45	-0.7845	5976	+0.0129	-0.6068	9612	
8	4 Sagittari	5	-10	-78	18 39.6	- 9	59 25	-0.5409	5944	+0.0426	-0.6059	9614	
9	24 Sagittari	6	+59	- 6	8 11.9	+ 3	0 55	+0.6132	5834	+0.0773	-0.6115	9603	
9	B.A.C. 6343	6	+35	-27	10 4.7	+ 4	49 24	+0.2369	5822	+0.0290	-0.6026	9620	
9	26 Sagittari	6	+65	- 1	11 25.7	+ 6	7 16	+0.7006	5810	+0.0857	-0.6086	9609	
9	v ^s Sagittari	5	+28	-36	16 19.6	+10	49 40	+0.0865	5772	+0.0977	-0.5843	9654	
9	v ^s Sagittari	5	+26	-38	16 52.8	+11	23 0	+0.0512	5774	+0.0893	-0.5890	9645	
9	o Sagittari	4	0	-71	20 52.2	- 8	47 36	-0.4688	5745	+0.1074	-0.5724	9673	
9	π Sagittari	3	-28	-90	23 1.0	- 6	43 34	-0.9685	5727	+0.1121	-0.5590	9694	
10	50 Sagittari	6	+68	0	6 0.3	+ 0	0 23	+0.7187	5669	+0.1266	-0.5745	9670	
10	B.A.C. 6671	6	+56	-13	7 58.9	+ 1	54 37	+0.5010	5666	+0.1308	-0.5650	9684	
10	f Sagittari	5	+21	-49	14 45.8	+ 8	27 4	-0.1465	5699	+0.1439	-0.5360	9727	
10	57 Sagittari	5½	+ 3	-73	17 19.5	+10	55 19	-0.4967	5680	+0.1484	-0.5312	9746	
11	π Capricor.	5	+72	+53	9 13.6	+ 2	16 45	+1.3161	5451	+0.1742	-0.5051	9765	
11	o Capricor.	5	+72	+20	9 57.0	+ 2	58 41	+1.0378	5448	+0.1763	-0.4961	9775	
11	B.A.C. 7043	6½	+69	- 6	10 0.8	+ 3	2 19	+0.6383	5446	+0.1754	-0.4873	9785	
11	B.A.C. 7097	6	+46	-27	13 4.7	+ 6	0 13	+0.2429	5425	+0.1798	-0.4659	9806	
11	r ^s Capricor.	5	-29	-90	14 52.4	+ 7	44 20	-1.0842	5414	+0.1829	-0.4351	9840	
12	18 Aquarii	6	+77	+21	12 48.5	+ 4	58 55	+1.0681	5264	+0.2066	-0.3671	9879	
14	z Aquarii	5	+54	-27	2 45.2	- 6	18 4	+0.2549	5892	+0.2289	-0.8347	9.9884	
15	z Piscium	4½	+67	-17	5 15.6	- 4	26 30	-0.4394	5047	+0.2311	+7.9437	0.0000	
15	9 Piscium	6	+82	- 7	5 25.9	- 4	16 32	+0.6287	5046	+0.2310	+7.9068	0.0000	
15	16 Piscium	6	+90	- 3	10 24.9	+ 0	34 5	+0.7110	5044	+0.2308	+8.3691	9.9999	
15	19 Piscium	6	+67	-17	15 51.1	+ 5	51 13	+0.4397	5044	+0.2290	+8.6744	9995	
16	d Piscium	5½	+11	-73	10 24.3	- 0	6 40	-0.5591	5068	+0.2215	+9.1115	9963	
16	45 Piscium	6	+80	- 7	13 9.5	+ 2	33 48	+0.6022	5063	+0.2201	+9.0816	9968	
18	γ Piscium	4	+ 2	-75	0 3.8	-11	32 1	-0.7901	5155	+0.1915	+9.4025	9657	
19	B.A.C. 782	6½	+90	+ 7	7 38.0	- 4	54 3	+0.6967	5270	+0.1506	+9.4963	9775	
19	μ Arietis	5½	+44	-26	11 57.4	- 0	42 40	+0.0587	5288	+0.1441	+9.5219	9745	
19	47 Arietis	6	+62	-10	19 39.0	+ 6	44 33	+0.3468	5219	+0.1314	+9.5364	9727	
19	ε Arietis	4½	+22	-46	20 11.9	+ 7	16 28	-0.3311	5319	+0.1308	+9.5501	9708	
20	ζ Arietis	4½	+90	+23	3 48.7	- 9	21 9	+0.8984	0.5362	+0.1123	+9.5450	9.9715	

ELEMENTS FOR FACILITATING THE CALCULATION OF OCCULTATIONS OF PLANETS AND STARS BY THE MOON, FOR THE YEAR 1861.

Date.	Star's Name.	Magnitude.	Limiting Parallels.		Washington Mean Time of δ .	At Washington Mean Time of Conjunction.						
			North-ern.	South-ern.		H	Y	p'	q'	Log $\sin D$	Log $\cos D$	
												h	m	s
Oct. 20	γ^1 Arctis	5	+90	+40	6 50.9	- 6 25 45	+1.1176	0.5362	+1.121	+9.5473	9.9712	
20	b Pleiadum	4 $\frac{1}{2}$	-30	-67	18 25.5	+ 4 25 19	-1.1089	.5400	+0.0913	+9.6038	.9618	
20	B.A.C. 1155	7	+41	-23	18 30.7	+ 4 52 38	+0.0061	.5401	+0.0904	+9.5867	.9649	
20	d Pleiadum	5	-10	-67	18 43.9	+ 5 5 20	-0.8666	.5402	+0.0900	+9.6010	.9623	
20	p Pleiadum	7 $\frac{1}{2}$	-21	-67	19 12.6	+ 5 33 10	-1.0104	.5405	+0.0890	+9.6039	.9618	
20	γ Tauri	3 $\frac{1}{2}$	-20	-67	19 16.4	+ 5 36 47	-0.9964	.5406	+0.0889	+9.6037	.9618	
20	β Pleiadum	7	+29	-34	19 41.8	+ 6 1 25	-0.2013	.5407	+0.0882	+9.5919	.9640	
20	e Pleiadum	7 $\frac{1}{2}$	-10	-67	19 58.1	+ 6 17 8	-0.8490	.5408	+0.0877	+9.6024	.9621	
20	f Pleiadum	4 $\frac{1}{2}$	-11	-67	20 3.9	+ 6 23 50	-0.8732	.5408	+0.0875	+9.6029	.9620	
20	λ Pleiadum	5 $\frac{1}{2}$	-18	-67	20 4.6	+ 6 23 24	-0.9649	.5408	+0.0875	+9.6044	.9617	
20	β Pleiadum	7 $\frac{1}{2}$	+14	-50	20 20.4	+ 6 38 44	-0.4718	.5409	+0.0870	+9.5970	.9631	
20	B.A.C. 1159	7	+90	+47	20 28.0	+ 6 46 5	+1.1682	.5409	+0.0869	+9.5702	.9677	
20	40 Pleiadum	7 $\frac{1}{2}$	0	-66	20 52.5	+ 7 9 44	-0.7026	.5411	+0.0869	+9.6014	.9623	
22	103 Tauri	6	+71	+9	8 35.5	- 6 18 28	+0.4582	.5494	+0.1112	+9.6107	.9604	
22	121 Tauri	6	+53	+15	21 2.4	+ 5 43 16	+0.5784	.5506	-0.1557	+9.6026	.9609	
23	132 Tauri	5 $\frac{1}{2}$	+30	-28	3 11.0	+11 39 20	-0.1912	.5507	-0.0222	+9.6180	.9690	
23	1 Geminor.	5	+90	+32	10 4.6	- 5 41 7	+0.9249	.5506	-0.0443	+9.5966	.9632	
23	2 Geminor.	6 $\frac{1}{2}$	+71	+5	11 17.2	- 4 31 2	+0.4539	.5607	-0.0469	+9.6032	.9619	
23	3 Geminor.	6	+90	+34	12 37.7	- 3 13 11	+0.9515	.5506	-0.0502	+9.5942	.9636	
23	5 Geminor.	6	+11	-51	13 24.5	- 2 27 59	-0.5259	.5506	-0.0519	+9.6168	.9692	
23	6 Geminor	6	+90	+45	13 48.2	- 2 4 58	+1.1064	.5506	-0.0526	+9.5907	.9642	
23	μ Geminor.	6	+90	+55	18 40.0	+ 2 36 46	+1.2114	.5500	-0.0631	+9.5643	.9654	
24	δ Geminor.	3 $\frac{1}{2}$	- 4	-68	20 46.9	+ 3 50 45	-0.7749	.5466	-0.1169	+9.5779	.9664	
24	56 Geminor.	5 $\frac{1}{2}$	+90	+15	21 39.9	+ 4 42 0	+0.7740	.5465	-0.1187	+9.5480	.9710	
25	63 Geminor.	5 $\frac{1}{2}$	+ 4	-66	0 18.2	+ 7 15 1	-0.6503	.5464	-0.1226	+9.5684	.9680	
25	ζ Cancri	4 $\frac{1}{2}$	+60	-14	21 0.9	+ 3 16 18	+0.3165	.5428	-0.1613	+9.4914	.9780	
27	ϵ Leonis	3 $\frac{1}{2}$	+47	-31	15 5.9	- 4 1 16	+0.1138	.5890	-0.2202	+9.2614	.9926	
28	π Leonis	5	+38	-41	0 8.3	+ 4 43 34	-0.0452	.5394	-0.2293	+9.1890	.9950	
28	36 Sextantis	6	+74	-12	21 20.7	+ 1 14 18	+0.5304	.5429	-0.2444	+8.7487	9.9993	
29	ρ^b Leonis	5	+30	-51	10 38.1	- 9 54 59	-0.1964	.5475	-0.2497	+8.0754	0.0000	
29	ϵ Leonis	5	+88	+ 5	18 13.1	- 2 35 8	+0.8437	.5502	-0.2504	-8.6924	9.9997	
Nov. 3	19 Scorpii	5 $\frac{1}{2}$	+24	-37	14 42.4	-10 34 44	+0.0658	.6104	-0.0638	-9.6064	.9613	
3	ϵ Ophiuchi	5	-20	-90	16 32.8	- 8 50 1	-0.7418	.6142	-0.0860	-9.5940	.9636	
3	22 Scorpii	5	+65	+ 8	18 12.0	- 7 15 7	+0.8218	.6145	-0.0542	-9.6228	.9579	
4	39 Ophiuchi	5 $\frac{1}{2}$	- 3	-61	11 44.4	+ 9 32 26	-0.3260	.6109	-0.0009	-9.6115	.9603	
4	δ Ophiuchi	3 $\frac{1}{2}$	+38	-18	13 11.9	+10 56 15	+0.3970	.6107	+0.0631	-9.6236	.9578	
4	b Ophiuchi	5	- 6	-66	14 49.9	-11 29 55	-0.4018	.6101	+0.0683	-9.6101	.9606	
4	c^2 Ophiuchi	5	-15	-82	16 42.5	- 9 42 1	-0.5727	.6091	+0.0139	-9.6068	.9612	
5	4 Sagittarii	5	+ 2	-60	2 20.7	+ 0 29 32	-0.3166	.6040	+0.0442	-9.6059	.9614	
6	γ^1 Sagittarii	5	+42	-22	0 27.7	- 3 14 28	+0.3279	.5875	+0.1001	-9.6003	.9643	
6	γ^2 Sagittarii	5	+40	-24	0 50.2	- 2 52 52	+0.2980	.5874	+0.1009	-9.5890	.9645	
6	ϵ^2 Sagittarii	4	-47	-90	1 55.3	- 1 50 14	-1.1749	.5865	+0.1034	-9.5599	.9693	
6	δ Sagittarii	4	+13	-53	4 42.0	+ 0 50 0	-0.2137	.5840	+0.1100	-9.5794	.9673	
6	π Sagittarii	3	-12	-90	6 46.9	+ 2 50 3	-0.6937	.5822	+0.1147	-9.5590	.9694	
6	f Sagittarii	5	+35	-33	22 3.8	- 6 27 48	+0.1249	.5682	+0.1462	-9.5359	.9727	
7	57 Sagittarii	5 $\frac{1}{2}$	+18	-54	0 33.8	- 4 2 47	-0.2196	.5651	+0.1518	-9.5212	.9746	
7	ϵ Capricor.	5	+72	+47	16 46.9	+11 36 13	+1.2880	.5509	+0.1773	-9.4961	.9775	
7	ρ^2 Capricor.	5	-10	-90	21 26.0	- 7 44 28	-0.7976	.5468	+0.1840	-9.4251	.9840	
9	30 Aquarii	5 $\frac{1}{2}$	-26	-90	14 43.2	+ 8 4 58	-1.1225	.5175	+0.2210	-9.0972	.9966	
10	κ Aquarii	5	+70	-14	8 45.7	+ 1 35 52	+0.4991	.5098	+0.2277	-8.9347	9.9984	
11	B.A.C. 8152	6 $\frac{1}{2}$	+90	+38	9 22.5	+ 1 30 52	+1.2767	.5036	+0.2269	-7.9065	0.0000	
11	κ Piscium	4 $\frac{1}{2}$	+84	- 6	11 13.8	+ 3 19 1	+0.6466	.5035	+0.2289	+7.9427	.0000	
11	9 Piscium	6	+90	+ 4	11 24.1	+ 3 29 2	+0.8394	.5023	+0.2287	+7.9091	0.0000	
12	d Piscium	5 $\frac{1}{2}$	+19	-62	16 26.0	+ 7 42 25	-0.3991	.5042	+0.2189	+9.1115	9.9963	
14	γ Piscium	4	+ 6	-72	6 10.9	- 3 37 7	-0.6263	0.5144	+0.1891	+9.4026	9.9657	

ELEMENTS FOR FACILITATING THE CALCULATION OF OCCULTATIONS OF PLANETS AND STARS BY THE MOON, FOR THE YEAR 1861.

Date.	Star's Name.	Magnitude.	Limiting Parallels.		Washington Mean Time of δ .	At Washington Mean Time of Conjunction.					
			North-ern.	South-ern.		H	Y	p'	q'	Log $\sin D$	Log $\cos D$
Nov. 14	101 Piscium	6	+76	-6	8 25.6	-1 26 17	+0.5487	0.5154	+1.1655	+9.3824	9.9870
15	B.A.C. 782	6½	+90	+8	13 46.0	+3 1 24	+0.7031	.5277	+1.1487	+9.4963	.9775
15	μ Arietis	5½	+43	-26	18 5.0	+7 12 26	+0.0498	.5295	+1.1223	+9.5219	.9745
16	α Arietis	4½	+21	-47	2 18.6	-8 49 24	-0.3509	.5333	+1.1291	+9.5501	.9708
16	ζ Arietis	4½	+90	+21	9 54.2	-1 28 12	+0.8634	.5365	+1.1160	+9.5450	.9715
16	τ^1 Arietis	5	+90	+37	12 55.8	+1 27 38	+1.0767	.5378	+1.1106	+9.5473	.9712
17	δ Pleiadum	4½	-36	-67	0 5.1	-11 44 38	-1.1698	.5423	+0.0899	+9.6038	.9618
17	d Pleiadum	5	-15	-67	0 46.3	-11 4 47	-0.9292	.5426	+0.0885	+9.6010	.9623
17	η Tauri	3½	-25	-67	1 18.7	-10 33 28	-1.0590	.5427	+0.0874	+9.6038	.9618
17	f Pleiadum	4½	-16	-67	2 6.1	-9 47 37	-0.9385	.5430	+0.0859	+9.6030	.9620
17	λ Pleiadum	5½	-23	-66	2 6.7	-9 47 1	-1.0294	.5430	+0.0859	+9.6044	.9617
17	β Tauri	6	+90	+40	5 44.9	-6 15 58	+1.0802	.5442	+0.0786	+9.5751	.9669
17	β Tauri	6	+60	-6	5 49.6	-6 11 25	+0.3183	.5442	+0.0785	+9.5878	.9647
18	103 Tauri	6	+61	+2	14 28.8	+1 22 23	+0.3302	.5520	+0.0097	+9.6107	.9604
19	132 Tauri	5½	+21	-37	9 1.7	-4 42 36	-0.3451	.5530	-0.0307	+9.6180	.9590
19	1 Geminor.	5	+90	+22	15 55.0	+1 56 42	+0.7636	.5526	-0.0458	+9.5966	.9632
19	2 Geminor.	6½	+58	-4	17 7.6	+3 6 49	+0.2898	.5523	-0.0484	+9.6032	.9619
19	3 Geminor.	6	+90	+23	18 28.2	+4 24 39	+0.7865	.5521	-0.0516	+9.5942	.9636
19	6 Geminor	6	+90	+33	19 38.9	+5 32 59	+0.9437	.5517	-0.0541	+9.5907	.9642
20	μ Geminor.	3	+90	+39	0 29.8	+10 14 1	+1.0411	.5514	-0.0646	+9.5843	.9654
20	d Geminor.	6	+90	+16	13 35.0	-1 7 12	+0.7367	.5492	-0.0917	+9.5721	.9674
21	δ Geminor.	3½	-18	-68	2 45.2	+11 36 29	-0.9815	.5461	-0.1177	+9.5779	.9664
21	56 Geminor.	5½	+80	+4	3 38.7	-11 31 49	+0.5751	.5459	-0.1195	+9.5484	.9710
21	63 Geminor.	5½	-9	-68	6 18.5	-8 57 20	-0.8598	.5454	-0.1242	+9.5684	.9680
21	g Geminor.	5½	+90	+36	14 58.2	-0 34 47	+1.1117	.5430	-1.1401	+9.5092	.9761
22	ζ Cancri	4½	+46	-26	3 16.8	+11 19 39	+0.0985	.5396	-1.1608	+9.4914	.9781
23	λ Leonis	6	+90	+23	17 50.6	+0 39 31	+1.0666	.5317	-0.2124	+9.2533	.9929
23	α Leonis	3½	+34	-44	22 19.9	+5 0 21	-0.1146	.5312	-0.2169	+9.2613	.9926
24	π Leonis	5	+26	-54	7 39.0	-9 58 7	-0.2730	.5310	-0.2253	+9.1799	9.9850
25	p^2 Leonis	6	+90	-2	14 29.6	-4 6 3	+0.7197	.5353	-0.2425	+8.1119	0.0000
25	p^1 Leonis	5	+19	-64	19 21.1	+0 36 4	-0.3992	.5367	-0.2436	+8.0747	0.0000
26	e Leonis	5	+86	-5	3 12.8	+8 12 30	+0.6685	.5393	-0.2444	+8.5923	9.9897
Dec. 3	B.A.C. 6343	6	+57	-8	4 43.8	+3 4 31	+0.5754	.6037	+0.0875	-9.6025	.9620
3	26 Sagittarii	6	+66	+23	6 0.1	+4 17 41	+1.0285	.6016	+0.0905	-9.6086	.9609
3	ν^1 Sagittarii	5	+49	-15	10 46.4	+8 52 21	+0.4407	.5972	+1.0288	-9.5803	.9643
3	ν^2 Sagittarii	5	+47	-17	11 8.2	+9 13 19	+0.4066	.5972	+1.034	-9.5890	.9645
3	ξ Sagittarii	4	-34	-90	12 11.6	+10 14 7	-1.0330	.5965	+1.061	-9.5599	.9693
3	σ Sagittarii	4	+90	-45	14 53.6	-11 10 22	-0.0867	.5943	+1.128	-9.5724	.9673
3	π Sagittarii	3	+4	-79	16 54.9	-9 13 51	-0.5578	.5922	+1.177	-9.5590	.9694
4	f Sagittarii	5	-43	-25	7 43.7	+5 0 37	+0.2673	.5780	+1.1497	-9.5359	.9727
4	57 Sagittarii	5½	+25	-44	10 9.5	+7 20 58	-0.0692	.5762	+1.1544	-9.5212	.9746
5	B.A.C. 7097	6	+72	-4	4 49.5	+1 20 30	+0.6691	.5582	+1.1854	-9.4659	.9806
5	τ^2 Capricor.	5	0	-83	6 32.0	+2 59 27	-0.6200	.5564	+1.1879	-9.4251	.9840
5	B.A.C. 7145	6	+73	-3	3 7 4.8	+3 31 6	+0.6950	.5311	+1.1894	-9.4562	.9815
6	30 Aquarii	5½	-12	-90	22 28.6	-6 21 53	-0.9298	.5242	+1.2240	-9.0972	.9865
7	κ Aquarii	5	+84	-4	16 6.6	+10 44 25	+0.6786	.5145	+1.2295	-8.9347	9.9984
8	κ Piscium	4½	+90	+4	18 8.2	-11 58 53	+0.8174	.5061	+1.2294	+7.9431	0.0000
9	19 Piscium	6	+90	+3	4 37.2	+1 47 41	+0.7943	.5047	+1.2263	+8.6771	9.9895
9	ω Piscium	4	-46	-84	11 34.6	+4 57 53	-1.3296	.5041	+1.2238	+9.0266	.9975
9	d Piscium	5½	+28	-53	23 4.3	-7 51 41	-0.2412	.5047	+1.2182	+9.1113	.9863
11	η Piscium	4	+13	-66	12 43.4	+4 42 57	-0.5084	.5133	+1.1875	+9.4026	.9857
11	101 Piscium	6	+88	0	14 58.1	+6 53 43	+0.6613	.5138	+1.1851	+9.3823	.9870
13	μ Arietis	5½	+48	-23	0 38.9	-8 26 11	+0.1235	.5286	+1.1406	+9.5219	.9745
13	47 Arietis	6	+65	-7	8 19.3	-1 0 7	+0.3907	.5320	+1.1286	+9.5364	.9727
13	α Arietis	5½	+24	-43	8 52.4	-0 28 2	-0.2861	.05325	+1.1275	+9.5501	9.9708

OCCULTATIONS, 1861. 433

ELEMENTS FOR FACILITATING THE CALCULATION OF OCCULTATIONS OF
PLANETS AND STARS BY THE MOON, FOR THE YEAR 1861.

Date.	Star's Name.	Magnitude.	Limiting Parallels.		Wash- ington Mean Time of δ.	At Washington Mean Time of Conjunction.					
			North- ern.	South- ern.		H	Y	p'	q'	Log sin D	Log cos D
Dec. 13	ζ Arietis	4½	+90	+25	16 27.8	+ 6 56 59	+0.9170	0.5362	+1.144	+9.5450	9.9715
13	τ¹ Arietis	5	+90	+41	19 29.3	+ 9 48 42	+1.1254	.5372	+1.090	+9.5473	.9712
14	δ Pleiadum	4½	-32	-67	6 37.5	- 3 24 44	-1.1293	.5425	+0.085	+9.6038	.9618
14	B.A.C. 1155	7	+39	-24	7 5.6	- 2 57 32	-0.0195	.5426	+0.079	+9.5867	.9649
14	d Pleiadum	5	-12	-67	7 18.8	- 2 44 47	-0.8898	.5427	+0.070	+9.6010	.9623
14	p Pleiadum	7½	-23	-67	7 47.3	- 2 17 14	-1.0373	.5428	+0.064	+9.6040	.9618
14	γ Tauri	3½	-22	-67	7 51.1	- 2 13 34	-1.0200	.5427	+0.063	+9.6038	.9618
14	23 Pleiadum	7	+27	-36	8 16.3	- 1 49 7	-0.2226	.5430	+0.068	+9.5918	.9640
14	e Pleiadum	7½	-11	-67	8 32.5	- 1 33 31	-0.8754	.5430	+0.081	+9.6024	.9621
14	f Pleiadum	4½	-13	-67	8 38.3	- 1 27 49	-0.9003	.5430	+0.049	+9.6030	.9620
14	k Pleiadum	5½	-20	-66	8 38.9	- 1 27 17	-0.9908	.5430	+0.049	+9.6044	.9617
14	34 Pleiadum	7½	+12	-52	8 54.7	- 1 12 4	-0.5003	.5432	+0.040	+9.5970	.9631
14	B.A.C. 1189	7	+90	+44	9 2.3	- 1 4 41	+1.1345	.5433	+0.037	+9.5703	.9677
14	40 Pleiadum	7½	- 2	-66	9 26.5	- 0 41 15	-0.7350	.5434	+0.030	+9.6014	.9623
14	32 Tauri	6	+90	+43	12 16.5	+ 2 3 12	+1.1133	.5446	+0.070	+9.5750	.9669
14	33 Tauri	6	+62	+ 3	12 21.3	+ 2 7 45	+0.3509	.5446	+0.077	+9.5878	.9647
15	103 Tauri	6	+61	+ 2	20 51.1	+ 9 32 8	+0.3275	.5541	+0.009	+9.6107	.9605
16	121 Tauri	6	+68	+ 6	9 10.5	- 2 33 47	+0.4169	.5555	-0.013	+9.6084	.9609
16	132 Tauri	5½	+18	-40	15 15.3	+ 3 18 34	-0.3650	.5560	-0.018	+9.6180	.9659
16	1 Geminor.	5	+90	+20	22 5.0	+ 9 54 11	+0.7359	.5569	-0.049	+9.5966	.9632
17	μ Geminor.	3	+90	+36	6 35.0	- 5 53 21	+1.0039	.5551	-0.068	+9.5843	.9654
17	d Geminor.	6	+90	+11	19 32.7	+ 6 37 49	+0.6598	.5531	-0.032	+9.5721	.9674
18	δ Geminor.	3½	-22	-68	8 35.3	- 4 46 0	-1.0337	.5499	-1.194	+9.5779	.9664
18	56 Geminor.	5½	+75	0	9 28.4	- 3 54 43	+0.5187	.5497	-1.212	+9.5483	.9710
18	63 Geminor.	5½	-13	-68	12 6.7	- 1 21 42	-0.9145	.5490	-1.258	+9.5684	.9680
18	g Geminor.	5½	+90	+31	20 42.1	+ 6 56 30	+1.0479	.5465	-1.418	+9.5091	.9761
19	ζ Cancrī	4½	+42	-29	8 55.6	- 5 14 7	+0.0278	.5428	-1.624	+9.4913	.9781
21	o Leonis	3½	+29	-49	3 57.1	-11 35 5	-0.2024	.5311	-2.170	+9.2613	.9926
21	π Leonis	5	+21	-59	13 20.4	- 2 29 21	-0.3636	.5297	-2.247	+9.1799	.9950
21	16 Sextantis	6	+78	- 9	17 49.0	+ 1 50 52	+0.5769	.5233	-2.281	+9.0762	.9969
22	36 Sextantis	6	+54	-27	11 34.0	- 4 57 15	+0.2386	.5292	-2.276	+8.7483	.9993
22	B.A.C. 3726	6	+90	+10	15 3.2	- 1 34 33	+0.9230	.5293	-2.287	+8.4884	.9998
22	55 Leonis	6	+90	+ 3	16 45.5	+ 0 4 35	+0.8128	.5295	-2.291	+8.4115	0.9998
22	p¹ Leonis	6	+83	- 7	20 38.9	+ 3 50 39	+0.6396	.5302	-2.401	+8.1152	0.0000
23	p² Leonis	5	+14	-70	1 37.0	+ 7 39 28	-0.4919	.5309	-2.408	+8.0778	0.0000
23	e Leonis	5	+79	- 9	9 40.3	- 7 32 28	+0.5909	.5330	-2.412	-8.5929	9.9997
23	B.A.C. 4006	6	+77	-10	19 39.0	+ 2 7 7	+0.5809	.5348	-2.391	-8.9010	.9986
25	75 Virginis	6	+54	-22	18 3.7	- 1 2 3	+0.3356	.5635	-2.408	-9.4030	.9856
27	42 Libræ	5½	+67	+10	21 21.2	+ 0 17 12	+0.8664	.6008	-1.034	-9.5984	.9628
28	δ Scorpī	2½	-33	-90	4 57.5	+ 7 34 47	-0.9725	.6050	-0.082	-0.5778	.9665
28	19 Scorpī	5½	+24	-36	12 30.7	- 9 11 1	+0.0781	.6091	-0.056	-9.6065	.9613
28	e Ophiuchi	5	-20	-90	14 21.9	- 7 24 25	-0.7321	.6095	-0.056	-9.5941	.9636
28	22 Scorpī	5	+65	+ 9	16 2.6	- 5 47 59	+0.8468	.6101	-0.013	-9.6222	.9679
28	25 Scorpī	6	+65	+25	22 11.5	+ 0 5 16	+1.0532	.6115	-0.034	-9.6304	.9653
29	B.A.C. 5709	6	+49	-10	3 1.9	+ 4 43 23	+0.5354	.6124	-0.019	-9.6240	.9677
29	26 Ophiuchi	6	+41	-18	3 6.2	+ 4 57 31	+0.4302	.6124	-0.019	-9.6223	.9680
29	39 Ophiuchi	5½	+ 1	-57	9 42.3	+11 6 53	-0.2664	.6128	-0.012	-9.6116	.9603
29	δ Ophiuchi	3½	+42	-14	11 9.5	-11 29 39	+0.4591	0.6126	+0.063	-9.6236	9.9678

Note. — B. A. C., British Association Catalogue.

OCCULTATIONS OF PLANETS AND STARS BY THE MOON, VISIBLE AT WASHINGTON, D. C., DURING THE YEAR 1861.

Date.	Star's Name.	Magnitude.	IMMERSION.				EMERSION.				Duration of Occultation.
			Washington.		Angle from		Washington.		Angle from		
			Sidereal Time.	Mean Time.	North Point.	Ver- tex.	Sidereal Time.	Mean Time.	North Point.	Ver- tex.	
Jan. 1	ρ^{δ} Leonis	5	5 5	10 18	290	169	5 57	11 9	87	37	0 52
6	B.A.C. 5314	6	12 43	17 35	198	162	13 26	18 18	124	94	0 42
15	\times Piscium	4 $\frac{1}{2}$	2 45	7 4	353	37	3 32	7 51	72	120	0 47
19	δ Arietis	6 $\frac{1}{2}$	4 28	8 30	265	312	5 45	9 47	131	185	1 17
24	δ Geminor.	3 $\frac{1}{2}$	10 40	14 22	157	214	Star 0'1	south of	ζ 's limb.		
Feb. 24	δ Geminor.	5 $\frac{1}{2}$	13 35	17 16	228	290	14 22	18 3	94	142	0 47
2	B.A.C. 5197	6	13 10	16 15	339	310	Star 1'1	north of	ζ 's limb.		
5	B.A.C. 6369 \dagger	6	13 12	16 6	292	242	14 12	17 5	69	24	1 0
17	40 Pleiadum	7 $\frac{1}{2}$	3 42	5 51	225	225	4 30	6 39	163	194	0 48
17	36 Tauri \ddagger	6 $\frac{1}{2}$	11 16	13 13	211	258	11 42	13 50	150	194	0 26
Mar. 20	B.A.C. 2238	6	10 33	12 29	276	335	11 30	13 26	45	103	0 57
21	δ Geminor.	6 $\frac{1}{2}$	13 28	15 19	279	333	14 13	16 5	38	89	0 45
22	54 Cancri	6 $\frac{1}{2}$	13 0	14 48	245	300	13 58	15 46	60	113	0 58
2	α Scorpii	1 $\frac{1}{2}$	14 10	15 25	207	180	15 1	16 16	125	108	0 51
4	λ Sagittarii \ddagger	3	13 24	14 32	301	253	14 20	15 28	56	13	0 56
Mar. 16	9 Tauri	6	7 12	7 34	238	295	8 11	8 32	131	189	0 58
20	δ Geminor.	3 $\frac{1}{2}$	9 1	9 7	228	276	10 13	10 19	86	142	1 12
20	63 Geminor.	5 $\frac{1}{2}$	12 57	13 2	274	328	13 46	13 52	47	98	0 50
21	δ^{δ} Cancri	6	14 33	14 34	203	255	15 10	15 11	112	161	0 37
29	B.A.C. 5286 \dagger	6 $\frac{1}{2}$	10 58	10 28	276	228	11 53	11 23	47	5	0 55
April 15	5 Geminor.	6	12 37	11 0	320	12	13 1	11 24	15	64	0 24
17	B.A.C. 2683 \ddagger	6	14 46	13 1	314	3	15 8	13 23	6	54	0 22
18	54 Cancri	6 $\frac{1}{2}$	11 10	9 21	302	349	11 43	9 54	358	48	0 33
20	36 Sextantist \ddagger	6	16 21	14 24	220	271	17 10	15 13	89	139	0 49
May 12	Mars		10 53	7 30	257	313	11 55	8 32	78	130	1 2
23	B.A.C. 5286	6 $\frac{1}{2}$	11 28	7 22	244	199	12 30	8 24	80	42	1 2
25	B.A.C. 6217	6 $\frac{1}{2}$	19 7	14 52	12	23	Star 1'6	north of	ζ 's limb.		
27	α Capricor.	5 $\frac{1}{2}$	19 8	14 45	240	226	19 56	15 32	171	168	0 48
31	B.A.C. 8152*	6 $\frac{1}{2}$	16 16	11 37	283	233	17 11	12 32	125	74	0 56
June 13	16 Sextantist*	6	16 40	11 10	194	244	17 12	11 42	117	166	0 32
July 14	55 Leonis	6	15 20	9 47	150	199	Star 0'9	south of	ζ 's limb.		
15	B.A.C. 4006 \ddagger	6	17 2	11 24	284	334	17 46	12 8	28	79	0 44
2	47 Arietist \ddagger	6	19 18	12 33	263	217	20 5	13 20	135	85	0 47
17	α Scorpii	3 $\frac{1}{2}$	18 32	10 48	282	309	19 43	11 59	78	116	1 12
19	B.A.C. 6217	6 $\frac{1}{2}$	16 19	8 28	4	340	Star 1'5	north of	ζ 's limb.		
21	α Capricor.	5 $\frac{1}{2}$	16 53	8 54	230	192	17 34	9 35	165	134	0 41
21	π Capricor.	5	22 8	14 8	243	266	22 48	14 48	176	206	0 40
21	ϵ Capricor.	5	23 5	15 5	266	319	0 11	16 11	131	174	1 6
21	B.A.C. 7073	6 $\frac{1}{2}$	0 5	16 5	28	70	Star 0'0	north of	ζ 's limb.		
25	16 Piscium	6	19 47	11 31	319	274	20 58	12 42	107	69	1 11
26	45 Piscium	6	23 18	14 58	246	225	23 59	15 39	189	182	0 42
29	α Arietis	5 $\frac{1}{2}$	21 31	12 59	311	256	22 33	14 2	98	43	1 3
30	9 Tauri	6	0 30	15 54	8	311	0 48	16 12	36	339	0 18
Aug. 13	B.A.C. 5286	6 $\frac{1}{2}$	16 41	7 11	298	309	17 46	8 16	46	69	1 6
24	101 Piscium	6 $\frac{1}{2}$	21 17	11 3	299	246	22 29	12 15	122	73	1 12
Sept. 10	25 Scorpii	6	19 38	8 17	320	354	20 25	9 5	45	86	0 48
22	47 Arietis	6	23 57	11 48	267	234	1 18	13 10	124	82	1 22
23	B.A.C. 1155	7	23 19	11 7	20	322	Star 4'7	north of	ζ 's limb.		
Oct. 9	24 Sagittarii \ddagger	6	22 7	8 52	289	330	23 10	9 56	106	153	1 4
10	50 Sagittarii \ddagger	6	18 50	5 32	321	315	20 3	6 45	78	88	1 12
10	B.A.C. 6671	6	21 53	8 34	328	358	22 52	9 34	79	118	0 59
11	B.A.C. 7043	6 $\frac{1}{2}$	0 6	10 43	263	304	0 59	11 36	151	198	0 53
15	16 Piscium	6	23 33	9 54	272	273	0 43	11 5	161	183	1 10

OCCULTATIONS OF PLANETS AND STARS BY THE MOON, VISIBLE AT WASHINGTON, D. C., DURING THE YEAR 1861.

Date.	Star's Name.	Magnitude.	IMMERSION.				EMERSION.				Duration of Occultation.
			Washington.		Angle from		Washington		Angle from		
			Sidereal Time.	Mean Time.	North Point.	Vertex.	Sidereal Time.	Mean Time.	North Point.	Vertex.	
Oct. 16	45 Piscium	6	h m	h m	°	°	h m	h m	°	°	h m
19	B.A.C. 732	6½	19 44	5 50	331	271	20 33	6 39	82	30	0 48
22	103 Tauri†	6	21 17	7 12	346	302	21 36	7 30	29	343	0 19
23	1 Geminor.	5	22 51	8 41	183	134	Star 3' 0	south of	°	limb.	
23	2 Geminor.	6½	23 33	9 23	233	232	0 32	10 22	84	23	0 59
27	o Leonis	3½	3 35	13 9	265	233	4 25	13 58	36	343	0 50
Nov. 10	* Aquarii	5	0 22	9 1	297	325	1 39	10 18	131	172	1 17
14	101 Piscium	6	22 36	7 0	313	264	23 55	8 18	111	76	1 19
18	103 Tauri	6	6 25	14 31	257	302	7 50	15 57	93	150	1 25
19	2 Geminor.	6½	9 55	17 57	306	4	10 37	18 40	25	82	0 43
Dec. 3	B.A.C. 6343‡	6	22 15	5 24	294	335	23 15	6 25	100	149	1 0
5	B.A.C. 7097	6	21 54	4 55	298	317	23 8	6 9	121	155	1 14
5	B.A.C. 7145	6½	1 8	8 8	218	264	1 19	8 20	197	244	0 11
13	47 Arietis	6	0 33	7 2	300	250	1 59	8 28	109	82	1 26
14	33 Tauri	6	6 21	12 46	260	315	7 39	14 4	105	163	1 18
16	121 Tauri	6	1 7	7 24	267	210	2 19	8 36	106	49	1 12
18	56 Geminor.	5½	1 31	7 40	230	176	2 23	8 33	118	62	0 53
22	36 Sextantist	6	3 44	9 37	256	206	4 38	10 31	60	8	0 54
22	55 Leonis	6	10 41	16 33	98	97	11 46	17 39	89	106	1 6

NOTES.

* Whole occultation below the horizon of Washington.

† Immersion below the horizon of Washington.

‡ Emersion below the horizon of Washington.

The *Angles of Position*, for the points of contact, are for *direct vision*, and are reckoned from the Moon's *North Point* and from its *Vertex* towards the West. For *inverted image*, add 180° to the angles given.

436 JUPITER'S SATELLITES, 1861.

WASHINGTON MEAN TIME.

JANUARY.

		d	h	m	s			d	h	m	s	
I.	Shadow	Ingress	1	7	18			I.	Transit	Egress	W.	8 12 18
I.	Transit	Ingress	1	8	11			III.	Shadow	Ingress		9 4 38
I.	Shadow	Egress	W.	1	9	38		II.	Shadow	Ingress		9 5 47
I.	Transit	Egress	W.	1	10	31		I.	Eclipse	Disapp.		9 6 29 4.7
III.	Shadow	Ingress		2	0	40		II.	Transit	Ingress		9 7 17
II.	Shadow	Ingress		2	3	14		III.	Transit	Ingress		9 7 35
III.	Transit	Ingress		2	4	9		III.	Shadow	Egress		9 8 21
III.	Shadow	Egress		2	4	23		II.	Shadow	Egress	W.	9 8 43
I.	Eclipse	Disapp.		2	4	35 49.4		I.	Occult.	Reapp.	W.	9 9 31
II.	Transit	Ingress		2	5	0		II.	Transit	Egress	W.	9 10 13
II.	Shadow	Egress		2	6	10		III.	Transit	Egress	W.	9 11 17
I.	Occult.	Reapp.		2	7	45		I.	Shadow	Ingress		10 3 41
III.	Transit	Egress		2	7	51		I.	Transit	Ingress		10 4 24
II.	Transit	Egress		2	7	56		I.	Shadow	Egress		10 6 1
I.	Shadow	Ingress		3	1	47		I.	Transit	Egress		10 6 44
I.	Transit	Ingress		3	2	38		II.	Eclipse	Disapp.		11 0 27 27.8
I.	Shadow	Egress		3	4	7		I.	Eclipse	Disapp.		11 0 57 35.3
I.	Transit	Egress		3	4	58		I.	Occult.	Reapp.		11 3 57
IV.	Eclipse	Disapp.	W.	3	14	58 50.9		II.	Occult.	Reapp.		11 4 48
IV.	Eclipse	Reapp.		3	19	45 21.3		I.	Shadow	Ingress		11 22 9
II.	Eclipse	Disapp.		3	21	51 9.6		IV.	Shadow	Ingress		11 22 20
IV.	Occult.	Disapp.		3	22	51		I.	Transit	Ingress		11 23 50
I.	Eclipse	Disapp.		3	23	4 8.0		I.	Shadow	Egress		12 0 29
I.	Occult.	Reapp.		4	2	11		I.	Transit	Egress		12 1 10
II.	Occult.	Reapp.		4	2	28		IV.	Shadow	Egress		12 3 16
IV.	Occult.	Reapp.		4	3	42		IV.	Transit	Ingress		12 4 40
I.	Shadow	Ingress		4	20	16		IV.	Transit	Egress	W.	12 9 31
I.	Transit	Ingress		4	21	5		III.	Eclipse	Disapp.		12 18 52 7.1
I.	Shadow	Egress		4	22	35		II.	Shadow	Ingress		12 19 4
I.	Transit	Egress		4	23	25		I.	Eclipse	Disapp.		12 19 25 44.9
III.	Eclipse	Disapp.	W.	5	14	54 18.3		II.	Transit	Ingress		12 20 24
II.	Shadow	Ingress	W.	5	16	31		II.	Shadow	Egress		12 22 0
I.	Eclipse	Disapp.	W.	5	17	32 26.2		I.	Occult.	Reapp.		12 23 23
II.	Transit	Ingress	W.	5	18	8		II.	Transit	Egress		12 23 21
II.	Shadow	Egress		5	19	27		III.	Occult.	Reapp.		13 1 10
I.	Occult.	Reapp.		5	20	38		I.	Shadow	Ingress	W.	13 16 38
II.	Transit	Egress		5	21	4		I.	Transit	Ingress	W.	13 17 17
III.	Occult.	Reapp.		5	21	46		I.	Shadow	Egress		13 18 58
I.	Shadow	Ingress	W.	6	14	44		I.	Transit	Egress		13 19 37
I.	Transit	Ingress	W.	6	15	31		II.	Eclipse	Disapp.	W.	14 13 45 6.3
I.	Shadow	Egress	W.	6	17	4		I.	Eclipse	Disapp.	W.	14 13 54 4.9
I.	Transit	Egress	W.	6	17	51		I.	Occult.	Reapp.	W.	14 16 49
II.	Eclipse	Disapp.	W.	7	11	8 44.0		II.	Occult.	Reapp.	W.	14 17 57
I.	Eclipse	Disapp.	W.	7	12	0 44.5		I.	Shadow	Ingress	W.	15 11 6
I.	Occult.	Reapp.	W.	7	15	4		I.	Transit	Ingress	W.	15 11 43
II.	Occult.	Reapp.	W.	7	15	38		I.	Shadow	Egress	W.	15 13 26
I.	Shadow	Ingress	W.	8	9	13		I.	Transit	Egress	W.	15 14 3
I.	Transit	Ingress	W.	8	9	58		II.	Shadow	Ingress	W.	16 8 20
I.	Shadow	Egress	W.	8	11	32		I.	Eclipse	Disapp.	W.	16 8 22 26.6

JUPITER'S SATELLITES, 1861. 437

WASHINGTON MEAN TIME.

JANUARY.

		d	h	m	s			d	h	m	s				
III.	Shadow	Ingress	W.	16	8	36		II.	Transit	Egress	W.	23	14	42	
II.	Transit	Ingress	W.	16	9	32		III.	Shadow	Egress	W.	23	16	18	
III.	Transit	Ingress	W.	16	10	57		III.	Transit	Egress	W.	23	18	0	
I.	Occult.	Reapp.	W.	16	11	15		I.	Shadow	Ingress	W.	24	7	29	
II.	Shadow	Egress	W.	16	11	17		I.	Transit	Ingress	W.	24	7	53	
III.	Shadow	Egress	W.	16	12	19		I.	Shadow	Egress	W.	24	9	49	
II.	Transit	Egress	W.	16	12	29		I.	Transit	Egress	W.	24	10	13	
III.	Transit	Egress	W.	16	14	40		I.	Eclipse	Disapp.		25	4	44	18.7
I.	Shadow	Ingress		17	5	35		II.	Eclipse	Disapp.		25	5	40	26.6
I.	Transit	Ingress		17	6	9		I.	Occult.	Reapp.	W.	25	7	25	
I.	Shadow	Egress		17	7	55		II.	Occult.	Reapp.	W.	25	9	22	
I.	Transit	Egress	W.	17	8	29		I.	Shadow	Ingress		26	1	57	
I.	Eclipse	Disapp.		18	2	50	48.9	I.	Transit	Ingress		26	2	19	
II.	Eclipse	Disapp.		18	3	3	53.7	I.	Shadow	Egress		26	4	17	
I.	Occult.	Reapp.		18	5	41		I.	Transit	Egress		26	4	39	
II.	Occult.	Reapp.		18	7	6		I.	Eclipse	Disapp.		26	23	12	41.3
I.	Shadow	Ingress		19	0	3		II.	Shadow	Ingress		27	0	11	
I.	Transit	Ingress		19	0	35		II.	Transit	Ingress		27	0	52	
I.	Shadow	Egress		19	2	23		I.	Occult.	Reapp.		27	1	51	
I.	Transit	Egress		19	2	55		III.	Eclipse	Disapp.		27	2	47	36.6
I.	Eclipse	Disapp.		19	21	19	9.9	II.	Shadow	Egress		27	3	7	
II.	Shadow	Ingress		19	21	37		II.	Transit	Egress		27	3	49	
II.	Transit	Ingress		19	22	39		III.	Occult.	Reapp.	W.	27	7	48	
III.	Eclipse	Disapp.		19	22	49	46.3	I.	Shadow	Ingress		27	20	26	
I.	Occult.	Reapp.		20	0	7		I.	Transit	Ingress		27	20	45	
II.	Shadow	Egress		20	0	34		I.	Shadow	Egress		27	22	46	
II.	Transit	Egress		20	1	35		I.	Transit	Egress		27	23	5	
III.	Occult.	Reapp.		20	4	30		IV.	Shadow	Ingress	W.	28	16	18	
IV.	Eclipse	Disapp.	W.	20	8	58	36.2	I.	Eclipse	Disapp.	W.	28	17	41	4.9
IV.	Occult.	Reapp.		20	18	28		II.	Eclipse	Disapp.		28	18	58	12.1
I.	Shadow	Ingress		20	18	32		IV.	Transit	Ingress		28	19	7	
I.	Transit	Ingress		20	19	1		I.	Occult.	Reapp.		28	20	17	
I.	Shadow	Egress		20	20	52		IV.	Shadow	Egress		28	21	14	
I.	Transit	Egress		20	21	21		II.	Occult.	Reapp.		28	22	30	
I.	Eclipse	Disapp.	W.	21	15	47	31.5	IV.	Transit	Egress		28	23	59	
II.	Eclipse	Disapp.	W.	21	16	21	35.8	I.	Shadow	Ingress	W.	29	14	54	
I.	Occult.	Reapp.		21	18	33		I.	Transit	Ingress	W.	29	15	11	
II.	Occult.	Reapp.		21	20	14		I.	Shadow	Egress	W.	29	17	14	
I.	Shadow	Ingress	W.	22	13	0		I.	Transit	Egress	W.	29	17	31	
I.	Transit	Ingress	W.	22	13	27		I.	Eclipse	Disapp.	W.	30	12	9	29.7
I.	Shadow	Egress	W.	22	15	20		II.	Shadow	Ingress	W.	30	13	28	
I.	Transit	Egress	W.	22	15	47		II.	Transit	Ingress	W.	30	14	0	
I.	Eclipse	Disapp.	W.	23	10	15	54.5	I.	Occult.	Reapp.	W.	30	14	43	
II.	Shadow	Ingress	W.	23	10	53		II.	Shadow	Egress	W.	30	16	24	
II.	Transit	Ingress	W.	23	11	46		III.	Shadow	Ingress	W.	30	16	33	
III.	Shadow	Ingress	W.	23	12	34		II.	Transit	Egress	W.	30	16	56	
I.	Occult.	Reapp.	W.	23	12	59		III.	Transit	Ingress	W.	30	17	36	
II.	Shadow	Egress	W.	23	13	50		III.	Shadow	Egress		30	20	17	
III.	Transit	Ingress	W.	23	14	18		III.	Transit	Egress		30	21	17	

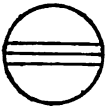
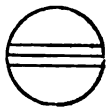
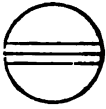
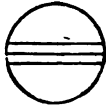
438 JUPITER'S SATELLITES, 1861.

WASHINGTON MEAN TIME.

JANUARY.

I. Shadow Ingress W. $31^d 9^h 23^m$ I. Transit Ingress W. $31^d 9^h 37^m$	I. Shadow Egress W. $31^d 11^h 43^m$ I. Transit Egress W. $31^d 11^h 57^m$
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Phases of the Eclipses of the Satellites for an Inverting Telescope.

I. d * 	III. d * 
II. d * 	IV. d * 

FEBRUARY.

I. Eclipse Disapp. $1^d 6^h 37^m 55.8^s$ II. Eclipse Disapp. W. $1^d 8^h 17^m 5.5^s$ I. Occult. Reapp. W. $1^d 9^h 8^m$ II. Occult. Reapp. W. $1^d 11^h 38^m$ I. Shadow Ingress $2^d 3^h 52^m$ I. Transit Ingress $2^d 4^h 3^m$ I. Shadow Egress $2^d 6^h 12^m$ I. Transit Egress $2^d 6^h 23^m$ I. Eclipse Disapp. $3^d 1^h 6^m 20.9^s$ II. Shadow Ingress $3^d 2^h 44^m$ II. Transit Ingress $3^d 3^h 5^m$ I. Occult. Reapp. $3^d 3^h 34^m$ II. Shadow Egress $3^d 5^h 41^m$ II. Transit Egress $3^d 6^h 1^m$ III. Eclipse Disapp. W. $3^d 6^h 46^m 3.3^s$ III. Occult. Reapp. W. $3^d 11^h 4^m$ I. Shadow Ingress $3^d 22^h 20^m$ I. Transit Ingress $3^d 22^h 29^m$ I. Shadow Egress $4^d 0^h 40^m$ I. Transit Egress $4^d 0^h 49^m$ I. Eclipse Disapp. $4^d 19^h 34^m 45.7^s$ II. Eclipse Disapp. $4^d 21^h 34^m 55.0^s$ I. Occult. Reapp. $4^d 22^h 0^m$ II. Occult. Reapp. $5^d 0^h 45^m$ I. Shadow Ingress W. $5^d 16^h 49^m$ I. Transit Ingress W. $5^d 16^h 55^m$ I. Shadow Egress $5^d 19^h 9^m$	I. Transit Egress $5^d 19^h 15^m$ IV. Eclipse Disapp. $6^d 2^h 58^m 32.3^s$ IV. Occult. Reapp. W. $6^d 8^h 41^m$ I. Eclipse Disapp. W. $6^d 14^h 3^m 12.0^s$ II. Shadow Ingress W. $6^d 16^h 1^m$ II. Transit Ingress W. $6^d 16^h 11^m$ I. Occult. Reapp. W. $6^d 16^h 26^m$ II. Shadow Egress $6^d 18^h 58^m$ II. Transit Egress $6^d 19^h 7^m$ III. Shadow Ingress $6^d 20^h 32^m$ III. Transit Ingress $6^d 20^h 52^m$ III. Shadow Egress $7^d 0^h 15^m$ III. Transit Egress $7^d 0^h 33^m$ I. Shadow Ingress W. $7^d 11^h 17^m$ I. Transit Ingress W. $7^d 11^h 21^m$ I. Shadow Egress W. $7^d 13^h 37^m$ I. Transit Egress W. $7^d 13^h 41^m$ I. Eclipse Disapp. W. $8^d 8^h 31^m 40.4^s$ I. Occult. Reapp. W. $8^d 10^h 51^m$ II. Eclipse Disapp. W. $8^d 10^h 53^m 50.0^s$ II. Occult. Reapp. W. $8^d 13^h 53^m$ I. Shadow Ingress $9^d 5^h 46^m$ I. Transit Ingress $9^d 5^h 47^m$ I. Shadow Egress W. $9^d 8^h 6^m$ I. Transit Egress W. $9^d 8^h 7^m$ I. Occult. Disapp. $10^d 2^h 57^m$ II. Transit Ingress $10^d 5^h 17^m$
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JUPITER'S SATELLITES, 1861. 439

WASHINGTON MEAN TIME.

FEBRUARY.

			d	h	m	s				d	h	m	s
II.	Shadow	Ingress	10	5	18		II.	Shadow	Egress W.	17	10	49	
I.	Occult.	Reapp.	10	5	17		III.	Occult.	Disapp. W.	17	13	53	
II.	Transit	Egress W.	10	8	14		III.	Eclipse	Reapp.	17	18	16	55.0
II.	Shadow	Egress W.	10	8	15		I.	Transit	Ingress	18	1	58	
III.	Occult.	Disapp. W.	10	10	37		I.	Shadow	Ingress	18	2	9	
III.	Occult.	Reapp. W.	10	14	19		I.	Transit	Egress	18	4	18	
I.	Transit	Ingress	11	0	13		I.	Shadow	Egress	18	4	29	
I.	Shadow	Ingress	11	0	15		I.	Occult.	Disapp.	18	23	7	
I.	Transit	Egress	11	2	34		I.	Eclipse	Reapp.	19	1	37	40.4
I.	Shadow	Egress	11	2	35		II.	Occult.	Disapp.	19	2	19	
I.	Occult.	Disapp.	11	21	23		II.	Eclipse	Reapp.	19	5	41	38.0
I.	Occult.	Reapp.	11	23	43		I.	Transit	Ingress	19	20	24	
II.	Occult.	Disapp.	12	0	4		I.	Shadow	Ingress	19	20	37	
II.	Eclipse	Reapp.	12	3	4	50.1	I.	Transit	Egress	19	22	44	
I.	Transit	Ingress	12	18	39		I.	Shadow	Egress	19	22	57	
I.	Shadow	Ingress	12	18	43		I.	Occult.	Disapp. W.	20	17	33	
I.	Transit	Egress	12	21	0		I.	Eclipse	Reapp.	20	20	6	10.5
I.	Shadow	Egress	12	21	3		II.	Transit	Ingress	20	20	36	
I.	Occult.	Disapp. W.	13	15	49		II.	Shadow	Ingress	20	21	9	
I.	Eclipse	Reapp.	13	18	12	10.7	II.	Transit	Egress	20	23	33	
II.	Transit	Ingress	13	18	24		II.	Shadow	Egress	21	0	6	
II.	Shadow	Ingress	13	18	35		III.	Transit	Ingress	21	3	23	
II.	Transit	Egress	13	21	21		III.	Shadow	Ingress	21	4	30	
II.	Shadow	Egress	13	21	32		III.	Transit	Egress W.	21	7	5	
III.	Transit	Ingress	14	0	7		III.	Shadow	Egress W.	21	8	12	
III.	Shadow	Ingress	14	0	31		I.	Transit	Ingress W.	21	14	50	
III.	Transit	Egress	14	3	49		I.	Shadow	Ingress W.	21	15	6	
III.	Shadow	Egress	14	4	14		I.	Transit	Egress W.	21	17	10	
IV.	Transit	Ingress W.	14	9	16		I.	Shadow	Egress W.	21	17	26	
IV.	Shadow	Ingress W.	14	10	18		I.	Occult.	Disapp. W.	22	11	59	
I.	Transit	Ingress W.	14	13	5		I.	Eclipse	Reapp. W.	22	14	34	43.9
I.	Shadow	Ingress W.	14	13	12		II.	Occult.	Disapp. W.	22	15	27	
IV.	Transit	Egress W.	14	14	8		IV.	Occult.	Disapp.	22	17	55	
IV.	Shadow	Egress W.	14	15	13		II.	Eclipse	Reapp.	22	19	0	32.6
I.	Transit	Egress W.	14	15	26		IV.	Eclipse	Reapp.	23	1	44	1.3
I.	Shadow	Egress W.	14	15	33		I.	Transit	Ingress W.	23	9	16	
I.	Occult.	Disapp. W.	15	10	15		I.	Shadow	Ingress W.	23	9	35	
I.	Eclipse	Reapp. W.	15	12	40	41.6	I.	Transit	Egress W.	23	11	36	
II.	Occult.	Disapp. W.	15	13	12		I.	Shadow	Egress W.	23	11	55	
II.	Eclipse	Reapp. W.	15	16	23	44.6	I.	Occult.	Disapp. W.	24	6	25	
I.	Transit	Ingress W.	16	7	31		I.	Eclipse	Reapp. W.	24	9	3	14.3
I.	Shadow	Ingress W.	16	7	40		II.	Transit	Ingress W.	24	9	43	
I.	Transit	Egress W.	16	9	52		II.	Shadow	Ingress W.	24	10	27	
I.	Shadow	Egress W.	16	10	0		II.	Transit	Egress W.	24	12	40	
I.	Occult.	Disapp.	17	4	31		II.	Shadow	Egress W.	24	13	24	
I.	Eclipse	Reapp. W.	17	7	9	10.2	III.	Occult.	Disapp. W.	24	17	10	
II.	Transit	Ingress W.	17	7	30		III.	Eclipse	Reapp.	24	22	15	24.5
II.	Shadow	Ingress W.	17	7	52		I.	Transit	Ingress	25	3	42	
II.	Transit	Egress W.	17	10	26		I.	Shadow	Ingress	25	4	3	

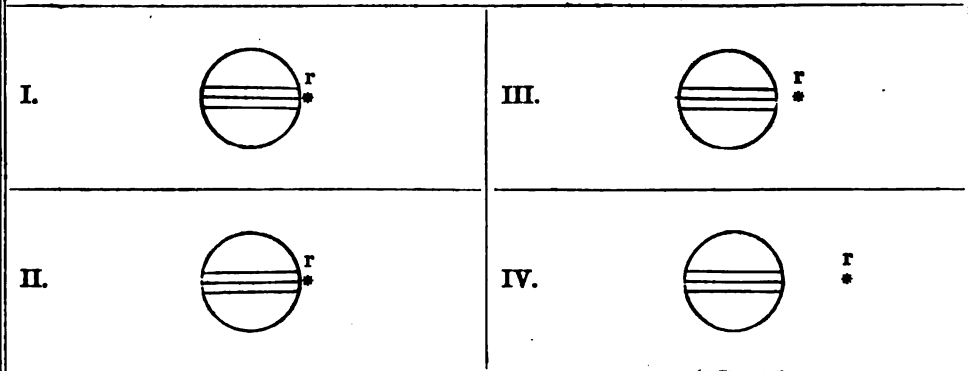
440 JUPITER'S SATELLITES, 1861.

WASHINGTON MEAN TIME.

FEBRUARY.

I. Transit	Egress W.	d	h	m	s	II. Transit	Ingress	d	h	m
I. Shadow	Egress W.	25	6	2		II. Shadow	Ingress	27	22	50
I. Occult.	Disapp.	25	6	23		II. Transit	Egress	28	1	47
I. Eclipse	Reapp.	26	0	51		II. Shadow	Egress	28	2	40
II. Occult.	Disapp.	26	3	31	46.6	III. Transit	Ingress W.	28	6	41
II. Eclipse	Reapp. W.	26	4	35		III. Shadow	Ingress W.	28	8	29
I. Transit	Ingress	26	8	18	28.1	III. Transit	Egress W.	28	10	25
I. Shadow	Ingress	26	22	9		III. Shadow	Egress W.	28	12	12
I. Transit	Egress	26	22	32		I. Transit	Ingress W.	28	16	35
I. Shadow	Egress	27	0	29		I. Shadow	Ingress W.	28	17	0
I. Transit	Egress	27	0	52		I. Transit	Egress	28	18	55
I. Occult.	Disapp.	27	19	17		I. Shadow	Egress	28	19	20
I. Eclipse	Reapp.	27	22	0	18.8					

Phases of the Eclipses of the Satellites for an Inverting Telescope.



MARCH.

I. Occult.	Disapp. W.	d	h	m	s	II. Shadow	Egress W.	d	h	m	s
I. Eclipse	Reapp. W.	1	13	43		III. Occult.	Disapp.	3	15	57	
II. Occult.	Disapp.	1	16	28	54.2	III. Eclipse	Reapp.	4	2	13	56.5
II. Eclipse	Reapp. W.	1	17	44		I. Transit	Ingress	4	5	28	
I. Transit	Ingress W.	1	21	37	22.3	I. Shadow	Ingress	4	5	58	
I. Shadow	Ingress W.	2	11	1		I. Transit	Egress W.	4	7	47	
I. Transit	Egress W.	2	11	29		I. Shadow	Egress W.	4	8	18	
I. Shadow	Egress W.	2	13	21		I. Occult.	Disapp.	5	2	35	
I. Shadow	Egress W.	2	13	49		I. Eclipse	Reapp.	5	5	26	1.1
IV. Transit	Ingress	2	23	32		II. Occult.	Disapp. W.	5	6	52	
IV. Shadow	Ingress	3	4	18		II. Eclipse	Reapp. W.	5	10	53	19.9
IV. Transit	Egress	3	4	26		I. Transit	Ingress	5	23	54	
I. Occult.	Disapp. W.	3	8	9		I. Shadow	Ingress	6	0	27	
IV. Shadow	Egress W.	3	9	12		I. Transit	Egress	6	2	13	
I. Eclipse	Reapp. W.	3	10	57	26.6	I. Shadow	Egress	6	2	47	
II. Transit	Ingress W.	3	11	58		I. Occult.	Disapp.	6	21	2	
II. Shadow	Ingress W.	3	13	0		I. Eclipse	Reapp.	6	23	54	35.0
II. Transit	Egress W.	3	14	54							

JUPITER'S SATELLITES, 1861. 441

WASHINGTON MEAN TIME.

MARCH.

		d	h	m	s			d	h	m	s			
II.	Transit	Ingress	7	1	6	II.	Shadow	Egress	W.	14	7	56		
II.	Shadow	Ingress	7	2	19	III.	Transit	Ingress	W.	14	13	27		
II.	Transit	Egress	7	4	2	III.	Shadow	Ingress		14	16	28		
II.	Shadow	Egress	7	5	15	III.	Transit	Egress		14	17	9		
III.	Transit	Ingress	W.	7	10	2	I.	Transit	Ingress		14	20	6	
III.	Shadow	Ingress	W.	7	12	23	III.	Shadow	Egress		14	20	10	
III.	Transit	Egress	W.	7	13	45	I.	Shadow	Ingress		14	20	50	
III.	Shadow	Egress	W.	7	16	11	I.	Transit	Egress		14	22	25	
I.	Transit	Ingress		7	18	20	I.	Shadow	Egress		14	23	10	
I.	Shadow	Ingress		7	18	55	I.	Occult.	Disapp.		15	17	14	
I.	Transit	Egress		7	20	39	I.	Eclipse	Reapp.		15	20	17	38.9
I.	Shadow	Egress		7	21	15	II.	Occult.	Disapp.		15	22	23	
I.	Occult.	Disapp.	W.	8	15	28	II.	Eclipse	Reapp.		16	2	51	2.0
I.	Eclipse	Reapp.		8	18	23	12.7	I.	Transit	Ingress	W.	16	14	33
II.	Occult.	Disapp.		8	20	2	I.	Shadow	Ingress	W.	16	15	19	
II.	Eclipse	Reapp.		9	0	14	12.6	I.	Transit	Egress		16	16	52
I.	Transit	Ingress	W.	9	12	47	I.	Shadow	Egress		16	17	39	
I.	Shadow	Ingress	W.	9	13	24	I.	Occult.	Disapp.	W.	17	11	40	
I.	Transit	Egress	W.	9	15	6	I.	Eclipse	Reapp.	W.	17	14	46	15.3
I.	Shadow	Egress	W.	9	15	44	II.	Transit	Ingress		17	16	32	
I.	Occult.	Disapp.	W.	10	9	54	II.	Shadow	Ingress		17	18	11	
I.	Eclipse	Reapp.	W.	10	12	51	47.1	II.	Transit	Egress		17	19	29
II.	Transit	Ingress	W.	10	14	14	II.	Shadow	Egress		17	21	7	
II.	Shadow	Ingress	W.	10	15	36	III.	Occult.	Disapp.		18	3	16	
II.	Transit	Egress		10	17	10	I.	Transit	Ingress	W.	18	8	59	
II.	Shadow	Egress		10	18	32	I.	Shadow	Ingress	W.	18	9	47	
III.	Occult.	Disapp.		10	23	51	III.	Eclipse	Reapp.	W.	18	10	10	57.6
III.	Eclipse	Reapp.		11	6	12	21.5	I.	Transit	Egress	W.	18	11	19
I.	Transit	Ingress	W.	11	7	13	I.	Shadow	Egress	W.	18	12	7	
I.	Shadow	Ingress	W.	11	7	52	I.	Occult.	Disapp.		19	6	7	
IV.	Occult.	Disapp.	W.	11	8	24	I.	Eclipse	Reapp.	W.	19	9	14	53.8
I.	Transit	Egress	W.	11	9	32	II.	Occult.	Disapp.	W.	19	11	32	
I.	Shadow	Egress	W.	11	10	12	IV.	Transit	Ingress	W.	19	14	22	
IV.	Occult.	Reapp.	W.	11	13	19	II.	Eclipse	Reapp.		19	16	9	1.8
IV.	Eclipse	Disapp.	W.	11	15	0	56.6	IV.	Transit	Egress		19	19	17
IV.	Eclipse	Reapp.		11	19	44	39.8	IV.	Shadow	Ingress		19	22	18
I.	Occult.	Disapp.		12	4	21	IV.	Shadow	Egress		20	3	12	
I.	Eclipse	Reapp.	W.	12	7	20	23.6	I.	Transit	Ingress		20	3	26
II.	Occult.	Disapp.	W.	12	9	11	I.	Shadow	Ingress		20	4	16	
II.	Eclipse	Reapp.	W.	12	13	32	11.6	I.	Transit	Egress		20	5	46
I.	Transit	Ingress		13	1	40	I.	Shadow	Egress	W.	20	6	36	
I.	Shadow	Ingress		13	2	21	I.	Occult.	Disapp.		21	0	34	
I.	Transit	Egress		13	3	59	I.	Eclipse	Reapp.		21	3	43	30.9
I.	Shadow	Egress		13	4	41	II.	Transit	Ingress		21	5	42	
I.	Occult.	Disapp.		13	22	47	II.	Shadow	Ingress	W.	21	7	28	
I.	Eclipse	Reapp.		14	1	48	59.2	II.	Transit	Egress	W.	21	8	38
II.	Transit	Ingress		14	3	23	II.	Shadow	Egress	W.	21	10	25	
II.	Shadow	Ingress		14	4	53	III.	Transit	Ingress		21	16	54	
II.	Transit	Egress		14	6	20	III.	Shadow	Ingress		21	20	27	

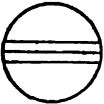
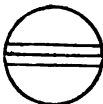
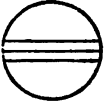
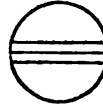
442 JUPITER'S SATELLITES, 1861.

WASHINGTON MEAN TIME.

MARCH.

		d	h	m	s			d	h	m	s			
III.	Transit	Egress	21	20	37			I.	Shadow	Ingress	27	6	12	
I.	Transit	Ingress	21	21	53			I.	Transit	Egress W.	27	7	34	
I.	Shadow	Ingress	21	22	45			I.	Shadow	Egress W.	27	8	32	
III.	Shadow	Egress	22	0	9			IV.	Occult.	Disapp.	27	23	38	
I.	Transit	Egress	22	0	13			I.	Occult.	Disapp.	28	2	23	
I.	Shadow	Egress	22	1	5			IV.	Occult.	Reapp.	28	4	33	
I.	Occult.	Disapp.	22	19	1			I.	Eclipse	Reapp.	28	5	38	9.0
I.	Eclipse	Reapp.	22	22	12	2.6		II.	Transit	Ingress W.	28	8	3	
II.	Occult.	Disapp.	23	0	44			IV.	Eclipse	Disapp. W.	28	9	2	44.3
II.	Eclipse	Reapp.	23	5	27	49.2		II.	Transit	Ingress W.	28	10	3	
I.	Transit	Ingress	23	16	20			II.	Transit	Egress W.	28	11	0	
I.	Shadow	Ingress	23	17	14			II.	Shadow	Egress W.	28	13	0	
I.	Transit	Egress	23	18	40			IV.	Eclipse	Reapp. W.	28	13	45	2.1
I.	Shadow	Egress	23	19	34			III.	Transit	Ingress	28	20	26	
I.	Occult.	Disapp. W.	24	13	28			I.	Transit	Ingress	28	23	41	
I.	Eclipse	Reapp.	24	16	40	50.3		III.	Transit	Egress	29	0	8	
II.	Transit	Ingress	24	18	52			III.	Shadow	Ingress	29	0	26	
II.	Shadow	Ingress	24	20	46			I.	Shadow	Ingress	29	0	40	
II.	Transit	Egress	24	21	49			I.	Transit	Egress	29	2	1	
II.	Shadow	Egress	24	23	42			I.	Shadow	Egress	29	3	0	
III.	Occult.	Disapp. W.	25	6	45			III.	Shadow	Egress	29	4	8	
III.	Occult.	Reapp. W.	25	10	28			I.	Occult.	Disapp.	29	20	49	
III.	Eclipse	Disapp. W.	25	10	37	29.9		I.	Eclipse	Reapp.	30	0	6	52.2
I.	Transit	Ingress W.	25	10	47			II.	Occult.	Disapp.	30	3	7	
I.	Shadow	Ingress W.	25	11	43			II.	Eclipse	Reapp. W.	30	8	4	32.9
I.	Transit	Egress W.	25	13	7			I.	Transit	Ingress	30	18	8	
I.	Shadow	Egress W.	25	14	3			I.	Shadow	Ingress	30	19	9	
III.	Eclipse	Reapp. W.	25	14	10	9.5		I.	Transit	Egress	30	20	28	
I.	Occult.	Disapp. W.	26	7	55			I.	Shadow	Egress	30	21	29	
I.	Eclipse	Reapp. W.	26	11	9	30.5		I.	Occult.	Disapp.	31	15	16	
II.	Occult.	Disapp. W.	26	13	55			I.	Eclipse	Reapp.	31	18	35	31.5
II.	Eclipse	Reapp.	26	18	45	49.1		II.	Transit	Ingress	31	21	14	
I.	Transit	Ingress	27	5	14			II.	Shadow	Ingress	31	23	21	

Phases of the Eclipses of the Satellites for an Inverting Telescope.

<p>I. </p>	<p>III. </p>
<p>II. </p>	<p>IV. </p>

JUPITER'S SATELLITES, 1861. 443

WASHINGTON MEAN TIME.

APRIL.

		d	h	m	s			d	h	m	s		
II.	Transit	Egress	1	0	13		II.	Shadow	Egress	8	4	53	
II.	Shadow	Egress	1	2	17		III.	Occult.	Disapp. W.	8	13	58	
III.	Occult.	Disapp. W.	1	10	19		I.	Transit	Ingress	8	14	25	
I.	Transit	Ingress W.	1	12	35		I.	Shadow	Ingress	8	15	33	
I.	Shadow	Ingress W.	1	13	38		I.	Transit	Egress	8	16	45	
III.	Occult.	Reapp. W.	1	14	2		III.	Occult.	Reapp.	8	17	41	
III.	Eclipse	Disapp. W.	1	14	36	46.3	I.	Shadow	Egress	8	17	53	
I.	Transit	Egress	1	14	55		III.	Eclipse	Disapp.	8	18	36	38.8
I.	Shadow	Egress	1	15	58		III.	Eclipse	Reapp.	8	22	8	56.8
III.	Eclipse	Reapp.	1	18	9	15.5	I.	Occult.	Disapp. W.	9	11	33	
I.	Occult.	Disapp. W.	2	9	43		I.	Eclipse	Reapp.	9	14	59	1.9
I.	Eclipse	Reapp. W.	2	13	4	13.3	II.	Occult.	Disapp.	9	18	47	
II.	Occult.	Disapp.	2	16	20		II.	Eclipse	Reapp.	9	23	59	19.9
II.	Eclipse	Reapp.	2	21	22	32.4	I.	Transit	Ingress W.	10	8	53	
I.	Transit	Ingress W.	3	7	3		I.	Shadow	Ingress W.	10	10	2	
I.	Shadow	Ingress W.	3	8	7		I.	Transit	Egress W.	10	11	13	
I.	Transit	Egress W.	3	9	23		I.	Shadow	Egress W.	10	12	22	
I.	Shadow	Egress W.	3	10	27		I.	Occult.	Disapp	11	6	1	
I.	Occult.	Disapp.	4	4	11		I.	Eclipse	Reapp. W.	11	9	27	42.8
I.	Eclipse	Reapp. W.	4	7	32	53.0	II.	Transit	Ingress W.	11	12	54	
II.	Transit	Ingress W.	4	10	28		II.	Shadow	Ingress	11	15	15	
II.	Shadow	Ingress W.	4	12	39		II.	Transit	Egress	11	15	50	
II.	Transit	Egress W.	4	13	22		II.	Shadow	Egress	11	18	11	
II.	Shadow	Egress W.	4	15	35		I.	Transit	Ingress	12	3	21	
III.	Transit	Ingress	5	0	2		III.	Transit	Ingress	12	3	43	
I.	Transit	Ingress	5	1	30		I.	Shadow	Ingress	12	4	30	
I.	Shadow	Ingress	5	2	36		I.	Transit	Egress	12	5	41	
III.	Transit	Egress	5	3	47		I.	Shadow	Egress	12	6	50	
I.	Transit	Egress	5	3	50		III.	Transit	Egress W.	12	7	26	
III.	Shadow	Ingress	5	4	25		III.	Shadow	Ingress W.	12	8	24	
I.	Shadow	Egress	5	4	56		III.	Shadow	Egress W.	12	12	6	
IV.	Transit	Ingress	5	6	4		I.	Occult.	Disapp.	13	0	29	
III.	Shadow	Egress W.	5	8	7		I.	Eclipse	Reapp.	13	3	56	29.0
IV.	Transit	Egress W.	5	10	58		II.	Occult.	Disapp. W.	13	8	1	
IV.	Shadow	Ingress	5	16	19		II.	Eclipse	Reapp. W.	13	13	17	44.3
IV.	Shadow	Egress	5	21	12		IV.	Occult.	Disapp.	13	15	48	
I.	Occult.	Disapp.	5	23	38		IV.	Occult.	Reapp.	13	20	42	
I.	Eclipse	Reapp.	6	2	1	37.8	I.	Transit	Ingress	13	21	49	
II.	Occult.	Disapp.	6	5	33		I.	Shadow	Ingress	13	22	59	
II.	Eclipse	Reapp. W.	6	10	41	11.2	I.	Transit	Egress	14	0	9	
I.	Transit	Ingress	6	19	58		I.	Shadow	Egress	14	1	19	
I.	Shadow	Ingress	6	21	5		IV.	Eclipse	Disapp.	14	3	4	55.5
I.	Transit	Egress	6	22	18		IV.	Eclipse	Reapp. W.	14	7	45	31.1
I.	Shadow	Egress	6	23	25		I.	Occult.	Disapp.	14	18	57	
I.	Occult.	Disapp.	7	17	6		I.	Eclipse	Reapp.	14	22	25	10.8
I.	Eclipse	Reapp.	7	20	30	18.3	II.	Transit	Ingress	15	2	9	
II.	Transit	Ingress	7	23	41		II.	Shadow	Ingress	15	4	33	
II.	Shadow	Ingress	8	1	57		II.	Transit	Egress	15	5	5	
II.	Transit	Egress	8	2	37		II.	Shadow	Egress W.	15	7	29	

444 JUPITER'S SATELLITES, 1861.

WASHINGTON MEAN TIME.

APRIL.

			d	h	m	s				d	h	m	s
I.	Transit	Ingress	15	16	17			I.	Shadow	Ingress	22	19	23
I.	Shadow	Ingress	15	17	28			I.	Transit	Egress	22	20	30
III.	Occult.	Disapp.	15	17	41			III.	Occult.	Disapp.	22	21	29
I.	Transit	Egress	15	18	37			I.	Shadow	Egress	22	21	43
I.	Shadow	Egress	15	19	48			III.	Occult.	Reapp.	23	1	12
III.	Occult.	Reapp.	15	21	24			III.	Eclipse	Disapp.	23	2	35 13.6
III.	Eclipse	Disapp.	15	22	35	57.1		III.	Eclipse	Reapp.	23	6	7 6.6
III.	Eclipse	Reapp.	16	2	8	3.1		I.	Occult.	Disapp.	23	15	27
I.	Occult.	Disapp. W.	16	13	25			I.	Eclipse	Reapp.	23	18	48 52.0
I.	Eclipse	Reapp.	16	16	53	55.3		II.	Occult.	Disapp.	23	23	48
II.	Occult.	Disapp.	16	21	16			II.	Eclipse	Reapp.	24	5	12 6.1
II.	Eclipse	Reapp.	17	2	35	41.8		I.	Transit	Ingress W.	24	12	38
I.	Transit	Ingress W.	17	10	45			I.	Shadow	Ingress	24	13	52
I.	Shadow	Ingress W.	17	11	57			I.	Transit	Egress	24	14	58
I.	Transit	Egress W.	17	13	5			I.	Shadow	Egress	24	16	12
I.	Shadow	Egress	17	14	17			I.	Occult.	Disapp. W.	25	9	45
I.	Occult.	Disapp. W.	18	7	53			I.	Eclipse	Reapp. W.	25	13	17 34.1
I.	Eclipse	Reapp. W.	18	11	22	36.6		II.	Transit	Ingress	25	17	55
II.	Transit	Ingress	18	15	24			II.	Shadow	Ingress	25	20	26
II.	Shadow	Ingress	18	17	51			II.	Transit	Egress	25	20	52
II.	Transit	Egress	18	18	20			II.	Shadow	Egress	25	23	23
II.	Shadow	Egress	18	20	47			I.	Transit	Ingress	26	7	6
I.	Transit	Ingress	19	5	13			I.	Shadow	Ingress W.	26	8	21
I.	Shadow	Ingress	19	6	25			I.	Transit	Egress W.	26	9	26
III.	Transit	Ingress W.	19	7	29			I.	Shadow	Egress W.	26	10	41
I.	Transit	Egress W.	19	7	33			III.	Transit	Ingress W.	26	11	19
I.	Shadow	Egress W.	19	8	45			III.	Transit	Egress	26	15	2
III.	Transit	Egress W.	19	11	12			III.	Shadow	Ingress	26	16	24
III.	Shadow	Ingress W.	19	12	24			III.	Shadow	Egress	26	20	5.
III.	Shadow	Egress	19	16	6			I.	Occult.	Disapp.	27	4	13
I.	Occult.	Disapp.	20	2	21			I.	Eclipse	Reapp. W.	27	7	46 22.3
I.	Eclipse	Reapp.	20	5	51	24.0		II.	Occult.	Disapp.	27	13	4
II.	Occult.	Disapp. W.	20	10	32			II.	Eclipse	Reapp.	27	18	30 28.0
II.	Eclipse	Reapp.	20	15	54	9.6		I.	Transit	Ingress	28	1	35
I.	Transit	Ingress	20	23	41			I.	Shadow	Ingress	28	2	50
I.	Shadow	Ingress	21	0	54			I.	Transit	Egress	28	3	55
I.	Transit	Egress	21	2	1			I.	Shadow	Egress	28	5	10
I.	Shadow	Egress	21	3	14			I.	Occult.	Disapp.	28	22	42
I.	Occult.	Disapp.	21	20	49			I.	Eclipse	Reapp.	29	2	15 5.6
IV.	Transit	Ingress	21	22	42			II.	Transit	Ingress	29	7	12
I.	Eclipse	Reapp.	22	0	20	6.3		II.	Shadow	Ingress W.	29	9	44
IV.	Transit	Egress	22	3	36			II.	Transit	Egress W.	29	10	8
II.	Transit	Ingress	22	4	40			II.	Shadow	Egress W.	29	12	40
II.	Shadow	Ingress	22	7	8			I.	Transit	Ingress	29	20	3
II.	Transit	Egress W.	22	7	36			I.	Shadow	Ingress	29	21	18
II.	Shadow	Egress W.	22	10	5			I.	Transit	Egress	29	22	23
IV.	Shadow	Ingress W.	22	10	21			I.	Shadow	Egress	29	23	38
IV.	Shadow	Egress	22	15	11			III.	Occult.	Disapp.	30	1	21
I.	Transit	Ingress	22	18	10			III.	Occult.	Reapp.	30	5	4

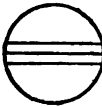
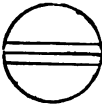
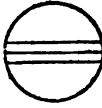
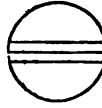
JUPITER'S SATELLITES, 1861. 445

WASHINGTON MEAN TIME.

APRIL.

III. Eclipse	Disapp.	d	h	m	s		I. Occult.	Disapp.	d	h	m	s
IV. Occult.	Disapp. W.	30	6	34	20.1		I. Eclipse	Reapp.	30	20	43	52.3
III. Eclipse	Reapp. W.	30	10	5	59.5		IV. Eclipse	Disapp.	30	21	7	53.4
IV. Occult.	Reapp.	30	13	52								

Phases of the Eclipses of the Satellites for an Inverting Telescope.

I. 	III. 
II. 	IV. 

MAY.

IV. Eclipse	Reapp.	d	h	m	s		I. Transit	Ingress	d	h	m	s
II. Occult.	Disapp.	1	2	21			I. Shadow	Ingress	5	4	44	
II. Eclipse	Reapp. W.	1	7	48	21.4		I. Transit	Egress	5	5	49	
I. Transit	Ingress	1	14	32			I. Shadow	Egress	5	7	4	
I. Shadow	Ingress	1	15	47			I. Occult.	Disapp.	6	0	36	
I. Transit	Egress	1	16	52			I. Eclipse	Reapp.	6	4	10	8.1
I. Shadow	Egress	1	18	7			II. Transit	Ingress W.	6	9	47	
I. Occult.	Disapp. W.	2	11	39			II. Shadow	Ingress W.	6	12	20	
I. Eclipse	Reapp.	2	15	12	35.2		II. Transit	Egress	6	12	43	
II. Transit	Ingress	2	20	30			II. Shadow	Egress	6	15	17	
II. Shadow	Ingress	2	23	3			I. Transit	Ingress	6	21	57	
II. Transit	Egress	2	23	26			I. Shadow	Ingress	6	23	13	
II. Shadow	Egress	3	2	0			I. Transit	Egress	7	0	17	
I. Transit	Ingress W.	3	9	0			I. Shadow	Egress	7	1	33	
I. Shadow	Ingress W.	3	10	16			III. Occult.	Disapp.	7	5	17	
I. Transit	Egress W.	3	11	20			III. Occult.	Reapp. W.	7	9	0	
I. Shadow	Egress W.	3	12	36			III. Eclipse	Disapp. W.	7	10	33	33.8
III. Transit	Ingress	3	15	14			III. Eclipse	Reapp.	7	14	4	58.6
III. Transit	Egress	3	18	57			I. Occult.	Disapp.	7	19	5	
III. Shadow	Ingress	3	20	24			I. Eclipse	Reapp.	7	22	38	55.4
III. Shadow	Egress	4	0	5			II. Occult.	Disapp.	8	4	57	
I. Occult.	Disapp.	4	6	7			II. Eclipse	Reapp. W.	8	10	24	27.7
I. Eclipse	Reapp. W.	4	9	41	24.0		IV. Transit	Ingress	8	16	16	
II. Occult.	Disapp.	4	15	39			I. Transit	Ingress	8	16	26	
II. Eclipse	Reapp.	4	21	6	36.9		I. Shadow	Ingress	8	17	42	

446 JUPITER'S SATELLITES, 1861.

WASHINGTON MEAN TIME.

MAY.

		d	h	m	s			d	h	m	s		
I.	Transit	Egress	8	18	46			I.	Occult.	Disapp.	16	15	29
I.	Shadow	Egress	8	20	2			I.	Eclipse	Reapp.	16	19	2 43.2
IV.	Transit	Egress	8	21	11			II.	Transit	Ingress	17	1	43
IV.	Shadow	Ingress	9	4	22			IV.	Occult.	Disapp.	17	2	58
IV.	Shadow	Egress W.	9	9	10			II.	Shadow	Ingress	17	4	15
I.	Occult.	Disapp.	9	13	33			II.	Transit	Egress	17	4	40
I.	Eclipse	Reapp.	9	17	7 38.6			II.	Shadow	Egress	17	7	12
II.	Transit	Ingress	9	23	5			IV.	Occult.	Reapp.	17	7	53
II.	Shadow	Ingress	10	1	39			I.	Transit	Ingress	17	12	50
II.	Transit	Egress	10	2	2			I.	Shadow	Ingress	17	14	6
II.	Shadow	Egress	10	4	35			I.	Transit	Egress	17	15	10
I.	Transit	Ingress W.	10	10	54			IV.	Eclipse	Disapp.	17	15	10 22.5
I.	Shadow	Ingress W.	10	12	10			I.	Shadow	Egress	17	16	26
I.	Transit	Egress	10	13	14			IV.	Eclipse	Reapp.	17	19	46 40.3
I.	Shadow	Egress	10	14	30			III.	Transit	Ingress	17	23	15
III.	Transit	Ingress	10	19	12			III.	Transit	Egress	18	2	58
III.	Transit	Egress	10	22	55			III.	Shadow	Ingress	18	4	22
III.	Shadow	Ingress	11	0	23			III.	Shadow	Egress W.	18	8	3
III.	Shadow	Egress	11	4	4			I.	Occult.	Disapp. W.	18	9	58
I.	Occult.	Disapp. W.	11	8	2			I.	Eclipse	Reapp.	18	13	31 33.0
I.	Eclipse	Reapp. W.	11	11	36 28.1			II.	Occult.	Disapp.	18	20	53
II.	Occult.	Disapp.	11	18	15			II.	Eclipse	Reapp.	19	2	18 25.5
II.	Eclipse	Reapp.	11	23	42 36.2			I.	Transit	Ingress	19	7	19
I.	Transit	Ingress	12	5	23			I.	Shadow	Ingress W.	19	8	35
I.	Shadow	Ingress	12	6	39			I.	Transit	Egress W.	19	9	39
I.	Transit	Egress	12	7	43			I.	Shadow	Egress W.	19	10	55
I.	Shadow	Egress W.	12	8	59			I.	Occult.	Disapp.	20	4	27
I.	Occult.	Disapp.	13	2	31			I.	Eclipse	Reapp. W.	20	8	0 17.8
I.	Eclipse	Reapp.	13	6	5 12.2			II.	Transit	Ingress	20	15	4
II.	Transit	Ingress	13	12	24			II.	Shadow	Ingress	20	17	33
II.	Shadow	Ingress	13	14	57			II.	Transit	Egress	20	18	0
II.	Transit	Egress	13	15	20			II.	Shadow	Egress	20	20	30
II.	Shadow	Egress	13	17	53			I.	Transit	Ingress	21	1	48
I.	Transit	Ingress	13	23	52			I.	Shadow	Ingress	21	3	3
I.	Shadow	Ingress	14	1	8			I.	Transit	Egress	21	4	8
I.	Transit	Egress	14	2	12			I.	Shadow	Egress	21	5	23
I.	Shadow	Egress	14	3	28			III.	Occult.	Disapp.	21	13	22
III.	Occult.	Disapp. W.	14	9	18			III.	Occult.	Reapp.	21	17	5
III.	Occult.	Reapp.	14	13	1			III.	Eclipse	Disapp.	21	18	32 54.2
III.	Eclipse	Disapp.	14	14	33 19.7			III.	Eclipse	Reapp.	21	22	3 47.6
III.	Eclipse	Reapp.	14	18	4 29.3			I.	Occult.	Disapp.	21	22	56
I.	Occult.	Disapp.	14	21	0			I.	Eclipse	Reapp.	22	2	29 5.8
I.	Eclipse	Reapp.	15	0	34 0.0			II.	Occult.	Disapp. W.	22	10	13
II.	Occult.	Disapp.	15	7	34			II.	Eclipse	Reapp.	22	15	36 9.8
II.	Eclipse	Reapp.	15	13	0 24.1			I.	Transit	Ingress	22	20	17
I.	Transit	Ingress	15	18	21			I.	Shadow	Ingress	22	21	32
I.	Shadow	Ingress	15	19	37			I.	Transit	Egress	22	22	37
I.	Transit	Egress	15	20	41			I.	Shadow	Egress	22	23	52
I.	Shadow	Egress	15	21	57			I.	Occult.	Disapp.	23	17	26

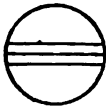
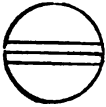
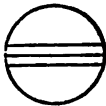
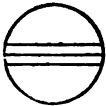
JUPITER'S SATELLITES, 1861. 447

WASHINGTON MEAN TIME.

