TABLES

OF

PARTHENOPE,

BY

E. SCHUBERT.

COMPUTED FOR THE

AMERICAN EPHEMERIS AND NAUTICAL ALMANAC.
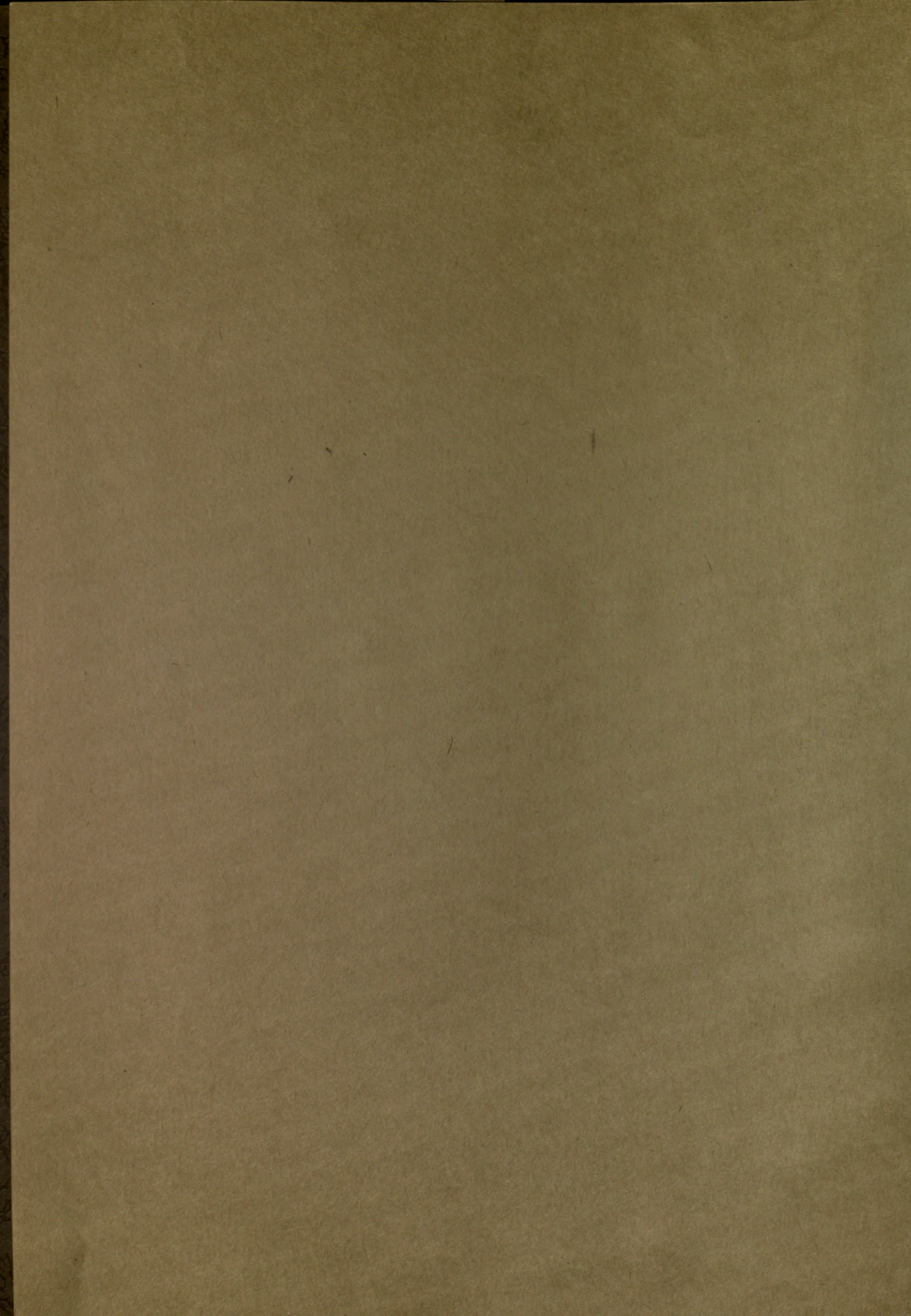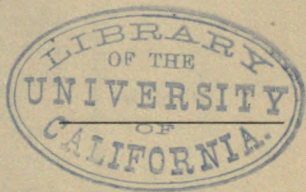
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INTRODUCTION.