M A Y .

		d	h	m	s			d	h	m	s
I.	Eclipse Reapp.	23	20	57	49.1	II.	Transit Egress	27	20	40	
II.	Transit Ingress	24	4	33		II.	Shadow Egress	27	23	6	
II.	Shadow Ingress	24	6	52		I.	Transit Ingress	28	3	44	
II.	Transit Egress	24	7	20		I.	Shadow Ingress	28	4	58	
II.	Shadow Egress W.	24	9	48		I.	Transit Egress	28	6	4	
I.	Transit Ingress	24	14	46		I.	Shadow Egress	28	7	18	
I.	Shadow Ingress	24	16	1		III.	Occult. Disapp.	28	17	31	
I.	Transit Egress	24	17	6		III.	Occult. Reapp.	28	21	14	
I.	Shadow Egress	24	18	21		III.	Eclipse Disapp.	28	23	32	58.5
III.	Transit Ingress	25	3	20		I.	Occult. Disapp.	29	0	54	
III.	Transit Egress	25	7	3		III.	Eclipse Reapp.	29	2	3	34.9
III.	Shadow Ingress W.	25	8	21		I.	Eclipse Reapp.	29	4	24	12.2
IV.	Transit Ingress W.	25	10	40		II.	Occult. Disapp.	29	12	53	
I.	Occult. Disapp.	25	11	55		II.	Eclipse Reapp.	29	18	11	44.8
III.	Shadow Egress	25	12	2		I.	Transit Ingress	29	22	14	
I.	Eclipse Reapp.	25	15	26	59.2	I.	Shadow Ingress	29	23	27	
IV.	Transit Egress	25	15	35		I.	Transit Egress	30	0	34	
IV.	Shadow Ingress	25	22	24		I.	Shadow Egress	30	1	47	
II.	Occult. Disapp.	25	23	33		I.	Occult. Disapp.	30	19	23	
IV.	Shadow Egress	26	3	12		I.	Eclipse Reapp.	30	22	52	55.1
II.	Eclipse Reapp.	26	4	54	4.3	II.	Transit Ingress	31	7	5	
I.	Transit Ingress W.	26	9	15		II.	Shadow Ingress W.	31	9	29	
I.	Shadow Ingress W.	26	10	29		II.	Transit Egress W.	31	10	1	
I.	Transit Egress	26	11	35		II.	Shadow Egress	31	12	25	
I.	Shadow Egress	26	12	49		I.	Transit Ingress	31	16	43	
I.	Occult. Disapp.	27	6	24		I.	Shadow Ingress	31	17	56	
I.	Eclipse Reapp. W.	27	9	55	23.7	I.	Transit Egress	31	19	3	
II.	Transit Ingress	27	17	44		I.	Shadow Egress	31	20	16	
II.	Shadow Ingress	27	20	10							

Phases of the Eclipses of the Satellites for an Inverting Telescope.

<p>I.  r *</p>	<p>III.  d * r *</p>
<p>II.  r *</p>	<p>IV.  d * r *</p>

448 JUPITER'S SATELLITES, 1861.

WASHINGTON MEAN TIME.

JUNE.

		d	h	m	s			d	h	m	s
III.	Transit	Ingress	1	7	29			III.	Transit	Egress	8 15 24
III.	Transit	Egress	1	11	12			I.	Occult.	Disapp	8 15 51
III.	Shadow	Ingress	1	12	21			III.	Shadow	Ingress	8 16 20
I.	Occult.	Disapp.	1	13	52			I.	Eclipse	Reapp.	8 19 16 50.3
III.	Shadow	Egress	1	16	1			III.	Shadow	Egress	8 20 0
I.	Eclipse	Reapp.	1	17	21	45.0		II.	Occult.	Disapp.	9 4 56
II.	Occult.	Disapp.	2	2	14			II.	Eclipse	Reapp. W.	9 10 4 49.2
II.	Eclipse	Reapp.	2	7	29	32.0		I.	Transit	Ingress	9 13 11
I.	Transit	Ingress	2	11	13			I.	Shadow	Ingress	9 14 19
I.	Shadow	Ingress	2	12	24			I.	Transit	Egress	9 15 31
I.	Transit	Egress	2	13	33			I.	Shadow	Egress	9 16 39
I.	Shadow	Egress	2	14	44			I.	Occult.	Disapp. W.	10 10 20
IV.	Occult.	Disapp.	2	21	45			I.	Eclipse	Reapp.	10 13 45 34.4
IV.	Occult.	Reapp.	3	2	40			II.	Transit	Ingress	10 23 11
I.	Occult.	Disapp. W.	3	8	22			II.	Shadow	Ingress	11 1 24
IV.	Eclipse	Disapp. W.	3	9	12	41.4		II.	Transit	Egress	11 2 7
I.	Eclipse	Reapp.	3	11	50	29.1		II.	Shadow	Egress	11 4 20
IV.	Eclipse	Reapp.	3	13	46	23.8		IV.	Transit	Ingress	11 5 44
II.	Transit	Ingress	3	20	26			I.	Transit	Ingress	11 7 40
II.	Shadow	Ingress	3	22	47			I.	Shadow	Ingress W.	11 8 47
II.	Transit	Egress	3	23	22			I.	Transit	Egress W.	11 10 0
II.	Shadow	Egress	4	1	43			IV.	Transit	Egress W.	11 10 39
I.	Transit	Ingress	4	5	42			I.	Shadow	Egress	11 11 7
I.	Shadow	Ingress	4	6	53			IV.	Shadow	Ingress	11 16 25
I.	Transit	Egress	4	8	2			IV.	Shadow	Egress	11 21 10
I.	Shadow	Egress W.	4	9	13			III.	Occult.	Disapp.	12 1 55
III.	Occult.	Disapp.	4	21	42			I.	Occult.	Disapp.	12 4 50
III.	Occult.	Reapp.	5	1	24			III.	Occult.	Reapp.	12 5 36
III.	Eclipse	Disapp.	5	2	32	24.0		III.	Eclipse	Disapp.	12 6 31 42.4
I.	Occult.	Disapp.	5	2	51			I.	Eclipse	Reapp. W.	12 8 14 22.7
III.	Eclipse	Reapp.	5	6	2	42.0		III.	Eclipse	Reapp. W.	12 10 1 42.4
I.	Eclipse	Reapp.	5	6	19	17.6		II.	Occult.	Disapp.	12 18 17
II.	Occult.	Disapp.	5	15	35			II.	Eclipse	Reapp.	12 23 22 21.6
II.	Eclipse	Reapp.	5	20	47	8.6		I.	Transit	Ingress	13 2 10
I.	Transit	Ingress	6	0	12			I.	Shadow	Ingress	13 3 16
I.	Shadow	Ingress	6	1	21			I.	Transit	Egress	13 4 30
I.	Transit	Egress	6	2	32			I.	Shadow	Egress	13 5 36
I.	Shadow	Egress	6	3	41			I.	Occult.	Disapp.	13 23 20
I.	Occult.	Disapp.	6	21	21			I.	Eclipse	Reapp.	14 2 43 5.5
I.	Eclipse	Reapp.	7	0	48	1.5		II.	Transit	Ingress	14 12 32
II.	Transit	Ingress W.	7	9	48			II.	Shadow	Ingress	14 14 43
II.	Shadow	Ingress	7	12	6			II.	Transit	Egress	14 15 29
II.	Transit	Egress	7	12	44			II.	Shadow	Egress	14 17 39
II.	Shadow	Egress	7	15	2			I.	Transit	Ingress	14 20 39
I.	Transit	Ingress	7	18	41			I.	Shadow	Ingress	14 21 45
I.	Shadow	Ingress	7	19	50			I.	Transit	Egress	14 22 59
I.	Transit	Egress	7	21	1			I.	Shadow	Egress	15 0 5
I.	Shadow	Egress	7	22	10			III.	Transit	Ingress	15 15 55
III.	Transit	Ingress	8	11	40			I.	Occult.	Disapp.	15 17 50

JUPITER'S SATELLITES, 1861. 449

WASHINGTON MEAN TIME.

JUNE.

		d	h	m	s			d	h	m	s		
III.	Transit	Egress	15	19	39		III.	Transit	Egress	22	23	56	
III.	Shadow	Ingress	15	20	20		III.	Shadow	Ingress	23	0	19	
I.	Eclipse	Reapp.	15	21	11	52.9	III.	Shadow	Egress	23	3	58	
III.	Shadow	Egress	15	23	59		II.	Occult.	Disapp.	23	10	23	
II.	Occult.	Disapp.	16	7	39		II.	Eclipse	Reapp.	23	15	14	51.2
II.	Eclipse	Reapp.	16	12	39	55.5	I.	Transit	Ingress	23	17	8	
I.	Transit	Ingress	16	15	9		I.	Shadow	Ingress	23	18	8	
I.	Shadow	Ingress	16	16	13		I.	Transit	Egress	23	19	28	
I.	Transit	Egress	16	17	29		I.	Shadow	Egress	23	20	28	
I.	Shadow	Egress	16	18	33		I.	Occult.	Disapp.	24	14	19	
I.	Occult.	Disapp.	17	12	19		I.	Eclipse	Reapp.	24	17	35	41.4
I.	Eclipse	Reapp.	17	15	40	38.7	II.	Transit	Ingress	25	4	41	
II.	Transit	Ingress	18	1	55		II.	Shadow	Ingress	25	6	38	
II.	Shadow	Ingress	18	4	1		II.	Transit	Egress	25	7	37	
II.	Transit	Egress	18	4	51		II.	Shadow	Egress	W.	25	9	34
II.	Shadow	Egress	18	6	57		I.	Transit	Ingress	25	11	38	
I.	Transit	Ingress	W.	18	9	39	I.	Shadow	Ingress	25	12	37	
I.	Shadow	Ingress	18	10	42		I.	Transit	Egress	25	13	58	
I.	Transit	Egress	18	11	59		I.	Shadow	Egress	25	14	57	
I.	Shadow	Egress	18	13	2		I.	Occult.	Disapp.	W.	26	8	49
III.	Occult.	Disapp.	19	6	11		III.	Occult.	Disapp.	26	10	29	
I.	Occult.	Disapp.	19	6	49		I.	Eclipse	Reapp.	26	12	4	29.2
III.	Occult.	Reapp.	W.	19	9	53	III.	Occult.	Reapp.	26	14	11	
I.	Eclipse	Reapp.	19	10	9	26.9	III.	Eclipse	Disapp.	26	14	29	58.6
III.	Eclipse	Disapp.	19	10	30	48.6	III.	Eclipse	Reapp.	26	17	59	18.6
III.	Eclipse	Reapp.	19	14	0	29.0	II.	Occult.	Disapp.	26	23	45	
IV.	Occult	Disapp.	19	17	10		II.	Eclipse	Reapp.	27	4	32	14.8
II.	Occult.	Disapp.	19	21	1		I.	Transit	Ingress	27	6	8	
IV.	Occult.	Reapp.	19	22	5		I.	Shadow	Ingress	27	7	5	
II.	Eclipse	Reapp.	20	1	57	22.5	I.	Transit	Egress	W.	27	8	28
IV.	Eclipse	Disapp.	20	3	15	23.2	I.	Shadow	Egress	W.	27	9	25
I.	Transit	Ingress	20	4	9		IV.	Transit	Ingress	28	1	25	
I.	Shadow	Ingress	20	5	11		I.	Occult.	Disapp.	28	3	19	
I.	Transit	Egress	20	6	29		IV.	Transit	Egress	28	6	18	
I.	Shadow	Egress	20	7	31		I.	Eclipse	Reapp.	28	6	33	10.4
IV.	Eclipse	Reapp.	20	7	46	14.0	IV.	Shadow	Ingress	28	10	27	
I.	Occult.	Disapp.	21	1	19		IV.	Shadow	Egress	28	15	8	
I.	Eclipse	Reapp.	21	4	38	8.8	II.	Transit	Ingress	28	18	5	
II.	Transit	Ingress	21	15	18		II.	Shadow	Ingress	28	19	57	
II.	Shadow	Ingress	21	17	20		II.	Transit	Egress	28	21	1	
II.	Transit	Egress	21	18	14		II.	Shadow	Egress	28	22	53	
II.	Shadow	Egress	21	20	16		I.	Transit	Ingress	29	0	38	
I.	Transit	Ingress	21	22	38		I.	Shadow	Ingress	29	1	34	
I.	Shadow	Ingress	21	23	39		I.	Transit	Egress	29	2	58	
I.	Transit	Egress	22	0	58		I.	Shadow	Egress	29	3	54	
I.	Shadow	Egress	22	1	59		I.	Occult.	Disapp.	29	21	49	
I.	Occult.	Disapp.	22	19	49		III.	Transit	Ingress	30	0	32	
III.	Transit	Ingress	22	20	13		I.	Eclipse	Reapp.	30	1	1	59.1
I.	Eclipse	Reapp.	22	23	6	58.4	III.	Transit	Egress	30	4	14	

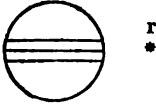

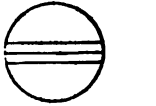

450 JUPITER'S SATELLITES, 1861.

WASHINGTON MEAN TIME.

JUNE.

III. Shadow	Ingress	d	h	m	s				
		30	4	18			I. Transit	Ingress	30 19 8
III. Shadow	Egress	30	7	57			I. Shadow	Ingress	30 20 3
II. Occult.	Disapp.	30	13	8			I. Transit	Egress	30 21 28
II. Eclipse	Reapp.	30	17	49	36.5		I. Shadow	Egress	30 22 23

Phases of the Eclipses of the Satellites for an Inverting Telescope.

I. 	III. 
II. 	IV. 

JULY.

I. Occult.	Disapp.	d	h	m	s				
I. Eclipse	Reapp.	1	19	30	41.4		II. Shadow	Egress	6 1 29
II. Transit	Ingress	2	7	28			I. Transit	Ingress	6 2 38
II. Shadow	Ingress W.	2	9	15			I. Shadow	Ingress	6 3 29
II. Transit	Egress	2	10	24			I. Transit	Egress	6 4 58
II. Shadow	Egress	2	12	10			I. Shadow	Egress	6 5 49
I. Transit	Ingress	2	13	38		IV. Occult.	Disapp.	6 13 5	
I. Shadow	Ingress	2	14	31		IV. Occult.	Reapp.	6 17 57	
I. Transit	Egress	2	15	58		IV. Eclipse	Disapp.	6 21 17 17.0	
I. Shadow	Egress	2	16	51		I. Occult.	Disapp.	6 23 49	
I. Occult.	Disapp.	3	10	49		IV. Eclipse	Reapp.	7 1 44 57.8	
I. Eclipse	Reapp.	3	13	59	28.6	I. Eclipse	Reapp.	7 2 56 57.0	
III. Occult.	Disapp.	3	14	50		III. Transit	Ingress	7 4 53	
III. Eclipse	Reapp.	3	21	58	36.8	III. Shadow	Ingress W.	7 8 17	
II. Occult.	Disapp.	4	2	30		III. Transit	Egress W.	7 8 35	
II. Eclipse	Reapp.	4	7	6	55.7	III. Shadow	Egress	7 11 56	
I. Transit	Ingress W.	4	8	8		II. Occult.	Disapp.	7 15 53	
I. Shadow	Ingress W.	4	9	0		II. Eclipse	Reapp.	7 20 24 11.8	
I. Transit	Egress	4	10	28		I. Transit	Ingress	7 21 8	
I. Shadow	Egress	4	11	20		I. Shadow	Ingress	7 21 57	
I. Occult.	Disapp.	5	5	19		I. Transit	Egress	7 23 28	
I. Eclipse	Reapp. W.	5	8	28	9.1	I. Shadow	Egress	8 0 17	
II. Transit	Ingress	5	20	52		I. Occult.	Disapp.	8 18 19	
II. Shadow	Ingress	5	22	34		I. Eclipse	Reapp.	8 21 25 38.9	
II. Transit	Egress	5	23	49		II. Transit	Ingress	9 10 16	
						II. Shadow	Ingress	9 11 52	

JUPITER'S SATELLITES, 1861. 451

WASHINGTON MEAN TIME.

JULY.

		d	h	m	s			d	h	m	s			
II.	Transit	Egress	9	13	13			I.	Shadow	Ingress	16	18	21	
II.	Shadow	Egress	9	14	48			I.	Transit	Egress	16	19	58	
I.	Transit	Ingress	9	15	38			I.	Shadow	Egress	16	20	41	
I.	Shadow	Ingress	9	16	26			I.	Occult.	Disapp.	17	14	50	
I.	Transit	Egress	9	17	58			I.	Eclipse	Reapp.	17	17	49	19.6
I.	Shadow	Egress	9	18	46			III.	Occult.	Disapp.	17	23	35	
I.	Occult.	Disapp.	10	12	49			III.	Eclipse	Reapp.	18	5	57	3.8
I.	Eclipse	Reapp.	10	15	54	25.6		II.	Occult.	Disapp.	W.	18	8	2
III.	Occult.	Disapp.	10	19	12			I.	Transit	Ingress	18	12	8	
III.	Eclipse	Reapp.	11	1	57	38.0		II.	Eclipse	Reapp.	18	12	15	46.9
II.	Occult.	Disapp.	11	5	16			I.	Shadow	Ingress	18	12	49	
II.	Eclipse	Reapp.	11	9	41	24.9		I.	Transit	Egress	18	14	28	
I.	Transit	Ingress	11	10	8			I.	Shadow	Egress	18	15	9	
I.	Shadow	Ingress	11	10	55			I.	Occult.	Disapp.	19	9	20	
I.	Transit	Egress	11	12	28			I.	Eclipse	Reapp.	19	12	17	58.3
I.	Shadow	Egress	11	13	15			II.	Transit	Ingress	20	2	30	
I.	Occult.	Disapp.	12	7	19			II.	Shadow	Ingress	20	3	48	
I.	Eclipse	Reapp.	12	10	23	5.1		II.	Transit	Egress	20	5	26	
II.	Transit	Ingress	12	23	41			I.	Transit	Ingress	20	6	39	
II.	Shadow	Ingress	13	1	10			II.	Shadow	Egress	20	6	43	
II.	Transit	Egress	13	2	37			I.	Shadow	Ingress	20	7	18	
II.	Shadow	Egress	13	4	6			I.	Transit	Egress	20	8	59	
I.	Transit	Ingress	13	4	38			I.	Shadow	Egress	20	9	38	
I.	Shadow	Ingress	13	5	23			I.	Occult.	Disapp.	21	3	51	
I.	Transit	Egress	13	6	58			I.	Eclipse	Reapp.	21	6	46	44.6
I.	Shadow	Egress	13	7	43			III.	Transit	Ingress	21	13	38	
I.	Occult.	Disapp.	14	1	49			III.	Shadow	Ingress	21	16	14	
I.	Eclipse	Reapp.	14	4	51	52.3		III.	Transit	Egress	21	17	20	
III.	Transit	Ingress	14	9	15			III.	Shadow	Egress	21	19	52	
III.	Shadow	Ingress	14	12	16			II.	Occult.	Disapp.	21	21	26	
III.	Transit	Egress	14	12	57			I.	Transit	Ingress	22	1	9	
III.	Shadow	Egress	14	15	54			II.	Eclipse	Reapp.	22	1	32	52.4
II.	Occult.	Disapp.	14	18	39			I.	Shadow	Ingress	22	1	47	
IV.	Transit	Ingress	14	21	29			I.	Transit	Egress	22	3	29	
II.	Eclipse	Reapp.	14	22	58	36.9		I.	Shadow	Egress	22	4	7	
I.	Transit	Ingress	14	23	8			I.	Occult.	Disapp.	22	22	21	
I.	Shadow	Ingress	14	23	52			I.	Eclipse	Reapp.	23	1	15	24.6
I.	Transit	Egress	15	1	28			IV.	Occult.	Disapp.	23	9	20	
I.	Shadow	Egress	15	2	12			IV.	Occult.	Reapp.	23	14	10	
IV.	Transit	Egress	15	2	19			IV.	Eclipse	Disapp.	23	15	18	46.5
IV.	Shadow	Ingress	15	4	28			II.	Transit	Ingress	23	15	54	
IV.	Shadow	Egress	15	9	6			II.	Shadow	Ingress	23	17	6	
I.	Occult.	Disapp.	15	20	19			II.	Transit	Egress	23	18	51	
I.	Eclipse	Reapp.	15	23	20	33.6		I.	Transit	Ingress	23	19	39	
II.	Transit	Ingress	16	13	5			IV.	Eclipse	Reapp.	23	19	43	1.3
II.	Shadow	Ingress	16	14	29			II.	Shadow	Egress	23	20	2	
II.	Transit	Egress	16	16	1			I.	Shadow	Ingress	23	20	15	
II.	Shadow	Egress	16	17	24			I.	Transit	Egress	23	21	59	
I.	Transit	Ingress	16	17	38			I.	Shadow	Egress	23	22	35	

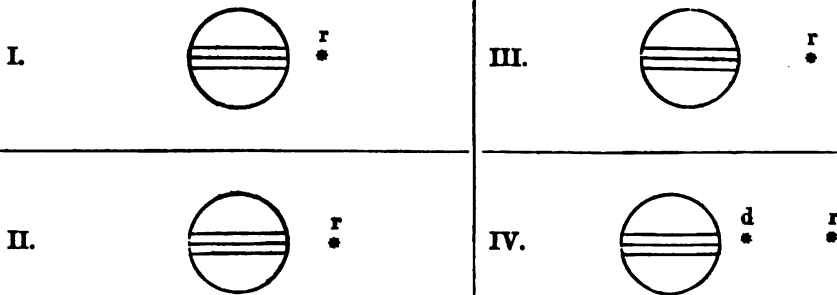
452 JUPITER'S SATELLITES, 1861.

WASHINGTON MEAN TIME.

JULY.

		d	h	m	s			d	h	m	s		
I.	Occult.	Disapp.	24	16	51		III.	Transit	Egress	28	21	45	
I.	Eclipse	Reapp.	24	19	44	9.6	III.	Shadow	Egress	28	23	50	
III.	Occult.	Disapp.	25	4	0		II.	Occult.	Disapp.	29	0	13	
III.	Eclipse	Reapp.	25	9	55	47.0	I.	Transit	Ingress	29	3	9	
II.	Occult.	Disapp.	25	10	49		I.	Shadow	Ingress	29	3	41	
I.	Transit	Ingress	25	14	9		II.	Eclipse	Reapp.	29	4	6	58.6
I.	Shadow	Ingress	25	14	44		I.	Transit	Egress	29	5	29	
II.	Eclipse	Reapp.	25	14	49	27.8	I.	Shadow	Egress	29	6	1	
I.	Transit	Egress	25	16	29		I.	Occult.	Disapp.	30	0	22	
I.	Shadow	Egress	25	17	4		I.	Eclipse	Reapp.	30	3	10	11.5
I.	Occult.	Disapp.	26	11	22		II.	Transit	Ingress	30	18	44	
I.	Eclipse	Reapp.	26	14	12	47.3	II.	Shadow	Ingress	30	19	43	
II.	Transit	Ingress	27	5	20		I.	Transit	Ingress	30	21	39	
II.	Shadow	Ingress	27	6	25		II.	Transit	Egress	30	21	40	
II.	Transit	Egress	27	8	16		I.	Shadow	Ingress	30	22	9	
I.	Transit	Ingress	27	8	39		II.	Shadow	Egress	30	22	38	
I.	Shadow	Ingress	27	9	12		I.	Transit	Egress	30	23	59	
II.	Shadow	Egress	27	9	21		I.	Shadow	Egress	31	0	29	
I.	Transit	Egress	27	10	59		IV.	Transit	Ingress	31	17	50	
I.	Shadow	Egress	27	11	32		I.	Occult.	Disapp.	31	18	53	
I.	Occult.	Disapp.	28	5	52		I.	Eclipse	Reapp.	31	21	38	55.4
I.	Eclipse	Reapp.	28	8	41	32.6	IV.	Shadow	Ingress	31	22	29	
III.	Transit	Ingress	28	18	4		IV.	Transit	Egress	31	22	36	
III.	Shadow	Ingress	28	20	13								

Phases of the Eclipses of the Satellites for an Inverting Telescope.



The Satellites are not visible from July 31st to October 1st, Jupiter being too near the Sun.

JUPITER'S SATELLITES, 1861. 453

WASHINGTON MEAN TIME.

OCTOBER.

		d	h	m	s			d	h	m	s	
II.	Eclipse	Disapp.	1	0	21	54.7	III.	Transit	Ingress	8	14	28
II.	Occult.	Reapp.	1	4	13		III.	Shadow	Egress	8	15	29
III.	Shadow	Ingress	1	8	0		III.	Transit	Egress	8	18	0
III.	Transit	Ingress	1	10	4		I.	Eclipse	Disapp.	8	19	58 37.3
III.	Shadow	Egress	1	11	32		I.	Occult.	Reapp.	8	22	53
III.	Transit	Egress	1	13	38		I.	Shadow	Ingress W.	9	17	7
I.	Eclipse	Disapp.	1	18	4	39.3	I.	Transit	Ingress W.	9	17	46
I.	Occult.	Reapp.	1	20	53		I.	Shadow	Egress	9	19	26
I.	Shadow	Ingress	2	15	13		I.	Transit	Egress	9	20	5
I.	Transit	Ingress	2	15	46		II.	Shadow	Ingress	9	21	50
I.	Shadow	Egress W.	2	17	32		II.	Transit	Ingress	9	23	6
I.	Transit	Egress	2	18	5		II.	Shadow	Egress	10	0	43
II.	Shadow	Ingress	2	19	13		II.	Transit	Egress	10	2	0
II.	Transit	Ingress	2	20	17		I.	Eclipse	Disapp.	10	14	27 9.3
II.	Shadow	Egress	2	22	7		I.	Occult.	Reapp. W.	10	17	23
II.	Transit	Egress	2	23	11		I.	Shadow	Ingress	11	11	35
I.	Eclipse	Disapp.	3	12	33	18.0	I.	Transit	Ingress	11	12	16
I.	Occult.	Reapp.	3	15	23		I.	Shadow	Egress	11	13	54
I.	Shadow	Ingress	4	9	41		I.	Transit	Egress	11	14	35
I.	Transit	Ingress	4	10	16		II.	Eclipse	Disapp. W.	11	16	12 6.4
I.	Shadow	Egress	4	12	0		II.	Occult.	Reapp.	11	20	22
I.	Transit	Egress	4	12	35		III.	Eclipse	Disapp.	12	2	13 22.6
II.	Eclipse	Disapp.	4	13	38	38.3	III.	Occult.	Reapp.	12	8	25
II.	Occult.	Reapp. W.	4	17	36		I.	Eclipse	Disapp.	12	8	55 33.4
III.	Eclipse	Disapp.	4	22	14	47.5	I.	Occult.	Reapp.	12	11	53
III.	Occult.	Reapp.	5	4	2		I.	Shadow	Ingress	13	6	3
I.	Eclipse	Disapp.	5	7	1	38.8	I.	Transit	Ingress	13	6	45
I.	Occult.	Reapp.	5	9	53		I.	Shadow	Egress	13	8	22
I.	Shadow	Ingress	6	4	10		I.	Transit	Egress	13	9	4
I.	Transit	Ingress	6	4	46		II.	Shadow	Ingress	13	11	8
I.	Shadow	Egress	6	6	29		II.	Transit	Ingress	13	12	30
I.	Transit	Egress	6	7	5		II.	Shadow	Egress	13	14	1
II.	Shadow	Ingress	6	8	32		II.	Transit	Egress	13	15	24
II.	Transit	Ingress	6	9	42		I.	Eclipse	Disapp.	14	3	24 3.5
II.	Shadow	Egress	6	11	26		I.	Occult.	Reapp.	14	6	23
II.	Transit	Egress	6	12	36		I.	Shadow	Ingress	15	0	31
IV.	Shadow	Ingress	6	22	27		I.	Transit	Ingress	15	1	15
I.	Eclipse	Disapp.	7	1	30	10.7	I.	Shadow	Egress	15	2	50
IV.	Shadow	Egress	7	2	45		I.	Transit	Egress	15	3	34
IV.	Transit	Ingress	7	4	10		II.	Eclipse	Disapp.	15	5	28 50.4
I.	Occult.	Reapp.	7	4	23		IV.	Eclipse	Disapp.	15	9	20 35.7
IV.	Transit	Egress	7	8	28		II.	Occult.	Reapp.	15	9	45
I.	Shadow	Ingress	7	22	38		IV.	Eclipse	Reapp.	15	13	22 59.5
I.	Transit	Ingress	7	23	16		III.	Shadow	Ingress	15	15	54
I.	Shadow	Egress	8	0	57		IV.	Occult.	Disapp. W.	15	16	10
I.	Transit	Egress	8	1	35		III.	Transit	Ingress	15	18	52
II.	Eclipse	Disapp.	8	2	55	22.6	III.	Shadow	Egress	15	19	27
II.	Occult.	Reapp.	8	6	59		IV.	Occult.	Reapp.	15	20	22
III.	Shadow	Ingress	8	11	57		I.	Eclipse	Disapp.	15	21	52 28.8

454 JUPITER'S SATELLITES, 1861.

WASHINGTON MEAN TIME.

OCTOBER.

			d	h	m	s				d	h	m	s		
III.	Transit	Egress	15	22	23					I.	Transit	Egress	24	0	2
I.	Occult.	Reapp.	16	0	53					IV.	Transit	Ingress	24	0	26
I.	Shadow	Ingress	16	19	0					II.	Shadow	Ingress	24	3	0
I.	Transit	Ingress	16	19	45					IV.	Transit	Egress	24	4	30
I.	Shadow	Egress	16	21	19					II.	Transit	Ingress	24	4	41
I.	Transit	Egress	16	22	4					II.	Shadow	Egress	24	5	54
II.	Shadow	Ingress	17	0	25					II.	Transit	Egress	24	7	33
II.	Transit	Ingress	17	1	54					I.	Eclipse	Disapp.	24	18	14 44.0
II.	Shadow	Egress	17	3	18					I.	Occult.	Reapp.	24	21	22
II.	Transit	Egress	17	4	47					I.	Shadow	Ingress	25	15	22
I.	Eclipse	Disapp. W.	17	16	20 59.5					I.	Transit	Ingress W.	25	16	14
I.	Occult.	Reapp.	17	19	23					I.	Shadow	Egress W.	25	17	41
I.	Shadow	Ingress	18	13	28					I.	Transit	Egress	25	18	32
I.	Transit	Ingress	18	14	15					II.	Eclipse	Disapp.	25	21	19 5.8
I.	Shadow	Egress	18	15	47					II.	Occult.	Reapp.	26	1	52
I.	Transit	Egress W.	18	16	34					III.	Eclipse	Disapp.	26	10	10 9.6
II.	Eclipse	Disapp.	18	18	45 35.2					I.	Eclipse	Disapp.	26	12	43 5.4
II.	Occult.	Reapp.	18	23	7					III.	Eclipse	Reapp.	26	13	31 34.6
III.	Eclipse	Disapp.	19	6	11 35.6					III.	Occult.	Disapp.	26	13	38
I.	Eclipse	Disapp.	19	10	49 22.3					I.	Occult.	Reapp. W.	26	15	52
III.	Occult.	Reapp.	19	12	48					III.	Occult.	Reapp. W.	26	17	7
I.	Occult.	Reapp.	19	13	52					I.	Shadow	Ingress	27	9	50
I.	Shadow	Ingress	20	7	57					I.	Transit	Ingress	27	10	44
I.	Transit	Ingress	20	8	45					I.	Shadow	Egress	27	12	9
I.	Shadow	Egress	20	10	16					I.	Transit	Egress	27	13	2
I.	Transit	Egress	20	11	4					II.	Shadow	Ingress W.	27	16	18
II.	Shadow	Ingress	20	13	43					II.	Transit	Ingress W.	27	18	5
II.	Transit	Ingress	20	15	18					II.	Shadow	Egress	27	19	12
II.	Shadow	Egress W.	20	16	36					II.	Transit	Egress	27	20	57
II.	Transit	Egress	20	18	11					I.	Eclipse	Disapp.	28	7	11 32.3
I.	Eclipse	Disapp.	21	5	17 51.1					I.	Occult.	Reapp.	28	10	21
I.	Occult.	Reapp.	21	8	22					I.	Shadow	Ingress	29	4	18
I.	Shadow	Ingress	22	2	25					I.	Transit	Ingress	29	5	13
I.	Transit	Ingress	22	3	15					I.	Shadow	Egress	29	6	37
I.	Shadow	Egress	22	4	44					I.	Transit	Egress	29	7	31
I.	Transit	Egress	22	5	33					II.	Eclipse	Disapp.	29	10	35 49.8
II.	Eclipse	Disapp.	22	8	2 19.1					II.	Occult.	Reapp.	29	15	13
II.	Occult.	Reapp.	22	12	30					III.	Shadow	Ingress	29	23	49
III.	Shadow	Ingress	22	19	52					I.	Eclipse	Disapp.	30	1	39 54.6
III.	Transit	Ingress	22	23	13					III.	Shadow	Egress	30	3	21
III.	Shadow	Egress	22	23	24					III.	Transit	Ingress	30	3	33
I.	Eclipse	Disapp.	22	23	46 14.7					I.	Occult.	Reapp.	30	4	51
III.	Transit	Egress	23	2	43					III.	Transit	Egress	30	7	1
I.	Occult.	Reapp.	23	2	52					I.	Shadow	Ingress	30	22	47
IV.	Shadow	Ingress W.	23	16	26					I.	Transit	Ingress	30	23	43
IV.	Shadow	Egress	23	20	40					I.	Shadow	Egress	31	1	6
I.	Shadow	Ingress	23	20	53					I.	Transit	Egress	31	2	1
I.	Transit	Ingress	23	21	44					II.	Shadow	Ingress	31	5	36
I.	Shadow	Egress	23	23	12					II.	Transit	Ingress	31	7	27

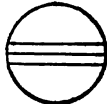
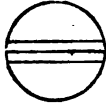
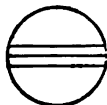
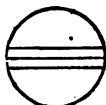
JUPITER'S SATELLITES, 1861. 455

WASHINGTON MEAN TIME.

OCTOBER.

II. Shadow	Egress	d ^d h ^h m ^m		I. Eclipse	Disapp.	d ^d h ^h m ^m s ^s
II. Transit	Egress	31 8 29		I. Occult.	Reapp.	31 20 8 22.3
		31 10 19				31 23 21

Phases of the Eclipses of the Satellites for an Inverting Telescope.

<p>I. d * </p>	<p>III. d * </p>
<p>II. d * </p>	<p>IV. d * r * </p>

NOVEMBER.

<p>IV. Eclipse Disapp. d^d h^h m^m s^s 1 3 19 36.1</p> <p>IV. Eclipse Reapp. 1 7 16 39.1</p> <p>IV. Occult. Disapp. 1 12 16</p> <p>IV. Occult. Reapp. W. 1 16 13</p> <p>I. Shadow Ingress W. 1 17 15</p> <p>I. Transit Ingress W. 1 18 12</p> <p>I. Shadow Egress 1 19 34</p> <p>I. Transit Egress 1 20 30</p> <p>II. Eclipse Disapp. 1 23 52 39.0</p> <p>II. Occult. Reapp. 2 4 35</p> <p>III. Eclipse Disapp. 2 14 8 0.7</p> <p>I. Eclipse Disapp. 2 14 36 42.5</p> <p>III. Eclipse Reapp. W. 2 17 28 50.7</p> <p>I. Occult. Reapp. W. 2 17 50</p> <p>III. Occult. Disapp. W. 2 17 57</p> <p>III. Occult. Reapp. 2 21 25</p> <p>I. Shadow Ingress 3 11 43</p> <p>I. Transit Ingress 3 12 42</p> <p>I. Shadow Egress 3 14 2</p> <p>I. Transit Egress 3 15 0</p> <p>II. Shadow Ingress 3 18 54</p> <p>II. Transit Ingress 3 20 50</p> <p>II. Shadow Egress 3 21 47</p> <p>II. Transit Egress 3 23 42</p> <p>I. Eclipse Disapp. 4 9 5 8.0</p> <p>I. Occult. Reapp. 4 12 20</p> <p>I. Shadow Ingress 5 6 12</p>	<p>I. Transit Ingress d^d h^h m^m s^s 5 7 11</p> <p>I. Shadow Egress 5 8 31</p> <p>I. Transit Egress 5 9 29</p> <p>II. Eclipse Disapp. 5 13 9 23.5</p> <p>II. Occult. Reapp. W. 5 17 56</p> <p>I. Eclipse Disapp. 6 3 33 29.3</p> <p>III. Shadow Ingress 6 3 47</p> <p>I. Occult. Reapp. 6 6 49</p> <p>III. Shadow Egress 6 7 18</p> <p>III. Transit Ingress 6 7 51</p> <p>III. Transit Egress 6 11 18</p> <p>I. Shadow Ingress 7 0 40</p> <p>I. Transit Ingress 7 1 41</p> <p>I. Shadow Egress 7 2 59</p> <p>I. Transit Egress 7 3 59</p> <p>II. Shadow Ingress 7 8 11</p> <p>II. Transit Ingress 7 10 12</p> <p>II. Shadow Egress 7 11 4</p> <p>II. Transit Egress 7 13 4</p> <p>I. Eclipse Disapp. 7 22 1 55.8</p> <p>I. Occult. Reapp. 8 1 19</p> <p>I. Shadow Ingress 8 19 8</p> <p>I. Transit Ingress 8 20 10</p> <p>I. Shadow Egress 8 21 27</p> <p>I. Transit Egress 8 22 28</p> <p>II. Eclipse Disapp. 9 2 26 16.2</p> <p>II. Occult. Reapp. 9 7 18</p>
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456 JUPITER'S SATELLITES, 1861.

WASHINGTON MEAN TIME.

NOVEMBER.

		d	h	m	s			d	h	m	s		
IV.	Shadow	Ingress	9	10	24			I.	Occult.	Reapp.	16	21	45
IV.	Shadow	Egress	9	14	32			III.	Eclipse	Disapp.	16	22	3 8.2
I.	Eclipse	Disapp. W.	9	16	30	14.9		III.	Eclipse	Reapp.	17	1	22 46.2
III.	Eclipse	Disapp. W.	9	18	5	39.4		III.	Occult.	Disapp.	17	2	28
I.	Occult.	Reapp.	9	19	48			III.	Occult.	Reapp.	17	5	52
IV.	Transit	Ingress	9	20	17			I.	Shadow	Ingress W.	17	15	30
III.	Eclipse	Reapp.	9	21	25	53.8		I.	Transit	Ingress W.	17	16	37
III.	Occult.	Disapp.	9	22	14			I.	Shadow	Egress W.	17	17	49
IV.	Transit	Egress	10	0	6			I.	Transit	Egress	17	18	54
III.	Occult.	Reapp.	10	1	40			IV.	Eclipse	Disapp.	17	21	18 42.2
I.	Shadow	Ingress	10	13	37			II.	Shadow	Ingress	18	0	3
I.	Transit	Ingress W.	10	14	40			IV.	Eclipse	Reapp.	18	1	10 3.4
I.	Shadow	Egress W.	10	15	56			II.	Transit	Ingress	18	2	17
I.	Transit	Egress W.	10	16	58			II.	Shadow	Egress	18	2	56
II.	Shadow	Ingress	10	21	30			II.	Transit	Egress	18	5	8
II.	Transit	Ingress	10	23	34			IV.	Occult.	Disapp.	18	7	55
II.	Shadow	Egress	11	0	23			IV.	Occult.	Reapp.	18	11	35
II.	Transit	Egress	11	2	25			I.	Eclipse	Disapp.	18	12	52 5.5
I.	Eclipse	Disapp.	11	10	58	39.3		I.	Occult.	Reapp. W.	18	16	15
I.	Occult.	Reapp.	11	14	18			I.	Shadow	Ingress	19	9	58
I.	Shadow	Ingress	12	8	5			I.	Transit	Ingress	19	11	6
I.	Transit	Ingress	12	9	9			I.	Shadow	Egress	19	12	17
I.	Shadow	Egress	12	10	24			I.	Transit	Egress	19	13	23
I.	Transit	Egress	12	11	27			II.	Eclipse	Disapp. W.	19	18	16 44.8
II.	Eclipse	Disapp. W.	12	15	43	1.7		II.	Occult.	Reapp.	19	23	20
II.	Occult.	Reapp.	12	20	39			I.	Eclipse	Disapp.	20	7	20 24.2
I.	Eclipse	Disapp.	13	5	26	59.1		I.	Occult.	Reapp.	20	10	44
III.	Shadow	Ingress	13	7	45			III.	Shadow	Ingress	20	11	43
I.	Occult.	Reapp.	13	8	47			III.	Shadow	Egress W.	20	15	13
III.	Shadow	Egress	13	11	16			III.	Transit	Ingress W.	20	16	20
III.	Transit	Ingress	13	12	7			III.	Transit	Egress	20	19	43
III.	Transit	Egress W.	13	15	32			I.	Shadow	Ingress	21	4	27
I.	Shadow	Ingress	14	2	33			I.	Transit	Ingress	21	5	35
I.	Transit	Ingress	14	3	38			I.	Shadow	Egress	21	6	46
I.	Shadow	Egress	14	4	52			I.	Transit	Egress	21	7	52
I.	Transit	Egress	14	5	56			II.	Shadow	Ingress	21	13	20
II.	Shadow	Ingress	14	10	46			II.	Transit	Ingress W.	21	15	36
II.	Transit	Ingress	14	12	55			II.	Shadow	Egress W.	21	16	13
II.	Shadow	Egress	14	13	39			II.	Transit	Egress W.	21	18	28
II.	Transit	Egress W.	14	15	46			I.	Eclipse	Disapp.	22	1	48 48.2
I.	Eclipse	Disapp.	14	23	55	24.3		I.	Occult.	Reapp.	22	5	13
I.	Occult.	Reapp.	15	3	16			I.	Shadow	Ingress	22	22	55
I.	Shadow	Ingress	15	21	2			I.	Transit	Ingress	23	0	4
I.	Transit	Ingress	15	22	8			I.	Shadow	Egress	23	1	14
I.	Shadow	Egress	15	23	21			I.	Transit	Egress	23	2	21
I.	Transit	Egress	16	0	25			II.	Eclipse	Disapp.	23	7	33 45.8
II.	Eclipse	Disapp.	16	4	59	58.2		II.	Occult.	Reapp.	23	12	40
II.	Occult.	Reapp.	16	10	0			I.	Eclipse	Disapp.	23	20	17 5.1
I.	Eclipse	Disapp. W.	16	18	23	42.4		I.	Occult.	Reapp.	23	23	42

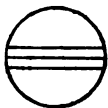
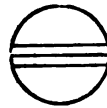
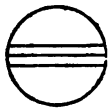
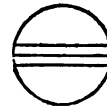
JUPITER'S SATELLITES, 1861. 457

WASHINGTON MEAN TIME.

NOVEMBER.

		d	h	m	s			d	h	m	s
III. Eclipse	Disapp.	24	2	0	39.9	I. Eclipse	Disapp.	27	9	13	44.2
III. Eclipse	Reapp.	24	5	19	40.7	I. Occult.	Reapp.	27	12	40	
III. Occult.	Disapp.	24	6	39		III. Shadow	Ingress W.	27	15	41	
III. Occult.	Reapp.	24	10	1		III. Shadow	Egress	27	19	10	
I. Shadow	Ingress W.	24	17	23		III. Transit	Ingress	27	20	30	
I. Transit	Ingress W.	24	18	33		III. Transit	Egress	27	23	51	
I. Shadow	Egress	24	19	42		I. Shadow	Ingress	28	6	20	
I. Transit	Egress	24	20	50		I. Transit	Ingress	28	7	31	
II. Shadow	Ingress	25	2	38		I. Shadow	Egress	28	8	39	
II. Transit	Ingress	25	4	58		I. Transit	Egress	28	9	48	
II. Shadow	Egress	25	5	31		II. Shadow	Ingress W.	28	15	55	
II. Transit	Egress	25	7	48		II. Transit	Ingress W.	28	18	18	
I. Eclipse	Disapp. W.	25	14	45	26.7	II. Shadow	Egress	28	18	48	
I. Occult.	Reapp. W.	25	18	11		II. Transit	Egress	28	21	8	
IV. Shadow	Ingress	26	4	22		I. Eclipse	Disapp.	29	3	42	7.0
IV. Shadow	Egress	26	8	26		I. Occult.	Reapp.	29	7	9	
I. Shadow	Ingress	26	11	52		I. Shadow	Ingress	30	0	48	
I. Transit	Ingress	26	13	2		I. Transit	Ingress	30	2	0	
I. Shadow	Egress W.	26	14	11		I. Shadow	Egress	30	3	7	
I. Transit	Egress W.	26	15	19		I. Transit	Egress	30	4	17	
IV. Transit	Ingress W.	26	15	38		II. Eclipse	Disapp.	30	10	7	40.0
IV. Transit	Egress	26	19	9		II. Occult.	Reapp. W.	30	15	19	
II. Eclipse	Disapp.	26	20	50	33.8	I. Eclipse	Disapp.	30	22	10	23.0
II. Occult.	Reapp.	27	1	59							

Phases of the Eclipses of the Satellites for an Inverting Telescope.

<p>I. d</p> <p style="margin-left: 100px;">*</p> 	<p>III. d r</p> <p style="margin-left: 100px;">* *</p> 
<p>II. d</p> <p style="margin-left: 100px;">*</p> 	<p>IV. d r</p> <p style="margin-left: 100px;">* *</p> 

DECEMBER.

I. Occult.	Reapp.	d	h	m	s	I. Shadow	Ingress	d	h	m
III. Eclipse	Disapp.	1	1	38		I. Transit	Ingress	1	20	29
III. Eclipse	Reapp.	1	5	58	43.4	I. Shadow	Egress	1	21	36
III. Occult.	Disapp.	1	9	17	5.4	I. Transit	Egress	1	22	46
III. Occult.	Reapp. W.	1	10	48		II. Shadow	Ingress	2	5	12
		1	14	8						

458 JUPITER'S SATELLITES, 1861.

WASHINGTON MEAN TIME.

DECEMBER.

		d	h	m	s			d	h	m	s
II. Transit	Ingress	2	7	38		II. Shadow	Egress	9	10	39	
II. Shadow	Egress	2	8	5		II. Transit	Egress W.	9	13	5	
II. Transit	Egress	2	10	28		I. Eclipse	Disapp. W.	9	18	31	57.2
I. Eclipse	Disapp. W.	2	16	38	43.5	I. Occult.	Reapp.	9	22	1	
I. Occult.	Reapp.	2	20	6		I. Shadow	Ingress W.	10	15	38	
I. Shadow	Ingress W.	3	13	45		I. Transit	Ingress W.	10	16	52	
I. Transit	Ingress W.	3	14	58		I. Shadow	Egress W.	10	17	57	
I. Shadow	Egress W.	3	16	4		I. Transit	Egress	10	19	9	
I. Transit	Egress W.	3	17	15		II. Eclipse	Disapp.	11	1	58	33.1
II. Eclipse	Disapp.	3	23	24	29.7	II. Occult.	Reapp.	11	7	14	
II. Occult.	Reapp.	4	4	38		I. Eclipse	Disapp. W.	11	13	0	13.2
I. Eclipse	Disapp.	4	11	7	0.3	I. Occult.	Reapp. W.	11	16	30	
I. Occult.	Reapp. W.	4	14	35		III. Shadow	Ingress	11	23	35	
IV. Eclipse	Disapp. W.	4	15	17	5.7	III. Shadow	Egress	12	3	3	
IV. Eclipse	Reapp.	4	19	2	25.5	III. Transit	Ingress	12	4	39	
III. Shadow	Ingress	4	19	38		III. Transit	Egress	12	7	56	
III. Shadow	Egress	4	23	7		I. Shadow	Ingress	12	10	7	
III. Transit	Ingress	5	0	36		I. Transit	Ingress	12	11	20	
IV. Occult.	Disapp.	5	2	58		I. Shadow	Egress	12	12	25	
III. Transit	Egress	5	3	56		I. Transit	Egress W.	12	13	37	
IV. Occult.	Reapp.	5	6	18		II. Shadow	Ingress	12	21	4	
I. Shadow	Ingress	5	8	13		IV. Shadow	Ingress	12	22	20	
I. Transit	Ingress	5	9	26		II. Transit	Ingress	12	23	34	
I. Shadow	Egress	5	10	32		II. Shadow	Egress	12	23	56	
I. Transit	Egress	5	11	43		IV. Shadow	Egress	13	2	18	
II. Shadow	Ingress W.	5	18	30		II. Transit	Egress	13	2	22	
II. Transit	Ingress	5	20	57		I. Eclipse	Disapp.	13	7	28	34.6
II. Shadow	Egress	5	21	22		IV. Transit	Ingress	13	10	19	
II. Transit	Egress	5	23	46		I. Occult.	Reapp.	13	10	58	
I. Eclipse	Disapp.	6	5	35	22.2	IV. Transit	Egress W.	13	13	28	
I. Occult.	Reapp.	6	9	4		I. Shadow	Ingress	14	4	35	
I. Shadow	Ingress	7	2	42		I. Transit	Ingress	14	5	49	
I. Transit	Ingress	7	3	55		I. Shadow	Egress	14	6	53	
I. Shadow	Egress	7	5	0		I. Transit	Egress	14	8	6	
I. Transit	Egress	7	6	12		II. Eclipse	Disapp. W.	14	15	15	51.0
II. Eclipse	Disapp.	7	12	41	41.5	II. Occult.	Reapp.	14	20	32	
II. Occult.	Reapp. W.	7	17	56		I. Eclipse	Disapp.	15	1	56	49.5
I. Eclipse	Disapp.	8	0	3	37.8	I. Occult.	Reapp.	15	5	26	
I. Occult.	Reapp.	8	3	33		III. Eclipse	Disapp. W.	15	13	54	29.8
III. Eclipse	Disapp.	8	9	56	24.9	III. Eclipse	Reapp. W.	15	17	11	35.2
III. Eclipse	Reapp. W.	8	13	14	9.3	III. Occult.	Disapp.	15	18	55	
III. Occult.	Disapp. W.	8	14	53		III. Occult.	Reapp.	15	22	11	
III. Occult.	Reapp. W.	8	18	11		I. Shadow	Ingress	15	23	3	
I. Shadow	Ingress	8	21	10		I. Transit	Ingress	16	0	17	
I. Transit	Ingress	8	22	23		I. Shadow	Egress	16	1	21	
I. Shadow	Egress	8	23	29		I. Transit	Egress	16	2	34	
I. Transit	Egress	9	0	40		II. Shadow	Ingress	16	10	21	
II. Shadow	Ingress	9	7	47		II. Transit	Ingress W.	16	12	52	
II. Transit	Ingress	9	10	16		II. Shadow	Egress W.	16	13	13	

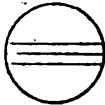
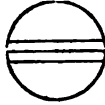
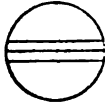
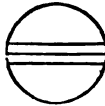
JUPITER'S SATELLITES, 1861. 459

WASHINGTON MEAN TIME.

D E C E M B E R .

		d	h	m	s			d	h	m	s
II.	Transit	Egress	W.	16	15	40		I.	Eclipse	Disapp.	23 22 18 17.0
I.	Eclipse	Disapp.		16	20	25	8.4	I.	Occult.	Reapp.	24 1 47
I.	Occult.	Reapp.		16	23	55		I.	Shadow	Ingress	24 19 24
I.	Shadow	Ingress	W.	17	17	32		I.	Transit	Ingress	24 20 38
I.	Transit	Ingress		17	18	46		I.	Shadow	Egress	24 21 42
I.	Shadow	Egress		17	19	50		I.	Transit	Egress	24 22 55
I.	Transit	Egress		17	21	3		II.	Eclipse	Disapp.	25 7 7 5.7
II.	Eclipse	Disapp.		18	4	32	44.9	II.	Occult.	Reapp. W.	25 12 22
II.	Occult.	Reapp.		18	9	49		I.	Eclipse	Disapp. W.	25 16 46 32.1
I.	Eclipse	Disapp. W.		18	14	53	23.8	I.	Occult.	Reapp.	25 20 15
I.	Occult.	Reapp. W.		18	18	23		III.	Shadow	Ingress	26 7 30
III.	Shadow	Ingress		19	3	32		III.	Shadow	Egress	26 10 57
III.	Shadow	Egress		19	7	0		III.	Transit	Ingress W.	26 12 32
III.	Transit	Ingress		19	8	37		I.	Shadow	Ingress W.	26 13 52
III.	Transit	Egress		19	11	53		I.	Transit	Ingress W.	26 15 6
I.	Shadow	Ingress		19	12	0		III.	Transit	Egress W.	26 15 47
I.	Transit	Ingress W.		19	13	14		I.	Shadow	Egress W.	26 16 10
I.	Shadow	Egress W.		19	14	18		I.	Transit	Egress W.	26 17 23
I.	Transit	Egress W.		19	15	31		II.	Shadow	Ingress	27 2 11
II.	Shadow	Ingress		19	23	38		II.	Transit	Ingress	27 4 41
II.	Transit	Ingress		20	2	10		II.	Shadow	Egress	27 5 3
II.	Shadow	Egress		20	2	30		II.	Transit	Egress	27 7 28
II.	Transit	Egress		20	4	57		I.	Eclipse	Disapp.	27 11 14 52.0
I.	Eclipse	Disapp.		20	9	21	44.1	I.	Occult.	Reapp. W.	27 14 43
I.	Occult.	Reapp. W.		20	12	51		I.	Shadow	Ingress	28 8 21
I.	Shadow	Ingress		21	6	28		I.	Transit	Ingress	28 9 34
I.	Transit	Ingress		21	7	42		I.	Shadow	Egress	28 10 39
I.	Shadow	Egress		21	8	46		I.	Transit	Egress	28 11 51
IV.	Eclipse	Disapp.		21	9	15	27.1	II.	Eclipse	Disapp.	28 20 24 37.1
I.	Transit	Egress		21	9	59		II.	Occult.	Reapp.	29 1 38
IV.	Eclipse	Reapp. W.		21	12	54	24.7	I.	Eclipse	Disapp.	29 5 43 6.9
II.	Eclipse	Disapp. W.		21	17	50	9.3	I.	Occult.	Reapp.	29 9 11
IV.	Occult.	Disapp.		21	21	16		IV.	Shadow	Ingress W.	29 16 19
II.	Occult.	Reapp.		21	23	6		IV.	Shadow	Egress	29 20 10
IV.	Occult.	Reapp.		22	0	13		III.	Eclipse	Disapp.	29 21 49 14.2
I.	Eclipse	Disapp.		22	3	49	58.8	III.	Eclipse	Reapp.	30 1 4 59.6
I.	Occult.	Reapp.		22	7	19		III.	Occult.	Disapp.	30 2 43
III.	Eclipse	Disapp. W.		22	17	51	56.2	I.	Shadow	Ingress	30 2 49
III.	Eclipse	Reapp.		22	21	8	21.8	I.	Transit	Ingress	30 4 2
III.	Occult.	Disapp.		22	22	51		IV.	Transit	Ingress	30 4 10
I.	Shadow	Ingress		23	0	56		I.	Shadow	Egress	30 5 7
III.	Occult.	Reapp.		23	2	6		III.	Occult.	Reapp.	30 5 56
I.	Transit	Ingress		23	2	10		I.	Transit	Egress	30 6 19
I.	Shadow	Egress		23	3	14		IV.	Transit	Egress	30 6 54
I.	Transit	Egress		23	4	27		II.	Shadow	Ingress W.	30 15 28
II.	Shadow	Ingress W.		23	12	55		II.	Transit	Ingress W.	30 17 57
II.	Transit	Ingress W.		23	15	25		II.	Shadow	Egress W.	30 18 20
II.	Shadow	Egress W.		23	15	47		II.	Transit	Egress	30 20 44
II.	Transit	Egress W.		23	18	13		I.	Eclipse	Disapp.	31 0 11 24.9

460 JUPITER'S SATELLITES, 1861.

WASHINGTON MEAN TIME.					
D E C E M B E R.					
I. Occult.	Reapp.	d	h	m	
		31	3	39	
I. Shadow	Ingress	31	21	17	
					d
					h
					m
					31
					22
					30
					31
					23
					35
Phases of the Eclipses of the Satellites for an Inverting Telescope.					
I.	d	*		r	
					
II.	d	*		d	r
				*	*
					
				IV.	

JUPITER'S SATELLITES, 1861. 461

WASHINGTON MEAN TIME OF GEOCENTRIC SUPERIOR CONJUNCTION.

SATELLITE I.

		h	m			h	m			h	m			h	m
Jan.	2	6	35.1	March	19	7	17.2	June	3	9	31.8	Oct.	17	18	13.5
	4	1	1.5		21	1	44.0		5	4	1.4		19	12	43.4
	5	19	27.9		22	20	10.7		6	22	30.9		21	7	13.3
	7	13	54.2		24	14	37.8		8	17	0.6		23	1	43.1
	9	8	20.6		26	9	4.8		10	11	30.3		24	20	12.9
	11	2	47.0		28	3	32.8		12	6	0.0		26	14	42.6
	12	21	12.9		29	21	59.0		14	0	29.7		28	9	12.3
	14	15	39.1		31	16	26.1		15	18	59.5		30	3	42.0
	16	10	5.2	April	2	10	53.4		17	13	29.2		31	22	11.6
	18	4	31.3		4	5	20.8		19	7	59.2		Nov.	2	16	41.1
	19	22	57.2		5	23	48.3		21	2	29.0		4	11	10.8
	21	17	23.2		7	18	15.8		22	20	58.9		6	5	40.2
	23	11	49.2		9	12	43.4		24	15	28.8		8	0	9.7
	25	6	15.1		11	7	11.0		26	9	58.8		9	18	39.1
	27	0	41.0		13	1	38.9		28	4	28.7		11	13	8.5
	28	19	6.7		14	20	6.6	July	29	22	58.8		13	7	37.8
Feb.	30	13	32.6		16	14	34.6		1	17	28.8		15	2	7.2
	1	7	58.4		18	9	2.5	3	11	58.9		16	20	36.4	
	3	2	24.2		20	3	30.6	5	6	28.9		18	15	5.7	
	4	20	50.0		21	21	58.7	7	0	59.0		20	9	34.8	
	6	15	15.8		23	16	36.8	8	19	29.1		22	4	4.0	
	8	9	41.5		25	10	55.0	10	13	59.2		23	22	33.0	
	10	4	7.3		27	5	23.4	12	8	29.4		25	17	2.0	
	11	22	33.1		28	23	51.7	14	2	59.7		27	11	31.0	
	13	16	59.0		30	18	20.2	15	21	29.9		29	5	59.9	
	15	11	24.9	May	2	12	48.6	17	16	0.2		Dec.	1	0	28.7
	17	5	40.8		4	7	17.2	19	10	30.4		2	18	57.5	
	19	0	16.7		6	1	45.9	21	5	0.7		4	13	26.3	
	20	18	42.7		7	20	14.6	22	23	31.0		6	7	55.0	
	22	13	8.8		9	14	43.3	24	18	1.3		8	2	23.6	
	24	7	34.8		11	9	12.2	26	12	31.5		9	20	52.2	
	26	2	0.8		13	3	41.1	28	7	1.9		11	15	20.7	
	27	20	26.8		14	22	10.1	30	1	32.2		13	9	49.2	
March	1	14	53.0		16	16	39.0	31	20	2.6		15	4	17.5	
	3	9	19.2		18	11	8.2	Oct.	1	19	43.4		16	22	45.9
	5	3	45.3		20	5	37.2	3	14	13.6		18	17	14.2	
	6	22	11.6		22	0	6.4	5	8	43.6		20	11	42.4	
	8	16	37.9		23	18	35.5	7	3	13.7		22	6	10.4	
	10	11	4.3		25	13	4.9	8	21	43.6		24	0	38.5	
	12	5	30.7		27	7	34.1	10	16	13.8		25	19	6.5	
	13	23	57.2		29	2	3.5	12	10	43.6		27	13	34.5	
	15	18	23.9		30	20	32.8	14	5	13.6		29	8	2.3	
	17	12	50.5	June	1	15	2.4	15	23	43.5		31	2	30.1	

SATELLITE II.

		h	m			h	m			h	m			h	m
Jan.	4	0	59.6	Jan.	28	21	1.5	Feb.	22	16	55.9	March	19	13	0.5
	7	14	9.2		Feb.	1	10		9.8	26	6		3.6	23	2	12.1
	11	3	19.4		4	23	16.8	March	1	19	12.5		26	15	23.3
	14	16	28.2		8	12	24.9		5	8	20.9		30	4	35.9
	18	5	37.6		12	1	32.0	8	21	30.6		April	2	17	48.2
	21	18	45.5		15	14	40.2	12	10	39.8		6	7	1.8	
	25	7	54.2		19	3	47.5	15	23	50.3		9	20	15.1	

462 JUPITER'S SATELLITES, 1861.

WASHINGTON MEAN TIME OF GEOCENTRIC SUPERIOR CONJUNCTION.

SATELLITE II.

April 13	h m 9 29.9	June 5	h m 17 28.8	July 25	h m 12 16.7	Nov. 12	h m 19 13.2
16	22 44.6	9	6 23.8	29	1 40.7	16	8 34.2
20	12 0.3	12	19 45.2	Oct. 1	2 46.4	19	21 54.5
24	1 16.1	16	9 6.9	4	16 9.6	23	11 14.8
27	14 32.8	19	22 28.8	8	5 32.7	27	0 34.5
May 1	3 49.5	23	11 50.9	11	18 55.6	30	13 54.2
4	17 7.2	27	1 13.3	15	8 18.4	Dec. 4	3 13.1
8	6 25.0	30	14 35.8	18	21 40.9	7	16 32.0
11	19 43.6	July 4	3 58.5	22	11 3.3	11	5 50.0
15	9 2.3	7	17 21.3	26	0 25.6	14	19 8.0
18	22 21.6	11	6 44.3	29	13 47.5	18	8 25.1
22	11 41.0	14	20 7.3	Nov. 2	3 9.3	21	21 42.2
26	1 1.0	18	9 30.5	5	16 30.8	25	10 58.3
29	14 21.2	21	22 53.8	9	5 52.2	29	0 14.5
June 2	3 41.8						

SATELLITE III.

Jan. 5	h m 19 54.9	March 25	h m 8 36.3	June 12	h m 3 46.3	Oct. 26	h m 15 22.6
12	23 18.6	April 1	12 10.4	19	8 2.0	Nov. 2	19 41.8
20	2 38.9	8	15 49.4	26	12 20.0	9	23 56.7
27	5 56.5	15	19 32.8	July 3	16 40.5	17	4 9.8
Feb. 3	9 12.8	22	23 20.6	10	21 2.5	24	8 20.3
10	12 28.2	30	3 12.7	18	1 26.4	Dec. 1	12 28.1
17	15 44.4	May 7	7 9.0	25	5 51.0	8	16 32.1
24	19 1.0	14	11 9.7	Oct. 5	2 15.4	15	20 32.6
March 3	22 19.9	21	15 13.9	12	6 39.4	23	0 28.5
11	1 41.5	28	19 22.2	19	11 1.7	30	4 19.9
18	5 6.6	June 4	23 33.1				

SATELLITE IV.

Jan. 4	h m 1 16.2	March 28	h m 2 5.2	June 19	h m 19 37.7	Nov. 1	h m 14 14.4
20	16 2.4	April 13	18 15.0	July 6	15 30.9	18	9 45.2
Feb. 6	6 14.8	30	11 24.2	July 23	11 45.3	Dec. 5	4 38.2
22	20 21.4	May 17	5 25.8	Oct. 15	18 16.1	21	22 44.4
March 11	10 51.5	June 3	0 12.7				

Factors by which x' and y' in the following Table must be multiplied to obtain the coordinates x and y for any time.

p = the inclination of the northern semi-minor axis of the apparent ellipse to the circle of declination; + East, — West.

x and y at the time of the visible phase of every fourth eclipse for the I^d, of every second eclipse for the II^d, and of every eclipse for the III^d and IVth Satellites.

JUPITER'S SATELLITES, 1861. 463

SATELLITE I.

1861.					1861.						
Date,	AT GEOCENTRIC SUPERIOR CONJUNCTION.			AT TIME OF ECLIPSE.		Date,	AT GEOCENTRIC SUPERIOR CONJUNCTION.			AT TIME OF ECLIPSE.	
	Factor for x'.	Factor for y'.	p.	z.	y.		Factor for x'.	Factor for y'.	p.	z.	y.
Jan. 2	1.133	-0.191	+22 ^o 1.9	-36 ^h	-1 ^m	June 6	0.906	-0.110	+20 ^o 53.2	+32 ^h	-1 ^m
9	1.152	0.202	21 55.6	35	1	14	0.891	0.116	21 9.0	31	1
16	1.167	0.209	21 46.9	32	1	21	0.877	0.123	21 25.5	30	1
23	1.179	0.210	21 36.2	29	1	28	0.864	0.131	21 42.5	29	1
30	1.187	0.206	21 24.1	27	1	July 5	0.853	0.140	21 59.7	27	1
Feb. 6	1.191	-0.200	+21 10.9	-24	-1	12	0.843	-0.151	+22 17.1	+26	-1
13	1.191	0.198	20 57.1	+24	1	19	0.834	0.162	22 34.3	24	1
20	1.186	0.183	20 43.1	27	1	26	0.827	0.172	22 51.2	+22	2
27	1.177	0.173	20 29.7	30	1	Oct. 1	0.825	0.310	24 52.6	-21	2
March 6	1.165	0.162	20 17.2	32	1	8	0.832	0.328	25 0.2	23	2
13	1.150	-0.150	+20 6.3	+34	-1	15	0.841	-0.348	+25 6.4	-25	-2
21	1.132	0.139	19 57.2	35	1	23	0.850	0.369	25 11.4	27	2
28	1.113	0.128	19 50.4	36	1	30	0.861	0.390	25 15.6	28	2
April 4	1.091	0.120	19 46.0	37	1	Nov. 6	0.874	0.413	25 19.1	30	2
11	1.069	0.113	19 44.3	38	1	13	0.888	0.436	25 21.9	31	3
18	1.046	-0.107	+19 45.2	+38	-1	20	0.903	-0.459	+25 24.0	-32	-3
25	1.023	0.103	19 48.7	38	1	27	0.920	0.483	25 25.5	33	3
May 2	1.001	0.101	19 54.6	38	1	Dec. 4	0.939	0.508	25 26.5	34	3
9	0.980	0.100	20 2.7	38	1	11	0.958	0.533	25 27.1	35	3
16	0.960	0.100	20 12.9	37	1	18	0.978	0.559	25 27.4	36	3
23	0.941	-0.102	+20 24.9	+35	-1	25	0.999	-0.585	+25 27.5	-37	-3
30	0.923	-0.105	+20 38.4	+34	-1						

SATELLITE II.

1861.					1861.						
Date,	AT GEOCENTRIC SUPERIOR CONJUNCTION.			AT TIME OF ECLIPSE.		Date,	AT GEOCENTRIC SUPERIOR CONJUNCTION.			AT TIME OF ECLIPSE.	
	Factor for x'.	Factor for y'.	p.	z.	y.		Factor for x'.	Factor for y'.	p.	z.	y.
Jan. 4	1.138	-0.057	+22 15.5	-45 ^h	-1 ^m	June 9	0.901	-0.005	+21 12.5	+42 ^h	-0 ^m
11	1.156	0.058	22 7.7	42	1	16	0.886	0.013	21 29.2	40	0
18	1.170	0.059	21 58.0	38	1	23	0.872	0.022	21 46.6	38	0
25	1.181	0.058	21 46.6	33	1	30	0.860	0.032	22 4.4	35	0
Feb. 1	1.188	0.055	21 33.9	28	1	July 7	0.849	0.042	22 22.4	33	1
8	1.191	-0.048	+21 20.2	-23	-1	14	0.839	-0.053	+22 40.4	+30	-1
15	1.190	0.039	21 6.0	+26	0	21	0.831	0.064	22 58.2	28	1
22	1.184	0.030	20 51.7	31	0	29	0.825	0.076	23 15.6	+26	1
March 1	1.174	0.020	20 38.1	36	0	Oct. 1	0.825	0.208	25 15.4	-25	2
8	1.161	-0.011	29 25.7	40	0	8	0.832	0.227	25 23.4	28	3
15	1.145	-0.003	+20 15.0	+44	-0	15	0.840	-0.247	+25 30.3	-30	-3
23	1.126	+0.005	20 6.3	47	0	22	0.849	0.267	25 35.9	33	3
30	1.106	0.011	20 0.1	49	0	29	0.860	0.288	25 40.6	35	3
April 6	1.084	0.016	19 56.6	50	0	Nov. 5	0.873	0.309	25 44.6	37	4
13	1.062	0.019	19 55.7	51	0	12	0.887	0.331	25 47.8	39	4
20	1.039	+0.021	+19 57.4	+51	-0	19	0.903	-0.352	+25 50.1	-41	-4
27	1.016	0.022	20 1.9	51	0	27	0.920	0.376	25 51.8	43	4
May 4	0.994	0.021	20 8.9	50	0	Dec. 4	0.938	0.399	25 52.9	45	5
11	0.973	0.018	20 18.1	49	0	11	0.957	0.422	25 53.7	47	5
18	0.953	0.014	20 29.3	47	0	18	0.977	0.445	25 54.2	48	5
26	0.935	+0.009	+20 42.3	+46	-0	25	0.999	-0.468	+25 54.4	-49	-5
June 2	0.917	+0.002	+20 56.7	+44	-0						

464 JUPITER'S SATELLITES, 1861.

SATELLITE III.

Date, 1861.	AT GEOCENTRIC SUPERIOR CONJUNCTION.			AT TIME OF ECLIPSE.			
	Factor for z'.	Factor for y'.	p.	Disappearance.		Reappearance.	
				z.	y.	z.	y.
Jan. 5	1.143	-0.140	+21 49.9	- 57	- 2	..	..
12	1.160	0.144	21 48.3	52	2	..	..
20	1.173	0.145	21 34.0	45	2	..	..
27	1.183	0.143	21 22.3	38	2	..	..
Feb. 3	1.189	0.139	21 9.3	- 30	- 2	..	..
10	1.191	-0.133	+20 55.5	..	..	..	..
17	1.189	0.126	20 41.2	..	..	+ 29	- 2
24	1.182	0.117	20 27.1	..	..	38	2
March 3	1.170	0.107	20 13.9	..	..	46	2
11	1.156	0.097	20 1.9	..	..	53	2
18	1.140	-0.088	+19 51.9	..	..	+ 58	- 2
25	1.120	0.079	19 44.0	+ 23	- 1	62	1
April 1	1.098	0.070	19 38.6	27	1	65	1
8	1.076	0.063	19 35.8	30	1	67	1
15	1.054	0.058	19 35.8	32	1	69	1
22	1.031	-0.055	+19 38.5	+ 33	- 1	+ 70	- 1
30	1.009	0.053	19 43.6	34	1	70	1
May 7	0.987	0.052	19 51.2	34	1	69	1
14	0.966	0.053	20 1.0	33	1	67	1
21	0.946	0.055	20 12.7	32	1	65	1
28	0.928	-0.058	+20 26.1	+ 30	- 1	+ 62	- 1
June 4	0.911	0.062	20 40.9	28	1	59	1
12	0.895	0.067	20 56.8	25	1	56	1
19	0.880	0.074	21 13.7	22	1	53	1
26	0.867	0.081	21 31.0	+ 19	1	49	1
July 3	0.855	-0.089	+21 48.6	..	..	+ 46	- 1
10	0.845	0.098	22 6.5	..	..	42	2
18	0.836	0.108	22 24.3	..	..	38	2
25	0.828	0.118	22 41.7	..	..	34	2
Oct. 5	0.825	0.257	24 53.0	- 33	- 4	..	..
12	0.835	-0.276	+25 0.0	- 37	- 5	..	..
19	0.845	0.295	25 6.2	41	5	..	..
26	0.856	0.315	25 11.7	45	5	- 16	- 5
Nov. 2	0.868	0.335	25 16.2	49	6	19	6
9	0.882	0.356	25 19.6	52	6	22	6
17	0.897	-0.378	+25 22.1	- 55	- 6	- 25	- 7
24	0.913	0.400	25 23.9	58	7	28	7
Dec. 1	0.931	0.423	25 25.3	61	7	30	7
8	0.950	0.446	25 26.1	63	8	32	8
15	0.970	0.470	25 26.7	65	8	33	8
23	0.991	-0.494	+25 27.1	- 66	- 8	- 33	- 9
30	1.013	-0.518	+25 27.2	- 66	- 9	- 33	- 9

JUPITER'S SATELLITES, 1861. 465

SATELLITE IV.

Date, 1861.	AT GEOCENTRIC SUPERIOR CONJUNCTION.			AT TIME OF ECLIPSE.			
	Factor for x' .	Factor for y' .	p .	Disappearance.		Reappearance.	
				x .	y .	x .	y .
Jan. 4	1.139	-0.115	+21 47.0	- 89	- 4	- 48	- 4
20	1.174	0.121	21 25.9	63	4	..	..
Feb. 6	1.191	0.116	20 56.4	- 30	4	..	..
22	1.184	0.102	20 23.5	..	..	+ 48	3
March 11	1.155	0.083	19 54.0	+ 36	3	77	3
28	1.113	-0.065	+19 34.2	+ 59	- 2	+ 98	- 2
April 13	1.060	0.052	19 28.0	71	2	108	2
30	1.008	0.045	19 36.4	74	1	109	1
May 17	0.956	0.045	19 57.8	71	1	104	1
June 3	0.915	0.051	20 29.3	63	2	94	2
19	0.879	-0.062	+21 7.4	+ 51	- 2	+ 81	- 2
July 6	0.851	0.077	21 48.6	37	3	66	3
23	0.830	0.096	22 27.4	+ 23	3	+ 50	3
Oct. 15	0.841	0.338	24 57.0	- 57	8	- 31	8
Nov. 1	0.866	0.277	25 9.1	72	9	46	9
18	0.899	-0.319	+25 16.6	- 85	-11	- 59	-11
Dec. 5	0.941	0.364	25 20.5	95	12	68	12
21	0.988	-0.412	+25 21.2	-101	-14	- 75	-14

SATELLITE I.

COORDINATES IN THE MEAN APPARENT ELLIPSE, DESCRIBED BY THE
SATELLITE, AND FOR THE MEAN DISTANCE OF JUPITER
FROM THE SUN, FOR THE TIME (t) AFTER GEO-
CENTRIC SUPERIOR CONJUNCTION.

t	x'	y'	t	x'	y'	t	x'	y'
d h m	"	"	d h m	"	"	d h m	"	"
0 0 0	+ 0.0	+ 6.6	0 5 20	+ 77.5	+ 4.7	0 10 40	+109.1	- 0.1
0 0 20	5.4	6.6	0 5 40	81.3	4.4	0 11 0	109.0	0.4
0 0 40	10.8	6.6	0 6 0	84.7	4.2	0 11 20	108.6	0.7
0 1 0	16.1	6.6	0 6 20	88.0	3.9	0 11 40	107.9	1.0
0 1 20	21.4	6.5	0 6 40	91.1	3.7	0 12 0	106.9	1.3
0 1 40	+ 26.6	+ 6.4	0 7 0	+ 94.0	+ 3.4	0 12 20	+105.7	- 1.7
0 2 0	31.8	6.3	0 7 20	96.6	3.1	0 12 40	104.2	2.0
0 2 20	36.9	6.2	0 7 40	99.0	2.8	0 13 0	102.5	2.3
0 2 40	42.0	6.1	0 8 0	101.1	2.5	0 13 20	100.5	2.6
0 3 0	46.9	6.0	0 8 20	103.0	2.2	0 13 40	98.3	2.9
0 3 20	+ 51.7	+ 5.8	0 8 40	+104.7	+ 1.9	0 14 0	+ 95.8	- 3.2
0 3 40	56.4	5.7	0 9 0	106.1	1.6	0 14 20	93.1	3.5
0 4 0	60.9	5.5	0 9 20	107.3	1.3	0 14 40	90.2	3.7
0 4 20	65.3	5.3	0 9 40	108.1	0.9	0 15 0	87.1	4.0
0 4 40	69.5	5.1	0 10 0	108.7	0.6	0 15 20	83.7	4.3
0 5 0	+ 73.6	+ 4.9	0 10 20	+109.1	+ 0.3	0 15 40	+ 80.1	- 4.5

466 JUPITER'S SATELLITES, 1861.

COORDINATES IN THE MEAN APPARENT ELLIPSE.

SATELLITE I.

<i>t</i>	<i>x'</i>	<i>y</i>	<i>t</i>	<i>x'</i>	<i>y'</i>	<i>t</i>	<i>x'</i>	<i>y'</i>
d. h. m.	[#]	[#]	d. h. m.	[#]	[#]	d. h. m.	[#]	[#]
0 16 0	+ 76.4	- 4.7	1 1 40	- 66.6	- 5.2	1 11 0	- 97.6	+ 6.0
0 16 20	72.5	5.0	1 2 0	70.8	5.0	1 11 20	95.1	3.3
0 16 40	68.4	5.2	1 2 20	74.8	4.8	1 11 40	92.3	3.5
0 17 0	64.1	5.4	1 2 40	78.6	4.6	1 12 0	89.3	3.8
0 17 20	59.6	5.5	1 3 0	82.2	4.4	1 12 20	86.1	4.1
0 17 40	+ 55.0	- 5.7	1 3 20	- 85.6	- 4.1	1 12 40	- 82.7	+ 4.3
0 18 0	50.3	5.9	1 3 40	88.9	3.8	1 13 0	79.1	4.6
0 18 20	45.5	6.0	1 4 0	91.9	3.6	1 13 20	75.3	4.8
0 18 40	40.5	6.1	1 4 20	94.7	3.3	1 13 40	71.3	5.0
0 19 0	35.5	6.3	1 4 40	97.3	3.0	1 14 0	67.1	5.2
0 19 20	+ 30.4	- 6.4	1 5 0	- 99.6	- 2.7	1 14 20	- 62.8	+ 5.4
0 19 40	25.2	6.4	1 5 20	101.7	2.4	1 14 40	58.3	5.6
0 20 0	19.9	6.5	1 5 40	103.5	2.1	1 15 0	53.7	5.8
0 20 20	14.6	6.6	1 6 0	105.1	1.8	1 15 20	49.0	5.9
0 20 40	9.2	6.6	1 6 20	106.4	1.5	1 15 40	44.1	6.1
0 21 0	+ 3.8	- 6.6	1 6 40	- 107.5	- 1.2	1 16 0	- 39.1	+ 6.2
0 21 20	- 1.5	6.6	1 7 0	108.3	0.8	1 16 20	34.0	6.3
0 21 40	6.9	6.6	1 7 20	108.8	0.5	1 16 40	28.9	6.4
0 22 0	12.3	6.6	1 7 40	109.1	- 0.2	1 17 0	23.7	6.5
0 22 20	17.6	6.5	1 8 0	109.1	+ 0.1	1 17 20	18.4	6.5
0 22 40	- 22.9	- 6.5	1 8 20	- 108.9	+ 0.5	1 17 40	- 13.0	+ 6.6
0 23 0	28.1	6.4	1 8 40	108.4	0.8	1 18 0	7.7	6.6
0 23 20	33.3	6.3	1 9 0	107.6	1.1	1 18 20	- 2.3	6.6
0 23 40	38.4	6.2	1 9 20	106.6	1.4	1 18 40	+ 3.1	6.6
1 0 0	43.4	6.1	1 9 40	105.3	1.8	1 19 0	8.5	6.6
1 0 20	- 48.3	- 5.9	1 10 0	- 103.8	+ 2.1	1 19 20	+ 13.8	+ 6.6
1 0 40	53.1	5.8	1 10 20	102.0	2.4	1 19 40	19.1	6.5
1 1 0	57.7	5.6	1 10 40	- 99.9	+ 2.7	1 20 0	+ 24.4	+ 6.5
1 1 20	- 62.2	- 5.4						

SATELLITE II.

<i>t</i>	<i>x'</i>	<i>y'</i>	<i>t</i>	<i>x'</i>	<i>y'</i>	<i>t</i>	<i>x'</i>	<i>y'</i>
d. h. m.	[#]	[#]	d. h. m.	[#]	[#]	d. h. m.	[#]	[#]
0 0 0	+ 0.0	+ 12.2	0 10 40	+ 122.9	+ 8.6	0 21 20	+ 173.8	- 0.0
0 0 40	8.5	12.2	0 11 20	128.8	8.2	0 22 0	173.6	0.6
0 1 20	17.0	12.1	0 12 0	134.4	7.7	0 22 40	172.9	1.2
0 2 0	25.5	12.1	0 12 40	139.6	7.3	0 23 20	171.8	1.8
0 2 40	33.9	12.0	0 13 20	144.5	6.8	1 0 0	170.4	2.4
0 3 20	+ 42.2	+ 11.8	0 14 0	+ 149.0	+ 6.3	1 0 40	+ 168.5	- 3.0
0 4 0	50.5	11.7	0 14 40	153.2	5.7	1 1 20	166.2	3.5
0 4 40	58.6	11.5	0 15 20	157.0	5.2	1 2 0	163.5	4.1
0 5 20	66.5	11.3	0 16 0	160.5	4.7	1 2 40	160.4	4.7
0 6 0	74.3	11.0	0 16 40	163.6	4.1	1 3 20	157.0	5.2
0 6 40	+ 81.9	+ 10.8	0 17 20	+ 166.3	+ 3.5	1 4 0	+ 153.2	- 5.8
0 7 20	89.4	10.5	0 18 0	168.6	3.0	1 4 40	149.0	6.3
0 8 0	96.6	10.1	0 18 40	170.5	2.4	1 5 20	144.4	6.8
0 8 40	103.6	9.8	0 19 20	171.9	1.8	1 6 0	139.5	7.3
0 9 20	110.3	9.4	0 20 0	172.9	1.2	1 6 40	134.2	7.7
0 10 0	+ 116.7	+ 9.0	0 20 40	+ 173.6	+ 0.6	1 7 20	+ 128.6	- 8.2

JUPITER'S SATELLITES, 1861. 467

COORDINATES IN THE MEAN APPARENT ELLIPSE.

SATELLITE II.

<i>t</i>	<i>x'</i>	<i>y'</i>	<i>t</i>	<i>x'</i>	<i>y'</i>	<i>t</i>	<i>x'</i>	<i>y'</i>
d. h. m.	+	—	d. h. m.	—	—	d. h. m.	—	+
1 8 0	+122.7	— 8.6	2 3 20	—103.7	— 9.8	2 22 0	—156.9	+ 5.2
1 8 40	116.5	9.0	2 4 0	110.4	9.4	2 22 40	153.0	5.8
1 9 20	110.1	9.4	2 4 40	116.8	9.0	2 23 20	148.8	6.3
1 10 0	103.4	9.8	2 5 20	123.0	8.6	3 0 0	144.2	6.8
1 10 40	96.4	10.1	2 6 0	128.9	8.2	3 0 40	139.3	7.3
1 11 20	+ 89.2	—10.5	2 6 40	—134.5	— 7.7	3 1 20	—134.1	+ 7.8
1 12 0	81.7	10.8	2 7 20	139.7	7.2	3 2 0	128.5	8.2
1 12 40	74.1	11.0	2 8 0	144.6	6.7	3 2 40	122.6	8.6
1 13 20	66.3	11.3	2 8 40	149.1	6.2	3 3 20	116.4	9.0
1 14 0	58.3	11.5	2 9 20	153.3	5.7	3 4 0	109.9	9.4
1 14 40	+ 50.2	—11.7	2 10 0	—157.1	— 5.2	3 4 40	—108.1	+ 9.8
1 15 20	42.0	11.8	2 10 40	160.6	4.6	3 5 20	96.1	10.1
1 16 0	33.7	12.0	2 11 20	163.7	4.1	3 6 0	88.9	10.5
1 16 40	25.3	12.1	2 12 0	166.4	3.5	3 6 40	81.5	10.8
1 17 20	16.8	12.1	2 12 40	168.6	2.9	3 7 20	73.9	11.0
1 18 0	+ 8.3	—12.2	2 13 20	—170.4	— 2.3	3 8 0	— 66.1	+11.3
1 18 40	— 0.2	12.2	2 14 0	171.9	1.8	3 8 40	58.1	11.5
1 19 20	8.8	12.2	2 14 40	173.0	1.2	3 9 20	50.0	11.7
1 20 0	17.3	12.1	2 15 20	173.6	— 0.6	3 10 0	41.3	11.8
1 20 40	25.7	12.1	2 16 0	173.8	+ 0.0	3 10 40	33.5	12.0
1 21 20	— 34.1	—12.0	2 16 40	—173.6	+ 0.6	3 11 20	— 25.1	+12.1
1 22 0	42.4	11.8	2 17 20	172.9	1.2	3 12 0	16.6	12.1
1 22 40	50.6	11.7	2 18 0	171.8	1.8	3 12 40	— 8.1	12.2
1 23 20	58.7	11.5	2 18 40	170.3	2.4	3 13 20	+ 0.4	12.2
2 0 0	66.7	11.3	2 19 20	168.4	3.0	3 14 0	9.0	12.2
2 0 40	— 74.5	—11.0	2 20 0	—166.2	+ 3.5	3 14 40	+ 17.5	+12.1
2 1 20	82.1	10.7	2 20 40	163.5	4.1	3 15 20	26.0	12.1
2 2 0	89.5	10.4	2 21 20	—160.4	+ 4.7	3 16 0	+ 34.4	+12.0
2 2 40	— 96.7	—10.1						

SATELLITE III.

<i>t</i>	<i>x'</i>	<i>y'</i>	<i>t</i>	<i>x'</i>	<i>y'</i>	<i>t</i>	<i>x'</i>	<i>y'</i>
d. h. m.	+	+	d. h. m.	+	+	d. h. m.	+	+
0 0 0	+ 0.0	+17.4	0 21 20	+194.7	+12.4	1 18 40	+277.2	+ 0.2
0 1 20	13.5	17.4	0 22 40	204.1	11.8	1 20 0	277.0	— 0.6
0 2 40	26.9	17.3	1 0 0	213.0	11.1	1 21 20	276.2	1.5
0 4 0	40.3	17.2	1 1 20	221.4	10.5	1 22 40	274.7	2.3
0 5 20	53.6	17.1	1 2 40	229.3	9.8	2 0 0	272.6	3.2
0 6 40	+ 66.8	+16.9	1 4 0	+236.6	+ 9.1	2 1 20	+269.8	— 4.0
0 8 0	79.8	16.7	1 5 20	243.3	8.3	2 2 40	266.4	4.8
0 9 20	92.7	16.4	1 6 40	249.5	7.6	2 4 0	262.3	5.6
0 10 40	105.3	16.1	1 8 0	255.1	6.8	2 5 20	257.6	6.4
0 12 0	117.6	15.8	1 9 20	260.0	6.0	2 6 40	252.3	7.2
0 13 20	+129.7	+15.4	1 10 40	+264.3	+ 5.2	2 8 0	+246.4	— 8.0
0 14 40	141.5	15.0	1 12 0	268.0	4.4	2 9 20	240.0	8.7
0 16 0	153.0	14.5	1 13 20	271.1	3.6	2 10 40	233.0	9.4
0 17 20	164.1	14.0	1 14 40	273.6	2.7	2 12 0	225.4	10.1
0 18 40	174.7	13.5	1 16 0	275.5	1.9	2 13 20	217.3	10.8
0 20 0	+184.9	+13.0	1 17 20	+276.7	+ 1.1	2 14 40	+208.6	—11.5

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COORDINATES IN THE MEAN APPARENT ELLIPSE.

SATELLITE III.

<i>t</i>	<i>x'</i>	<i>y'</i>	<i>t</i>	<i>x'</i>	<i>y'</i>	<i>t</i>	<i>x'</i>	<i>y'</i>
d. h. m.	+ ^u	- ^u	d. h. m.	- ^u	- ^u	d. h. m.	- ^u	+ ^u
2 16 0	+199.5	-12.1	4 6 40	-158.4	-14.3	5 20 0	-255.1	+ 6.8
2 17 20	189.9	12.7	4 8 0	169.3	13.8	5 21 20	249.5	7.6
2 18 40	179.9	13.3	4 9 20	179.8	13.3	5 22 40	243.3	8.3
2 20 0	169.4	13.8	4 10 40	189.9	12.7	6 0 0	236.6	9.1
2 21 20	158.5	14.3	4 12 0	199.5	12.1	6 1 20	229.3	9.8
2 22 40	+147.2	-14.8	4 13 20	-208.6	-11.5	6 2 40	-221.4	+10.5
3 0 0	135.6	15.2	4 14 40	217.3	10.8	6 4 0	213.0	11.1
3 1 20	123.7	15.6	4 16 0	225.5	10.1	6 5 20	204.1	11.8
3 2 40	111.5	16.0	4 17 20	233.1	9.4	6 6 40	194.7	12.4
3 4 0	99.0	16.3	4 18 40	240.1	8.7	6 8 0	184.9	13.0
3 5 20	+ 86.3	-16.6	4 20 0	-246.5	- 8.0	6 9 20	-174.7	+13.5
3 6 40	73.3	16.8	4 21 20	252.3	7.3	6 10 40	164.1	14.0
3 8 0	60.2	17.0	4 22 40	257.6	6.4	6 12 0	153.0	14.5
3 9 20	47.0	17.2	5 0 0	262.3	5.6	6 13 20	141.5	15.0
3 10 40	33.6	17.3	5 1 20	266.4	4.8	6 14 40	129.7	15.4
3 12 0	+ 20.2	-17.4	5 2 40	-269.8	- 4.0	6 16 0	-117.6	+15.8
3 13 20	+ 6.7	17.4	5 4 0	272.6	3.2	6 17 20	105.2	16.1
3 14 40	- 6.8	17.4	5 5 20	274.7	2.3	6 18 40	92.6	16.4
3 16 0	20.3	17.4	5 6 40	276.2	1.5	6 20 0	79.3	16.7
3 17 20	33.7	17.3	5 8 0	277.0	- 0.6	6 21 20	66.8	16.9
3 18 40	- 47.1	-17.2	5 9 20	-277.2	+ 0.2	6 22 40	- 53.6	+17.1
3 20 0	60.3	17.0	5 10 40	276.7	1.1	7 0 0	40.3	17.2
3 21 20	73.4	16.8	5 12 0	275.5	1.9	7 1 20	26.9	17.3
3 22 40	86.3	16.6	5 13 20	273.7	2.7	7 2 40	- 13.4	17.4
4 0 0	99.0	16.3	5 14 40	271.2	3.6	7 4 0	+ 0.1	17.4
4 1 20	-111.5	-16.0	5 16 0	-268.1	+ 4.4	7 5 20	+ 13.6	+17.4
4 2 40	123.7	15.6	5 17 20	264.4	5.2	7 6 40	27.0	17.3
4 4 0	135.7	15.2	5 18 40	-260.1	+ 6.0	7 8 0	+ 40.4	+17.2
4 5 20	-147.2	-14.8						

SATELLITE IV.

<i>t</i>	<i>x'</i>	<i>y'</i>	<i>t</i>	<i>x'</i>	<i>y'</i>	<i>t</i>	<i>x'</i>	<i>y'</i>
d. h.	+ ^u	+ ^u	d. h.	+ ^u	+ ^u	d. h.	+ ^u	+ ^u
0 0	+ 0.0	+34.8	2 0	+332.3	+25.5	4 0	+486.2	+ 2.5
0 3	22.8	34.8	2 3	348.6	24.3	4 3	487.3	+ 0.8
0 6	45.6	34.7	2 6	364.1	23.1	4 6	487.3	- 0.8
0 9	68.3	34.5	2 9	378.9	21.9	4 9	486.3	2.4
0 12	90.9	34.2	2 12	392.9	20.6	4 12	484.2	4.1
0 15	+113.2	+33.9	2 15	+406.0	+19.3	4 15	+480.9	- 5.7
0 18	135.3	33.5	2 18	418.2	17.9	4 18	476.6	7.3
0 21	157.1	33.0	2 21	429.5	16.5	4 21	471.3	8.9
1 0	178.5	32.4	3 0	439.8	15.0	5 0	465.0	10.4
1 3	199.6	31.8	3 3	449.1	13.5	5 3	457.7	12.0
1 6	+220.3	+31.1	3 6	+457.5	+12.0	5 6	+449.3	-13.5
1 9	240.4	30.3	3 9	464.9	10.5	5 9	439.9	15.0
1 12	260.0	29.5	3 12	471.3	8.9	5 12	429.6	16.4
1 15	279.0	28.6	3 15	476.6	7.3	5 15	418.4	17.9
1 18	297.4	27.6	3 18	480.8	5.7	5 18	406.2	19.3
1 21	+315.2	+26.6	3 21	+484.0	+ 4.1	5 21	+393.1	-20.6

JUPITER'S SATELLITES, 1861. 469

COORDINATES IN THE MEAN APPARENT ELLIPSE.

SATELLITE IV.

t		x'	y'	t		x'	y'	t		x'	y'
d.	h.	#	#	d.	h.	#	#	d.	h.	#	#
6	0	+379.2	-21.9	9	18	-240.1	-30.3	18	12	-457.6	+12.0
6	3	364.4	23.1	9	21	259.7	29.5	18	15	449.3	13.5
6	6	348.8	24.3	10	0	278.7	28.6	18	18	440.0	15.0
6	9	332.5	25.5	10	3	297.2	27.6	18	21	429.7	16.4
6	12	315.4	26.6	10	6	315.0	26.6	14	0	418.5	17.8
6	15	+297.6	-27.6	10	9	-332.1	-25.5	14	3	-406.3	+19.2
6	18	279.2	28.5	10	12	348.4	24.4	14	6	393.2	20.6
6	21	260.2	29.4	10	15	363.9	23.2	14	9	379.3	21.9
7	0	240.6	30.3	10	18	378.7	21.9	14	12	364.6	23.1
7	3	220.5	31.1	10	21	392.7	20.6	14	15	349.1	24.3
7	6	+199.9	-31.8	11	0	-405.8	-19.3	14	18	-332.8	+25.4
7	9	178.8	32.4	11	3	418.0	17.9	14	21	315.7	26.5
7	12	157.4	33.0	11	6	429.3	16.5	15	0	298.0	27.5
7	15	135.6	33.5	11	9	439.6	15.0	15	3	279.6	28.5
7	18	113.5	33.9	11	12	449.0	13.5	15	6	260.5	29.4
7	21	+ 91.2	-34.2	11	15	-457.4	-12.0	15	9	-240.9	+30.3
8	0	68.7	34.5	11	18	464.8	10.5	15	12	220.8	31.1
8	3	46.0	34.7	11	21	471.3	8.9	15	15	200.2	31.8
8	6	23.2	34.8	12	0	476.5	7.3	15	18	179.2	32.4
8	9	+ 0.3	34.8	12	3	480.8	5.7	15	21	157.7	33.0
8	12	- 22.5	-34.8	12	6	-484.0	- 4.1	16	0	-135.9	+33.5
8	15	45.3	34.7	12	9	486.2	2.5	16	3	113.8	33.9
8	18	68.0	34.5	12	12	487.3	- 0.8	16	6	91.5	34.2
8	21	90.5	34.2	12	15	487.3	+ 0.8	16	9	69.0	34.5
9	0	112.9	33.9	12	18	486.3	2.4	16	12	46.3	34.7
9	3	-135.0	-33.5	12	21	-484.2	+ 4.0	16	15	- 23.5	+34.8
9	6	156.8	33.0	13	0	480.9	5.7	16	18	- 0.6	34.8
9	9	178.2	32.4	13	3	476.6	7.3	16	21	+ 22.2	34.8
9	12	199.3	31.8	13	6	471.3	8.9	17	0	+ 45.0	+34.7
9	15	-220.0	-31.1	13	9	-465.0	+10.5				

THE APPARENT ELEMENTS OF SATURN'S RING.

Sidereal Date Oh.	α Outer Major Axis.	b Outer Minor Axis.	p Inclination of Northern Semi-minor Axis to Circle of Declination from North to East.	l The Elevation of the Earth above the Plane of the Ring.	l' The Elevation of the Sun above the Plane of the Ring.	u u' Earth's Longitude from Saturn counted on Plane of Ring from the Ring's Ascending Node on	
						Equator.	Ecliptic.
0	42.90	4.08	-5° 46.9	-5° 26.9	-7° 46.6	216° 47.3	173° 31.2
20	44.14	4.53	5 50.2	5 53.4	7 28.2	216 8.1	172 52.1
40	44.93	5.12	5 55.9	6 32.9	7 9.8	214 59.9	171 44.0
60	45.09	5.74	6 2.6	7 21.2	6 51.3	213 35.8	170 20.0
80	44.59	6.21	6 8.8	8 0.5	6 32.7	212 16.4	169 0.9
100	43.56	6.43	6 13.3	8 29.6	6 14.1	211 17.0	168 1.4
120	42.19	6.34	6 14.8	8 38.9	5 55.5	211 0.0	167 44.5
140	40.71	6.04	6 13.7	8 31.7	5 37.0	211 10.6	167 55.2
160	39.31	5.54	6 10.9	8 6.2	5 18.4	211 46.3	168 31.0
180	38.10	4.91	6 4.8	7 23.8	4 59.8	213 3.5	169 48.3
200	37.16	4.20	5 56.7	6 29.0	4 41.2	214 46.5	171 31.4
220	36.52	3.44	5 46.9	5 24.4	4 22.5	216 44.9	173 29.9
240	36.21	2.70	5 36.0	4 16.3	4 3.9	218 54.7	175 39.8
260	36.24	2.47	5 24.4	3 6.6	3 45.3	221 7.8	177 53.6
280	36.62	1.28	5 12.9	2 0.0	3 26.7	223 16.6	180 1.9
300	37.31	0.66	5 2.2	1 1.0	3 8.1	225 14.2	181 59.6
320	38.32	0.15	4 53.1	0 13.3	2 49.5	226 50.8	183 36.3
325	38.62	0.04	4 51.1	-0 4.0	2 44.8	227 11.2	183 56.7
330	38.93	0.05	4 49.4	+0 4.5	2 40.1	227 29.5	184 15.0
335	39.25	0.14	4 47.9	0 1.9	2 35.5	227 44.7	184 30.3
340	39.59	0.21	4 46.5	0 18.0	2 30.8	228 0.3	184 45.9
360	41.01	0.25	4 44.4	0 26.8	2 12.2	228 22.3	185 8.0
366	41.45	0.36	-4 43.0	+0 30.2	-2 7.2	228 37.3	185 23.0

Factor which is to be multiplied by a and b to obtain the axes of

- The inner ellipse of the outer Ring = 0.8801 log. Factor = 9.9445
- The outer ellipse of the inner Ring = 0.8599 " = 9.9344
- The inner ellipse of the inner Ring = 0.6350 " = 9.8228
- The inner ellipse of Bond's dusky Ring = 0.5486 " = 9.7392

NOTE. — The sign of l indicates whether the visible surface of the Ring is northern or southern.

THE APPARENT DISCS OF VENUS AND MARS.

The Versed Sines of their Illuminated Portions, divided by their Apparent Diameters.

1861.		Venus.	Mars.	1861.		Venus.	Mars.
January	15	0.880	0.886	July	15	0.952	0.995
February	15	0.932	0.908	August	15	0.896	1.000
March	15	0.969	0.930	September	15	0.824	0.989
April	15	0.993	0.952	October	15	0.741	0.983
May	15	1.000	0.970	November	15	0.637	0.980
June	15	0.986	0.988	December	15	0.507	0.963

WASHINGTON MEAN TIME.

PLANETARY CONSTELLATIONS.

	d	h	m					
Jan.	1	2	36	♂	♄	♄	♄	♄ + 6 12
	1	13	40		♄	♄	♄	in ♄
	8	0	31	♂	♄	♄	♄	♄ + 4 7
	9	8	40	♂	♄	♄	♄	♄ + 0 34
	10			☉				Eclipsed, invis. at Wash.
	11	17	45		♄	♄	♄	in Aphelion.
	15	18	21	♂	♄	♄	♄	♄ - 6 44
	16	22	15	♂	♄	♄	♄	♄ - 5 39
	17	17	21		♄	♄	♄	in ♄
	21	16	44	♂	♄	♄	♄	♄ - 3 45
Feb.	27	6	40	♂	♄	♄	♄	♄ + 4 8
	28	7	50	♂	♄	♄	♄	♄ + 6 13
	30	17	18	♂	♄	♄	♄	Sup.
	1	3	45		♄	♄	♄	greatest Hel. Lat. S.
	2	1	30	♂	♄	♄	♄	in ♄
	7	2	51	♂	♄	♄	♄	♄ - 0 32
	9	23	48	♂	♄	♄	♄	♄ - 5 12
	10	0	33	♂	♄	♄	♄	♄ - 6 40
	12	3	36	♂	♄	♄	♄	stationary.
	13	19	52	♂	♄	♄	♄	stationary.
March	14	21	10	♂	♄	♄	♄	♄ - 5 2
	18	1	15	♂	♄	♄	♄	♄ - 3 39
	20	2	38		♄	♄	♄	in ♄
	23	11	6	♂	♄	♄	♄	♄ + 3 51
	24	0	5	♂	♄	♄	♄	♄
	24	14	22	♂	♄	♄	♄	♄ + 6 5
	24	17	24		♄	♄	♄	in Perihelion.
	25	23	25	♂	♄	♄	♄	♄
	26	23	18	♂	♄	♄	♄	greatest elong. E. 18 6
	March 5	11	34	♂	♄	♄	♄	stationary.
April	7	1	22		♄	♄	♄	greatest Hel. Lat. N.
	8	8	58		♄	♄	♄	in Aphelion.
	9	13	49	♂	♄	♄	♄	♄ - 5 10
	11	12	18	♂	♄	♄	♄	♄ - 6 36
	11	12	58	♂	♄	♄	♄	♄ - 1 11
	15	9	4	♂	♄	♄	♄	Inf.
	15	17	53	♂	♄	♄	♄	♄ - 3 50
	17	9	27	♂	♄	♄	♄	♄ - 3 24
	18	23	11	♂	♄	♄	♄	♄
	19	21	40	♂	♄	♄	♄	enters ♀, spring begins.
April	21	13	51	♂	♄	♄	♄	♄ + 4 1
	22	17	19	♂	♄	♄	♄	♄ + 3 45
	23	22	4	♂	♄	♄	♄	♄ + 6 0
	27	19	55		♄	♄	♄	stationary.
	30	12	54	♂	♄	♄	♄	in ♄
	30	21	57	♂	♄	♄	♄	greatest Hel. Lat. S.
	7	8	13	♂	♄	♄	♄	♄ - 6 38
	7	20	27	♂	♄	♄	♄	♄ - 6 39
	9	1	21	♂	♄	♄	♄	♄ - 6 56
	9	17	1		♄	♄	♄	in Aphelion.
April	12	2	0	♂	♄	♄	♄	greatest elong. W. 27 32
	12	10	2		♄	♄	♄	stationary.
	13	12	45	♂	♄	♄	♄	♄ - 2 17
	13	17	22	♂	♄	♄	♄	♄ - 3 5
	17	10	15	♂	♄	♄	♄	♄ + 1 0
	19	1	21	♂	♄	♄	♄	♄ + 3 52
	20	5	56	♂	♄	♄	♄	♄ + 6 4
	30	3	0		♄	♄	♄	greatest Hel. Lat. S.
	4	6	52		♄	♄	♄	stationary.
	5	4	28	♂	♄	♄	♄	♄ - 6 49
May	7	22	54	♂	♄	♄	♄	♄
	8	2	54	♂	♄	♄	♄	♄ - 6 55
	9	8	1	♂	♄	♄	♄	♄ - 4 59
	10	22	28	♂	♄	♄	♄	Sup.
	11	1	44	♂	♄	♄	♄	♄ - 2 51
	12	6	33	♂	♄	♄	♄	♄ - 0 33
	16	11	12	♂	♄	♄	♄	♄ + 4 12
	17	13	34	♂	♄	♄	♄	♄ + 6 14
	19	2	52		♄	♄	♄	in ♄
	21	10	48	♂	♄	♄	♄	Sup.
June	23	13	0	♂	♄	♄	♄	in Perihelion.
	23	16	40		♄	♄	♄	♄
	24	13	2	♂	♄	♄	♄	♄ + 1 0
	26	4	48		♄	♄	♄	in ♄
	26	11	11	♂	♄	♄	♄	♄ + 1 13
	28	0	41	♂	♄	♄	♄	♄ + 0 5
	1	13	38	♂	♄	♄	♄	♄ - 7 3
	2	2	54	♂	♄	♄	♄	♄
	3	0	40		♄	♄	♄	greatest Hel. Lat. N.
	7	11	9	♂	♄	♄	♄	♄ - 2 43
June	8	12	39	♂	♄	♄	♄	♄ - 1 3
	9	14	4	♂	♄	♄	♄	♄ + 1 41
	9	23	58	♂	♄	♄	♄	♄ + 1 16
	12	23	15	♂	♄	♄	♄	♄ + 4 36
	13	21	37	♂	♄	♄	♄	♄ + 6 25
	15	1	7	♂	♄	♄	♄	♄ + 0 34
	20	18	27	♂	♄	♄	♄	enters ♄, summer begins.
	22	10	50	♂	♄	♄	♄	♄
	24	12	28	♂	♄	♄	♄	greatest elong. E. 25 27
	26	12	9		♄	♄	♄	in ♄
July	28	17	52		♄	♄	♄	in Perihelion.
	28	20	56	♂	♄	♄	♄	♄ - 7 11
	2	19	24	♂	♄	♄	♄	in Apogee.
	4	21	37	♂	♄	♄	♄	♄ - 2 36
	6	16	18		♄	♄	♄	in Aphelion.
	7			♂	♄	♄	♄	Eclipsed, invis. at Wash.
	7	16	57		♄	♄	♄	stationary.
	8	8	17	♂	♄	♄	♄	♄ + 0 14
	8	17	22	♂	♄	♄	♄	♄ + 3 4
	8	17	50	♂	♄	♄	♄	♄ + 3 20

WASHINGTON MEAN TIME.

PLANETARY CONSTELLATIONS.

	d	h	m								
July	8	21	28	♄	♃	♄	♄	♄	♄	♄	♄
	10	4	17	♄	♃	♄	♄	♄	♄	♄	♄
	10	13	51	♄	♃	♄	♄	♄	♄	♄	♄
	11	7	17	♄	♃	♄	♄	♄	♄	♄	♄
	11	10	22	♄	♃	♄	♄	♄	♄	♄	♄
	20	16	54	♃	♄	♄	♄	♄	♄	♄	♄
	22	0	52	♃	♄	♄	♄	♄	♄	♄	♄
	22	3	27	♄	♃	♄	♄	♄	♄	♄	♄
	26	4	53	♄	♃	♄	♄	♄	♄	♄	♄
	27	2	11	♄	♃	♄	♄	♄	♄	♄	♄
Aug.	31	14	52	♄	♃	♄	♄	♄	♄	♄	♄
	1	6	7	♄	♃	♄	♄	♄	♄	♄	♄
	1	8	29	♄	♃	♄	♄	♄	♄	♄	♄
	4	10	59	♄	♃	♄	♄	♄	♄	♄	♄
	6	10	45	♄	♃	♄	♄	♄	♄	♄	♄
	7	7	10	♄	♃	♄	♄	♄	♄	♄	♄
	7	12	58	♄	♃	♄	♄	♄	♄	♄	♄
	7	19	29	♄	♃	♄	♄	♄	♄	♄	♄
	7	20	3	♄	♃	♄	♄	♄	♄	♄	♄
	10	8	15	♄	♃	♄	♄	♄	♄	♄	♄
Sept.	15	2	8	♄	♃	♄	♄	♄	♄	♄	♄
	19	15	57	♄	♃	♄	♄	♄	♄	♄	♄
	22	11	49	♄	♃	♄	♄	♄	♄	♄	♄
	25	14	15	♄	♃	♄	♄	♄	♄	♄	♄
	26	14	1	♄	♃	♄	♄	♄	♄	♄	♄
	28	18	35	♄	♃	♄	♄	♄	♄	♄	♄
	29	23	55	♄	♃	♄	♄	♄	♄	♄	♄
	30	10	37	♄	♃	♄	♄	♄	♄	♄	♄
	1	19	1	♄	♃	♄	♄	♄	♄	♄	♄
	1	22	15	♄	♃	♄	♄	♄	♄	♄	♄
Oct.	2	6	52	♄	♃	♄	♄	♄	♄	♄	♄
	2	8	11	♄	♃	♄	♄	♄	♄	♄	♄
	4	2	39	♄	♃	♄	♄	♄	♄	♄	♄
	4	3	59	♄	♃	♄	♄	♄	♄	♄	♄
	4	5	28	♄	♃	♄	♄	♄	♄	♄	♄
	4	9	54	♄	♃	♄	♄	♄	♄	♄	♄
	4	10	14	♄	♃	♄	♄	♄	♄	♄	♄
	4	12	35	♄	♃	♄	♄	♄	♄	♄	♄
	4	19	27	♄	♃	♄	♄	♄	♄	♄	♄
	6	15	38	♄	♃	♄	♄	♄	♄	♄	♄
Nov.	8	8	35	♄	♃	♄	♄	♄	♄	♄	♄
	11	7	48	♄	♃	♄	♄	♄	♄	♄	♄
	14	18	17	♄	♃	♄	♄	♄	♄	♄	♄
	18	17	32	♄	♃	♄	♄	♄	♄	♄	♄
	21	3	52	♄	♃	♄	♄	♄	♄	♄	♄
	22	8	40	♄	♃	♄	♄	♄	♄	♄	♄
	22	11	24	♄	♃	♄	♄	♄	♄	♄	♄
	22	13	52	♄	♃	♄	♄	♄	♄	♄	♄
	25	2	40	♄	♃	♄	♄	♄	♄	♄	♄
	1	23	15	♄	♃	♄	♄	♄	♄	♄	♄
Dec.	2	2	31	♄	♃	♄	♄	♄	♄	♄	♄
	2	15	34	♄	♃	♄	♄	♄	♄	♄	♄
	2	20	52	♄	♃	♄	♄	♄	♄	♄	♄
	5	2	17	♄	♃	♄	♄	♄	♄	♄	♄
	6	7	29	♄	♃	♄	♄	♄	♄	♄	♄
	15	22	21	♄	♃	♄	♄	♄	♄	♄	♄
	19	0	37	♄	♃	♄	♄	♄	♄	♄	♄
	20	9	1	♄	♃	♄	♄	♄	♄	♄	♄
	22	8	20	♄	♃	♄	♄	♄	♄	♄	♄
	23	1	25	♄	♃	♄	♄	♄	♄	♄	♄
Jan.	24	23	24	♄	♃	♄	♄	♄	♄	♄	♄
	29	18	21	♄	♃	♄	♄	♄	♄	♄	♄
	29	19	0	♄	♃	♄	♄	♄	♄	♄	♄
	31	13	12	♄	♃	♄	♄	♄	♄	♄	♄
	31	23	8	♄	♃	♄	♄	♄	♄	♄	♄
	3	3	24	♄	♃	♄	♄	♄	♄	♄	♄
	5	1	17	♄	♃	♄	♄	♄	♄	♄	♄
	10	14	47	♄	♃	♄	♄	♄	♄	♄	♄
	11	-	-	♄	♃	♄	♄	♄	♄	♄	♄
	11	1	24	♄	♃	♄	♄	♄	♄	♄	♄
Feb.	11	14	18	♄	♃	♄	♄	♄	♄	♄	♄
	12	3	15	♄	♃	♄	♄	♄	♄	♄	♄
	15	15	12	♄	♃	♄	♄	♄	♄	♄	♄
	18	12	27	♄	♃	♄	♄	♄	♄	♄	♄
	20	15	55	♄	♃	♄	♄	♄	♄	♄	♄
	22	23	-	♄	♃	♄	♄	♄	♄	♄	♄
	25	23	11	♄	♃	♄	♄	♄	♄	♄	♄
	26	7	18	♄	♃	♄	♄	♄	♄	♄	♄
	26	11	30	♄	♃	♄	♄	♄	♄	♄	♄
	28	17	22	♄	♃	♄	♄	♄	♄	♄	♄
March.	29	4	48	♄	♃	♄	♄	♄	♄	♄	♄
	30	1	51	♄	♃	♄	♄	♄	♄	♄	♄
	4	22	25	♄	♃	♄	♄	♄	♄	♄	♄
	5	17	41	♄	♃	♄	♄	♄	♄	♄	♄
	9	9	32	♄	♃	♄	♄	♄	♄	♄	♄
	13	14	28	♄	♃	♄	♄	♄	♄	♄	♄
	15	16	37	♄	♃	♄	♄	♄	♄	♄	♄
	15	17	52	♄	♃	♄	♄	♄	♄	♄	♄
	16	-	-	♄	♃	♄	♄	♄	♄	♄	♄
	17	16	1	♄	♃	♄	♄	♄	♄	♄	♄
April.	19	10	40	♄	♃	♄	♄	♄	♄	♄	♄
	19	23	40	♄	♃	♄	♄	♄	♄	♄	♄
	21	2	27	♄	♃	♄	♄	♄	♄	♄	♄
	23	15	54	♄	♃	♄	♄	♄	♄	♄	♄
	23	22	50	♄	♃	♄	♄	♄	♄	♄	♄
	27	19	35	♄	♃	♄	♄	♄	♄	♄	♄
	29	14	48	♄	♃	♄	♄	♄	♄	♄	♄
	30	-	-	♄	♃	♄	♄	♄	♄	♄	♄
	30	8	10	♄	♃	♄	♄	♄	♄	♄	♄
	31	9	52	♄	♃	♄	♄	♄	♄	♄	♄

LATITUDES AND LONGITUDES OF THE PRINCIPAL OBSERVATORIES.

- Åbo.** N. Lat. $60^{\circ} 26' 56''.8 \pm 0''.11$. ARGELANDER, *Obs. Astron.*, I. p. xxi.
 Long. E. from Paris, $1^{\text{h}} 19^{\text{m}} 47''.3$. *Astr. Nachr.*, IX. 264.
 This Observatory was abandoned, and the instruments transferred, together with the University of Finland, to Helsingfors, in consequence of the great fire of 1827, by which the University buildings, library, &c. were destroyed.
- Albany.** N. Lat. $42^{\circ} 39' 50'' \pm 2''$. } GOULD, *Astr. Journal*,
 Long. E. from Washington, $0^{\text{h}} 13^{\text{m}} 12''.6 \pm 0''.2$. } V. 144.
- Altona.** N. Lat. $53^{\circ} 32' 45''.27$. GAUSS, *Bestimmung des Breiten-Unterschiedes zwischen den Sternwarten von Göttingen und Altona*, p. 71. In the edition of SCHUMACHER'S *Hülftafeln*, published by WARNSTORFF, Altona, 1845, the latitude of Altona is given, p. 114, as $+53^{\circ} 32' 45''.7$.
 Long. E. from Greenwich, $0^{\text{h}} 39^{\text{m}} 46''.151 \pm 0''.042$. STRUVE, *Expéd. Chronomet. exécutée en 1844, entre Altona et Greenwich*, p. 206.
- Ann Arbor.** N. Lat. $42^{\circ} 16' 48''$. BRÜNNOW, *Astr. Journal*, V. 112.
 Long. W. from Washington, $0^{\text{h}} 26^{\text{m}} 41''.0$. BRÜNNOW, *Astr. Journal*, V. 145.
- Athens.** N. Lat. $37^{\circ} 58' 20'' \pm 1''$. BOURIS, *Astr. Nachr.*, XXXIII. 197.
 Long. E. from Paris, $1^{\text{h}} 25^{\text{m}} 34''.23 \pm 1''$. *Ergänzungs-Heft zu den Astr. Nachr.*, 1849, p. 151. This longitude was obtained from moon-culminating stars observed on ten nights at Athens and Hamburg. The result of a series observed at Athens and Copenhagen gave the longitude of Athens $6''.84$ farther East, but this series was rejected. *Ibid.*, pp. 150, 151, 158. Diminishing the E. longitude of Hamburg in conformity with STRUVE'S chronometric determination, we have for the longitude of the meridian-circle $1^{\text{h}} 25^{\text{m}} 33''.73 \pm 1''$.
 The centre of the Observatory is $0''.19$ W. from the meridian-circle, *Erg.-Heft z. d. Astr. Nachr.*, p. 152.
- Berlin.** N. Lat. $52^{\circ} 30' 16''.68 \pm 0''.2$. ENCKE, *Astr. Nachr.*, XXIII. 372.
 For the Longitude of the centre of the Observatory, we have
- | | | | |
|---------------------------|--------------------------------------|------------|-----------------------------------|
| Berlin E. from Altona, | $0^{\text{h}} 13^{\text{m}} 48''.78$ | ± 0.03 | <i>Berl. Astr. Jahrb.</i> , 1839, |
| Altona E. from Greenwich, | $0 39 46.15$ | | [p. 275. |
| Berlin " " | $0 53 34.98$ | | |

THE PRINCIPAL OBSERVATORIES.

The old Observatory was situated $0^{\circ} 56''.72$ North (*Berl. Astr. Jahrb.*, 1839, p. 242; *Astr. Nachr.*, XXIII. 370), and $0^{\circ}.39$ West (*Ibid.*, pp. 261, 265), of the new one. Hence we have for the old Berlin Observatory,

N. Lat. $52^{\circ} 31' 13''.4$.

Long. E. from Greenwich, $0^{\text{h}} 53^{\text{m}} 84^{\text{s}}.54$.

Bilk. N. Lat. $51^{\circ} 12' 25''$. *Astr. Nachr.*, XXVII. 300.
Long. W. from Berlin, $0^{\text{h}} 26^{\text{m}} 30^{\text{s}}$. *Ibid.*

Bonn. N. Lat. $50^{\circ} 43' 45''.0$. } Orally communicated by Prof. ARGE-
Long. E. from Paris, $0^{\text{h}} 19^{\text{m}} 3^{\text{s}}$. } LANDER to the compiler.

The provisional Observatory on the *Alter Zoll*, in which were made the observations published in Vol. I. of the Bonn series, was situated in

N. Lat. $50^{\circ} 44' 9''$.

Long. E. from Paris, $0^{\text{h}} 19^{\text{m}} 5^{\text{s}}.5$. *Bonn Astr. Beob.*, I. p. i.

Breslau. N. Lat. $51^{\circ} 6' 56''$. (MS. communication from Professor BOGUSLAWSKI to Professor ENCKE.) *Berl. Astr. Jahrb.*, 1852, p. 289. The value given in the *Berl. Jahrb.* previously to 1851, was $51^{\circ} 6' 30''.0$.

The Longitude given in the table is derived from a mean of four determinations of the longitude E. from Paris, viz. :—

Triangulation in 1805 (fire-signals), <i>Astr. Nachr.</i> , XVI. 871,	$0^{\text{h}} 58^{\text{m}} 48.6$
STECZKOWSKI (6 star-immersions), <i>Ibid.</i> ,	48.17
HANSEN (occultations); <i>Astr. Nachr.</i> , XVII. 170,	48.74
ERMAN and PETERSEN (meteors), <i>Astr. Nachr.</i> , XIX. 27,	48.67
Mean, Breslau E. from Paris,	<hr style="width: 100%; border: 0.5px solid black;"/> 0 58 48.54

Brussels. N. Lat. $50^{\circ} 51' 10''.7$. *Annales de l'Obs. de Bruxelles*, 1837, p. 264.
Long. E. from Greenwich, $0^{\text{h}} 17^{\text{m}} 27^{\text{s}}.6$. QUETELET, *Mém. de l'Acad. R. de Bruxelles*, XVI. 18.

Cambridge (Eng.). N. Lat. $52^{\circ} 12' 51''.76$. *Camb. Phil. Trans.*, V. 279.
Long. E. from Greenwich, $0^{\text{h}} 0^{\text{m}} 23^{\text{s}}.54$. *Ibid.*, III. 168.

Cambridge (Mass.). N. Lat. $42^{\circ} 22' 48''.6$. PEIRCE, *Mem. Amer. Acad.*, N. S., II. 203.
Long. by the telegraphic determinations of the U. S. Coast-Survey, Cambridge E. from Stuyvesant Garden, N. Y.,

By 34 sets of clock-signals,	$0^{\text{h}} 11^{\text{m}} 26.10$
“ 10 “ “ star-signals (Western),	26.13
“ 24 “ “ “ (exchanged E. and W.),	25.96
“ 17 “ “ “ (Eastern),	26.18

Mean,

Geodetic reduction to dome of Cambridge Observatory,	—0.02
Stuyvesant Garden E. of Jersey City (geodetic),	0 11.93
Cambridge E. from C. S. Station, Jersey City,	<hr style="width: 100%; border: 0.5px solid black;"/> 0 11 38.00
Jersey City E. from Washington (see Philadelphia),	0 12 3.54
Cambridge (dome) E. from Washington,	<hr style="width: 100%; border: 0.5px solid black;"/> 0 23 41.54

Cape of Good Hope. S. Lat. $33^{\circ} 58' 8''$. HENDERSON, *Mem. R. Astr. Soc.*, VI. 130.
 Long. E. from Greenwich,
 By Greenwich Observations, $1^{\text{h}} 13^{\text{m}} 56.1$ *Ibid.*, p. 126.
 " Cambridge " 55.04 " p. 127.
 " Åbo " 58.56 " p. 128.
 " Edinburgh " 54.2 " p. 129.
 Mean, $1^{\text{h}} 13^{\text{m}} 56.0$

Christiania. . . . N. Lat. $59^{\circ} 54' 43''.7$.
 Long. E. from Paris, $0^{\text{h}} 33^{\text{m}} 38''.3$ } *Astr. Journal*, II. 178.

Cincinnati. . . . N. Lat. $39^{\circ} 5' 54''$. *Astr. Nachr.*, XXIII. 813.
 Long. W. from Washington, $0^{\text{h}} 29^{\text{m}} 46''.85$. (U. S. Coast-Survey.) *Proc. Amer. Assoc. for Adv. Science*, Cincinnati, 1851, p. 118.

Copenhagen. . . . By Copenhagen Observatory is usually understood the "Round Tower" of the University. The new instruments are, however, mounted in a temporary wooden building known as "Holkens Bastion." (See *Astr. Nachr.*, XIX. 119).

N. Lat. of the Round Tower, $55^{\circ} 40' 53''$. *Astr. Nachr.*, V. 366.
 For the Longitude,

Holkens Bastion E. from Altona,	
HANSEN (<i>Astr. Nachr.</i> , VIII. 281),	$0^{\text{h}} 10^{\text{m}} 32.585$ (189.88)
SCHUMACHER (<i>Astr. Nachr.</i> , IX. 463),	32.565 (19.42)
Mean,	$10^{\text{m}} 32.583$
Altona E. from Greenwich,	39 46.151
Holkens Bastion E. from Greenwich,	50 18.734
Round Tower E. from Holkens Bastion (WURM,	
<i>Astr. Nachr.</i> , III. 438; V. 337),	0.57
Round Tower E. from Greenwich,	$0^{\text{h}} 50^{\text{m}} 19.80$

Cracow. N. Lat. $50^{\circ} 3' 50''.0 \pm 0.09$. WEISSE, *Astr. Nachr.*, VIII. 175; XVI. 256.

Longitude E. from Paris,
 Mean of 19 obs. by WURM (*Astr. Nachr.*, VII. 458, VIII. 358), (6 of the 25 being rejected,) $1^{\text{h}} 10^{\text{m}} 28.986 \pm 0.461$
 Mean of 25 obs. by STECZKOWSKI (*Astr. Nachr.*, XVI. 352), 30.221 ± 0.301
 Mean of 4 obs. by STECZKOWSKI (*Astr. Nachr.*, XVIII. 332), 29.760 ± 0.085
 Mean of 16 obs. of three occultations (STECZKOWSKI, *Astr. Nachr.*, X. 232), 30.95 ± 0.258
 Assigning to each of these determinations a weight proportional to the number of observations from which it was derived, we obtain the mean,

Cracow E. from Paris,	$1^{\text{h}} 10^{\text{m}} 29.78$
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THE PRINCIPAL OBSERVATORIES.

- Dorpat. N. Lat. $58^{\circ} 22' 47''.40 \pm 0''.05$. STRUVE, *Posit. Med.*, p. xl.
 Long. E. from Paris, $1^{\text{h}} 37^{\text{m}} 32''.70$ WURM, *Astr. Nachr.*, III. 437.
 38.5 BESSEL, " III. 46.
 Mean, $1^{\text{h}} 37^{\text{m}} 38''.1$
- Dublin. N. Lat. $53^{\circ} 23' 18''$.
 Long. W. from Greenwich, $0^{\text{h}} 25^{\text{m}} 22''$. *Astr. Nachr.*, X. 274.
- Durham. N. Lat. $54^{\circ} 46' 6''.4$.
 Long. W. from Greenwich, $0^{\text{h}} 6^{\text{m}} 18''.0$. *Astr. Nachr.*, XXVI. 215.
- Edinburgh. . . . N. Lat. $55^{\circ} 57' 23''.2$.
 Long. W. from Greenwich, $0^{\text{h}} 12^{\text{m}} 43''.0$. *Edinb. Observ.*, X. v.
- Florence. N. Lat. $43^{\circ} 46' 40''.8$. ZACH, *Corresp. Astron.*, I. 15.
 Long. E. from Paris, $0^{\text{h}} 35^{\text{m}} 40''.2$. *Ibid.*, p. 14.
- Geneva. N. Lat. by observations of pole-star, $46^{\circ} 11' 58''.72 \pm 0''.1$
 " " " nadir-point, 58.97 ± 0.1
 Mean, $46^{\circ} 11' 58.84$ PLANTAMOUR, *Mém.*
 [de la Soc. de Physique et d'Hist. Nat. de Genève, XI. 15.
 Long. E. from Paris, $0^{\text{h}} 15^{\text{m}} 16''.22$. *Astr. Nachr.*, XX. 7.
- Georgetown. . . . N. Lat. $38^{\circ} 54' 26''.1$. *Astron. Journ.*, I. 69.
 Long. W. from Washington, $0^{\text{h}} 0^{\text{m}} 6''.20$. *Astron. Journ.*, I. 70.
- Götha. (Seeberg.)
 N. Lat. $50^{\circ} 56' 5''.19$. GAUSS, *Best. d. Breit.-Untersch.*, p. 80.
 For the Longitude E. from Paris,
 WURM found by 11 occultations (*Astr. Nachr.*,
 II. 405), $0^{\text{h}} 33^{\text{m}} 34''.8 \pm 0.13$
 PETERS found (*Astr. Nachr.*, V. 68),

Seeberg East from Altona,	8	10.2	weigh.	2
" " Göttingen,	8	8.9	15	
West " Königsberg,	39	5.6	18	
East " Paris,	38	34.3	24	
West " Vienna,	22	38.0	17	

 Whence, using the present data, we find,
 Seeberg E. from Paris, $0^{\text{h}} 33^{\text{m}} 33''.66$
 Mean, $0^{\text{h}} 33^{\text{m}} 34''.2$
 For the Observatory attached to Professor HANSEN'S house,
 Long. E. from Paris, $0^{\text{h}} 33^{\text{m}} 30''.046$. SCHUMACHER, *Astr. Nachr.*,
 XXIII. 263.
- Göttingen. GAUSS found, *Best. d. Breit.-Untersch.*, p. 71, for the N. Latitude of the
 meridian-circle, $51^{\circ} 31' 47''.85$, with the weight 60.9.
 The Longitude of the same, GAUSS found (*Ibid.*) by his trigonometrical
 survey to be West of the meridian-circle in Altona by 7.211 Paris
 toises. Using BESSEL'S data we find $1' = 148.33$ toises, whence we
 have,

Göttingen West of Altona,	0 ^h 0 ^m 0.049
Altona East of Greenwich,	0 39 46.151
Göttingen East of Greenwich,	0 39 46.102

For the old Observatory,

Lat. = +51° 31' 55".6. *Monatl. Corr.*, XXVII. 483.

Long. E. of Paris, 0^h 30^m 25".2. *Astr. Nachr.*, II. 497, 408.

Greenwich. . . . N. Lat. 51° 28' 38".2. *AIRY*, *Mem. Astr. Soc.*, XVII. 49.
 Long. W. from Paris, 0^h 9^m 21".46 ± 15. *HENDERSON*, *Phil. Trans.*,
 1827, p. 286. See also Washington.

Hamburg. . . . N. Lat. 53° 38' 7", by geodetical connection with Altona. *Preface to RÜMKEE'S Catalogue.*

The Longitude given in the table is derived thus:—

Hamburg E. from Altona (<i>HANSEN</i> , <i>Astr. Nachr.</i> , VIII. 277),	0 ^h 0 ^m 7.41
Altona E. from Greenwich (<i>STRUVE</i> , <i>Exp. Chron.</i> <i>de 1844</i>),	0 39 46.15
Whence Hamburg E. from Greenwich,	0 39 53.56

Hudson. N. Lat. 41° 14' 42".6. *LOOMIS*, *Trans. Am. Phil. Soc.*, N. S., X. 61.
 Long. W. from Philadelphia (U. S. Coast-Survey),

By 3 sets Eastern clock-signals,	0 ^h 25 ^m 5.72
" 2 " Western "	5.68
	0 25 5.70
Philadelphia E. from Washington,	7 33.64
Hudson W. from Washington,	0 17 32.06

Professor LOOMIS deduced from moon-culminations,

Hudson W. from Greenwich, 5^h 25^m 41".3. *Astr. Journ.*, I. 67.

Kasan. N. Lat. 55° 47' 23".1. *Astr. Nachr.*, XXVIII. 47.
 Long. E. from Berlin, 2^h 22^m 57".0. *Berl. Astr. Jahrb.*, 1854, p. 293.

Königsberg. . . . N. Lat. 54° 42' 50".4. *BESSEL*, *Astr. Nachr.*, I. 248.
 Long. E. from Paris, 1^h 12^m 38".8 *WURM*, *Astr. Nachr.*, III. 437.
 38.93 *BESSEL*, " III. 46.
 Mean, 1 12 38.9

Kronsmünster. . . . N. Lat. 48° 3' 23".81 ± 0".03. *Astr. Nachr.*, XXXVII. 271.
 Long. E. from Paris, 0^h 47^m 11".96. *SCHUMACHER*, *Astr. Nachr.*,
 XXIII. 263.

Leipzic. (Pleissenburg.)
 N. Lat. *D'ARREST*, *Astr. Nachr.*, XXVIII.
 148, 51° 20' 20".7 ± 0.36 *Weight.* 26.37
D'ARREST, *Astr. Nachr.*, XXVIII. 160, 20.4
 Long. E. from Greenwich, 0^h 49^m 28".5.

THE PRINCIPAL OBSERVATORIES

Leyden.	N. Lat. $52^{\circ} 9' 28''.16 \pm 0''.15$ Long. E. from Paris, $0^{\text{h}} 8^{\text{m}} 35''.97 \pm 0''.19$	} KAISER, <i>Astr. Nachr.</i> , XVII 100.
Liverpool.	N. Lat. $53^{\circ} 24' 47''.40$. <i>Memoirs R. Astr. Soc.</i> , XXVI 7. Long. W. from Greenwich, $0^{\text{h}} 12^{\text{m}} 0''.11$. <i>Naut. Abn.</i> , 1852, p. 598.	
London.	(Mr. Bishop's Observatory.) N. Lat. $51^{\circ} 31' 29''.8$. <i>Astr. Obs. at the Observatory South Villa</i> , p. xix. Long. W. from Greenwich, $0^{\text{h}} 0^{\text{m}} 37''.1$.	
Madras.	N. Lat. $13^{\circ} 4' 9''.2$. Long. E. from Greenwich, $5^{\text{h}} 20^{\text{m}} 57''$. TAYLOR, <i>Madras General Catal.</i> , 1844, <i>Pref.</i> p. ii.	
Mannheim.	N. Lat. $49^{\circ} 29' 12''.9$. <i>Astr. Nachr.</i> , XII. 129. Long. E. from Paris, as determined	
	By WURM, from occultations (<i>Astr. Nachr.</i> , VIII. 458),	0 24 29.92
	“ connection with Strasburg (<i>Astr. Nachr.</i> , XV. 280),	29.87
	“ “ “ Vienna (<i>Astr. Nachr.</i> , XV. 279 ; XXIII. 263),	30.28
	By connection with Dunkirk (MÜFFLING, <i>Astr. Nachr.</i> , XV. 279),	30.05
	By OLUFSEN from solar eclipse (<i>Astr. Nachr.</i> , XXII. 234),	30.10
	Mean,	0 24 30.04
Markree.	N. Lat. $54^{\circ} 10' 31''.72$. <i>Astr. Journal</i> , II. 12. Long. W. from Greenwich, $0^{\text{h}} 33^{\text{m}} 48''.4$. <i>Naut. Abn.</i> , 1852, p. 598.	
Marseilles.	N. Lat. $43^{\circ} 17' 49''$. <i>Monatl. Corresp.</i> , XIII. 139. Long. E. from Paris, according to	
	LINDENAU (<i>Monatl. Corr.</i> , XIX. 421),	No. Obs. 4 0 12 7.7
	WURM (<i>Monatl. Corr.</i> , XXVI. 185),	19 7.6
	“ (<i>Astr. Nachr.</i> , IV. 38),	12 7.5
	INNES (<i>Astr. Nachr.</i> , VIII. 435),	4 7.05
	Mean,	0 12 7.53
Milan.	(Brera.) N. Lat. $45^{\circ} 28' 0''.7$. <i>Corresp. Astron.</i> , V. 300; <i>Effem. Astr. di Mi-</i> <i>lano</i> , 1846, <i>App.</i> , pp. 73-86. Long. E. from Paris,	
	DAUSSY found from 31 occultations (<i>Conn. d. Temps</i> , 1836, <i>Add.</i> , p. 131),	0 27 24.91
	LITTEBOW found Milan W. from Vienna (<i>Ibid.</i>),	28 45.63
		56 11.07
	Mean,	0 27 25.44
		0 27 25.18

- Modena.** N. Lat. $44^{\circ} 38' 52''.75$. BIANCHI, *Astr. Nachr.*, XVI. 221; *Atti del R. Osserv. di Modena*, I. 336 (1884).
 Long. E. from Milan, $0^h 6^m 55''.99$. *Ibid.*, p. 337.
 Hence E. from Paris,
 By comparison with Milan $0^h 84^m 20.45$
 WURM from occultations, 23.5 *Astr. Nachr.*, I. 504.
 " " " 24.5 " III. 222.
 STECZKOWSKI from occultations, 21.81 " XVI. 299, 302.
 OLUFSEN from solar eclipse, 22.32 " XXII. 234.
 Mean, $0^h 84^m 22.51$
- Moscow.** N. Lat. $55^{\circ} 45' 19''.88 \pm 0.08$. SCHWEIZER, *Astr. Nachr.*, XXXVIII. 100.
 Long. E. from Greenwich, $2^h 30^m 16''.98$. *Astr. Nachr.*, XXXVIII. 103.
- Munich.** (Bogenhausen.)
 N. Lat. $48^{\circ} 8' 45''$. SOLDNER, *Astr. Nachr.*, IX. 422.
 Long. E. from Paris, $0^h 37^m 4''.98$. *Astr. Nachr.*, VIII. 148.
- Naples.** N. Lat. $40^{\circ} 51' 46''.63$. BRIOSCHI, *Astr. Nachr.*, V. 294.
 The Longitude adopted is that by which PETERS has apparently made his reductions, *Astr. Nachr.*, XXIII. 302, 303, according to which we have, Naples E. from Berlin, $0^h 3^m 26''.0$.
 For determinations from solar eclipses by BRIOSCHI and SANTINI, see *Astr. Nachr.*, VI. 413.
- Olmütz.** N. Lat. $49^{\circ} 35' 40''$.
 Long. E. from Greenwich, $1^h 9^m 0''.1$. } *Astr. Nachr.*, XXXVII. 77.
- Oxford.** N. Lat. $51^{\circ} 45' 36''.0$.
 Long. W. from Greenwich, $0^h 5^m 2''.6$. } *Naut. Alm.*, 1852, p. 599.
- Padua.** N. Lat. $45^{\circ} 24' 2''.5$. SANTINI, *Astr. Nachr.*, VI. 411; XVII. 346.
 Long. E. from Paris,
 WURM (*Astr. Nachr.*, IV. 347), $0^h 38^m 7.7$
 Padua E. from Milan by powder signals
 (FALLON, *Astr. Nachr.*, IV. 115), $0^h 10^m 43.27$
 Milan E. from Paris, $27 24.18$
 Mean, Padua E. from Paris, $0^h 38^m 7.57$
- Palermo.** N. Lat. $38^{\circ} 6' 44''$. CACCIATORE, *Del Real Osservatorio di Palermo Libri*, VII, VIII, IX, p. 2; *Storia Celeste del R. Osserv. di Palermo*, in *Ann. d. Wiener Sternwarte*, XXIV. 6.
 Long. E. from Paris, $0^h 44^m 4''.0$. DAUSSY, *Add. Conn. d. Temps*, 1835, p. 8.
 BIANCHI, *Astr. Nachr.*, XVII. 350, calls the latitude of the Palermo Observatory, $+38^{\circ} 6' 25''.50$.

- Paramatta. . . . S. Lat. $33^{\circ} 48' 49''.79$. RÜMCKER, *Phil. Trans.*, 1829, Part III. p. 16.
Long. E. from Greenwich, $10^{\text{h}} 4^{\text{m}} 6^{\text{s}}.25$. *Ibid.*, p. 29.
- Paris. N. Lat. $48^{\circ} 50' 18''.2$. *Conn. d. Temps*, 1835, p. 356.
Long. as above under Greenwich.
- St. Petersburg. . . (Academy.)
N. Lat. $59^{\circ} 56' 29''.67$.
Long. W. from Pulkowa, $0^{\text{m}} 5^{\text{s}}.194$. STRUVE, *Description de l'Obs. de Poulkova*, p. 292.
- Philadelphia. . . . N. Lat. $39^{\circ} 57' 7''.5$. MS. communication from Professor KENDALL.
Long. E. from Washington (U. S. Coast Survey),
By 5 sets Eastern clock-signals, $7^{\text{m}} 33.66$
" " Western " 33.60
Mean, $7 33.63$
Long. Jersey City Station E. from Washington,
By 2 sets Eastern clock-signals, $12^{\text{m}} 3.58$
" " Western " 3.52
Mean, $12 3.56$
Long. W. from Jersey City Station,
By 8 sets Eastern clock-signals, $4 29.91$
" " " " 29.84
Mean, $4 29.88$
Hence we may use,
Jersey City Station E. from Philadelphia, $0^{\text{h}} 4^{\text{m}} 29.89$
" " " Washington, $0 12 3.53$
Philadelphia " " " $0 7 33.64$
- Prague. N. Lat. $50^{\circ} 5' 18''.5$. DAVID, *Astr. Nachr.*, VIII. 198.
Long. E. from Paris,
Mean of 6 occultations (*Astr. Nachr.*, XVI. 299,
802), $0^{\text{h}} 48^{\text{m}} 21.66 \pm 4.15$
HANSEN from occultations (*Astr. Nachr.*, XVII.
170), 19.59 ± 3.67
Mean, Prague E. from Paris, $0 48 20.50$
- Pulkowa. N. Lat. $59^{\circ} 46' 18''.70$. STRUVE, *Descr. de l'Obs. de Poulkova*, p. 290.
Long. E. from Altona (*Exp. Chron. de* 1843,
p. 144), $1^{\text{h}} 21^{\text{m}} 32.523 \pm 0.099$
Altona E. from Greenwich (*Exp. Chron. de*
1844, p. 206), $0 39 46.151 \pm 0.042$
Pulkowa E. from Greenwich (*Exp. Chron. de*
1844, p. ix.), $2 1 18.674 \pm 0.057$
- Rome. (Collegio Romano.)
N. Lat. $41^{\circ} 53' 54''$. *Conn. d. Temps*, 1840, p. 354.
Long. E. from Greenwich, $0^{\text{h}} 49^{\text{m}} 54^{\text{s}}.7$. *Astr. Nachr.*, VIII. 88.

- San Fernando.** . . . N. Lat. $36^{\circ} 27' 45''$. *Corresp. Astron.*, XIV. 240.
 Long. W. from Paris, $0^h 34^m 10^s.6 \pm 0^s.31$. *Astr. Nachr.*, IX. 358.
- Santiago.** . . . (National Observatory.)
 S. Lat. $33^{\circ} 26' 24''.8$. GILLISS, *Astron. Journal*, III. 55.
 Long. W. from Greenwich, $4^h 42^m 18^s.9$. GILLISS, *Astron. Journal*,
 II. 118.
- Scuttenberg.** . . . N. Lat. $50^{\circ} 5' 10''.1$.
 Long. E. from Berlin, $0^h 12^m 15^s$. } *Astr. Nachr.*, XXXI. 174, 331.
- Upsala.** N. Lat. $59^{\circ} 51' 31''.5$. SCHULTZ, *Nova Acta Reg. Soc. Sc. Upsala*, II. 206.
 Long. W. from Stockholm, $0^h 1^m 43^s.64$ *Ibid.*, II. 218.
 Stockholm E. from Greenwich, $1 12 14.8$
 Upsala E. from Greenwich, $1 10 31.2$
- Vienna.** N. Lat. $48^{\circ} 12' 35''.5$. *Berl. Astr. Jahrb.*, 1852, p. 290.
 Long. E. from Paris, $0^h 56^m 11^s.07$. SCHUMACHER, *Astr. Nachr.*,
 XXIII. 263.
- Washington.** . . . N. Lat. $38^{\circ} 53' 39''.25$. *Astron. Journ.*, III. 12.
 Long. W. from Greenwich, as derived from data of the U. S. Coast Sur-
 vey, up to 1852, $5^h 8^m 11^s.2$.
 The situation of the first, or provisional, Naval Observatory, in which
 were made the observations published by Lieutenant GILLISS, was,
 N. Lat. $38^{\circ} 53' 32''.8$. GILLISS, *Astr. Obs.*, p. viii.
 Long. W. from Greenwich, $5^h 8^m 4^s.6$. *Ibid.*, p. x.
- Wilna.** N. Lat. $54^{\circ} 40' 59''.1$. *Astr. Nachr.*, IV. 562.
 Long. E. from Paris,
 WURM from 22 occultations (*Astr. Nachr.*, VIII. 96), $1^h 31^m 50^s.4$
 STECZKOWSKI from 1 occultation (*Astr. Nachr.*, XVI. 302), 48.3
 Mean, $1 31 50.81$

These results are arranged in the following Table for reference.

POSITIONS OF THE PRINCIPAL OBSERVATORIES.

(North Latitudes and West Longitudes are considered as positive.)

Place.	Latitude.	Longitude from Washington in Time.	Longitude from Washington in Arc.	Longitude from Greenwich in Arc.
Åbo,	+60° 26' 56.8	— 6 37 20.0	260° 40' 0.6	337° 42' 48.6
Albany,	+42 39 50.0	— 0 13 12.6	356 41 51.0	73 44 39.0
Altona,	+53 32 45.3	— 5 47 57.4	273 0 39.8	350 3 27.8
Ann Arbor,	+42 16 48.0	+ 0 26 41.0	6 40 15.0	83 43 3.0
Athens,	+37 58 20.0	— 6 43 6.4	259 13 24.2	336 16 12.2
Berlin,	+52 30 16.7	— 6 1 46.1	269 33 28.1	346 36 16.1
Bilk,	+51 12 25.0	— 5 35 16.1	276 10 58.1	353 13 46.1
Bonn,	+50 43 45.0	— 5 36 35.7	275 51 5.1	352 53 53.1
Breslau,	+51 6 56.0	— 6 16 21.2	265 54 42.0	342 57 30.0
Brussels,	+50 51 10.7	— 5 25 38.8	278 35 18.0	355 38 6.0
Cambridge (Eng.),	+52 12 51.8	— 5 8 34.7	282 51 18.9	359 54 6.9
Cambridge (Mass.),	+42 22 48.6	— 0 23 41.5	354 4 36.9	71 7 24.9
Cape of Good Hope,	—33 56 3.0	— 6 22 7.2	264 28 12.3	341 31 0.3
Christiania,	+59 54 43.7	— 5 51 6.0	272 13 30.6	349 16 18.6
Cincinnati,	+39 5 54.0	+ 0 29 46.9	7 26 42.8	84 29 30.8
Copenhagen,	+55 40 53.0	— 5 58 30.5	270 22 22.5	347 25 10.5
Cracow,	+50 3 50.0	— 6 28 2.4	262 59 23.4	340 2 11.4
Dorpat,	+58 22 47.1	— 6 55 5.8	256 13 32.6	333 16 21.6
Dublin,	+53 23 13.0	— 4 42 49.2	289 17 42.0	6 20 30.0
Durham,	+54 46 6.4	— 5 1 53.2	284 31 42.0	1 34 30.0
Edinburgh,	+55 57 23.2	— 4 55 28.2	286 7 57.0	3 10 45.0
Florence,	+43 46 40.8	— 5 53 12.9	271 41 47.1	348 44 35.1
Geneva,	+46 11 58.8	— 5 32 48.9	276 47 46.8	353 50 34.8
Georgetown,	+38 54 26.1	+ 0 0 6.2	0 1 33.0	77 4 21.0
Göttingen,	+51 31 47.9	— 5 47 57.3	273 0 40.5	350 3 28.5
Gotha,	+50 56 5.2	— 5 51 6.9	272 13 17.1	349 16 5.1
Greenwich,	+51 28 38.2	— 5 8 11.2	282 57 12.0	0 0 0.0
Hamburg,	+53 33 7.0	— 5 48 4.8	272 58 48.6	350 1 36.6
Hudson,	+41 14 42.6	+ 0 17 32.1	4 23 0.9	81 25 48.9
Kasan,	+55 47 23.1	— 8 24 43.1	233 49 13.1	310 52 1.1
Königsberg,	+54 42 50.4	— 6 30 11.6	262 27 6.6	339 29 54.6
Kremsmünster,	+48 3 23.8	— 6 4 44.6	268 48 50.7	345 51 38.7
Leipsic,	+51 20 20.7	— 5 57 39.7	270 35 4.5	347 37 52.5
Leyden,	+52 9 28.2	— 5 26 8.6	278 27 50.6	355 30 38.6
Liverpool,	+53 24 47.4	— 4 56 11.1	285 57 13.7	3 0 1.7
London,	+51 31 29.8	— 5 7 34.1	283 6 28.5	0 9 16.5
Madras,	+13 4 9.2	—10 29 8.2	202 42 57.0	279 45 45.0
Mannheim,	+49 29 12.9	— 5 42 2.7	274 29 19.5	351 32 7.5
Markree,	+54 10 31.7	— 4 34 22.8	291 24 18.0	8 27 6.0
Marseilles,	+43 17 49.0	— 5 29 40.2	277 34 57.2	354 37 45.2
Milan,	+45 28 0.7	— 5 44 57.8	273 45 32.4	350 48 20.4
Modena,	+44 38 52.8	— 5 51 55.2	272 1 12.5	349 4 0.5
Moscow,	+55 45 19.8	— 7 38 28.1	245 22 58.5	322 25 46.5
Munich,	+48 8 45.0	— 5 54 37.6	271 20 35.4	348 23 23.4
Naples,	+40 51 46.6	— 6 5 12.1	268 41 58.1	345 44 46.1
Olmütz,	+49 35 40.0	— 6 17 11.3	265 42 10.5	342 44 58.5
Oxford,	+51 45 36.0	— 5 3 8.6	284 12 51.0	1 15 39.0
Padua,	+45 24 2.5	— 5 55 40.2	271 4 56.6	348 7 44.6
Palermo,	+38 6 44.0	— 6 1 36.7	269 35 50.1	346 38 38.1
Paramatta,	—33 48 49.8	+ 8 47 42.6	131 55 38.3	208 58 26.3
Paris,	+48 50 13.2	— 5 17 32.7	280 36 50.1	357 39 38.1

Place.	Latitude.	Longitude from Washington in Time.	Longitude from Washington in Arc.	Longitude from Greenwich in Arc.
St. Petersburg, . . .	+59° 56' 29.7"	^h ^m ^s -7 9 24.7	252° 38' 49.8"	329° 41' 37.8"
Philadelphia, . . .	+39 57 7.5	-0 7 33.6	358 6 35.4	75 9 23.4
Prague,	+50 5 18.5	-6 5 53.2	268 31 42.6	345 34 30.6
Pulkowa,	+59 46 18.7	-7 9 29.9	252 37 31.9	329 40 19.9
Rome,	+41 58 54.0	-5 58 5.9	270 28 31.5	347 31 19.5
San Fernando, . . .	+36 27 45.0	-4 43 22.1	289 9 29.1	6 12 17.1
Santiago,	-33 26 24.8	-0 25 52.3	353 31 55.5	70 34 43.5
Senftenberg, . . .	+50 5 10.1	-6 14 1.1	266 29 43.1	343 32 31.1
Upsala,	+59 51 31.5	-6 18 42.4	265 19 24.0	342 22 12.0
Vienna,	+48 12 35.5	-6 13 43.7	266 34 4.1	343 36 52.1
Washington,	+38 53 39.3	-0 0 0.0	0 0 0.0	77 2 48.0
Wilna,	+54 40 59.1	-6 49 23.0	257 39 15.5	334 42 3.5

ON THE ARRANGEMENT AND USE OF THE TABLES IN THIS EPHEMERIS.

THIS Ephemeris is divided into two distinct parts. One part is designed for the special use of NAVIGATORS, and is adapted to the Meridian of Greenwich.

The other part is suited to the convenience of ASTRONOMERS, on this continent particularly, and is adapted to the Meridian of Washington.

THE NAUTICAL PART.

This part contains the Ephemeris of the Sun and Moon; the Distances of the Moon from the centres of the Sun and the four most conspicuous Planets, and from certain Fixed Stars; the Ephemeris of the Planets Venus, Mars, Jupiter, and Saturn; the Mean Places of 100 principal Fixed Stars, for January 1, 1861.

Time.—Astronomers make use of several different kinds of time; an explanation of the nature of which, and of the method of passing from one to another, properly precedes an explanation of the uses of the Ephemeris.

Sidereal Time.—Sidereal Time is measured by the daily motion of the stars, or, as it is used by astronomers, by the daily motion of that point in the equator from which the true right ascensions of the stars are counted.

A *Sidereal Day* is the interval of time between the transit of the vernal equinox over any meridian, and its next succeeding return to the same meridian. It is divided into 24 hours. The sidereal hours are counted from 0 to 24, commencing with the instant of the passage of the true vernal equinox over the upper meridian, and ending with its return to the same meridian.

Solar Time.—Solar Time is measured by the daily motion of the sun. A *Solar Day* is the interval of time between two successive transits of the sun over the same meridian; and the hour angle of the sun is called *Solar Time*. This is the most natural and direct measure of time. But the intervals between the successive returns of the sun to the meridian are not exactly equal, but depend upon the variable motion of the sun in right ascension.

The want of uniformity in the sun's motion in right ascension arises from two different causes; one, that the sun does not move in the equator, but in the ecliptic; the other, that the sun's motion in the ecliptic is not uniform.

To avoid the irregularity in time caused by the want of uniformity in the sun's motion, a fictitious sun, called a *Mean Sun*, is supposed to move in the equator with a uniform velocity.

Mean Time, which is perfectly equable in its increase, is measured by the motion of this *Mean Sun*; the latter at certain periods agrees with the real sun, then again is in advance of it, and at other times is behind it.

True or Apparent Time is measured by the motion of the real sun.

The difference between the *true* and *mean* time is called the *Equation of Time*. By means of it we pass from *true* to *mean* time, or the reverse. Thus, if the *true* time be given, the *mean* time corresponding to it will be obtained by adding or subtracting the equation of time, according to the precept at the head of the column in which it is found, on page I. of the Calendar. If the *mean* time be given, the *true* time is obtained by applying the equation of time as directed by the precept on page II. of the Calendar.

The vernal equinox, by the motion of which Sidereal Time is measured, is not a fixed, but a movable, point on the equator. Its motion is composed of two parts: precession, which is proportional to the time, and is combined with the daily motion of the heavens; and nutation, which is periodical. In consequence of the latter, the daily motion of the equinox is not strictly a uniform measure of time, and the Sidereal Time in common use might therefore be called *Apparent Sidereal Time*, and *Mean Sidereal Time* would be that reckoned from the transit of the mean equinox; but the irregularity referred to cannot exceed 2".3 in a period of nineteen years, and is, therefore, of no practical importance.

Day. — According to the customs of society, the hours are counted from 0 to 12 from noon to midnight, after which they are again reckoned from 0 to 12 from midnight to noon. The *civil day* consists of twenty-four hours, but is divided in this manner into two periods, commencing at midnight. In this respect it differs from the *astronomical day*, which commences at noon. The *civil day* comprises twenty-four hours, from one midnight to the next following. The first period of twelve hours is marked A. M., the last period of twelve hours is marked P. M. The *astronomical day* also comprises twenty-four hours, but they are counted from 0 to 24, and from the noon of one day to that of the next following.

The civil day begins twelve hours before the astronomical day; therefore the first part of the *civil day* answers to the last part of the preceding *astronomical day*, and the last part of the *civil day* to the first part of the same *astronomical day*. Thus, January 10th, 2^h. A. M., *civil day*, is January 9th, 14^h., *astronomical day*; and January 9th, 2^h. P. M., *civil day*, is also January 9th, 2^h., *astronomical day*. The rule, then, for the transformation of the civil time into astronomical time is this: If the civil time is marked A. M., take one from the date, and add twelve to the hours, and the result is the astronomical time wanted; if the civil time is marked P. M., take away the designation P. M., and the astronomical time is had without further change.

The Calendar is divided into twelve months, and to each month are assigned eighteen pages, of which the contents are as follows: —

Pages I., II., III. are devoted to the Ephemeris of the Sun. Page I. contains, first, the *Apparent Right Ascension and Declination* of the sun at Greenwich apparent noon.

The former of these quantities is used for finding the error of a clock regulated to sidereal time. The difference between the time by the clock of the meridian passage of the sun, and the sun's right ascension reduced to apparent noon, is the error of the clock from sidereal time. It is also employed in determining the time by the transit of a fixed star over the meridian, as is explained in page 223 of BOWDITCH'S *American Practical Navigator*. The use of the sun's declination in finding the true amplitude and azimuth, the latitude by altitudes of the sun in and out of the meridian, the time, &c., is also so clearly defined in this standard work, which is in the hands of all American seamen, that any further explanation in this place is unnecessary. Adjoining the columns of *Right Ascension* and *Declination* are the differences of these quantities for one hour (at noon), by means of which they may be calculated for any time out of the meridian, by multiplying this difference by the hours and parts of hours from noon, and adding the amount to, or subtracting it from, the quantity at noon, according as it is increasing or decreasing. If, for example, the declination of the sun were required at 3^h. 40^m. P. M. of Friday, January 18th, 1861, the declination of the sun would be taken out first for

January 18th, at noon,	20° 29' 1.2 S.
From which subtract the diff. for 1 hour, 30".91, multiplied by 3,	1 32.7
	20 27 28.5
And the proportional part for 40 minutes,	20.6
The result is the sun's declination on the 18th, at 3 ^h . 40 ^m . P. M.,	20 27 7.9

The difference for one hour is not the same for every hour in the twenty-four; but being given in the pages of this Ephemeris for the first hour of the day, it is sufficiently accurate for the purposes of the navigator.

The column of the *Sun's Semidiameter* requires no explanation.

The column headed *Sidereal Time of the Semidiameter passing the Meridian*, is employed in obtaining the passage of the sun's centre over the wires of a transit-instrument, when the passage of one limb only has been observed. If the western limb has been observed, the quantity found in this column is to be added to the time of transit over the middle wire, or the mean of the times of transit over all the wires; but if the eastern limb has been observed, the quantities in this column are to be subtracted.

The next column contains the *Equation of Time*, which, as has been before explained, is the number of minutes and seconds to be added to or subtracted from the *apparent time*, or the time given by an observation of the sun, to obtain the *mean time*, or the time shown by a clock. The heading of the column directs the manner in which the equation is to be applied, and where there is a change in the course of the month from addition to subtraction, or the reverse, as in the months of April and June, the two different directions are separated by a line, while a corresponding line below points out the date at which the change takes place. The difference for one hour is given in an adjoining column, by means of which the equation for any time from noon is easily obtained. If, for example, the equation of time for January 16th, at 3^h 20^m P. M., were required, we should have

Equation for January 16, at noon,	m. s.
Correction for 3 ^h 20 ^m (additive),	10 9.84
Equation, January 16, at 3 ^h 20 ^m P. M.,	2.82
	10 12.66

Which, according to the rule at the head of the column, is to be added to *apparent time* to obtain *mean time*.

Page II. contains the Apparent Right Ascension and Declination of the Sun, and the Equation of Time for Greenwich *Mean Noon*; to these is added a column containing the *Sidereal Time of Mean Noon*.

Page III. contains the Longitude and Latitude of the Sun, and the Logarithm of the Distance of the Earth, at Greenwich Mean Noon of each day. The Longitude is given in two columns, headed λ and λ' ; the one, λ , is the Sun's longitude counted from the true equinox of the date; the other, λ' , is the same coordinate counted from the mean equinox of the beginning of the year. A column of hourly differences enables the computer to obtain the Sun's longitude for any hour from noon. The hourly differences of the logarithm of the Radius Vector are likewise given. The longitudes of the Sun are the true longitudes, not affected by aberration. The last column on this page contains the Mean Time of Sidereal Noon.

Page IV. contains the Moon's *Semidiameter* and *Horizontal Parallax* for every noon and midnight. The former may be corrected for any time between the dates for which it is given in the Ephemeris, by means of Table XI. of BOWDITCH'S *Navigators*, or simply by computing the proportional part.

This is readily done by considering that the semidiameter is given for every twelve hours, that the difference, therefore, between any two successive semidiameters corresponds to twelve hours, and that the difference required (or correction) is that difference which corresponds to a time less than twelve hours. If, for example, the semidiameter of the moon is to be taken out for 9 o'clock, P. M. of the 23d of January, then we say, that as twelve hours is to 6".6, the whole difference between the semidiameters at noon and midnight of the 23d, so is nine hours to 5".0, the correction to be added to the semidiameter at noon, because it is increasing; the moon's semidiameter, then, for Jan. 23^d 9^h is 15' 37".1. Adjoining the columns containing the Moon's

Horizontal Parallax for noon and midnight, are columns giving the change which these quantities undergo in one hour. The sign plus or minus (+ or —) is prefixed to these differences, showing whether they are additive or subtractive, or, in other words, whether the horizontal parallax is increasing or decreasing. In order to reduce the parallax to any time intermediate between those dates for which it is given in the Ephemeris, the mode of proceeding is that which has been already explained in the case of the equation of time. The Moon's *Meridian Passage*, which is given on this page to minutes and tenths of minutes, is also accompanied with a column of differences for one hour, by means of which, having the longitude turned into time, the time of the moon's meridian passage at any other place may be computed. Or it may be more quickly derived from BOWDITCH'S Table XVIII., by simple inspection. The last column of this page contains the *Age* of the Moon, to tenths of days, or the time elapsed since the preceding new moon. It requires no explanation.

The pages from V. to XII. inclusive are taken up with the Moon's *Right Ascension and Declination*, which are given for every hour of every day in the month, and are accompanied with columns of differences for every minute of each hour. The right ascension and declination of the moon change so rapidly, that, if they were not given at frequent intervals, the moon would cease to be useful to the practical navigator as a means of determining the latitude and time. These quantities are wanted for Greenwich mean time, which is either taken directly from the face of a well-regulated chronometer, or is obtained by applying the longitude, turned into time, to the local time of the computer. They have only to be corrected for the minutes and seconds of the time at Greenwich. Thus, if the right ascension and declination of the moon were required for Tuesday, January 1^d 8^h 10^m, we have only to add to the right ascension at 8^h as given in the Ephemeris, viz. to 10^h 47^m 3^s.72, the product of the difference for one minute in the adjoining column multiplied by 10, the product, that is, of 2^s.1303 by 10, or 21^s.30; the result is the moon's right ascension at the required time, equal to 10^h 47^m 25^s.02. If we were to take out the declination for the same date, the correction for the ten minutes above the hour would be subtractive, because the declination, unlike the right ascension, is decreasing; thus,

Moon's declination for January 1 ^d 8 ^h	3° 25' 9.6 N.
Correction for 10 ^m is 153 ^s .7, or	2 33.7
Moon's declination for January 1 ^d 8 ^h 10 ^m	3 22 35.9

The last page of the right ascensions and declinations contains the *Phases* of the Moon, and the dates of the Moon's *Perigee* and *Apogee*, or least and greatest distances from the earth.

The remaining six pages of the month are occupied by the *Lunar Distances*. They are given in the same manner as in the *British Nautical Almanac*, in order to conform to the rules of BOWDITCH'S *Navigator*. These tables contain the geocentric distances of the centre of the moon from the sun, the larger planets, and certain fixed stars, at intervals of three hours, beginning with the noon of each day. All the distances that can be observed on the same day are grouped together under that date, and the letter E. or W. is affixed to the name of the star or planet, to indicate whether it is on the east or west side of the moon. The columns are read from the left to the right, across both pages of the same opening. The principle of determining the longitude by means of lunar distances consists in this: that they furnish the navigator with the means of comparing his own time, on board ship, with the time at the Greenwich Observatory. At the moment of observing a distance he notes the time by his own watch or chronometer, and by looking into the Ephemeris he discovers what o'clock it is at Greenwich when the moon and star are in the relative position with regard to each other which he has measured with his sextant. But it will very rarely occur that the navigator's *true distance*, that is, his observed distance cleared from the effects of refraction and

lunar parallax, will be found in the Ephemeris. It will prove in most cases to be a quantity lying between two given distances. He is obliged, therefore, to take the difference between his own true distance and the one nearest to it in the pages of the Ephemeris, and to apply to the time standing over the latter a correction proportioned to this difference. This is a case of the simple rule of three. Owing, however, to the various denominations of space and time that enter into the question, it has been found convenient to lessen the labor of the operation by putting between every two successive distances given in the Ephemeris the proportional logarithm of their difference. This proportional logarithm is obtained by subtracting the logarithm of the difference of the two distances from the logarithm of three hours (both quantities being reduced to seconds), because three hours is the interval of time between two successive distances.

On the 1st of March, at midnight, of Greenwich mean time, the distance of the moon's centre from the planet Saturn, west of her, is $72^{\circ} 35' 11''$, and at fifteen hours of the same date it is $74^{\circ} 22' 9''$; the difference between the two distances is $1^{\circ} 46' 58''$, or, reduced to seconds, is 6418'', the logarithm of which, subtracted from the logarithm of three hours, or 10800'', gives for the proportional logarithm of the difference between the two distances 2260, as it is in the column headed *P. L. of Diff.* If the calculated *true distance* of the navigator lie between the two given distances above mentioned, as, for instance, if it should be $73^{\circ} 30' 47''$, the corresponding correction of the time would be found as follows:—

Distance in the Ephemeris at Midnight,	$72^{\circ} 35' 11''$
Calculated <i>True Distance</i> ,	$73 30 47$
Difference,	<u>0 55 36</u>
Prop. log. in Ephemeris,	2260
Prop. log. of Difference, $0^{\circ} 55' 36''$,	<u>5102</u>
Prop. log. of $1^{\text{h}} 33^{\text{m}} 33^{\text{s}}$.	2842

And this time is to be added to the time at the head of the column from which the distance of the Ephemeris was taken, which would make the time at Greenwich corresponding to the Navigator's True Distance $1^{\text{h}} 33^{\text{m}} 33^{\text{s}}$ on the morning of the 2d of March.

This method of getting the Greenwich time between two given times in the Ephemeris rests upon the supposition, that the variation between one distance and the next following is uniform and regular. But owing to the inequalities in the moon's motion, this is not the case; and it is, in consequence of this, necessary to apply to the Greenwich time obtained by the preceding method a small correction.

This correction, due to the second differences in the moon's motion, is given in the Table on page 28 of the Appendix, and is taken out and applied as follows.

The top of the Table is entered with the difference between that proportional logarithm of the Ephemeris which has already been used and the one next following, and the side of the Table is entered with the time which has been added to that at the head of the column of the Ephemeris, that is, the time given by the difference of the proportional logarithms at the close of the preceding paragraph; under the former, and opposite the latter, will be found the correction, in seconds of time, to be added to the time at Greenwich if the proportional logarithms are decreasing, but subtracted if they are increasing.

The Ephemeris of the Planets, from page 218 to page 241, consists of the apparent right ascension at Greenwich mean noon and its variation for one hour, the apparent declination at the same date and its variation for one hour, and the mean time of their meridian passage; and at the bottom of the page will be found the semidiameter and horizontal parallax for every fifth day of the month. The hourly variations belong to noon of the day on which they are given. The mode of correcting by means of the hourly variation for any time from noon has already been explained.

The Solar Coördinates for Greenwich mean noon, on pages 242 - 244, are added, and the Moon's Longitude and Latitude on pages 245 - 248.

• Finally, the Mean Places of the one hundred principal Fixed Stars for January 1, 1861, are given on pages 256 - 258.

When the latitude is to be deduced from the meridian altitude of one of these stars, its time of passing the meridian can be ascertained by taking the sum of the right ascension of the star, and the mean time of sidereal noon contained in the last column of page III. of each month. The right ascension of the star is, in fact, its hour-angle, or difference in time, from the sidereal noon, or 0^h. If, then, a vessel in longitude 45° West should wish to obtain the latitude by a meridian observation of a star, as, for example, α TAURI (*Aldebaran*), on the evening of January 1, 1861, the process for obtaining the time of meridian passage would be as follows:—

	h. m. s.
Mean Time of sidereal 0 ^h January 1, 1861,	5 14 40
Correction for Longitude omitted.	
Right Ascension of α TAURI (<i>Aldebaran</i>),	4 27 57
Time of star's meridian passage,	9 42 37

The instant of passage might be more accurately determined by making an allowance for the difference between mean solar and sidereal time, and by applying the correction for longitude; but the above is sufficiently near for the purpose for which it is wanted, which is, to know the period of meridian passage approximately, in order to identify the star if necessary, and to be in time with the observation. The navigator will perceive that the dates in this column of page III. are astronomical, and will observe the distinctions of time explained in the first part of this article; he will also remember that when the sum exceeds 24 hours, 24 hours are to be subtracted, and a unit is to be added to the day of the month.

The Sun's Right Ascension may also be used for finding the time of meridian passage of a star, as shown in BOWDITCH'S *Navigator*, p. 223.

THE ASTRONOMICAL PART.

THIS part is adapted to the meridian of Washington.

Obliquity of the Ecliptic, &c., p. 250.— On this page are given the apparent obliquity, the equation of equinoxes in longitude and right ascension, the precession of equinoxes in longitude, and the sun's aberration and horizontal parallax, for every ten days of the year; at the bottom of the page will be found the mean obliquity for the beginning of the year, the precession for the middle of the year, the logarithm of the precession, in a sidereal day, and the logarithm of the precession in a solar day. On the same page, the mean longitude of the moon's ascending node is also given for every ten days, and at the bottom of the page its daily motion.

Fixed Stars.— The Logarithms *A, B, C, D*, for correcting the places of the Fixed Stars, are given for the mean midnight of every day of the year, and the constants of reduction for every five days. To these tables are added BRÜNNER's formulas of reduction, with PETERS' coefficients, and the notation of the catalogue of stars of the British Association.

The *mean* places of 100 principal Fixed Stars on January 1, 1861; the *apparent* places of α and δ Ursæ Minoris, at the time of the upper transit at Washington, for every day of the year; and the *apparent* places of the remaining principal stars for every ten days; together with a table giving the correction of ζ Cephei, σ Octantis, and λ Ursæ Minoris, for terms of nutation involving 2ϵ , — complete the subject of the Fixed Stars.

Solar Ephemeris.— In the Solar Ephemeris, given for Washington mean and apparent noon, the hourly motions in right ascension and declination are the motions at the instant of noon. Only the seconds of right ascension and declination are given for apparent noon, the degrees and minutes being usually the same as for mean noon.

The *Moon Culminations* and *Moon-culminating Stars* are given in two distinct lists. The list of Moon Culminations contains both the solar and sidereal dates of transit; the apparent right ascension is the right ascension of the limb, and the declination is the declination of the centre, at their respective periods of culmination. The form of the lists of moon-culminating stars has been somewhat changed. In the first volume of the Ephemeris, reference to the stars to be used in connection with the Moon was made by a figure, and the stars themselves were entered successively in the order of numbers. In the present volume these figures are dispensed with, and the proper star to be observed in connection with the transit of the moon's limb is determined by means of the sidereal dates, common to both lists. Each star occupies a separate column containing its right ascension to hundredths of seconds for every sidereal date throughout the year for which it is available, and also its declination and magnitude. The first column of each page contains the sidereal date, and the last the daily change in right ascension of the corresponding stars. It is hoped that the standard observatories will determine the place of each one of these stars once at least in the course of the year. The whole list has been taken from the Twelve-Year Catalogue.

The *Ephemeris of the Moon*, which follows, and the *Moon's Phases*, require no special observation. In the moon's ephemeris, as in that of the sun, the hourly motions belong to the instant for which they are given.

The ephemeris of the two interior planets is given for mean noon and the time of transit; and that of the exterior planets is given for sidereal noon and the time of transit. The place of a planet for any number of minutes t , from the nearest noon for which it is given, t being negative when the time precedes the noon, may be computed by the formula,

$$\text{Planet's R. A. (or Dec.)} = A + B t + C t^2,$$

in which $A =$ R. A. (or Dec.) for the noon,
 $B =$ the motion of R. A. (or Dec.) for 1 minute,
 or, more exactly, $=$ the factor of t , as given in the Ephemeris ;
 $C =$ the factor of $t^2 =$ factor for second differences.

The *Solar Coördinates* are given for each mean noon and midnight, referred to the apparent equinox and equator, and also to the mean equinox and equator, at the beginning of the year. In the case of the rectangular coördinates, only the last four decimals are given for the mean equinox and equator, and the first three places are to be taken from the apparent equinox and equator. When a change of a unit is to be made in the third place, it is indicated by a corresponding colon (:).

The *Planetary Coördinates* are referred to the mean equinox and ecliptic of the mean noon of the 2400,000th day of the Julian Period, and the dates for which they are given are counted from this epoch in mean solar days. They may be converted into days of the Julian Period by adding 2400,000. The columns $-\frac{k^2}{3}x$, &c. contain the quantities $-1600 m \frac{k^2}{3}x$, $-1600 m \frac{k^2}{3}y$, $-1600 m \frac{k^2}{3}z$, in which m denotes the mass of the planet, and k^2 the unit of attractive force in the solar system, or $\log k = 8.2855614$.