IN the construction of these Tables some twenty of the smaller terms of the perturbations by Jupiter and Saturn, published in No. 1761 of the " Astronomische Nachrichten," have been omitted, since the effect of them upon the final result is almost everywhere nearly zero.

Denoting the arguments in the following manner :—

I $=$	$-\ M'$	XI $=$	$-\ M''$	XXI $=$	$3\,M - 4\,M'$
II $=$	$2\,M - 3\,M'$	XII $=$	$M - M''$	XXII $=$	$2\,M - 5\,M'$
III $=$	$M - 3\,M'$	XIII $=$	$2\,M - M''$	XXIII $=$	$M - 6\,M'$
IV $=$	$M - M'$	XIV $=$	$M - 2\,M''$	XXIV $=$	$3\,M - 5\,M'$
V $=$	$M - 2\,M'$	XV $= -$	$M - 3\,M'$	XXV $=$	$4\,M - 5\,M'$
VI $=$	$2\,M - M'$	XVI $=$	$4\,M - 3\,M'$	XXVI $=$	$M - 5\,M'$
VII $=$	$3\,M - 2\,M'$	XVII $= -$	$2\,M - 3\,M'$	XXVII $= -$	$2\,M - M'$
VIII $= -\,M -$	M'	XVIII $= -$	$M - 2\,M'$	XXVIII $=$	$5\,M - 2\,M'$
IX $=$	M	XIX $=$	$M - 4\,M'$	XXIX $=$	$4\,M - M'$
X $=$	$3\,M - M'$	XX $=$	$5\,M - 3\,M'$	XXX $= -$	$M - M''$

The perturbations by Jupiter and Saturn, retained for the construction of the Tables, in units of the sixth decimal are :—

	ξ_1		η_1		ζ_1	
	cos	sin	cos	sin	cos	sin
0 M	$-\ 16.08t$		$-\ 134.23t$		$+\ 4.22t$	
1 M	$-\ 0.75t$	$+\ 69.97t$	$-\ 87.87t$	$-\ 1.33t$	$-\ 28.27t$	$+\ 0.79t$
2 M	$+\ 5.25t$	$+\ 51.69t$	$-\ 51.92t$	$+\ 5.23t$	$-\ 1.40t$	$+\ 0.04t$
3 M	$+\ 0.78t$	$+\ 7.72t$	$-\ 7.44t$	$+\ 0.78t$	$-\ 0.10t$	
4 M	$+\ 0.10t$	$+\ 0.96t$	$-\ 0.96t$	$+\ 0.10t$	$-\ 0.01t$	
5 M	$+\ 0.01t$	$+\ 0.12t$	$-\ 0.11t$	$+\ 0.01t$		
I	$+\ 607.1$	$+\ 924.2$	$+\ 933.1$	$-\ 600.5$	$+\ 20.6$	$-\ 14.8$
2 I	$+\ 694.5$	$-\ 1272.7$	$-\ 1269.2$	$-\ 690.7$	$-\ 15.3$	$-\ 12.3$
3 I	-3832.4	-15443.2	-15398.8	$+3818.4$	$-\ 27.3$	$+\ 11.5$
4 I	$+\ 1.1$	$-\ 10.8$	$-\ 10.8$	$-\ 1.1$		
5 I	0.0	$-\ 2.3$	$-\ 2.3$	0.0		
6 I	$+\ 1.4$	$+\ 6.7$	$+\ 6.7$	$-\ 1.3$		
II	$+3682.2$	$+14639.1$	-14575.4	$+3198.5$	$-\ 63.8$	$-\ 342.7$
2 II	$+\ 16.3$	$-\ 11.0$	$+\ 17.0$	$+\ 7.2$		
III	-3783.1	$-\ 3604.8$	$-\ 3648.8$	$+3783.2$	$+\ 18.4$	$+\ 45.3$
2 III	$-\ 41.8$	$+\ 23.4$	$+\ 25.1$	$+\ 30.9$		