Eclipses.—The *Tables of Data of the Solar Eclipses* are adapted to very accurate computation by the following formulas.

$$\begin{aligned} \text{Let } \phi &= \text{the latitude of the place,} \\ \lambda &= \text{its western longitude from Washington,} \\ \log e &= 8.9110835, \\ \log(1 - e^2) &= 9.9971066, \\ \sin \phi' &= e \sin \phi, \\ h &= \sec \phi' \cos \phi, \\ k &= (1 - e^2) \sec \phi' \sin \phi, \\ a &= A - h \sin(\mu - \lambda), \\ b &= B - Ek + Gh \cos(\mu - \lambda), \\ c &= -C + Fk - Hh \cos(\mu - \lambda), \\ m &= \sqrt{bc}. \end{aligned}$$

If the instant for computation were correctly chosen at the time of beginning or end of the eclipse, m would be exactly equal to a . If m be not equal to a , the instant for a new computation, which will be an approximation to the actual time of beginning or end, may be found by adding to the preceding time of computation an interval t , which may be obtained in seconds by the formulas,

$$\begin{aligned} \log \mu' &= 1.86167, \\ \tan \frac{1}{2} \psi &= \frac{c}{m} = \frac{m}{b}, \\ a' &= A' - \mu' h \cos(\mu - \lambda), \\ b' &= B' - \mu' G h \sin(\mu - \lambda), \\ t &= \frac{1000000(m - a)}{a' + b' \cot \psi}; \end{aligned}$$

ψ must be taken of the same sign with a , and is a sufficiently near approximation to the angle of contact from the north towards the east. For the shadow of a total eclipse, ψ must be taken with a sign opposite that of a .

The magnitude of the eclipse is found by taking the difference (with regard to the signs) between the value of ψ at the beginning and its value at the end of the eclipse, and if this difference is denoted by 2θ , the number of digits eclipsed is

$$12(1 + n) \sin^2 \frac{1}{2} \theta, \quad \text{or, } 12(1 + n) \cos^2 \frac{1}{2} \theta,$$

according as θ is acute or obtuse; π is the ratio of the semidiameter of the moon to that of the sun.

The value of θ may also be obtained by the formulas

$$\tan \chi = \frac{b'}{a'}, \quad \theta = \psi + \chi,$$

(in which χ has the sign of b'); and the expression of t may be changed to

$$t = 1000000 \cdot \frac{m - a}{a'} \cdot \frac{\cos \chi \sin \psi}{\sin \theta}.$$

The following is an example of the computation of the end of the Eclipse of December 30, for the Observatory at Washington.

For Washington, $\phi = 38^\circ 53' 39''.3$	$\lambda = 0^\circ 0' 0''$
$\log \sin \phi = 9.7978801$	$\log \cos \phi = 9.8911505$
$\log \sin \phi' = 8.7089636$	$\log \sec \phi' = 0.0005692$
$\log k = 9.7955559$	$\log h = 9.8917197$

A first approximation may be made from the chart, and corrected by computation. In this way we obtain $20^h 36^m$ Washington mean time as a near approximation to the time of the end of the eclipse at Washington. For a nearer approximation, take from table (p. 410) for $20^h 36^m$

$A = - 0.13542$	$\log E = 9.962870$
$B = + 1.04771$	$\log F = 9.964630$
$C = - 0.04228$	$\log G = 9.598217 \pi$
$A' = +155.17$	$\log H = 9.588525 \pi$
$B' = + 27.28$	$\mu = 308^\circ 8' 43''.1$

Hence

$$\mu - \lambda = 308^\circ 8' 43''.1$$

$\log \cos (\mu - \lambda) = 9.790748$	$\log \sin (\mu - \lambda) = 9.895669 \pi$
$\log [h \cos (\mu - \lambda)] = 9.682468$	$\log [h \sin (\mu - \lambda)] = 9.787389 \pi$
$\log [G h \cos (\mu - \lambda)] = 9.280685 \pi$	$\log [H h \cos (\mu - \lambda)] = 9.270993 \pi$
$\log (E k) = 9.758426$	$\log F k = 9.760186$
$G h \cos (\mu - \lambda) = -0.19085$	$- H h \cos (\mu - \lambda) = + 0.18664$
$- E k = -0.57336$	$F k = + 0.57569$
$B = +1.04771$	$- C = + 0.04228$
$b = +0.28350$	$c = + 0.80461$
$\log b = 9.4525531$	$- h \sin (\mu - \lambda) = + 0.61290$
$\log c = 9.9055854$	$A = - 0.13542$
$\log m = 9.6790693$	$a = + 0.47748$
$\log \tan \frac{1}{2} \psi = 0.2265161$	$m = + 0.47761$
$\psi = +118^\circ 37'$	$m - a = + 0.00013$
$\log [\mu' h \cos (\mu - \lambda)] = 1.54414$	$\log [G \mu' h \sin (\mu - \lambda)] = 1.24728$
$- \mu' h \cos (\mu - \lambda) = - 35.01$	$- G \mu' h \sin (\mu - \lambda) = -17.67$
$a' = +120.16$	$b' = + 9.61$
$a' + b' \cot \psi = +114.92$	$\log b' = 0.9827$
$\log [10' (m - a)] = 2.1139$	$\log \cot \psi = 9.7369 \pi$
$\log [a' + b' \cot \psi] = 2.0604$	$b' \cot \psi = - 5.24$
$\log t = 0.0585$	$t = + 1.13$

Approximate time	20 36 0.00
t , the correction	+1.13
Washington mean time of end	20 36 1.13

Occultations.—The pages 413 to 495 inclusive are taken up with *Elements for Facilitating the Calculation of Occultations of Planets and Stars by the Moon*. These elements are given for all the stars to the fifth, and for some of the sixth magnitude, inclusive, contained in the British Association Catalogue, which can be occulted by the moon during the year 1861.

The several columns of these pages contain, — 1. the date; 2. the star's name; 3. the star's magnitude; 4. the limiting parallels of visibility; 5. Washington mean time of the moon's true conjunction with the star in right ascension; 6. Washington hour angle, in time, of the star at the time of true conjunction; 7. coördinate q at the time of true conjunction; 8. hourly variation p' of coördinate p ; 9. hourly variation q' of coördinate q ; 10. logarithmic sine of the star's declination; 11. logarithmic cosine of the star's declination.

Designating the time of true conjunction by the usual symbol, δ , we have, at this time, $T = \delta$, $h = H$, $p = 0$, and $q = Y$. For any other time during the occultation, we shall have $T = \delta + (t)$, $h = H +$ sidereal equivalent of (t) , $p = (t) p'$, and $q = Y + (t) q'$. The other elements are considered as constant for the occultation.

In the prediction of an occultation for a particular place, the principal objects of determination are, the instant of *immersion*, or of the star's disappearance behind the moon's limb; of *emersion*, or of the star's reappearance; and the points on the moon's border where these appearances take place.

The calculations are made according to the method of BESSEL, whose original paper on the subject may be found in SCHUMACHER'S *Astronomische Nachrichten*, Vol. VII. p. 1; also in the *Berliner Astronomisches Jahrbuch* for 1831, p. 257. The letters and numerals prefixed to the stars belonging to the group of the Pleiades, and the magnitudes of these stars, are taken from No. V. of BESSEL'S *Astronomische Untersuchungen*.

The process of computation is shown by the following equations:—

d = Longitude for Washington, of the place, + West, — East

ϕ = Geographical North Latitude of the place.

ϕ' = Geocentric North Latitude of the place.

r = Earth's radius at the place, or the distance of the observer's position from the earth's centre.

It is unnecessary to calculate ϕ' and r separately, as we have

$$r \sin \phi' = \frac{(1 - e^2) \sin \phi}{\sqrt{(1 - e^2 \sin^2 \phi)}} \qquad r \cos \phi' = \frac{\cos \phi}{\sqrt{(1 - e^2 \sin^2 \phi)}}$$

in which e denotes the eccentricity of the earth's meridians.

The logarithms of $\frac{1 - e^2}{\sqrt{(1 - e^2 \sin^2 \phi)}} = \log A$, and of $\frac{1}{\sqrt{(1 - e^2 \sin^2 \phi)}} = \log B$, derived from $e = .081697$, according to the latest determination of BESSEL, may be taken from the following table, where the geographical latitude of the place is the argument.

ϕ	Log. A	Log. B
0	9.9971	0.0000
10	9.9971	0.0000
20	9.9973	0.0002
30	9.9975	0.0004
40	9.9977	0.0006
50	9.9979	0.0009
60	9.9982	0.0011
70	9.9984	0.0018

$$r \sin \phi' = A \sin \phi$$

$$r \cos \phi' = B \cos \phi$$

USE OF THE TABLES.

$$a = r \cos \phi' \sin (\lambda - d)$$

$$b = r \cos \phi' \cos (\lambda - d)$$

$$\log \lambda = 9.4192$$

$$u = a$$

$$u' = b \lambda$$

$$v = r \sin \phi' \cos D - b \sin D$$

$$v' = a \lambda \sin D$$

$$m \sin M = p - u$$

$$n \sin N = p' - u'$$

$$m \cos M = q - v$$

$$n \cos N = q' - v'$$

$$\log k = 9.4350$$

$$\cos \psi = \frac{m \sin (M - N)}{k}$$

$$Q = 90^\circ - N \mp \psi$$

$$t = -\frac{m}{n} \cos (M - N) \mp \frac{k \sin \psi}{n}$$

Upper signs for Immersion; under signs for Emersion.

$$c \sin C = u + t u'$$

$$c \cos C = v + t v'$$

$$V = Q + C$$

Mean solar time of the star's apparent contact with the moon's limb

$$= T - d + t$$

$$\text{Angle from North Point} = Q$$

$$\text{Angle from Vertex} = V$$

The angle ψ is to be taken out positive and less than 180° . If $\log m \sin (M - N)$ be greater than $\log k$, $\cos \psi$ will evidently be greater than 1, or impossible, and there will be no occultation, except in some rare instances where the moon's limb passes very close to the star, when $\log \cos \psi$ will result very near 0. In these cases, a recalculation should be made according to the method which follows, using

$$t = -\frac{m}{n} \cos (M - N),$$

which may give $\log m \sin (M - N)$ less than $\log k$, when the star will be occulted. On the other hand, it may happen that, in these cases of very near approach, a first determination may give a $\cos \psi$ less than 1, which a recalculation will show to be impossible. The angle ψ is then to be considered $= 0^\circ$ when $m \sin (M - N)$ is positive, and we shall have $Q = 90^\circ - N$. When $m \sin (M - N)$ is negative, $\psi = 180^\circ$, or $Q = 90^\circ - N + 180^\circ = 270^\circ - N$. We shall also have, at the time of nearest approach,

$$\text{star's distance from moon's limb} = \pi (m \sin (M - N) - .2723),$$

in which π is the moon's horizontal parallax.

By *Angle from North Point* is to be understood the arc included between the star when in contact, and the point where the limb is intersected by an arc of a great circle passing from the moon's centre to the North Pole; and by *Angle from Vertex*, the arc between the star at contact, and the point where the limb is intersected by an arc of a great circle passing from the moon's centre to the zenith. These angles are reckoned from the north point and from the vertex towards the *West* round the circumference of the moon's disc. For the image as seen in an inverting telescope, add to them 180° .

The results obtained by the above equations are only approximate, yet the computed times of immersion and emersion will usually be within one or two minutes of the truth. The error generally increases with the star's distance from the apparent path of the moon's centre, and may, in some cases, amount to several minutes. For an immersion, this error is not of much consequence; but for an emersion, especially of a small star, the time should be determined with greater precision. For this purpose u' and v' must be computed with

$$h' - d = h - d + \frac{1}{2} \mu,$$

u being the symbol by which we express the sidereal equivalent of t in these equations.

$$\begin{aligned} u' &= r \cos \phi' \lambda \cos (h' - d) \\ v' &= r \cos \phi' \lambda \sin (h' - d) \sin D. \end{aligned}$$

Then with these values of u' and v' , recompute N , n , ψ , and t , by means of

$$\begin{aligned} n \sin N &= p' - u' \\ n \cos N &= q' - v' \\ \cos \psi &= \frac{m \sin (M - N)}{k} \end{aligned}$$

$$t = -\frac{m}{n} \cos (M - N) \mp \frac{k \sin \psi}{n}$$

using the M and m obtained by the first computation, and we shall have the time of contact $T - d + t$, generally within a few seconds of the truth.

As a check on the accuracy of the work, we might compute

$$\begin{aligned} u &= r \cos \phi' \sin (h - d + \mu) \\ v &= r \cos \phi' \cos D - r \cos \phi' \cos (h - d + \mu) \end{aligned}$$

and we should have

$$(p + t p' - u)^2 + (q + t q' - v)^2 = k^2 = 0.0741.$$

But if $m \sin M$, $m \cos M$, $\log n \sin N$, and $\log n \cos N$, have been correctly computed, we shall have the following shorter and more convenient check on the subsequent calculations for the time of contact:

$$(m \sin M + t n \sin N)^2 + (m \cos M + t n \cos N)^2 = k^2 = 0.0741.$$

The elements of computation, H , Y , etc., are given for the instant of the moon's true conjunction with the star in right ascension. It is desirable, however, in computing an occultation for a particular place, to assume a time for the calculation near to the time of the nearest approach of the moon's centre to the star, as seen at that place, and to reduce the elements to this assumed time. This time, for which the nearest tenth of an hour will be sufficiently accurate, will not differ greatly from the time of *apparent* conjunction, as affected by parallax, which may be determined approximately by the following equations. Let $T - d$ be the time of apparent conjunction; then

$$\begin{aligned} (t) &= \frac{\sin (H - d)}{p' \sec \phi - [9.4027] \cos (H - d)} \\ T - d &= \delta - d + (t). \end{aligned}$$

The elements corresponding to the time $T - d$ may then be obtained as follows:

$$\begin{aligned} h - d &= H - d + (\mu) \\ p &= (t) p' \\ q &= Y + (t) q' \end{aligned}$$

Where occultations are to be generally observed, as at astronomical stations, either temporary or permanent, the observer will find an advantage in looking over the list and selecting, beforehand, all those which may be visible at his station, by observing if his latitude be included between the *limiting parallels* for any given occultation, if the time ($T - d$) be favorable as regards the absence of daylight, and if the star's hour-angle ($h - d$) be not greater than its semidiurnal arc for the given latitude.

For obtaining the time

$$T - d = \delta - d + (t),$$

it will be well to tabulate the values of

$$(t) = \frac{\sin(H - d)}{p' \sec \phi - [9.4027] \cos(H - d)}$$

for every half-hour of ($H - d$) as far as the greatest semidiurnal arc computed for the latitude of the station with a declination of 30° ; and for all values of p' , using two decimal figures, from 0.50 to 0.60.

It will also be found advantageous to have tabulated values of

$$u = r \cos \phi' \sin(h - d)$$

$$u' = r \cos \phi' \lambda \cos(h - d)$$

which should be given for every minute (in time) of ($h - d$), from 0^h to 6^h . If ($h - d$) exceeds 6^h , the argument will be $12^h - (h - d)$, instead of ($h - d$). It will be seen by the equations that u will have the same sign as $\sin(h - d)$, and that u' will have the same sign as $\cos(h - d)$.

In the equation

$$v = r \sin \phi' \cos D - b \sin D$$

the term $r \sin \phi' \cos D$ may be tabulated for every tenth minute of declination, from 0° to 30° .

For a practical application of the preceding formulæ, we will make the calculations for an occultation of the star 26 Arietis, January 19, 1861, as it will appear at Ann Arbor, Michigan, in north latitude $42^\circ 16' 48'' = \phi$, and west longitude from Washington $0^h 27^m 12^s = d$. The data for the computation are given on page 413, and, with the latitude and longitude of the place, are as follows:—

January 19. 26 Arietis, $6\frac{1}{2}$.

$\phi + 42^\circ 16.8'$	$H + 1^h 48^m 46^s$	$p' 0.5246$
$d + 0^h 27.2'$	$d + 0^h 27.12'$	$q' + 0.1644$
$\delta 8 14.0$	$H - d + 1^h 21.34'$	$\log \sin D + 9.5178$
$\delta - d 7 46.8$	$Y + 0.3470$	$\log \cos D + 9.9751$

Calculation of the Time, $T - d$, and reduction of the elements of computation.

	$\log p' + 9.720$	
	$\log \sec \phi + 0.131$	$(t) + 0.7$
$\log p' \sec \phi =$	$\log (1) + 9.851$	
	$\log \text{constant } 9.403$	(Reduced to hours and minutes)
	$\log \cos(H - d) + 9.972$	Sidereal equivalent for (t)
$\log [9.403] \cos(H - d) =$	$\log (2) + 9.375$	$H - d + (\mu) =$
	$(2) + 237$	$h - d + 2 3 41$
	$(1) + .710$	$\delta - d 7 46.8$
$(1) - (2) =$	$(3) + 473$	$T - d 8 28.8$
	$\log (3) + 9.675$	$Y + 0.3470$
	$\log \sin(H - d) + 9.542$	$(t) q' + 0.1151$
$\log \frac{\sin(H - d)}{(3)} =$	$\log (t) + 9.867$	$q + 0.4621$
		$p + 0.3672$
	$0.7 \times 0.1644 =$	
	$Y + (t) q' =$	
	$(t) p' = 0.7 \times 0.5246 =$	

Calculation of the times of *Immersion* and *Emersion*, etc.

(Table, page 493, Arg. ϕ)	$\log A$	9.9977
	$\log \sin \phi$	+9.8279
$\log A \sin \phi =$	$\log r \sin \phi'$	+9.8256
	$\log \cos D$	+9.9751
	$\log r \sin \phi' \cos D$	+9.8007
(Table, page 493, Arg. ϕ)	$\log B$	0.0007
	$\log \cos \phi$	+9.8691
$\log B \cos \phi =$	$\log r \cos \phi'$	+9.8698
	$\log \sin (h-d)$	+9.7108
$\log r \cos \phi' \sin (h-d) = \log u = \log a$		+9.5906
	$\log \cos (h-d)$	+9.9334
$\log r \cos \phi' \cos (h-d) =$	$\log b$	+9.8032
	$\log \lambda$	9.4192
	$\log a \lambda$	+8.9998
	$\log \sin D$	+9.5178
	$\log b \sin D$	+9.3210
$\log a \lambda \sin D =$	$\log v'$	+8.5176
$\log b \lambda =$	$\log u'$	+9.2224
	$r \sin \phi' \cos D +$	.6320
	$b \sin D +$	.2094
$r \sin \phi' \cos D - b \sin D =$	$v +$	.4226
	$q +$	.4621
$q - v =$	$m \cos M +$	.0395
	$p +$	.3672
$p - u =$	$u +$	.3807
	$m \sin M -$	.0135
	$q' +$	.1644
	$v' +$	.0329
$q' - v' =$	$n \cos N +$	.1315
	$p' +$	.5246
	$u' +$	.1669
$p' - u' =$	$n \sin N +$	.3577
	M	341° 8'
	N	69 49
	$M - N$	271 19
	$90^\circ - N$	20 11
	ψ	98 49
For Immersion, $90^\circ - N - \psi =$	Q	281 22

	$\log m \sin M$	-8.1303
	$\log m \cos M$	+8.5966
	$\log \tan M$	-9.5337
	$\log \cos M$	+9.9760
	$\log m$	+8.6206
	$\log n \sin N$	+9.5535
	$\log n \cos N$	+9.1189
	$\log \tan N$	+0.4346
	$\log \sin N$	+9.9725
	$\log n$	+9.5810
	$-\log \frac{m}{n}$	-0.0396
	$\log \cos (M - N)$	+8.3613
$-\log \frac{m}{n} \cos (M - N) =$	$\log (1)$	-7.4009
	$\log \sin (M - N)$	-9.9999
	$\log m \sin (M - N)$	-8.6205
	$\log k$	9.4350
$\log \frac{m \sin (M - N)}{k} =$	$\log \cos \psi$	-9.1855
	$\log \sin \psi$	+9.9948
	$\log k \sin \psi$	+9.4298
$\log \frac{k \sin \psi}{n} =$	$\log (2)$	+9.8488
	(1) -	.0025
	(2) +	.7060
For Immersion, (1) - (2) =	$t_1 -$	.7085
For Emersion, (1) + (2) =	$t_2 +$	.7035
	$\log t_1$	-9.8503
	$\log u' +$	9.2224
	$\log t_1 u' -$	9.0727
	$\log v' +$	8.5176
	$\log t_1 v' -$	8.3679
	$t_1 v' -$	.0233
	$v +$	.4226
$v + t_1 v' =$	$c \cos C +$	.3993
	$t_1 u' -$	.1182
	$u +$	.3807
$u + t_1 u' =$	$c \sin C +$	.2625
	$\log c \sin C$	+9.4191
	$\log c \cos C$	+9.6013
	$\log \tan C$	+9.8178

$T - d$	$\frac{h}{8}$	$\frac{m}{28.8}$
(Reduced to hours and minutes,)	$t_1 - 0$	42.5
	$T - d + t_1$	7 46.3

IMMERSION: *Ann Arbor Mean Time*,

Immersion Angle from North Point =
 Immersion Angle from Vertex = $Q + C =$

$C +$	33° 19'
Q	281 22
V	314 41

(Reduced to hours and minutes,)	$\frac{h}{8}$	$\frac{m}{28.2}$
	+ 0	42.2
		9 11.0

EMERSION: *Ann Arbor Mean Time*,

Calculation of a more accurate time, etc. of *Emersion*.

	$h - d + 2 \frac{h}{3} \frac{m}{41}$	From first determination,	$M \ 341^{\circ} \ 6'$
Sidereal equiv. for $\frac{1}{2} t_2 =$	$\frac{1}{2} \mu_2 + 21 \ 3$		$N \ 71 \ 0$
$h - d + \frac{1}{2} \mu_2 =$	$h' - d + 2 \ 24 \ 44$		$M - N \ 270 \ 8$
			$90^{\circ} - N \ 19 \ 0$
	$\log \cos (h' - d) + 9.9069$		$\psi \ 98 \ 49$
	$\log r \cos \phi' + 9.8698$	For Emersion, $90^{\circ} - N + \psi =$	$Q \ 117 \ 49$
	$\log \lambda \ 9.4192$		(1) $- .0002$
$\log r \cos \phi' \lambda \cos (h' - d) =$	$\log u' + 9.1959$		(2) $+ .6921$
	$\log \sin (h' - d) + 9.7712$	(1) + (2) =	$t + .6919$
	$\log r \cos \phi' \lambda + 9.9860$		$\log t + 9.8400$
	$\log \sin D + 9.5178$		$\log n \sin N + 9.5653$
$\log r \cos \phi' \lambda \sin (h' - d) \sin D =$	$\log v' + 8.5780$		$\log n \sin N + 9.4053$
	$v' + .0378$		$\log n \cos N + 9.1024$
	$q' + .1644$		$\log n \cos N + 8.9424$
$q' - v' =$	$n \cos N + .1266$		$n \cos N + .0876$
	$u' + .1570$	From first determination,	$m \cos M + n \cos N =$
	$p' + .5246$		(3) $.1271$
$p' - u' =$	$n \sin N + .3676$		$n \sin N + .2543$
	$\log n \sin N + 9.5653$	From first determination,	$m \sin M -$
	$\log n \cos N + 9.1024$		(4) $.2408$
	$\log \tan N + 0.4629$		(4) ² $.0580$
	$\log \sin N + 9.9757$		(3) ² $.0161$
	$\log n + 9.5896$	(3) ² + (4) ² = $k^2 = 0.0741,$	Check $.0741$
From first determination,	$\log m + 8.6206$		$\log u' + 9.1959$
	$-\log \frac{m}{n} - 0.0310$		$\log t u' + 9.0359$
	$\log \cos (M - N) + 7.3668$		$\log v' + 8.5780$
	$\log \sin (M - N) - 0.0000$		$\log t v' + 8.4180$
	$\log m \sin (M - N) - 8.6206$		$t v' + .0262$
	$\log k \ 9.4350$	From first determination,	$v + .4226$
$\log \frac{m \sin (M - N)}{k} =$	$\log \cos \psi - 9.1856$		$c \cos C + .4468$
	$\log \sin \psi + 9.9948$		$t u' + .1086$
	$\log k \sin \psi + 9.4298$	From first determination,	$u + .3807$
$\log \frac{k \sin \psi}{n} =$	$\log (2) + 9.8402$		$c \sin C + .4883$
			$\log c \sin C + 9.6896$
$-\log \frac{m}{n} \cos (M - N) =$	$\log (1) - 6.3978$		$\log c \cos C + 9.6520$
			$\log \tan C + 0.0376$
			$T - d \ 8 \ 98.8$
		(Reduced to hours and minutes,)	$t + 0 \ 41.5$
EMERSION: <i>Ann Arbor Mean Time,</i>			$T - d + t \ 9 \ 10.3$
			$C + 47^{\circ} \ 29'$
Emersion Angle from North Point =		$Q \ 117 \ 49$	
Emersion Angle from Vertex = $Q + V =$		$V \ 165 \ 18$	

The last two pages of the Occultations contain a list of such Occultations as will be visible at Washington during the year 1861.

The Tables of *Jupiter's Satellites* embrace, —

A list of the occultations, eclipses, transits, and transits of shadows, in the order of the time of the occurrence of the phenomena for the satellites taken promiscuously. They are given for every month, accompanied with a diagram, constructed for the eclipse which occurs nearest the middle of the month, showing the phases of the eclipses for an inverting telescope.

A table containing the mean time of the geocentric superior conjunction, and the rectangu-

lar coördinates of the satellites corresponding to the time from the next preceding superior conjunction, at intervals of twenty minutes for the first satellite, of forty minutes for the second, of one hour and twenty minutes for the third, and of three hours for the fourth satellite. They are also given for the time of eclipse for the first, second, and third satellites at intervals of seven days, and for the fourth for every eclipse. They enable the astronomer to obtain the configurations at all times. They are given in seconds of arc.

The coördinates have their origin in the centre of the primary, and are referred to the major and minor axes of the apparent ellipse described by the path of the satellite.

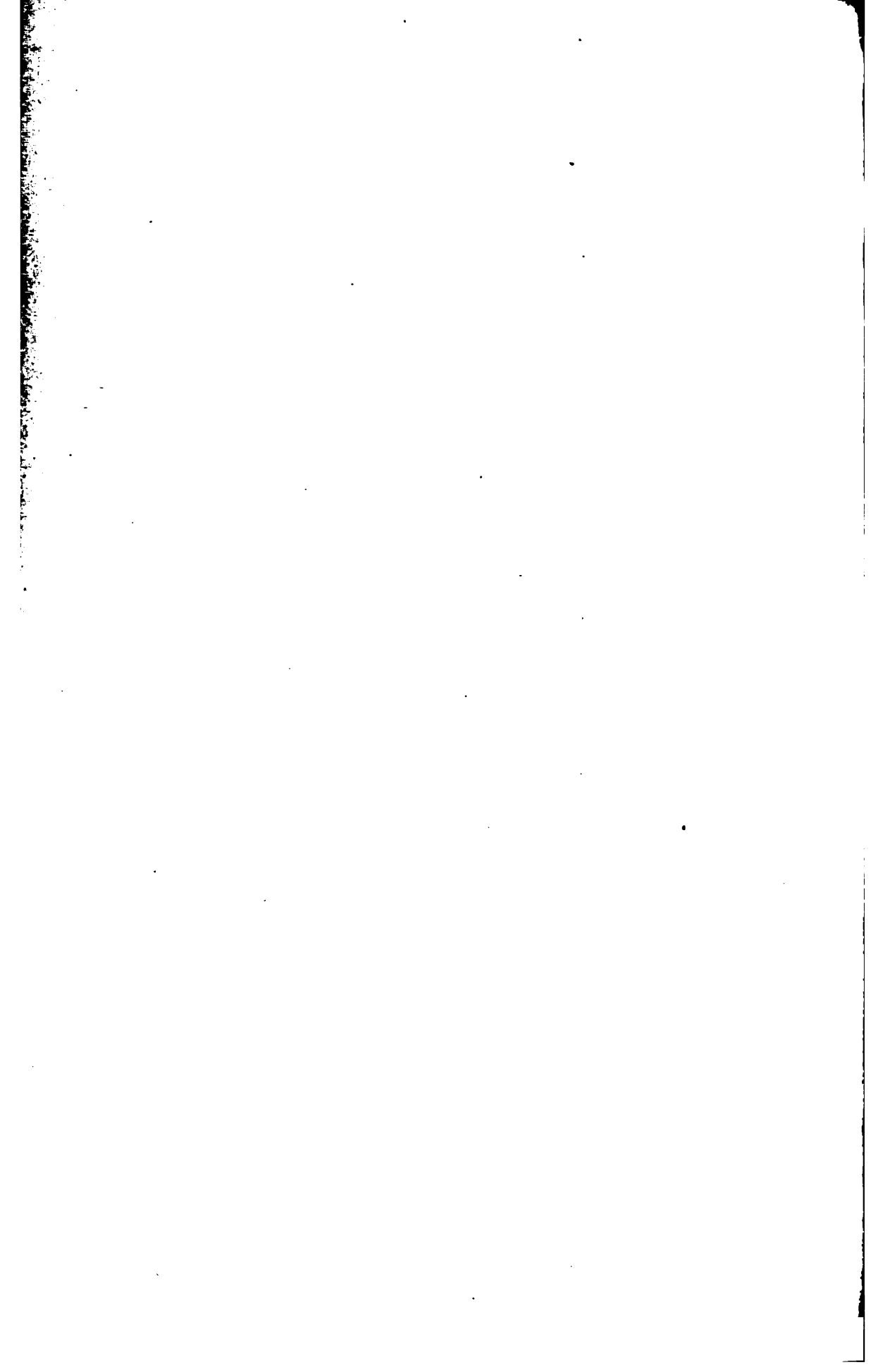
The major axis of this ellipse is constant, for the earth's mean place; but the minor axis takes all values from the positive and negative maxima to zero, owing to the changes in the earth's elevation above the plane of the satellite's orbit.

The values in the table correspond to the maximum value of the conjugate axis, as seen from the sun or that of the mean maximum for the earth (which is a constant value). Factors are given in an adjoining column, at intervals of seven days for the first, second, and third satellites, and seventeen days for the fourth, to reduce the above values to those corresponding to the axis for the time being; also for the same intervals, the angle of inclination of the northern semi-minor axis to the circle of declination.

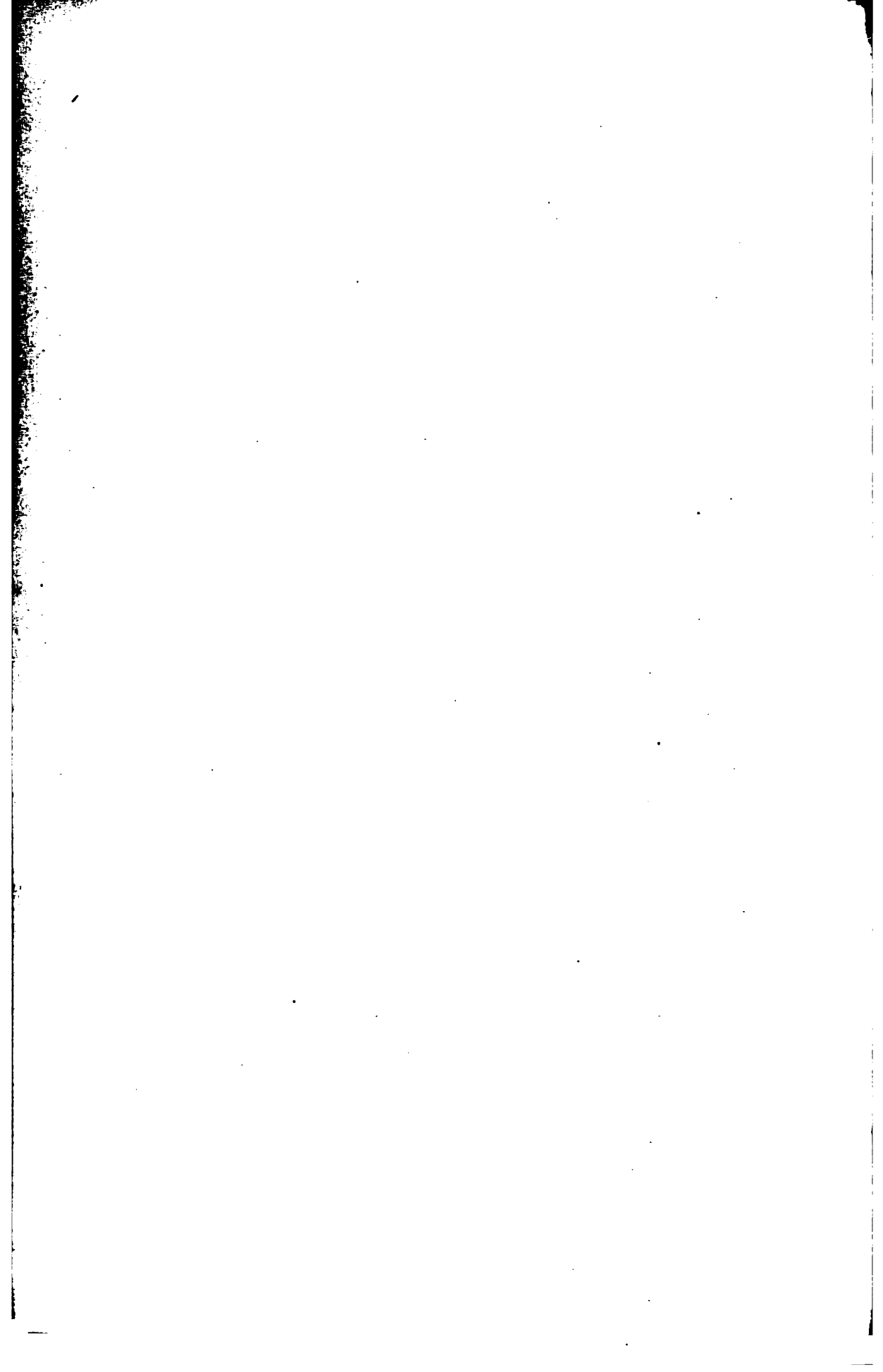
x is positive after superior conjunction, or on the east side of the planet, negative before superior conjunction, or on the west side. y will be positive north, negative south. The eclipses, occultations, &c. of the satellites, visible at Washington, that is, those which occur when the sun is 8° below and Jupiter 8° above the horizon, are distinguished by a *W.* placed after the name of the phase.

The *Appendix* contains an article on the construction of this work, similar to that of the preceding year.

It also contains tables of reduction from the equator to the ecliptic, and the reverse; a general table for the Libration of the Moon, constructed by means of the formulas on page 334, and furnishing the values to be employed in the computation of the moon's libration in latitude and longitude (see page 334); a table showing the moon's mean motion in longitude for sidereal intervals of time, carried out to tenths of minutes; a table of logarithms of small arcs in space and time; a table showing the correction required on account of second differences in the moon's motion, the use of which is explained in the preceding part of this article, page 488; a table for converting mean solar into sidereal time, and the reverse; and a table containing the corrections to be applied to the places of Polaris and δ Ursæ Minoris in the years 1857, 1858, and 1859, arising from the terms of nutation depending upon 2 C .



A P P E N D I X .



CONSTRUCTION OF THE ASTRONOMICAL AND NAUTICAL EPHEMERIDES FOR 1861.

THE Precession of the Equinoxes adopted in this volume is taken from STRUVE and PETERS; * it is,

$$\text{Precession} = 50''.2411 + 0''.0002268 t,$$

in which t is the number of years after 1800.

The Mean Obliquity of the Ecliptic is also taken from STRUVE and PETERS, and its value is, †

$$\text{Obliquity} = 23^\circ 27' 54''.22 - 0''.4645 t - 0''.0000014 t^2.$$

The constant of aberration is that of STRUVE, and is, ‡

$$\text{Aberration} = 20''.4451 \pm 0''.0111.$$

The Nutation of the Apparent Obliquity and the Equation of the Equinoxes are computed from PETERS' formulas given in his *Numerus Constans Nutationis*. § These formulas are reprinted in the volume of this ephemeris for 1855.

Of the Mean Places of 100 Fixed Stars, thirty-three have been taken from LE VERRIER's list of Fundamental Stars, *Annales de l'Observatoire Impériale de Paris*, Vol. II.; nine from a list of Circumpolar Stars prepared by Dr. GOULD, *U. S. Coast Survey Report*, 1855; and the remainder from the list of stars in the *English Nautical Almanac* for 1855, combined with that given in the *Astronomical Observations made during the Year 1846 at the National Observatory, Washington*.

The Apparent Places of the Fixed Stars have been obtained by means of PETERS' formulas, which are given on page 255.

The place of Sirius is corrected by the following formula, given by PETERS, for the variability of its motion in right ascension compared with those of β Orionis, α Orionis, and Procyon.

$$\text{Variation of right ascension} = 0''.101 + 0''.00072 t + 0''.170 \sin. (u + 92^\circ 18');$$

in which

* PETERS' *Numerus Constans Nutationis*, p. 71.

† Ibid., pp. 66 and 71.

‡ STRUVE'S *Constant de l'Aberration*, p. 47.

§ PETERS' *Numerus Constans Nutationis*, pp. 46-48.

APPENDIX.

ϵ = the eccentric anomaly from the inferior apsis. It is found from the elements,

Mean annual motion of Sirius in its orbit	= $7^{\circ}.3104 \pm 0^{\circ}.2162$
Period of its revolution	= $49^{\circ}.245 \pm 1^{\circ}.456$
Passage through the inferior apsis	= $1792.819 \pm 2^{\circ}.039$
Eccentricity	= 0.5647 ± 0.0627 .

The List of Moon-culminating Stars is large, and so arranged in a systematic form as to permit the observer a great range for selection.

The Ephemeris of the Sun is constructed from the Tables of HANSEN and OLUFSEN, Copenhagen, 1853. In the computation of the Sun's Geocentric Coördinates, regard has been had to the sun's latitude; the computation has been made by means of the formulas given in the *Construction of the Almanac for 1855*.

ENCKE's discussion of the Transits of Venus in 1761 and 1769, in his *Der Venusdurchgang von 1769, &c.*, has furnished the standard

Equatorial Horizontal Parallax at the Earth's Mean Distance = $8''.5776$.

The Sun's Semidiameter at the Earth's Mean Distance has been taken equal to $16' 2''$.

For reducing observations of different observers, the following corrections may be added:—

For Greenwich Mural Circle, H.	+ 0.21
“ “ “ “ H. B.	— 0.43
“ “ “ “ F.	— 0.86
“ “ “ “ E.	+ 0.17
“ “ “ “ R.	— 0.57
“ “ “ “ G.	— 0.18
“ “ “ “ I. H.	— 0.87
“ “ “ “ D.	— 0.61
“ “ “ “ W. R.	+ 0.49
“ “ “ “ P.	— 1.28
Königsberg Meridian Circle, Bessel	— 1.10
Dorpat “ “ W. Struve	— 1.36
Washington Mural Circle, Prof. Coffin	+ 1.00
“ “ “ Lieut. Page	+ 1.00
Washington Meridian Circle, Prof. Hubbard	— 0.41

The Ephemeris of the Moon has been constructed from PEIRCE's *Tables of the Moon*, with the *Tables of the Moon's Parallax*, constructed from WALKER's and ADAMS' formulas, and arranged as a Supplement to the first edition of PEIRCE's *Tables of the Moon*.

The Semidiameter of the Moon at the Earth's Mean Distance is taken to be $\frac{1}{50}$ part greater than that given by BURCKHARDT, although that given by BURCKHARDT is probably better adapted to the computation of eclipses and occultations.

CONSTRUCTION OF THE ALMANAC.

The Ephemeris of Mercury has been constructed from the theory of LE VERRIER, published in the *Additions to the Connaissance des Temps* for 1848, without any alteration. Manuscript Tables have been computed from LE VERRIER'S formulas for this purpose.

The Ephemeris of Venus has been derived from manuscript Tables, constructed from LINDENAU'S Tables, in a form similar to that adopted for the Lunar Tables; applying AIRY'S Long Equation and the corrections proceeding from the discussion, by the method of Least Squares, of Mr. HUGH BREEN'S results contained in his paper on the *Corrections of LINDENAU'S Elements of the Orbit of Venus, &c.*, published in the *Memoirs of the Royal Astronomical Society*, Vol. XVIII.; and adopting the secular variations of the elements from LE VERRIER'S *Memoir on the Determination of the Secular Inequalities of the Planets*, which appeared in the *Connaissance des Temps* for the year 1844. The following are the corresponding corrected elements, and annual variations for Washington, 1855.0.

$$\begin{aligned} L &= 289^{\circ} 51' 53.5'' \\ \pi &= 129 32 59.6 + 49.57459 t. \\ \Omega &= 75 23 27.3 + 32.88424 t. \\ i &= 3 23 34.6 + 0.04363 t. \\ e &= 1410''.6847 - 0.11157 t. \\ n &= 2106641.438 \\ a &= 0.7233323 \end{aligned}$$

The Ephemeris of Mars is derived from manuscript Tables constructed from LINDENAU'S Tables in the same manner as the Tables of Venus. Mr. HUGH BREEN'S results contained in his paper *On the Corrections of LINDENAU'S Elements of Mars*, published in the *Memoirs of the Royal Astronomical Society*, Vol. XX., have also been discussed and applied; and LE VERRIER'S secular variations of the elements are likewise adopted. The following are the corresponding corrected elements, and secular variations for Washington, 1855.0.

$$\begin{aligned} L &= 320^{\circ} 13' 33.71'' \\ \pi &= 333 23 17.80 + 65.99145 t. \\ \Omega &= 48 25 55.18 + 27.68294 t. \\ i &= 1 51 2.20 - 0.02141 t. \\ e &= 19236''.75 + 0.18549 t. \\ n &= 689050.9023 \\ a &= 1.5236878 \end{aligned}$$

The Ephemeris of Jupiter is derived from manuscript Tables constructed from BOUVARD'S Tables, with such changes as were required to make them correspond more nearly to the formulas.

The Ephemeris of Saturn is also derived from manuscript Tables constructed from the Tables of BOUVARD, with changes having the same object. The mass of Jupiter given by BESSEL has been adopted and used.

$$\text{This mass} = \frac{1}{1047.879 \pm 0.235} \text{ of the sun's mass.}$$

The following corrections of the elements have also been introduced for 1861:—

APPENDIX.

corr. mean long.	= +4".9
corr. long. of node	= -143".4
corr. inclination	= -5".7.

The Ephemeris of Uranus is derived from the elliptical portion of BOUVARD'S Tables, with LE VERRIER'S corrections and perturbations caused by Jupiter and Saturn, contained in his *Recherches sur les Mouvements de la Planète Herschel (dite Uranus)*, published in the *Connaissance des Temps* for 1849, and also PEIRCE'S corrections and perturbations arising from the influence of Neptune,

The combined corrections of the elements deduced by PEIRCE for January 1, 1800, are as follows:—

corr. mean distance	= +0.000942
corr. mean motion	= -1."13560
corr. eccentricity	= -0.0003626
corr. long. of per.	= +8252".4
corr. long. of epoch	= +2575".4.

The Ephemeris of Neptune is derived from PEIRCE'S theory and WALKER'S orbit. The eclipses and elongations of Jupiter's Satellites are computed from DAMOISEAU'S Tables.

The vertical semidiameters of the Planets are computed from the following values:—

Vertical Semidiameter.	Log. Dist.	Authority
Mercury 3.34	0.00	LE VERRIER, <i>Theory of Mercury</i> .
Venus 8.546 ± 0.086	0.00	} PEIRCE, from the Washington Observations of 1845 and 1846, made with the mural circle.
Mars 2.842 ± 0.057	0.25	
Jupiter 18.78 ± 0.067	0.70	
Saturn 8.77 ± 0.039	0.95	
Uranus 1.68 ± 0.3	1.30	

To correspond to the apparent semidiameters observed with the Washington mural circle, all the semidiameters, except those of Mercury, computed from these values, must be increased by a constant quantity = 0".57.

The apparent elements of Saturn's Rings are computed from BESSEL'S data, except those for BOND'S dusky ring.

The elements of the eclipse are adapted to the neat and simple modification of BESSEL'S formulas, suggested by T. HENRY SAFFORD, Jr.

The elements adapted to BESSEL'S formulas are given for all occultations of stars greater than those of the sixth magnitude.

The Heliocentric Coördinates of the Planets are given for the computation of perturbations, and the following are the values of the masses, that of the Sun being unity:—

Mercury	$\frac{1}{4865751}$	ENCKE, <i>A. N.</i> , No. 443.
Venus	$\frac{1}{390000}$	LE VERRIER, <i>Théor. de Merc.</i> , p. 115.

CONSTRUCTION OF THE ALMANAC.

The Earth	$\frac{1}{354936}$	LE VERRIER, <i>Théor. de Merc.</i> , p. 26.
Mars	$\frac{1}{2680637}$	BURCKHARDT, <i>Conn. des Temps</i> , 1816, p. 343.
Jupiter	$\frac{1}{1047.879 \pm 0.235}$	BESSEL, <i>Die Masse des Jupiter</i> , p. 64.
Saturn	$\frac{1}{3501.6}$	BESSEL, <i>Comptes Rendus</i> , 1841.
Uranus	$\frac{1}{24905}$	LAMONT, <i>Mem. Ast. Soc.</i> , Vol. XI p. 54.
Neptune	$\frac{1}{18780}$	PEIRCE, <i>Am. Ac. Proc.</i> , Vol. I. p. 333.

The intervals of original computation have in all cases been made sufficiently small to authorize the use of the differences as a check of the accuracy of the work. The results have also been tested, in various portions, by means of duplicate computations. The proofs from the stereotype plates have been thoroughly examined by an independent series of differences. And it is believed that, in every respect, that system has been adopted in which accuracy was most likely to be secured.

The principal computations of the Ephemeris have been distributed in the following manner.

The Sun has been computed by Mr. EASTWOOD; the Ephemeris of the Moon, by Mr. RUNKLE, Mr. OLIVER, Mr. WRIGHT, and Professor KERR; the Moon Culminations, by Mr. LOOMIS; and the Lunar Distances, by Mr. LOOMIS, Mr. NEWCOMB, and Professor VAN VLECK. Mercury has been computed by Mr. BRADFORD, Venus by Miss MITCHELL, Mars by Professor BARDWELL, Jupiter by Professor KENDALL, Saturn by Professor VAN VLECK, Uranus by Mr. FERREL, and Neptune by Professor KENDALL. The Fixed Stars and the General Constants for Reduction have been computed by Mr. SPRAGUE, and the Occultations, by Mr. DOWNES. The Eclipses have been computed and the Charts projected by Mr. WRIGHT. The Table of Geographical Positions of the Principal Observatories has been prepared by Dr. GOULD.

EQUATOR TO ECLIPTIC.

TABLE FOR CHANGING LATITUDE AND LONGITUDE TO RIGHT ASCENSION AND DECLINATION, OR THE REVERSE.

λ	λ	A	α	Diff.	Log. α	Diff.	b	Log. b	B	Diff.	λ	λ
$^{\circ}$	h. m.	$^{\circ}$	$^{\circ}$						$^{\circ}$	$^{\circ}$	h. m.	$^{\circ}$
0	0 0	0 0.0	0.3981	1	9.6000	1	0.9173	9.9625	0 0.0	26.0	12 0	180
1	0 4	0 5.4	0.3980	2	9.5999	2	0.9174	9.9626	0 26.0	26.1	11 56	179
2	0 8	0 10.8	0.3978	3	9.5997	3	0.9175	9.9626	0 52.1	26.0	11 52	178
3	0 12	0 16.2	0.3975	4	9.5994	4	0.9176	9.9627	1 18.1	25.9	11 48	177
4	0 16	0 21.5	0.3971	5	9.5989	5	0.9178	9.9627	1 44.0	25.9	11 44	176
5	0 20	0 26.9	0.3966	7	9.5983	7	0.9180	9.9628	2 9.9	25.9	11 40	175
6	0 24	0 32.2	0.3959	8	9.5976	8	0.9183	9.9630	2 35.8	25.8	11 36	174
7	0 28	0 37.4	0.3951	9	9.5967	9	0.9186	9.9631	3 1.6	25.8	11 32	173
8	0 32	0 42.6	0.3942	10	9.5957	10	0.9190	9.9633	3 27.4	25.6	11 28	172
9	0 36	0 47.7	0.3932	13	9.5946	13	0.9195	9.9635	3 53.0	25.6	11 24	171
10	0 40	0 52.8	0.3920	13	9.5933	14	0.9200	9.9638	4 18.6	25.4	11 20	170
11	0 44	0 57.8	0.3907	13	9.5919	15	0.9205	9.9640	4 44.0	25.3	11 16	169
12	0 48	1 2.7	0.3894	15	9.5904	17	0.9211	9.9643	5 9.3	25.2	11 12	168
13	0 52	1 7.5	0.3879	16	9.5887	18	0.9217	9.9646	5 34.5	25.1	11 8	167
14	0 56	1 12.3	0.3863	17	9.5869	20	0.9224	9.9649	5 59.6	24.9	11 4	166
15	1 0	1 17.0	0.3846	19	9.5849	21	0.9231	9.9652	6 24.5	24.8	11 0	165
16	1 4	1 21.5	0.3827	20	9.5828	22	0.9239	9.9656	6 49.3	24.6	10 56	164
17	1 8	1 25.9	0.3807	21	9.5806	24	0.9247	9.9660	7 13.9	24.4	10 52	163
18	1 12	1 30.2	0.3786	22	9.5782	25	0.9256	9.9664	7 38.3	24.2	10 48	162
19	1 16	1 34.4	0.3764	23	9.5757	27	0.9265	9.9668	8 2.5	24.0	10 44	161
20	1 20	1 38.5	0.3741	24	9.5730	29	0.9274	9.9673	8 26.5	23.9	10 40	160
21	1 24	1 42.4	0.3717	26	9.5701	30	0.9284	9.9677	8 50.4	23.6	10 36	159
22	1 28	1 46.2	0.3691	27	9.5671	31	0.9294	9.9682	9 14.0	23.4	10 32	158
23	1 32	1 49.9	0.3664	27	9.5640	33	0.9304	9.9687	9 37.4	23.2	10 28	157
24	1 36	1 53.4	0.3637	29	9.5607	35	0.9315	9.9692	10 0.6	22.9	10 24	156
25	1 40	1 56.7	0.3608	30	9.5572	36	0.9326	9.9697	10 23.5	22.7	10 20	155
26	1 44	1 59.9	0.3578	31	9.5536	38	0.9338	9.9703	10 46.2	22.5	10 16	154
27	1 48	2 2.9	0.3547	32	9.5498	39	0.9350	9.9708	11 8.7	22.2	10 12	153
28	1 52	2 5.8	0.3515	33	9.5459	41	0.9362	9.9714	11 30.9	21.9	10 8	152
29	1 56	2 8.5	0.3482	34	9.5418	43	0.9374	9.9719	11 52.8	21.7	10 4	151
30	2 0	2 11.1	0.3448	35	9.5375	45	0.9387	9.9725	12 14.5	21.4	10 0	150
31	2 4	2 13.5	0.3413	37	9.5330	46	0.9400	9.9731	12 35.9	21.1	9 56	149
32	2 8	2 15.7	0.3376	38	9.5284	48	0.9413	9.9737	12 57.0	20.8	9 52	148
33	2 12	2 17.7	0.3338	38	9.5236	51	0.9426	9.9743	13 17.8	20.6	9 48	147
34	2 16	2 19.6	0.3300	39	9.5185	52	0.9440	9.9750	13 38.4	20.3	9 44	146
35	2 20	2 21.3	0.3261	40	9.5133	54	0.9453	9.9756	13 58.6	20.0	9 40	145
36	2 24	2 22.8	0.3221	41	9.5079	56	0.9467	9.9762	14 18.6	19.6	9 36	144
37	2 28	2 24.1	0.3180	43	9.5023	58	0.9481	9.9768	14 38.2	19.3	9 32	143
38	2 32	2 25.2	0.3137	44	9.4965	60	0.9495	9.9775	14 57.5	19.0	9 28	142
39	2 36	2 26.2	0.3093	44	9.4905	63	0.9509	9.9781	15 16.5	18.6	9 24	141
40	2 40	2 27.0	0.3049	45	9.4842	65	0.9524	9.9788	15 35.1	18.4	9 20	140
41	2 44	2 27.6	0.3004	46	9.4777	67	0.9538	9.9794	15 53.5	18.0	9 16	139
42	2 48	2 28.0	0.2958	47	9.4710	69	0.9552	9.9801	16 11.5	17.7	9 12	138
43	2 52	2 28.2	0.2911	47	9.4641	72	0.9566	9.9807	16 29.2	17.3	9 8	137
44	2 56	2 28.2	0.2864	49	9.4569	74	0.9581	9.9814	16 46.5	17.0	9 4	136
45	3 0	2 28.1	0.2815	50	9.4495	78	0.9595	9.9820	17 3.5	16.7	9 0	135
46	3 4	2 27.8	0.2765	50	9.4417	80	0.9610	9.9827	17 20.2	16.3	8 56	134
47	3 8	2 27.3	0.2715	51	9.4337	82	0.9625	9.9834	17 36.5	15.9	8 52	133
48	3 12	2 26.6	0.2664	52	9.4255	86	0.9639	9.9840	17 52.4	15.6	8 48	132
49	3 16	2 25.8	0.2612	53	9.4169	89	0.9653	9.9847	18 8.0	15.3	8 44	131
50	3 20	2 24.8	0.2559	54	9.4080	92	0.9667	9.9853	18 23.3	14.9	8 40	130
51	3 24	2 23.6	0.2505	54	9.3988	95	0.9681	9.9859	18 38.2	14.5	8 36	129
52	3 28	2 22.2	0.2451	55	9.3893	99	0.9695	9.9865	18 52.7	14.2	8 32	128
53	3 32	2 20.7	0.2396	56	9.3794	102	0.9709	9.9872	19 6.9	13.8	8 28	127
54	3 36	2 19.0	0.2340	57	9.3692	106	0.9722	9.9878	19 20.7	13.4	8 24	126
55	3 40	2 17.1	0.2283	57	9.3586	111	0.9736	9.9884	19 34.1	13.1	8 20	125

EQUATOR TO ECLIPTIC.

TABLE FOR CHANGING LATITUDE AND LONGITUDE TO RIGHT ASCENSION AND DECLINATION, OR THE REVERSE.

<i>k</i>	<i>k</i>	<i>A</i>	<i>a</i>	Dif.	Log. <i>a</i>	Dif.	<i>b</i>	Log. <i>b</i>	<i>B</i>	Dif.	<i>k</i>	<i>k</i>
°	h. m.	°							°		h. m.	°
56	3 44	2 15.1	0.2226	58	9.3475	114	0.9749	9.9890	19 47.2	12.7	8 16	124
57	3 48	2 13.0	0.2168	59	9.3361	119	0.9762	9.9895	19 59.9	12.3	8 12	123
58	3 52	2 10.7	0.2109	59	9.3242	124	0.9775	9.9901	20 12.2	12.0	8 8	122
59	3 56	2 8.2	0.2050	60	9.3118	129	0.9788	9.9907	20 24.2	11.6	8 4	121
60	4 0	2 5.6	0.1990	60	9.2989	134	0.9800	9.9912	20 35.8	11.2	8 0	120
61	4 4	2 2.8	0.1930	61	9.2855	139	0.9812	9.9918	20 47.0	10.9	7 56	119
62	4 8	1 59.9	0.1896	62	9.2716	146	0.9824	9.9923	20 57.9	10.4	7 52	118
63	4 12	1 56.9	0.1807	62	9.2570	152	0.9836	9.9928	21 8.3	10.1	7 48	117
64	4 16	1 53.7	0.1745	63	9.2418	159	0.9847	9.9933	21 18.4	9.7	7 44	116
65	4 20	1 50.4	0.1682	63	9.2259	166	0.9858	9.9938	21 28.1	9.4	7 40	115
66	4 24	1 47.0	0.1619	64	9.2093	175	0.9868	9.9942	21 37.5	8.9	7 36	114
67	4 28	1 43.5	0.1555	64	9.1918	183	0.9878	9.9947	21 46.4	8.6	7 32	113
68	4 32	1 39.8	0.1491	64	9.1735	192	0.9888	9.9951	21 55.0	8.2	7 28	112
69	4 36	1 36.1	0.1427	65	9.1543	203	0.9898	9.9955	22 3.2	7.9	7 24	111
70	4 40	1 32.2	0.1362	66	9.1340	214	0.9907	9.9959	22 11.1	7.4	7 20	110
71	4 44	1 28.2	0.1296	66	9.1126	227	0.9916	9.9963	22 18.5	7.1	7 16	109
72	4 48	1 24.2	0.1230	66	9.0899	240	0.9924	9.9967	22 25.6	6.7	7 12	108
73	4 52	1 20.0	0.1164	67	9.0659	256	0.9932	9.9970	22 32.3	6.3	7 8	107
74	4 56	1 15.7	0.1097	67	9.0403	273	0.9940	9.9974	22 38.6	5.9	7 4	106
75	5 0	1 11.4	0.1030	67	9.0130	294	0.9947	9.9977	22 44.5	5.6	7 0	105
76	5 4	1 7.0	0.0963	67	8.9836	315	0.9954	9.9980	22 50.1	5.1	6 56	104
77	5 8	1 2.5	0.0896	68	8.9521	342	0.9960	9.9982	22 55.2	4.8	6 52	103
78	5 12	0 58.0	0.0828	68	8.9179	373	0.9966	9.9985	23 0.0	4.4	6 48	102
79	5 16	0 53.4	0.0760	69	8.8806	410	0.9971	9.9987	23 4.4	4.0	6 44	101
80	5 20	0 48.7	0.0691	68	8.8396	453	0.9976	9.9990	23 8.4	3.6	6 40	100
81	5 24	0 44.0	0.0623	69	8.7943	508	0.9981	9.9992	23 12.0	3.3	6 36	99
82	5 28	0 39.2	0.0554	69	8.7435	576	0.9985	9.9993	23 15.3	2.8	6 32	98
83	5 32	0 34.4	0.0485	69	8.6859	667	0.9988	9.9995	23 18.1	2.5	6 28	97
84	5 36	0 29.6	0.0416	69	8.6192	789	0.9991	9.9996	23 20.6	2.1	6 24	96
85	5 40	0 24.7	0.0347	69	8.5403	967	0.9994	9.9997	23 22.7	1.7	6 20	95
86	5 44	0 19.8	0.0278	69	8.4436	1248	0.9996	9.9998	23 24.4	1.3	6 16	94
87	5 48	0 14.9	0.0209	70	8.3188	1760	0.9998	9.9999	23 25.7	1.0	6 12	93
88	5 52	0 9.9	0.0139	69	8.1428	3010	0.9999	0.0000	23 26.7	0.6	6 8	92
89	5 56	0 5.0	0.0070	70	7.8418		1.0000	0.0000	23 27.3	0.2	6 4	91
90	6 0	0 0.0	0.0000				1.0000	0.0000	23 27.5		6 0	90

This table is computed for an obliquity of 23° 27' 30".

The argument *k* is either the longitude or the right ascension, or their excess above 180° or 12^h.

Right ascension (*a*) and declination (*δ*) are converted into longitude (*λ*) and latitude (*β*) by the formulæ

$$k = a \text{ or } = a - 12^h \quad \left| \quad \begin{array}{l} \text{in which the sign of } a \text{ is that of } \cos. a \\ \text{the sign of } B \text{ is that of } \sin. a \\ \text{the sign of } A \text{ is that of } \tan. a \end{array} \right.$$

$$\tan. p = a \tan. (\delta - B)$$

$$\tan. \beta = b \tan. (\delta - B) \cos. p$$

$$\lambda = a + A + p$$

Longitude (*λ*) and latitude (*β*) are converted into right ascension and declination by the formulæ

$$k = \lambda = \lambda - 180^\circ \quad \left| \quad \begin{array}{l} \text{in which the sign of } a \text{ is that of } \cos. \lambda \\ \text{the sign of } B \text{ is that of } \sin. \lambda \\ \text{the sign of } A \text{ is that of } \tan. \lambda \end{array} \right.$$

$$\tan. g = a \tan. (\beta + B)$$

$$\tan. \delta = b \tan. (\beta + B) \cos. g$$

$$a = \lambda + A - g$$

The following approximate formulæ can be used when *β* is less than 10°.

$$\beta = b (\delta - B)$$

$$\lambda = a + A + a (\delta - B) \sec. \beta$$

and the factor *sec. β* can be neglected when *β* is less than 4°.

MOON'S LIBRATION.

TABLE FOR THE LIBRATION OF THE MOON.

$\Omega - \lambda$	$\Delta \lambda$	a	B	$\Omega - \lambda$	$\Omega - \lambda$	$\Delta \lambda$	a	B	$\Omega - \lambda$
0	0.0	39	0 0.0	180	0	0.6	56	1 3.9	134
1	0.0	39	0 1.6	179	47	0.6	57	1 4.9	133
2	0.0	39	0 3.1	178	48	0.6	58	1 6.0	132
3	0.1	39	0 4.7	177	49	0.6	59	1 7.0	131
4	0.1	39	0 6.2	176	50	0.6	60	1 8.0	130
5	0.1	39	0 7.7	175	51	0.6	62	1 9.0	129
6	0.2	39	0 9.3	174	52	0.6	63	1 10.0	128
7	0.2	39	0 10.8	173	53	0.5	64	1 10.9	127
8	0.2	39	0 12.4	172	54	0.5	66	1 11.8	126
9	0.2	39	0 13.9	171	55	0.5	67	1 12.7	125
10	0.2	39	0 15.4	170	56	0.5	69	1 13.6	124
11	0.3	39	0 16.9	169	57	0.5	71	1 14.5	123
12	0.3	40	0 18.5	168	58	0.5	73	1 15.3	122
13	0.3	40	0 20.0	167	59	0.5	75	1 16.1	121
14	0.3	40	0 21.5	166	60	0.5	77	1 16.9	120
15	0.3	40	0 23.0	165	61	0.5	80	1 17.6	119
16	0.3	40	0 24.5	164	62	0.5	83	1 18.4	118
17	0.3	40	0 26.0	163	63	0.5	86	1 19.1	117
18	0.3	41	0 27.4	162	64	0.5	89	1 19.8	116
19	0.4	41	0 28.9	161	65	0.4	92	1 20.4	115
20	0.4	41	0 30.4	160	66	0.4	95	1 21.1	114
21	0.4	41	0 31.8	159	67	0.4	99	1 21.7	113
22	0.4	42	0 33.2	158	68	0.4	103	1 22.3	112
23	0.4	42	0 34.7	157	69	0.4	108	1 22.9	111
24	0.4	42	0 36.1	156	70	0.4	113	1 23.4	110
25	0.4	43	0 37.5	155	71	0.4	119	1 23.9	109
26	0.5	43	0 38.9	154	72	0.4	125	1 24.4	108
27	0.5	43	0 40.3	153	73	0.4	132	1 24.9	107
28	0.5	44	0 41.7	152	74	0.3	141	1 25.3	106
29	0.5	44	0 43.1	151	75	0.3	150	1 25.7	105
30	0.5	45	0 44.4	150	76	0.3	160	1 26.1	104
31	0.5	45	0 45.7	149	77	0.3	172	1 26.5	103
32	0.5	46	0 47.0	148	78	0.2	186	1 26.8	102
33	0.5	46	0 48.4	147	79	0.2	202	1 27.1	101
34	0.5	47	0 49.7	146	80	0.2	222	1 27.4	100
35	0.5	47	0 51.0	145	81	0.2	247	1 27.7	99
36	0.5	48	0 52.2	144	82	0.2	278	1 27.9	98
37	0.5	48	0 53.4	143	83	0.1	318	1 28.1	97
38	0.6	49	0 54.7	142	84	0.1	370	1 28.3	96
39	0.6	50	0 55.9	141	85	0.1	440	1 28.5	95
40	0.6	50	0 57.1	140	86	0.1	555	1 28.6	94
41	0.6	51	0 58.3	139	87	0.1	740	1 28.7	93
42	0.6	52	0 59.4	138	88	0.0	1110	1 28.7	92
43	0.6	53	1 0.6	137	89	0.0	2220	1 28.8	91
44	0.6	54	1 1.7	136	90	0.0	∞	1 28.8	90
45	0.6	55	1 2.8	135					

$\Delta \lambda$ has the sign of $\tan. (\Omega - \lambda)$
 a has the sign of $\cos. (\Omega - \lambda)$
 B has the sign of $\sin. (\Omega - \lambda)$

When $\Omega - \lambda$ exceeds 180° the table is to be entered with $(\Omega - \lambda) - 180^\circ$ as the argument in the column $\Omega - \lambda$.

MOON'S MEAN MOTION.

MOON'S MEAN MOTION IN LONGITUDE FOR SIDEREAL INTERVALS.					
Day.	C's Motion in Longitude.	Minutes.	C's Motion in Longitude.	Minutes.	C's Motion in Longitude.
				30	16.4
1	13 8.4	1	0.5	31	17.0
2	26 16.9	2	1.1	32	17.5
3	39 25.3	3	1.6	33	18.1
4	52 33.7	4	2.2	34	18.6
5	65 42.1	5	2.7	35	19.2
6	78 50.6	6	3.3	36	19.7
7	91 59.0	7	3.8	37	20.3
8	105 7.4	8	4.4	38	20.8
9	118 15.8	9	4.9	39	21.4
10	131 24.3	10	5.5	40	21.9
Hour.		11	6.0	41	22.4
1	0 32.9	12	6.6	42	23.0
2	1 5.7	13	7.1	43	23.5
3	1 38.6	14	7.7	44	24.1
		15	8.2	45	24.6
4	2 11.3	16	8.8	46	25.2
5	2 44.3	17	9.3	47	25.7
6	3 17.1	18	9.9	48	26.3
7	3 50.0	19	10.4	49	26.8
8	4 22.8	20	11.0	50	27.4
9	4 55.7	21	11.5	51	27.9
10	5 28.5	22	12.0	52	28.5
11	6 1.4	23	12.5	53	29.0
12	6 34.2	24	13.1	54	29.6
13	7 7.1	25	13.6	55	30.1
14	7 39.9	26	14.2	56	30.7
15	8 12.8	27	14.7	57	31.2
16	8 45.6	28	15.3	58	31.8
17	9 18.5	29	15.9	59	32.3
18	9 51.3	30	16.4	60	32.9
				Seconds.	
19	10 24.2			10	0.1
20	10 57.0			20	0.2
21	11 29.9			30	0.3
22	12 2.7			40	0.4
23	12 35.6			50	0.5
24	13 8.4			60	0.5

TABLE I.

LOGARITHMS OF SMALL ARCS IN SPACE OR TIME.										
Arc.	0	1	2	3	4	5	6	7	8	9
0 0	0.0000	0.3010	0.4771	0.6021	0.6990	0.7782	0.8451	0.9081	0.9542	
0 10	1.0000	1.0414	1.0792	1.1189	1.1461	1.1761	1.2041	1.2304	1.2553	1.2788
0 20	1.3010	1.3222	1.3424	1.3617	1.3802	1.3979	1.4150	1.4314	1.4472	1.4624
0 30	1.4771	1.4914	1.5051	1.5185	1.5315	1.5441	1.5563	1.5682	1.5798	1.5911
0 40	1.6021	1.6128	1.6232	1.6335	1.6435	1.6532	1.6628	1.6721	1.6812	1.6902
0 50	1.6990	1.7076	1.7160	1.7243	1.7324	1.7404	1.7482	1.7559	1.7634	1.7709
0 1 0	1.7782	1.7853	1.7924	1.7993	1.8062	1.8129	1.8195	1.8261	1.8325	1.8388
1 10	1.8451	1.8513	1.8573	1.8633	1.8692	1.8751	1.8808	1.8865	1.8921	1.8976
1 20	1.9031	1.9085	1.9138	1.9191	1.9243	1.9294	1.9345	1.9395	1.9445	1.9494
1 30	1.9542	1.9589	1.9638	1.9685	1.9731	1.9777	1.9823	1.9868	1.9912	1.9956
1 40	2.0000	2.0043	2.0086	2.0128	2.0170	2.0212	2.0253	2.0294	2.0334	2.0374
1 50	2.0414	2.0453	2.0492	2.0531	2.0569	2.0607	2.0645	2.0682	2.0719	2.0755
0 2 0	2.0792	2.0828	2.0864	2.0899	2.0934	2.0969	2.1004	2.1038	2.1072	2.1106
2 10	2.1139	2.1173	2.1206	2.1239	2.1271	2.1303	2.1335	2.1367	2.1399	2.1430
2 20	2.1461	2.1492	2.1523	2.1553	2.1584	2.1614	2.1644	2.1673	2.1703	2.1732
2 30	2.1761	2.1790	2.1818	2.1847	2.1875	2.1903	2.1931	2.1959	2.1987	2.2014
2 40	2.2041	2.2068	2.2095	2.2122	2.2148	2.2175	2.2201	2.2227	2.2253	2.2279
2 50	2.2304	2.2330	2.2355	2.2380	2.2405	2.2430	2.2455	2.2480	2.2504	2.2529
0 3 0	2.2553	2.2577	2.2601	2.2625	2.2648	2.2672	2.2695	2.2718	2.2742	2.2765
3 10	2.2788	2.2810	2.2833	2.2856	2.2878	2.2900	2.2923	2.2945	2.2967	2.2989
3 20	2.3010	2.3032	2.3054	2.3075	2.3096	2.3118	2.3139	2.3160	2.3181	2.3201
3 30	2.3222	2.3243	2.3263	2.3284	2.3304	2.3324	2.3345	2.3365	2.3385	2.3404
3 40	2.3424	2.3444	2.3464	2.3483	2.3502	2.3522	2.3541	2.3560	2.3579	2.3598
3 50	2.3617	2.3636	2.3655	2.3674	2.3692	2.3711	2.3729	2.3747	2.3766	2.3784
0 4 0	2.3802	2.3820	2.3838	2.3856	2.3874	2.3892	2.3909	2.3927	2.3945	2.3962
4 10	2.3979	2.3997	2.4014	2.4031	2.4048	2.4065	2.4082	2.4099	2.4116	2.4133
4 20	2.4150	2.4166	2.4183	2.4200	2.4216	2.4232	2.4249	2.4265	2.4281	2.4298
4 30	2.4314	2.4330	2.4346	2.4362	2.4378	2.4393	2.4409	2.4425	2.4440	2.4456
4 40	2.4472	2.4487	2.4502	2.4518	2.4533	2.4548	2.4564	2.4579	2.4594	2.4609
4 50	2.4624	2.4639	2.4654	2.4669	2.4683	2.4698	2.4713	2.4728	2.4742	2.4757
0 5 0	2.4771	2.4786	2.4800	2.4814	2.4829	2.4843	2.4857	2.4871	2.4886	2.4900
5 10	2.4914	2.4928	2.4942	2.4955	2.4969	2.4983	2.4997	2.5011	2.5024	2.5038
5 20	2.5051	2.5065	2.5079	2.5092	2.5105	2.5119	2.5132	2.5145	2.5159	2.5172
5 30	2.5185	2.5198	2.5211	2.5224	2.5237	2.5250	2.5263	2.5276	2.5289	2.5302
5 40	2.5315	2.5328	2.5340	2.5353	2.5366	2.5378	2.5391	2.5403	2.5416	2.5428
5 50	2.5441	2.5453	2.5465	2.5478	2.5490	2.5502	2.5514	2.5527	2.5539	2.5551
0 6 0	2.5563	2.5575	2.5587	2.5599	2.5611	2.5623	2.5635	2.5647	2.5658	2.5670
6 10	2.5682	2.5694	2.5705	2.5717	2.5729	2.5740	2.5752	2.5763	2.5775	2.5786
6 20	2.5798	2.5809	2.5821	2.5832	2.5843	2.5855	2.5866	2.5877	2.5888	2.5899
6 30	2.5911	2.5922	2.5933	2.5944	2.5955	2.5966	2.5977	2.5988	2.5999	2.6010
6 40	2.6021	2.6031	2.6042	2.6053	2.6064	2.6075	2.6085	2.6096	2.6107	2.6117
6 50	2.6128	2.6138	2.6149	2.6160	2.6170	2.6180	2.6191	2.6201	2.6212	2.6222
0 7 0	2.6232	2.6243	2.6253	2.6263	2.6274	2.6284	2.6294	2.6304	2.6314	2.6325
7 10	2.6335	2.6345	2.6355	2.6365	2.6375	2.6385	2.6395	2.6405	2.6415	2.6425
7 20	2.6435	2.6444	2.6454	2.6464	2.6474	2.6484	2.6493	2.6503	2.6513	2.6522
7 30	2.6532	2.6542	2.6551	2.6561	2.6571	2.6580	2.6590	2.6599	2.6609	2.6618
7 40	2.6628	2.6637	2.6646	2.6656	2.6665	2.6675	2.6684	2.6693	2.6702	2.6712
7 50	2.6721	2.6730	2.6739	2.6749	2.6758	2.6767	2.6776	2.6785	2.6794	2.6803
0 8 0	2.6812	2.6821	2.6830	2.6839	2.6848	2.6857	2.6866	2.6875	2.6884	2.6893
8 10	2.6902	2.6911	2.6920	2.6928	2.6937	2.6946	2.6955	2.6964	2.6972	2.6981
8 20	2.6990	2.6998	2.7007	2.7016	2.7024	2.7033	2.7042	2.7050	2.7059	2.7067
8 30	2.7076	2.7084	2.7093	2.7101	2.7110	2.7118	2.7126	2.7135	2.7143	2.7152
8 40	2.7160	2.7168	2.7177	2.7185	2.7193	2.7202	2.7210	2.7218	2.7226	2.7235
8 50	2.7243	2.7251	2.7259	2.7267	2.7275	2.7284	2.7292	2.7300	2.7308	2.7316
0 9 0	2.7324	2.7332	2.7340	2.7348	2.7356	2.7364	2.7372	2.7380	2.7388	2.7396
9 10	2.7404	2.7412	2.7419	2.7427	2.7435	2.7443	2.7451	2.7459	2.7466	2.7474
9 20	2.7482	2.7490	2.7497	2.7505	2.7513	2.7520	2.7528	2.7536	2.7543	2.7551
9 30	2.7559	2.7566	2.7574	2.7582	2.7589	2.7597	2.7604	2.7612	2.7619	2.7627
9 40	2.7634	2.7642	2.7649	2.7657	2.7664	2.7672	2.7679	2.7686	2.7694	2.7701
9 50	2.7709	2.7716	2.7723	2.7731	2.7738	2.7745	2.7752	2.7760	2.7767	2.7774

TABLE I.

LOGARITHMS OF SMALL ARCS IN SPACE OR TIME.										
Arc.	0	1	2	3	4	5	6	7	8	9
$0^{\circ} 10^m 0^s$	2.7782	2.7789	2.7796	2.7803	2.7810	2.7818	2.7825	2.7832	2.7839	2.7846
10 10	2.7853	2.7860	2.7868	2.7875	2.7882	2.7889	2.7896	2.7903	2.7910	2.7917
10 20	2.7924	2.7931	2.7938	2.7945	2.7952	2.7959	2.7966	2.7973	2.7980	2.7987
10 30	2.7993	2.8000	2.8007	2.8014	2.8021	2.8028	2.8035	2.8041	2.8048	2.8055
10 40	2.8062	2.8069	2.8075	2.8082	2.8089	2.8096	2.8102	2.8109	2.8116	2.8122
10 50	2.8129	2.8136	2.8142	2.8149	2.8156	2.8162	2.8169	2.8176	2.8182	2.8189
0 11 0	2.8195	2.8202	2.8209	2.8215	2.8222	2.8228	2.8235	2.8241	2.8248	2.8254
11 10	2.8261	2.8267	2.8274	2.8280	2.8287	2.8293	2.8299	2.8306	2.8312	2.8319
11 20	2.8325	2.8331	2.8338	2.8344	2.8351	2.8357	2.8363	2.8370	2.8376	2.8382
11 30	2.8388	2.8395	2.8401	2.8407	2.8414	2.8420	2.8426	2.8432	2.8439	2.8445
11 40	2.8451	2.8457	2.8463	2.8470	2.8476	2.8482	2.8488	2.8494	2.8500	2.8506
11 50	2.8513	2.8519	2.8525	2.8531	2.8537	2.8543	2.8549	2.8555	2.8561	2.8567
0 12 0	2.8573	2.8579	2.8585	2.8591	2.8597	2.8603	2.8609	2.8615	2.8621	2.8627
12 10	2.8633	2.8639	2.8645	2.8651	2.8657	2.8663	2.8669	2.8675	2.8681	2.8686
12 20	2.8692	2.8698	2.8704	2.8710	2.8716	2.8722	2.8727	2.8733	2.8739	2.8745
12 30	2.8751	2.8756	2.8762	2.8768	2.8774	2.8779	2.8785	2.8791	2.8797	2.8802
12 40	2.8808	2.8814	2.8820	2.8825	2.8831	2.8837	2.8842	2.8848	2.8854	2.8859
12 50	2.8865	2.8871	2.8876	2.8882	2.8887	2.8893	2.8899	2.8904	2.8910	2.8915
0 13 0	2.8921	2.8927	2.8932	2.8938	2.8943	2.8949	2.8954	2.8960	2.8965	2.8971
13 10	2.8976	2.8982	2.8987	2.8993	2.8998	2.9004	2.9009	2.9015	2.9020	2.9025
13 20	2.9031	2.9036	2.9042	2.9047	2.9053	2.9058	2.9063	2.9069	2.9074	2.9079
13 30	2.9085	2.9090	2.9096	2.9101	2.9106	2.9112	2.9117	2.9122	2.9128	2.9133
13 40	2.9138	2.9143	2.9149	2.9154	2.9159	2.9165	2.9170	2.9175	2.9180	2.9186
13 50	2.9191	2.9196	2.9201	2.9206	2.9212	2.9217	2.9222	2.9227	2.9232	2.9238
0 14 0	2.9243	2.9248	2.9253	2.9258	2.9263	2.9269	2.9274	2.9279	2.9284	2.9289
14 10	2.9294	2.9299	2.9304	2.9309	2.9315	2.9320	2.9325	2.9330	2.9335	2.9340
14 20	2.9345	2.9350	2.9355	2.9360	2.9365	2.9370	2.9375	2.9380	2.9385	2.9390
14 30	2.9395	2.9400	2.9405	2.9410	2.9415	2.9420	2.9425	2.9430	2.9435	2.9440
14 40	2.9445	2.9450	2.9455	2.9460	2.9465	2.9469	2.9474	2.9479	2.9484	2.9489
14 50	2.9494	2.9499	2.9504	2.9509	2.9513	2.9518	2.9523	2.9528	2.9533	2.9538
0 15 0	2.9542	2.9547	2.9552	2.9557	2.9562	2.9566	2.9571	2.9576	2.9581	2.9586
15 10	2.9590	2.9595	2.9600	2.9605	2.9609	2.9614	2.9619	2.9624	2.9628	2.9633
15 20	2.9638	2.9643	2.9647	2.9652	2.9657	2.9661	2.9666	2.9671	2.9675	2.9680
15 30	2.9685	2.9689	2.9694	2.9699	2.9703	2.9708	2.9713	2.9717	2.9722	2.9727
15 40	2.9731	2.9736	2.9741	2.9745	2.9750	2.9754	2.9759	2.9763	2.9768	2.9773
15 50	2.9777	2.9782	2.9786	2.9791	2.9795	2.9800	2.9805	2.9809	2.9814	2.9818
0 16 0	2.9823	2.9827	2.9832	2.9836	2.9841	2.9845	2.9850	2.9854	2.9859	2.9863
16 10	2.9868	2.9872	2.9877	2.9881	2.9886	2.9890	2.9894	2.9899	2.9903	2.9908
16 20	2.9912	2.9917	2.9921	2.9926	2.9930	2.9934	2.9939	2.9943	2.9948	2.9952
16 30	2.9956	2.9961	2.9965	2.9969	2.9974	2.9978	2.9983	2.9987	2.9991	2.9996
16 40	3.0000	3.0004	3.0009	3.0013	3.0017	3.0022	3.0026	3.0030	3.0035	3.0039
16 50	3.0043	3.0048	3.0052	3.0056	3.0060	3.0065	3.0069	3.0073	3.0077	3.0082
0 17 0	3.0086	3.0090	3.0095	3.0099	3.0103	3.0107	3.0111	3.0116	3.0120	3.0124
17 10	3.0128	3.0133	3.0137	3.0141	3.0145	3.0149	3.0154	3.0158	3.0162	3.0166
17 20	3.0170	3.0175	3.0179	3.0183	3.0187	3.0191	3.0195	3.0199	3.0204	3.0208
17 30	3.0212	3.0216	3.0220	3.0224	3.0228	3.0233	3.0237	3.0241	3.0245	3.0249
17 40	3.0253	3.0257	3.0261	3.0265	3.0269	3.0273	3.0278	3.0282	3.0286	3.0290
17 50	3.0294	3.0298	3.0302	3.0306	3.0310	3.0314	3.0318	3.0322	3.0326	3.0330
0 18 0	3.0334	3.0338	3.0342	3.0346	3.0350	3.0354	3.0358	3.0362	3.0366	3.0370
18 10	3.0374	3.0378	3.0382	3.0386	3.0390	3.0394	3.0398	3.0402	3.0406	3.0410
18 20	3.0414	3.0418	3.0422	3.0426	3.0430	3.0434	3.0438	3.0441	3.0445	3.0449
18 30	3.0453	3.0457	3.0461	3.0465	3.0469	3.0473	3.0477	3.0481	3.0484	3.0488
18 40	3.0492	3.0496	3.0500	3.0504	3.0508	3.0512	3.0515	3.0519	3.0523	3.0527
18 50	3.0531	3.0535	3.0538	3.0542	3.0546	3.0550	3.0554	3.0558	3.0561	3.0565
0 19 0	3.0569	3.0573	3.0577	3.0580	3.0584	3.0588	3.0592	3.0596	3.0599	3.0603
19 10	3.0607	3.0611	3.0615	3.0618	3.0622	3.0626	3.0630	3.0633	3.0637	3.0641
19 20	3.0645	3.0648	3.0652	3.0656	3.0660	3.0663	3.0667	3.0671	3.0674	3.0678
19 30	3.0682	3.0686	3.0689	3.0693	3.0697	3.0700	3.0704	3.0708	3.0711	3.0715
19 40	3.0719	3.0722	3.0726	3.0730	3.0734	3.0737	3.0741	3.0745	3.0748	3.0752
19 50	3.0755	3.0759	3.0763	3.0766	3.0770	3.0774	3.0777	3.0781	3.0785	3.0788

TABLE I.

LOGARITHMS OF SMALL ARCS IN SPACE OR TIME.										
Arc.	0	1	2	3	4	5	6	7	8	9
0° 20' 0"	3.0792	3.0795	3.0799	3.0803	3.0806	3.0810	3.0813	3.0817	3.0821	3.0824
20 10	3.0828	3.0831	3.0835	3.0839	3.0842	3.0846	3.0849	3.0853	3.0856	3.0860
20 20	3.0864	3.0867	3.0871	3.0874	3.0878	3.0881	3.0885	3.0888	3.0892	3.0896
20 30	3.0899	3.0903	3.0906	3.0910	3.0913	3.0917	3.0920	3.0924	3.0927	3.0931
20 40	3.0934	3.0938	3.0941	3.0945	3.0948	3.0952	3.0955	3.0959	3.0962	3.0966
20 50	3.0969	3.0973	3.0976	3.0980	3.0983	3.0986	3.0990	3.0993	3.0997	3.1000
0 21 0	3.1004	3.1007	3.1011	3.1014	3.1017	3.1021	3.1024	3.1028	3.1031	3.1035
21 10	3.1038	3.1041	3.1045	3.1048	3.1052	3.1055	3.1059	3.1062	3.1065	3.1069
21 20	3.1072	3.1075	3.1079	3.1082	3.1086	3.1089	3.1092	3.1096	3.1099	3.1103
21 30	3.1106	3.1109	3.1113	3.1116	3.1119	3.1123	3.1126	3.1129	3.1133	3.1136
21 40	3.1139	3.1143	3.1146	3.1149	3.1153	3.1156	3.1159	3.1163	3.1166	3.1169
21 50	3.1173	3.1176	3.1179	3.1183	3.1186	3.1189	3.1193	3.1196	3.1199	3.1202
0 22 0	3.1206	3.1209	3.1212	3.1216	3.1219	3.1222	3.1225	3.1229	3.1232	3.1235
22 10	3.1239	3.1242	3.1245	3.1248	3.1252	3.1255	3.1258	3.1261	3.1265	3.1268
22 20	3.1271	3.1274	3.1278	3.1281	3.1284	3.1287	3.1290	3.1294	3.1297	3.1300
22 30	3.1303	3.1307	3.1310	3.1313	3.1316	3.1319	3.1323	3.1326	3.1329	3.1332
22 40	3.1335	3.1339	3.1342	3.1345	3.1348	3.1351	3.1355	3.1358	3.1361	3.1364
22 50	3.1367	3.1370	3.1374	3.1377	3.1380	3.1383	3.1386	3.1389	3.1392	3.1396
0 23 0	3.1399	3.1402	3.1405	3.1408	3.1411	3.1414	3.1418	3.1421	3.1424	3.1427
23 10	3.1430	3.1433	3.1436	3.1440	3.1443	3.1446	3.1449	3.1452	3.1455	3.1458
23 20	3.1461	3.1464	3.1467	3.1471	3.1474	3.1477	3.1480	3.1483	3.1486	3.1489
23 30	3.1492	3.1495	3.1498	3.1501	3.1504	3.1508	3.1511	3.1514	3.1517	3.1520
23 40	3.1523	3.1526	3.1529	3.1532	3.1535	3.1538	3.1541	3.1544	3.1547	3.1550
23 50	3.1553	3.1556	3.1559	3.1562	3.1565	3.1569	3.1572	3.1575	3.1578	3.1581
0 24 0	3.1584	3.1587	3.1590	3.1593	3.1596	3.1599	3.1602	3.1605	3.1608	3.1611
24 10	3.1614	3.1617	3.1620	3.1623	3.1626	3.1629	3.1632	3.1635	3.1638	3.1641
24 20	3.1644	3.1647	3.1649	3.1652	3.1655	3.1658	3.1661	3.1664	3.1667	3.1670
24 30	3.1673	3.1676	3.1679	3.1682	3.1685	3.1688	3.1691	3.1694	3.1697	3.1700
24 40	3.1703	3.1706	3.1708	3.1711	3.1714	3.1717	3.1720	3.1723	3.1726	3.1729
24 50	3.1732	3.1735	3.1738	3.1741	3.1744	3.1746	3.1749	3.1752	3.1755	3.1758
0 25 0	3.1761	3.1764	3.1767	3.1770	3.1772	3.1775	3.1778	3.1781	3.1784	3.1787
25 10	3.1790	3.1793	3.1796	3.1798	3.1801	3.1804	3.1807	3.1810	3.1813	3.1816
25 20	3.1818	3.1821	3.1824	3.1827	3.1830	3.1833	3.1836	3.1838	3.1841	3.1844
25 30	3.1847	3.1850	3.1853	3.1855	3.1858	3.1861	3.1864	3.1867	3.1870	3.1872
25 40	3.1875	3.1878	3.1881	3.1884	3.1886	3.1889	3.1892	3.1895	3.1898	3.1901
25 50	3.1903	3.1906	3.1909	3.1912	3.1915	3.1917	3.1920	3.1923	3.1926	3.1928
0 26 0	3.1931	3.1934	3.1937	3.1940	3.1942	3.1945	3.1948	3.1951	3.1953	3.1956
26 10	3.1959	3.1962	3.1965	3.1967	3.1970	3.1973	3.1976	3.1978	3.1981	3.1984
26 20	3.1987	3.1989	3.1992	3.1995	3.1998	3.2000	3.2003	3.2006	3.2009	3.2011
26 30	3.2014	3.2017	3.2019	3.2022	3.2025	3.2028	3.2030	3.2033	3.2036	3.2038
26 40	3.2041	3.2044	3.2047	3.2049	3.2052	3.2055	3.2057	3.2060	3.2063	3.2066
26 50	3.2068	3.2071	3.2074	3.2076	3.2079	3.2082	3.2084	3.2087	3.2090	3.2092
0 27 0	3.2095	3.2098	3.2101	3.2103	3.2106	3.2109	3.2111	3.2114	3.2117	3.2119
27 10	3.2122	3.2125	3.2127	3.2130	3.2133	3.2135	3.2138	3.2140	3.2143	3.2146
27 20	3.2148	3.2151	3.2154	3.2156	3.2159	3.2162	3.2164	3.2167	3.2170	3.2172
27 30	3.2175	3.2177	3.2180	3.2183	3.2185	3.2188	3.2191	3.2193	3.2196	3.2198
27 40	3.2201	3.2204	3.2206	3.2209	3.2212	3.2214	3.2217	3.2219	3.2222	3.2225
27 50	3.2227	3.2230	3.2232	3.2235	3.2238	3.2240	3.2243	3.2245	3.2248	3.2250
0 28 0	3.2253	3.2256	3.2258	3.2261	3.2263	3.2266	3.2269	3.2271	3.2274	3.2276
28 10	3.2279	3.2281	3.2284	3.2287	3.2289	3.2292	3.2294	3.2297	3.2299	3.2302
28 20	3.2304	3.2307	3.2310	3.2312	3.2315	3.2317	3.2320	3.2322	3.2325	3.2327
28 30	3.2330	3.2333	3.2335	3.2338	3.2340	3.2343	3.2345	3.2348	3.2350	3.2353
28 40	3.2355	3.2358	3.2360	3.2363	3.2365	3.2368	3.2370	3.2373	3.2375	3.2378
28 50	3.2380	3.2383	3.2385	3.2388	3.2390	3.2393	3.2395	3.2398	3.2400	3.2403
0 29 0	3.2405	3.2408	3.2410	3.2413	3.2415	3.2418	3.2420	3.2423	3.2425	3.2428
29 10	3.2430	3.2433	3.2435	3.2438	3.2440	3.2443	3.2445	3.2448	3.2450	3.2453
29 20	3.2455	3.2458	3.2460	3.2463	3.2465	3.2467	3.2470	3.2472	3.2475	3.2477
29 30	3.2480	3.2482	3.2485	3.2487	3.2490	3.2492	3.2494	3.2497	3.2499	3.2502
29 40	3.2504	3.2507	3.2509	3.2512	3.2514	3.2516	3.2519	3.2521	3.2524	3.2526
29 50	3.2529	3.2531	3.2533	3.2536	3.2538	3.2541	3.2543	3.2545	3.2548	3.2550

TABLE I.

LOGARITHMS OF SMALL ARCS IN SPACE OR TIME.										
Arc.	0	1	2	3	4	5	6	7	8	9
0° 30' 0"	3.2553	3.2555	3.2558	3.2560	3.2562	3.2565	3.2567	3.2570	3.2572	3.2574
30 10	3.2577	3.2579	3.2582	3.2584	3.2586	3.2589	3.2591	3.2594	3.2596	3.2598
30 20	3.2601	3.2603	3.2605	3.2608	3.2610	3.2613	3.2615	3.2617	3.2620	3.2622
30 30	3.2625	3.2627	3.2629	3.2632	3.2634	3.2636	3.2639	3.2641	3.2643	3.2646
30 40	3.2648	3.2651	3.2653	3.2655	3.2658	3.2660	3.2662	3.2665	3.2667	3.2669
30 50	3.2672	3.2674	3.2676	3.2679	3.2681	3.2683	3.2686	3.2688	3.2690	3.2693
0 31 0	3.2695	3.2697	3.2700	3.2702	3.2704	3.2707	3.2709	3.2711	3.2714	3.2716
31 10	3.2718	3.2721	3.2723	3.2725	3.2728	3.2730	3.2732	3.2735	3.2737	3.2739
31 20	3.2742	3.2744	3.2746	3.2749	3.2751	3.2753	3.2755	3.2758	3.2760	3.2762
31 30	3.2765	3.2767	3.2769	3.2772	3.2774	3.2776	3.2778	3.2781	3.2783	3.2785
31 40	3.2788	3.2790	3.2792	3.2794	3.2797	3.2799	3.2801	3.2804	3.2806	3.2808
31 50	3.2810	3.2813	3.2815	3.2817	3.2819	3.2822	3.2824	3.2826	3.2828	3.2831
0 32 0	3.2833	3.2835	3.2838	3.2840	3.2842	3.2844	3.2847	3.2849	3.2851	3.2853
32 10	3.2856	3.2858	3.2860	3.2862	3.2865	3.2867	3.2869	3.2871	3.2874	3.2876
32 20	3.2878	3.2880	3.2882	3.2885	3.2887	3.2889	3.2891	3.2894	3.2896	3.2898
32 30	3.2900	3.2903	3.2905	3.2907	3.2909	3.2911	3.2914	3.2916	3.2918	3.2920
32 40	3.2923	3.2925	3.2927	3.2929	3.2931	3.2934	3.2936	3.2938	3.2940	3.2942
32 50	3.2945	3.2947	3.2949	3.2951	3.2953	3.2956	3.2958	3.2960	3.2962	3.2964
0 33 0	3.2967	3.2969	3.2971	3.2973	3.2975	3.2978	3.2980	3.2982	3.2984	3.2986
33 10	3.2989	3.2991	3.2993	3.2995	3.2997	3.2999	3.3002	3.3004	3.3006	3.3008
33 20	3.3010	3.3012	3.3015	3.3017	3.3019	3.3021	3.3023	3.3025	3.3028	3.3030
33 30	3.3032	3.3034	3.3036	3.3038	3.3041	3.3043	3.3045	3.3047	3.3049	3.3051
33 40	3.3054	3.3056	3.3058	3.3060	3.3062	3.3064	3.3066	3.3069	3.3071	3.3073
33 50	3.3075	3.3077	3.3079	3.3081	3.3084	3.3086	3.3088	3.3090	3.3092	3.3094
0 34 0	3.3096	3.3098	3.3101	3.3103	3.3105	3.3107	3.3109	3.3111	3.3113	3.3115
34 10	3.3118	3.3120	3.3122	3.3124	3.3126	3.3128	3.3130	3.3132	3.3134	3.3137
34 20	3.3139	3.3141	3.3143	3.3145	3.3147	3.3149	3.3151	3.3153	3.3156	3.3158
34 30	3.3160	3.3162	3.3164	3.3166	3.3168	3.3170	3.3172	3.3174	3.3176	3.3179
34 40	3.3181	3.3183	3.3185	3.3187	3.3189	3.3191	3.3193	3.3195	3.3197	3.3199
34 50	3.3201	3.3204	3.3206	3.3208	3.3210	3.3212	3.3214	3.3216	3.3218	3.3220
0 35 0	3.3222	3.3224	3.3226	3.3228	3.3230	3.3233	3.3235	3.3237	3.3239	3.3241
35 10	3.3243	3.3245	3.3247	3.3249	3.3251	3.3253	3.3255	3.3257	3.3259	3.3261
35 20	3.3263	3.3265	3.3267	3.3269	3.3272	3.3274	3.3276	3.3278	3.3280	3.3282
35 30	3.3284	3.3286	3.3288	3.3290	3.3292	3.3294	3.3296	3.3298	3.3300	3.3302
35 40	3.3304	3.3306	3.3308	3.3310	3.3312	3.3314	3.3316	3.3318	3.3320	3.3322
35 50	3.3324	3.3326	3.3328	3.3330	3.3332	3.3334	3.3336	3.3339	3.3341	3.3343
0 36 0	3.3345	3.3347	3.3349	3.3351	3.3353	3.3355	3.3357	3.3359	3.3361	3.3363
36 10	3.3365	3.3367	3.3369	3.3371	3.3373	3.3375	3.3377	3.3379	3.3381	3.3383
36 20	3.3385	3.3387	3.3389	3.3391	3.3393	3.3395	3.3397	3.3398	3.3400	3.3402
36 30	3.3404	3.3406	3.3408	3.3410	3.3412	3.3414	3.3416	3.3418	3.3420	3.3422
36 40	3.3424	3.3426	3.3428	3.3430	3.3432	3.3434	3.3436	3.3438	3.3440	3.3442
36 50	3.3444	3.3446	3.3448	3.3450	3.3452	3.3454	3.3456	3.3458	3.3460	3.3462
0 37 0	3.3464	3.3465	3.3467	3.3469	3.3471	3.3473	3.3475	3.3477	3.3479	3.3481
37 10	3.3483	3.3485	3.3487	3.3489	3.3491	3.3493	3.3495	3.3497	3.3499	3.3501
37 20	3.3502	3.3504	3.3506	3.3508	3.3510	3.3512	3.3514	3.3516	3.3518	3.3520
37 30	3.3522	3.3524	3.3526	3.3528	3.3530	3.3531	3.3533	3.3535	3.3537	3.3539
37 40	3.3541	3.3543	3.3545	3.3547	3.3549	3.3551	3.3553	3.3555	3.3556	3.3558
37 50	3.3560	3.3562	3.3564	3.3566	3.3568	3.3570	3.3572	3.3574	3.3576	3.3577
0 38 0	3.3579	3.3581	3.3583	3.3585	3.3587	3.3589	3.3591	3.3593	3.3595	3.3596
38 10	3.3598	3.3600	3.3602	3.3604	3.3606	3.3608	3.3610	3.3612	3.3614	3.3615
38 20	3.3617	3.3619	3.3621	3.3623	3.3625	3.3627	3.3629	3.3630	3.3632	3.3634
38 30	3.3636	3.3638	3.3640	3.3642	3.3644	3.3646	3.3647	3.3649	3.3651	3.3653
38 40	3.3655	3.3657	3.3659	3.3660	3.3662	3.3664	3.3666	3.3668	3.3670	3.3672
38 50	3.3674	3.3675	3.3677	3.3679	3.3681	3.3683	3.3685	3.3687	3.3688	3.3690
0 39 0	3.3692	3.3694	3.3696	3.3698	3.3700	3.3701	3.3703	3.3705	3.3707	3.3709
39 10	3.3711	3.3713	3.3714	3.3716	3.3718	3.3720	3.3722	3.3724	3.3725	3.3727
39 20	3.3729	3.3731	3.3733	3.3735	3.3736	3.3738	3.3740	3.3742	3.3744	3.3746
39 30	3.3747	3.3749	3.3751	3.3753	3.3755	3.3757	3.3758	3.3760	3.3762	3.3764
39 40	3.3766	3.3768	3.3769	3.3771	3.3773	3.3775	3.3777	3.3779	3.3780	3.3782
39 50	3.3784	3.3786	3.3788	3.3789	3.3791	3.3793	3.3795	3.3797	3.3798	3.3800

TABLE I.

LOGARITHMS OF SMALL ARCS IN SPACE OR TIME.										
Arc.	0	1	2	3	4	5	6	7	8	9
0° 40' 0"	3.3802	3.3804	3.3806	3.3808	3.3809	3.3811	3.3813	3.3815	3.3817	3.3818
40 10	3.3820	3.3822	3.3824	3.3826	3.3827	3.3829	3.3831	3.3833	3.3835	3.3836
40 20	3.3838	3.3840	3.3842	3.3844	3.3845	3.3847	3.3849	3.3851	3.3852	3.3854
40 30	3.3856	3.3858	3.3860	3.3861	3.3863	3.3865	3.3867	3.3869	3.3870	3.3872
40 40	3.3874	3.3876	3.3877	3.3879	3.3881	3.3883	3.3885	3.3886	3.3888	3.3890
40 50	3.3892	3.3893	3.3895	3.3897	3.3899	3.3901	3.3902	3.3904	3.3906	3.3908
41 0	3.3909	3.3911	3.3913	3.3915	3.3916	3.3918	3.3920	3.3922	3.3923	3.3925
41 10	3.3927	3.3929	3.3930	3.3932	3.3934	3.3936	3.3938	3.3939	3.3941	3.3943
41 20	3.3945	3.3946	3.3948	3.3950	3.3952	3.3953	3.3955	3.3957	3.3959	3.3960
41 30	3.3962	3.3964	3.3965	3.3967	3.3969	3.3971	3.3972	3.3974	3.3976	3.3978
41 40	3.3979	3.3981	3.3983	3.3985	3.3986	3.3988	3.3990	3.3992	3.3993	3.3995
41 50	3.3997	3.3998	3.4000	3.4002	3.4004	3.4005	3.4007	3.4009	3.4011	3.4012
0 42 0	3.4014	3.4016	3.4017	3.4019	3.4021	3.4023	3.4024	3.4026	3.4028	3.4029
42 10	3.4031	3.4033	3.4035	3.4036	3.4038	3.4040	3.4041	3.4043	3.4045	3.4047
42 20	3.4048	3.4050	3.4052	3.4053	3.4055	3.4057	3.4059	3.4060	3.4062	3.4064
42 30	3.4065	3.4067	3.4069	3.4071	3.4073	3.4074	3.4076	3.4077	3.4079	3.4081
42 40	3.4082	3.4084	3.4086	3.4087	3.4089	3.4091	3.4093	3.4094	3.4096	3.4098
42 50	3.4099	3.4101	3.4103	3.4104	3.4106	3.4108	3.4109	3.4111	3.4113	3.4115
0 43 0	3.4116	3.4118	3.4120	3.4121	3.4123	3.4125	3.4126	3.4128	3.4130	3.4131
43 10	3.4133	3.4135	3.4136	3.4138	3.4140	3.4141	3.4143	3.4145	3.4146	3.4148
43 20	3.4150	3.4151	3.4153	3.4155	3.4156	3.4158	3.4160	3.4161	3.4163	3.4165
43 30	3.4166	3.4168	3.4170	3.4171	3.4173	3.4175	3.4176	3.4178	3.4180	3.4181
43 40	3.4183	3.4185	3.4186	3.4188	3.4190	3.4191	3.4193	3.4195	3.4196	3.4198
43 50	3.4200	3.4201	3.4203	3.4205	3.4206	3.4208	3.4209	3.4211	3.4213	3.4214
0 44 0	3.4216	3.4218	3.4219	3.4221	3.4223	3.4224	3.4226	3.4228	3.4229	3.4231
44 10	3.4232	3.4234	3.4236	3.4237	3.4239	3.4241	3.4242	3.4244	3.4246	3.4247
44 20	3.4249	3.4250	3.4252	3.4254	3.4255	3.4257	3.4259	3.4260	3.4262	3.4263
44 30	3.4265	3.4267	3.4268	3.4270	3.4272	3.4273	3.4275	3.4276	3.4278	3.4280
44 40	3.4281	3.4283	3.4285	3.4286	3.4288	3.4289	3.4291	3.4293	3.4294	3.4296
44 50	3.4298	3.4299	3.4301	3.4302	3.4304	3.4306	3.4307	3.4309	3.4310	3.4312
0 45 0	3.4314	3.4315	3.4317	3.4318	3.4320	3.4322	3.4323	3.4325	3.4326	3.4328
45 10	3.4330	3.4331	3.4333	3.4334	3.4336	3.4338	3.4339	3.4341	3.4342	3.4344
45 20	3.4346	3.4347	3.4349	3.4350	3.4352	3.4354	3.4355	3.4357	3.4358	3.4360
45 30	3.4362	3.4363	3.4365	3.4366	3.4368	3.4370	3.4371	3.4373	3.4374	3.4376
45 40	3.4378	3.4379	3.4381	3.4382	3.4384	3.4385	3.4387	3.4389	3.4390	3.4392
45 50	3.4393	3.4395	3.4396	3.4398	3.4400	3.4401	3.4403	3.4404	3.4406	3.4408
0 46 0	3.4409	3.4411	3.4412	3.4414	3.4415	3.4417	3.4419	3.4420	3.4422	3.4423
46 10	3.4425	3.4426	3.4428	3.4429	3.4431	3.4433	3.4434	3.4436	3.4437	3.4439
46 20	3.4440	3.4442	3.4444	3.4445	3.4447	3.4448	3.4450	3.4451	3.4453	3.4454
46 30	3.4456	3.4458	3.4459	3.4461	3.4462	3.4464	3.4465	3.4467	3.4468	3.4470
46 40	3.4472	3.4473	3.4475	3.4476	3.4478	3.4479	3.4481	3.4482	3.4484	3.4486
46 50	3.4487	3.4489	3.4490	3.4492	3.4493	3.4495	3.4496	3.4498	3.4499	3.4501
0 47 0	3.4502	3.4504	3.4506	3.4507	3.4509	3.4510	3.4512	3.4513	3.4515	3.4516
47 10	3.4518	3.4519	3.4521	3.4522	3.4524	3.4526	3.4527	3.4529	3.4530	3.4532
47 20	3.4533	3.4535	3.4536	3.4538	3.4539	3.4541	3.4542	3.4544	3.4545	3.4547
47 30	3.4548	3.4550	3.4551	3.4553	3.4555	3.4556	3.4558	3.4559	3.4561	3.4562
47 40	3.4564	3.4565	3.4567	3.4568	3.4570	3.4571	3.4573	3.4574	3.4576	3.4577
47 50	3.4579	3.4580	3.4582	3.4583	3.4585	3.4586	3.4588	3.4589	3.4591	3.4592
0 48 0	3.4594	3.4595	3.4597	3.4598	3.4600	3.4601	3.4603	3.4604	3.4606	3.4607
48 10	3.4609	3.4610	3.4612	3.4613	3.4615	3.4616	3.4618	3.4619	3.4621	3.4622
48 20	3.4624	3.4625	3.4627	3.4628	3.4630	3.4631	3.4633	3.4634	3.4636	3.4637
48 30	3.4639	3.4640	3.4642	3.4643	3.4645	3.4646	3.4648	3.4649	3.4651	3.4652
48 40	3.4654	3.4655	3.4657	3.4658	3.4660	3.4661	3.4663	3.4664	3.4666	3.4667
48 50	3.4669	3.4670	3.4672	3.4673	3.4675	3.4676	3.4678	3.4679	3.4681	3.4682
0 49 0	3.4683	3.4685	3.4686	3.4688	3.4689	3.4691	3.4692	3.4694	3.4695	3.4697
49 10	3.4698	3.4700	3.4701	3.4703	3.4704	3.4706	3.4707	3.4709	3.4710	3.4711
49 20	3.4713	3.4714	3.4716	3.4717	3.4719	3.4720	3.4722	3.4723	3.4725	3.4726
49 30	3.4728	3.4729	3.4730	3.4732	3.4733	3.4735	3.4736	3.4738	3.4739	3.4741
49 40	3.4742	3.4744	3.4745	3.4747	3.4748	3.4749	3.4751	3.4752	3.4754	3.4755
49 50	3.4757	3.4758	3.4760	3.4761	3.4763	3.4764	3.4765	3.4767	3.4768	3.4770

TABLE I.

LOGARITHMS OF SMALL ARCS IN SPACE OR TIME.										
Arc.	0	1	2	3	4	5	6	7	8	9
0°-50'-0"	3.4771	3.4773	3.4774	3.4776	3.4777	3.4778	3.4780	3.4781	3.4783	3.4784
50 10	3.4786	3.4787	3.4789	3.4790	3.4791	3.4793	3.4794	3.4796	3.4797	3.4799
50 20	3.4800	3.4802	3.4803	3.4804	3.4806	3.4807	3.4809	3.4810	3.4812	3.4813
50 30	3.4814	3.4816	3.4817	3.4819	3.4820	3.4822	3.4823	3.4824	3.4826	3.4827
50 40	3.4829	3.4830	3.4832	3.4833	3.4834	3.4836	3.4837	3.4839	3.4840	3.4842
50 50	3.4848	3.4844	3.4846	3.4847	3.4849	3.4850	3.4852	3.4853	3.4854	3.4856
0 51 0	3.4857	3.4859	3.4860	3.4861	3.4863	3.4864	3.4866	3.4867	3.4869	3.4870
51 10	3.4871	3.4873	3.4874	3.4876	3.4877	3.4878	3.4880	3.4881	3.4883	3.4884
51 20	3.4886	3.4887	3.4888	3.4890	3.4891	3.4893	3.4894	3.4895	3.4897	3.4898
51 30	3.4900	3.4901	3.4902	3.4904	3.4905	3.4907	3.4908	3.4909	3.4911	3.4912
51 40	3.4914	3.4915	3.4916	3.4918	3.4919	3.4921	3.4922	3.4923	3.4925	3.4926
51 50	3.4928	3.4929	3.4930	3.4932	3.4933	3.4935	3.4936	3.4937	3.4939	3.4940
0 52 0	3.4943	3.4943	3.4944	3.4946	3.4947	3.4949	3.4950	3.4951	3.4953	3.4954
52 10	3.4955	3.4957	3.4958	3.4960	3.4961	3.4962	3.4964	3.4965	3.4967	3.4968
52 20	3.4969	3.4971	3.4972	3.4973	3.4975	3.4976	3.4978	3.4979	3.4980	3.4982
52 30	3.4983	3.4984	3.4986	3.4987	3.4989	3.4990	3.4991	3.4993	3.4994	3.4995
52 40	3.4997	3.4998	3.5000	3.5001	3.5002	3.5004	3.5005	3.5006	3.5008	3.5009
52 50	3.5011	3.5012	3.5013	3.5015	3.5016	3.5017	3.5019	3.5020	3.5022	3.5023
0 53 0	3.5024	3.5026	3.5027	3.5028	3.5030	3.5031	3.5032	3.5034	3.5035	3.5037
53 10	3.5038	3.5039	3.5041	3.5042	3.5043	3.5045	3.5046	3.5047	3.5049	3.5050
53 20	3.5051	3.5053	3.5054	3.5056	3.5057	3.5058	3.5060	3.5061	3.5062	3.5064
53 30	3.5065	3.5066	3.5068	3.5069	3.5070	3.5072	3.5073	3.5075	3.5076	3.5077
53 40	3.5079	3.5080	3.5081	3.5083	3.5084	3.5085	3.5087	3.5088	3.5089	3.5091
53 50	3.5092	3.5093	3.5095	3.5096	3.5097	3.5099	3.5100	3.5101	3.5103	3.5104
0 54 0	3.5105	3.5107	3.5108	3.5109	3.5111	3.5112	3.5113	3.5115	3.5116	3.5117
54 10	3.5119	3.5120	3.5122	3.5123	3.5124	3.5126	3.5127	3.5128	3.5130	3.5131
54 20	3.5132	3.5134	3.5135	3.5136	3.5138	3.5139	3.5140	3.5141	3.5143	3.5144
54 30	3.5145	3.5147	3.5148	3.5149	3.5151	3.5152	3.5153	3.5155	3.5156	3.5157
54 40	3.5159	3.5160	3.5161	3.5163	3.5164	3.5165	3.5167	3.5168	3.5169	3.5171
54 50	3.5172	3.5173	3.5175	3.5176	3.5177	3.5179	3.5180	3.5181	3.5183	3.5184
0 55 0	3.5185	3.5186	3.5188	3.5189	3.5190	3.5192	3.5193	3.5194	3.5196	3.5197
55 10	3.5198	3.5200	3.5201	3.5202	3.5204	3.5205	3.5206	3.5207	3.5209	3.5210
55 20	3.5211	3.5213	3.5214	3.5215	3.5217	3.5218	3.5219	3.5221	3.5222	3.5223
55 30	3.5224	3.5226	3.5227	3.5228	3.5230	3.5231	3.5232	3.5234	3.5235	3.5236
55 40	3.5237	3.5239	3.5240	3.5241	3.5243	3.5244	3.5245	3.5247	3.5248	3.5249
55 50	3.5250	3.5252	3.5253	3.5254	3.5256	3.5257	3.5258	3.5260	3.5261	3.5262
0 56 0	3.5263	3.5265	3.5266	3.5267	3.5269	3.5270	3.5271	3.5272	3.5274	3.5275
56 10	3.5276	3.5278	3.5279	3.5280	3.5281	3.5283	3.5284	3.5285	3.5287	3.5288
56 20	3.5289	3.5290	3.5292	3.5293	3.5294	3.5296	3.5297	3.5298	3.5299	3.5301
56 30	3.5302	3.5303	3.5305	3.5306	3.5307	3.5308	3.5310	3.5311	3.5312	3.5314
56 40	3.5315	3.5316	3.5317	3.5319	3.5320	3.5321	3.5322	3.5324	3.5325	3.5326
56 50	3.5328	3.5329	3.5330	3.5331	3.5333	3.5334	3.5335	3.5336	3.5338	3.5339
0 57 0	3.5340	3.5342	3.5343	3.5344	3.5345	3.5347	3.5348	3.5349	3.5350	3.5352
57 10	3.5353	3.5354	3.5355	3.5357	3.5358	3.5359	3.5361	3.5362	3.5363	3.5364
57 20	3.5366	3.5367	3.5368	3.5369	3.5371	3.5372	3.5373	3.5374	3.5376	3.5377
57 30	3.5378	3.5379	3.5381	3.5382	3.5383	3.5384	3.5386	3.5387	3.5388	3.5390
57 40	3.5391	3.5392	3.5393	3.5395	3.5396	3.5397	3.5398	3.5400	3.5401	3.5402
57 50	3.5403	3.5405	3.5406	3.5407	3.5408	3.5410	3.5411	3.5412	3.5413	3.5415
0 58 0	3.5416	3.5417	3.5418	3.5420	3.5421	3.5422	3.5423	3.5425	3.5426	3.5427
58 10	3.5428	3.5429	3.5431	3.5432	3.5433	3.5434	3.5436	3.5437	3.5438	3.5439
58 20	3.5441	3.5442	3.5443	3.5444	3.5446	3.5447	3.5448	3.5449	3.5451	3.5452
58 30	3.5453	3.5454	3.5456	3.5457	3.5458	3.5459	3.5460	3.5462	3.5463	3.5464
58 40	3.5465	3.5467	3.5468	3.5469	3.5470	3.5472	3.5473	3.5474	3.5475	3.5477
58 50	3.5478	3.5479	3.5480	3.5481	3.5483	3.5484	3.5485	3.5486	3.5488	3.5489
0 59 0	3.5490	3.5491	3.5492	3.5494	3.5495	3.5496	3.5497	3.5499	3.5500	3.5501
59 10	3.5502	3.5504	3.5505	3.5506	3.5507	3.5508	3.5510	3.5511	3.5512	3.5513
59 20	3.5514	3.5516	3.5517	3.5518	3.5519	3.5521	3.5522	3.5523	3.5524	3.5525
59 30	3.5527	3.5528	3.5529	3.5530	3.5532	3.5533	3.5534	3.5535	3.5536	3.5538
59 40	3.5539	3.5540	3.5541	3.5542	3.5544	3.5545	3.5546	3.5547	3.5549	3.5550
59 50	3.5551	3.5552	3.5553	3.5555	3.5556	3.5557	3.5558	3.5559	3.5561	3.5562

TABLE I.

LOGARITHMS OF SMALL ARCS IN SPACE OR TIME.		0	1	2	3	4	5	6	7	8	9
Arc.											
0	0	3.5563	3.5564	3.5565	3.5567	3.5568	3.5569	3.5570	3.5571	3.5573	3.5574
0	10	3.5575	3.5576	3.5577	3.5579	3.5580	3.5581	3.5582	3.5583	3.5585	3.5586
0	20	3.5587	3.5588	3.5589	3.5591	3.5592	3.5593	3.5594	3.5595	3.5597	3.5598
0	30	3.5599	3.5600	3.5601	3.5603	3.5604	3.5605	3.5606	3.5607	3.5609	3.5610
0	40	3.5611	3.5612	3.5613	3.5615	3.5616	3.5617	3.5618	3.5619	3.5621	3.5622
0	50	3.5623	3.5624	3.5625	3.5626	3.5628	3.5629	3.5630	3.5631	3.5632	3.5634
1	1 0	3.5635	3.5636	3.5637	3.5638	3.5640	3.5641	3.5642	3.5643	3.5644	3.5645
	1 10	3.5647	3.5648	3.5649	3.5650	3.5651	3.5653	3.5654	3.5655	3.5656	3.5657
	1 20	3.5658	3.5660	3.5661	3.5662	3.5663	3.5664	3.5666	3.5667	3.5668	3.5669
	1 30	3.5670	3.5671	3.5673	3.5674	3.5675	3.5676	3.5677	3.5678	3.5680	3.5681
	1 40	3.5682	3.5683	3.5684	3.5686	3.5687	3.5688	3.5689	3.5690	3.5691	3.5693
	1 50	3.5694	3.5695	3.5696	3.5697	3.5698	3.5700	3.5701	3.5702	3.5703	3.5704
1	2 0	3.5705	3.5707	3.5708	3.5709	3.5710	3.5711	3.5712	3.5714	3.5715	3.5716
	2 10	3.5717	3.5718	3.5719	3.5721	3.5722	3.5723	3.5724	3.5725	3.5726	3.5728
	2 20	3.5729	3.5730	3.5731	3.5732	3.5733	3.5735	3.5736	3.5737	3.5738	3.5739
	2 30	3.5740	3.5741	3.5742	3.5744	3.5745	3.5746	3.5747	3.5748	3.5750	3.5751
	2 40	3.5752	3.5753	3.5754	3.5755	3.5756	3.5758	3.5759	3.5760	3.5761	3.5762
	2 50	3.5763	3.5765	3.5766	3.5767	3.5768	3.5769	3.5770	3.5771	3.5773	3.5774
1	3 0	3.5775	3.5776	3.5777	3.5778	3.5780	3.5781	3.5782	3.5783	3.5784	3.5785
	3 10	3.5786	3.5788	3.5789	3.5790	3.5791	3.5792	3.5798	3.5794	3.5796	3.5797
	3 20	3.5798	3.5799	3.5800	3.5801	3.5802	3.5804	3.5805	3.5806	3.5807	3.5808
	3 30	3.5809	3.5810	3.5812	3.5813	3.5814	3.5815	3.5816	3.5817	3.5818	3.5819
	3 40	3.5821	3.5822	3.5823	3.5824	3.5825	3.5826	3.5827	3.5829	3.5830	3.5831
	3 50	3.5832	3.5833	3.5834	3.5835	3.5837	3.5838	3.5839	3.5840	3.5841	3.5842
1	4 0	3.5843	3.5844	3.5846	3.5847	3.5848	3.5849	3.5850	3.5851	3.5852	3.5853
	4 10	3.5855	3.5856	3.5857	3.5858	3.5859	3.5860	3.5861	3.5862	3.5864	3.5865
	4 20	3.5866	3.5867	3.5868	3.5869	3.5870	3.5871	3.5873	3.5874	3.5875	3.5876
	4 30	3.5877	3.5878	3.5879	3.5880	3.5882	3.5883	3.5884	3.5885	3.5886	3.5887
	4 40	3.5888	3.5889	3.5891	3.5892	3.5893	3.5894	3.5895	3.5896	3.5897	3.5898
	4 50	3.5899	3.5901	3.5902	3.5903	3.5904	3.5905	3.5906	3.5907	3.5908	3.5910
1	5 0	3.5911	3.5912	3.5913	3.5914	3.5915	3.5916	3.5917	3.5918	3.5920	3.5921
	5 10	3.5922	3.5923	3.5924	3.5925	3.5926	3.5927	3.5928	3.5930	3.5931	3.5932
	5 20	3.5933	3.5934	3.5935	3.5936	3.5937	3.5938	3.5940	3.5941	3.5942	3.5943
	5 30	3.5944	3.5945	3.5946	3.5947	3.5948	3.5949	3.5951	3.5952	3.5953	3.5954
	5 40	3.5955	3.5956	3.5957	3.5958	3.5959	3.5960	3.5962	3.5963	3.5964	3.5965
	5 50	3.5966	3.5967	3.5968	3.5969	3.5970	3.5971	3.5973	3.5974	3.5975	3.5976
1	6 0	3.5977	3.5978	3.5979	3.5980	3.5981	3.5982	3.5984	3.5985	3.5986	3.5987
	6 10	3.5988	3.5989	3.5990	3.5991	3.5992	3.5993	3.5994	3.5996	3.5997	3.5998
	6 20	3.5999	3.6000	3.6001	3.6002	3.6003	3.6004	3.6005	3.6006	3.6008	3.6009
	6 30	3.6010	3.6011	3.6012	3.6013	3.6014	3.6015	3.6016	3.6017	3.6018	3.6020
	6 40	3.6021	3.6022	3.6023	3.6024	3.6025	3.6026	3.6027	3.6028	3.6029	3.6030
	6 50	3.6031	3.6033	3.6034	3.6035	3.6036	3.6037	3.6038	3.6039	3.6040	3.6041
1	7 0	3.6042	3.6043	3.6044	3.6046	3.6047	3.6048	3.6049	3.6050	3.6051	3.6052
	7 10	3.6053	3.6054	3.6055	3.6056	3.6057	3.6058	3.6060	3.6061	3.6062	3.6063
	7 20	3.6064	3.6065	3.6066	3.6067	3.6068	3.6069	3.6070	3.6071	3.6072	3.6073
	7 30	3.6075	3.6076	3.6077	3.6078	3.6079	3.6080	3.6081	3.6082	3.6083	3.6084
	7 40	3.6085	3.6086	3.6087	3.6088	3.6090	3.6091	3.6092	3.6093	3.6094	3.6095
	7 50	3.6096	3.6097	3.6098	3.6099	3.6100	3.6101	3.6102	3.6103	3.6104	3.6106
1	8 0	3.6107	3.6108	3.6109	3.6110	3.6111	3.6112	3.6113	3.6114	3.6115	3.6116
	8 10	3.6117	3.6118	3.6119	3.6120	3.6121	3.6123	3.6124	3.6125	3.6126	3.6127
	8 20	3.6128	3.6129	3.6130	3.6131	3.6132	3.6133	3.6134	3.6135	3.6136	3.6137
	8 30	3.6138	3.6139	3.6141	3.6142	3.6143	3.6144	3.6145	3.6146	3.6147	3.6148
	8 40	3.6149	3.6150	3.6151	3.6152	3.6153	3.6154	3.6155	3.6156	3.6157	3.6158
	8 50	3.6160	3.6161	3.6162	3.6163	3.6164	3.6165	3.6166	3.6167	3.6168	3.6169
1	9 0	3.6170	3.6171	3.6172	3.6173	3.6174	3.6175	3.6176	3.6177	3.6178	3.6179
	9 10	3.6180	3.6182	3.6183	3.6184	3.6185	3.6186	3.6187	3.6188	3.6189	3.6190
	9 20	3.6191	3.6192	3.6193	3.6194	3.6195	3.6196	3.6197	3.6198	3.6199	3.6200
	9 30	3.6201	3.6202	3.6203	3.6204	3.6206	3.6207	3.6208	3.6209	3.6210	3.6211
	9 40	3.6212	3.6213	3.6214	3.6215	3.6216	3.6217	3.6218	3.6219	3.6220	3.6221
	9 50	3.6222	3.6223	3.6224	3.6225	3.6226	3.6227	3.6228	3.6229	3.6230	3.6231

TABLE I.

LOGARITHMS OF SMALL ARCS IN SPACE OR TIME.										
Arc.	0	1	2	3	4	5	6	7	8	9
$1^{\circ} 10^m 0^s$	3.6232	3.6234	3.6235	3.6236	3.6237	3.6238	3.6239	3.6240	3.6241	3.6242
10 10	3.6243	3.6244	3.6245	3.6246	3.6247	3.6248	3.6249	3.6250	3.6251	3.6252
10 20	3.6253	3.6254	3.6255	3.6256	3.6257	3.6258	3.6259	3.6260	3.6261	3.6262
10 30	3.6263	3.6264	3.6265	3.6266	3.6268	3.6269	3.6270	3.6271	3.6272	3.6273
10 40	3.6274	3.6275	3.6276	3.6277	3.6278	3.6279	3.6280	3.6281	3.6282	3.6283
10 50	3.6284	3.6285	3.6286	3.6287	3.6288	3.6289	3.6290	3.6291	3.6292	3.6293
1 11 0	3.6294	3.6295	3.6296	3.6297	3.6298	3.6299	3.6300	3.6301	3.6302	3.6303
11 10	3.6304	3.6305	3.6306	3.6307	3.6308	3.6309	3.6310	3.6311	3.6312	3.6313
11 20	3.6314	3.6315	3.6316	3.6317	3.6318	3.6320	3.6321	3.6322	3.6323	3.6324
11 30	3.6325	3.6326	3.6327	3.6328	3.6329	3.6330	3.6331	3.6332	3.6333	3.6334
11 40	3.6335	3.6336	3.6337	3.6338	3.6339	3.6340	3.6341	3.6342	3.6343	3.6344
11 50	3.6345	3.6346	3.6347	3.6348	3.6349	3.6350	3.6351	3.6352	3.6353	3.6354
1 12 0	3.6355	3.6356	3.6357	3.6358	3.6359	3.6360	3.6361	3.6362	3.6363	3.6364
12 10	3.6365	3.6366	3.6367	3.6368	3.6369	3.6370	3.6371	3.6372	3.6373	3.6374
12 20	3.6375	3.6376	3.6377	3.6378	3.6379	3.6380	3.6381	3.6382	3.6383	3.6384
12 30	3.6385	3.6386	3.6387	3.6388	3.6389	3.6390	3.6391	3.6392	3.6393	3.6394
12 40	3.6395	3.6396	3.6397	3.6398	3.6399	3.6400	3.6401	3.6402	3.6403	3.6404
12 50	3.6405	3.6406	3.6407	3.6408	3.6409	3.6410	3.6411	3.6412	3.6413	3.6414
1 13 0	3.6415	3.6416	3.6417	3.6418	3.6419	3.6420	3.6421	3.6422	3.6423	3.6424
13 10	3.6425	3.6426	3.6427	3.6428	3.6429	3.6430	3.6431	3.6432	3.6433	3.6434
13 20	3.6435	3.6436	3.6437	3.6437	3.6438	3.6439	3.6440	3.6441	3.6442	3.6443
13 30	3.6444	3.6445	3.6446	3.6447	3.6448	3.6449	3.6450	3.6451	3.6452	3.6453
13 40	3.6454	3.6455	3.6456	3.6457	3.6458	3.6459	3.6460	3.6461	3.6462	3.6463
13 50	3.6464	3.6465	3.6466	3.6467	3.6468	3.6469	3.6470	3.6471	3.6472	3.6473
1 14 0	3.6474	3.6475	3.6476	3.6477	3.6478	3.6479	3.6480	3.6481	3.6482	3.6483
14 10	3.6484	3.6485	3.6486	3.6487	3.6488	3.6488	3.6489	3.6490	3.6491	3.6492
14 20	3.6493	3.6494	3.6495	3.6496	3.6497	3.6498	3.6499	3.6500	3.6501	3.6502
14 30	3.6503	3.6504	3.6505	3.6506	3.6507	3.6508	3.6509	3.6510	3.6511	3.6512
14 40	3.6513	3.6514	3.6515	3.6516	3.6517	3.6518	3.6519	3.6520	3.6521	3.6522
14 50	3.6522	3.6523	3.6524	3.6525	3.6526	3.6527	3.6528	3.6529	3.6530	3.6531
1 15 0	3.6532	3.6533	3.6534	3.6535	3.6536	3.6537	3.6538	3.6539	3.6540	3.6541
15 10	3.6542	3.6543	3.6544	3.6545	3.6546	3.6547	3.6548	3.6549	3.6549	3.6550
15 20	3.6551	3.6552	3.6553	3.6554	3.6555	3.6556	3.6557	3.6558	3.6559	3.6560
15 30	3.6561	3.6562	3.6563	3.6564	3.6565	3.6566	3.6567	3.6568	3.6569	3.6570
15 40	3.6571	3.6572	3.6572	3.6573	3.6574	3.6575	3.6576	3.6577	3.6578	3.6579
15 50	3.6580	3.6581	3.6582	3.6583	3.6584	3.6585	3.6586	3.6587	3.6588	3.6589
1 16 0	3.6590	3.6591	3.6592	3.6593	3.6593	3.6594	3.6595	3.6596	3.6597	3.6598
16 10	3.6599	3.6600	3.6601	3.6602	3.6603	3.6604	3.6605	3.6606	3.6607	3.6608
16 20	3.6609	3.6610	3.6611	3.6611	3.6612	3.6613	3.6614	3.6615	3.6616	3.6617
16 30	3.6618	3.6619	3.6620	3.6621	3.6622	3.6623	3.6624	3.6625	3.6626	3.6627
16 40	3.6628	3.6629	3.6629	3.6630	3.6631	3.6632	3.6633	3.6634	3.6635	3.6636
16 50	3.6637	3.6638	3.6639	3.6640	3.6641	3.6642	3.6643	3.6644	3.6645	3.6645
1 17 0	3.6646	3.6647	3.6648	3.6649	3.6650	3.6651	3.6652	3.6653	3.6654	3.6655
17 10	3.6656	3.6657	3.6658	3.6659	3.6660	3.6660	3.6661	3.6662	3.6663	3.6664
17 20	3.6665	3.6666	3.6667	3.6668	3.6669	3.6670	3.6671	3.6672	3.6673	3.6674
17 30	3.6675	3.6675	3.6676	3.6677	3.6678	3.6679	3.6680	3.6681	3.6682	3.6683
17 40	3.6684	3.6685	3.6686	3.6687	3.6688	3.6689	3.6689	3.6690	3.6691	3.6692
17 50	3.6693	3.6694	3.6695	3.6696	3.6697	3.6698	3.6699	3.6700	3.6701	3.6702
1 18 0	3.6702	3.6703	3.6704	3.6705	3.6706	3.6707	3.6708	3.6709	3.6710	3.6711
18 10	3.6712	3.6713	3.6714	3.6715	3.6715	3.6716	3.6717	3.6718	3.6719	3.6720
18 20	3.6721	3.6722	3.6723	3.6724	3.6725	3.6726	3.6727	3.6727	3.6728	3.6729
18 30	3.6730	3.6731	3.6732	3.6733	3.6734	3.6735	3.6736	3.6737	3.6738	3.6738
18 40	3.6739	3.6740	3.6741	3.6742	3.6743	3.6744	3.6745	3.6746	3.6747	3.6748
18 50	3.6749	3.6750	3.6750	3.6751	3.6752	3.6753	3.6754	3.6755	3.6756	3.6757
1 19 0	3.6758	3.6759	3.6760	3.6761	3.6761	3.6762	3.6763	3.6764	3.6765	3.6766
19 10	3.6767	3.6768	3.6769	3.6770	3.6771	3.6772	3.6772	3.6773	3.6774	3.6775
19 20	3.6776	3.6777	3.6778	3.6779	3.6780	3.6781	3.6782	3.6782	3.6783	3.6784
19 30	3.6785	3.6786	3.6787	3.6788	3.6789	3.6790	3.6791	3.6792	3.6792	3.6793
19 40	3.6794	3.6795	3.6796	3.6797	3.6798	3.6799	3.6800	3.6801	3.6802	3.6802
19 50	3.6803	3.6804	3.6805	3.6806	3.6807	3.6808	3.6809	3.6810	3.6811	3.6812

TABLE I.

LOGARITHMS OF SMALL ARCS IN SPACE OR TIME.										
Arc.	0	1	2	3	4	5	6	7	8	9
1 ^o 20 ^m 0 ^s	3.6812	3.6813	3.6814	3.6815	3.6816	3.6817	3.6818	3.6819	3.6820	3.6821
20 10	3.6821	3.6822	3.6823	3.6824	3.6825	3.6826	3.6827	3.6828	3.6829	3.6830
20 20	3.6830	3.6831	3.6832	3.6833	3.6834	3.6835	3.6836	3.6837	3.6838	3.6839
20 30	3.6839	3.6840	3.6841	3.6842	3.6843	3.6844	3.6845	3.6846	3.6847	3.6848
20 40	3.6848	3.6849	3.6850	3.6851	3.6852	3.6853	3.6854	3.6855	3.6856	3.6857
20 50	3.6857	3.6858	3.6859	3.6860	3.6861	3.6862	3.6863	3.6864	3.6865	3.6865
1 21 0	3.6866	3.6867	3.6868	3.6869	3.6870	3.6871	3.6872	3.6873	3.6874	3.6874
21 10	3.6875	3.6876	3.6877	3.6878	3.6879	3.6880	3.6881	3.6882	3.6882	3.6883
21 20	3.6884	3.6885	3.6886	3.6887	3.6888	3.6889	3.6890	3.6890	3.6891	3.6892
21 30	3.6893	3.6894	3.6895	3.6896	3.6897	3.6898	3.6898	3.6899	3.6900	3.6901
21 40	3.6902	3.6903	3.6904	3.6905	3.6906	3.6906	3.6907	3.6908	3.6909	3.6910
21 50	3.6911	3.6912	3.6913	3.6913	3.6914	3.6915	3.6916	3.6917	3.6918	3.6919
1 22 0	3.6920	3.6921	3.6921	3.6922	3.6923	3.6924	3.6925	3.6926	3.6927	3.6928
22 10	3.6928	3.6929	3.6930	3.6931	3.6932	3.6933	3.6934	3.6935	3.6936	3.6936
22 20	3.6937	3.6938	3.6939	3.6940	3.6941	3.6942	3.6943	3.6943	3.6944	3.6945
22 30	3.6946	3.6947	3.6948	3.6949	3.6950	3.6950	3.6951	3.6952	3.6953	3.6954
22 40	3.6955	3.6956	3.6957	3.6957	3.6958	3.6959	3.6960	3.6961	3.6962	3.6963
22 50	3.6964	3.6964	3.6965	3.6966	3.6967	3.6968	3.6969	3.6970	3.6971	3.6971
1 23 0	3.6972	3.6973	3.6974	3.6975	3.6976	3.6977	3.6978	3.6978	3.6979	3.6980
23 10	3.6981	3.6982	3.6983	3.6984	3.6984	3.6985	3.6986	3.6987	3.6988	3.6989
23 20	3.6990	3.6991	3.6991	3.6992	3.6993	3.6994	3.6995	3.6996	3.6997	3.6998
23 30	3.6998	3.6999	3.7000	3.7001	3.7002	3.7003	3.7004	3.7004	3.7005	3.7006
23 40	3.7007	3.7008	3.7009	3.7010	3.7010	3.7011	3.7012	3.7013	3.7014	3.7015
23 50	3.7016	3.7017	3.7017	3.7018	3.7019	3.7020	3.7021	3.7022	3.7023	3.7023
1 24 0	3.7024	3.7025	3.7026	3.7027	3.7028	3.7029	3.7029	3.7030	3.7031	3.7032
24 10	3.7033	3.7034	3.7035	3.7035	3.7036	3.7037	3.7038	3.7039	3.7040	3.7041
24 20	3.7042	3.7042	3.7043	3.7044	3.7045	3.7046	3.7047	3.7048	3.7048	3.7049
24 30	3.7050	3.7051	3.7052	3.7053	3.7054	3.7054	3.7055	3.7056	3.7057	3.7058
24 40	3.7059	3.7060	3.7060	3.7061	3.7062	3.7063	3.7064	3.7065	3.7065	3.7066
24 50	3.7067	3.7068	3.7069	3.7070	3.7071	3.7071	3.7072	3.7073	3.7074	3.7075
1 25 0	3.7076	3.7077	3.7077	3.7078	3.7079	3.7080	3.7081	3.7082	3.7083	3.7083
25 10	3.7084	3.7085	3.7086	3.7087	3.7088	3.7088	3.7089	3.7090	3.7091	3.7092
25 20	3.7093	3.7094	3.7094	3.7095	3.7096	3.7097	3.7098	3.7099	3.7099	3.7100
25 30	3.7101	3.7102	3.7103	3.7104	3.7105	3.7105	3.7106	3.7107	3.7108	3.7109
25 40	3.7110	3.7110	3.7111	3.7112	3.7113	3.7114	3.7115	3.7116	3.7116	3.7117
25 50	3.7118	3.7119	3.7120	3.7121	3.7121	3.7122	3.7123	3.7124	3.7125	3.7126
1 26 0	3.7126	3.7127	3.7128	3.7129	3.7130	3.7131	3.7132	3.7132	3.7133	3.7134
26 10	3.7135	3.7136	3.7137	3.7137	3.7138	3.7139	3.7140	3.7141	3.7142	3.7142
26 20	3.7143	3.7144	3.7145	3.7146	3.7147	3.7147	3.7148	3.7149	3.7150	3.7151
26 30	3.7152	3.7153	3.7153	3.7154	3.7155	3.7156	3.7157	3.7158	3.7159	3.7159
26 40	3.7160	3.7161	3.7162	3.7163	3.7163	3.7164	3.7165	3.7166	3.7167	3.7168
26 50	3.7168	3.7169	3.7170	3.7171	3.7172	3.7173	3.7173	3.7174	3.7175	3.7176
1 27 0	3.7177	3.7178	3.7178	3.7179	3.7180	3.7181	3.7182	3.7183	3.7183	3.7184
27 10	3.7185	3.7186	3.7187	3.7188	3.7188	3.7189	3.7190	3.7191	3.7192	3.7192
27 20	3.7193	3.7194	3.7195	3.7196	3.7197	3.7197	3.7198	3.7199	3.7200	3.7201
27 30	3.7202	3.7202	3.7203	3.7204	3.7205	3.7206	3.7207	3.7207	3.7208	3.7209
27 40	3.7210	3.7211	3.7212	3.7212	3.7213	3.7214	3.7215	3.7216	3.7216	3.7217
27 50	3.7218	3.7219	3.7220	3.7221	3.7221	3.7222	3.7223	3.7224	3.7225	3.7226
1 28 0	3.7226	3.7227	3.7228	3.7229	3.7230	3.7230	3.7231	3.7232	3.7233	3.7234
28 10	3.7235	3.7235	3.7236	3.7237	3.7238	3.7239	3.7239	3.7240	3.7241	3.7242
28 20	3.7243	3.7244	3.7244	3.7245	3.7246	3.7247	3.7248	3.7248	3.7249	3.7250
28 30	3.7251	3.7252	3.7253	3.7253	3.7254	3.7255	3.7256	3.7257	3.7257	3.7258
28 40	3.7259	3.7260	3.7261	3.7262	3.7262	3.7263	3.7264	3.7265	3.7266	3.7266
28 50	3.7267	3.7268	3.7269	3.7270	3.7271	3.7271	3.7272	3.7273	3.7274	3.7275
1 29 0	3.7275	3.7276	3.7277	3.7278	3.7279	3.7279	3.7280	3.7281	3.7282	3.7283
29 10	3.7284	3.7284	3.7285	3.7286	3.7287	3.7288	3.7288	3.7289	3.7290	3.7291
29 20	3.7292	3.7292	3.7293	3.7294	3.7295	3.7296	3.7297	3.7297	3.7298	3.7299
29 30	3.7300	3.7301	3.7301	3.7302	3.7303	3.7304	3.7305	3.7305	3.7306	3.7307
29 40	3.7308	3.7309	3.7309	3.7310	3.7311	3.7312	3.7313	3.7313	3.7314	3.7315
29 50	3.7316	3.7317	3.7317	3.7318	3.7319	3.7320	3.7321	3.7322	3.7322	3.7323

TABLE I.

LOGARITHMS OF SMALL ARCS IN SPACE OR TIME.										
Arc.	0	1	2	3	4	5	6	7	8	9
1 ^h 30 ^m 0 ^s	3.7324	3.7325	3.7326	3.7326	3.7327	3.7328	3.7329	3.7330	3.7330	3.7331
30 10	3.7332	3.7333	3.7334	3.7334	3.7335	3.7336	3.7337	3.7338	3.7338	3.7339
30 20	3.7340	3.7341	3.7342	3.7342	3.7343	3.7344	3.7345	3.7346	3.7346	3.7347
30 30	3.7348	3.7349	3.7350	3.7350	3.7351	3.7352	3.7353	3.7354	3.7354	3.7355
30 40	3.7356	3.7357	3.7358	3.7358	3.7359	3.7360	3.7361	3.7362	3.7362	3.7363
30 50	3.7364	3.7365	3.7366	3.7366	3.7367	3.7368	3.7369	3.7370	3.7370	3.7371
1 31 0	3.7372	3.7373	3.7374	3.7374	3.7375	3.7376	3.7377	3.7377	3.7378	3.7379
31 10	3.7380	3.7381	3.7381	3.7382	3.7383	3.7384	3.7385	3.7385	3.7386	3.7387
31 20	3.7388	3.7389	3.7389	3.7390	3.7391	3.7392	3.7393	3.7393	3.7394	3.7395
31 30	3.7396	3.7397	3.7397	3.7398	3.7399	3.7400	3.7400	3.7401	3.7402	3.7403
31 40	3.7404	3.7404	3.7405	3.7406	3.7407	3.7408	3.7408	3.7409	3.7410	3.7411
31 50	3.7412	3.7412	3.7413	3.7414	3.7415	3.7415	3.7416	3.7417	3.7418	3.7419
1 32 0	3.7419	3.7420	3.7421	3.7422	3.7423	3.7423	3.7424	3.7425	3.7426	3.7426
32 10	3.7427	3.7428	3.7429	3.7430	3.7430	3.7431	3.7432	3.7433	3.7434	3.7434
32 20	3.7435	3.7436	3.7437	3.7437	3.7438	3.7439	3.7440	3.7441	3.7441	3.7442
32 30	3.7443	3.7444	3.7444	3.7445	3.7446	3.7447	3.7448	3.7448	3.7449	3.7450
32 40	3.7451	3.7452	3.7452	3.7453	3.7454	3.7455	3.7455	3.7456	3.7457	3.7458
32 50	3.7459	3.7459	3.7460	3.7461	3.7462	3.7462	3.7463	3.7464	3.7465	3.7466
1 33 0	3.7466	3.7467	3.7468	3.7469	3.7469	3.7470	3.7471	3.7472	3.7473	3.7473
33 10	3.7474	3.7475	3.7476	3.7476	3.7477	3.7478	3.7479	3.7480	3.7480	3.7481
33 20	3.7482	3.7483	3.7483	3.7484	3.7485	3.7486	3.7487	3.7487	3.7488	3.7489
33 30	3.7490	3.7490	3.7491	3.7492	3.7493	3.7493	3.7494	3.7495	3.7496	3.7497
33 40	3.7497	3.7498	3.7499	3.7500	3.7500	3.7501	3.7502	3.7503	3.7504	3.7504
33 50	3.7505	3.7506	3.7507	3.7507	3.7508	3.7509	3.7510	3.7510	3.7511	3.7512
1 34 0	3.7513	3.7514	3.7514	3.7515	3.7516	3.7517	3.7517	3.7518	3.7519	3.7520
34 10	3.7520	3.7521	3.7522	3.7523	3.7524	3.7524	3.7525	3.7526	3.7527	3.7527
34 20	3.7529	3.7529	3.7530	3.7530	3.7531	3.7532	3.7533	3.7534	3.7534	3.7535
34 30	3.7536	3.7537	3.7537	3.7538	3.7539	3.7540	3.7540	3.7541	3.7542	3.7543
34 40	3.7543	3.7544	3.7545	3.7546	3.7547	3.7547	3.7548	3.7549	3.7550	3.7550
34 50	3.7551	3.7552	3.7553	3.7553	3.7554	3.7555	3.7556	3.7556	3.7557	3.7558
1 35 0	3.7559	3.7560	3.7560	3.7561	3.7562	3.7563	3.7563	3.7564	3.7565	3.7566
35 10	3.7566	3.7567	3.7568	3.7569	3.7569	3.7570	3.7571	3.7572	3.7572	3.7573
35 20	3.7574	3.7575	3.7575	3.7576	3.7577	3.7578	3.7579	3.7579	3.7580	3.7581
35 30	3.7582	3.7582	3.7583	3.7584	3.7585	3.7585	3.7586	3.7587	3.7588	3.7588
35 40	3.7589	3.7590	3.7591	3.7591	3.7592	3.7593	3.7594	3.7594	3.7595	3.7596
35 50	3.7597	3.7597	3.7598	3.7599	3.7600	3.7600	3.7601	3.7602	3.7603	3.7603
1 36 0	3.7604	3.7605	3.7606	3.7606	3.7607	3.7608	3.7609	3.7609	3.7610	3.7611
36 10	3.7612	3.7613	3.7613	3.7614	3.7615	3.7616	3.7616	3.7617	3.7618	3.7619
36 20	3.7619	3.7620	3.7621	3.7622	3.7622	3.7623	3.7624	3.7625	3.7625	3.7626
36 30	3.7627	3.7628	3.7628	3.7629	3.7630	3.7631	3.7631	3.7632	3.7633	3.7634
36 40	3.7634	3.7635	3.7636	3.7637	3.7637	3.7638	3.7639	3.7640	3.7640	3.7641
36 50	3.7642	3.7643	3.7643	3.7644	3.7645	3.7645	3.7646	3.7647	3.7648	3.7648
1 37 0	3.7649	3.7650	3.7651	3.7651	3.7652	3.7653	3.7654	3.7654	3.7655	3.7656
37 10	3.7657	3.7657	3.7658	3.7659	3.7660	3.7660	3.7661	3.7662	3.7663	3.7663
37 20	3.7664	3.7665	3.7666	3.7666	3.7667	3.7668	3.7669	3.7669	3.7670	3.7671
37 30	3.7672	3.7672	3.7673	3.7674	3.7675	3.7675	3.7676	3.7677	3.7677	3.7678
37 40	3.7679	3.7680	3.7681	3.7681	3.7682	3.7683	3.7683	3.7684	3.7685	3.7686
37 50	3.7686	3.7687	3.7688	3.7689	3.7689	3.7690	3.7691	3.7692	3.7692	3.7693
1 38 0	3.7694	3.7695	3.7695	3.7696	3.7697	3.7697	3.7698	3.7699	3.7700	3.7700
38 10	3.7701	3.7702	3.7703	3.7703	3.7704	3.7705	3.7706	3.7706	3.7707	3.7708
38 20	3.7709	3.7709	3.7710	3.7711	3.7711	3.7712	3.7713	3.7714	3.7714	3.7715
38 30	3.7716	3.7717	3.7717	3.7718	3.7719	3.7720	3.7720	3.7721	3.7722	3.7722
38 40	3.7723	3.7724	3.7725	3.7725	3.7726	3.7727	3.7728	3.7728	3.7729	3.7730
38 50	3.7731	3.7731	3.7732	3.7733	3.7733	3.7734	3.7735	3.7736	3.7736	3.7737
1 39 0	3.7738	3.7739	3.7739	3.7740	3.7741	3.7742	3.7742	3.7743	3.7744	3.7744
39 10	3.7745	3.7746	3.7747	3.7747	3.7748	3.7749	3.7750	3.7750	3.7751	3.7752
39 20	3.7753	3.7753	3.7754	3.7755	3.7755	3.7756	3.7757	3.7758	3.7758	3.7759
39 30	3.7760	3.7760	3.7761	3.7762	3.7763	3.7763	3.7764	3.7765	3.7766	3.7766
39 40	3.7767	3.7768	3.7768	3.7769	3.7770	3.7771	3.7771	3.7772	3.7773	3.7774
39 50	3.7774	3.7775	3.7776	3.7776	3.7777	3.7778	3.7779	3.7779	3.7780	3.7781

TABLE I.

LOGARITHMS OF SMALL ARCS IN SPACE OR TIME.										
Arc.	0	1	2	3	4	5	6	7	8	9
$i^h 40^m 0^s$	3.7782	3.7782	3.7783	3.7784	3.7784	3.7785	3.7786	3.7787	3.7787	3.7788
40 10	3.7789	3.7789	3.7790	3.7791	3.7792	3.7792	3.7793	3.7794	3.7795	3.7795
40 20	3.7796	3.7797	3.7797	3.7798	3.7799	3.7800	3.7800	3.7801	3.7802	3.7802
40 30	3.7803	3.7804	3.7805	3.7805	3.7806	3.7807	3.7807	3.7808	3.7809	3.7810
40 40	3.7810	3.7811	3.7812	3.7813	3.7813	3.7814	3.7815	3.7815	3.7816	3.7817
40 50	3.7818	3.7818	3.7819	3.7820	3.7820	3.7821	3.7822	3.7823	3.7823	3.7824
1 41 0	3.7825	3.7825	3.7826	3.7827	3.7828	3.7828	3.7829	3.7830	3.7830	3.7831
41 10	3.7832	3.7833	3.7833	3.7834	3.7835	3.7835	3.7836	3.7837	3.7838	3.7838
41 20	3.7839	3.7840	3.7840	3.7841	3.7842	3.7843	3.7843	3.7844	3.7845	3.7845
41 30	3.7846	3.7847	3.7848	3.7848	3.7849	3.7850	3.7850	3.7851	3.7852	3.7853
41 40	3.7853	3.7854	3.7855	3.7855	3.7856	3.7857	3.7858	3.7858	3.7859	3.7860
41 50	3.7860	3.7861	3.7862	3.7863	3.7863	3.7864	3.7865	3.7865	3.7866	3.7867
1 42 0	3.7868	3.7868	3.7869	3.7870	3.7870	3.7871	3.7872	3.7872	3.7873	3.7874
42 10	3.7875	3.7875	3.7876	3.7877	3.7877	3.7878	3.7879	3.7880	3.7880	3.7881
42 20	3.7882	3.7882	3.7883	3.7884	3.7885	3.7885	3.7886	3.7887	3.7887	3.7888
42 30	3.7889	3.7889	3.7890	3.7891	3.7892	3.7892	3.7893	3.7894	3.7894	3.7895
42 40	3.7896	3.7897	3.7897	3.7898	3.7899	3.7899	3.7900	3.7901	3.7901	3.7902
42 50	3.7903	3.7904	3.7904	3.7905	3.7906	3.7906	3.7907	3.7908	3.7908	3.7909
1 43 0	3.7910	3.7911	3.7911	3.7912	3.7913	3.7913	3.7914	3.7915	3.7916	3.7916
43 10	3.7917	3.7918	3.7918	3.7919	3.7920	3.7920	3.7921	3.7922	3.7923	3.7923
43 20	3.7924	3.7925	3.7925	3.7926	3.7927	3.7927	3.7928	3.7929	3.7930	3.7930
43 30	3.7931	3.7932	3.7932	3.7933	3.7934	3.7934	3.7935	3.7936	3.7937	3.7937
43 40	3.7938	3.7939	3.7939	3.7940	3.7941	3.7941	3.7942	3.7943	3.7943	3.7944
43 50	3.7945	3.7946	3.7946	3.7947	3.7948	3.7948	3.7949	3.7950	3.7950	3.7951
1 44 0	3.7952	3.7953	3.7953	3.7954	3.7955	3.7955	3.7956	3.7957	3.7957	3.7958
44 10	3.7959	3.7959	3.7960	3.7961	3.7962	3.7962	3.7963	3.7964	3.7964	3.7965
44 20	3.7966	3.7966	3.7967	3.7968	3.7969	3.7969	3.7970	3.7971	3.7971	3.7972
44 30	3.7973	3.7973	3.7974	3.7975	3.7975	3.7976	3.7977	3.7978	3.7978	3.7979
44 40	3.7980	3.7980	3.7981	3.7982	3.7982	3.7983	3.7984	3.7984	3.7985	3.7986
44 50	3.7987	3.7987	3.7988	3.7989	3.7989	3.7990	3.7991	3.7991	3.7992	3.7993
1 45 0	3.7993	3.7994	3.7995	3.7995	3.7996	3.7997	3.7998	3.7998	3.7999	3.8000
45 10	3.8000	3.8001	3.8002	3.8002	3.8003	3.8004	3.8004	3.8005	3.8006	3.8006
45 20	3.8007	3.8008	3.8009	3.8009	3.8010	3.8011	3.8011	3.8012	3.8013	3.8013
45 30	3.8014	3.8015	3.8015	3.8016	3.8017	3.8017	3.8018	3.8019	3.8020	3.8020
45 40	3.8021	3.8022	3.8022	3.8023	3.8024	3.8024	3.8025	3.8026	3.8026	3.8027
45 50	3.8028	3.8028	3.8029	3.8030	3.8030	3.8031	3.8032	3.8033	3.8033	3.8034
1 46 0	3.8035	3.8035	3.8036	3.8036	3.8037	3.8038	3.8039	3.8039	3.8040	3.8041
46 10	3.8041	3.8042	3.8043	3.8043	3.8044	3.8045	3.8045	3.8046	3.8047	3.8048
46 20	3.8048	3.8049	3.8050	3.8050	3.8051	3.8052	3.8052	3.8053	3.8054	3.8054
46 30	3.8055	3.8056	3.8056	3.8057	3.8058	3.8058	3.8059	3.8060	3.8060	3.8061
46 40	3.8062	3.8062	3.8063	3.8064	3.8065	3.8065	3.8066	3.8067	3.8067	3.8068
46 50	3.8069	3.8069	3.8070	3.8071	3.8071	3.8072	3.8073	3.8073	3.8074	3.8075
1 47 0	3.8075	3.8076	3.8077	3.8077	3.8078	3.8079	3.8079	3.8080	3.8081	3.8081
47 10	3.8082	3.8083	3.8083	3.8084	3.8085	3.8085	3.8086	3.8087	3.8088	3.8088
47 20	3.8089	3.8090	3.8090	3.8091	3.8092	3.8092	3.8093	3.8094	3.8094	3.8095
47 30	3.8096	3.8096	3.8097	3.8098	3.8098	3.8099	3.8099	3.8100	3.8101	3.8102
47 40	3.8102	3.8103	3.8104	3.8104	3.8105	3.8106	3.8106	3.8107	3.8108	3.8108
47 50	3.8109	3.8110	3.8110	3.8111	3.8112	3.8112	3.8113	3.8114	3.8114	3.8115
1 48 0	3.8116	3.8116	3.8117	3.8118	3.8118	3.8119	3.8120	3.8120	3.8121	3.8122
48 10	3.8122	3.8123	3.8124	3.8124	3.8125	3.8126	3.8126	3.8127	3.8128	3.8128
48 20	3.8129	3.8130	3.8130	3.8131	3.8132	3.8132	3.8133	3.8134	3.8134	3.8135
48 30	3.8136	3.8136	3.8137	3.8138	3.8138	3.8139	3.8140	3.8140	3.8141	3.8142
48 40	3.8142	3.8143	3.8144	3.8144	3.8145	3.8146	3.8146	3.8147	3.8148	3.8148
48 50	3.8149	3.8150	3.8150	3.8151	3.8152	3.8152	3.8153	3.8154	3.8154	3.8155
1 49 0	3.8156	3.8156	3.8157	3.8158	3.8158	3.8159	3.8160	3.8160	3.8161	3.8162
49 10	3.8162	3.8163	3.8164	3.8164	3.8165	3.8166	3.8166	3.8167	3.8168	3.8168
49 20	3.8169	3.8170	3.8170	3.8171	3.8172	3.8172	3.8173	3.8174	3.8174	3.8175
49 30	3.8176	3.8176	3.8177	3.8178	3.8178	3.8179	3.8180	3.8180	3.8181	3.8182
49 40	3.8182	3.8183	3.8184	3.8184	3.8185	3.8185	3.8186	3.8187	3.8188	3.8188
49 50	3.8189	3.8190	3.8190	3.8191	3.8191	3.8192	3.8193	3.8193	3.8194	3.8195

TABLE I.

LOGARITHMS OF SMALL ARCS IN SPACE OR TIME.										
Arc.	0	1	2	3	4	5	6	7	8	9
$i^{\circ} 50^m 0^s$	3.8195	3.8196	3.8197	3.8197	3.8198	3.8199	3.8199	3.8200	3.8201	3.8201
50 10	3.8202	3.8203	3.8203	3.8204	3.8205	3.8205	3.8206	3.8207	3.8207	3.8208
50 20	3.8209	3.8209	3.8210	3.8211	3.8211	3.8212	3.8213	3.8213	3.8214	3.8214
50 30	3.8215	3.8216	3.8216	3.8217	3.8218	3.8218	3.8219	3.8220	3.8220	3.8221
50 40	3.8222	3.8222	3.8223	3.8224	3.8224	3.8225	3.8226	3.8226	3.8227	3.8228
50 50	3.8228	3.8229	3.8230	3.8230	3.8231	3.8231	3.8232	3.8233	3.8233	3.8234
1 51 0	3.8235	3.8235	3.8236	3.8237	3.8237	3.8238	3.8239	3.8239	3.8240	3.8241
51 10	3.8241	3.8242	3.8243	3.8243	3.8244	3.8245	3.8245	3.8246	3.8246	3.8247
51 20	3.8248	3.8248	3.8249	3.8250	3.8250	3.8251	3.8252	3.8252	3.8253	3.8254
51 30	3.8254	3.8255	3.8256	3.8256	3.8257	3.8258	3.8258	3.8259	3.8259	3.8260
51 40	3.8261	3.8261	3.8262	3.8263	3.8263	3.8264	3.8265	3.8265	3.8266	3.8267
51 50	3.8267	3.8268	3.8269	3.8269	3.8270	3.8270	3.8271	3.8272	3.8272	3.8273
1 52 0	3.8274	3.8274	3.8275	3.8276	3.8276	3.8277	3.8278	3.8278	3.8279	3.8280
52 10	3.8280	3.8281	3.8281	3.8282	3.8283	3.8283	3.8284	3.8285	3.8285	3.8286
52 20	3.8287	3.8287	3.8288	3.8289	3.8289	3.8290	3.8290	3.8291	3.8292	3.8292
52 30	3.8293	3.8294	3.8294	3.8295	3.8296	3.8296	3.8297	3.8298	3.8298	3.8299
52 40	3.8299	3.8300	3.8301	3.8301	3.8302	3.8303	3.8303	3.8304	3.8305	3.8305
52 50	3.8306	3.8307	3.8307	3.8308	3.8308	3.8309	3.8310	3.8310	3.8311	3.8312
1 53 0	3.8312	3.8313	3.8314	3.8314	3.8315	3.8315	3.8316	3.8317	3.8317	3.8318
53 10	3.8319	3.8319	3.8320	3.8321	3.8321	3.8322	3.8323	3.8323	3.8324	3.8324
53 20	3.8325	3.8326	3.8326	3.8327	3.8328	3.8328	3.8329	3.8330	3.8330	3.8331
53 30	3.8331	3.8332	3.8333	3.8333	3.8334	3.8335	3.8335	3.8336	3.8337	3.8337
53 40	3.8338	3.8338	3.8339	3.8340	3.8340	3.8341	3.8342	3.8342	3.8343	3.8344
53 50	3.8344	3.8345	3.8345	3.8346	3.8347	3.8347	3.8348	3.8349	3.8349	3.8350
1 54 0	3.8351	3.8351	3.8352	3.8352	3.8353	3.8354	3.8354	3.8355	3.8356	3.8356
54 10	3.8357	3.8358	3.8358	3.8359	3.8359	3.8360	3.8361	3.8361	3.8362	3.8363
54 20	3.8363	3.8364	3.8365	3.8365	3.8366	3.8366	3.8367	3.8368	3.8368	3.8369
54 30	3.8370	3.8370	3.8371	3.8371	3.8372	3.8373	3.8373	3.8374	3.8375	3.8375
54 40	3.8376	3.8377	3.8377	3.8378	3.8378	3.8379	3.8380	3.8380	3.8381	3.8382
54 50	3.8382	3.8383	3.8383	3.8384	3.8385	3.8385	3.8386	3.8387	3.8387	3.8388
1 55 0	3.8388	3.8389	3.8390	3.8390	3.8391	3.8392	3.8392	3.8393	3.8394	3.8394
55 10	3.8395	3.8395	3.8396	3.8397	3.8397	3.8398	3.8399	3.8399	3.8400	3.8400
55 20	3.8401	3.8402	3.8402	3.8403	3.8404	3.8404	3.8405	3.8405	3.8406	3.8407
55 30	3.8407	3.8408	3.8409	3.8409	3.8410	3.8410	3.8411	3.8412	3.8412	3.8413
55 40	3.8414	3.8414	3.8415	3.8415	3.8416	3.8417	3.8417	3.8418	3.8419	3.8419
55 50	3.8420	3.8420	3.8421	3.8422	3.8422	3.8423	3.8424	3.8424	3.8425	3.8425
1 56 0	3.8426	3.8427	3.8427	3.8428	3.8429	3.8429	3.8430	3.8430	3.8431	3.8432
56 10	3.8432	3.8433	3.8434	3.8434	3.8435	3.8435	3.8436	3.8437	3.8437	3.8438
56 20	3.8439	3.8439	3.8440	3.8440	3.8441	3.8442	3.8442	3.8443	3.8444	3.8444
56 30	3.8445	3.8445	3.8446	3.8447	3.8447	3.8448	3.8448	3.8449	3.8450	3.8450
56 40	3.8451	3.8452	3.8452	3.8453	3.8453	3.8454	3.8455	3.8455	3.8456	3.8457
56 50	3.8457	3.8458	3.8458	3.8459	3.8460	3.8460	3.8461	3.8462	3.8462	3.8463
1 57 0	3.8463	3.8464	3.8465	3.8465	3.8466	3.8466	3.8467	3.8468	3.8468	3.8469
57 10	3.8470	3.8470	3.8471	3.8471	3.8472	3.8473	3.8473	3.8474	3.8474	3.8475
57 20	3.8476	3.8476	3.8477	3.8478	3.8478	3.8479	3.8479	3.8480	3.8481	3.8481
57 30	3.8482	3.8483	3.8483	3.8484	3.8484	3.8485	3.8486	3.8486	3.8487	3.8487
57 40	3.8488	3.8489	3.8489	3.8490	3.8491	3.8491	3.8492	3.8492	3.8493	3.8494
57 50	3.8494	3.8495	3.8495	3.8496	3.8497	3.8497	3.8498	3.8499	3.8499	3.8500
1 58 0	3.8500	3.8501	3.8502	3.8502	3.8503	3.8503	3.8504	3.8505	3.8505	3.8506
58 10	3.8506	3.8507	3.8508	3.8508	3.8509	3.8510	3.8510	3.8511	3.8511	3.8512
58 20	3.8513	3.8513	3.8514	3.8514	3.8515	3.8516	3.8516	3.8517	3.8517	3.8518
58 30	3.8519	3.8519	3.8520	3.8521	3.8521	3.8522	3.8522	3.8523	3.8524	3.8524
58 40	3.8525	3.8525	3.8526	3.8527	3.8527	3.8528	3.8528	3.8529	3.8530	3.8530
58 50	3.8531	3.8532	3.8532	3.8533	3.8533	3.8534	3.8535	3.8535	3.8536	3.8536
1 59 0	3.8537	3.8538	3.8538	3.8539	3.8539	3.8540	3.8541	3.8541	3.8542	3.8542
59 10	3.8543	3.8544	3.8544	3.8545	3.8545	3.8546	3.8547	3.8547	3.8548	3.8549
59 20	3.8549	3.8550	3.8550	3.8551	3.8552	3.8552	3.8553	3.8553	3.8554	3.8555
59 30	3.8555	3.8556	3.8556	3.8557	3.8558	3.8558	3.8559	3.8559	3.8560	3.8561
59 40	3.8561	3.8562	3.8562	3.8563	3.8564	3.8564	3.8565	3.8565	3.8566	3.8567
59 50	3.8567	3.8568	3.8568	3.8569	3.8570	3.8570	3.8571	3.8572	3.8572	3.8573

TABLE I.

LOGARITHMS OF SMALL ARCS IN SPACE OR TIME.											
Arc.	0	1	2	3	4	5	6	7	8	9	
2 ^h 0 ^m 0 ^s	3.8578	3.8574	3.8575	3.8575	3.8576	3.8576	3.8577	3.8578	3.8578	3.8579	
0 10	3.8579	3.8580	3.8581	3.8581	3.8582	3.8582	3.8583	3.8584	3.8584	3.8585	
0 20	3.8585	3.8586	3.8587	3.8587	3.8588	3.8588	3.8589	3.8590	3.8590	3.8591	
0 30	3.8591	3.8592	3.8593	3.8593	3.8594	3.8594	3.8595	3.8596	3.8596	3.8597	
0 40	3.8597	3.8598	3.8599	3.8599	3.8600	3.8600	3.8601	3.8602	3.8602	3.8603	
0 50	3.8603	3.8604	3.8605	3.8605	3.8606	3.8606	3.8607	3.8608	3.8608	3.8609	
2 1 0	3.8609	3.8610	3.8611	3.8611	3.8612	3.8612	3.8613	3.8614	3.8614	3.8615	
1 10	3.8615	3.8616	3.8617	3.8617	3.8618	3.8618	3.8619	3.8620	3.8620	3.8621	
1 20	3.8621	3.8622	3.8623	3.8623	3.8624	3.8624	3.8625	3.8625	3.8626	3.8627	
1 30	3.8627	3.8628	3.8628	3.8629	3.8630	3.8630	3.8631	3.8631	3.8632	3.8633	
1 40	3.8633	3.8634	3.8634	3.8635	3.8636	3.8636	3.8637	3.8637	3.8638	3.8639	
1 50	3.8639	3.8640	3.8640	3.8641	3.8642	3.8642	3.8643	3.8643	3.8644	3.8645	
2 2 0	3.8645	3.8646	3.8646	3.8647	3.8647	3.8648	3.8649	3.8649	3.8650	3.8650	
2 10	3.8651	3.8652	3.8652	3.8653	3.8653	3.8654	3.8655	3.8655	3.8656	3.8656	
2 20	3.8657	3.8658	3.8658	3.8659	3.8659	3.8660	3.8661	3.8661	3.8662	3.8662	
2 30	3.8663	3.8663	3.8664	3.8665	3.8665	3.8666	3.8666	3.8667	3.8668	3.8668	
2 40	3.8669	3.8669	3.8670	3.8671	3.8671	3.8672	3.8672	3.8673	3.8673	3.8674	
2 50	3.8675	3.8675	3.8676	3.8676	3.8677	3.8678	3.8678	3.8679	3.8679	3.8680	
2 3 0	3.8681	3.8681	3.8682	3.8682	3.8683	3.8684	3.8684	3.8685	3.8685	3.8686	
3 10	3.8686	3.8687	3.8688	3.8688	3.8689	3.8689	3.8690	3.8691	3.8691	3.8692	
3 20	3.8692	3.8693	3.8693	3.8694	3.8695	3.8695	3.8696	3.8696	3.8697	3.8698	
3 30	3.8698	3.8699	3.8699	3.8700	3.8701	3.8701	3.8702	3.8702	3.8703	3.8703	
3 40	3.8704	3.8705	3.8705	3.8706	3.8706	3.8707	3.8707	3.8708	3.8709	3.8709	
3 50	3.8710	3.8710	3.8711	3.8712	3.8712	3.8713	3.8713	3.8714	3.8715	3.8715	
2 4 0	3.8716	3.8716	3.8717	3.8717	3.8718	3.8719	3.8719	3.8720	3.8720	3.8721	
4 10	3.8722	3.8722	3.8723	3.8723	3.8724	3.8724	3.8725	3.8726	3.8726	3.8727	
4 20	3.8727	3.8728	3.8729	3.8729	3.8730	3.8730	3.8731	3.8731	3.8732	3.8733	
4 30	3.8733	3.8734	3.8734	3.8735	3.8736	3.8736	3.8737	3.8737	3.8738	3.8738	
4 40	3.8739	3.8740	3.8740	3.8741	3.8741	3.8742	3.8742	3.8743	3.8744	3.8744	
4 50	3.8745	3.8745	3.8746	3.8747	3.8747	3.8748	3.8748	3.8749	3.8749	3.8750	
2 5 0	3.8751	3.8751	3.8752	3.8752	3.8753	3.8754	3.8754	3.8755	3.8755	3.8756	
5 10	3.8756	3.8757	3.8758	3.8758	3.8759	3.8759	3.8760	3.8760	3.8761	3.8762	
5 20	3.8762	3.8763	3.8763	3.8764	3.8764	3.8765	3.8766	3.8766	3.8767	3.8767	
5 30	3.8768	3.8769	3.8769	3.8770	3.8770	3.8771	3.8771	3.8772	3.8773	3.8773	
5 40	3.8774	3.8774	3.8775	3.8775	3.8776	3.8777	3.8777	3.8778	3.8778	3.8779	
5 50	3.8779	3.8780	3.8781	3.8781	3.8782	3.8782	3.8783	3.8783	3.8784	3.8785	
2 6 0	3.8785	3.8786	3.8786	3.8787	3.8788	3.8788	3.8789	3.8789	3.8790	3.8790	
6 10	3.8791	3.8792	3.8792	3.8793	3.8793	3.8794	3.8794	3.8795	3.8796	3.8796	
6 20	3.8797	3.8797	3.8798	3.8798	3.8799	3.8800	3.8800	3.8801	3.8801	3.8802	
6 30	3.8802	3.8803	3.8804	3.8804	3.8805	3.8805	3.8806	3.8806	3.8807	3.8808	
6 40	3.8808	3.8809	3.8809	3.8810	3.8810	3.8811	3.8811	3.8812	3.8813	3.8813	
6 50	3.8814	3.8814	3.8815	3.8816	3.8816	3.8817	3.8817	3.8818	3.8818	3.8819	
2 7 0	3.8820	3.8820	3.8821	3.8821	3.8822	3.8822	3.8823	3.8824	3.8824	3.8825	
7 10	3.8825	3.8826	3.8826	3.8827	3.8828	3.8828	3.8829	3.8829	3.8830	3.8830	
7 20	3.8831	3.8832	3.8832	3.8833	3.8833	3.8834	3.8834	3.8835	3.8835	3.8836	
7 30	3.8837	3.8837	3.8838	3.8838	3.8839	3.8839	3.8840	3.8841	3.8841	3.8842	
7 40	3.8842	3.8843	3.8843	3.8844	3.8845	3.8845	3.8846	3.8846	3.8847	3.8847	
7 50	3.8848	3.8849	3.8849	3.8850	3.8850	3.8851	3.8851	3.8852	3.8852	3.8853	
2 8 0	3.8854	3.8854	3.8855	3.8855	3.8856	3.8856	3.8857	3.8858	3.8858	3.8859	
8 10	3.8859	3.8860	3.8860	3.8861	3.8862	3.8862	3.8863	3.8863	3.8864	3.8864	
8 20	3.8865	3.8865	3.8866	3.8867	3.8867	3.8868	3.8868	3.8869	3.8869	3.8870	
8 30	3.8871	3.8871	3.8872	3.8872	3.8873	3.8873	3.8874	3.8874	3.8875	3.8876	
8 40	3.8876	3.8877	3.8877	3.8878	3.8878	3.8879	3.8880	3.8880	3.8881	3.8881	
8 50	3.8882	3.8882	3.8883	3.8883	3.8884	3.8885	3.8885	3.8886	3.8886	3.8887	
2 9 0	3.8887	3.8888	3.8889	3.8889	3.8890	3.8890	3.8891	3.8891	3.8892	3.8892	
9 10	3.8893	3.8894	3.8894	3.8895	3.8895	3.8896	3.8896	3.8897	3.8897	3.8898	
9 20	3.8899	3.8899	3.8900	3.8900	3.8901	3.8901	3.8902	3.8903	3.8903	3.8904	
9 30	3.8904	3.8905	3.8905	3.8906	3.8906	3.8907	3.8908	3.8908	3.8909	3.8909	
9 40	3.8910	3.8910	3.8911	3.8911	3.8912	3.8912	3.8913	3.8914	3.8914	3.8915	
9 50	3.8915	3.8916	3.8916	3.8917	3.8918	3.8918	3.8919	3.8919	3.8920	3.8920	

TABLE I.