	ξ_1		η_1		ζ_1	
	cos	sin	cos	sin	cos	sin
IV	+ 22.9	− 108.6	+ 124.0	+ 31.6	− 3.0	+ 7.7
2 IV	− 434.5	+ 774.0	− 739.0	− 412.4	+ 4.5	− 0.9
3 IV	+1576.5	+2644.5	−2641.9	+1568.3	− 2.7	− 17.3
4 IV	− 7.0	+ 18.8	− 17.7	− 10.2		
5 IV	− 0.7	+ 2.5	− 0.9	− 1.1		
V	+ 620.1	−1521.7	−1532.5	− 555.5	+ 38.5	+ 17.5
2 V	+ 24.3	− 67.9	− 87.3	− 5.5	+ 8.5	+ 4.0
3 V	+ 4.0	− 66.7	+ 55.3	+ 2.6	− 4.9	− 1.2
4 V	− 1.3		− 0.5			
VI	− 280.9	− 444.6	+ 442.2	− 279.2	+ 9.0	− 6.3
2 VI	− 29.7	+ 73.6	− 73.4	− 29·6		
3 VI	+ 2.8	+ 5.2	− 5.2	+ 2.8		
VII	− 195.3	+ 466.6	− 464.5 ·	− 194.5	+ 2.6	+ 0.8
2 VII	− 0.9			− 0.9		
VIII	+ 24.6	+ 152.2	+ 151.6	− 24.9	+ 7.9	− 0.6
2 VIII	+ 3.5	− 10.8	− 10.8	− 3.5		
3 VIII	− 4.5	− 19.3	− 19.2	+ 4.6		
0 IX	− 3.8		+ 10.7		+ 1.1	
1 IX	+ 170.0	− 0.6	− 1.0	+ 159.7		+ 9.1
2 IX	+ 16.4	− 7.1	+ 7.0	+ 16.3		+ 1.4
3 IX		− 0.9	+ 0.9			
X	− 37.1	− 61.7	+ 61.5	− 37.0		
2 X	− 0.5	+ 1.2	− 1.2	− 0.5		
XI	− 29.8	+ 29.5	+ 33.2	+ 35.7		
2 XI		+ 48.2	+ 48.2			
3 XI	+ 2.5	+ 13.0	+ 13.0	− 2.9		
XII	+ 3.8	+ 9.0	− 10.6	+ 2.8		
2 XII		− 19.9	+ 20.0			
3 XII	0.8	− 2.5	+ 2.5	− 0.7		
XIII	+ 12.8	− 11.1	+ 11.0	+ 12.8		
2 XIII		− 1.1	+ 1.1			
XIV	+ 4.3	+ 22.1	+ 23.1	+ 1.7		
2 XIV	− 0.9	− 0.6		+ 0.8		
XV	− 368.2	−1501.3	−1498.5	+ 367.3	1.4	+ 0.6
XVI	+ 196.2	+ 346.7	− 346.6	+ 195.8		
XVII	− 40.6	− 166.2	− 166.0	+ 40.5		
XVIII	+ 39.7	− 105.2	− 105.2	− 39.8	− 0.8	− 1.0