LOGARITHMS OF SMALL ARCS IN SPACE OR TIME.										
Arc.	0	1	2	3	4	5	6	7	8	9
$2^{\circ} 10' 0''$	3.8921	3.8922	3.8923	3.8923	3.8923	3.8924	3.8924	3.8925	3.8925	3.8926
10 10	3.8927	3.8927	3.8928	3.8928	3.8929	3.8929	3.8930	3.8930	3.8931	3.8932
10 20	3.8932	3.8933	3.8933	3.8934	3.8934	3.8935	3.8935	3.8936	3.8937	3.8937
10 30	3.8938	3.8938	3.8939	3.8939	3.8940	3.8940	3.8941	3.8941	3.8942	3.8943
10 40	3.8943	3.8944	3.8944	3.8945	3.8945	3.8946	3.8946	3.8947	3.8948	3.8948
10 50	3.8949	3.8949	3.8950	3.8950	3.8951	3.8951	3.8952	3.8953	3.8953	3.8954
2 11 0	3.8954	3.8955	3.8955	3.8956	3.8956	3.8957	3.8958	3.8958	3.8959	3.8959
11 10	3.8960	3.8960	3.8961	3.8961	3.8962	3.8963	3.8963	3.8964	3.8964	3.8965
11 20	3.8965	3.8966	3.8966	3.8967	3.8967	3.8968	3.8969	3.8969	3.8970	3.8970
11 30	3.8971	3.8971	3.8972	3.8972	3.8973	3.8974	3.8974	3.8975	3.8975	3.8976
11 40	3.8976	3.8977	3.8977	3.8978	3.8978	3.8979	3.8980	3.8980	3.8981	3.8981
11 50	3.8982	3.8982	3.8983	3.8983	3.8984	3.8985	3.8985	3.8986	3.8986	3.8987
2 12 0	3.8987	3.8988	3.8988	3.8989	3.8989	3.8990	3.8991	3.8991	3.8992	3.8992
12 10	3.8993	3.8993	3.8994	3.8994	3.8995	3.8995	3.8996	3.8997	3.8997	3.8998
12 20	3.8998	3.8999	3.8999	3.9000	3.9000	3.9001	3.9001	3.9002	3.9003	3.9003
12 30	3.9004	3.9004	3.9005	3.9005	3.9006	3.9006	3.9007	3.9007	3.9008	3.9009
12 40	3.9009	3.9010	3.9010	3.9011	3.9011	3.9012	3.9012	3.9013	3.9013	3.9014
12 50	3.9015	3.9015	3.9016	3.9016	3.9017	3.9017	3.9018	3.9018	3.9019	3.9019
2 13 0	3.9020	3.9021	3.9021	3.9022	3.9022	3.9023	3.9023	3.9024	3.9024	3.9025
13 10	3.9025	3.9026	3.9027	3.9027	3.9028	3.9028	3.9029	3.9029	3.9030	3.9030
13 20	3.9031	3.9031	3.9032	3.9033	3.9033	3.9034	3.9034	3.9035	3.9035	3.9036
13 30	3.9036	3.9037	3.9037	3.9038	3.9038	3.9039	3.9040	3.9040	3.9041	3.9041
13 40	3.9042	3.9042	3.9043	3.9043	3.9044	3.9044	3.9045	3.9046	3.9046	3.9047
13 50	3.9047	3.9048	3.9048	3.9049	3.9049	3.9050	3.9050	3.9051	3.9051	3.9052
2 14 0	3.9053	3.9053	3.9054	3.9054	3.9055	3.9055	3.9056	3.9056	3.9057	3.9057
14 10	3.9058	3.9058	3.9059	3.9060	3.9060	3.9061	3.9061	3.9062	3.9062	3.9063
14 20	3.9063	3.9064	3.9064	3.9065	3.9066	3.9066	3.9067	3.9067	3.9068	3.9068
14 30	3.9069	3.9069	3.9070	3.9070	3.9071	3.9071	3.9072	3.9073	3.9073	3.9074
14 40	3.9074	3.9075	3.9075	3.9076	3.9076	3.9077	3.9077	3.9078	3.9078	3.9079
14 50	3.9079	3.9080	3.9081	3.9081	3.9082	3.9082	3.9083	3.9083	3.9084	3.9084
2 15 0	3.9085	3.9085	3.9086	3.9086	3.9087	3.9088	3.9088	3.9089	3.9089	3.9090
15 10	3.9090	3.9091	3.9091	3.9092	3.9092	3.9093	3.9093	3.9094	3.9094	3.9095
15 20	3.9096	3.9096	3.9097	3.9097	3.9098	3.9098	3.9099	3.9099	3.9100	3.9100
15 30	3.9101	3.9101	3.9102	3.9103	3.9103	3.9104	3.9104	3.9105	3.9105	3.9106
15 40	3.9106	3.9107	3.9107	3.9108	3.9108	3.9109	3.9109	3.9110	3.9111	3.9111
15 50	3.9112	3.9112	3.9113	3.9113	3.9114	3.9114	3.9115	3.9115	3.9116	3.9116
2 16 0	3.9117	3.9117	3.9118	3.9118	3.9119	3.9120	3.9120	3.9121	3.9121	3.9122
16 10	3.9122	3.9123	3.9123	3.9124	3.9124	3.9125	3.9125	3.9126	3.9126	3.9127
16 20	3.9128	3.9128	3.9129	3.9129	3.9130	3.9130	3.9131	3.9131	3.9132	3.9132
16 30	3.9133	3.9133	3.9134	3.9134	3.9135	3.9135	3.9136	3.9137	3.9137	3.9138
16 40	3.9138	3.9139	3.9139	3.9140	3.9140	3.9141	3.9141	3.9142	3.9142	3.9143
16 50	3.9143	3.9144	3.9144	3.9145	3.9145	3.9146	3.9147	3.9147	3.9148	3.9148
2 17 0	3.9149	3.9149	3.9150	3.9150	3.9151	3.9151	3.9152	3.9152	3.9153	3.9153
17 10	3.9154	3.9155	3.9155	3.9156	3.9156	3.9157	3.9157	3.9158	3.9158	3.9159
17 20	3.9159	3.9160	3.9160	3.9161	3.9161	3.9162	3.9162	3.9163	3.9163	3.9164
17 30	3.9165	3.9165	3.9166	3.9166	3.9167	3.9167	3.9168	3.9168	3.9169	3.9169
17 40	3.9170	3.9170	3.9171	3.9171	3.9172	3.9172	3.9173	3.9173	3.9174	3.9175
17 50	3.9175	3.9176	3.9176	3.9177	3.9177	3.9178	3.9178	3.9179	3.9179	3.9180
2 18 0	3.9180	3.9181	3.9181	3.9182	3.9182	3.9183	3.9183	3.9184	3.9184	3.9185
18 10	3.9186	3.9186	3.9187	3.9187	3.9188	3.9188	3.9189	3.9189	3.9190	3.9190
18 20	3.9191	3.9191	3.9192	3.9192	3.9193	3.9193	3.9194	3.9194	3.9195	3.9195
18 30	3.9196	3.9197	3.9197	3.9198	3.9198	3.9199	3.9199	3.9200	3.9200	3.9201
18 40	3.9201	3.9202	3.9202	3.9203	3.9203	3.9204	3.9204	3.9205	3.9205	3.9206
18 50	3.9206	3.9207	3.9207	3.9208	3.9209	3.9209	3.9210	3.9210	3.9211	3.9211
2 19 0	3.9212	3.9212	3.9213	3.9213	3.9214	3.9214	3.9215	3.9215	3.9216	3.9216
19 10	3.9217	3.9217	3.9218	3.9218	3.9219	3.9219	3.9220	3.9221	3.9221	3.9222
19 20	3.9222	3.9223	3.9223	3.9224	3.9224	3.9225	3.9225	3.9226	3.9226	3.9227
19 30	3.9227	3.9228	3.9228	3.9229	3.9229	3.9230	3.9230	3.9231	3.9231	3.9232
19 40	3.9232	3.9233	3.9233	3.9234	3.9235	3.9235	3.9236	3.9236	3.9237	3.9237
19 50	3.9238	3.9238	3.9239	3.9239	3.9240	3.9240	3.9241	3.9241	3.9242	3.9242

TABLE I.

LOGARITHMS OF SMALL ARCS IN SPACE OR TIME.										
Arc.	0	1	2	3	4	5	6	7	8	9
$20^{\circ} 0'$	3.9243	3.9243	3.9244	3.9244	3.9245	3.9245	3.9246	3.9246	3.9247	3.9247
20 10	3.9248	3.9248	3.9249	3.9250	3.9250	3.9251	3.9251	3.9252	3.9252	3.9253
20 20	3.9253	3.9254	3.9254	3.9255	3.9255	3.9256	3.9256	3.9257	3.9257	3.9258
20 30	3.9258	3.9259	3.9259	3.9260	3.9260	3.9261	3.9261	3.9262	3.9262	3.9263
20 40	3.9263	3.9264	3.9264	3.9265	3.9265	3.9266	3.9267	3.9267	3.9268	3.9268
20 50	3.9269	3.9269	3.9270	3.9270	3.9271	3.9271	3.9272	3.9272	3.9273	3.9273
2 21 0	3.9274	3.9274	3.9275	3.9275	3.9276	3.9276	3.9277	3.9277	3.9278	3.9278
21 10	3.9279	3.9279	3.9280	3.9280	3.9281	3.9281	3.9282	3.9282	3.9283	3.9283
21 20	3.9284	3.9284	3.9285	3.9285	3.9286	3.9287	3.9287	3.9288	3.9288	3.9289
21 30	3.9289	3.9290	3.9290	3.9291	3.9291	3.9292	3.9292	3.9293	3.9293	3.9294
21 40	3.9294	3.9295	3.9295	3.9296	3.9296	3.9297	3.9297	3.9298	3.9298	3.9299
21 50	3.9299	3.9300	3.9300	3.9301	3.9301	3.9302	3.9302	3.9303	3.9303	3.9304
2 22 0	3.9304	3.9305	3.9305	3.9306	3.9306	3.9307	3.9307	3.9308	3.9308	3.9309
22 10	3.9309	3.9310	3.9311	3.9311	3.9312	3.9312	3.9313	3.9313	3.9314	3.9314
22 20	3.9315	3.9315	3.9316	3.9316	3.9317	3.9317	3.9318	3.9318	3.9319	3.9319
22 30	3.9320	3.9320	3.9321	3.9321	3.9322	3.9322	3.9323	3.9323	3.9324	3.9324
22 40	3.9325	3.9325	3.9326	3.9326	3.9327	3.9327	3.9328	3.9328	3.9329	3.9329
22 50	3.9330	3.9330	3.9331	3.9331	3.9332	3.9332	3.9333	3.9333	3.9334	3.9334
2 23 0	3.9335	3.9335	3.9336	3.9336	3.9337	3.9337	3.9338	3.9338	3.9339	3.9339
23 10	3.9340	3.9340	3.9341	3.9341	3.9342	3.9342	3.9343	3.9343	3.9344	3.9344
23 20	3.9345	3.9345	3.9346	3.9346	3.9347	3.9348	3.9348	3.9349	3.9349	3.9350
23 30	3.9350	3.9351	3.9351	3.9352	3.9352	3.9353	3.9353	3.9354	3.9354	3.9355
23 40	3.9355	3.9356	3.9356	3.9357	3.9357	3.9358	3.9358	3.9359	3.9359	3.9360
23 50	3.9360	3.9361	3.9361	3.9362	3.9362	3.9363	3.9363	3.9364	3.9364	3.9365
2 24 0	3.9365	3.9366	3.9366	3.9367	3.9367	3.9368	3.9368	3.9369	3.9369	3.9370
24 10	3.9370	3.9371	3.9371	3.9372	3.9372	3.9373	3.9373	3.9374	3.9374	3.9375
24 20	3.9375	3.9376	3.9376	3.9377	3.9377	3.9378	3.9378	3.9379	3.9379	3.9380
24 30	3.9380	3.9381	3.9381	3.9382	3.9382	3.9383	3.9383	3.9384	3.9384	3.9385
24 40	3.9385	3.9386	3.9386	3.9387	3.9387	3.9388	3.9388	3.9389	3.9389	3.9390
24 50	3.9390	3.9391	3.9391	3.9392	3.9392	3.9393	3.9393	3.9394	3.9394	3.9395
2 25 0	3.9395	3.9396	3.9396	3.9397	3.9397	3.9398	3.9398	3.9399	3.9399	3.9400
25 10	3.9400	3.9401	3.9401	3.9402	3.9402	3.9403	3.9403	3.9404	3.9404	3.9405
25 20	3.9405	3.9406	3.9406	3.9407	3.9407	3.9408	3.9408	3.9409	3.9409	3.9410
25 30	3.9410	3.9411	3.9411	3.9412	3.9412	3.9413	3.9413	3.9414	3.9414	3.9415
25 40	3.9415	3.9416	3.9416	3.9417	3.9417	3.9418	3.9418	3.9419	3.9419	3.9420
25 50	3.9420	3.9421	3.9421	3.9422	3.9422	3.9423	3.9423	3.9424	3.9424	3.9425
2 26 0	3.9425	3.9426	3.9426	3.9427	3.9427	3.9428	3.9428	3.9429	3.9429	3.9430
26 10	3.9430	3.9430	3.9431	3.9431	3.9432	3.9432	3.9433	3.9433	3.9434	3.9434
26 20	3.9435	3.9435	3.9436	3.9436	3.9437	3.9437	3.9438	3.9438	3.9439	3.9439
26 30	3.9440	3.9440	3.9441	3.9441	3.9442	3.9442	3.9443	3.9443	3.9444	3.9444
26 40	3.9445	3.9445	3.9446	3.9446	3.9447	3.9447	3.9448	3.9448	3.9449	3.9449
26 50	3.9450	3.9450	3.9451	3.9451	3.9452	3.9452	3.9453	3.9453	3.9454	3.9454
2 27 0	3.9455	3.9455	3.9456	3.9456	3.9457	3.9457	3.9458	3.9458	3.9459	3.9459
27 10	3.9460	3.9460	3.9461	3.9461	3.9462	3.9462	3.9463	3.9463	3.9464	3.9464
27 20	3.9465	3.9465	3.9466	3.9466	3.9467	3.9467	3.9468	3.9468	3.9469	3.9469
27 30	3.9469	3.9470	3.9470	3.9471	3.9471	3.9472	3.9472	3.9473	3.9473	3.9474
27 40	3.9474	3.9475	3.9475	3.9476	3.9476	3.9477	3.9477	3.9478	3.9478	3.9479
27 50	3.9479	3.9480	3.9480	3.9481	3.9481	3.9482	3.9482	3.9483	3.9483	3.9484
2 28 0	3.9484	3.9485	3.9485	3.9486	3.9486	3.9487	3.9487	3.9488	3.9488	3.9489
28 10	3.9489	3.9490	3.9490	3.9490	3.9491	3.9491	3.9492	3.9492	3.9493	3.9493
28 20	3.9494	3.9494	3.9495	3.9495	3.9496	3.9496	3.9497	3.9497	3.9498	3.9498
28 30	3.9499	3.9499	3.9500	3.9500	3.9501	3.9501	3.9502	3.9502	3.9503	3.9503
28 40	3.9504	3.9504	3.9505	3.9505	3.9506	3.9506	3.9507	3.9507	3.9508	3.9508
28 50	3.9509	3.9509	3.9509	3.9510	3.9510	3.9511	3.9511	3.9512	3.9512	3.9513
2 29 0	3.9513	3.9514	3.9514	3.9515	3.9515	3.9516	3.9516	3.9517	3.9517	3.9518
29 10	3.9518	3.9519	3.9519	3.9520	3.9520	3.9521	3.9521	3.9522	3.9522	3.9523
29 20	3.9523	3.9524	3.9524	3.9525	3.9525	3.9526	3.9526	3.9527	3.9527	3.9528
29 30	3.9528	3.9528	3.9529	3.9529	3.9530	3.9530	3.9531	3.9531	3.9532	3.9532
29 40	3.9533	3.9533	3.9534	3.9534	3.9535	3.9535	3.9536	3.9536	3.9537	3.9537
29 50	3.9538	3.9538	3.9539	3.9539	3.9540	3.9540	3.9541	3.9541	3.9542	3.9542

TABLE I.

LOGARITHMS OF SMALL ARCS IN SPACE OR TIME.										
Arc.	0	1	2	3	4	5	6	7	8	9
2 ^h 30 ^m 0 ^s	3.9542	3.9543	3.9543	3.9544	3.9544	3.9545	3.9545	3.9546	3.9546	3.9547
30 10	3.9547	3.9548	3.9548	3.9549	3.9549	3.9550	3.9550	3.9551	3.9551	3.9552
30 20	3.9552	3.9553	3.9553	3.9554	3.9554	3.9554	3.9555	3.9555	3.9556	3.9556
30 30	3.9557	3.9557	3.9558	3.9558	3.9559	3.9559	3.9560	3.9560	3.9561	3.9561
30 40	3.9562	3.9562	3.9563	3.9563	3.9564	3.9564	3.9565	3.9565	3.9566	3.9566
30 50	3.9566	3.9567	3.9567	3.9568	3.9568	3.9569	3.9569	3.9570	3.9570	3.9571
2 31 0	3.9571	3.9572	3.9572	3.9573	3.9573	3.9574	3.9574	3.9575	3.9575	3.9576
31 10	3.9576	3.9577	3.9577	3.9578	3.9578	3.9578	3.9579	3.9579	3.9580	3.9580
31 20	3.9581	3.9581	3.9582	3.9582	3.9583	3.9583	3.9584	3.9584	3.9585	3.9585
31 30	3.9586	3.9586	3.9587	3.9587	3.9588	3.9588	3.9589	3.9589	3.9590	3.9590
31 40	3.9590	3.9591	3.9591	3.9592	3.9592	3.9593	3.9593	3.9594	3.9594	3.9595
31 50	3.9595	3.9596	3.9596	3.9597	3.9597	3.9598	3.9598	3.9599	3.9599	3.9599
2 32 0	3.9600	3.9600	3.9601	3.9601	3.9602	3.9602	3.9603	3.9603	3.9604	3.9604
32 10	3.9605	3.9605	3.9606	3.9606	3.9607	3.9607	3.9608	3.9608	3.9609	3.9609
32 20	3.9609	3.9610	3.9610	3.9611	3.9611	3.9612	3.9612	3.9613	3.9613	3.9614
32 30	3.9614	3.9615	3.9615	3.9616	3.9616	3.9617	3.9617	3.9618	3.9618	3.9618
32 40	3.9619	3.9619	3.9620	3.9620	3.9621	3.9621	3.9622	3.9622	3.9623	3.9623
32 50	3.9624	3.9624	3.9625	3.9625	3.9626	3.9626	3.9627	3.9627	3.9627	3.9628
2 33 0	3.9628	3.9629	3.9629	3.9630	3.9630	3.9631	3.9631	3.9632	3.9632	3.9633
33 10	3.9633	3.9634	3.9634	3.9634	3.9635	3.9635	3.9636	3.9636	3.9637	3.9637
33 20	3.9638	3.9638	3.9639	3.9639	3.9640	3.9640	3.9641	3.9641	3.9642	3.9642
33 30	3.9642	3.9643	3.9643	3.9644	3.9644	3.9645	3.9645	3.9646	3.9646	3.9647
33 40	3.9647	3.9648	3.9648	3.9649	3.9649	3.9650	3.9650	3.9651	3.9651	3.9652
33 50	3.9652	3.9653	3.9653	3.9653	3.9654	3.9654	3.9655	3.9655	3.9656	3.9656
2 34 0	3.9657	3.9657	3.9658	3.9658	3.9658	3.9659	3.9659	3.9660	3.9660	3.9661
34 10	3.9661	3.9662	3.9662	3.9663	3.9663	3.9664	3.9664	3.9665	3.9665	3.9665
34 20	3.9666	3.9666	3.9667	3.9667	3.9668	3.9668	3.9669	3.9669	3.9670	3.9670
34 30	3.9671	3.9671	3.9672	3.9672	3.9672	3.9673	3.9673	3.9674	3.9674	3.9675
34 40	3.9675	3.9676	3.9676	3.9677	3.9677	3.9678	3.9678	3.9679	3.9679	3.9680
34 50	3.9680	3.9681	3.9681	3.9682	3.9682	3.9682	3.9683	3.9683	3.9684	3.9684
2 35 0	3.9685	3.9685	3.9686	3.9686	3.9687	3.9687	3.9688	3.9688	3.9689	3.9689
35 10	3.9689	3.9690	3.9690	3.9691	3.9691	3.9692	3.9692	3.9693	3.9693	3.9694
35 20	3.9694	3.9695	3.9695	3.9696	3.9696	3.9696	3.9697	3.9697	3.9698	3.9698
35 30	3.9699	3.9699	3.9700	3.9700	3.9701	3.9701	3.9702	3.9702	3.9703	3.9703
35 40	3.9703	3.9704	3.9704	3.9705	3.9705	3.9706	3.9706	3.9707	3.9707	3.9708
35 50	3.9708	3.9709	3.9709	3.9710	3.9710	3.9710	3.9711	3.9711	3.9712	3.9712
2 36 0	3.9713	3.9713	3.9714	3.9714	3.9715	3.9715	3.9716	3.9716	3.9716	3.9717
36 10	3.9717	3.9718	3.9718	3.9719	3.9719	3.9720	3.9720	3.9721	3.9721	3.9722
36 20	3.9722	3.9722	3.9723	3.9723	3.9724	3.9724	3.9725	3.9725	3.9726	3.9726
36 30	3.9727	3.9727	3.9728	3.9728	3.9729	3.9729	3.9729	3.9730	3.9730	3.9731
36 40	3.9731	3.9732	3.9732	3.9733	3.9733	3.9734	3.9734	3.9735	3.9735	3.9735
36 50	3.9736	3.9736	3.9737	3.9737	3.9738	3.9738	3.9739	3.9739	3.9740	3.9740
2 37 0	3.9741	3.9741	3.9741	3.9742	3.9742	3.9743	3.9743	3.9744	3.9744	3.9745
37 10	3.9745	3.9746	3.9746	3.9746	3.9747	3.9747	3.9748	3.9748	3.9749	3.9749
37 20	3.9750	3.9750	3.9751	3.9751	3.9752	3.9752	3.9752	3.9753	3.9753	3.9754
37 30	3.9754	3.9755	3.9755	3.9756	3.9756	3.9757	3.9757	3.9758	3.9758	3.9758
37 40	3.9759	3.9759	3.9760	3.9760	3.9761	3.9761	3.9762	3.9762	3.9763	3.9763
37 50	3.9768	3.9764	3.9764	3.9765	3.9765	3.9766	3.9766	3.9767	3.9767	3.9768
2 38 0	3.9768	3.9769	3.9769	3.9769	3.9770	3.9770	3.9771	3.9771	3.9772	3.9772
38 10	3.9773	3.9773	3.9774	3.9774	3.9774	3.9775	3.9775	3.9776	3.9776	3.9777
38 20	3.9777	3.9778	3.9778	3.9779	3.9779	3.9779	3.9780	3.9780	3.9781	3.9781
38 30	3.9782	3.9782	3.9783	3.9783	3.9784	3.9784	3.9785	3.9785	3.9785	3.9786
38 40	3.9786	3.9787	3.9787	3.9788	3.9788	3.9789	3.9789	3.9790	3.9790	3.9790
38 50	3.9791	3.9791	3.9792	3.9792	3.9793	3.9793	3.9794	3.9794	3.9795	3.9795
2 39 0	3.9795	3.9796	3.9796	3.9797	3.9797	3.9798	3.9798	3.9799	3.9799	3.9800
39 10	3.9800	3.9800	3.9801	3.9801	3.9802	3.9802	3.9803	3.9803	3.9804	3.9804
39 20	3.9805	3.9805	3.9805	3.9806	3.9806	3.9807	3.9807	3.9808	3.9808	3.9809
39 30	3.9809	3.9810	3.9810	3.9810	3.9811	3.9811	3.9812	3.9812	3.9813	3.9813
39 40	3.9814	3.9814	3.9815	3.9815	3.9815	3.9816	3.9816	3.9817	3.9817	3.9818
39 50	3.9818	3.9819	3.9819	3.9819	3.9820	3.9820	3.9821	3.9821	3.9822	3.9822

TABLE I.

LOGARITHMS OF SMALL ARCS IN SPACE OR TIME.										
Arc.	0	1	2	3	4	5	6	7	8	9
2 40 ^m 0 ^s	3.9823	3.9823	3.9824	3.9824	3.9825	3.9825	3.9825	3.9826	3.9826	3.9827
40 10	3.9827	3.9828	3.9828	3.9829	3.9829	3.9829	3.9830	3.9830	3.9831	3.9831
40 20	3.9832	3.9832	3.9833	3.9833	3.9834	3.9834	3.9834	3.9835	3.9835	3.9836
40 30	3.9836	3.9837	3.9837	3.9838	3.9838	3.9839	3.9839	3.9839	3.9840	3.9840
40 40	3.9841	3.9841	3.9842	3.9842	3.9843	3.9843	3.9843	3.9844	3.9844	3.9845
40 50	3.9845	3.9846	3.9846	3.9847	3.9847	3.9848	3.9848	3.9848	3.9849	3.9849
2 41 0	3.9850	3.9850	3.9851	3.9851	3.9852	3.9852	3.9852	3.9853	3.9853	3.9854
41 10	3.9854	3.9855	3.9855	3.9856	3.9856	3.9857	3.9857	3.9857	3.9858	3.9858
41 20	3.9859	3.9859	3.9860	3.9860	3.9861	3.9861	3.9861	3.9862	3.9862	3.9863
41 30	3.9863	3.9864	3.9864	3.9865	3.9865	3.9866	3.9866	3.9866	3.9867	3.9867
41 40	3.9868	3.9868	3.9869	3.9869	3.9870	3.9870	3.9870	3.9871	3.9871	3.9872
41 50	3.9872	3.9873	3.9873	3.9874	3.9874	3.9874	3.9875	3.9875	3.9876	3.9876
2 42 0	3.9877	3.9877	3.9878	3.9878	3.9878	3.9879	3.9879	3.9880	3.9880	3.9881
42 10	3.9881	3.9882	3.9882	3.9882	3.9883	3.9883	3.9884	3.9884	3.9885	3.9885
42 20	3.9886	3.9886	3.9886	3.9887	3.9887	3.9888	3.9888	3.9889	3.9889	3.9890
42 30	3.9890	3.9890	3.9891	3.9891	3.9892	3.9892	3.9893	3.9893	3.9894	3.9894
42 40	3.9894	3.9895	3.9895	3.9896	3.9896	3.9897	3.9897	3.9898	3.9898	3.9898
42 50	3.9899	3.9899	3.9900	3.9900	3.9901	3.9901	3.9902	3.9902	3.9903	3.9903
2 43 0	3.9903	3.9904	3.9904	3.9905	3.9905	3.9906	3.9906	3.9906	3.9907	3.9907
43 10	3.9908	3.9908	3.9909	3.9909	3.9910	3.9910	3.9911	3.9911	3.9912	3.9912
43 20	3.9912	3.9913	3.9913	3.9914	3.9914	3.9914	3.9915	3.9915	3.9916	3.9916
43 30	3.9917	3.9917	3.9918	3.9918	3.9918	3.9919	3.9919	3.9920	3.9920	3.9921
43 40	3.9921	3.9922	3.9922	3.9922	3.9923	3.9923	3.9924	3.9924	3.9925	3.9925
43 50	3.9926	3.9926	3.9926	3.9927	3.9927	3.9928	3.9928	3.9929	3.9929	3.9930
2 44 0	3.9930	3.9930	3.9931	3.9931	3.9932	3.9932	3.9933	3.9933	3.9933	3.9934
44 10	3.9934	3.9935	3.9935	3.9936	3.9936	3.9937	3.9937	3.9937	3.9938	3.9938
44 20	3.9939	3.9939	3.9940	3.9940	3.9941	3.9941	3.9941	3.9942	3.9942	3.9943
44 30	3.9943	3.9944	3.9944	3.9944	3.9945	3.9945	3.9946	3.9946	3.9947	3.9947
44 40	3.9948	3.9948	3.9948	3.9949	3.9949	3.9950	3.9950	3.9951	3.9951	3.9952
44 50	3.9952	3.9952	3.9953	3.9953	3.9954	3.9954	3.9955	3.9955	3.9955	3.9956
2 45 0	3.9956	3.9957	3.9957	3.9958	3.9958	3.9959	3.9959	3.9959	3.9960	3.9960
45 10	3.9961	3.9961	3.9962	3.9962	3.9962	3.9963	3.9963	3.9964	3.9964	3.9965
45 20	3.9965	3.9966	3.9966	3.9966	3.9967	3.9967	3.9968	3.9968	3.9969	3.9969
45 30	3.9969	3.9970	3.9970	3.9971	3.9971	3.9972	3.9972	3.9973	3.9973	3.9973
45 40	3.9974	3.9974	3.9975	3.9975	3.9976	3.9976	3.9976	3.9977	3.9977	3.9978
45 50	3.9978	3.9979	3.9979	3.9980	3.9980	3.9980	3.9981	3.9981	3.9982	3.9982
2 46 0	3.9983	3.9983	3.9983	3.9984	3.9984	3.9985	3.9985	3.9986	3.9986	3.9987
46 10	3.9987	3.9987	3.9988	3.9988	3.9989	3.9989	3.9990	3.9990	3.9991	3.9991
46 20	3.9991	3.9992	3.9992	3.9993	3.9993	3.9993	3.9994	3.9994	3.9995	3.9995
46 30	3.9996	3.9996	3.9997	3.9997	3.9997	3.9998	3.9998	3.9999	3.9999	4.0000
46 40	4.0000	4.0000	4.0001	4.0001	4.0002	4.0002	4.0003	4.0003	4.0003	4.0004
46 50	4.0004	4.0005	4.0005	4.0006	4.0006	4.0007	4.0007	4.0007	4.0008	4.0008
2 47 0	4.0009	4.0009	4.0010	4.0010	4.0010	4.0011	4.0011	4.0012	4.0012	4.0013
47 10	4.0013	4.0013	4.0014	4.0014	4.0015	4.0015	4.0016	4.0016	4.0016	4.0017
47 20	4.0017	4.0018	4.0018	4.0019	4.0019	4.0019	4.0020	4.0020	4.0021	4.0021
47 30	4.0022	4.0022	4.0023	4.0023	4.0023	4.0024	4.0024	4.0025	4.0025	4.0026
47 40	4.0026	4.0026	4.0027	4.0027	4.0028	4.0028	4.0029	4.0029	4.0029	4.0030
47 50	4.0030	4.0031	4.0031	4.0032	4.0032	4.0032	4.0033	4.0033	4.0034	4.0034
2 48 0	4.0035	4.0035	4.0035	4.0036	4.0036	4.0037	4.0037	4.0038	4.0038	4.0038
48 10	4.0039	4.0039	4.0040	4.0040	4.0041	4.0041	4.0041	4.0042	4.0042	4.0043
48 20	4.0043	4.0044	4.0044	4.0045	4.0045	4.0045	4.0046	4.0046	4.0047	4.0047
48 30	4.0048	4.0048	4.0048	4.0049	4.0049	4.0050	4.0050	4.0051	4.0051	4.0051
48 40	4.0052	4.0052	4.0053	4.0053	4.0054	4.0054	4.0054	4.0055	4.0055	4.0056
48 50	4.0056	4.0057	4.0057	4.0057	4.0058	4.0058	4.0059	4.0059	4.0060	4.0060
2 49 0	4.0060	4.0061	4.0061	4.0062	4.0062	4.0063	4.0063	4.0063	4.0064	4.0064
49 10	4.0065	4.0065	4.0066	4.0066	4.0066	4.0067	4.0067	4.0068	4.0068	4.0069
49 20	4.0069	4.0069	4.0070	4.0070	4.0071	4.0071	4.0072	4.0072	4.0072	4.0073
49 30	4.0073	4.0074	4.0074	4.0074	4.0075	4.0075	4.0076	4.0076	4.0077	4.0077
49 40	4.0077	4.0078	4.0078	4.0079	4.0079	4.0080	4.0080	4.0080	4.0081	4.0081
49 50	4.0082	4.0082	4.0083	4.0083	4.0083	4.0084	4.0084	4.0085	4.0085	4.0086

TABLE I.

LOGARITHMS OF SMALL ARCS IN SPACE OR TIME.										
Arc.	0	1	2	3	4	5	6	7	8	9
$0^{\circ} 50^m \frac{0}{10}$	4.0086	4.0086	4.0087	4.0087	4.0088	4.0088	4.0089	4.0089	4.0089	4.0090
50 10	4.0090	4.0091	4.0091	4.0092	4.0092	4.0092	4.0093	4.0093	4.0094	4.0094
50 20	4.0095	4.0095	4.0095	4.0096	4.0096	4.0097	4.0097	4.0097	4.0098	4.0098
50 30	4.0099	4.0099	4.0100	4.0100	4.0100	4.0101	4.0101	4.0102	4.0102	4.0103
50 40	4.0103	4.0103	4.0104	4.0104	4.0105	4.0105	4.0106	4.0106	4.0106	4.0107
50 50	4.0107	4.0108	4.0108	4.0109	4.0109	4.0109	4.0110	4.0110	4.0111	4.0111
2 51 0	4.0111	4.0112	4.0112	4.0113	4.0113	4.0114	4.0114	4.0114	4.0115	4.0115
51 10	4.0116	4.0116	4.0117	4.0117	4.0117	4.0118	4.0118	4.0119	4.0119	4.0120
51 20	4.0120	4.0120	4.0121	4.0121	4.0122	4.0122	4.0122	4.0123	4.0123	4.0124
51 30	4.0124	4.0125	4.0125	4.0125	4.0126	4.0126	4.0127	4.0127	4.0128	4.0128
51 40	4.0128	4.0129	4.0129	4.0130	4.0130	4.0130	4.0131	4.0131	4.0132	4.0132
51 50	4.0133	4.0133	4.0133	4.0134	4.0134	4.0135	4.0135	4.0136	4.0136	4.0136
2 52 0	4.0137	4.0137	4.0138	4.0138	4.0138	4.0139	4.0139	4.0140	4.0140	4.0141
52 10	4.0141	4.0141	4.0142	4.0142	4.0143	4.0143	4.0144	4.0144	4.0144	4.0145
52 20	4.0145	4.0146	4.0146	4.0146	4.0147	4.0147	4.0148	4.0148	4.0149	4.0149
52 30	4.0149	4.0150	4.0150	4.0151	4.0151	4.0152	4.0152	4.0153	4.0153	4.0153
52 40	4.0154	4.0154	4.0154	4.0155	4.0155	4.0156	4.0156	4.0157	4.0157	4.0157
52 50	4.0158	4.0158	4.0159	4.0159	4.0159	4.0160	4.0160	4.0161	4.0161	4.0162
2 53 0	4.0162	4.0162	4.0163	4.0163	4.0164	4.0164	4.0164	4.0165	4.0165	4.0166
53 10	4.0166	4.0167	4.0167	4.0167	4.0168	4.0168	4.0169	4.0169	4.0169	4.0170
53 20	4.0170	4.0171	4.0171	4.0172	4.0172	4.0172	4.0173	4.0173	4.0174	4.0174
53 30	4.0175	4.0175	4.0175	4.0176	4.0176	4.0177	4.0177	4.0177	4.0178	4.0178
53 40	4.0179	4.0179	4.0180	4.0180	4.0180	4.0181	4.0181	4.0182	4.0182	4.0182
53 50	4.0183	4.0183	4.0184	4.0184	4.0185	4.0185	4.0185	4.0186	4.0186	4.0187
2 54 0	4.0187	4.0187	4.0188	4.0188	4.0189	4.0189	4.0190	4.0190	4.0190	4.0191
54 10	4.0191	4.0192	4.0192	4.0192	4.0193	4.0193	4.0194	4.0194	4.0194	4.0195
54 20	4.0195	4.0196	4.0196	4.0197	4.0197	4.0197	4.0198	4.0198	4.0199	4.0199
54 30	4.0199	4.0200	4.0200	4.0201	4.0201	4.0202	4.0202	4.0202	4.0203	4.0203
54 40	4.0204	4.0204	4.0204	4.0205	4.0205	4.0206	4.0206	4.0207	4.0207	4.0207
54 50	4.0208	4.0208	4.0209	4.0209	4.0209	4.0210	4.0210	4.0211	4.0211	4.0211
2 55 0	4.0212	4.0212	4.0213	4.0213	4.0214	4.0214	4.0214	4.0215	4.0215	4.0216
55 10	4.0216	4.0216	4.0217	4.0217	4.0218	4.0218	4.0219	4.0219	4.0219	4.0220
55 20	4.0220	4.0221	4.0221	4.0221	4.0222	4.0222	4.0223	4.0223	4.0223	4.0224
55 30	4.0224	4.0225	4.0225	4.0225	4.0226	4.0226	4.0227	4.0227	4.0228	4.0228
55 40	4.0228	4.0229	4.0229	4.0230	4.0230	4.0230	4.0231	4.0231	4.0232	4.0232
55 50	4.0233	4.0233	4.0233	4.0234	4.0234	4.0235	4.0235	4.0235	4.0236	4.0236
2 56 0	4.0237	4.0237	4.0237	4.0238	4.0238	4.0239	4.0239	4.0240	4.0240	4.0240
56 10	4.0241	4.0241	4.0242	4.0242	4.0242	4.0243	4.0243	4.0244	4.0244	4.0244
56 20	4.0245	4.0245	4.0246	4.0246	4.0246	4.0247	4.0247	4.0248	4.0248	4.0249
56 30	4.0249	4.0249	4.0250	4.0250	4.0251	4.0251	4.0251	4.0252	4.0252	4.0253
56 40	4.0253	4.0253	4.0254	4.0254	4.0255	4.0255	4.0256	4.0256	4.0256	4.0257
56 50	4.0257	4.0258	4.0258	4.0258	4.0259	4.0259	4.0260	4.0260	4.0260	4.0261
2 57 0	4.0261	4.0262	4.0262	4.0262	4.0263	4.0263	4.0264	4.0264	4.0265	4.0265
57 10	4.0265	4.0266	4.0266	4.0267	4.0267	4.0267	4.0268	4.0268	4.0269	4.0269
57 20	4.0269	4.0270	4.0270	4.0271	4.0271	4.0271	4.0272	4.0272	4.0273	4.0273
57 30	4.0273	4.0274	4.0274	4.0275	4.0275	4.0276	4.0276	4.0276	4.0277	4.0277
57 40	4.0278	4.0278	4.0278	4.0279	4.0279	4.0280	4.0280	4.0280	4.0281	4.0281
57 50	4.0282	4.0282	4.0282	4.0283	4.0283	4.0284	4.0284	4.0284	4.0285	4.0285
2 58 0	4.0286	4.0286	4.0287	4.0287	4.0287	4.0288	4.0288	4.0289	4.0289	4.0289
58 10	4.0290	4.0290	4.0291	4.0291	4.0291	4.0292	4.0292	4.0293	4.0293	4.0293
58 20	4.0294	4.0294	4.0295	4.0295	4.0295	4.0296	4.0296	4.0297	4.0297	4.0297
58 30	4.0298	4.0298	4.0299	4.0299	4.0300	4.0300	4.0300	4.0301	4.0301	4.0302
58 40	4.0302	4.0302	4.0303	4.0303	4.0304	4.0304	4.0304	4.0305	4.0305	4.0306
58 50	4.0306	4.0306	4.0307	4.0307	4.0308	4.0308	4.0308	4.0309	4.0309	4.0310
2 59 0	4.0310	4.0310	4.0311	4.0311	4.0312	4.0312	4.0312	4.0313	4.0313	4.0314
59 10	4.0314	4.0314	4.0315	4.0315	4.0316	4.0316	4.0317	4.0317	4.0317	4.0318
59 20	4.0318	4.0319	4.0319	4.0319	4.0320	4.0320	4.0321	4.0321	4.0321	4.0322
59 30	4.0322	4.0323	4.0323	4.0323	4.0324	4.0324	4.0325	4.0325	4.0325	4.0326
59 40	4.0326	4.0327	4.0327	4.0327	4.0328	4.0328	4.0329	4.0329	4.0329	4.0330
59 50	4.0330	4.0331	4.0331	4.0331	4.0332	4.0332	4.0333	4.0333	4.0333	4.0334

TABLE II.

TABLE, SHOWING THE CORRECTION REQUIRED, ON ACCOUNT OF
SECOND DIFFERENCES OF THE MOON'S MOTION, IN FINDING
THE GREENWICH TIME CORRESPONDING TO A
CORRECTED LUNAR DISTANCE.

Approximate Interval.		Difference of the Proportional Logarithms in the Ephemeris.																											
		9	4	6	8	10	12	14	16	18	20	22	24	26	28	30	32	34	36	38	40	42	44	46	48	50	52		
h. m.	h. m.	s.	s.	s.	s.	s.	s.	s.	s.	s.	s.	s.	s.	s.	s.	s.	s.	s.	s.	s.	s.	s.	s.	s.	s.	s.	s.		
0 0	3 0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
0 10	2 50	0	0	0	1	1	1	1	1	1	1	2	2	2	2	2	2	2	2	2	2	2	3	3	3	3	3		
0 20	2 40	0	1	1	1	1	2	2	2	2	2	3	3	3	3	4	4	4	4	4	5	5	5	5	6	6	6		
0 30	2 30	0	1	1	2	2	2	2	3	3	3	4	4	5	5	5	6	6	6	7	7	7	7	8	8	8	9		
0 40	2 20	0	1	1	2	2	3	3	3	4	4	5	5	6	6	6	7	7	8	8	9	9	10	10	10	11	11		
0 50	2 10	1	1	2	2	3	3	4	4	5	5	6	6	7	7	8	8	9	9	10	10	10	11	12	12	13	13		
1 0	2 0	1	1	2	2	3	3	4	4	5	6	6	7	7	8	8	9	9	10	10	11	12	12	13	13	14	14		
1 10	1 50	1	1	2	2	3	4	4	5	5	6	6	7	8	8	9	9	10	11	11	12	12	13	14	14	15	15		
1 20	1 40	1	1	2	3	3	4	4	5	6	6	7	7	8	9	9	10	10	11	12	12	13	14	14	15	15	16		
1 30	1 30	1	1	2	3	3	4	4	5	6	6	7	8	8	9	9	10	11	11	12	12	13	14	14	15	16	16		

Approximate Interval.		Difference of the Proportional Logarithms in the Ephemeris.																											
		54	56	58	60	62	64	66	68	70	72	74	76	78	80	82	84	86	88	90	92	94	96	98	100	102			
h. m.	h. m.	s.	s.	s.	s.	s.	s.	s.	s.	s.	s.	s.	s.	s.	s.	s.	s.	s.	s.	s.	s.	s.	s.	s.	s.	s.			
0 0	3 0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
0 10	2 50	4	4	4	4	4	4	4	4	5	5	5	5	5	5	6	6	6	6	6	6	6	6	6	7	7			
0 20	2 40	7	7	7	7	8	8	8	8	9	9	9	9	10	10	10	10	11	11	11	11	12	12	12	12	13			
0 30	2 30	9	10	10	10	11	11	12	12	12	13	13	13	14	14	14	14	15	15	16	16	16	17	17	17	18			
0 40	2 20	12	12	13	13	13	14	14	15	15	16	16	17	17	18	18	19	19	19	20	20	20	21	21	22	22			
0 50	2 10	14	14	15	15	16	16	16	17	17	18	19	19	20	20	21	21	22	22	23	23	23	24	24	25	26			
1 0	2 0	15	16	16	17	17	18	18	19	19	20	21	21	22	22	23	23	24	24	25	25	26	27	27	28	28			
1 10	1 50	16	17	17	18	18	19	19	20	21	21	22	22	23	24	24	25	25	26	27	27	28	28	29	30	30			
1 20	1 40	17	17	18	19	19	20	20	21	21	22	23	23	24	25	25	26	26	27	28	28	29	29	30	31	31			
1 30	1 30	17	18	18	19	19	20	21	21	22	23	23	24	24	25	25	26	27	27	28	29	29	30	31	31	32			

Approximate Interval.		Difference of the Proportional Logarithms in the Ephemeris.																											
		104	106	108	110	112	114	116	118	120	122	124	126	128	130	132	134	136	138										
h. m.	h. m.	s.	s.	s.	s.	s.	s.	s.	s.	s.	s.	s.	s.	s.	s.	s.	s.	s.	s.										
0 0	3 0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0										
0 10	2 50	7	7	7	7	7	7	8	8	8	8	8	8	8	8	9	9	9	9										
0 20	2 40	13	13	13	14	14	14	14	15	15	15	15	15	16	16	16	16	17	17										
0 30	2 30	18	18	19	19	19	20	20	20	21	21	21	22	22	22	23	23	24	24										
0 40	2 20	22	23	23	24	24	25	25	25	26	26	27	27	28	28	28	29	29	30										
0 50	2 10	26	26	27	27	28	29	29	29	30	30	31	31	31	32	32	33	33	34										
1 0	2 0	29	29	30	30	31	31	32	33	33	34	34	35	35	36	36	37	37	38										
1 10	1 50	31	31	32	32	33	34	34	35	35	36	37	37	38	38	39	40	40	41										
1 20	1 40	32	33	33	34	34	35	35	36	37	38	38	39	39	40	41	41	42	42										
1 30	1 30	32	33	34	34	35	35	36	36	37	38	39	39	40	40	41	42	42	43										

The Correction is to be *added* to the approximate Greenwich Time when the Proportional Logarithms in the Ephemeris are *decreasing*, and *subtracted* when they are *increasing*.

TABLE III. SIDEREAL INTO MEAN SOLAR TIME.

Sidereal.	0 h.	1 h.	2 h.	3 h.	4 h.	5 h.	6 h.	7 h.	For Seconds.	
m.	m. s.	m. s.	m. s.	m. s.	m. s.	m. s.	m. s.	m. s.	m.	s.
0	0 00.000	0 09.830	0 19.859	0 29.489	0 39.318	0 49.148	0 58.977	1 08.807		
1	0 00.164	0 09.993	0 19.823	0 29.653	0 39.482	0 49.312	0 59.141	1 08.971	1	0.003
2	0 00.328	0 10.157	0 19.987	0 29.816	0 39.646	0 49.475	0 59.305	1 09.135	2	.005
3	0 00.491	0 10.321	0 20.151	0 29.980	0 39.810	0 49.639	0 59.469	1 09.298	3	.008
4	0 00.655	0 10.485	0 20.314	0 30.144	0 39.974	0 49.803	0 59.633	1 09.462	4	.011
5	0 00.819	0 10.649	0 20.478	0 30.308	0 40.137	0 49.967	0 59.796	1 09.626	5	.014
6	0 00.983	0 10.813	0 20.642	0 30.472	0 40.301	0 50.131	0 59.960	1 09.790	6	.016
7	0 01.147	0 10.976	0 20.806	0 30.635	0 40.465	0 50.295	1 00.124	1 09.954	7	.019
8	0 01.311	0 11.140	0 20.970	0 30.799	0 40.629	0 50.458	1 00.288	1 10.118	8	.022
9	0 01.474	0 11.304	0 21.134	0 30.963	0 40.793	0 50.622	1 00.452	1 10.281	9	.025
10	0 01.638	0 11.468	0 21.297	0 31.127	0 40.956	0 50.786	1 00.616	1 10.445	10	.027
11	0 01.802	0 11.632	0 21.461	0 31.291	0 41.120	0 50.950	1 00.779	1 10.609	11	.030
12	0 01.966	0 11.795	0 21.625	0 31.455	0 41.284	0 51.114	1 00.943	1 10.773	12	.033
13	0 02.130	0 11.959	0 21.789	0 31.618	0 41.448	0 51.278	1 01.107	1 10.937	13	.035
14	0 02.294	0 12.123	0 21.953	0 31.782	0 41.612	0 51.441	1 01.271	1 11.100	14	.038
15	0 02.457	0 12.287	0 22.117	0 31.946	0 41.776	0 51.605	1 01.435	1 11.264	15	.041
16	0 02.621	0 12.451	0 22.280	0 32.110	0 41.939	0 51.769	1 01.599	1 11.428	16	.044
17	0 02.785	0 12.615	0 22.444	0 32.274	0 42.103	0 51.933	1 01.762	1 11.592	17	.046
18	0 02.949	0 12.778	0 22.608	0 32.438	0 42.267	0 52.097	1 01.926	1 11.756	18	.049
19	0 03.113	0 12.942	0 22.772	0 32.601	0 42.431	0 52.260	1 02.090	1 11.920	19	.052
20	0 03.277	0 13.106	0 22.936	0 32.765	0 42.595	0 52.424	1 02.254	1 12.083	20	.055
21	0 03.440	0 13.270	0 23.099	0 32.929	0 42.759	0 52.588	1 02.418	1 12.247	21	.057
22	0 03.604	0 13.434	0 23.263	0 33.093	0 42.922	0 52.752	1 02.582	1 12.411	22	.060
23	0 03.768	0 13.598	0 23.427	0 33.257	0 43.086	0 52.916	1 02.745	1 12.575	23	.063
24	0 03.932	0 13.761	0 23.591	0 33.420	0 43.250	0 53.080	1 02.909	1 12.739	24	.066
25	0 04.096	0 13.925	0 23.755	0 33.584	0 43.414	0 53.243	1 03.073	1 12.903	25	.068
26	0 04.259	0 14.089	0 23.919	0 33.748	0 43.578	0 53.407	1 03.237	1 13.066	26	.071
27	0 04.423	0 14.253	0 24.082	0 33.912	0 43.742	0 53.571	1 03.401	1 13.230	27	.074
28	0 04.587	0 14.417	0 24.246	0 34.076	0 43.906	0 53.735	1 03.564	1 13.394	28	.076
29	0 04.751	0 14.581	0 24.410	0 34.240	0 44.069	0 53.899	1 03.728	1 13.558	29	.079
30	0 04.915	0 14.744	0 24.574	0 34.403	0 44.233	0 54.063	1 03.892	1 13.722	30	.082
31	0 05.079	0 14.908	0 24.738	0 34.567	0 44.397	0 54.226	1 04.056	1 13.886	31	.085
32	0 05.242	0 15.072	0 24.902	0 34.731	0 44.561	0 54.390	1 04.220	1 14.049	32	.087
33	0 05.406	0 15.236	0 25.065	0 34.895	0 44.724	0 54.554	1 04.384	1 14.213	33	.090
34	0 05.570	0 15.400	0 25.229	0 35.059	0 44.888	0 54.718	1 04.547	1 14.377	34	.093
35	0 05.734	0 15.563	0 25.393	0 35.223	0 45.052	0 54.882	1 04.711	1 14.541	35	.096
36	0 05.898	0 15.727	0 25.557	0 35.386	0 45.216	0 55.046	1 04.875	1 14.705	36	.098
37	0 06.062	0 15.891	0 25.721	0 35.550	0 45.380	0 55.209	1 05.039	1 14.868	37	.101
38	0 06.225	0 16.055	0 25.885	0 35.714	0 45.544	0 55.373	1 05.203	1 15.032	38	.104
39	0 06.389	0 16.219	0 26.048	0 35.878	0 45.707	0 55.537	1 05.367	1 15.196	39	.106
40	0 06.553	0 16.383	0 26.212	0 36.042	0 45.871	0 55.701	1 05.530	1 15.360	40	.109
41	0 06.717	0 16.546	0 26.376	0 36.206	0 46.035	0 55.865	1 05.694	1 15.524	41	.112
42	0 06.881	0 16.710	0 26.540	0 36.369	0 46.199	0 56.028	1 05.858	1 15.688	42	.115
43	0 07.045	0 16.874	0 26.704	0 36.533	0 46.363	0 56.192	1 06.022	1 15.851	43	.117
44	0 07.208	0 17.038	0 26.867	0 36.697	0 46.527	0 56.356	1 06.186	1 16.015	44	.120
45	0 07.372	0 17.202	0 27.031	0 36.861	0 46.690	0 56.520	1 06.350	1 16.179	45	.123
46	0 07.536	0 17.366	0 27.195	0 37.025	0 46.854	0 56.684	1 06.513	1 16.343	46	.126
47	0 07.700	0 17.529	0 27.359	0 37.188	0 47.018	0 56.848	1 06.677	1 16.507	47	.128
48	0 07.864	0 17.693	0 27.523	0 37.352	0 47.182	0 57.011	1 06.841	1 16.671	48	.131
49	0 08.027	0 17.857	0 27.687	0 37.516	0 47.346	0 57.175	1 07.005	1 16.834	49	.134
50	0 08.191	0 18.021	0 27.850	0 37.680	0 47.510	0 57.339	1 07.169	1 16.998	50	.137
51	0 08.355	0 18.185	0 28.014	0 37.844	0 47.673	0 57.503	1 07.332	1 17.162	51	.139
52	0 08.519	0 18.349	0 28.178	0 38.008	0 47.837	0 57.667	1 07.496	1 17.326	52	.142
53	0 08.683	0 18.512	0 28.342	0 38.171	0 48.001	0 57.831	1 07.660	1 17.490	53	.145
54	0 08.847	0 18.676	0 28.506	0 38.335	0 48.165	0 57.994	1 07.824	1 17.654	54	.147
55	0 09.010	0 18.840	0 28.670	0 38.499	0 48.329	0 58.158	1 07.988	1 17.817	55	.150
56	0 09.174	0 19.004	0 28.833	0 38.663	0 48.492	0 58.322	1 08.152	1 17.981	56	.153
57	0 09.338	0 19.168	0 28.997	0 38.827	0 48.656	0 58.486	1 08.315	1 18.145	57	.156
58	0 09.502	0 19.331	0 29.161	0 38.991	0 48.820	0 58.650	1 08.479	1 18.309	58	.158
59	0 09.666	0 19.495	0 29.325	0 39.154	0 48.984	0 58.814	1 08.643	1 18.473	59	.161

TABLE III. SIDEREAL INTO MEAN SOLAR TIME.

Sidereal.	8 h.	9 h.	10 h.	11 h.	12 h.	13 h.	14 h.	15 h.	For Seconds.
0	1 18.636	1 28.466	1 38.296	1 48.125	1 57.955	2 07.784	2 17.614	2 27.443	1 0.003
1	1 18.800	1 28.630	1 38.459	1 48.289	1 58.119	2 07.948	2 17.778	2 27.607	2 .005
2	1 18.964	1 28.794	1 38.623	1 48.453	1 58.282	2 08.112	2 17.941	2 27.771	3 .008
3	1 19.128	1 28.958	1 38.787	1 48.617	1 58.446	2 08.276	2 18.105	2 27.935	4 .011
4	1 19.292	1 29.121	1 38.951	1 48.780	1 58.610	2 08.440	2 18.269	2 28.099	5 .014
5	1 19.456	1 29.285	1 39.115	1 48.944	1 58.774	2 08.603	2 18.433	2 28.263	6 .016
6	1 19.619	1 29.449	1 39.279	1 49.108	1 58.938	2 08.767	2 18.597	2 28.426	7 .019
7	1 19.783	1 29.613	1 39.442	1 49.272	1 59.101	2 08.931	2 18.761	2 28.590	8 .022
8	1 19.947	1 29.777	1 39.606	1 49.436	1 59.265	2 09.095	2 18.924	2 28.754	9 .025
9	1 20.111	1 29.940	1 39.770	1 49.600	1 59.429	2 09.259	2 19.088	2 28.918	10 .027
10	1 20.275	1 30.104	1 39.934	1 49.763	1 59.593	2 09.423	2 19.252	2 29.082	11 .030
11	1 20.439	1 30.268	1 40.098	1 49.927	1 59.757	2 09.586	2 19.416	2 29.245	12 .033
12	1 20.602	1 30.432	1 40.261	1 50.091	1 59.921	2 09.750	2 19.580	2 29.409	13 .035
13	1 20.766	1 30.596	1 40.425	1 50.255	2 00.084	2 09.914	2 19.744	2 29.573	14 .038
14	1 20.930	1 30.760	1 40.589	1 50.419	2 00.248	2 10.078	2 19.907	2 29.737	15 .041
15	1 21.094	1 30.923	1 40.753	1 50.583	2 00.412	2 10.242	2 20.071	2 29.901	16 .044
16	1 21.258	1 31.087	1 40.917	1 50.746	2 00.576	2 10.405	2 20.235	2 30.065	17 .046
17	1 21.422	1 31.251	1 41.081	1 50.910	2 00.740	2 10.569	2 20.399	2 30.229	18 .049
18	1 21.585	1 31.415	1 41.244	1 51.074	2 00.904	2 10.733	2 20.563	2 30.392	19 .052
19	1 21.749	1 31.579	1 41.408	1 51.238	2 01.067	2 10.897	2 20.727	2 30.556	20 .055
20	1 21.913	1 31.743	1 41.572	1 51.402	2 01.231	2 11.061	2 20.890	2 30.720	21 .057
21	1 22.077	1 31.906	1 41.736	1 51.565	2 01.395	2 11.225	2 21.054	2 30.884	22 .060
22	1 22.241	1 32.070	1 41.900	1 51.729	2 01.559	2 11.388	2 21.218	2 31.048	23 .063
23	1 22.404	1 32.234	1 42.064	1 51.893	2 01.723	2 11.552	2 21.382	2 31.211	24 .066
24	1 22.568	1 32.398	1 42.227	1 52.057	2 01.887	2 11.716	2 21.546	2 31.375	25 .068
25	1 22.732	1 32.562	1 42.391	1 52.221	2 02.050	2 11.880	2 21.709	2 31.539	26 .071
26	1 22.896	1 32.726	1 42.555	1 52.385	2 02.214	2 12.044	2 21.873	2 31.703	27 .074
27	1 23.060	1 32.889	1 42.719	1 52.548	2 02.378	2 12.208	2 22.037	2 31.867	28 .076
28	1 23.224	1 33.053	1 42.883	1 52.712	2 02.542	2 12.371	2 22.201	2 32.031	29 .079
29	1 23.387	1 33.217	1 43.047	1 52.876	2 02.706	2 12.535	2 22.365	2 32.194	30 .082
30	1 23.551	1 33.381	1 43.210	1 53.040	2 02.869	2 12.699	2 22.529	2 32.358	31 .085
31	1 23.715	1 33.545	1 43.374	1 53.204	2 03.033	2 12.863	2 22.692	2 32.522	32 .087
32	1 23.879	1 33.708	1 43.538	1 53.368	2 03.197	2 13.027	2 22.856	2 32.686	33 .090
33	1 24.043	1 33.872	1 43.702	1 53.531	2 03.361	2 13.191	2 23.020	2 32.850	34 .092
34	1 24.207	1 34.036	1 43.866	1 53.695	2 03.525	2 13.354	2 23.184	2 33.013	35 .095
35	1 24.370	1 34.200	1 44.029	1 53.859	2 03.689	2 13.518	2 23.348	2 33.177	36 .098
36	1 24.534	1 34.364	1 44.193	1 54.023	2 03.852	2 13.682	2 23.512	2 33.341	37 .101
37	1 24.698	1 34.528	1 44.357	1 54.187	2 04.016	2 13.846	2 23.675	2 33.505	38 .104
38	1 24.862	1 34.691	1 44.521	1 54.351	2 04.180	2 14.010	2 23.839	2 33.669	39 .106
39	1 25.026	1 34.855	1 44.685	1 54.514	2 04.344	2 14.173	2 24.003	2 33.833	40 .109
40	1 25.190	1 35.019	1 44.849	1 54.678	2 04.508	2 14.337	2 24.167	2 33.996	41 .112
41	1 25.353	1 35.183	1 45.012	1 54.842	2 04.672	2 14.501	2 24.331	2 34.160	42 .115
42	1 25.517	1 35.347	1 45.176	1 55.006	2 04.835	2 14.665	2 24.495	2 34.324	43 .117
43	1 25.681	1 35.511	1 45.340	1 55.170	2 04.999	2 14.829	2 24.658	2 34.488	44 .120
44	1 25.845	1 35.674	1 45.504	1 55.333	2 05.163	2 14.993	2 24.822	2 34.652	45 .123
45	1 26.009	1 35.838	1 45.668	1 55.497	2 05.327	2 15.156	2 24.986	2 34.816	46 .126
46	1 26.172	1 36.002	1 45.832	1 55.661	2 05.491	2 15.320	2 25.150	2 34.979	47 .128
47	1 26.336	1 36.166	1 45.995	1 55.825	2 05.655	2 15.484	2 25.314	2 35.143	48 .131
48	1 26.500	1 36.330	1 46.159	1 55.989	2 05.818	2 15.648	2 25.477	2 35.307	49 .134
49	1 26.664	1 36.493	1 46.323	1 56.153	2 05.982	2 15.812	2 25.641	2 35.471	50 .137
50	1 26.828	1 36.657	1 46.487	1 56.316	2 06.146	2 15.976	2 25.805	2 35.635	51 .139
51	1 26.992	1 36.821	1 46.651	1 56.480	2 06.310	2 16.139	2 25.969	2 35.798	52 .142
52	1 27.155	1 36.985	1 46.815	1 56.644	2 06.474	2 16.303	2 26.133	2 35.962	53 .145
53	1 27.319	1 37.149	1 46.978	1 56.808	2 06.637	2 16.467	2 26.297	2 36.126	54 .147
54	1 27.483	1 37.313	1 47.142	1 56.972	2 06.801	2 16.631	2 26.460	2 36.290	55 .150
55	1 27.647	1 37.477	1 47.306	1 57.136	2 06.965	2 16.795	2 26.624	2 36.454	56 .153
56	1 27.811	1 37.640	1 47.470	1 57.299	2 07.129	2 16.959	2 26.788	2 36.618	57 .156
57	1 27.975	1 37.804	1 47.634	1 57.463	2 07.293	2 17.123	2 26.952	2 36.781	58 .158
58	1 28.138	1 37.968	1 47.797	1 57.627	2 07.457	2 17.286	2 27.116	2 36.945	59 .161
59	1 28.302	1 38.132	1 47.961	1 57.791	2 07.620	2 17.450	2 27.280	2 37.109	

TABLE III. SIDEREAL INTO MEAN SOLAR TIME.

Side- real.	16 ^h .		17 ^h .		18 ^h .		19 ^h .		20 ^h .		21 ^h .		22 ^h .		23 ^h .		For Seconds.	
	m.	s.	m.	s.	m.	s.	m.	s.	m.	s.	m.	s.	m.	s.	m.	s.	1.	2.
0	2	37.273	2	47.102	2	56.992	3	06.762	3	16.591	3	26.421	3	36.250	3	46.080		
1	2	37.437	2	47.266	2	57.096	3	06.925	3	16.755	3	26.585	3	36.414	3	46.244	1	0.003
2	2	37.601	2	47.430	2	57.260	3	07.089	3	16.919	3	26.748	3	36.578	3	46.407	2	.005
3	2	37.764	2	47.594	2	57.424	3	07.253	3	17.083	3	26.912	3	36.742	3	46.571	3	.008
4	2	37.928	2	47.758	2	57.587	3	07.417	3	17.246	3	27.076	3	36.906	3	46.735	4	.011
5	2	38.092	2	47.922	2	57.751	3	07.581	3	17.410	3	27.240	3	37.069	3	46.899	5	.014
6	2	38.256	2	48.085	2	57.915	3	07.745	3	17.574	3	27.404	3	37.233	3	47.063	6	.016
7	2	38.420	2	48.249	2	58.079	3	07.908	3	17.738	3	27.568	3	37.397	3	47.227	7	.019
8	2	38.584	2	48.413	2	58.243	3	08.072	3	17.902	3	27.731	3	37.561	3	47.390	8	.022
9	2	38.747	2	48.577	2	58.406	3	08.236	3	18.066	3	27.895	3	37.725	3	47.554	9	.025
10	2	38.911	2	48.741	2	58.570	3	08.400	3	18.229	3	28.059	3	37.889	3	47.718	10	.027
11	2	39.075	2	48.905	2	58.734	3	08.564	3	18.393	3	28.223	3	38.052	3	47.882	11	.030
12	2	39.239	2	49.068	2	58.898	3	08.728	3	18.557	3	28.387	3	38.216	3	48.046	12	.033
13	2	39.403	2	49.232	2	59.062	3	08.891	3	18.721	3	28.550	3	38.380	3	48.210	13	.035
14	2	39.566	2	49.396	2	59.226	3	09.055	3	18.885	3	28.714	3	38.544	3	48.373	14	.038
15	2	39.730	2	49.560	2	59.389	3	09.219	3	19.049	3	28.878	3	38.708	3	48.537	15	.041
16	2	39.894	2	49.724	2	59.553	3	09.383	3	19.212	3	29.042	3	38.871	3	48.701	16	.044
17	2	40.058	2	49.888	2	59.717	3	09.547	3	19.376	3	29.206	3	39.035	3	48.865	17	.046
18	2	40.222	2	50.051	2	59.881	3	09.710	3	19.540	3	29.370	3	39.199	3	49.029	18	.049
19	2	40.386	2	50.215	2	00.045	3	09.874	3	19.704	3	29.533	3	39.363	3	49.193	19	.052
20	2	40.549	2	50.379	3	00.209	3	10.038	3	19.868	3	29.697	3	39.527	3	49.356	20	.055
21	2	40.713	2	50.543	3	00.372	3	10.202	3	20.032	3	29.861	3	39.691	3	49.520	21	.057
22	2	40.877	2	50.707	3	00.536	3	10.366	3	20.195	3	30.025	3	39.854	3	49.684	22	.060
23	2	41.041	2	50.870	3	00.700	3	10.530	3	20.359	3	30.189	3	40.018	3	49.848	23	.063
24	2	41.205	2	51.034	3	00.864	3	10.693	3	20.523	3	30.353	3	40.182	3	50.012	24	.066
25	2	41.369	2	51.198	3	01.028	3	10.857	3	20.687	3	30.516	3	40.346	3	50.175	25	.068
26	2	41.532	2	51.362	3	01.192	3	11.021	3	20.851	3	30.680	3	40.510	3	50.339	26	.071
27	2	41.696	2	51.526	3	01.355	3	11.185	3	21.014	3	30.844	3	40.674	3	50.503	27	.074
28	2	41.860	2	51.690	3	01.519	3	11.349	3	21.178	3	31.008	3	40.837	3	50.667	28	.076
29	2	42.024	2	51.853	3	01.683	3	11.513	3	21.342	3	31.172	3	41.001	3	50.831	29	.079
30	2	42.188	2	52.017	3	01.847	3	11.676	3	21.506	3	31.336	3	41.165	3	50.995	30	.082
31	2	42.352	2	52.181	3	02.011	3	11.840	3	21.670	3	31.499	3	41.329	3	51.158	31	.085
32	2	42.515	2	52.345	3	02.174	3	12.004	3	21.834	3	31.663	3	41.493	3	51.322	32	.087
33	2	42.679	2	52.509	3	02.338	3	12.168	3	21.997	3	31.827	3	41.657	3	51.486	33	.090
34	2	42.843	2	52.673	3	02.502	3	12.332	3	22.161	3	31.991	3	41.820	3	51.650	34	.093
35	2	43.007	2	52.836	3	02.666	3	12.496	3	22.325	3	32.155	3	41.984	3	51.814	35	.096
36	2	43.171	2	53.000	3	02.830	3	12.659	3	22.489	3	32.318	3	42.148	3	51.978	36	.098
37	2	43.334	2	53.164	3	02.994	3	12.823	3	22.653	3	32.482	3	42.312	3	52.141	37	.101
38	2	43.498	2	53.328	3	03.157	3	12.987	3	22.817	3	32.646	3	42.476	3	52.305	38	.104
39	2	43.662	2	53.492	3	03.321	3	13.151	3	22.980	3	32.810	3	42.639	3	52.469	39	.106
40	2	43.826	2	53.656	3	03.485	3	13.315	3	23.144	3	32.974	3	42.803	3	52.633	40	.109
41	2	43.990	2	53.819	3	03.649	3	13.478	3	23.308	3	33.138	3	42.967	3	52.797	41	.112
42	2	44.154	2	53.983	3	03.813	3	13.642	3	23.472	3	33.301	3	43.131	3	52.961	42	.115
43	2	44.317	2	54.147	3	03.977	3	13.806	3	23.636	3	33.465	3	43.295	3	53.124	43	.117
44	2	44.481	2	54.311	3	04.140	3	13.970	3	23.800	3	33.629	3	43.459	3	53.288	44	.120
45	2	44.645	2	54.475	3	04.304	3	14.134	3	23.963	3	33.793	3	43.622	3	53.452	45	.123
46	2	44.809	2	54.638	3	04.468	3	14.298	3	24.127	3	33.957	3	43.786	3	53.616	46	.126
47	2	44.973	2	54.802	3	04.632	3	14.461	3	24.291	3	34.121	3	43.950	3	53.780	47	.128
48	2	45.137	2	54.966	3	04.796	3	14.625	3	24.455	3	34.284	3	44.114	3	53.943	48	.131
49	2	45.300	2	55.130	3	04.960	3	14.789	3	24.619	3	34.448	3	44.278	3	54.107	49	.134
50	2	45.464	2	55.294	3	05.123	3	14.953	3	24.782	3	34.612	3	44.442	3	54.271	50	.137
51	2	45.628	2	55.458	3	05.287	3	15.117	3	24.946	3	34.776	3	44.605	3	54.435	51	.139
52	2	45.792	2	55.621	3	05.451	3	15.281	3	25.110	3	34.940	3	44.769	3	54.599	52	.142
53	2	45.956	2	55.785	3	05.615	3	15.444	3	25.274	3	35.104	3	44.933	3	54.763	53	.145
54	2	46.120	2	55.949	3	05.779	3	15.608	3	25.438	3	35.267	3	45.097	3	54.926	54	.147
55	2	46.283	2	56.113	3	05.942	3	15.772	3	25.602	3	35.431	3	45.261	3	55.090	55	.150
56	2	46.447	2	56.277	3	06.106	3	15.936	3	25.765	3	35.595	3	45.425	3	55.254	56	.153
57	2	46.611	2	56.441	3	06.270	3	16.100	3	25.929	3	35.759	3	45.588	3	55.418	57	.156
58	2	46.775	2	56.604	3	06.434	3	16.264	3	26.093	3	35.923	3	45.752	3	55.582	58	.158
59	2	46.939	2	56.768	3	06.598	3	16.427	3	26.257	3	36.086	3	45.916	3	55.746	59	.161

TABLE III. MEAN SOLAR INTO SIDEREAL TIME.

Mean Solar.	0 ^h .		1 ^h .		2 ^h .		3 ^h .		4 ^h .		5 ^h .		6 ^h .		7 ^h .		For Seconds.	
	m.	s.	m.	s.	m.	s.	m.	s.	m.	s.	m.	s.	m.	s.	m.	s.	s.	."
0	0	00.000	0	09.856	0	19.713	0	29.569	0	39.426	0	49.282	0	59.139	1	08.995		
1	0	00.164	0	10.021	0	19.877	0	29.734	0	39.590	0	49.447	0	59.308	1	09.160	1	0.003
2	0	00.329	0	10.185	0	20.041	0	29.898	0	39.754	0	49.611	0	59.467	1	09.324	2	.005
3	0	00.493	0	10.349	0	20.206	0	30.062	0	39.919	0	49.775	0	59.632	1	09.488	3	.008
4	0	00.657	0	10.514	0	20.370	0	30.227	0	40.083	0	49.939	0	59.796	1	09.652	4	.011
5	0	00.821	0	10.678	0	20.534	0	30.391	0	40.247	0	50.104	0	59.960	1	09.817	5	.014
6	0	00.986	0	10.842	0	20.699	0	30.555	0	40.412	0	50.268	1	00.124	1	09.981	6	.016
7	0	01.150	0	11.006	0	20.863	0	30.719	0	40.576	0	50.432	1	00.289	1	10.145	7	.019
8	0	01.314	0	11.171	0	21.027	0	30.884	0	40.740	0	50.597	1	00.453	1	10.310	8	.022
9	0	01.478	0	11.335	0	21.191	0	31.048	0	40.904	0	50.761	1	00.617	1	10.474	9	.025
10	0	01.643	0	11.499	0	21.356	0	31.212	0	41.069	0	50.925	1	00.782	1	10.638	10	.027
11	0	01.807	0	11.663	0	21.520	0	31.376	0	41.233	0	51.089	1	00.946	1	10.802	11	.030
12	0	01.971	0	11.828	0	21.684	0	31.541	0	41.397	0	51.254	1	01.110	1	10.967	12	.033
13	0	02.136	0	11.992	0	21.849	0	31.705	0	41.561	0	51.418	1	01.274	1	11.131	13	.036
14	0	02.300	0	12.156	0	22.013	0	31.869	0	41.726	0	51.582	1	01.439	1	11.295	14	.038
15	0	02.464	0	12.321	0	22.177	0	32.034	0	41.890	0	51.746	1	01.603	1	11.459	15	.041
16	0	02.628	0	12.485	0	22.341	0	32.198	0	42.054	0	51.911	1	01.767	1	11.624	16	.044
17	0	02.793	0	12.649	0	22.506	0	32.362	0	42.219	0	52.075	1	01.932	1	11.788	17	.047
18	0	02.957	0	12.813	0	22.670	0	32.526	0	42.383	0	52.239	1	02.096	1	11.952	18	.049
19	0	03.121	0	12.978	0	22.834	0	32.691	0	42.547	0	52.404	1	02.260	1	12.117	19	.052
20	0	03.285	0	13.142	0	22.998	0	32.855	0	42.711	0	52.568	1	02.424	1	12.281	20	.055
21	0	03.450	0	13.306	0	23.163	0	33.019	0	42.876	0	52.732	1	02.589	1	12.445	21	.057
22	0	03.614	0	13.471	0	23.327	0	33.183	0	43.040	0	52.896	1	02.753	1	12.609	22	.060
23	0	03.778	0	13.635	0	23.491	0	33.348	0	43.204	0	53.061	1	02.917	1	12.774	23	.063
24	0	03.943	0	13.799	0	23.656	0	33.512	0	43.368	0	53.225	1	03.081	1	12.938	24	.066
25	0	04.107	0	13.963	0	23.820	0	33.676	0	43.533	0	53.389	1	03.246	1	13.102	25	.068
26	0	04.271	0	14.128	0	23.984	0	33.841	0	43.697	0	53.554	1	03.410	1	13.266	26	.071
27	0	04.435	0	14.292	0	24.148	0	34.005	0	43.861	0	53.718	1	03.574	1	13.431	27	.074
28	0	04.600	0	14.456	0	24.313	0	34.169	0	44.026	0	53.882	1	03.739	1	13.595	28	.077
29	0	04.764	0	14.620	0	24.477	0	34.333	0	44.190	0	54.046	1	03.903	1	13.759	29	.079
30	0	04.928	0	14.785	0	24.641	0	34.498	0	44.354	0	54.211	1	04.067	1	13.924	30	.082
31	0	05.093	0	14.949	0	24.805	0	34.662	0	44.518	0	54.375	1	04.231	1	14.088	31	.085
32	0	05.257	0	15.113	0	24.970	0	34.826	0	44.683	0	54.539	1	04.396	1	14.252	32	.088
33	0	05.421	0	15.278	0	25.134	0	34.990	0	44.847	0	54.703	1	04.560	1	14.416	33	.090
34	0	05.585	0	15.442	0	25.298	0	35.155	0	45.011	0	54.868	1	04.724	1	14.581	34	.093
35	0	05.750	0	15.606	0	25.463	0	35.319	0	45.176	0	55.032	1	04.888	1	14.745	35	.096
36	0	05.914	0	15.770	0	25.627	0	35.483	0	45.340	0	55.196	1	05.053	1	14.909	36	.099
37	0	06.078	0	15.935	0	25.791	0	35.648	0	45.504	0	55.361	1	05.217	1	15.073	37	.101
38	0	06.242	0	16.099	0	25.955	0	35.812	0	45.668	0	55.525	1	05.381	1	15.238	38	.104
39	0	06.407	0	16.263	0	26.120	0	35.976	0	45.833	0	55.689	1	05.546	1	15.402	39	.107
40	0	06.571	0	16.427	0	26.284	0	36.140	0	45.997	0	55.853	1	05.710	1	15.566	40	.110
41	0	06.735	0	16.592	0	26.448	0	36.305	0	46.161	0	56.018	1	05.874	1	15.731	41	.112
42	0	06.900	0	16.756	0	26.612	0	36.469	0	46.325	0	56.182	1	06.038	1	15.895	42	.115
43	0	07.064	0	16.920	0	26.777	0	36.633	0	46.490	0	56.346	1	06.203	1	16.059	43	.118
44	0	07.228	0	17.085	0	26.941	0	36.798	0	46.654	0	56.510	1	06.367	1	16.223	44	.120
45	0	07.392	0	17.249	0	27.105	0	36.962	0	46.818	0	56.675	1	06.531	1	16.388	45	.123
46	0	07.557	0	17.413	0	27.270	0	37.126	0	46.983	0	56.839	1	06.695	1	16.552	46	.126
47	0	07.721	0	17.577	0	27.434	0	37.290	0	47.147	0	57.003	1	06.860	1	16.716	47	.129
48	0	07.885	0	17.742	0	27.598	0	37.455	0	47.311	0	57.168	1	07.024	1	16.881	48	.131
49	0	08.049	0	17.906	0	27.762	0	37.619	0	47.475	0	57.332	1	07.188	1	17.045	49	.134
50	0	08.214	0	18.070	0	27.927	0	37.783	0	47.640	0	57.496	1	07.353	1	17.209	50	.137
51	0	08.378	0	18.234	0	28.091	0	37.947	0	47.804	0	57.660	1	07.517	1	17.373	51	.140
52	0	08.542	0	18.399	0	28.255	0	38.112	0	47.968	0	57.825	1	07.681	1	17.538	52	.142
53	0	08.707	0	18.563	0	28.420	0	38.276	0	48.132	0	57.989	1	07.845	1	17.702	53	.145
54	0	08.871	0	18.727	0	28.584	0	38.440	0	48.297	0	58.153	1	08.010	1	17.866	54	.148
55	0	09.035	0	18.892	0	28.748	0	38.605	0	48.461	0	58.317	1	08.174	1	18.030	55	.151
56	0	09.199	0	19.056	0	28.912	0	38.769	0	48.625	0	58.482	1	08.338	1	18.195	56	.153
57	0	09.364	0	19.220	0	29.077	0	38.933	0	48.790	0	58.646	1	08.502	1	18.359	57	.156
58	0	09.528	0	19.384	0	29.241	0	39.097	0	48.954	0	58.810	1	08.667	1	18.523	58	.159
59	0	09.692	0	19.549	0	29.405	0	39.262	0	49.118	0	58.975	1	08.831	1	18.688	59	.162

TABLE III. MEAN SOLAR INTO SIDEREAL TIME.

Mean Solar.	8 h.		9 h.		10 h.		11 h.		12 h.		13 h.		14 h.		15 h.		For Seconds.	
	m.	s.	m.	s.	m.	s.	m.	s.	m.	s.	m.	s.	m.	s.	m.	s.	s.	a.
0	1	18.852	1	28.708	1	38.565	1	48.421	1	58.278	2	08.134	2	17.991	2	27.847		
1	1	19.016	1	28.873	1	38.729	1	48.585	1	58.442	2	08.298	2	18.155	2	28.011	1	0.003
2	1	19.180	1	29.037	1	38.893	1	48.750	1	58.606	2	08.463	2	18.319	2	28.176	2	.005
3	1	19.345	1	29.201	1	39.058	1	48.914	1	58.771	2	08.627	2	18.483	2	28.340	3	.008
4	1	19.509	1	29.365	1	39.222	1	49.078	1	58.935	2	08.791	2	18.648	2	28.504	4	.011
5	1	19.673	1	29.530	1	39.386	1	49.243	1	59.099	2	08.956	2	18.812	2	28.668	5	.014
6	1	19.837	1	29.694	1	39.550	1	49.407	1	59.263	2	09.120	2	18.976	2	28.833	6	.016
7	1	20.002	1	29.858	1	39.715	1	49.571	1	59.428	2	09.284	2	19.141	2	28.997	7	.019
8	1	20.166	1	30.022	1	39.879	1	49.735	1	59.592	2	09.448	2	19.305	2	29.161	8	.022
9	1	20.330	1	30.187	1	40.043	1	49.900	1	59.756	2	09.613	2	19.469	2	29.326	9	.025
10	1	20.495	1	30.351	1	40.207	1	50.064	1	59.920	2	09.777	2	19.633	2	29.490	10	.027
11	1	20.659	1	30.515	1	40.372	1	50.228	2	00.085	2	09.941	2	19.798	2	29.654	11	.030
12	1	20.823	1	30.680	1	40.536	1	50.393	2	00.249	2	10.105	2	19.962	2	29.818	12	.033
13	1	20.987	1	30.844	1	40.700	1	50.557	2	00.413	2	10.270	2	20.126	2	29.983	13	.036
14	1	21.152	1	31.008	1	40.865	1	50.721	2	00.578	2	10.434	2	20.290	2	30.147	14	.038
15	1	21.316	1	31.172	1	41.029	1	50.885	2	00.742	2	10.598	2	20.455	2	30.311	15	.041
16	1	21.480	1	31.337	1	41.193	1	51.050	2	00.906	2	10.763	2	20.619	2	30.476	16	.044
17	1	21.644	1	31.501	1	41.357	1	51.214	2	01.070	2	10.927	2	20.783	2	30.640	17	.047
18	1	21.809	1	31.665	1	41.522	1	51.378	2	01.235	2	11.091	2	20.948	2	30.804	18	.049
19	1	21.973	1	31.829	1	41.686	1	51.542	2	01.399	2	11.255	2	21.112	2	30.968	19	.052
20	1	22.137	1	31.994	1	41.850	1	51.707	2	01.563	2	11.420	2	21.276	2	31.133	20	.055
21	1	22.302	1	32.158	1	42.015	1	51.871	2	01.727	2	11.584	2	21.440	2	31.297	21	.057
22	1	22.466	1	32.322	1	42.179	1	52.035	2	01.892	2	11.748	2	21.605	2	31.461	22	.060
23	1	22.630	1	32.487	1	42.343	1	52.200	2	02.056	2	11.912	2	21.769	2	31.625	23	.063
24	1	22.794	1	32.651	1	42.507	1	52.364	2	02.220	2	12.077	2	21.933	2	31.790	24	.066
25	1	22.959	1	32.815	1	42.672	1	52.528	2	02.385	2	12.241	2	22.098	2	31.954	25	.068
26	1	23.123	1	32.979	1	42.836	1	52.692	2	02.549	2	12.405	2	22.262	2	32.118	26	.071
27	1	23.287	1	33.144	1	43.000	1	52.857	2	02.713	2	12.570	2	22.426	2	32.283	27	.074
28	1	23.451	1	33.308	1	43.164	1	53.021	2	02.877	2	12.734	2	22.590	2	32.447	28	.077
29	1	23.616	1	33.472	1	43.329	1	53.185	2	03.042	2	12.898	2	22.755	2	32.611	29	.079
30	1	23.780	1	33.637	1	43.493	1	53.349	2	03.206	2	13.062	2	22.919	2	32.775	30	.082
31	1	23.944	1	33.801	1	43.657	1	53.514	2	03.370	2	13.227	2	23.083	2	32.940	31	.085
32	1	24.109	1	33.965	1	43.822	1	53.678	2	03.534	2	13.391	2	23.247	2	33.104	32	.088
33	1	24.273	1	34.129	1	43.986	1	53.842	2	03.699	2	13.555	2	23.412	2	33.268	33	.090
34	1	24.437	1	34.294	1	44.150	1	54.007	2	03.863	2	13.720	2	23.576	2	33.432	34	.093
35	1	24.601	1	34.458	1	44.314	1	54.171	2	04.027	2	13.884	2	23.740	2	33.597	35	.096
36	1	24.766	1	34.622	1	44.479	1	54.335	2	04.192	2	14.048	2	23.905	2	33.761	36	.099
37	1	24.930	1	34.786	1	44.643	1	54.499	2	04.356	2	14.212	2	24.069	2	33.925	37	.101
38	1	25.094	1	34.951	1	44.807	1	54.664	2	04.520	2	14.377	2	24.233	2	34.090	38	.104
39	1	25.259	1	35.115	1	44.971	1	54.828	2	04.684	2	14.541	2	24.397	2	34.254	39	.107
40	1	25.423	1	35.279	1	45.136	1	54.992	2	04.849	2	14.705	2	24.562	2	34.418	40	.110
41	1	25.587	1	35.444	1	45.300	1	55.156	2	05.013	2	14.869	2	24.726	2	34.582	41	.112
42	1	25.751	1	35.608	1	45.464	1	55.321	2	05.177	2	15.034	2	24.890	2	34.747	42	.115
43	1	25.916	1	35.772	1	45.629	1	55.485	2	05.342	2	15.198	2	25.054	2	34.911	43	.118
44	1	26.080	1	35.936	1	45.793	1	55.649	2	05.506	2	15.362	2	25.219	2	35.075	44	.120
45	1	26.244	1	36.101	1	45.957	1	55.814	2	05.670	2	15.527	2	25.383	2	35.239	45	.123
46	1	26.408	1	36.265	1	46.121	1	55.978	2	05.834	2	15.691	2	25.547	2	35.404	46	.126
47	1	26.573	1	36.429	1	46.286	1	56.142	2	05.999	2	15.855	2	25.712	2	35.568	47	.129
48	1	26.737	1	36.593	1	46.450	1	56.306	2	06.163	2	16.019	2	25.876	2	35.732	48	.131
49	1	26.901	1	36.758	1	46.614	1	56.471	2	06.327	2	16.184	2	26.040	2	35.897	49	.134
50	1	27.066	1	36.922	1	46.778	1	56.635	2	06.491	2	16.348	2	26.204	2	36.061	50	.137
51	1	27.230	1	37.086	1	46.943	1	56.799	2	06.656	2	16.512	2	26.369	2	36.225	51	.140
52	1	27.394	1	37.251	1	47.107	1	56.964	2	06.820	2	16.676	2	26.533	2	36.389	52	.142
53	1	27.558	1	37.415	1	47.271	1	57.128	2	06.984	2	16.841	2	26.697	2	36.554	53	.145
54	1	27.723	1	37.579	1	47.436	1	57.292	2	07.149	2	17.005	2	26.861	2	36.718	54	.148
55	1	27.887	1	37.743	1	47.600	1	57.456	2	07.313	2	17.169	2	27.026	2	36.882	55	.151
56	1	28.051	1	37.908	1	47.764	1	57.621	2	07.477	2	17.334	2	27.190	2	37.047	56	.153
57	1	28.215	1	38.072	1	47.928	1	57.785	2	07.641	2	17.498	2	27.354	2	37.211	57	.156
58	1	28.380	1	38.236	1	48.093	1	57.949	2	07.806	2	17.662	2	27.519	2	37.375	58	.159
59	1	28.544	1	38.400	1	48.257	1	58.113	2	07.970	2	17.826	2	27.683	2	37.539	59	.162

TABLE III. MEAN SOLAR INTO SIDEREAL TIME.

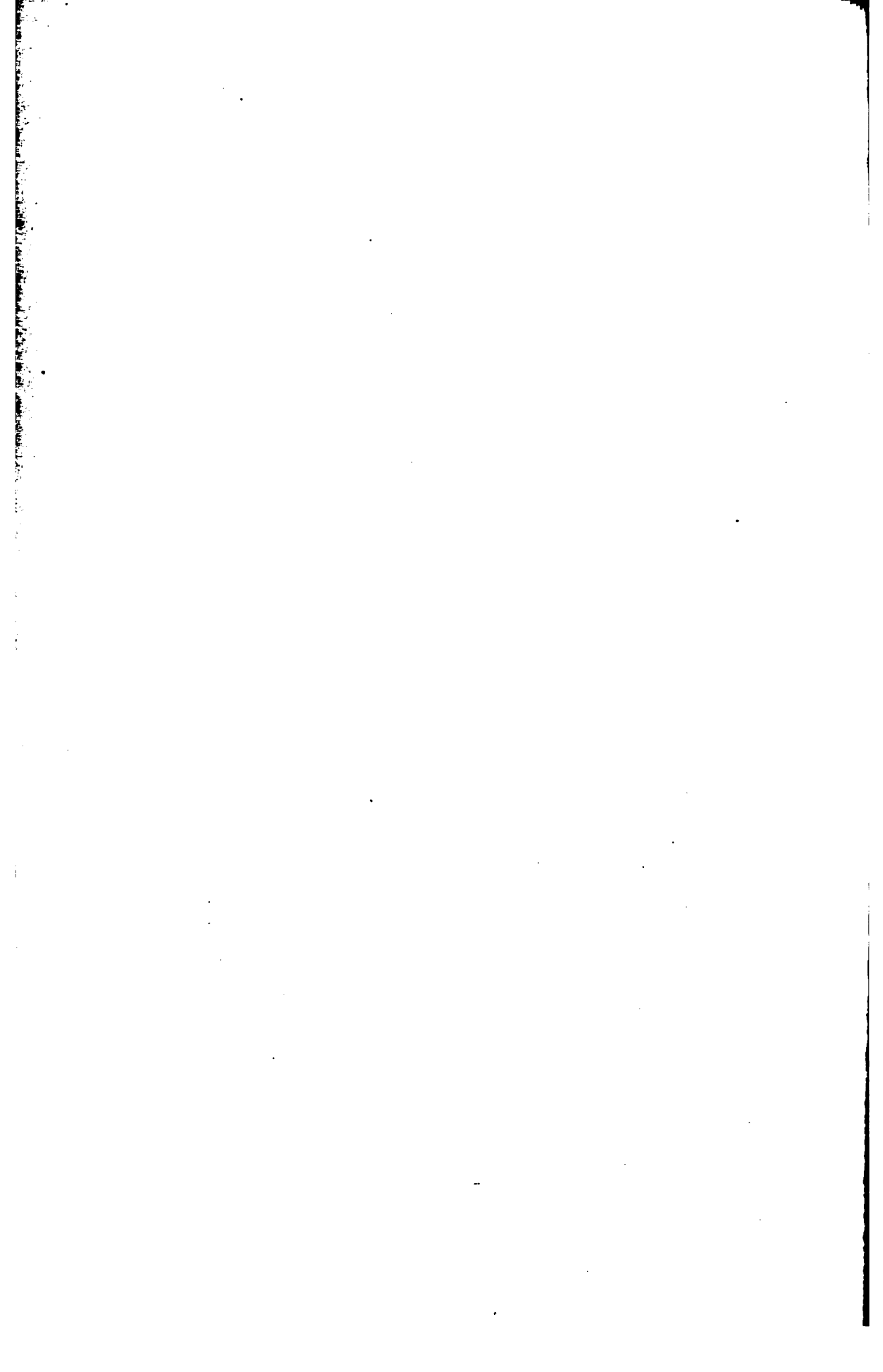
Mean Solar.	16 ^h .		17 ^h .		18 ^h .		19 ^h .		20 ^h .		21 ^h .		22 ^h .		23 ^h .		For Seconds.	
	m.	s.	m.	s.	m.	s.	m.	s.	m.	s.	m.	s.	m.	s.	m.	s.	m.	s.
0	2	37.704	2	47.560	2	57.417	3	07.273	3	17.129	3	26.986	3	36.842	3	46.699		
1	2	37.868	2	47.724	2	57.581	3	07.437	3	17.294	3	27.150	3	37.007	3	46.863	1	0.003
2	2	38.032	2	47.889	2	57.745	3	07.602	3	17.458	3	27.315	3	37.171	3	47.027	2	.006
3	2	38.196	2	48.053	2	57.909	3	07.766	3	17.622	3	27.479	3	37.335	3	47.192	3	.008
4	2	38.361	2	48.217	2	58.074	3	07.930	3	17.787	3	27.643	3	37.500	3	47.356	4	.011
5	2	38.525	2	48.381	2	58.238	3	08.094	3	17.951	3	27.807	3	37.664	3	47.520	5	.014
6	2	38.689	2	48.546	2	58.402	3	08.259	3	18.115	3	27.972	3	37.828	3	47.685	6	.016
7	2	38.854	2	48.710	2	58.566	3	08.423	3	18.279	3	28.136	3	37.992	3	47.849	7	.019
8	2	39.018	2	48.874	2	58.731	3	08.587	3	18.444	3	28.300	3	38.157	3	48.013	8	.022
9	2	39.182	2	49.039	2	58.895	3	08.751	3	18.608	3	28.464	3	38.321	3	48.177	9	.025
10	2	39.346	2	49.203	2	59.059	3	08.916	3	18.772	3	28.629	3	38.485	3	48.342	10	.027
11	2	39.511	2	49.367	2	59.224	3	09.080	3	18.937	3	28.793	3	38.649	3	48.506	11	.030
12	2	39.675	2	49.531	2	59.388	3	09.244	3	19.101	3	28.957	3	38.814	3	48.670	12	.033
13	2	39.839	2	49.696	2	59.552	3	09.409	3	19.265	3	29.122	3	38.978	3	48.834	13	.036
14	2	40.003	2	49.860	2	59.716	3	09.573	3	19.429	3	29.286	3	39.142	3	48.999	14	.038
15	2	40.168	2	50.024	2	59.881	3	09.737	3	19.594	3	29.450	3	39.307	3	49.163	15	.041
16	2	40.332	2	50.188	3	00.045	3	09.901	3	19.758	3	29.614	3	39.471	3	49.327	16	.044
17	2	40.496	2	50.353	3	00.209	3	10.066	3	19.922	3	29.779	3	39.635	3	49.492	17	.047
18	2	40.661	2	50.517	3	00.373	3	10.230	3	20.086	3	29.943	3	39.799	3	49.656	18	.049
19	2	40.825	2	50.681	3	00.538	3	10.394	3	20.251	3	30.107	3	39.964	3	49.820	19	.052
20	2	40.989	2	50.846	3	00.702	3	10.559	3	20.415	3	30.271	3	40.128	3	49.984	20	.055
21	2	41.153	2	51.010	3	00.866	3	10.723	3	20.579	3	30.436	3	40.292	3	50.149	21	.057
22	2	41.318	3	51.174	3	01.031	3	10.887	3	20.744	3	30.600	3	40.456	3	50.313	22	.060
23	2	41.482	2	51.338	3	01.195	3	11.051	3	20.908	3	30.764	3	40.621	3	50.477	23	.063
24	2	41.646	2	51.503	3	01.359	3	11.216	3	21.072	3	30.929	3	40.785	3	50.642	24	.066
25	2	41.810	2	51.667	3	01.523	3	11.380	3	21.236	3	31.093	3	40.949	3	50.806	25	.068
26	2	41.975	2	51.831	3	01.688	3	11.544	3	21.401	3	31.257	3	41.114	3	50.970	26	.071
27	2	42.139	2	51.995	3	01.852	3	11.708	3	21.565	3	31.421	3	41.278	3	51.134	27	.074
28	2	42.303	2	52.160	3	02.016	3	11.873	3	21.729	3	31.586	3	41.442	3	51.299	28	.077
29	2	42.468	2	52.324	3	02.181	3	12.037	3	21.893	3	31.750	3	41.606	3	51.463	29	.079
30	2	42.632	2	52.488	3	02.345	3	12.201	3	22.058	3	31.914	3	41.771	3	51.627	30	.082
31	2	42.796	2	52.653	3	02.509	3	12.366	3	22.222	3	32.078	3	41.935	3	51.791	31	.085
32	2	42.960	2	52.817	3	02.673	3	12.530	3	22.386	3	32.243	3	42.099	3	51.956	32	.088
33	2	43.125	2	52.981	3	02.838	3	12.694	3	22.551	3	32.407	3	42.264	3	52.120	33	.090
34	2	43.289	2	53.145	3	03.002	3	12.858	3	22.715	3	32.571	3	42.428	3	52.284	34	.093
35	2	43.453	2	53.310	3	03.166	3	13.023	3	22.879	3	32.736	3	42.592	3	52.449	35	.096
36	2	43.617	2	53.474	3	03.330	3	13.187	3	23.043	3	32.900	3	42.756	3	52.613	36	.099
37	2	43.782	2	53.638	3	03.495	3	13.351	3	23.208	3	33.064	3	42.921	3	52.777	37	.101
38	2	43.946	2	53.803	3	03.659	3	13.515	3	23.372	3	33.228	3	43.085	3	52.941	38	.104
39	2	44.110	2	53.967	3	03.823	3	13.680	3	23.536	3	33.393	3	43.249	3	53.106	39	.107
40	2	44.275	2	54.131	3	03.988	3	13.844	3	23.700	3	33.557	3	43.413	3	53.270	40	.110
41	2	44.439	2	54.295	3	04.152	3	14.008	3	23.865	3	33.721	3	43.578	3	53.434	41	.112
42	2	44.603	2	54.460	3	04.316	3	14.173	3	24.029	3	33.886	3	43.742	3	53.598	42	.115
43	2	44.767	2	54.624	3	04.480	3	14.337	3	24.193	3	34.050	3	43.906	3	53.763	43	.118
44	2	44.932	2	54.788	3	04.645	3	14.501	3	24.358	3	34.214	3	44.071	3	53.927	44	.120
45	2	45.096	2	54.952	3	04.809	3	14.665	3	24.522	3	34.378	3	44.235	3	54.091	45	.123
46	2	45.260	2	55.117	3	04.973	3	14.830	3	24.686	3	34.543	3	44.399	3	54.256	46	.126
47	2	45.425	2	55.281	3	05.137	3	14.994	3	24.850	3	34.707	3	44.563	3	54.420	47	.129
48	2	45.589	2	55.445	3	05.302	3	15.158	3	25.015	3	34.871	3	44.728	3	54.584	48	.131
49	2	45.753	2	55.610	3	05.466	3	15.322	3	25.179	3	35.035	3	44.892	3	54.748	49	.134
50	2	45.917	2	55.774	3	05.630	3	15.487	3	25.343	3	35.200	3	45.056	3	54.913	50	.137
51	2	46.082	2	55.938	3	05.795	3	15.651	3	25.508	3	35.364	3	45.220	3	55.077	51	.140
52	2	46.246	2	56.102	3	05.959	3	15.815	3	25.672	3	35.528	3	45.385	3	55.241	52	.142
53	2	46.410	2	56.267	3	06.123	3	15.980	3	25.836	3	35.693	3	45.549	3	55.405	53	.145
54	2	46.574	2	56.431	3	06.287	3	16.144	3	26.000	3	35.857	3	45.713	3	55.570	54	.148
55	2	46.739	2	56.595	3	06.452	3	16.308	3	26.165	3	36.021	3	45.878	3	55.734	55	.151
56	2	46.903	2	56.759	3	06.616	3	16.472	3	26.329	3	36.185	3	46.042	3	55.898	56	.153
57	2	47.067	2	56.924	3	06.780	3	16.637	3	26.493	3	36.350	3	46.206	3	56.063	57	.156
58	2	47.232	2	57.088	3	06.944	3	16.801	3	26.657	3	36.514	3	46.370	3	56.227	58	.159
59	2	47.396	2	57.252	3	07.109	3	16.965	3	26.822	3	36.678	3	46.535	3	56.391	59	.162

TABLE. IV.

TABLE GIVING THE CORRECTION OF α URSÆ MINORIS AND δ URSÆ MINORIS
FOR TERMS OF NUTATION INVOLVING 2ϵ .

D or D - 180°.	α Ursæ Minoris.		δ Ursæ Minoris.		D or D - 180°.	D or D - 180°.	α Ursæ Minoris.		δ Ursæ Minoris.		D or D - 180°.
	R.A.	Dec.	R.A.	Dec.			R.A.	Dec.	R.A.	Dec.	
0	-.229 ^s	+.03 ^m	-.008 ^s	-.09 ^m	90	45	-.075 ^s	-.08 ^m	+.078 ^s	-.01 ^m	135
1	.231	.02	.005	.09	91	46	.067	.08	.078	-.01	136
2	.233	.02	-.003	.09	92	47	.058	.08	.079	.00	137
3	.235	.02	.000	.09	93	48	.050	.08	.079	.00	138
4	.236	.01	+.003	.09	94	49	.042	.08	.078	.00	139
5	-.238	+.01	+.006	-.09	95	50	-.034	-.08	+.078	+.01	140
6	.239	+.01	.008	.09	96	51	.026	.08	.078	.01	141
7	.240	.00	.011	.09	97	52	.017	.08	.077	.01	142
8	.240	.00	.013	.09	98	53	-.008	.08	.077	.02	143
9	.240	.00	.016	.09	99	54	.000	.08	.077	.02	144
10	-.240	.00	+.019	-.09	100	55	+.008	-.08	+.076	+.02	145
11	.240	-.01	.021	.09	101	56	.016	.08	.075	.03	146
12	.239	.01	.024	.08	102	57	.025	.08	.074	.03	147
13	.238	.01	.026	.08	103	58	.033	.08	.073	.03	148
14	.236	.02	.029	.08	104	59	.042	.08	.072	.04	149
15	-.235	-.02	+.032	-.08	105	60	+.050	-.08	+.071	+.04	150
16	.233	.02	.034	.08	106	61	.058	.08	.070	.04	151
17	.231	.03	.037	.08	107	62	.066	.08	.069	.04	152
18	.229	.03	.039	.08	108	63	.074	.08	.067	.05	153
19	.226	.03	.042	.08	109	64	.082	.08	.066	.05	154
20	-.223	-.03	+.044	-.07	110	65	+.090	-.07	+.064	+.05	155
21	.220	.03	.046	.07	111	66	.097	.07	.062	.05	156
22	.216	.04	.048	.07	112	67	.105	.07	.061	.06	157
23	.212	.04	.050	.07	113	68	.113	.07	.060	.06	158
24	.208	.04	.052	.07	114	69	.120	.07	.058	.06	159
25	-.204	-.04	+.054	-.06	115	70	+.127	-.07	+.056	+.06	160
26	.200	.05	.055	.06	116	71	.134	.07	.054	.06	161
27	.196	.05	.057	.06	117	72	.141	.07	.052	.07	162
28	.190	.05	.059	.06	118	73	.148	.07	.050	.07	163
29	.185	.05	.061	.06	119	74	.154	.06	.048	.07	164
30	-.179	-.05	+.063	-.05	120	75	+.161	-.06	+.046	+.07	165
31	.173	.06	.064	.05	121	76	.167	.06	.045	.07	166
32	.168	.06	.065	.05	122	77	.173	.06	.043	.08	167
33	.162	.06	.067	.05	123	78	.178	.05	.040	.08	168
34	.155	.06	.068	.04	124	79	.184	.05	.037	.08	169
35	-.148	-.06	+.070	-.04	125	80	+.189	-.05	+.034	+.08	170
36	.141	.07	.071	.04	126	81	.194	.05	.031	.08	171
37	.133	.07	.072	.03	127	82	.199	.04	.029	.08	172
38	.126	.07	.073	.03	128	83	.204	.04	.026	.08	173
39	.119	.07	.074	.03	129	84	.207	.04	.024	.09	174
40	-.113	-.07	+.075	-.02	130	85	+.212	-.04	+.022	+.09	175
41	.106	.07	.076	.02	131	86	.216	.03	.020	.09	176
42	.099	.07	.077	.02	132	87	.220	.03	.017	.09	177
43	.092	.08	.077	.02	133	88	.223	.03	.013	.09	178
44	.084	.08	.078	.01	134	89	.226	.03	.011	.09	179
45	-.075	-.08	+.078	-.01	135	90	+.229	-.03	+.008	+.09	180

NOTE. — These corrections were omitted in the places of these Stars in the volumes of this Ephemeris for 1857, 1858, and 1859. They have been applied in this volume.

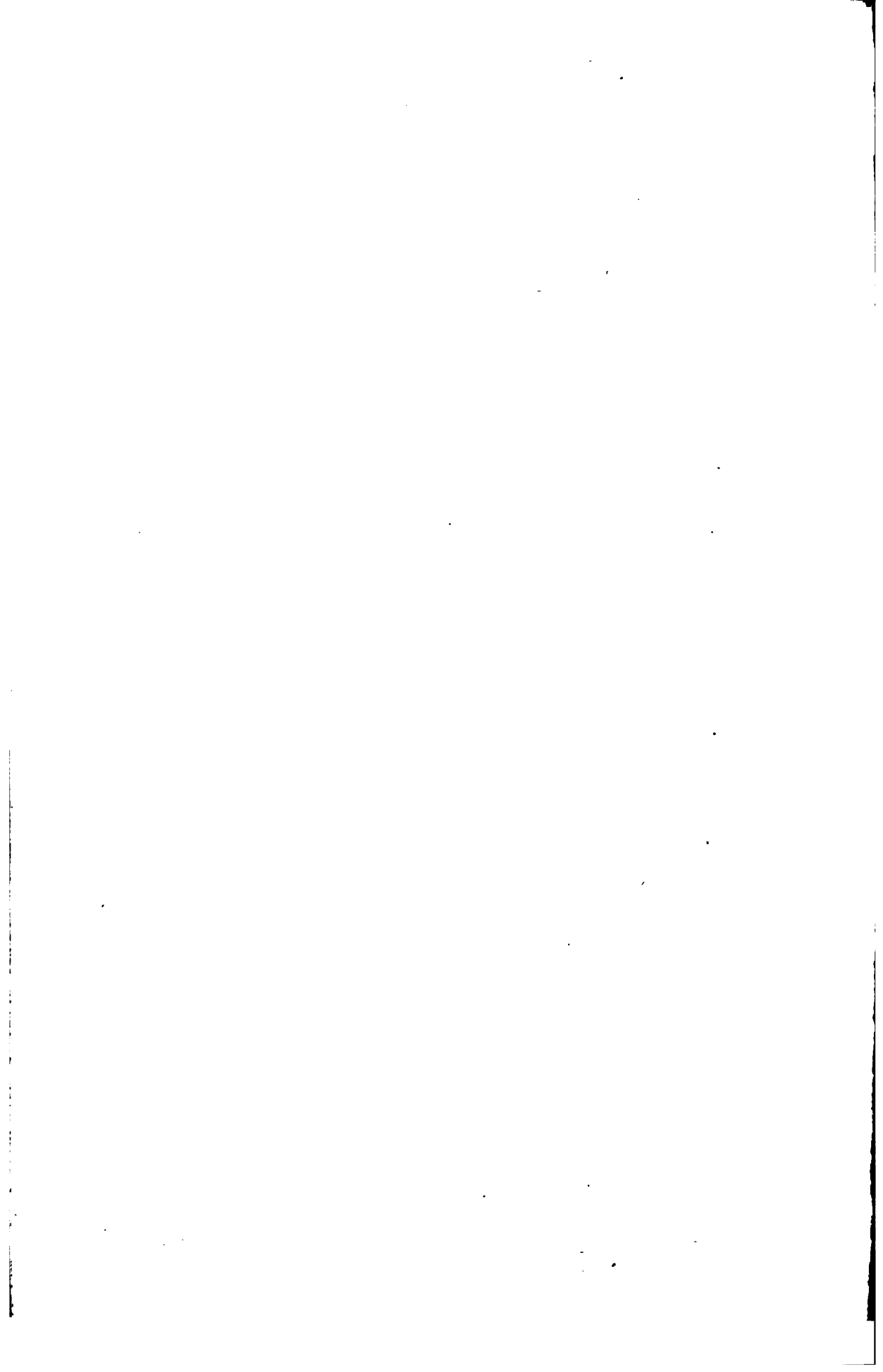


ASTEROIDS FOR THE YEAR 1859.

A SUPPLEMENT

TO THE

AMERICAN EPHEMERIS FOR 1861.



ASTEROIDS

FOR THE YEAR 1859.

THE ephemerides contained in the following pages were intended to accompany the volume of the *American Ephemeris* for the year 1860; but it has been thought expedient to publish them as a Supplement to the volume for the year 1861, in order that the earlier annual publication of the *Ephemeris* which is contemplated may not remove the portion devoted to the Asteroids in future volumes too far from the date for which it is prepared.

To facilitate the computation of Special Perturbations, the Heliocentric Coördinates of the principal planets have been referred to the mean equinox and ecliptic of Washington mean noon of the 2400,000th day of the Julian Period, which will be called in this *Ephemeris* the Asteroid Epoch, and, for convenience of printing, dates will be reckoned from it in mean solar days, which may easily be converted into days of the Julian Period by the addition of 2400,000. Elements of the Asteroids will be selected and reduced to this epoch, and those that seem sufficiently accurate — generally those that have satisfied observations at four oppositions — will remain unchanged until the computations become inconvenient in consequence of the magnitude of the perturbations. In the mean time, the effect of such small corrections of the elements as may seem necessary will be combined with the perturbations and applied to the coördinates. A change of the epoch will probably not be necessary within less than 5000 days. The computation of the perturbations of those of which the orbits are sufficiently well determined, and to which special methods must be applied, will be carried forward simultaneously. The effect of Jupiter and Saturn will be taken account of rigorously, that of the other planets will be neglected. In this way it is hoped that the *American Ephemeris* may contain annually approximate ephemerides of all or nearly all of the Asteroids. Corrected coördinates or accurate ephemerides at oppositions for comparison with observations will be published in some *Astronomical Journal*.

The table on pages 8 – 11 contains the elements which appear to be the best that have been computed up to this time. They are given for the dates for which they were originally computed, or the latest to which they have been reduced by the addition of perturbations, expressed in mean solar days, Washington time. In the next volume they will be reduced to the Asteroid Epoch (November 16, 1858). A small Table of Periodic Comets is appended, containing only those that have been observed at more than one appearance.

The following statement gives the authorities for the elements, and furnishes some idea of their accuracy. The comparisons with observations have not been very carefully made in all cases, but are sufficiently accurate to answer the purpose for which they are published here.

① *Ceres*. — *Astronomical Journal*, Vol. III. p. 165, by Mr. ERNEST SCHUBERT, from a thorough discussion of observations from 1832 to 1853, taking account of perturbations by Jupiter only. They have been reduced by him from 1854, January 0, to 1859, Septem-

ber 7, by applying the perturbations depending on Jupiter and Saturn. Comparison with observations at opposition in 1858 gave $\Delta a \cos \delta = -5''.2$, $\Delta \delta = +6''.2$.

(2) *Pallas*. — *English Nautical Almanac* for 1860, p. 572, by Mr. FARLEY, from eight oppositions, 1845 to 1853, inclusive, reduced, by addition of perturbations, depending on Venus, the Earth, Mars, Jupiter, and Saturn, to 1858, May 29, Greenwich. They nearly satisfy all the observations made at Greenwich near the times of oppositions as far as 1855 inclusive.

(3) *Juno*. — *English Nautical Almanac* for 1859, p. 564, from twelve oppositions, 1841 to 1855 inclusive, reduced by addition of perturbations depending on Venus, the Earth, Mars, Jupiter, and Saturn. Comparison with Greenwich observations at opposition in 1856 gave $\Delta a \cos \delta = -10''.7$, $\Delta \delta = +0''.7$, and at Königsberg in 1858,

$$\Delta a \cos \delta = -21''.0, \quad \Delta \delta = +3''.0.$$

(4) *Vesta*. — *English Nautical Almanac* for the year 1860, p. 575, by Mr. FARLEY, from twelve oppositions, 1840 to 1855 inclusive, reduced by addition of perturbations depending on Venus, the Earth, Mars, Jupiter, and Saturn. They very nearly satisfy all the observations made at Greenwich near the times of oppositions as far as 1855 inclusive, and observations at Königsberg in 1858, within about 5".

(5) *Astrea*. — *Berliner Astron. Jahrbuch* for the year 1858, by Professor ZECH. They have satisfied observations at seven oppositions, from 1845 to 1853 inclusive, and at the opposition in 1856 gave, about, $\Delta a \cos \delta = +13''$, $\Delta \delta = +4''$.

(6) *Hebe*. — *Astronomische Nachrichten*, Vol. XXXI. p. 13, by R. LUTHER, from four oppositions, 1847 - 1850; in 1857 the errors at opposition were $\Delta a \cos \delta = +21''$, $\Delta \delta = -7''$.

(7) *Iris*. — *Astronomische Nachrichten*, Vol. XXVIII. p. 277, by Mr. ERNEST SCHUBERT, from two oppositions, 1847 - 1848, reduced by addition of perturbations.* They have agreed with observations since, until 1858, when the errors were

$$\Delta a \cos \delta = 46'', \quad \Delta \delta = 15''.$$

(8) *Flora*. — *Tables of Flora*, by Professor F. BRÜNNOW, Berlin, 1855. They were computed from four oppositions, 1848 - 1852.

(9) *Metis*. — *Astronomische Nachrichten*, Vol. XXXVI. p. 71, by J. PH. WOLFERS, from six oppositions, 1848 - 1852. Have agreed with observations since; at opposition in 1857 the errors were $\Delta a \cos \delta = -11''$, $\Delta \delta = -1''$.

(10) *Hygea*. — *Astronomische Nachrichten*, Vol. XXXIX. p. 347, by Professor J. ZECH, from five oppositions, 1849 - 1854, reduced by addition of perturbations. At opposition in 1856 the errors were $\Delta a \cos \delta = -8''$, $\Delta \delta = +1''$.

(11) *Parthenope*. — *Astronomische Nachrichten*, Vol. XLI. p. 283, from four oppositions, 1850 - 1854. Errors in 1857, $\Delta a \cos \delta = -3''$, $\Delta \delta = -6''$.

(12) *Chio*. — *Astronomische Nachrichten*, Vol. XLV. p. 321, by Professor F. BRÜNNOW, from six oppositions, 1850 - 1856. Tables have been constructed by him.

(13) *Egeria*. — *Astronomical Journal*, Vol. II. p. 282, by Professor J. S. HUBBARD, 1850 - 1851. Tables have been constructed by Professor PEIRCE.

(14) *Irene*. — *Astronomische Nachrichten*, Vol. XLII. p. 141, from four oppositions, 1851 - 1855, by C. BRUHNS. At opposition in November, 1857, the errors were

$$\Delta a \cos \delta = -4'', \quad \Delta \delta = -1''.$$

(15) *Eunomia*. — *Astronomical Journal*, Vol. IV. p. 170, by Mr. ERNEST SCHUBERT, from

* Perturbations by Jupiter and Saturn have been taken account of in all cases where it is not otherwise stated.

four oppositions, 1851-1854. Have agreed well with observations since. At opposition in 1858 the errors were $\Delta a \cos \delta = +3''$, $\Delta \delta = -3''$.

⑩ *Psyche*. — Provisional elements selected, and reduced by Mr. SCHUBERT by addition of perturbations preparatory to a new determination of the orbit.

⑪ *Thetis*. — *Berliner Astron. Jahrbuch*, 1859, p. 419, by E. SCHÖNFELD, from four oppositions, 1852-1856. The errors at opposition in 1857 were $\Delta a \cos \delta = -38''$, $\Delta \delta = -13''$.

⑫ *Melpomene*. — *Astronomical Journal*, Vol. V. p. 41, from four oppositions, 1852-1856. At opposition in 1858, $\Delta a \cos \delta = +6''$, $\Delta \delta = -3''$.

⑬ *Fortuna*. — *Astronomische Nachrichten*, Vol. XLVI. p. 247, by C. POWALKY, from four oppositions, 1852-1856. Errors at opposition in 1858, $\Delta a \cos \delta = -10''$, $\Delta \delta = +5''$.

⑭ *Massilia*. — *Astronomische Nachrichten*, Vol. XLV. p. 287, by W. GÜNTHER, from four oppositions, 1852-1856, perturbations by Jupiter alone being applied. In 1858,

$$\Delta a \cos \delta = -11'', \Delta \delta = +1''.$$

⑮ *Lutetia*. — *Astronomische Nachrichten*, Vol. XLVIII. p. 17, from four oppositions, perturbations by Jupiter alone being taken account of. Errors at opposition in 1858,

$$\Delta a \cos \delta = +7'', \Delta \delta = +1''.$$

⑯ *Calliope*. — *Vienna Sitzungsberichte*, 1855, by Dr. C. HORNSTEIN, corrected by T. H. SAFFORD, Jr., so as to satisfy four oppositions, 1852-1856.

⑰ *Thalia*. — *Astronomical Journal*, Vol. V. p. 107, by ERNEST SCHUBERT, from four oppositions, 1853-1856. Errors at opposition in 1858, $\Delta a \cos \delta = +4''$, $\Delta \delta = +1''$.

⑱ *Themis*. — *Astronomische Nachrichten*, Vol. XLVII. p. 161, by Dr. A. KRÜGER, from four oppositions, 1853-1856. At opposition in 1858, $\Delta a \cos \delta = +2''$, $\Delta \delta = -1''$.

⑲ *Phocæa*. — *Astronomische Nachrichten*, Vol. XLVI. p. 129, by W. GÜNTHER, from three oppositions, 1853-1856. Errors in 1857, $\Delta a \cos \delta = +19''$, $\Delta \delta = -7''$.

⑳ *Proserpina*. — *Astronomische Nachrichten*, Vol. XLVIII. p. 171, by J. A. C. OUDEMANN, corrected by M. HOEK to satisfy four oppositions, 1853-1857. Errors at the opposition in 1858, $\Delta a \cos \delta = +14''$, $\Delta \delta = -2''$.

㉑ *Euterpe*. — *Astronomische Nachrichten*, Vol. XLVIII. p. 229, by W. GÜNTHER, from four oppositions, 1853-1858.

㉒ *Bellona*. — *Berliner Astron. Jahrbuch*, 1859, from two oppositions, 1854-1855. They have not been compared with observations since.

㉓ *Amphitrite*. — *Astronomische Nachrichten*, Vol. XLVIII. p. 363, by W. GÜNTHER, from four oppositions, 1854-1858.

㉔ *Urania*. — *Astronomische Nachrichten*, Vol. XLVII. p. 21, by W. GÜNTHER, from three oppositions, 1854-1857.

㉕ *Euphrosyne*. — *Astronomische Nachrichten*, Vol. XLI. p. 289, by A. WINNECKE, from one opposition, 1854-1855. Errors at opposition in 1857 were $\Delta a \cos \delta = +1''$, $\Delta \delta = +10''$.

㉖ *Pomona*. — Elements selected and reduced by Mr. ERNEST SCHUBERT, preparatory to a new determination of the orbit.

㉗ *Polyhymnia*. — Selected for correction by Mr. SCHUBERT.

㉘ *Circe*. — *Berliner Astron. Jahrbuch*, 1859, p. 420, from two oppositions, 1855-1856, by Dr. W. KLINCKELFURS. At opposition in 1858, the errors were,

$$\Delta a \cos \delta = -14' 3'', \Delta \delta = -3' 45''.$$

㉙ *Leucothea*. — Selected for correction by Mr. ERNEST SCHUBERT.

- ④② *Atalanta*. — *Berliner Astron. Jahrbuch*, 1860, p. 404, from two oppositions, by Dr. W. FÖRSTER, 1855 - 1857; agreed well with observation in 1858.
- ④⑦ *Fides*. — *Astronomische Nachrichten*, Vol. XLV. p. 17, from one opposition, by G. RÜMKE, 1855 - 1856; in 1857 they were in error about 20" in R. A. and 14" in Dec.
- ④⑧ *Leda*. — *Berliner Astron. Jahrbuch*, 1860, from one opposition, 1856, by M. LÖWY; agreed with observation in 1858 within about 2' in R. A. and 1' in Dec.
- ④⑨ *Laetitia*. — *Astronomische Nachrichten*, Vol. XLV. p. 379, from one opposition, 1856, by M. ALLÉ.
- ④④ *Harmonia*. — *Astronomische Nachrichten*, Vol. XLIV. p. 281, from one opposition, 1856, by C. POWALKY. Did not agree well with observation in 1857.
- ④⑤ *Daphne*. — *Astronomische Nachrichten*, Vol. XLVII. p. 26, from five days' observations by C. F. PAPER, very uncertain.
- ④①* *Astronomical Journal*, Vol. V. p. 174, by Mr. ERNEST SCHUBERT, from observations in 1857.
- ④② *Isis*. — *Astronomische Nachrichten*, Vol. XLVI. p. 91, from observations in 1856. In December, 1857, the errors were $\Delta \alpha = -1'.7$, $\Delta \delta = -0'.6$.
- ④③ *Ariadne*. — *Astronomische Nachrichten*, Vol. XLIX. p. 39, by E. WEISS, from observations in 1857.
- ④④ *Nysa*. — *Astronomische Nachrichten*, Vol. XLVIII. p. 233, by M. GUSSEW, from observations in 1857.
- ④⑤ *Astronomische Nachrichten*, Vol. XLVIII. p. 359, by M. LÖWY, from observations in 1857.
- ④⑥ *Hestia*. — *Astronomical Journal*, Vol. V. p. 153, by J. C. WATSON.
- ④⑦ *Aglais*. — From observations in 1857, by T. H. SAFFORD, Jr. In February, 1858, the errors were $\Delta \alpha = +50''$, $\Delta \delta = +20''$.
- ④⑧ *Doris*. — *Astronomische Nachrichten*, Vol. XLVII. p. 319, by C. POWALKY.
- ④⑨ *Pales*. — *Astronomische Nachrichten*, Vol. XLVII. p. 315, by C. POWALKY.
- ⑤① *Verginia*. — *Astronomical Journal*, Vol. V. p. 118, by Mr. JAMES FERGUSON. They will probably give the place of the planet within 5'.
- ⑤② *Nemausa*. — *Astronomische Nachrichten*, Vol. XLVIII. p. 124, from a few observations, by Dr. W. FÖRSTER.
- ⑤③ *Europa*. — *Astronomische Nachrichten*, Vol. XLVIII. p. 221, by Dr. H. S. SCHULTZ. Approximate.
- ⑤④ *Calypso*. — *Astronomische Nachrichten*, Vol. XLVIII. p. 335, by W. OELTZEN.
- ⑤⑤ *Astronomische Nachrichten*, Vol. XLIX. p. 185, by SCHJELLERUP.
- ⑤⑥ *Astronomical Journal*, Vol. V. p. 162, by T. H. SAFFORD, Jr. and S. NEWCOMB.

Oppositions. — PAGE 12 contains the dates of the oppositions for the years 1859 and 1860. Those that cannot be accurately determined are marked with two dots (:), or, when the date is very uncertain, the day of the month is omitted. Several oppositions have been unintentionally omitted from the list of 1860. They are, *Laetitia*, January 14; ⑤⑤, February 1; *Verginia*, April 14; *Harmonia*, June 29.

Ephemerides. — The approximate ephemerides on pages 18 - 29 are given for days of the

year corresponding to the days of the Julian Period for which the coördinates of the planets are given. They have been computed, in most cases, from the elements on pages 8-11, reduced, by the addition of perturbations by Jupiter and Saturn, to the date of the opposition nearest to the middle of the year 1859. The exceptions are Astræa, from elements in the *English Nautical Almanac* for 1861; Calliope, from HORNSTEIN'S Elements, without Mr. SAFFORD'S corrections; Amphitrite, from elements in *Astronomische Nachrichten*, Vol. XLV. p. 345; Urania, from elements in *Astronomische Nachrichten*, Vol. XLIII. p. 247; Egeria, from manuscript Tables by Professor PEIRCE; Flora, from BRÜNNOW'S Tables.

The ephemerides of Astræa and Egeria have been computed by Professor PEIRCE; Ceres, Iris, Eunomia, Melpomene, Thalia, Pomona, and Polyhymnia, by Mr. SAFFORD, using Mr. SCHUBERT'S elements and perturbations; Vesta, Metis, Massilia, Proserpina, Euterpe, Amphitrite, and Urania, by Professor A. W. SMITH; Pallas, Juno, Hebe, Hygea, Parthenope, Thetis, and Lutetia, by Professor J. M. VAN VLECK; Circe, Leda, and Isis, by Mr. G. SEARLE; Calliope, by Mr. W. FERREL; Flora and Fides, by Mr. F. W. BARDWELL; Irene, Fortuna, Aglaia, and Verginia, by Mr. SAFFORD.

Heliocentric Coördinates. — The Heliocentric Coördinates of Mars, Jupiter, and Saturn, referred to the Mean Equinox and Ecliptic of the Asteroid Epoch (November 16, 1858), are given on pages 30-34. They are intended to be used instead of the Equatorial Coördinates of the planets in *this Ephemeris*, for the years 1859 and 1860; for convenience, 2400,000 has been subtracted from the days of the Julian Period for which the coördinates are given.

The columns $-\frac{r^2}{r^3}x$, $-\frac{r^2}{r^3}y$, $-\frac{r^2}{r^3}z$, contain the quantities $-1600 m \frac{k^2}{r^3}x$, $-1600 m \frac{k^2}{r^3}y$, $-1600 m \frac{k^2}{r^3}z$, in which m is the mass of the planet, and k^2 the unit of attractive force in the solar system, or $\log k = 8.23558$.

Symbol.	Name.	π .	Ω .	ϕ .	i .	μ .	L .
①	Ceres.	149 26 13.1	80 49 54.7	4 36 12.1	10 36 27.8	12 51.3333	346 48 15.4
②	Pallas.	122 7 38.4	172 38 32.7	13 50 57.1	34 42 29.8	12 49.4780	224 28 25.5
③	Juno.	54 0 55.8	170 58 22.0	14 50 35.7	13 3 9.8	13 33.8848	104 2 31.1
④	Vesta.	250 35 29.4	103 21 10.3	5 10 31.2	7 8 9.1	16 17.8432	218 26 1.1
⑤	Astræa.	134 35 35.7	141 24 48.5	10 57 8.3	5 19 35.2	14 17.9486	80 56 2.7
⑥	Hebe.	15 2 23.4	138 35 19.5	11 38 1.9	14 46 35.4	15 39.3481	124 54 18.6
⑦	Iris.	41 29 15.3	259 46 16.1	13 20 45.9	5 28 1.4	16 2.6335	322 34 38.8
⑧	Flora.	32 54 28.3	110 17 48.6	9 0 56.3	5 53 8.0	18 6.3310	68 48 32.0
⑨	Metis.	71 3 55.6	68 31 31.6	7 5 1.6	5 36 0.6	16 2.8856	128 8 12.7
⑩	Hygea.	227 47 58.8	287 38 34.2	5 46 16.6	3 47 9.3	10 34.8491	354 47 47.6
⑪	Parthenope.	316 10 7.1	125 3 41.1	5 40 30.3	4 36 57.9	15 23.7824	283 56 41.9
⑫	Clio.	301 39 24.7	235 34 41.7	12 38 44.1	8 23 19.4	16 35.8341	7 42 5.0
⑬	Egeria.	119 12 59.0	43 17 55.7	4 52 7.4	16 33 6.7	14 18.3861	138 44 42.6
⑭	Irene.	179 28 21.9	86 40 4.5	9 30 38.1	9 7 7.4	14 11.5608	67 12 20.6
⑮	Eunomia.	27 31 8.1	293 56 15.8	10 47 54.8	11 43 39.0	13 45.2220	238 54 5.1
⑯	Psyche.	13 16 14.8	150 35 34.0	7 42 49.7	3 4 6.5	11 50.0987	50 51 42.0
⑰	Thetis.	259 22 51.2	125 27 13.3	7 17 18.4	5 35 40.7	15 11.9760	210 1 24.3
⑱	Melpomene.	15 11 48.0	150 4 33.3	12 32 14.8	10 8 58.3	16 59.8395	304 33 25.3
⑲	Fortuna.	30 22 50.2	211 29 28.7	9 5 10.8	1 32 28.8	15 30.1578	148 28 55.8
⑳	Massilia.	98 28 37.6	206 41 27.6	8 15 42.3	0 41 7.3	15 48.7396	196 16 53.9
㉑	Lutetia.	327 2 45.2	80 27 23.3	9 19 32.1	3 5 11.1	15 33.5610	41 24 9.0
㉒	Calliope.	58 16 41.1	66 36 54.7	5 56 53.6	13 44 51.9	11 54.9070	76 59 2.0
㉓	Thalia.	123 58 40.6	67 38 34.4	13 23 56.7	10 13 13.6	13 52.4617	280 7 33.7
㉔	Themis.	137 54 9.7	36 10 30.3	6 44 53.0	0 49 1.8	10 34.6753	30 2 41.5
㉕	Phocæa.	302 46 9.0	214 4 54.6	14 37 38.8	21 35 53.6	15 53.6780	294 46 13.5
㉖	Proserpina.	235 17 26.8	45 53 14.6	5 1 15.7	3 35 40.3	13 39.6815	181 21 20.9
㉗	Euterpe.	87 39 0.0	93 44 45.0	9 57 22.5	1 35 31.1	16 26.6260	260 43 32.7
㉘	Bellona.	122 22 48.3	144 43 5.4	8 53 17.5	9 22 30.8	12 47.4862	159 3 36.8
㉙	Amphitrite.	56 39 6.6	356 26 51.8	4 9 3.1	6 7 49.6	14 28.8694	293 11 23.8
㉚	Urania.	31 23 24.7	308 13 46.3	7 18 22.7	2 5 56.9	16 16.0689	19 30 24.4
㉛	Euphrosyne.	93 51 6.6	31 25 23.0	12 28 29.8	26 25 12.4	10 32.8031	53 49 50.3
㉜	Pomona.	193 33 42.5	220 48 1.4	4 37 26.6	5 28 49.1	14 11.7238	134 30 20.0
㉝	Polyhymnia.	340 51 46.1	9 16 9.2	19 41 36.4	1 56 41.5	12 10.8833	266 47 55.8
㉞	Circe.	149 58 35.1	184 47 10.8	6 12 52.4	5 26 33.2	13 24.9883	193 36 37.2
㉟	Leucothea.	198 51 53.9	355 57 26.3	12 46 9.3	8 12 10.7	11 29.3084	173 36 11.3
㊱	Atalanta.	42 22 25.0	359 8 48.4	17 19 53.4	18 42 9.5	12 58.6000	36 19 53.2
㊲	Fides.	66 5 35.8	8 10 23.4	10 4 0.8	3 7 19.3	13 46.2860	42 34 30.3
㊳	Leda.	100 40 28.4	296 27 47.3	8 57 0.8	6 58 31.9	13 2.4484	112 55 7.2
㊴	Lætitia.	1 58 57.7	157 19 31.0	6 22 38.2	10 20 50.7	12 49.8940	146 44 19.7
㊵	Harmonia.	2 1 50.9	93 32 2.9	2 38 29.0	4 15 48.4	17 19.4100	222 12 9.1
㊶	Daphne.	230 21 29.8	180 5 50.8	11 40 57.0	15 48 23.0	15 54.1100	202 28 48.5
㊷	.....	303 17 28.1	195 29 38.4	11 42 3.8	7 38 19.1	14 40.0100	335 48 51.5
㊸	Isis.	317 57 48.4	84 27 49.7	12 52 50.1	8 34 39.6	15 34.4490	276 45 1.9
㊹	Ariadne.	277 14 9.5	264 29 27.4	9 38 46.6	3 27 47.6	18 4.5177	224 5 10.4
㊺	Nysa.	111 46 12.3	130 54 33.4	8 25 51.6	3 41 56.6	15 36.4700	232 55 23.7
㊻	.....	235 4 34.4	147 51 37.7	4 54 10.7	6 35 59.1	13 5.1037	215 29 8.3

ASTEROIDS, 1859.

Symbol.	Period.	<i>a.</i>	<i>e.</i>	Epoch.	Date of Discovery.	By whom Discovered.
	<i>a</i>					
①	1680.207	2.765938	0.080257	1859, Sept. 7.0000	1801, Jan. 1	Piazzi, at Palermo.
②	1684.258	2.770386	0.239367	1858, May 28.7860	1802, Mar. 29	Harding, at Göttingen.
③	1592.365	2.668678	0.256176	1858, Jan. 28.7860	1804, Sept. 1	Oibers, at Bremen.
④	1325.366	2.361339	0.090204	1858, April 22.7860	1807, Mar. 29	Oibers, at Bremen.
⑤	1510.580	2.576500	0.189992	1849, Dec. 30.7488	1845, Dec. 8	Hencke, at Driessen.
⑥	1379.680	2.425418	0.201657	1857, Feb. 12.7488	1847, July 1	Hencke, at Driessen.
⑦	1346.307	2.396147	0.230832	1858, July 18.7488	1847, Aug. 13	Hind, at London.
⑧	1193.007	2.201386	0.156704	1848, Jan. 0.7488	1847, Oct. 18	Hind, at London.
⑨	1345.354	2.385730	0.123391	1858, June 29.7488	1848, April 25	Graham, at Markree.
⑩	2041.430	3.149373	0.100557	1851, Sept. 16.7488	1849, April 12	De Gasparis, at Naples.
⑪	1402.928	2.452588	0.098887	1858, June 26.7488	1850, May 13	De Gasparis, at Naples.
⑫	1301.423	2.332811	0.218920	1850, Dec. 30.7488	1850, Sept. 13	Hind, at London.
⑬	1509.810	2.575625	0.084873	1851, Dec. 5.0000	1850, Nov. 2	De Gasparis, at Naples.
⑭	1521.912	2.589368	0.165230	1857, Nov. 19.7488	1851, May 20	Hind, at London.
⑮	1570.486	2.644180	0.187357	1859, May 11.0000	1851, July 29	De Gasparis, at Naples.
⑯	1825.008	2.922752	0.134225	1860, Nov. 20.0000	1852, Mar. 17	De Gasparis, at Naples.
⑰	1421.090	2.473710	0.126865	1856, April 3.7488	1852, April 17	Luther, at Bilk.
⑱	1270.788	2.296060	0.217078	1859, July 2.0000	1852, June 24	Hind, at London.
⑲	1393.312	2.441368	0.157922	1858, Mar. 2.7488	1852, Aug. 22	Hind, at London.
⑳	1366.023	2.409386	0.143696	1858, April 20.7488	1852, Sept. 19	Chacornac, at Marseilles.
㉑	1388.232	2.435431	0.169045	1853, Jan. 1.7488	1852, Nov. 15	Goldschmidt, at Paris.
㉒	1439.977	2.495579	0.103630	1852, Dec. 30.7488	1852, Nov. 16	Hind, at London.
㉓	1556.829	2.628824	0.231732	1859, July 10.0000	1852, Dec. 15	Hind, at London.
㉔	2041.980	3.149947	0.117504	1856, Sept. 24.7488	1853, April 5	De Gasparis, at Naples.
㉕	1358.949	2.401060	0.252533	1857, July 9.7488	1853, April 6	Chacornac, at Marseilles.
㉖	1581.102	2.656079	0.087521	1857, Mar. 19.7488	1853, May 5	Luther, at Bilk.
㉗	1313.568	2.347305	0.172896	1859, June 13.7488	1853, Nov. 8	Hind, at London.
㉘	1688.630	2.775177	0.154507	1854, Feb. 27.7488	1854, May 1	Luther, at Bilk.
㉙	1491.594	2.554866	0.072383	1859, July 8.7488	1854, Mar. 1	Luther, at Bilk.
㉚	1327.805	2.364199	0.137174	1858, Oct. 8.7488	1854, July 22	Hind, at London.
㉛	2048.030	3.156158	0.216013	1854, Dec. 30.7488	1854, Sept. 1	Ferguson, at Washington
㉜	1521.620	2.589039	0.080617	1860, Jan. 24.7488	1854, Oct. 26	Goldschmidt, at Paris.
㉝	1773.197	2.867075	0.336087	1858, April 13.7488	1854, Oct. 28	Chacornac, at Paris.
㉞	1609.961	2.688302	0.108253	1855, April 9.4488	1855, April 15	Chacornac, at Paris.
㉟	1880.145	2.981229	0.221025	1860, Feb. 14.0000	1855, April 19	Luther, at Bilk.
㊱	1664.526	2.748705	0.297900	1855, Dec. 30.7488	1855, Oct. 5	Goldschmidt, at Paris.
㊲	1568.465	2.641907	0.174798	1855, Dec. 30.7488	1855, Oct. 5	Luther, at Bilk.
㊳	1636.339	2.739685	0.155576	1855, Dec. 30.7488	1856, Jan. 12	Chacornac, at Paris.
㊴	1633.349	2.769387	0.111075	1855, Dec. 31.7488	1856, Feb. 8	Chacornac, at Paris.
㊵	1246.861	2.267148	0.046085	1856, June 30.7488	1856, Mar. 31	Goldschmidt, at Paris.
㊶	1358.334	2.400337	0.202488	1856, May 31.2488	1856, May 23	Goldschmidt, at Paris.
㊷	1472.710	2.533257	0.202805	1857, Sept. 16.2844	1857, Sept. 9	Goldschmidt, at Paris.
㊸	1386.913	2.433889	0.222920	1856, June 30.7488	1856, May 23	Pogson, at Oxford.
㊹	1195.001	2.203838	0.167565	1857, April 16.7488	1857, April 15	Pogson, at Oxford.
㊺	1383.921	2.430386	0.146618	1857, July 9.7488	1857, May 27	Goldschmidt, at Paris.
㊻	1659.191	2.742828	0.085469	1856, Dec. 30.7488	1857, June 27	Goldschmidt, at Paris.

Symbol.	Name.	π .	Ω .	ϕ .	i .	μ .	L .
(46)	Hestia.	355° 4' 36.8	181° 26' 43.6	9° 45' 28.8	2° 17' 48.3	14' 36.5246	333° 1' 31.1
(47)	Aglaia.	314 16 26.4	4 29 19.6	7 21 42.5	5 0 24.7	12 5.8040	0 37 45.4
(48)	Doris.	77 11 47.7	185 13 39.9	4 25 19.8	6 29 44.0	10 47.9290	359 3 37.3
(49)	Pales.	32 49 23.3	290 27 1.0	13 44 54.4	3 8 25.0	10 54.4680	10 29 28.9
(50)	Virginia.	10 29 59.0	173 30 22.8	16 41 14.6	2 47 45.7	13 42.0410	12 5 7.9
(51)	Nemausa.	190 12 40.0	175 37 43.9	3 36 13.0	10 14 39.4	16 7.6380	172 47 1.8
(52)	Europa.	102 10 43.7	129 55 43.8	5 52 11.5	7 23 48.7	10 50.6371	147 35 49.8
(53)	Calypso.	94 38 52.3	143 30 27.8	10 23 3.6	5 3 38.8	14 0.0660	169 59 43.1
(54)	.....	306 19 28.9	313 22 43.9	10 50 23.7	11 31 21.0	13 9.0790	329 25 3.3
(55)	.....	21 47 23.8	10 51 28.2	7 41 19.4	7 36 47.4	12 46.0760	10 49 0.2

PERIODIC COMETS.

Name.	π .	Ω .	ϕ .	i .	μ .	L .
Halley's.	304° 32' 16.6	55° 10' 43.7	75° 19' 40.2	162° 14' 54.9	0' 46.5067	304° 32' 16.6
Encke's.	157 57 30.0	334 28 34.0	(57 57 30.3)	13 4 15.0	17 54.0500	157 59 18.0
Biela's I.	108 58 52.7	245 54 5.2	49 7 23.6	12 33 49.6	8 55.2767	108 58 52.7
Biela's II.	109 5 56.0	245 50 9.9	49 2 34.5	12 33 27.8	8 58.7065	109 5 56.0
Faye's.	49 49 4.6	209 45 23.4	33 42 43.4	11 21 36.7	7 55.1849	49 49 4.6
Brorsen's.	115 43 44.4	101 46 41.7	53 21 5.6	29 48 59.2	10 37.9365	115 43 44.4
Winnecke's.	275 59 53.0	113 0 53.1	47 35 5.2	10 42 43.4	11 48.0070	275 59 33.3
Tuttle's.	115 51 35.0	269 3 13.0	55 10 31.4	54 24 10.5	4 18.9576	116 10 44.5

Symbol.	Period.	a.	e.	Epoch.	Date of Discovery.	By whom Discovered.
	d					
(46)	1478.567	2.539968	0.169487	1857, Sept. 19.5000	1857, Aug. 16	Pogson, at Oxford.
(47)	1785.606	2.880435	0.128134	1857, Nov. 16.0000	1857, Sept. 15	Luther, at Bilk.
(48)	2000.219	3.106845	0.077105	1857, Oct. 30.7488	1857, Sept. 19	Goldschmidt, at Paris.
(49)	1980.234	3.086115	0.237660	1857, Oct. 30.7488	1857, Sept. 19	" "
(50)	1576.563	2.650994	0.287150	1857, Oct. 5.0000	1857, Oct. 4	Ferguson, at Washington.
(51)	1339.344	2.377912	0.062853	1858, Mar. 2.3400	1858, Jan. 22	Laurent, at Nismes.
(52)	1991.893	3.098218	0.102270	1858, Mar. 3.9052	1858, Feb. 4	Goldschmidt, at Paris.
(53)	1542.700	2.612894	0.180250	1858, April 27.2635	1858, April 4	Luther, at Bilk.
(54)	1642.436	2.724332	0.188066	1858, Sept. 25.1342	1858, Sept. 11	Goldschmidt, at Paris.
(55)	1691.750	2.778581	0.133791	1858, Sept. 27.3496	1858, Sept. 11	Searle, at Albany.

PERIODIC COMETS.

Period.	a.	e.	Epoch.	Perihelion Passage.
	d			
27866.953	17.988470	0.967301	1835, Nov. 15.6941	1912.1
1206.648	2.218135	0.847663	1858, Oct. 18.2488	1862.1
2421.174	3.528733	0.756119	1852, Sept. 22.7316	1859.4
2405.760	3.513750	0.755201	1852, Sept. 23.4975	1859.4
2727.360	3.820286	0.555020	1858, Sept. 12.3908	1866.2
2031.554	3.139206	0.802313	1857, Mar. 29.0128	1862.8
1830.490	2.928505	0.738276	1858, May 2.2488	1863.3
5004.680	5.726007	0.820904	1858, Feb. 27.7488	1871.9

OPPOSITIONS.

1859.		1860.	
Jan.	1 (41)*.	Jan.	6 (44) Nysa.
	4 (12) Clio.		26 (82) Pomona.
Feb.	9 (46) Harmonia.		30 (18) Egeria.
	17 (24) Circe.	Feb.	10 (7) Iris.
	19 (64) Verginia.		29 (48) Doris.
	25 (42) Isis.	March	1 (43) Ariadne.
March	14 (8) Astræa.		1 (47) Aglaia.
	19 (22) Calliope.		6 (25) Leucothea.
	24 (14) Irene.		10 (10) Hygea.
April	16 (24) Themis.		10 (26) Phocæa.
	26 (3) Juno.		11 (50) Urania.
	27 (9) Metis.		20: (41)*.
	27 (28) Bellona.		24: (48) Pales.
May	10 (15) Eunomia.		30: (46) Hestia.
	15 (8) Flora.	April	9 (12) Clio.
	15: (52) Europa.		26 (17) Thetis.
June	3 (19) Fortuna.	June	1 (22) Calliope.
	12: (23) Calypso.		20 (24) Circe.
	13 (27) Euterpe.	July	1 (3) Juno.
July	1 (18) Melpomene.		2 (24) Themis.
	2 (36) Atalanta.		6 (42) Isis.
	9 (29) Amphitrite.		10 (5) Astræa.
	10 (25) Thalia.		19 (28) Bellona.
	10 (21) Lutetia.		: (62) Europa.
	23 (10) Psyche.	Aug.	7 (14) Irene.
Aug.	1 (20) Massilia.		13 (9) Metis.
	9: (51) Nemausa.		20 (15) Eunomia.
	10 (2) Pallas.	Sept.	: (53) Calypso.
	20 (27) Fides.		28 (24) Thalia.
	26 (31) Euphrosyne.	Oct.	6 (27) Euterpe.
Sept.	6 (1) Ceres.		9 (2) Pallas.
Oct.	4 (4) Vesta.	Nov.	7 (19) Fortuna.
	15 (6) Hebe.		13 (28) Amphitrite.
Nov.	4 (26) Proserpina.		13 (8) Flora.
	7 (38) Leda.		19 (31) Euphrosyne.
	26 (53) Polyhymnia.		23 (10) Psyche.
Dec.	1 (11) Parthenope.	Dec.	: (51) Nemausa.
	: (54)		7 (1) Ceres.
	16: (45)		21 (20) Massilia.
			25 (21) Lutetia.

WASHINGTON MEAN NOON.

① CERES.

② PALLAS.

① CERES.						② PALLAS.					
Date.	Right Ascension.	Diff. for 1 Day.	Declination.	Diff. for 1 Day.	Log. Dist. from Earth.	Date.	Right Ascension.	Diff. for 1 Day.	Declination.	Diff. for 1 Day.	Log. Dist. from Earth.
	h m	m	° ' "	"			h m	m	° ' "	"	
Jan. -5	19 35.6	+1.73	26 28.9	+2.80	0.5882	Jan. -5	18 44.5	+1.39	2 31.3	- 0.28	0.6248
+5	19 52.8	1.73	25 58.2	2.80	0.5922	+5	18 58.4	1.38	2 33.7	+ 0.73	0.6270
15	20 10.1	1.73	25 21.1	2.97	0.5947	15	19 12.2	1.37	2 45.9	1.08	0.6277
25	20 27.2	1.69	24 38.8	4.46	0.5954	25	19 25.8	1.24	3 7.3	2.66	0.6268
Feb. 4	20 44.0	1.67	23 51.8	4.89	0.5945	Feb. 4	19 39.0	1.30	3 37.2	2.38	0.6244
14	21 0.6	1.64	23 1.0	5.22	0.5919	14	19 51.8	1.25	4 15.0	4.14	0.6204
24	21 16.9	1.60	22 7.2	5.47	0.5875	24	20 4.1	1.20	5 0.0	4.81	0.6149
Mar. 6	21 32.7	1.56	21 11.5	5.61	0.5818	Mar. 6	20 15.9	1.14	5 51.3	5.30	0.6078
16	21 48.0	1.51	20 14.9	5.64	0.5742	16	20 27.0	1.07	6 47.9	6.08	0.5992
26	22 2.9	1.46	19 18.5	5.87	0.5554	26	20 37.3	0.98	7 48.9	6.28	0.5891
April 5	22 17.3	1.40	18 23.4	5.37	0.5543	April 5	20 46.7	0.89	8 53.1	6.87	0.5775
15	22 30.9	1.33	17 31.1	5.02	0.5415	15	20 55.1	0.78	9 59.4	6.66	0.5645
25	22 43.8	1.26	16 43.0	4.55	0.5272	25	21 2.4	0.66	11 6.3	6.64	0.5502
May 5	22 56.1	1.18	16 0.1	4.01	0.5124	May 5	21 8.4	0.53	12 12.2	6.44	0.5346
15	23 7.4	1.08	15 22.8	3.34	0.4952	15	21 13.1	0.38	13 15.2	6.04	0.5180
25	23 17.7	0.98	14 53.3	2.44	0.4769	25	21 16.1	0.21	14 13.1	5.40	0.5007
June 4	23 27.0	0.86	14 34.0	1.37	0.4572	June 4	21 17.4	+0.04	15 3.2	4.46	0.4829
14	23 34.9	0.73	14 25.9	+0.19	0.4364	14	21 16.9	-0.14	15 42.3	2.19	0.4651
24	23 41.4	0.58	14 30.1	-1.09	0.4149	24	21 14.6	0.32	16 7.1	+ 1.87	0.4479
July 4	23 46.1	0.38	14 47.7	2.46	0.3896	July 4	21 10.5	0.49	16 13.8	- 0.40	0.4321
14	23 49.0	+0.18	15 19.4	2.34	0.3714	14	21 4.7	0.64	15 59.1	2.66	0.4184
24	23 49.7	-0.04	16 4.5	5.83	0.3510	24	20 57.7	0.73	15 20.7	5.06	0.4077
Aug. 3	23 48.1	0.27	17 1.8	6.18	0.3326	Aug. 3	20 50.0	0.77	14 17.9	7.41	0.4008
13	23 44.3	0.48	18 7.2	6.70	0.3174	13	20 42.3	0.74	12 52.5	9.45	0.3963
23	23 38.5	0.66	19 15.9	6.73	0.3066	23	20 35.1	0.65	11 8.8	10.99	0.4003
Sept. 2	23 31.0	0.79	20 21.6	6.07	0.3011	Sept. 2	20 29.2	0.50	9 12.7	11.09	0.4070
12	23 22.7	0.88	21 17.4	4.78	0.3008	12	20 25.0	0.32	7 10.8	12.15	0.4177
22	23 14.4	0.79	21 56.5	2.87	0.3068	22	20 22.7	-0.12	5 9.6	11.81	0.4316
Oct. 2	23 6.9	0.65	22 14.9	-0.77	0.3185	Oct. 2	20 22.5	+0.08	3 14.5	11.01	0.4479
12	23 1.1	0.46	22 11.9	+1.28	0.3346	12	20 24.3	0.27	+ 1 29.4	9.89	0.4657
22	22 57.6	0.24	21 49.2	2.04	0.3541	22	20 28.0	0.46	- 0 3.4	8.00	0.4843
Nov. 1	22 56.2	-0.02	21 11.0	4.58	0.3751	Nov. 1	20 33.4	0.61	1 22.6	7.21	0.5028
11	22 57.2	+0.20	20 18.6	5.81	0.3971	11	20 40.3	0.75	2 27.7	6.81	0.5209
21	23 0.3	0.40	19 14.7	6.88	0.4192	21	20 48.5	0.88	3 18.9	4.46	0.5381
Dec. 1	23 5.2	0.59	18 0.9	7.75	0.4410	Dec. 1	20 57.9	0.98	3 56.8	2.17	0.5541
11	23 12.1	0.75	16 39.6	8.41	0.4617	11	21 8.2	1.08	4 22.3	1.97	0.5686
21	23 20.3	0.87	15 12.7	8.92	0.4820	21	21 19.2	1.14	4 36.2	- 0.66	0.5816
31	23 29.6	+0.98	-13 41.2	+9.30	0.4987	31	21 31.0	+1.21	- 4 39.5	+ 0.18	0.5929

WASHINGTON MEAN NOON.

② JUNO.						④ VESTA.					
Date.	Right Ascension.	Diff. for 1 Day.	Declination.	Diff. for 1 Day.	Log. Dist. from Earth.	Date.	Right Ascension.	Diff. for 1 Day.	Declination.	Diff. for 1 Day.	Log. Dist. from Earth.
Jan. -5	14 14.8	+1.00	7 46.6	-2.68	0.5460	Jan. -5	19 12.8	+2.29	-23 9.6	+2.34	0.4978
+5	14 25.1	0.98	8 7.5	1.00	0.5311	+5	19 35.7	2.27	22 39.9	2.86	0.5015
15	14 34.4	0.98	8 18.6	-0.98	0.5147	15	19 58.3	2.24	21 58.5	4.08	0.5039
25	14 42.4	0.78	8 19.1	+0.80	0.4969	25	20 20.6	2.21	21 6.3	6.09	0.5050
Feb. 4	14 49.0	0.58	8 8.6	1.02	0.4780	Feb. 4	20 42.5	2.18	20 4.6	6.88	0.5047
14	14 54.0	0.40	7 46.5	2.79	0.4583	14	21 3.9	2.11	18 54.6	7.34	0.5031
24	14 57.0	+0.20	7 12.7	2.94	0.4385	24	21 24.8	2.06	17 37.8	7.96	0.5002
Mar. 6	14 58.0	0.00	6 27.6	6.02	0.4191	Mar. 6	21 45.2	2.01	16 15.5	8.42	0.4960
16	14 56.9	-0.22	5 32.1	6.96	0.4012	16	22 5.0	1.96	14 49.3	8.75	0.4904
26	14 53.6	0.42	4 28.4	6.02	0.3858	26	22 24.2	1.89	13 20.5	8.94	0.4834
April 5	14 48.4	0.60	3 19.4	6.88	0.3738	April 5	22 42.9	1.82	11 50.5	8.98	0.4750
15	14 41.6	0.72	2 9.4	6.80	0.3665	15	23 0.9	1.77	10 20.9	8.67	0.4652
25	14 33.9	0.78	1 3.4	6.16	0.3643	25	23 18.4	1.71	8 53.0	8.64	0.4539
May 5	14 26.0	0.77	0 6.3	6.07	0.3675	May 5	23 35.2	1.64	7 28.1	8.26	0.4412
15	14 18.5	0.69	+ 0 38.0	3.06	0.3760	15	23 51.3	1.57	6 7.9	7.72	0.4270
25	14 12.1	0.56	1 7.0	2.10	0.3888	25	0 6.7	1.49	4 53.7	7.07	0.4112
June 4	14 7.2	0.39	1 20.0	+0.53	0.4052	June 4	0 21.2	1.40	3 46.5	6.27	0.3939
14	14 4.2	0.20	1 17.6	-0.22	0.4239	14	0 34.8	1.29	2 48.3	5.21	0.3751
24	14 3.1	-0.02	1 1.4	2.21	0.4440	24	0 47.3	1.19	2 0.2	4.22	0.3548
July 4	14 3.8	+0.16	+ 0 33.3	2.20	0.4646	July 4	0 58.6	1.08	1 23.7	3.29	0.3330
14	14 6.4	0.32	0 4.5	4.16	0.4852	14	1 8.3	0.98	1 0.4	1.61	0.3101
24	14 10.5	0.49	0 49.9	4.08	0.5051	24	1 16.3	0.89	0 51.5	+0.10	0.2861
Aug. 3	14 16.0	0.62	1 42.2	6.22	0.5241	Aug. 3	1 22.1	0.76	0 58.4	-1.80	0.2618
13	14 22.9	0.74	2 36.6	6.02	0.5419	13	1 25.6	+0.21	1 21.5	2.12	0.2376
23	14 30.8	0.84	3 34.8	6.09	0.5583	23	1 26.3	-0.07	2 0.7	4.05	0.2148
Sept. 2	14 39.8	0.94	4 34.4	6.07	0.5732	Sept. 2	1 24.3	0.24	2 54.6	4.21	0.1947
12	14 49.7	1.02	5 34.3	6.96	0.5865	12	1 19.5	0.09	3 59.0	6.67	0.1789
22	15 0.3	1.10	6 33.5	6.02	0.5982	22	1 12.2	0.00	5 8.0	6.77	0.1692
Oct. 2	15 11.7	1.16	7 31.0	6.02	0.6082	Oct. 2	1 3.4	0.91	6 14.5	3.26	0.1666
12	15 23.6	1.22	8 25.9	6.22	0.6165	12	0 54.0	0.91	7 7.3	4.41	0.1719
22	15 36.1	1.27	9 17.4	4.94	0.6231	22	0 45.2	0.79	7 42.7	2.22	0.1847
Nov. 1	15 49.0	1.21	10 4.8	4.60	0.6280	Nov. 1	0 38.1	0.69	7 56.0	-0.20	0.2038
11	16 2.3	1.24	10 47.4	3.96	0.6312	11	0 33.4	0.24	7 46.8	+1.95	0.2276
21	16 15.8	1.26	11 24.4	3.40	0.6326	21	0 31.3	-0.07	7 17.0	2.86	0.2542
Dec. 1	16 29.6	1.28	11 55.5	2.78	0.6323	Dec. 1	0 31.9	+0.18	6 29.5	6.48	0.2622
11	16 43.5	1.29	12 20.1	2.12	0.6302	11	0 35.0	0.42	5 27.3	6.78	0.3107
21	16 57.5	1.29	12 37.9	1.42	0.6264	21	0 40.3	0.02	4 13.8	7.90	0.3385
31	17 11.4	+1.28	-12 48.6	-0.06	0.6207	31	0 47.5	+0.00	- 2 51.2	+0.01	0.3652

WASHINGTON MEAN NOON.

⑥ ASTRÆA.

⑥ HEBE.

⑥ ASTRÆA.						⑥ HEBE.					
Date.	Right Ascension.	Diff. for 1 Day.	Declination.	Diff. for 1 Day.	Log. Dist. from Earth.	Date.	Right Ascension.	Diff. for 1 Day.	Declination.	Diff. for 1 Day.	Log. Dist. from Earth.
	h m	m	° ' "	"			h m	m	° ' "	"	
Jan. -5	11 48.1	+1.14	+ 2 11.3	-4.30	0.2349	Jan. -5	18 36.2	+2.02	-16 37.1	- 0.08	0.5245
+5	11 58.3	0.00	1 35.8	3.03	0.2070	+5	18 56.6	2.05	16 38.7	+ 0.29	0.5221
15	12 6.1	0.08	1 18.8	-0.04	0.1788	15	19 17.2	2.08	16 29.3	1.46	0.5181
25	12 11.6	0.20	1 22.8	+1.53	0.1509	25	19 37.9	2.07	16 9.4	2.48	0.5127
Feb. 4	12 14.0	+0.08	1 49.4	3.77	0.1248	Feb. 4	19 58.7	2.08	15 39.6	3.44	0.5059
14	12 13.2	-0.23	2 38.2	5.04	0.1022	14	20 19.5	2.07	15 0.6	4.32	0.4976
24	12 9.5	0.50	3 46.2	7.43	0.0850	24	20 40.2	2.08	14 13.2	5.11	0.4878
Mar. 6	12 3.3	0.00	5 6.9	8.20	0.0752	Mar. 6	21 0.8	2.05	13 18.4	5.80	0.4765
16	11 55.7	0.77	6 30.3	7.03	0.0743	16	21 21.2	2.03	12 17.3	6.38	0.4637
26	11 47.9	0.73	7 45.3	6.06	0.0826	26	21 41.4	2.01	11 11.2	6.78	0.4495
April 5	11 41.2	0.87	8 43.6	4.08	0.0993	April 5	22 1.5	2.00	10 1.6	7.07	0.4340
15	11 36.5	0.23	9 18.9	3.24	0.1227	15	22 21.4	1.97	8 49.8	7.23	0.4169
25	11 34.5	-0.07	9 30.4	+0.02	0.1506	25	22 41.0	1.95	7 37.1	7.16	0.3984
May 5	11 35.2	+0.20	9 19.4	-2.00	0.1812	May 5	23 0.4	1.98	6 26.5	6.92	0.3785
15	11 38.5	0.45	8 48.7	3.90	0.2129	15	23 19.6	1.90	5 18.6	6.53	0.3571
25	11 44.1	0.66	8 1.4	5.39	0.2446	25	23 38.4	1.86	4 15.9	6.90	0.3343
June 4	11 51.6	0.84	7 0.8	6.00	0.2757	June 4	23 56.8	1.82	3 20.6	6.04	0.3100
14	12 0.8	0.99	5 49.4	7.58	0.3055	14	0 14.9	1.78	2 35.1	3.84	0.2842
24	12 11.4	1.11	4 29.2	8.38	0.3338	24	0 32.5	1.72	2 1.8	2.99	0.2570
July 4	12 23.0	1.21	3 2.2	8.06	0.3606	July 4	0 49.4	1.64	1 43.3	+ 0.06	0.2286
14	12 35.6	1.30	+ 1 30.2	9.36	0.3856	14	1 5.3	1.53	1 42.5	- 0.95	0.1987
24	12 49.0	1.38	- 0 5.1	9.04	0.4089	24	1 20.0	1.39	2 2.3	2.14	0.1683
Aug. 3	13 3.1	1.44	1 42.6	9.79	0.4306	Aug. 3	1 33.2	1.22	2 45.3	6.55	0.1374
13	13 17.7	1.49	3 21.0	9.82	0.4505	13	1 44.5	1.00	3 53.4	8.09	0.1065
23	13 32.8	1.54	4 59.1	9.74	0.4688	23	1 53.3	0.74	5 27.2	10.08	0.0766
Sept. 2	13 48.4	1.58	6 35.9	9.07	0.4854	Sept. 2	1 59.3	0.44	7 25.1	12.72	0.0491
12	14 4.4	1.62	8 10.5	9.29	0.5004	12	2 2.1	+0.10	9 41.6	14.10	0.0256
22	14 20.8	1.66	9 41.8	8.88	0.5138	22	2 1.4	-0.23	12 7.0	14.26	0.0079
Oct. 2	14 37.5	1.69	11 9.2	8.49	0.5257	Oct. 2	1 57.5	0.50	14 26.8	12.84	9.9978
12	14 54.5	1.72	12 31.6	7.98	0.5359	12	1 51.3	0.67	16 23.9	9.80	9.9965
22	15 11.8	1.74	13 48.4	7.36	0.5445	22	1 44.0	0.71	17 43.8	6.09	0.0042
Nov. 1	15 29.3	1.76	14 58.9	6.70	0.5515	Nov. 1	1 37.0	0.61	18 17.8	- 1.04	0.0200
11	15 47.0	1.78	16 2.4	6.07	0.5570	11	1 31.8	0.39	18 4.7	+ 3.28	0.0423
21	16 4.8	1.79	16 58.3	5.20	0.5609	21	1 29.2	-0.11	17 10.2	7.13	0.0693
Dec. 1	16 22.7	1.78	17 46.4	4.39	0.5631	Dec. 1	1 20.6	+0.19	15 42.1	10.04	0.0993
11	16 40.5	1.77	18 26.2	3.58	0.5636	11	1 33.1	0.48	13 49.3	12.18	0.1307
21	16 58.2	1.76	18 57.4	2.71	0.5626	21	1 39.2	0.71	11 39.5	13.51	0.1623
31	17 15.8	+1.75	-19 20.4	-1.01	0.5598	31	1 47.3	+0.08	- 9 19.1	+14.29	0.1936

WASHINGTON MEAN NOON.

⑦ IRIS.

⑧ FLORA.

⑦ IRIS.						⑧ FLORA.					
Date.	Right Ascension.	Diff. for 1 Day.	Declination.	Diff. for 1 Day.	Log. Dist. from Earth.	Date.	Right Ascension.	Diff. for 1 Day.	Declination.	Diff. for 1 Day.	Log. Dist. from Earth.
	h m	m	° ' "	' "			h m	m	° ' "	' "	
Jan. -5	21 38.1	+2.00	- 9 31.4	+ 9.39	0.3980	Jan. -5	14 41.9	+1.47	-10 29.6	-2.99	0.4768
+5	21 58.5	2.07	7 53.5	10.36	0.4083	+5	14 56.4	1.42	11 24.6	2.07	0.4603
15	22 19.4	2.10	6 4.1	11.26	0.4172	15	15 10.3	1.34	12 11.0	4.30	0.4421
25	22 40.6	2.14	4 7.2	12.06	0.4250	25	15 23.3	1.24	12 48.6	2.30	0.4219
Feb. 4	23 2.2	2.17	- 2 2.9	12.71	0.4317	Feb. 4	15 35.2	1.12	13 17.1	2.39	0.3996
14	23 24.1	2.20	+ 0 7.1	12.27	0.4372	14	15 45.7	0.97	13 36.5	1.49	0.3760
24	23 46.3	2.24	2 21.4	12.55	0.4419	24	15 54.7	0.80	13 46.9	-0.60	0.3506
Mar. 6	0 8.9	2.27	4 38.2	12.71	0.4451	Mar. 6	16 1.7	0.68	13 48.6	+0.25	0.3229
16	0 31.8	2.29	6 55.7	12.68	0.4487	16	16 6.4	0.54	13 41.9	1.05	0.2965
26	0 54.7	2.31	9 11.9	12.46	0.4509	26	16 8.5	+0.06	13 27.5	1.73	0.2682
April 5	1 18.0	2.41	11 24.8	12.04	0.4519	April 5	16 7.7	-0.22	13 6.3	2.39	0.2429
15	1 42.9	2.47	13 32.8	12.42	0.4533	15	16 3.9	0.22	12 39.6	2.24	0.2190
25	2 7.5	2.48	15 33.4	11.80	0.4536	25	15 57.3	0.77	12 9.4	2.07	0.1992
May 5	2 32.5	2.52	17 24.8	10.69	0.4533	May 5	15 48.5	0.96	11 38.1	2.99	0.1854
15	2 57.9	2.56	19 5.3	9.40	0.4525	15	15 38.1	1.05	11 9.6	2.53	0.1735
25	3 23.7	2.59	20 32.9	8.02	0.4510	25	15 27.4	1.02	10 47.5	1.71	0.1794
June 4	3 49.8	2.62	21 46.4	6.57	0.4490	June 4	15 17.7	0.87	10 35.4	+0.69	0.1877
14	4 16.1	2.63	22 44.4	4.99	0.4464	14	15 9.9	0.65	10 35.6	-0.73	0.2024
24	4 42.4	2.63	23 26.2	3.41	0.4431	24	15 4.6	0.39	10 49.0	1.08	0.2218
July 4	5 8.7	2.61	23 51.3	+ 1.66	0.4392	July 4	15 2.1	-0.10	11 15.2	2.19	0.2443
14	5 34.7	2.58	23 59.4	- 0.06	0.4344	14	15 2.6	+0.18	11 52.8	4.22	0.2684
24	6 0.3	2.52	23 51.1	1.61	0.4289	24	15 5.7	0.42	12 39.8	5.06	0.2930
Aug. 3	6 25.3	2.46	23 27.1	3.12	0.4224	Aug. 3	15 11.2	0.66	13 34.1	5.69	0.3172
13	6 49.6	2.38	22 48.5	4.68	0.4150	13	15 18.9	0.87	14 33.6	6.11	0.3407
23	7 13.0	2.29	21 56.5	5.78	0.4065	23	15 28.6	1.06	15 36.3	6.28	0.3626
Sept. 2	7 35.4	2.18	20 52.8	6.88	0.3968	Sept. 2	15 40.1	1.22	16 40.3	6.26	0.3834
12	7 56.7	2.07	19 39.3	7.06	0.3859	12	15 53.1	1.27	17 43.9	6.26	0.4023
22	8 16.8	1.95	18 19.1	6.45	0.3736	22	16 7.5	1.20	18 45.5	4.97	0.4196
Oct. 2	8 35.7	1.81	16 50.2	5.01	0.3597	Oct. 2	16 23.2	1.02	19 43.4	4.24	0.4352
12	8 53.1	1.66	15 18.8	3.22	0.3443	12	16 40.0	1.73	20 36.3	4.97	0.4490
22	9 9.0	1.50	13 45.5	1.80	0.3273	22	16 57.8	1.82	21 22.8	4.27	0.4612
Nov. 1	9 23.2	1.32	12 12.7	0.14	0.3096	Nov. 1	17 16.6	1.92	22 1.7	2.45	0.4717
11	9 35.6	1.12	10 42.6	0.74	0.2883	11	17 36.2	1.99	22 31.8	2.22	0.4805
21	9 45.9	0.91	9 17.8	0.08	0.2666	21	17 56.5	2.06	22 52.1	1.20	0.4877
Dec. 1	9 53.8	0.65	8 0.9	7.15	0.2437	Dec. 1	18 17.5	2.12	23 1.8	-0.41	0.4984
11	9 58.9	0.37	6 54.7	5.24	0.2203	11	18 38.9	2.15	23 0.3	+0.72	0.4975
21	10 1.2	+0.06	6 2.1	4.42	0.1970	21	19 0.6	2.19	22 47.1	1.21	0.5000
31	10 0.2	-0.22	+ 5 26.2	- 2.71	0.1753	31	19 22.7	+2.22	-22 22.1	+2.12	0.5011

WASHINGTON MEAN NOON.

⑨ METIS.

⑩ HYGIA.

⑨ METIS.						⑩ HYGIA.					
Date.	Right Ascension.	Dist. for 1 Day.	Declination.	Diff. for 1 Day.	Log. Dist. from Earth.	Date.	Right Ascension.	Dist. for 1 Day.	Declination.	Diff. for 1 Day.	Log. Dist. from Earth.
	h m	m	° ' "	'			h m	m	° ' "	'	
Jan. -5	13 58.4	+1.84	- 7 26.7	-6.84	0.4385	Jan. -5	6 19.9	-0.88	+24 30.7	-0.43	0.3790
+5	14 11.4	1.24	8 30.9	5.97	0.4215	+5	6 11.1	0.84	24 25.1	0.08	0.3808
15	14 23.3	1.18	9 26.1	5.04	0.4017	15	6 3.1	0.72	24 17.1	0.08	0.3879
25	14 33.8	0.97	10 11.7	4.08	0.3803	25	5 56.7	0.68	24 7.5	0.08	0.3996
Feb. 4	14 42.8	0.80	10 47.3	3.04	0.3574	Feb. 4	5 52.4	0.81	23 57.5	0.08	0.4150
14	14 49.9	0.59	11 12.6	2.08	0.3334	14	5 50.4	-0.08	23 48.2	0.07	0.4328
24	14 54.7	0.35	11 27.4	-0.08	0.3087	24	5 50.8	+0.15	23 40.0	0.77	0.4520
Mar. 6	14 57.0	+0.09	11 31.6	+0.10	0.2842	Mar. 6	5 53.5	0.37	23 32.8	0.08	0.4717
16	14 56.6	-0.18	11 25.4	1.11	0.2608	16	5 58.2	0.56	23 26.2	0.08	0.4913
26	14 53.3	0.47	11 9.4	2.01	0.2399	26	6 4.7	0.73	23 19.5	0.71	0.5102
April 5	14 47.2	0.71	10 45.1	2.71	0.2231	April 5	6 12.8	0.87	23 12.0	0.84	0.5279
15	14 39.0	0.89	10 15.1	2.11	0.2119	15	6 22.2	1.00	23 2.6	1.07	0.5444
25	14 29.4	0.97	9 42.9	2.10	0.2075	25	6 32.9	1.11	22 50.5	1.88	0.5595
May 5	14 19.5	0.98	9 13.1	2.08	0.2106	May 5	6 44.5	1.19	22 35.0	1.76	0.5731
15	14 10.4	0.88	8 50.3	1.78	0.2208	15	6 56.8	1.28	22 15.4	2.19	0.5851
25	14 2.9	0.68	8 38.1	+0.59	0.2370	25	7 9.8	1.32	21 51.2	2.08	0.5965
June 4	13 57.8	0.38	8 38.4	-0.09	0.2579	June 4	7 23.3	1.37	21 22.1	2.17	0.6043
14	13 55.2	-0.13	8 52.0	1.08	0.2817	14	7 37.2	1.40	20 47.8	2.09	0.6116
24	13 53.2	+0.11	9 18.1	2.17	0.3072	24	7 51.3	1.42	20 8.2	4.23	0.6173
July 4	13 57.5	0.28	9 55.4	4.20	0.3331	July 4	8 5.6	1.43	19 23.2	4.78	0.6214
14	14 2.1	0.58	10 42.1	5.05	0.3588	14	8 20.0	1.44	18 33.1	5.27	0.6240
24	14 8.6	0.73	11 36.4	5.73	0.3836	24	8 34.5	1.44	17 37.9	5.76	0.6251
Aug. 3	14 16.8	0.89	12 36.7	6.24	0.4072	Aug. 3	8 48.9	1.43	16 37.9	6.22	0.6246
13	14 26.4	1.03	13 41.2	6.59	0.4293	13	9 3.2	1.43	15 33.4	6.05	0.6225
23	14 37.4	1.18	14 48.5	6.80	0.4498	23	9 17.4	1.41	14 24.9	7.03	0.6188
Sept. 2	14 49.5	1.28	15 57.2	6.88	0.4686	Sept. 2	9 31.4	1.38	13 12.9	7.34	0.6136
12	15 2.7	1.36	17 5.8	6.79	0.4857	12	9 45.1	1.35	11 58.0	7.00	0.6068
22	15 16.8	1.45	18 13.1	6.03	0.5011	22	9 58.5	1.33	10 40.8	7.79	0.5983
Oct. 2	15 31.8	1.53	19 18.2	6.38	0.5147	Oct. 2	10 11.5	1.27	9 22.1	7.91	0.5882
12	15 47.5	1.60	20 20.1	5.97	0.5266	12	10 24.0	1.23	8 2.5	7.98	0.5764
22	16 3.9	1.67	21 17.6	5.48	0.5367	22	10 36.1	1.17	6 43.0	7.90	0.5629
Nov. 1	16 20.9	1.73	22 9.9	4.93	0.5452	Nov. 1	10 47.5	1.10	5 24.5	7.75	0.5477
11	16 38.4	1.77	22 56.1	4.28	0.5519	11	10 58.2	1.02	4 8.0	7.49	0.5308
21	16 56.4	1.83	23 35.5	3.67	0.5570	21	11 8.0	0.98	2 54.7	7.10	0.5122
Dec. 1	17 14.8	1.88	24 7.6	2.93	0.5604	Dec. 1	11 16.8	0.88	1 45.9	6.89	0.4920
11	17 33.4	1.87	24 31.9	2.03	0.5620	11	11 24.5	0.70	+ 0 42.8	5.84	0.4703
21	17 52.3	1.89	24 48.0	1.30	0.5620	21	11 30.8	0.64	- 0 13.0	5.13	0.4474
31	18 11.2	+1.00	-24 56.0	-0.88	0.5603	31	11 35.4	+0.37	- 0 59.8	-4.16	0.4236

WASHINGTON MEAN NOON.

⑪ PARTHENOPE.						⑫ EGERIA.					
Date.	Right Ascension.	Diff. for 1 Day.	Declination.	Diff. for 1 Day.	Log. Dist. from Earth.	Date.	Right Ascension.	Diff. for 1 Day.	Declination.	Diff. for 1 Day.	Log. Dist. from Earth.
	h m	m	° ' "	' "			h m	m	° ' "	' "	
Jan. -5	21 18.6	+2.00	-17 30.9	+ 8.29	0.4550	Jan. -5	0 15.8	+0.73	- 4 42.6	+11.24	0.3683
+5	21 38.5	1.99	16 3.6	9.14	0.4671	+5	0 23.8	0.87	2 48.1	11.63	0.4100
15	21 58.4	1.98	14 28.6	9.88	0.4777	15	0 33.3	1.01	- 0 49.9	11.94	0.4301
25	22 18.2	1.97	12 47.0	10.43	0.4869	25	0 44.1	1.13	+ 1 10.8	12.17	0.4485
Feb. 4	22 37.9	1.96	10 59.9	10.92	0.4948	Feb. 4	0 55.9	1.23	3 13.4	12.30	0.4652
14	22 57.4	1.94	9 8.5	11.29	0.5012	14	1 8.7	1.33	5 16.8	12.33	0.4802
24	23 16.8	1.93	7 14.0	11.54	0.5064	24	1 22.3	1.40	7 20.1	12.31	0.4934
Mar. 6	23 36.0	1.91	5 17.6	11.67	0.5102	Mar. 6	1 36.7	1.47	9 23.0	12.21	0.5068
16	23 55.1	1.90	3 20.5	11.69	0.5127	16	1 51.8	1.54	11 24.3	12.02	0.5146
26	0 14.0	1.88	- 1 23.8	11.59	0.5139	26	2 7.5	1.60	13 23.5	11.78	0.5227
April 5	0 32.7	1.87	+ 0 31.3	11.38	0.5139	April 5	2 23.8	1.66	15 19.9	11.45	0.5292
15	0 51.4	1.86	2 23.8	11.07	0.5126	15	2 40.7	1.72	17 12.5	11.05	0.5341
25	1 9.9	1.84	4 12.7	10.66	0.5100	25	2 58.2	1.77	19 0.9	10.56	0.5376
May 5	1 28.3	1.83	5 57.1	10.17	0.5061	May 5	3 16.2	1.83	20 44.1	10.09	0.5395
15	1 46.5	1.81	7 36.1	9.59	0.5009	15	3 34.8	1.88	22 21.6	9.43	0.5400
25	2 4.6	1.80	9 8.9	8.93	0.4944	25	3 53.8	1.92	23 52.7	8.76	0.5390
June 4	2 22.5	1.78	10 34.7	8.20	0.4865	June 4	4 13.2	1.97	25 16.9	8.03	0.5367
14	2 40.2	1.75	11 53.0	7.43	0.4772	14	4 33.2	2.01	26 33.4	7.25	0.5330
24	2 57.6	1.72	13 3.3	6.60	0.4665	24	4 53.5	2.04	27 42.0	6.45	0.5280
July 4	3 14.6	1.67	14 5.0	5.73	0.4543	July 4	5 14.1	2.07	28 42.4	5.61	0.5216
14	3 31.0	1.61	14 58.0	4.85	0.4406	14	5 35.0	2.09	29 34.3	4.79	0.5138
24	3 46.8	1.54	15 42.1	3.96	0.4253	24	5 56.0	2.10	30 18.0	3.96	0.5047
Aug. 3	4 1.9	1.46	16 17.3	3.06	0.4084	Aug. 3	6 17.1	2.11	30 53.5	3.18	0.4942
13	4 15.9	1.34	16 43.8	2.23	0.3899	13	6 38.2	2.10	31 21.6	2.45	0.4822
23	4 28.7	1.20	17 1.9	1.42	0.3698	23	6 59.1	2.07	31 42.6	1.82	0.4668
Sept. 2	4 40.0	1.04	17 12.2	0.66	0.3483	Sept. 2	7 19.7	2.04	31 58.0	1.31	0.4540
12	4 49.5	0.84	17 15.5	+ 0.01	0.3254	12	7 39.9	1.99	32 8.8	0.84	0.4376
22	4 56.8	0.61	17 12.5	- 0.56	0.3015	22	7 59.5	1.92	32 16.8	0.74	0.4196
Oct. 2	5 1.7	0.35	17 4.3	1.02	0.2772	Oct. 2	8 18.4	1.84	32 23.9	0.79	0.4004
12	5 3.8	+0.06	16 52.0	1.37	0.2533	12	8 36.4	1.75	32 32.6	1.04	0.3795
22	5 2.8	-0.26	16 36.8	1.60	0.2309	22	8 53.4	1.63	32 44.8	1.59	0.3573
Nov. 1	4 58.6	0.56	16 19.9	1.71	0.2115	Nov. 1	9 9.1	1.49	33 4.2	2.40	0.3337
11	4 51.6	0.81	16 2.5	1.68	0.1968	11	9 23.2	1.31	33 32.9	3.49	0.3090
21	4 42.4	0.96	15 46.2	1.47	0.1886	21	9 35.4	1.11	34 14.1	4.67	0.2836
Dec. 1	4 32.0	1.03	15 33.0	1.06	0.1880	Dec. 1	9 45.3	0.88	35 10.3	6.41	0.2579
11	4 21.7	0.96	15 25.1	- 0.42	0.1953	11	9 52.5	0.54	36 22.4	7.96	0.2327
21	4 12.8	0.77	15 24.5	+ 0.37	0.2100	21	9 56.4	+0.21	37 49.3	9.34	0.2091
31	4 6.3	-0.80	+15 32.6	+ 1.28	0.2306	31	9 56.7	-0.17	+39 27.3	+10.29	0.1883

WASHINGTON MEAN NOON.