	ξ_1		η_1		ζ_1	
	cos	sin	cos	sin	cos	sin
XIX	+101.9	− 59.8	− 62.3	−100.0	− 1.8	− 1.3
XX	+ 22.4	+ 42.4	− 42.0	+ 22.1		
XXI	− 13.3	+ 52.7	+ 1.4	− 73.2	+ 4.3	− 4.0
XXII	− 26.2	− 15.6	− 17.9	+ 25.7		
XXIII	− 5.7	+ 67.9	+ 67.4	+ 6.7		
XXIV	+ 16.6	+ 7.2	− 19.8	− 17.0	− 0.9	− 3.5
XXV	+ 5.4	+ 16.7	+ 5.4	+ 7.4	+ 1.1	
XXVI	− 1.0	− 22.8	− 22.8	+ 1.1		
XXVII	+ 1.3	+ 16.8	+ 16.9	− 1.2		
XXVIII	− 4.0	+ 10.2	− 9.9	− 3.9		
XXIX	− 4.7	− 7.8	+ 7.9	− 4.7		
XXX	− 5.3	− 6.1	− 5.9	+ 5.4		

Normals referred to the mean equinox 1850.0.

Berlin M. T.		a	δ	Berlin M. T.		a	δ
1850 May	31.0	225° 57′ 33″.5	− 9° 48′ 27″.9	1859 December	2.0	67° 40′ 6″.8	+15° 31′ 7″.3
1851 October	22.0	28 46 48.3	+ 3 20 40.6	1861 March	13.0	172 44 43.7	+ 8 55 54.5
1853 February	7.0	141 50 9.9	+16 50 37.7	1862 July	26.0	306 21 31.2	−19 3 26.1
1854 June	3.0	252 46 36.7	−16 0 53.0	1863 December	8.0	88 56 39.5	+18 36 38.2
1855 November	9.0	49 49 12.4	+10 32 47.2	1865 March	28.0	189 4 52.7	+ 3 18 58.3
1857 February	20.0	158 10 19.5	+12 58 7.7	1866 August	24.0	334 30 24.6	−14 35 2.7
1858 June	18.0	281 16 13.4	−18 50 29.8	1868 January	3.0	103 56 14.8	+20 3 8.3

Elements.

1850, Jan. 0, Washington Mean Time.

$$M = 250° \; 52′ \; 17″.3$$
$$\pi = 316 \; 46 \; 46.3$$
$$\Omega = 124 \; 58 \; 43.9 \Big\} \text{M. Eq. Ep.}$$
$$i = 4 \; 37 \; 32.1$$

$$\varphi = 5° \; 45′ \; 40″.4$$
$$\mu = 923″.8703$$
$$\log a = 0.389597$$

Example for computing a Place from the Tables.

1870, September 20.5, Berlin M. T. = September 20, 5^h 58^m 15^s Washington M. T.

In the first place we have to write down the constants to be used :—

	$\log e$		$\log \dfrac{1-e}{1+e}$		$\log p$	
From Table II.,	9.001660		9.912513		0.385199	

	cos $(x_1 x)$	cos $(y_1 x)$	cos $(z_1 x)$	cos $(x_1 y)$	cos $(y_1 y)$
From Table V.,	9.864213	9.831649	8.818516	9.791508n	9.845887
	cos $(z_1 y)$	cos $(x_1 z)$	cos $(y_1 z)$	cos $(z_1 z)$	
	9.549111n	9.457092n	9.339004	9.969831	

	A'	B'	C'	log sin a	log sin b	log sin c
	° ′ ″	° ′ ″	° ′ ″			
And from Table VI.,	47 8 45.9	318 34 39.4	307 18 16.4	9.999056	9.970910	9.556492

M = mean anomaly ; t = time since 1850.0.

From Table I., M t

	M		t
	° ′ ″		
1870	325 33 29.84	+20.0000	
September	62 21 40.48	0.6653	
20 days	5 7 57.40	0.0548	
5 hours	3 12.47	0.0006	
58 minutes	37.21		
15 seconds	0.16		
	33 6 57.56	+20.7207	

$$\frac{1-c}{1+e}\cot \tfrac{1}{2} M = \cot \tfrac{1}{2} v'$$

		° ′ ″	
cot $\tfrac{1}{2} M$		16 33 28.8	0.526783
cot $\tfrac{1}{2} v'$		19 59 4.8	0.439296
v'		39 58 9.6	
From Table II. $c +$		16 51.6	
v		40 7 1.2	
cos v			9.883508
e cos v	+0.076766		8.885168
$1 + e$ cos v	1.076766		0.032121
r			0.353078

Formation of the Arguments from Table III.*

	I.	II.	III.	IV.	V.	VI.	VII.	VIII.	IX.	X.
1870	324.734	185.318	219.760	290.292	255.03	255.85	186.14	359.17	325.56	221.41
September . .	339.814	64.152	1.796	42.158	21.99	104.54	146.70	277.45	62.34	166.89
20 days . . .	358.338	5.280	0.148	3.470	1.81	8.60	12.07	353.20	5.13	13.74
6 hours . . .	359.979	0.066	0.002	0.043	0.02	0.11	0.15	359.92	6.06	0.17
	302.865	254.816	221.706	335.963	278.85	9.10	345.06	269.74	33.09	42.21

	XI.	XII.	XIII.	XIV.	XV.	XVI.	XVII.	XVIII.	XIX.	XX.
1870	191.6	157.2	122.8	348.8	288.6	116.4	323.1	323.9	184.5	82.0
September . .	351.9	54.2	116.6	46.1	237.0	188.9	174.7	257.2	341.6	251.2
20 days . . .	359.3	4.5	9.6	3.8	349.9	15.5	344.8	351.6	358.5	20.7
	182.8	215.9	249.0	38.7	155.5	320.8	122.6	212.7	164.6	353.9

	XXI.	XXII.	XXIII.	XXIV.	XXV.	XXVI.	XXVII.	XXVIII.	XXIX.	XXX.
1870	116	115	114	80	46	149	34	117	187	226
September . .	106	24	301	86	148	321	215	271	229	289
20 days . . .	9	2	355	7	12	357	348	22	19	354
	231	141	50	173	206	107	237	50	75	149

* The arguments being expressed in degrees and decimals, 360.0, 720.0, or 1080.0 must be subtracted when one of the sums is greater than one of those numbers.

	ξ'		η'		ζ'	
	+	−	+	−	+	−
Terms with t	1632.8			4372.1		404.5
I	6515.5	15112.1	16829.6		66.3	
II			718.2		347.5	
III	5241.2		237.5			44.0
IV		2851.1		2379.5	13.4	
V	1533.8		375.5			19.3
VI		347.5	310.8		7.7	
VII		308.0		399.3		
VIII		175.0	39.4			
IX	137.3		114.7		7.2	
X		67.6	20.0			
XI	28.8		0.4			
XII		25.0	14.4			
XIII	5.0		16.6			
XIV	16.4		19.8			
XV		288.3	1513.8		1.5	
XVI		65.7		392.3		
XVII		119.0	122.7			
XVIII	23.9		109.7		1.2	
XIX		113.5	34.1		1.4	
XX	17.9			44.0		
XXI		32.6	56.0			
XXII	10.0		30.2			
XXIII	48.3		48.4			
XXIV		15.6	17.9			
XXV		12.4		8.2		
XXVI		21.5	7.7			
XXVII		12.8		8.1		
XXVIII	5.6			9.0		
XXIX		8.6		2.6		
XXX	1.5		7.6			
	15218.0	19576.3	20645.0	7615.1	446.2	467.8
ξ', η', ζ'	−4358.3		+13029.9		−21.6	

Reduction to the apparent equinox.