⑭ IRENE.

⑮ FORTUNA.

⑭ IRENE.						⑮ FORTUNA.					
Date.	Right Ascension.	Diff. for 1 Day.	Declination.	Diff. for 1 Day.	Log. Dist. from Earth.	Date.	Right Ascension.	Diff. for 1 Day.	Declination.	Diff. for 1 Day.	Log. Dist. from Earth.
	h m	m	° ' "	' "			h m	m	° ' "	' "	
Jan. -5	12 22.3	+1.30	+ 8 12.5	- 3.14	0.2802	Jan. -5	15 29.1	+1.53	-18 43.2	-5.13	0.5436
+5	12 34.6	1.14	7 48.1	- 1.61	0.2517	+5	15 44.1	1.48	19 31.5	4.40	0.5309
15	12 45.1	0.98	7 40.3	+ 0.11	0.2222	15	15 58.8	1.44	20 13.0	3.82	0.5163
25	12 53.6	0.71	7 50.3	1.00	0.1923	25	16 12.9	1.37	20 47.9	3.16	0.4998
Feb. 4	12 59.4	0.43	8 18.4	3.71	0.1628	Feb. 4	16 26.2	1.29	21 16.2	2.51	0.4814
14	13 2.3	+0.13	9 4.5	5.33	0.1351	14	16 38.7	1.19	21 38.1	1.89	0.4612
24	13 2.1	-0.18	10 5.0	6.48	0.1105	24	16 50.0	1.08	21 54.1	1.32	0.4392
Mar. 6	12 58.7	0.47	11 14.1	6.86	0.0910	Mar. 6	16 59.8	0.90	22 4.5	0.79	0.4156
16	12 52.6	0.71	12 22.3	6.23	0.0777	16	17 8.0	0.71	22 10.0	-0.33	0.3906
26	12 44.5	0.84	13 18.8	4.59	0.0739	26	17 14.1	0.61	22 11.0	+0.08	0.3646
April 5	12 35.8	0.88	13 54.1	+ 2.14	0.0783	April 5	17 18.3	+0.28	22 8.8	0.40	0.3379
15	12 27.9	0.69	14 1.6	- 0.69	0.0906	15	17 19.8	0.00	22 3.0	0.73	0.3116
25	12 21.9	0.47	13 40.2	3.46	0.1096	25	17 18.3	-0.27	21 54.2	1.05	0.2864
May 5	12 18.5	-0.19	12 52.3	6.00	0.1335	May 5	17 14.0	0.66	21 42.0	1.36	0.2636
15	12 18.0	+0.09	11 42.1	4.88	0.1606	15	17 7.3	0.77	21 26.9	1.68	0.2448
25	12 20.3	0.35	10 14.7	9.40	0.1892	25	16 58.7	0.92	21 8.4	1.99	0.2315
June 4	12 25.1	0.69	8 34.1	10.54	0.2183	June 4	16 48.7	1.00	20 47.0	2.17	0.2246
14	12 32.1	0.79	6 43.8	11.38	0.2471	14	16 38.6	0.98	20 24.9	2.14	0.2248
24	12 41.0	0.97	4 46.9	11.92	0.2751	24	16 29.5	0.81	20 4.2	1.85	0.2318
July 4	12 51.5	1.11	2 45.4	12.20	0.3021	July 4	16 22.3	0.69	19 47.9	1.31	0.2447
14	13 3.3	1.24	+ 0 41.1	12.49	0.3278	14	16 17.6	0.52	19 38.0	+0.62	0.2621
24	13 16.3	1.34	- 1 24.4	12.54	0.3520	24	16 15.8	-0.04	19 35.5	-0.13	0.2825
Aug. 3	13 30.2	1.43	3 29.7	12.47	0.3748	Aug. 3	16 16.7	+0.22	19 40.7	0.85	0.3046
13	13 45.0	1.52	5 33.8	12.30	0.3961	13	16 20.3	0.48	19 52.6	1.45	0.3374
23	14 0.6	1.59	7 35.6	11.99	0.4160	23	16 26.3	0.71	20 9.8	1.90	0.3499
Sept. 2	14 16.9	1.66	9 33.7	11.69	0.4344	Sept. 2	16 34.5	0.92	20 30.7	2.18	0.3718
12	14 33.8	1.73	11 27.5	11.10	0.4512	12	16 44.8	1.11	20 53.3	2.26	0.3923
22	14 51.3	1.78	13 15.7	10.51	0.4668	22	16 56.7	1.29	21 15.9	2.18	0.4118
Oct. 2	15 9.4	1.83	14 57.7	9.84	0.4808	Oct. 2	17 10.7	1.41	21 36.9	1.91	0.4296
12	15 28.0	1.88	16 32.5	9.08	0.4934	12	17 24.9	1.50	21 54.2	1.49	0.4458
22	15 47.0	1.92	17 59.4	8.28	0.4956	22	17 40.8	1.64	22 6.7	0.94	0.4604
Nov. 1	16 6.5	1.96	19 17.7	7.39	0.5143	Nov. 1	17 57.7	1.73	22 13.0	-0.26	0.4733
11	16 26.2	1.99	20 26.6	6.40	0.5225	11	18 15.5	1.81	22 11.9	+0.48	0.4846
21	16 46.3	1.97	21 25.7	5.40	0.5293	21	18 34.0	1.88	22 2.4	1.39	0.4943
Dec. 1	17 6.5	2.01	22 14.7	4.38	0.5345	Dec. 1	18 53.1	1.93	21 44.0	2.34	0.5023
11	17 26.8	2.03	22 53.4	3.36	0.5303	11	19 12.6	1.97	21 15.5	3.34	0.5087
21	17 47.2	2.02	23 22.0	2.36	0.5406	21	19 32.5	2.00	20 37.2	4.32	0.5136
31	18 7.3	+1.96	-23 40.6	- 1.36	0.5413	31	19 52.6	+2.01	-19 48.8	+5.30	0.5169

WASHINGTON MEAN NOON.

⑮ EUNOMIA.						⑰ THETIS.					
Date.	Right Ascension.	Diff. for 1 Day.	Declination.	Diff. for 1 Day.	Log. Dist. from Earth.	Date.	Right Ascension.	Diff. for 1 Day.	Declination.	Diff. for 1 Day.	Log. Dist. from Earth.
Jan. -5	14 26.4	+1.30	25 10.8	-7.03	0.5596	Jan. -5	6 40.8	-1.03	19 7.1	+2.44	0.2523
+5	14 38.0	1.14	26 23.5	7.13	0.5455	+5	6 30.3	1.02	19 32.8	2.60	0.2525
15	14 49.2	1.06	27 34.4	6.91	0.5292	15	6 20.4	0.90	19 59.2	2.61	0.2594
25	14 59.3	0.94	28 41.7	6.49	0.5112	25	6 12.3	0.69	20 25.1	2.58	0.2725
Feb. 4	15 8.1	0.81	29 44.3	6.03	0.4918	Feb. 4	6 6.6	0.42	20 49.8	2.40	0.2905
14	15 15.5	0.66	30 42.8	5.80	0.4710	14	6 3.8	-0.13	21 13.2	2.26	0.3118
24	15 21.1	0.46	31 36.3	5.06	0.4492	24	6 3.9	+0.16	21 35.0	2.06	0.3349
Mar. 6	15 24.7	+0.24	32 24.0	4.39	0.4268	Mar. 6	6 6.8	0.42	21 54.8	1.84	0.3586
16	15 25.9	-0.01	33 4.1	3.55	0.4044	16	6 12.3	0.66	22 11.9	1.54	0.3820
26	15 24.5	0.27	33 35.0	2.46	0.3828	26	6 20.0	0.66	22 25.7	1.16	0.4046
April 5	15 20.5	0.52	33 53.4	-1.09	0.3629	April 5	6 29.6	1.04	22 35.2	0.70	0.4269
15	15 14.1	0.74	33 56.8	+0.54	0.3459	15	6 40.8	1.18	22 39.7	+0.15	0.4457
25	15 5.7	0.90	33 42.5	2.26	0.3328	25	6 53.3	1.30	22 38.3	-0.46	0.4638
May 5	14 56.1	0.97	33 9.6	4.13	0.3248	May 5	7 6.9	1.41	22 30.4	1.14	0.4802
15	14 46.3	0.94	32 19.8	5.60	0.3223	15	7 21.5	1.49	22 15.5	1.86	0.4948
25	14 37.3	0.81	31 17.5	6.58	0.3255	25	7 36.8	1.66	21 53.4	2.26	0.5077
June 4	14 30.0	0.62	30 8.2	6.92	0.3341	June 4	7 52.7	1.61	21 23.8	2.24	0.5189
14	14 24.9	0.28	28 59.1	6.63	0.3470	14	8 9.0	1.63	20 46.6	4.10	0.5285
24	14 22.3	-0.13	27 55.6	5.88	0.3633	24	8 25.7	1.68	20 1.8	4.26	0.5364
July 4	14 22.3	+0.11	27 1.5	4.82	0.3819	July 4	8 42.6	1.70	19 9.6	4.22	0.5427
14	14 24.5	0.23	26 19.2	3.64	0.4015	14	8 59.7	1.71	18 10.4	4.25	0.5475
24	14 29.0	0.84	25 48.6	2.47	0.4217	24	9 16.9	1.72	17 4.5	4.00	0.5508
Aug. 3	14 35.4	0.73	25 29.7	1.28	0.4416	Aug. 3	9 34.1	1.72	15 52.4	7.49	0.5525
13	14 43.6	0.90	25 21.0	+0.43	0.4608	13	9 51.4	1.73	14 34.7	8.02	0.5527
23	14 53.4	1.03	25 21.1	-0.25	0.4788	23	10 8.7	1.72	13 11.9	8.20	0.5515
Sept. 2	15 4.3	1.15	25 23.0	0.96	0.4957	Sept. 2	10 25.0	1.71	11 44.7	8.20	0.5487
12	15 16.5	1.27	25 40.1	1.29	0.5112	12	10 43.0	1.71	10 13.9	9.21	0.5444
22	15 29.8	1.37	25 55.8	1.66	0.5253	22	11 0.1	1.70	8 40.5	9.43	0.5386
Oct. 2	15 44.0	1.46	26 13.3	1.78	0.5377	Oct. 2	11 17.1	1.69	7 5.3	9.67	9.5312
12	15 59.1	1.54	26 31.1	1.72	0.5484	12	11 34.0	1.69	5 29.1	9.61	9.5222
22	16 14.9	1.61	26 47.7	1.53	0.5575	22	11 50.9	1.68	3 53.0	9.55	0.5116
Nov. 1	16 31.4	1.68	27 1.8	1.22	0.5649	Nov. 1	12 7.6	1.66	2 18.0	9.29	0.4994
11	16 48.5	1.73	27 12.3	0.80	0.5707	11	12 24.1	1.64	+ 0 45.2	9.11	0.4855
21	17 6.1	1.77	27 17.8	-0.27	0.5748	21	12 40.4	1.62	- 0 44.2	8.66	0.4698
Dec. 1	17 24.0	1.80	27 17.7	+0.23	0.5771	Dec. 1	12 56.5	1.60	2 9.1	8.20	0.4523
11	17 42.2	1.83	27 11.2	1.02	0.5778	11	13 12.3	1.55	3 26.3	7.67	0.4330
21	18 0.7	1.86	26 57.3	1.75	0.5768	21	13 27.6	1.50	4 40.6	6.81	0.4119
31	18 19.2	+1.85	26 36.2	+2.49	0.5741	31	13 42.3	+1.49	- 5 44.6	-6.95	0.3889

WASHINGTON MEAN NOON.

(18) MELPOMENE.						(20) MASSILIA.									
Date.	Right Ascension.		Diff. for 1 Day.	Declination.	Diff. for 1 Day.	Log. Dist. from Earth.	Date.	Right Ascension.		Diff. for 1 Day.	Declination.	Diff. for 1 Day.	Log. Dist. from Earth.		
	h	m	m	°	'			h	m	m	°	'			
Jan. -5	16	16.1	+1.70	-13	26.9	-3.35	0.5353	Jan. -5	17	50.0	+1.80	-23	1.6	-0.30	0.5702
+5	16	33.0	1.88	13	56.4	2.48	0.5234	+5	18	8.0	1.79	23	0.2	+0.47	0.5677
15	16	49.8	1.87	14	16.5	1.87	0.5100	15	18	25.8	1.77	22	52.1	1.17	0.5634
25	17	6.4	1.84	14	27.8	-0.67	0.4947	25	18	43.4	1.73	22	36.7	1.88	0.5575
Feb. 4	17	22.6	1.89	14	30.0	+0.22	0.4774	Feb. 4	19	0.5	1.69	22	14.5	2.84	0.5498
14	17	38.3	1.84	14	23.4	1.08	0.4582	14	19	17.2	1.63	21	45.9	3.13	0.5404
24	17	53.4	1.46	14	8.3	1.90	0.4372	24	19	33.2	1.87	21	11.9	3.62	0.5291
Mar. 6	18	7.6	1.37	13	45.3	2.65	0.4140	Mar. 6	19	48.6	1.80	20	33.4	4.02	0.5161
16	18	20.3	1.27	13	15.3	3.30	0.3890	16	20	3.2	1.41	19	51.5	4.30	0.5012
26	18	33.0	1.14	12	39.2	3.85	0.3622	26	20	16.9	1.32	19	7.4	4.45	0.4846
April 5	18	43.7	0.98	11	58.3	4.24	0.3335	April 5	20	29.6	1.21	18	22.4	4.47	0.4663
15	18	52.7	0.80	11	14.4	4.48	0.3032	15	20	41.1	1.08	17	37.9	4.24	0.4462
25	18	59.7	0.68	10	29.7	4.40	0.2717	25	20	51.3	0.96	16	55.5	4.04	0.4245
May 5	19	4.4	0.34	9	46.3	4.11	0.2392	May 5	21	0.3	0.79	16	17.0	3.87	0.4013
15	19	6.6	+0.07	9	7.5	3.47	0.2067	15	21	7.1	0.69	15	44.0	2.98	0.3769
25	19	5.9	-0.22	8	36.8	2.49	0.1750	25	21	12.2	0.40	15	18.3	2.12	0.3516
June 4	19	2.2	0.61	8	17.6	+1.14	0.1459	June 4	21	15.1	+0.17	15	1.7	+1.12	0.3260
14	18	55.7	0.76	8	14.0	-0.63	0.1209	14	21	15.7	-0.07	14	55.8	0.00	0.3009
24	18	46.9	0.94	8	23.3	2.38	0.1018	24	21	13.8	0.22	15	1.8	-1.18	0.2772
July 4	18	36.8	1.02	9	1.6	4.21	0.0903	July 4	21	9.3	0.66	15	19.5	2.27	0.2563
14	18	26.5	0.96	9	52.6	5.79	0.0872	14	21	2.5	0.77	15	47.3	3.14	0.2397
24	18	17.5	0.77	10	57.5	7.00	0.0923	24	20	53.8	0.92	16	22.4	2.69	0.2288
Aug. 3	18	11.1	0.48	12	14.5	7.00	0.1046	Aug. 3	20	44.1	0.96	17	1.1	2.81	0.2246
13	18	7.8	-0.15	13	29.6	7.65	0.1222	13	20	34.5	0.90	17	38.7	2.51	0.2272
23	18	8.0	+0.20	14	47.6	7.12	0.1433	23	20	26.0	0.72	18	11.3	2.89	0.2371
Sept. 2	18	11.8	0.64	16	2.0	7.12	0.1665	Sept. 2	20	19.7	0.51	18	36.6	2.09	0.2523
12	18	18.9	0.86	17	10.0	6.87	0.1903	12	20	15.8	-0.26	18	53.1	1.20	0.2717
22	18	29.0	1.14	18	9.4	5.42	0.2140	22	20	14.4	+0.01	19	0.6	-0.30	0.2938
Oct. 2	18	41.7	1.22	18	58.4	4.29	0.2369	Oct. 2	20	16.0	0.29	18	59.1	+0.00	0.3173
12	18	56.8	1.00	19	35.3	3.02	0.2587	12	20	20.3	0.64	18	48.6	1.48	0.3412
22	19	13.8	1.79	19	58.9	1.69	0.2792	22	20	26.8	0.76	18	29.4	2.24	0.3646
Nov. 1	19	32.6	1.94	20	8.0	-0.14	0.2983	Nov. 1	20	35.4	0.94	18	1.8	2.17	0.3871
11	19	52.7	2.06	20	1.8	+1.39	0.3159	11	20	45.6	1.09	17	25.9	4.01	0.4083
21	20	13.9	2.16	19	40.1	2.97	0.3321	21	20	57.3	1.28	16	41.6	4.83	0.4280
Dec. 1	20	36.0	2.24	19	2.4	4.84	0.3469	Dec. 1	21	10.2	1.34	15	48.8	5.89	0.4459
11	20	58.8	2.20	18	9.3	6.06	0.3604	11	21	24.1	1.42	14	47.7	6.80	0.4622
21	21	22.0	2.24	17	1.1	7.88	0.3727	21	21	38.7	1.49	13	38.7	7.27	0.4766
31	21	45.6	+2.27	-15	38.7	+8.87	0.3838	31	21	53.9	+1.84	-12	22.2	+7.98	0.4893

WASHINGTON MEAN NOON.

②① LUTETIA.

②② CALLIOPE.

②① LUTETIA.						②② CALLIOPE.					
Date.	Right Ascension.	Diff. for 1 Day.	Declination.	Diff. for 1 Day.	Log. Dist. from Earth.	Date.	Right Ascension.	Diff. for 1 Day.	Declination.	Diff. for 1 Day.	Log. Dist. from Earth.
	h m	m	° ' "	' "			h m	m	° ' "	' "	
Jan. -5	16 2.6	+1.98	-19 30.2	- 5.84	0.5089	Jan. -5	12 34.3	+0.77	+12 17.1	-0.41	0.4418
+5	16 22.0	1.94	20 24.7	5.00	0.4911	+5	12 41.1	0.59	12 19.6	+0.95	0.4215
15	16 41.4	1.94	21 10.3	4.11	0.4766	15	12 46.1	0.39	12 36.1	2.34	0.4008
25	17 0.8	1.93	21 47.0	3.23	0.4605	25	12 48.9	+0.16	13 6.4	2.68	0.3805
Feb. 4	17 20.0	1.90	22 14.9	2.36	0.4427	Feb. 4	12 49.4	-0.07	13 49.4	4.79	0.3614
14	17 38.9	1.86	22 34.3	1.54	0.4231	14	12 47.5	0.30	14 42.3	5.57	0.3445
24	17 57.3	1.81	22 45.7	0.77	0.4017	24	12 43.3	0.52	15 40.9	5.88	0.3311
Mar. 6	18 15.2	1.75	22 49.7	- 0.09	0.3785	Mar. 6	12 37.0	0.71	16 39.0	5.43	0.3220
16	18 32.3	1.65	22 47.6	+ 0.45	0.3535	16	12 29.2	0.82	17 29.5	4.39	0.3185
26	18 48.3	1.54	22 40.7	0.84	0.3267	26	12 20.7	0.84	18 6.8	2.89	0.3205
April 5	19 3.2	1.41	22 30.7	1.05	0.2963	April 5	12 12.3	0.79	18 25.9	+0.80	0.3222
15	19 16.6	1.25	22 19.6	1.05	0.2683	15	12 4.9	0.65	18 24.6	-1.14	0.3409
25	19 28.3	1.06	22 9.7	0.30	0.2368	25	11 59.1	0.48	18 3.1	2.02	0.3576
May 5	19 37.9	0.83	22 3.6	+ 0.29	0.2043	May 5	11 55.3	0.27	17 24.2	4.64	0.3779
15	19 45.0	0.57	22 3.8	- 0.45	0.1712	15	11 53.6	-0.06	16 30.3	5.99	0.3961
25	19 49.3	+0.27	22 12.5	1.38	0.1385	25	11 54.0	+0.13	15 24.3	7.07	0.4200
June 4	19 50.5	-0.04	22 31.4	2.41	0.1073	June 4	11 56.3	0.32	14 8.8	7.98	0.4421
14	19 48.4	0.27	23 0.7	3.35	0.0793	14	12 0.4	0.48	12 45.6	8.58	0.4638
24	19 43.1	0.63	23 38.4	3.99	0.0565	24	12 5.9	0.62	11 18.2	9.28	0.4843
July 4	19 35.1	0.88	24 20.6	4.16	0.0408	July 4	12 12.8	0.74	9 45.9	9.38	0.5039
14	19 25.6	0.96	25 1.6	3.77	0.0340	14	12 20.8	0.84	8 10.6	9.64	0.5221
24	19 16.1	0.87	25 36.1	2.96	0.0365	24	12 29.7	0.93	6 33.1	9.61	0.5389
Aug. 3	19 8.2	0.68	26 0.9	1.94	0.0477	Aug. 3	12 39.4	1.01	4 54.3	9.22	0.5542
13	19 3.1	-0.33	26 15.0	0.98	0.0661	13	12 49.9	1.07	3 14.7	9.26	0.5680
23	19 1.5	+0.03	26 19.5	- 0.02	0.0898	23	13 0.9	1.13	+ 1 35.0	9.25	0.5801
Sept. 2	19 3.7	0.39	26 15.5	+ 0.79	0.1168	Sept. 2	13 12.5	1.18	- 0 4.4	9.28	0.5906
12	19 9.4	0.72	26 3.6	1.58	0.1454	12	13 24.5	1.22	1 42.7	9.75	0.5996
22	19 18.2	1.02	25 43.8	2.39	0.1746	22	13 36.9	1.25	3 19.4	9.87	0.6072
Oct. 2	19 29.8	1.27	25 15.8	3.24	0.2034	Oct. 2	13 49.6	1.29	4 54.2	9.34	0.6129
12	19 43.6	1.46	24 38.9	4.16	0.2314	12	14 2.6	1.31	6 26.3	9.05	0.6171
22	19 59.1	1.62	23 52.5	5.14	0.2582	22	14 15.9	1.34	7 55.3	8.72	0.6196
Nov. 1	20 16.1	1.75	22 56.0	6.17	0.2837	Nov. 1	14 29.4	1.35	9 20.8	8.24	0.6203
11	20 34.2	1.84	21 49.1	7.21	0.3078	11	14 43.0	1.36	10 42.2	7.91	0.6191
21	20 53.0	1.91	20 31.8	8.23	0.3304	21	14 56.7	1.37	11 59.0	7.44	0.6168
Dec. 1	21 12.4	1.96	19 4.4	9.21	0.3515	Dec. 1	15 10.4	1.36	13 11.0	6.28	0.6125
11	21 32.1	1.98	17 27.6	10.11	0.3712	11	15 24.0	1.35	14 17.7	6.40	0.6064
21	21 52.0	2.00	15 42.2	10.93	0.3895	21	15 37.4	1.33	15 19.0	5.65	0.5986
31	22 12.1	+2.01	-13 48.9	+11.67	0.4064	31	15 50.6	+1.30	-16 14.8	-3.29	0.5890

WASHINGTON MEAN NOON.

29 THALIA.

20 PROSERPINA.

29 THALIA.						20 PROSERPINA.					
Date.	Right Ascension.	Diff. for 1 Day.	Declination.	Diff. for 1 Day.	Log. Dist. from Earth.	Date.	Right Ascension.	Diff. for 1 Day.	Declination.	Diff. for 1 Day.	Log. Dist. from Earth.
	h m	m	° ' "	'			h m	m	° ' "	'	
Jan. -5	17 20.9	+1.07	24 22.4	-2.03	0.5909	Jan. -5	21 43.9	+1.00	16 34.6	+8.40	0.5111
+5	17 37.4	1.04	24 49.3	2.49	0.5882	+5	21 59.0	1.02	15 7.8	8.89	0.5252
15	17 53.7	1.00	25 10.0	1.99	0.5838	15	22 14.4	1.04	13 36.8	9.29	0.5373
25	18 9.4	1.05	25 26.9	1.36	0.5776	25	22 29.9	1.05	12 2.0	9.64	0.5476
Feb. 4	18 24.7	1.49	25 38.0	0.91	0.5697	Feb. 4	22 45.5	1.06	10 24.0	9.92	0.5563
14	18 39.3	1.42	25 45.2	0.00	0.5597	14	23 1.1	1.06	8 43.6	10.12	0.5633
24	18 53.2	1.24	25 49.9	0.29	0.5482	24	23 16.6	1.04	7 1.5	10.26	0.5686
Mar. 6	19 6.2	1.24	25 53.1	0.81	0.5350	Mar. 6	23 32.0	1.04	5 18.3	10.32	0.5722
16	19 18.1	1.13	25 56.1	0.37	0.5201	16	23 47.4	1.03	3 35.0	10.31	0.5743
26	19 28.9	1.00	26 0.5	0.08	0.5036	26	0 2.6	1.01	1 52.1	10.28	0.5748
April 5	19 38.2	0.86	26 7.8	0.04	0.4856	April 5	0 17.7	1.00	- 0 10.4	10.07	0.5737
15	19 46.0	0.69	26 19.4	1.46	0.4668	15	0 32.6	1.48	+ 1 20.4	9.85	0.5710
25	19 52.0	0.50	26 37.0	2.12	0.4470	25	0 47.3	1.46	3 6.7	9.57	0.5667
May 5	19 56.0	0.29	27 1.8	2.86	0.4267	May 5	1 1.8	1.44	4 40.9	9.22	0.5609
15	19 57.8	+0.06	27 34.3	2.08	0.4067	15	1 16.1	1.41	6 11.2	8.81	0.5535
25	19 57.2	-0.19	28 14.5	4.28	0.3877	25	1 30.0	1.37	7 37.3	8.26	0.5446
June 4	19 54.0	0.44	29 1.0	4.85	0.3706	June 4	1 43.6	1.34	8 53.5	7.85	0.5340
14	19 48.4	0.07	29 51.5	5.06	0.3566	14	1 56.8	1.29	10 14.4	7.20	0.5218
24	19 40.6	0.85	30 42.1	4.88	0.3468	24	2 9.4	1.22	11 24.6	6.71	0.5081
July 4	19 31.4	0.97	31 28.2	4.21	0.3420	July 4	2 21.3	1.15	12 28.6	6.07	0.4926
14	19 21.2	1.00	32 6.4	2.24	0.3428	14	2 32.5	1.06	13 26.0	5.40	0.4757
24	19 11.3	0.93	32 33.0	2.06	0.3491	24	2 42.6	0.98	14 16.6	4.70	0.4571
Aug. 3	19 2.6	0.77	32 47.6	-0.91	0.3604	Aug. 3	2 51.6	0.82	15 0.1	2.98	0.4371
13	18 55.8	0.56	32 51.3	+0.07	0.3759	13	2 59.1	0.67	15 36.2	2.22	0.4159
23	18 51.3	0.81	32 46.1	0.81	0.3946	23	3 4.9	0.48	16 4.5	2.42	0.3937
Sept. 2	18 49.5	-0.06	32 35.1	1.25	0.4150	Sept. 2	3 8.7	0.26	16 24.6	1.59	0.3710
12	18 50.1	+0.18	32 19.1	1.78	0.4366	12	3 10.3	+0.03	16 36.4	+0.73	0.3485
22	18 53.2	0.43	31 59.5	2.08	0.4583	22	3 9.4	-0.22	16 39.2	-0.18	0.3269
Oct. 2	18 58.7	0.81	31 37.4	2.34	0.4796	Oct. 2	3 5.9	0.46	16 32.7	1.09	0.3076
12	19 5.5	0.78	31 12.6	2.60	0.5001	12	3 0.1	0.08	16 17.3	1.95	0.2918
22	19 14.2	0.94	30 45.4	2.87	0.5193	22	2 52.3	0.84	15 53.7	2.66	0.2810
Nov. 1	19 24.4	1.07	30 15.1	2.19	0.5371	Nov. 1	2 43.2	0.92	15 24.0	2.08	0.2763
11	19 35.6	1.17	29 41.6	2.88	0.5533	11	2 33.8	0.90	14 52.1	2.10	0.2784
21	19 47.8	1.26	29 4.4	3.92	0.5679	21	2 25.2	0.78	14 21.9	2.72	0.2870
Dec. 1	20 0.8	1.32	28 23.1	4.21	0.5806	Dec. 1	2 18.1	0.59	13 57.7	1.91	0.3015
11	20 14.3	1.37	27 38.2	4.71	0.5918	11	2 13.4	0.35	13 43.6	-0.85	0.3202
21	20 28.3	1.41	26 48.9	5.12	0.6011	21	2 11.0	-0.11	13 40.6	+0.29	0.3421
31	20 42.6	+1.44	-25 55.5	+3.55	0.6086	31	2 11.2	+0.09	+13 49.4	+1.35	0.3656

WASHINGTON MEAN NOON.

(27) EUTERPE.

(29) AMPHITRITE.

(27) EUTERPE.						(29) AMPHITRITE.					
Date.	Right Ascension.	Diff. for 1 Day.	Declination.	Diff. for 1 Day.	Log. Dist. from Earth.	Date.	Right Ascension.	Diff. for 1 Day.	Declination.	Diff. for 1 Day.	Log. Dist. from Earth.
	h m	m	° ' "	'			h m	m	° ' "	'	
Jan. -5	15 53.6	+1.67	-19 22.9	-6.13	0.5290	Jan. -5	16 42.3	+1.62	-26 36.0	-4.06	0.5568
+5	16 10.3	1.63	20 10.3	4.35	0.5196	+5	17 0.5	1.61	27 13.1	3.34	0.5515
15	16 26.3	1.57	20 49.9	3.60	0.5085	15	17 18.6	1.79	27 42.9	2.64	0.5425
25	16 41.7	1.51	21 22.4	2.91	0.4954	25	17 36.4	1.76	28 6.0	1.99	0.5318
Feb. 4	16 56.5	1.43	21 48.2	2.25	0.4806	Feb. 4	17 53.8	1.71	28 22.8	1.39	0.5194
14	17 10.4	1.33	22 7.5	1.64	0.4639	14	18 10.7	1.65	28 33.9	0.67	0.5052
24	17 23.2	1.21	22 21.1	1.13	0.4455	24	18 26.9	1.67	28 40.2	0.44	0.4893
Mar. 6	17 34.6	1.06	22 30.0	0.71	0.4254	Mar. 6	18 42.2	1.48	28 42.8	-0.13	0.4717
16	17 44.4	0.89	22 35.3	0.40	0.4037	16	18 56.5	1.37	28 42.9	+0.04	0.4524
26	17 52.4	0.69	22 38.1	0.21	0.3808	26	19 9.6	1.24	28 42.0	+0.06	0.4314
April 5	17 58.3	0.46	22 39.5	0.12	0.3569	April 5	19 21.3	1.06	28 41.7	-0.08	0.4069
15	18 1.8	+0.21	22 40.5	0.11	0.3327	15	19 31.2	0.89	28 43.6	0.38	0.3852
25	18 2.6	-0.07	22 41.8	0.16	0.3069	25	19 39.2	0.70	28 49.3	0.62	0.3603
May 5	18 0.4	0.26	22 43.8	0.21	0.2866	May 5	19 45.2	0.46	29 0.1	1.37	0.3349
15	17 55.4	0.62	22 46.1	0.20	0.2672	15	19 48.5	+0.19	29 16.8	2.00	0.3096
25	17 47.9	0.86	22 47.9	-0.10	0.2519	25	19 49.0	-0.09	29 40.1	2.57	0.2851
June 4	17 38.4	1.00	22 48.2	+0.08	0.2423	June 4	19 46.6	0.39	30 8.3	2.62	0.2626
14	17 27.8	1.03	22 46.2	0.30	0.2393	14	19 41.2	0.66	30 38.7	2.94	0.2435
24	17 17.3	0.99	22 42.1	0.44	0.2432	24	19 33.3	0.89	31 7.2	2.32	0.2292
July 4	17 7.9	0.83	22 37.3	0.45	0.2538	July 4	19 23.4	1.03	31 29.1	1.66	0.2209
14	17 0.6	0.60	22 33.0	0.32	0.2696	14	19 12.7	1.05	31 40.2	-0.47	0.2195
24	16 55.8	0.33	22 30.9	+0.01	0.2896	24	19 2.4	0.94	31 38.6	+0.76	0.2249
Aug. 3	16 53.9	-0.05	22 32.7	-0.37	0.3122	Aug. 3	18 53.8	0.72	31 24.9	1.66	0.2366
13	16 54.7	+0.21	22 38.3	0.72	0.3364	13	18 47.7	0.46	31 1.4	2.08	0.2533
23	16 58.1	0.46	22 47.2	1.03	0.3606	23	18 44.6	-0.15	30 31.3	2.21	0.2737
Sept. 2	17 3.9	0.68	22 58.9	1.22	0.3845	Sept. 2	18 44.6	+0.14	29 57.1	2.33	0.2964
12	17 11.7	0.87	23 11.7	1.27	0.4075	12	18 47.5	0.43	29 20.6	2.73	0.2902
22	17 21.4	1.04	23 24.4	1.20	0.4293	22	18 53.2	0.68	28 42.4	2.91	0.3442
Oct. 2	17 32.6	1.19	23 35.8	1.00	0.4495	Oct. 2	19 1.1	0.89	28 2.3	4.14	0.3677
12	17 45.3	1.32	23 44.4	0.66	0.4682	12	19 11.1	1.06	27 19.6	4.42	0.3902
22	17 59.0	1.42	23 49.1	-0.22	0.4851	22	19 22.8	1.22	26 33.7	4.79	0.4115
Nov. 1	18 13.8	1.32	23 48.8	+0.32	0.5002	Nov. 1	19 35.8	1.36	25 43.7	5.26	0.4314
11	18 29.4	1.59	23 42.6	0.94	0.5135	11	19 50.0	1.46	24 48.6	5.79	0.4497
21	18 45.7	1.66	23 29.9	1.63	0.5251	21	20 5.1	1.54	23 47.9	6.68	0.4663
Dec. 1	19 2.6	1.71	23 10.0	2.26	0.5348	Dec. 1	20 20.9	1.60	22 41.0	7.01	0.4813
11	19 19.9	1.74	22 42.6	3.13	0.5427	11	20 37.2	1.65	21 27.7	7.66	0.4945
21	19 37.4	1.76	22 7.4	3.90	0.5469	21	20 53.9	1.69	20 7.8	8.32	0.5061
31	19 55.1	+1.77	-21 24.5	+4.65	0.5534	31	21 11.0	+1.72	-18 41.2	+8.66	0.5160

WASHINGTON MEAN NOON.

♅ URANIA.

♁ POMONA.

♅ URANIA.						♁ POMONA.					
Date.	Right Ascension.	Diff. for 1 Day.	Declination.	Diff. for 1 Day.	Log. Dist. from Earth.	Date.	Right Ascension.	Diff. for 1 Day.	Declination.	Diff. for 1 Day.	Log. Dist. from Earth.
	h m	m	° /	'			h m	m	° /	'	
Jan. -5	0 53.7	+1.08	+ 8 36.6	+5.46	0.2155	Jan. -5	1 1.9	+0.52	+ 7 2.0	+1.60	0.3797
+5	1 5.5	1.26	9 37.4	6.54	0.2454	+5	1 8.1	0.70	7 24.8	2.86	0.4035
15	1 18.9	1.42	10 47.5	7.35	0.2737	15	1 16.0	0.87	7 59.2	3.91	0.4263
25	1 33.9	1.56	12 4.5	7.91	0.3003	25	1 25.4	1.00	8 43.0	4.78	0.4476
Feb. 4	1 50.1	1.67	13 25.8	8.24	0.3252	Feb. 4	1 36.1	1.12	9 34.2	5.40	0.4672
14	2 7.3	1.77	14 49.4	8.36	0.3484	14	1 47.9	1.22	10 30.9	6.06	0.4852
24	2 25.5	1.86	16 13.1	8.27	0.3698	24	2 0.6	1.31	11 31.5	6.17	0.5013
Mar. 6	2 44.5	1.93	17 34.8	7.97	0.3896	Mar. 6	2 14.2	1.39	12 34.4	6.31	0.5156
16	3 4.2	2.00	18 52.5	7.49	0.4077	16	2 28.5	1.46	13 37.7	6.30	0.5262
26	3 24.6	2.06	20 4.7	6.87	0.4242	26	2 43.5	1.53	14 40.5	6.21	0.5390
April 5	3 45.5	2.12	21 9.9	6.09	0.4393	April 5	2 59.1	1.58	15 42.0	5.97	0.5477
15	4 7.0	2.16	22 6.6	5.19	0.4529	15	3 15.2	1.63	16 40.0	5.57	0.5554
25	4 28.8	2.19	22 53.8	4.20	0.4651	25	3 31.7	1.67	17 33.5	5.19	0.5612
May 5	4 50.9	2.22	23 30.7	3.12	0.4759	May 5	3 48.6	1.71	18 22.5	4.61	0.5653
15	5 13.2	2.23	23 56.5	2.00	0.4854	15	4 5.9	1.74	19 5.8	4.01	0.5679
25	5 35.6	2.24	24 10.8	+0.85	0.4937	25	4 23.4	1.76	19 42.7	3.33	0.5690
June 4	5 58.0	2.23	24 13.5	-0.23	0.5006	June 4	4 41.2	1.78	20 12.5	2.60	0.5685
14	6 20.3	2.22	24 4.2	1.51	0.5063	14	4 59.1	1.79	20 34.8	1.82	0.5665
24	6 42.5	2.20	23 43.2	2.64	0.5107	24	5 17.1	1.79	20 49.0	+1.01	0.5630
July 4	7 4.3	2.16	23 11.3	3.71	0.5139	July 4	5 35.0	1.79	20 55.1	-0.18	0.5580
14	7 25.8	2.12	22 28.9	4.73	0.5158	14	5 52.9	1.78	20 52.7	0.64	0.5515
24	7 46.8	2.07	21 36.6	5.67	0.5164	24	6 10.7	1.76	20 42.3	1.48	0.5433
Aug. 3	8 7.3	2.02	20 35.4	6.52	0.5157	Aug. 3	6 28.2	1.73	20 23.1	2.29	0.5338
13	8 27.4	1.97	19 26.2	7.27	0.5137	13	6 45.3	1.69	19 56.5	3.04	0.5226
23	8 46.8	1.91	18 10.0	7.90	0.5103	23	7 2.0	1.64	19 22.2	3.76	0.5098
Sept. 2	9 5.7	1.85	16 48.2	8.43	0.5055	Sept. 2	7 18.1	1.58	18 41.2	4.40	0.4953
12	9 23.9	1.78	15 21.4	8.86	0.4991	12	7 33.6	1.51	17 54.1	4.98	0.4790
22	9 41.4	1.72	13 51.0	9.16	0.4912	22	7 48.3	1.42	17 1.5	5.44	0.4610
Oct. 2	9 58.3	1.65	12 18.3	9.32	0.4818	Oct. 2	8 2.0	1.31	16 5.2	5.78	0.4413
12	10 14.4	1.57	10 44.6	9.37	0.4706	12	8 14.6	1.19	15 5.8	6.02	0.4198
22	10 29.7	1.49	9 10.9	9.23	0.4578	22	8 25.9	1.06	14 4.7	6.05	0.3965
Nov. 1	10 44.2	1.40	7 38.9	9.05	0.4432	Nov. 1	8 35.8	0.90	13 4.7	5.90	0.3716
11	10 57.7	1.30	6 9.8	8.66	0.4267	11	8 43.9	0.71	12 6.6	5.59	0.3453
21	11 10.2	1.18	4 45.2	8.16	0.4084	21	8 50.0	0.49	11 12.9	5.02	0.3179
Dec. 1	11 21.4	1.04	3 26.5	7.48	0.3884	Dec. 1	8 53.7	+0.24	10 26.1	4.20	0.2900
11	11 31.1	0.89	2 15.5	6.62	0.3667	11	8 54.9	-0.02	9 48.9	3.12	0.2625
21	11 39.2	0.71	1 14.1	5.56	0.3434	21	8 53.3	0.23	9 23.7	1.61	0.2365
31	11 45.3	+0.53	+ 0 24.3	-4.32	0.3191	31	8 48.3	-0.70	+ 9 12.7	-0.24	0.2136

WASHINGTON MEAN NOON.

③ POLYHYMNA.						④ CIRCE.					
Date.	Right Ascension.	Diff. for 1 Day.	Declination.	Diff. for 1 Day.	Log. Dist. from Earth.	Date.	Right Ascension.	Diff. for 1 Day.	Declination.	Diff. for 1 Day.	Log. Dist. from Earth.
Jan. -5	19 23.9	+2.47	23 21.0	+ 5.12	0.4755	Jan. -5	10 15.7	+0.22	4 34.4	- 2.12	0.2471
+5	19 48.7	2.48	22 22.0	6.03	0.4753	+5	10 16.6	-0.04	4 21.5	- 0.32	0.2202
15	20 13.5	2.48	21 8.3	8.08	0.4742	15	10 14.8	0.31	4 28.0	+ 1.63	0.1956
25	20 38.3	2.47	19 40.4	9.46	0.4723	25	10 10.4	0.53	4 54.6	3.61	0.1752
Feb. 4	21 3.0	2.45	17 59.2	10.72	0.4696	Feb. 4	10 3.7	0.73	5 40.2	6.28	0.1607
14	21 27.4	2.43	16 6.0	11.86	0.4663	14	9 55.7	0.81	6 40.3	6.40	0.1536
24	21 51.6	2.40	14 2.0	12.86	0.4623	24	9 47.5	0.77	7 48.3	6.79	0.1548
Mar. 6	22 15.4	2.36	11 48.7	12.66	0.4577	Mar. 6	9 40.2	0.63	8 56.2	6.43	0.1640
16	22 38.9	2.33	9 28.7	14.26	0.4526	16	9 34.9	0.40	9 57.0	5.48	0.1800
26	23 2.0	2.29	7 3.5	14.73	0.4469	26	9 32.1	-0.12	10 45.8	4.12	0.2012
April 5	23 24.8	2.27	4 34.0	15.00	0.4408	April 5	9 32.2	+0.14	11 19.7	2.63	0.2256
15	23 47.3	2.24	2 3.5	15.03	0.4341	15	9 35.0	0.41	11 37.8	+ 1.03	0.2522
25	0 9.6	2.21	+ 0 26.6	14.89	0.4270	25	9 40.4	0.64	11 40.4	- 0.45	0.2792
May 5	0 31.6	2.18	2 54.4	14.69	0.4193	May 5	9 47.9	0.84	11 28.7	1.85	0.3060
15	0 53.3	2.15	5 18.5	14.12	0.4109	15	9 57.3	1.01	11 3.3	2.14	0.3319
25	1 14.7	2.12	7 36.9	13.49	0.4020	25	10 8.2	1.16	10 25.9	4.29	0.3566
June 4	1 35.8	2.09	9 48.4	12.74	0.3924	June 4	10 20.3	1.26	9 37.4	5.24	0.3799
14	1 56.5	2.06	11 51.8	11.88	0.3819	14	10 33.5	1.35	8 39.1	6.26	0.4017
24	2 16.8	2.00	13 46.0	10.92	0.3705	24	10 47.4	1.42	7 32.2	7.07	0.4220
July 4	2 36.5	1.94	15 30.2	9.89	0.3582	July 4	11 1.9	1.48	6 17.7	7.77	0.4406
14	2 55.6	1.86	17 3.9	8.83	0.3448	14	11 17.0	1.53	4 56.8	8.26	0.4578
24	3 13.8	1.77	18 26.9	7.77	0.3302	24	11 32.5	1.56	3 30.5	8.24	0.4732
Aug. 3	3 31.0	1.65	19 39.3	6.72	0.3144	Aug. 3	11 48.3	1.60	2 0.0	9.21	0.4875
13	3 46.8	1.49	20 41.4	5.68	0.2973	13	12 4.5	1.63	+ 0 26.3	9.47	0.5001
23	4 0.9	1.32	21 33.9	4.80	0.2790	23	12 20.9	1.63	- 1 9.5	9.64	0.5113
Sept. 2	4 13.2	1.10	22 17.4	3.94	0.2596	Sept. 2	12 37.6	1.68	2 46.5	9.71	0.5210
12	4 23.0	0.84	22 52.7	3.16	0.2394	12	12 54.5	1.70	4 23.7	9.67	0.5293
22	4 30.0	0.54	23 20.7	2.45	0.2189	22	13 11.6	1.72	6 0.0	9.54	0.5363
Oct. 2	4 33.8	+0.21	23 41.7	1.76	0.1989	Oct. 2	13 28.9	1.74	7 34.5	9.31	0.5418
12	4 34.2	-0.12	23 56.0	1.03	0.1804	12	13 46.4	1.76	9 6.2	8.97	0.5458
22	4 31.1	0.48	24 2.7	+ 0.22	0.1651	22	14 4.1	1.78	10 34.0	8.54	0.5485
Nov. 1	4 24.6	0.77	24 0.7	- 0.66	0.1546	Nov. 1	14 21.9	1.78	11 57.1	7.03	0.5497
11	4 15.6	0.97	23 49.5	1.64	0.1508	11	14 39.8	1.79	13 14.6	7.43	0.5494
21	4 5.2	1.04	23 29.8	2.27	0.1548	21	14 57.8	1.80	14 25.8	6.76	0.5476
Dec. 1	3 54.8	0.96	23 4.1	2.63	0.1671	Dec. 1	15 15.8	1.79	15 29.9	6.06	0.5443
11	3 45.9	0.76	22 37.1	2.53	0.1868	11	15 33.7	1.78	16 26.1	5.20	0.5395
21	3 39.5	0.50	22 13.4	2.03	0.2125	21	15 51.5	1.77	17 14.0	4.36	0.5330
31	3 35.9	-0.24	+21 56.5	- 1.22	0.2423	31	16 9.1	+1.75	-17 53.3	- 2.64	0.5250

WASHINGTON MEAN NOON.

②7 FIDES.

②8 LEDA.

②7 FIDES.						②8 LEDA.					
Date.	Right Ascension.	Diff. for 1 Day.	Declination.	Diff. for 1 Day.	Log. Dist. from Earth.	Date.	Right Ascension.	Diff. for 1 Day.	Declination.	Diff. for 1 Day.	Log. Dist. from Earth.
	h m	m	o'	'			h m	m	o'	'	
Jan. -5	18 39.5	+1.70	25 29.0	+1.07	0.5992	Jan. -5	21 26.5	+1.26	11 14.6	+ 6.46	0.5505
+5	18 56.7	1.71	25 9.1	2.20	0.5984	+5	21 40.3	1.29	10 6.4	7.16	0.5598
15	19 13.7	1.09	24 43.0	2.02	0.5957	15	21 54.3	1.41	8 51.3	7.02	0.5674
25	19 30.5	1.07	24 10.7	2.20	0.5914	25	22 8.5	1.42	7 30.0	8.40	0.5737
Feb. 4	19 47.1	1.04	23 33.0	4.02	0.5853	Feb. 4	22 22.9	1.44	6 3.2	8.91	0.5787
14	20 3.4	1.61	22 50.3	4.49	0.5774	14	22 37.4	1.46	4 31.8	9.24	0.5820
24	20 19.4	1.07	22 3.1	4.20	0.5678	24	22 52.1	1.47	2 56.3	9.71	0.5838
Mar. 6	20 34.9	1.01	21 12.2	5.24	0.5567	Mar. 6	23 6.9	1.48	- 1 17.5	10.01	0.5838
16	20 49.8	1.46	20 18.2	5.48	0.5438	16	23 21.8	1.49	+ 0 23.9	10.25	0.5819
26	21 4.1	1.40	19 22.6	5.61	0.5289	26	23 36.7	1.48	2 7.5	10.42	0.5782
April 5	21 17.8	1.22	18 26.1	5.64	0.5120	April 5	23 51.5	1.48	3 52.3	10.22	0.5730
15	21 30.7	1.24	17 29.9	5.22	0.4933	15	0 6.3	1.48	5 37.9	10.87	0.5665
25	21 42.7	1.16	16 35.5	5.27	0.4730	25	0 21.1	1.47	7 23.8	10.66	0.5583
May 5	21 53.7	1.04	15 44.6	4.00	0.4511	May 5	0 35.8	1.46	9 9.2	10.48	0.5488
15	22 3.6	0.92	14 57.6	4.40	0.4276	15	0 50.3	1.44	10 53.4	10.22	0.5373
25	22 12.1	0.77	14 16.5	2.69	0.4025	25	1 4.7	1.42	12 35.9	10.14	0.5246
June 4	22 19.1	0.61	13 43.9	2.78	0.3762	June 4	1 19.0	1.42	14 16.3	9.89	0.5100
14	22 24.4	0.42	13 20.8	1.81	0.3494	14	1 33.1	1.29	15 53.7	9.67	0.4939
24	22 27.6	+0.21	13 7.8	+0.06	0.3224	24	1 46.9	1.22	17 27.7	9.20	0.4762
July 4	22 28.6	-0.01	13 7.6	-0.61	0.2954	July 4	2 0.2	1.20	18 57.8	8.79	0.4568
14	22 27.3	0.26	13 20.0	1.06	0.2699	14	2 12.9	1.22	20 23.6	8.22	0.4357
24	22 23.5	0.20	13 44.7	2.06	0.2474	24	2 24.8	1.14	21 44.8	7.06	0.4131
Aug. 3	22 17.3	0.71	14 19.2	2.75	0.2292	Aug. 3	2 35.7	1.02	23 0.8	7.21	0.3888
13	22 9.3	0.86	14 59.9	4.06	0.2162	13	2 45.5	0.89	24 11.1	6.70	0.3632
23	22 0.3	0.90	15 40.4	2.81	0.2100	23	2 53.6	0.72	25 14.9	6.01	0.3363
Sept. 2	21 51.2	0.86	16 16.1	2.09	0.2113	Sept. 2	2 59.9	0.61	26 11.4	5.22	0.3084
12	21 43.2	0.71	16 42.2	1.06	0.2194	12	3 3.9	+0.26	26 59.4	4.27	0.2802
22	21 37.1	0.42	16 55.3	-0.62	0.2331	22	3 5.1	-0.02	27 36.8	2.08	0.2525
Oct. 2	21 33.6	-0.22	16 54.7	+0.72	0.2512	Oct. 2	3 3.5	0.20	28 1.1	+ 1.61	0.2263
12	21 32.8	+0.06	16 41.0	2.06	0.2722	12	2 59.0	0.66	28 9.1	- 0.16	0.2032
22	21 34.9	0.24	16 13.7	2.21	0.2949	22	2 51.8	0.81	27 58.0	2.11	0.1848
Nov. 1	21 39.6	0.66	15 34.9	4.42	0.3179	Nov. 1	2 42.8	0.92	27 26.8	4.02	0.1727
11	21 46.6	0.20	14 45.2	5.47	0.3406	11	2 33.3	0.91	26 37.4	2.66	0.1682
21	21 55.5	0.08	13 45.4	6.47	0.3623	21	2 24.6	0.77	25 35.5	6.40	0.1715
Dec. 1	22 6.2	1.12	12 35.8	7.40	0.3829	Dec. 1	2 17.8	0.66	24 29.4	6.41	0.1821
11	22 18.2	1.26	11 17.4	8.22	0.4020	11	2 13.6	-0.26	23 27.3	2.06	0.1969
21	22 31.5	1.27	9 51.4	8.97	0.4196	21	2 12.8	+0.06	22 36.2	4.26	0.2199
31	22 45.6	+1.46	- 8 17.9	+9.07	0.4355	31	2 15.2	+0.40	+21 59.1	- 2.00	0.2421

WASHINGTON MEAN NOON.

④2 ISIS.						④0 VERGINIA.					
Date.	Right Ascension.	Diff. for 1 Day.	Declination.	Diff. for 1 Day.	Log. Dist. from Earth.	Date.	Right Ascension.	Diff. for 1 Day.	Declination.	Diff. for 1 Day.	Log. Dist. from Earth.
	h m	m	° ' "	' "			h m	m	° ' "	' "	
Jan. -5	11 21.3	+0.24	14 7.9	+ 1.34	0.3978	Jan. -5	10 42.4	+0.04	6 18.0	- 0.24	0.3909
+5	11 23.5	+0.13	14 32.3	2.26	0.3733	+5	10 41.5	-0.20	6 23.0	+ 1.23	0.3722
15	11 23.7	-0.11	15 15.0	6.01	0.3500	15	10 38.4	0.42	6 42.5	2.68	0.3558
25	11 21.2	0.28	16 12.6	6.29	0.3289	25	10 33.1	0.03	7 16.6	2.28	0.3421
Feb. 4	11 16.1	0.61	17 20.9	7.10	0.3110	Feb. 4	10 25.9	0.78	8 2.1	4.04	0.3332
14	11 9.0	0.79	18 34.7	7.28	0.2980	14	10 17.5	0.23	8 55.5	6.47	0.3299
24	11 0.3	0.20	19 47.5	6.78	0.2909	24	10 8.8	0.25	9 51.5	5.47	0.3329
Mar. 6	10 50.9	0.04	20 50.4	6.00	0.2901	Mar. 6	10 0.4	0.77	10 45.0	6.00	0.3419
16	10 41.5	0.87	21 37.6	2.76	0.2958	16	9 53.3	0.61	11 31.5	4.15	0.3563
26	10 33.5	0.70	22 5.6	+ 1.29	0.3070	26	9 48.1	0.41	12 8.0	2.07	0.3746
April 5	10 27.4	0.49	22 13.4	- 0.19	0.3227	April 5	9 45.0	-0.20	12 32.9	1.00	0.3969
15	10 23.7	-0.25	22 2.6	1.20	0.3413	15	9 44.0	+0.01	12 46.1	+ 0.75	0.4190
25	10 22.4	0.00	21 35.5	2.28	0.3616	25	9 45.2	0.21	12 48.0	- 0.23	0.4426
May 5	10 23.7	+0.23	20 54.9	4.04	0.3926	May 5	9 48.2	0.22	12 39.4	1.24	0.4651
15	10 27.1	0.44	20 2.7	6.00	0.4036	15	9 52.9	0.24	12 21.1	2.25	0.4868
25	10 32.5	0.23	19 1.2	6.46	0.4239	25	9 59.0	0.27	11 54.3	2.07	0.5105
June 4	10 39.6	0.78	17 51.7	7.21	0.4429	June 4	10 6.4	0.79	11 19.6	2.23	0.5308
14	10 48.2	0.91	16 34.9	6.00	0.4606	14	10 14.8	0.87	10 37.9	4.45	0.5495
24	10 57.9	1.02	15 11.6	2.28	0.4769	24	10 23.9	0.26	9 49.9	5.07	0.5666
July 4	11 8.6	1.11	13 43.6	9.02	0.4916	July 4	10 33.8	1.01	8 56.5	5.20	0.5820
14	11 20.1	1.18	12 11.1	9.45	0.5046	14	10 44.2	1.06	7 58.1	6.24	0.5957
24	11 32.3	1.26	10 34.5	9.24	0.5160	24	10 55.1	1.10	6 55.6	6.43	0.6077
Aug. 3	11 45.3	1.23	8 54.3	10.16	0.5267	Aug. 3	11 6.3	1.13	5 49.4	6.76	0.6179
13	11 58.8	1.27	7 11.3	10.40	0.5339	13	11 17.8	1.16	4 40.3	7.03	0.6264
23	12 12.8	1.23	5 26.2	10.20	0.5404	23	11 29.5	1.17	3 29.8	7.24	0.6331
Sept. 2	12 27.3	1.26	3 39.3	10.70	0.5452	Sept. 2	11 41.3	1.19	2 15.5	7.46	0.6383
12	12 42.3	1.22	1 51.2	10.22	0.5486	12	11 53.3	1.20	+ 1 0.7	7.49	0.6416
22	12 57.7	1.25	+ 0 2.9	10.20	0.5503	22	12 5.3	1.20	- 0 14.3	7.20	0.6432
Oct. 2	13 13.4	1.20	- 1 44.9	10.44	0.5504	Oct. 2	12 17.4	1.20	1 29.3	7.47	0.6431
12	13 29.5	1.23	3 31.8	10.61	0.5489	12	12 29.4	1.19	2 43.7	7.26	0.6411
22	13 46.0	1.27	5 17.2	10.41	0.5459	22	12 41.3	1.18	3 56.6	7.19	0.6375
Nov. 1	14 2.9	1.70	7 0.1	10.11	0.5413	Nov. 1	12 53.1	1.17	5 7.6	6.26	0.6319
11	14 20.1	1.74	8 39.4	9.71	0.5350	11	13 4.7	1.14	6 15.8	6.25	0.6246
21	14 37.7	1.78	10 14.3	9.24	0.5271	21	13 16.0	1.11	7 20.6	6.26	0.6155
Dec. 1	14 55.7	1.81	11 44.2	8.71	0.5176	Dec. 1	13 26.9	1.08	8 21.4	5.20	0.6045
11	15 14.0	1.84	13 8.6	8.11	0.5065	11	13 37.3	1.01	9 17.3	5.22	0.5916
21	15 32.6	1.87	14 26.4	7.29	0.4937	21	13 47.1	0.98	10 7.8	4.72	0.5769
31	15 51.4	+1.09	-15 36.5	- 6.55	0.4792	31	13 56.0	+0.23	-10 51.8	- 4.07	0.5606

WASHINGTON MEAN NOON.

⑦ AGLAIA.

Date.	Right Ascension.	Diff. for 1 Day.	Declination.	Diff. for 1 Day.	Log. Dist. from Earth.
	h m	m	° ' "	' "	
Jan. -5	6 8.6	-1.00	+30 43.7	0.00	0.3388
+5	5 58.8	0.81	30 39.6	-0.79	0.3400
15	5 50.3	0.74	30 27.8	1.43	0.3518
25	5 44.0	0.50	30 10.9	1.81	0.3681
Feb. 4	5 40.2	-0.25	29 51.5	1.95	0.3876
14	5 39.0	+0.01	29 31.8	1.91	0.4093
24	5 40.5	0.27	29 13.2	1.79	0.4318
Mar. 6	5 44.3	0.48	28 55.9	1.64	0.4584
16	5 50.2	0.68	28 40.3	1.54	0.4756
26	5 57.9	0.85	28 25.1	1.52	0.4977
April 5	6 7.2	0.89	28 9.8	1.58	0.5175
15	6 17.7	1.10	27 53.4	1.76	0.5358
25	6 29.2	1.20	27 34.6	1.97	0.5535
May 5	6 41.7	1.28	27 14.0	2.25	0.5677
15	6 54.8	1.34	26 49.6	2.68	0.5811
25	7 8.5	1.38	26 21.4	3.08	0.5929
June 4	7 22.5	1.43	25 49.0	3.45	0.6030
14	7 36.8	1.44	25 12.4	3.88	0.6114
24	7 51.3	1.45	24 31.3	4.25	0.6182
July 4	8 5.9	1.48	23 45.7	4.77	0.6234
14	8 20.4	1.48	22 55.9	5.26	0.6270
24	8 34.9	1.44	22 2.1	5.55	0.6289
Aug. 3	8 49.3	1.43	21 4.9	5.90	0.6293
13	9 3.5	1.41	20 4.1	6.21	0.6280
23	9 17.5	1.38	19 0.7	6.44	0.6251
Sept. 2	9 31.2	1.35	17 55.2	6.62	0.6206
12	9 44.5	1.31	16 48.2	6.73	0.6144
22	9 57.4	1.26	15 40.5	6.76	0.6065
Oct. 2	10 9.8	1.21	14 32.9	6.71	0.5970
12	10 21.7	1.16	13 26.3	6.55	0.5856
22	10 33.0	1.09	12 21.6	6.23	0.5726
Nov. 1	10 43.6	1.01	11 19.9	5.95	0.5578
11	10 53.3	0.92	10 22.5	5.47	0.5513
21	11 2.0	0.81	9 30.4	4.86	0.5231
Dec. 1	11 9.6	0.68	8 45.3	4.13	0.5035
11	11 15.7	0.54	8 8.0	3.25	0.4825
21	11 20.4	0.38	7 40.3	-2.23	0.4606
31	11 23.3	+0.20	+ 7 23.3		0.4362

30 HELIOCENTRIC COÖRDINATES.

MARS.

Days from Epoch.	x .	y .	z .	Log Radius Vector.	Longitude in Orbit.	$-\frac{x^2}{r^2}$.	$-\frac{y^2}{r^2}$.	$-\frac{z^2}{r^2}$.
0	+1.3310	-0.3767	-0.0412	0.1411	344 11.2	-0.88	+0.25	+0.03
10	1.3673	0.2285	0.0388	0.1420	350 30.0	0.91	0.15	0.03
20	1.3886	-0.0779	0.0361	0.1434	356 46.5	0.91	+0.05	0.02
30	1.3947	+0.0737	0.0329	0.1452	3 00.5	0.90	-0.05	0.02
40	1.3858	0.2243	0.0294	0.1474	9 11.0	0.88	0.14	0.02
50	1.3620	0.3726	0.0255	0.1496	15 17.4	0.86	0.23	0.02
60	1.3238	0.5171	0.0214	0.1527	21 19.4	0.81	0.32	0.01
70	1.2721	0.6563	0.0171	0.1558	27 16.6	0.77	0.40	0.01
80	1.2076	0.7888	0.0126	0.1591	33 8.5	0.71	0.46	+0.01
90	1.1311	0.9135	0.0080	0.1625	38 54.9	0.65	0.53	0.00
100	1.0438	1.0295	-0.0033	0.1662	44 35.7	0.59	0.58	0.00
110	0.9469	1.1358	+0.0014	0.1699	50 10.9	0.52	0.62	0.00
120	0.8411	1.2317	0.0062	0.1736	55 40.4	0.45	0.65	-0.01
130	0.7278	1.3166	0.0109	0.1774	61 4.1	0.38	0.68	0.01
140	0.6083	1.3901	0.0154	0.1811	66 22.4	0.31	0.70	0.01
150	0.4836	1.4519	0.0199	0.1848	71 35.2	0.24	0.71	0.01
160	0.3550	1.5018	0.0241	0.1885	76 42.8	0.17	0.72	0.01
170	0.2234	1.5396	0.0282	0.1920	81 45.3	0.10	0.72	0.01
180	+0.0901	1.5653	0.0321	0.1954	86 43.1	-0.04	0.71	0.02
190	-0.0439	1.5790	0.0357	0.1986	91 36.4	+0.02	0.70	0.02
200	0.1776	1.5809	0.0391	0.2017	96 25.5	0.08	0.69	0.02
210	0.3100	1.5711	0.0421	0.2046	101 10.7	0.13	0.67	0.02
220	0.4402	1.5499	0.0448	0.2073	105 52.1	0.19	0.65	0.02
230	0.5672	1.5178	0.0473	0.2098	110 30.3	0.24	0.63	0.02
240	0.6903	1.4753	0.0494	0.2121	115 5.4	0.28	0.60	0.02
250	0.8087	1.4226	0.0512	0.2141	119 37.7	0.32	0.57	0.02
260	0.9217	1.3603	0.0526	0.2159	124 7.6	0.37	0.54	0.02
270	1.0285	1.2890	0.0537	0.2175	128 35.5	0.40	0.51	0.02
280	1.1286	1.2093	0.0544	0.2188	133 1.5	0.44	0.47	0.02
290	1.2212	1.1217	0.0548	0.2199	137 26.0	0.47	0.43	0.02
300	1.3061	1.0268	0.0548	0.2207	141 49.5	0.50	0.39	0.02
310	1.3826	0.9253	0.0545	0.2213	146 12.2	0.53	0.35	0.02
320	1.4501	0.8178	0.0538	0.2216	150 34.3	0.55	0.31	0.02
330	1.5083	0.7050	0.0528	0.2216	154 56.2	0.58	0.27	0.02
340	1.5570	0.5877	0.0514	0.2214	159 18.2	0.60	0.23	0.02
350	1.5956	0.4668	0.0497	0.2209	163 40.6	0.61	0.18	0.02
360	1.6239	0.3429	0.0477	0.2202	168 3.8	0.63	0.13	0.02
370	1.6417	0.2167	0.0454	0.2192	172 27.9	0.64	0.08	0.02
380	-1.6490	+0.0891	+0.0428	0.2180	176 53.6	+0.64	-0.03	-0.02

NOTE. — The Epoch is the 2400,000th day of the Julian Period = 1858, November 16; to the Mean Equinox and Equinox of this date all the coördinates are referred.

HELIOCENTRIC COÖRDINATES. 31

M A R S.

Days from Epoch.	x .	y .	z .	Log Radius Vector.	Longitude in Orbit.	$-\frac{x^2}{r^3} x$.	$-\frac{x^2}{r^3} y$.	$-\frac{x^2}{r^3} z$.
390	-1.6454	-0.0392	+0.0398	0.2165	181 20.9	+0.65	+0.02	-0.02
400	1.6310	0.1671	0.0367	0.2148	185 50.1	0.65	0.07	0.01
410	1.6054	0.2938	0.0333	0.2128	190 21.6	0.65	0.12	0.01
420	1.5688	0.4186	0.0296	0.2105	194 55.7	0.65	0.17	0.01
430	1.5215	0.5406	0.0258	0.2081	199 32.8	0.64	0.23	0.01
440	1.4636	0.6587	0.0218	0.2055	204 13.2	0.62	0.28	0.01
450	1.3951	0.7721	0.0176	0.2028	208 57.1	0.61	0.34	0.01
460	1.3166	0.8799	0.0133	0.1996	213 44.8	0.59	0.39	-0.01
470	1.2282	0.9611	0.0089	0.1964	218 36.8	0.56	0.45	0.00
480	1.1305	1.0749	+0.0044	0.1931	223 33.1	0.53	0.50	0.00
490	1.0240	1.1602	-0.0001	0.1896	228 34.2	0.49	0.55	0.00
500	0.9092	1.2363	0.0046	0.1860	233 40.2	0.44	0.60	0.00
510	0.7870	1.3023	0.0091	0.1823	238 51.4	0.39	0.65	+0.01
520	0.6583	1.3573	0.0135	0.1786	244 8.0	0.33	0.68	0.01
530	0.5238	1.4007	0.0177	0.1748	249 30.1	0.27	0.72	0.01
540	0.3848	1.4317	0.0219	0.1710	254 57.9	0.21	0.77	0.01
550	0.2423	1.4497	0.0258	0.1673	260 31.3	0.13	0.81	0.02
560	-0.0976	1.4541	0.0294	0.1637	266 10.5	+0.05	0.83	0.02
570	+0.0482	1.4447	0.0328	0.1602	271 55.4	-0.04	0.85	0.02
580	0.1935	1.4212	0.0359	0.1568	277 45.7	0.12	0.85	0.02
590	0.3368	1.3834	0.0387	0.1536	283 41.4	0.21	0.84	0.02
600	0.4765	1.3317	0.0410	0.1507	289 42.0	0.30	0.83	0.03
610	0.6113	1.2658	0.0430	0.1481	295 47.3	0.39	0.80	0.03
620	0.7397	1.1866	0.0443	0.1458	301 56.8	0.48	0.77	0.03
630	0.8600	1.0945	0.0453	0.1439	308 9.9	0.55	0.71	0.03
640	0.9710	0.9905	0.0458	0.1423	314 25.9	0.64	0.65	0.03
650	1.0712	0.8755	0.0457	0.1412	320 44.3	0.71	0.58	0.03
660	1.1594	0.7508	0.0451	0.1405	327 4.3	0.77	0.50	0.03
670	1.2347	0.6177	0.0441	0.1403	333 25.0	0.83	0.41	0.03
680	1.2961	0.4777	0.0426	0.1406	339 45.8	0.87	0.32	0.03
690	1.3430	0.3323	0.0405	0.1412	346 5.7	0.89	0.22	0.03
700	1.3751	0.1831	0.0380	0.1423	352 24.1	0.90	0.12	0.03
710	1.3920	-0.0320	0.0351	0.1439	358 40.1	0.91	+0.02	0.02
720	1.3934	+0.1195	0.0318	0.1458	4 53.3	0.90	-0.07	0.02
730	1.3798	0.2697	0.0282	0.1481	11 2.7	0.88	0.17	0.02
740	1.3517	0.4171	0.0243	0.1507	17 8.0	0.84	0.26	0.02
750	1.3095	0.5602	0.0201	0.1536	23 8.7	0.80	0.34	0.01
760	1.2538	0.6973	0.0158	0.1568	29 4.3	0.75	0.42	0.01
770	+1.1858	+0.8273	-0.0112	0.1602	34 54.7	-0.70	-0.48	+0.01

NOTE.—The Epoch is the 2480,000th day of the Julian Period = 1858, November 16; to the Mean Ecliptic and Equinox of this date all the coördinates are referred.

32 HELIOCENTRIC COÖRDINATES.

JUPITER.

Days from Epoch.	x .	y .	z .	Log Radius Vector.	Longitude in Orbit.	$-\frac{x^2}{r^3}$.	$-\frac{xy}{r^3}$.	$-\frac{z^2}{r^3}$.
0	+1.34902	+4.89465	-0.04793	0.70564	74 35 3	-46.56	-168.95	+1.66
10	1.27530	4.91770	0.04634	0.70591	75 27 17	43.94	169.43	1.60
20	1.20129	4.93965	0.04474	0.70619	76 19 28	41.31	169.86	1.54
30	1.12702	4.96049	0.04314	0.70647	77 11 35	38.69	170.25	1.48
40	1.05248	4.98021	0.04153	0.70675	78 3 37	36.06	170.59	1.43
50	0.97770	4.99881	0.03990	0.70704	78 55 35	33.43	170.88	1.37
60	0.90270	5.01630	0.03826	0.70732	79 47 29	30.81	171.14	1.31
70	0.82751	5.03266	0.03662	0.70761	80 39 19	28.19	171.37	1.26
80	0.75214	5.04791	0.03498	0.70789	81 31 5	25.57	171.56	1.20
90	0.67661	5.06203	0.03332	0.70818	82 22 48	22.96	171.70	1.14
100	0.60092	5.07503	0.03166	0.70847	83 14 26	20.35	171.79	1.08
110	0.52510	5.08690	0.02999	0.70876	84 6 1	17.75	171.85	1.02
120	0.44915	5.09764	0.02831	0.70905	84 57 31	15.15	171.87	0.96
130	0.37310	5.10725	0.02662	0.70935	85 48 57	12.56	171.84	0.90
140	0.29698	5.11573	0.02493	0.70964	86 40 19	9.98	171.77	0.84
150	0.22080	5.12308	0.02324	0.70994	87 31 37	7.41	171.67	0.78
160	0.14457	5.12930	0.02154	0.71023	88 22 51	4.84	171.53	0.72
170	+0.06830	5.13441	0.01984	0.71053	89 13 59	- 2.28	171.35	0.66
180	-0.00799	5.13840	0.01812	0.71082	90 5 4	+ 0.26	171.13	0.61
190	0.06427	5.14126	0.01640	0.71112	90 56 4	2.79	170.88	0.55
200	0.16053	5.14301	0.01468	0.71142	91 47 0	5.32	170.58	0.49
210	0.23676	5.14364	0.01296	0.71172	92 37 52	7.83	170.25	0.43
220	0.31294	5.14315	0.01123	0.71203	93 28 39	10.33	169.88	0.38
230	0.38905	5.14154	0.00950	0.71233	94 19 23	12.82	169.47	0.32
240	0.46508	5.13882	0.00777	0.71263	95 10 2	15.29	169.02	0.26
250	0.54101	5.13500	0.00603	0.71293	96 0 37	17.75	168.54	0.20
260	0.61681	5.13007	0.00430	0.71324	96 51 7	20.19	168.02	0.15
270	0.69248	5.12404	0.00257	0.71354	97 41 34	22.62	167.48	0.09
280	0.76801	5.11692	-0.00083	0.71384	98 31 57	25.04	166.90	+0.03
290	0.84337	5.10870	+0.00090	0.71414	99 22 15	27.44	166.29	-0.02
300	0.91855	5.09939	0.00263	0.71445	100 12 30	29.83	165.63	0.08
310	0.99354	5.08999	0.00436	0.71475	101 2 41	32.19	164.95	0.13
320	1.06832	5.07751	0.00609	0.71505	101 52 47	34.54	164.24	0.19
330	1.14287	5.06496	0.00782	0.71535	102 42 49	36.87	163.49	0.25
340	1.21718	5.05133	0.00955	0.71566	103 32 47	39.19	162.70	0.30
350	1.29123	5.03664	0.01127	0.71596	104 22 40	41.49	161.89	0.36
360	1.36601	5.02089	0.01299	0.71626	105 12 29	43.77	161.05	0.41
370	1.43951	5.00408	0.01472	0.71656	106 2 13	46.03	160.18	0.47
380	-1.51170	+4.98622	+0.01644	0.71686	106 51 54	+48.28	-159.28	-0.52

Note. — The Epoch is the 2400,000th day of the Julian Period = 1858, November 16; to the Mean Elliptic and Equinox of this date all the coördinates are referred.

HELIOCENTRIC COÖRDINATES. 33

JUPITER.

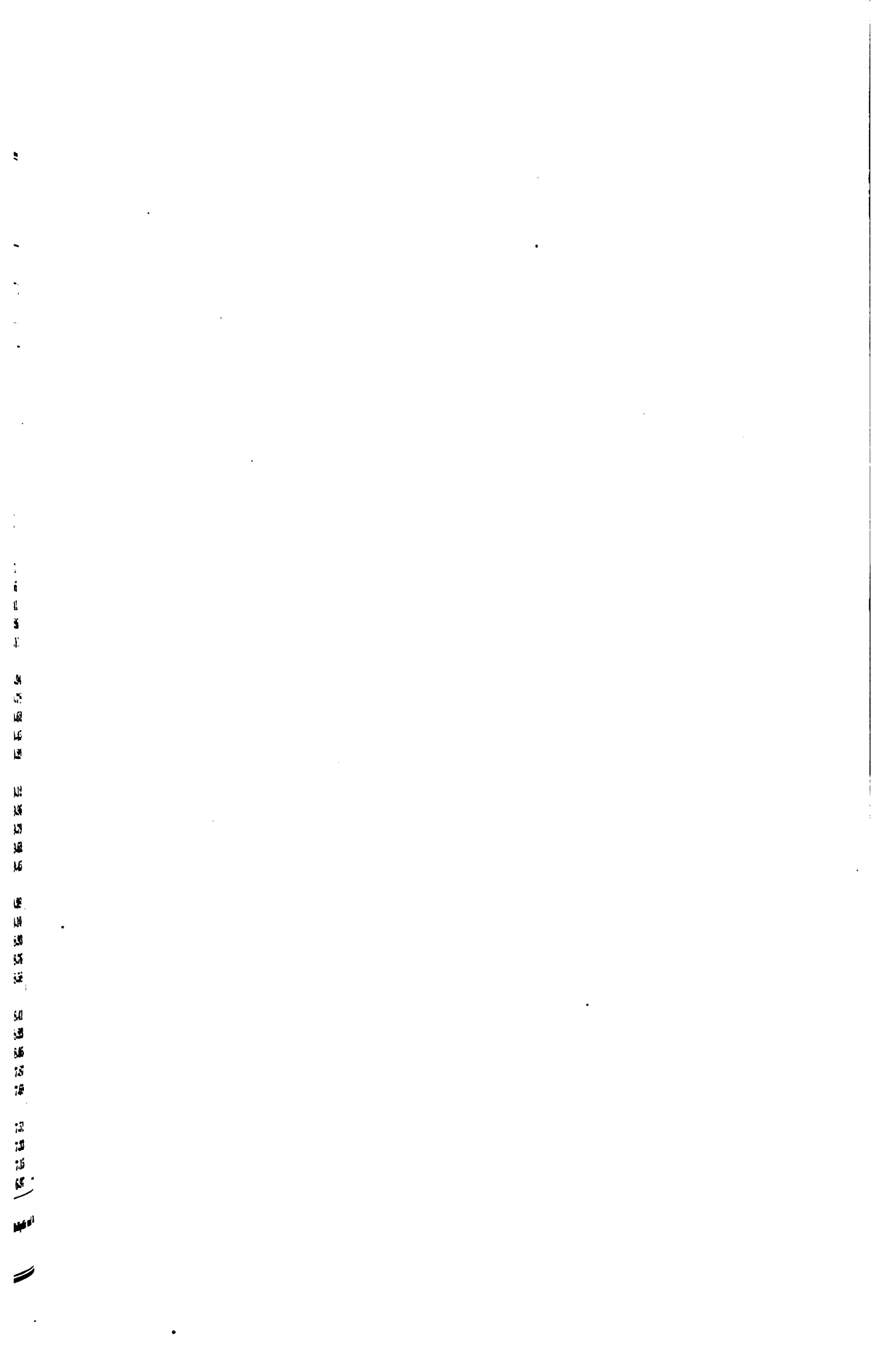
Days from Epoch.	x .	y .	z .	Log Radius Vector.	Longitude in Orbit.	$-\frac{x^2}{r^3}x$.	$-\frac{x^2}{r^3}y$.	$-\frac{x^2}{r^3}z$.
390	-1.58457	+4.96732	+0.01815	0.71716	107 41 30	‡ 50.50	-158.35	-0.56
400	1.65711	4.94738	0.01986	0.71746	108 31 2	52.72	157.38	0.60
410	1.72931	4.92641	0.02157	0.71776	109 20 30	54.90	156.39	0.66
420	1.80115	4.90442	0.02327	0.71807	110 9 54	57.07	155.37	0.72
430	1.87261	4.88141	0.02497	0.71837	110 59 14	59.21	154.32	0.78
440	1.94369	4.85739	0.02667	0.71866	111 48 30	61.32	153.24	0.83
450	2.01437	4.83237	0.02836	0.71896	112 37 43	63.42	152.14	0.88
460	2.08463	4.80635	0.03004	0.71926	113 26 51	65.50	151.01	0.94
470	2.15447	4.77934	0.03172	0.71955	114 15 55	67.56	149.86	0.99
480	2.22386	4.75134	0.03339	0.71984	115 4 56	69.60	148.68	1.04
490	2.29290	4.72237	0.03505	0.72014	115 53 53	71.61	147.48	1.09
500	2.36127	4.69243	0.03670	0.72043	116 42 46	73.60	146.25	1.14
510	2.42926	4.66154	0.03835	0.72072	117 31 35	75.57	144.99	1.19
520	2.49675	4.62969	0.03999	0.72101	118 20 20	77.52	143.71	1.24
530	2.56373	4.59691	0.04162	0.72129	119 9 0	79.44	142.41	1.29
540	2.63019	4.56319	0.04324	0.72158	119 57 37	81.34	141.08	1.33
550	2.69612	4.52855	0.04485	0.72186	120 46 10	83.22	139.73	1.38
560	2.76150	4.49299	0.04646	0.72214	121 34 39	85.07	138.37	1.42
570	2.82632	4.45652	0.04806	0.72242	122 23 4	86.90	136.99	1.47
580	2.89058	4.41916	0.04964	0.72270	123 11 25	88.70	135.58	1.51
590	2.95426	4.38090	0.05122	0.72298	123 59 43	90.48	134.15	1.56
600	3.01735	4.34177	0.05278	0.72326	124 47 57	92.24	132.70	1.60
610	3.07983	4.30176	0.05434	0.72353	125 36 8	93.97	131.23	1.65
620	3.14169	4.26090	0.05588	0.72380	126 24 15	95.68	129.74	1.69
630	3.20293	4.21918	0.05741	0.72407	127 12 19	97.36	128.23	1.74
640	3.26353	4.17663	0.05894	0.72434	128 0 19	99.02	126.71	1.78
650	3.32348	4.13324	0.06045	0.72461	128 48 16	100.65	125.17	1.82
660	3.38277	4.08904	0.06195	0.72487	129 36 10	102.26	123.60	1.87
670	3.44139	4.04402	0.06343	0.72514	130 24 0	103.84	122.01	1.91
680	3.49933	3.99821	0.06490	0.72540	131 11 46	105.40	120.41	1.95
690	3.55658	3.95161	0.06636	0.72566	131 59 28	106.93	118.79	1.99
700	3.61314	3.90423	0.06780	0.72592	132 47 8	108.44	117.15	2.03
710	3.66898	3.85609	0.06924	0.72617	133 34 44	109.92	115.50	2.07
720	3.72411	3.80719	0.07067	0.72642	134 22 17	111.38	113.83	2.11
730	3.77850	3.75754	0.07208	0.72667	135 9 46	112.82	112.15	2.15
740	3.83216	3.70716	0.07348	0.72691	135 57 11	114.23	110.46	2.19
750	3.88507	3.65605	0.07486	0.72716	136 44 33	115.60	108.75	2.23
760	3.93721	3.60423	0.07622	0.72740	137 31 52	116.95	107.02	2.27
770	-3.98859	+3.55170	+0.07757	0.72764	138 19 10	‡ 118.28	-105.28	-2.30

NOTE. — The Epoch is the 2400,000th day of the Julian Period = 1858, November 16; to the Mean Elliptic and Equinox of this date all the coördinates are referred.

34 HELIOCENTRIC COÖRDINATES.

SATURN								
Days from Epoch.	x .	y .	z .	Log Radius Vector.	Longitude in Orbit.	$-\frac{x^2}{r^3}x$.	$-\frac{x^2}{r^3}y$.	$-\frac{x^2}{r^3}z$.
0	-5.37566	+7.34932	+0.09391	0.95933	126 11 40	+ 9.63	-13.16	-0.17
20	5.47156	7.28220	0.09887	0.95950	126 55 43	9.79	13.02	0.18
40	5.56661	7.21513	0.10381	0.95968	127 39 46	9.94	12.88	0.18
60	5.66080	7.14631	0.10874	0.95986	128 23 46	10.10	12.74	0.19
80	5.75411	7.07636	0.11365	0.96005	129 7 44	10.25	12.60	0.20
100	5.84651	7.00530	0.11855	0.96024	129 51 39	10.40	12.45	0.21
120	5.93800	6.93314	0.12342	0.96044	130 35 33	10.55	12.31	0.22
140	6.02856	6.85990	0.12827	0.96063	131 19 25	10.70	12.16	0.23
160	6.11818	6.78559	0.13310	0.96083	132 3 15	10.84	12.02	0.24
180	6.20684	6.71024	0.13792	0.96103	132 47 1	10.98	11.87	0.24
200	6.29454	6.63385	0.14271	0.96123	133 30 44	11.12	11.71	0.25
220	6.38127	6.55642	0.14747	0.96144	134 14 25	11.26	11.56	0.26
240	6.46701	6.47796	0.15221	0.96165	134 58 4	11.40	11.41	0.27
260	6.55175	6.39849	0.15694	0.96186	135 41 39	11.53	11.26	0.28
280	6.63547	6.31802	0.16164	0.96207	136 25 14	11.66	11.10	0.28
300	6.71817	6.23658	0.16631	0.96229	137 8 46	11.79	10.94	0.29
320	6.79982	6.15419	0.17095	0.96250	137 52 16	11.91	10.78	0.30
340	6.88141	6.07065	0.17556	0.96272	138 35 43	12.03	10.62	0.31
360	6.95995	5.98658	0.18015	0.96295	139 19 7	12.15	10.45	0.31
380	7.03842	5.90138	0.18471	0.96317	140 2 28	12.27	10.29	0.32
400	7.11581	5.81527	0.18925	0.96340	140 45 45	12.39	10.12	0.33
420	7.19212	5.72827	0.19375	0.96363	141 28 59	12.51	9.96	0.34
440	7.26733	5.64039	0.19823	0.96386	142 12 25	12.62	9.79	0.35
460	7.34142	5.55165	0.20268	0.96409	142 55 37	12.73	9.62	0.35
480	7.41439	5.46207	0.20711	0.96433	143 38 44	12.83	9.45	0.36
500	7.48622	5.37165	0.21150	0.96456	144 21 49	12.93	9.28	0.36
520	7.55690	5.28041	0.21585	0.96480	145 4 51	13.03	9.10	0.37
540	7.62642	5.18836	0.22016	0.96504	145 47 49	13.13	8.93	0.37
560	7.69479	5.09552	0.22444	0.96528	146 30 45	13.22	8.76	0.38
580	7.76200	5.00191	0.22869	0.96553	147 13 37	13.32	8.58	0.39
600	7.82804	4.90755	0.23290	0.96577	147 56 27	13.41	8.41	0.40
620	7.89290	4.81245	0.23708	0.96602	148 39 15	13.50	8.23	0.41
640	7.95657	4.71663	0.24122	0.96627	149 21 59	13.58	8.05	0.41
660	8.01904	4.62011	0.24533	0.96652	150 4 40	13.66	7.87	0.42
680	8.08029	4.52290	0.24941	0.96677	150 47 18	13.74	7.69	0.42
700	8.14032	4.42501	0.25344	0.96702	151 29 53	13.82	7.51	0.43
720	8.19914	4.32645	0.25744	0.96728	152 12 26	13.90	7.33	0.44
740	8.25674	4.22723	0.26140	0.96753	152 54 56	13.97	7.15	0.44
760	-8.31312	+4.12737	+0.26532	0.96779	153 37 22	+14.04	- 6.97	-0.45

Norw. — The Epoch is the 2400,000th day of the Julian Period = 1858, November 16; to the Mean Elliptic and Equinox of this date all the coördinates are referred.





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