f		$+17.88$	
g			0.9036
G		$13\ 9$	
$\sin (G + a')$		$13\ 9$	9.3570
$\tan \delta'$			9.0993n
		$- 0.23$	9.3599
$\Delta a'$		$+17.65$	
$\cos (G + a')$			9.9885
$\Delta \delta'$		$+ 7.80$	0.8921

$$a = 0\ 0\ 0.3$$
$$\delta = -7\ 9\ 39.6$$

$\cos (x_1\, x)\ \xi'$	$- 3188.2$	
$\cos (y_1\, x)\ \eta'$	$+ 8842.8$	
$\cos (z_1\, x)\ \zeta'$	$- 1.4$	
ξ	$+ 5653.2$	
$\cos (x_1\, y)\ \xi'$	$+ 2696.7$	
$\cos (y_1\, y)\ \eta'$	$+ 9137.5$	
$\cos (z_1\, y)\ \zeta'$	$+ 7.6$	
η	$+11841.8$	
$\cos (x_1\, z)\ \xi'$	$+ 1248.6$	
$\cos (y_1\, z)\ \eta'$	$+ 2844.1$	
$\cos (z_1\, z)\ \zeta'$	$- 20.2$	
ζ	$+ 4072.5$	
$\sin (A' + v)$	$87\ 15\ 47.1$	9.999505
$r \sin a$		0.352134
x		0.351639
$\sin (B' + v)$	$358\ 41\ 40.6$	8.357580n
$r \sin b$		0.323988
y		8.681568n
$\sin (C' + v)$	$347\ 25\ 17.6$	9.338011n
$r \sin c$		9.909570
z		9.247581n
y	$- 0.048036$	
η	$+ 11842$	
Y	$+ 0.036089$	
$\Delta \cos \delta' \sin a'$	$- 0.000105$	6.021189n
x	$+ 2.247185$	
ξ	$+ 5653$	
X	$- 1.002746$	
$\Delta \cos \delta' \cos a'$	$+ 1.250092$	0.096942
$\cos a'$		0.000000
$\tan a'$	$359\ 59\ 42.7$	5.924247n
z	$- 0.176840$	
ζ	$+ 4072$	
Z	$+ 0.015661$	
$\Delta \sin \delta'$	$- 0.157107$	9.196196n
$\Delta \cos \delta'$		0.096942
$\cos \delta'$		9.996597
$\tan \delta'$	$-7\ 9\ 47.4$	9.099254n
Δ		0.100345

a' and δ' are referred to the mean equinox 1870.0

TABLE I.

FOR THE MEAN ANOMALY.

For Washington mean noon of Jan. 0 in common years, of Jan. 1 in bissextile years.

Years.	M	t	Years.	M	t
1850	250° 52′ 17″.30	0.0000	1876 B	168° 5′ 33″.54	+ 26.0014
1851	344 32 29.96	+ 0.9993	1877	261 45 46.20	27.0007
1852 B	78 28 6.49	2.0014	1878	355 25 58.86	28.0000
1853	172 8 19.15	3.0007	1879	89 6 11.52	28.9993
1854	265 48 31.81	4.0000	1880 B	183 1 48.05	30.0014
1855	359 28 44.47	4.9993	1881	276 42 0.71	31.0007
1856 B	93 24 21.00	6.0014	1882	10 22 13.37	32.0000
1857	187 4 33.66	7.0007	1883	104 2 26.03	32.9993
1858	280 44 46.32	8.0000	1884 B	197 58 2.56	34.0014
1859	14 24 58.98	8.9993	1885	291 38 15.22	35.0007
1860 B	108 20 35.51	10.0014	1886	25 18 27.88	36.0000
1861	202 0 48.17	11.0007	1887	118 58 40.53	36.9993
1862	295 41 0.82	12.0000	1888 B	212 54 17.06	38.0014
1863	29 21 13.48	12.9993	1889	306 34 29.72	39.0007
1864 B	123 16 50.01	14.0014	1890	40 14 42.38	40.0000
1865	216 57 2.67	15.0007	1891	133 54 55.04	40.9993
1866	310 37 15.33	16.0000	1892 B	227 50 31.57	42.0014
1867	44 17 28.00	16.9993	1893	321 30 44.23	43.0007
1868 B	138 13 4.52	18.0014	1894	55 10 56.89	44.0000
1869	231 53 17.18	19.0007	1895	148 51 9.55	44.9993
1870	325 33 29.84	20.0000	1896 B	242 46 46.08	46.0014
1871	59 13 42.50	20.9993	1897	336 26 58.74	47.0007
1872 B	153 9 19.03	22.0014	1898	70 7 11.40	48.0000
1873	246 49 31.69	23.0007	1899	163 47 24.06	48.9993
1874	340 29 44.35	24.0000	1900 B	257 43 0.59	+ 50.0014
1875	74 9 57.01	+ 24.9993			

Months.	M	t	Days.	M	t
January	0° 0′ 0″.00	0.0000	1	0° 15′ 23″.87	+ 0.0027
February	7 57 19.98	+ 0.0849	2	0 30 47.74	0.0055
March	15 8 28.35	0.1615	3	0 46 11.61	0.0082
April	23 5 48.33	0.2464	4	1 1 35.48	0.0109
May	30 47 44.44	0.3286	5	1 16 59.35	0.0137
June	38 45 4.41	0.4134	6	1 32 23.22	0.0164
July	46 27 0.52	0.4956	7	1 47 47.09	0.0192
August	54 24 20.50	0.5805	8	2 3 10.96	0.0219
September	62 21 40.48	0.6653	9	2 18 34.83	0.0246
October	70 3 36.59	0.7475	10	2 33 58.70	0.0274
November	78 0 56.57	0.8324	20	5 7 57.40	0.0548
December	85 42 52.68	+ 0.9145	30	7 41 56.10	+ 0.0821

In Bissextile Years one day must be subtracted from the date in the first two months.

TABLE I.—*Concluded.*

FOR THE MEAN ANOMALY.

The times are referred to the meridian of Washington.

Hours.	M	t	Hours.	M	t
	$'\quad''$			$'\quad.''$	
1	0 38.49	+0.0001	13	8 20.43	+ 0.0015
2	1 16.99	0.0002	14	8 58.92	0.0016
3	1 55.48	0.0003	15	9 37.42	0.0017
4	2 33.98	0.0005	16	10 15.91	0.0018
5	3 12.47	0.0006	17	10 54.41	0.0019
6	3 50.97	0.0007	18	11 32.90	0.0021
7	4 29.46	0.0008	19	12 11.40	0.0022
8	5 7.96	0.0009	20	12 49.89	0.0023
9	5 46.45	0.0010	21	13 28.39	0.0024
10	6 24.94	0.0011	22	14 6.88	0.0025
11	7 3.44	0.0013	23	14 45.37	0.0026
12	7 41.93	+0.0014	24	15 23.87	+ 0.0027

	M			M	
	For Minutes.	For Seconds.		For Minutes.	For Seconds.
	$'$	$''$		$'$	$''$
1	0.64	0.01	31	19.89	0.33
2	1.28	0.02	32	20.53	0.34
3	1.92	0.03	33	21.17	0.35
4	2.57	0.04	34	21.81	0.36
5	3.21	0.05	35	22.45	0.37
6	3.85	0.06	36	23.10	0.38
7	4.49	0.07	37	23.74	0.40
8	5.13	0.09	38	24.38	0.41
9	5.77	0.10	39	25.02	0.42
10	6.42	0.11	40	25.66	0.43
11	7.06	0.12	41	26.30	0.44
12	7.70	0.13	42	26.95	0.45
13	8.34	0.14	43	27.59	0.46
14	8.98	0.15	44	28.23	0.47
15	9.62	0.16	45	28.87	0.48
16	10.27	0.17	46	29.51	0.49
17	10.91	0.18	47	30.15	0.50
18	11.55	0.19	48	30.80	0.51
19	12.19	0.20	49	31.44	0.52
20	12.83	0.21	50	32.08	0.53
21	13.47	0.22	51	32.72	0.55
22	14.11	0.24	52	33.36	0.56
23	14.76	0.25	53	34.00	0.57
24	15.40	0.26	54	34.64	0.58
25	16.04	0.27	55	35.29	0.59
26	16.68	0.28	56	35.93	0.60
27	17.32	0.29	57	36.57	0.61
28	17.96	0.30	58	37.21	0.62
29	18.61	0.31	59	37.85	0.63
30	19.25	0.32	60	38.49	0.64

2

TABLE II.

FOR THE CORRECTION c TO BE ADDED TO THE AUXILIARY ANOMALY v′.

Argument = M. For $M > 180°$ the Argument is $360° - M$, and the sign of c to be reversed.

Arg.	c	Diff.	Arg.	c	Diff.	Arg.	c	Diff.	Arg.	c	Diff.
°	′ ″	″	°	′ ″	″	°	′ ″	″	°	′ ″	″
0	0 0.0	+22.3	45	+ 8 52.2	− 5.1	90	− 2 16.3	−16.9	135	− 8 7.4	+ 3.3
1	+ 0 22.3	22.3	46	8 47.1	5.8	91	2 33.2	16.6	136	8 4.1	3.8
2	0 44.6	22.3	47	8 41.3	6.6	92	2 49.8	16.3	137	8 0.3	4.2
3	1 6.9	22.1	48	8 34.7	7.3	93	3 6.1	16.1	138	7 56.1	4.7
4	1 29.0	21.9	49	8 27.4	8.0	94	3 22.2	15.7	139	7 51.4	5.1
5	1 50.9	21.8	50	8 19.4	8.7	95	3 37.9	15.4	140	7 46.3	5.6
6	2 12.7	21.5	51	8 10.7	9.4	96	3 53.3	15.1	141	7 40.7	6.0
7	2 34.2	21.3	52	8 1.3	10.0	97	4 8.4	14.8	142	7 34.7	6.4
8	2 55.5	21.0	53	7 51.3	10.6	98	4 23.2	14.3	143	7 28.3	6.9
9	3 16.5	20.6	54	7 40.7	11.3	99	4 37.5	14.0	144	7 21.4	7.3
10	3 37.1	20.2	55	7 29.4	11.8	100	4 51.5	13.7	145	7 14.1	7.7
11	3 57.3	19.8	56	7 17.6	12.4	101	5 5.2	13.2	146	7 6.4	8.0
12	4 17.1	19.4	57	7 5.2	12.9	102	5 18.4	12.8	147	6 58.4	8.5
13	4 36.5	18.9	58	6 52.3	13.4	103	5 31.2	12.3	148	6 49.9	8.8
14	4 55.4	18.5	59	6 38.9	13.9	104	5 43.5	12.0	149	6 41.1	9.2
15	5 13.9	17.9	60	6 25.0	14.4	105	5 55.5	11.5	150	6 31.9	9.6
16	5 31.8	17.3	61	6 10.6	14.9	106	6 7.0	11.0	151	6 22.3	9.9
17	5 49.1	16.7	62	5 55.7	15.2	107	6 18.0	10.6	152	6 12.4	10.2
18	6 5.8	16.1	63	5 40.5	15.6	108	6 28.6	10.2	153	6 2.2	10.6
19	6 21.9	15.4	64	5 24.9	16.0	109	6 38.8	9.6	154	5 51.6	10.8
20	6 37.3	14.8	65	5 8.9	16.4	110	6 48.4	9.2	155	5 40.8	11.2
21	6 52.1	14.1	66	4 52.5	16.6	111	6 57.6	8.7	156	5 29.6	11.5
22	7 6.2	13.4	67	4 35.9	16.9	112	7 6.3	8.2	157	5 18.1	11.7
23	7 19.6	12.7	68	4 19.0	17.2	113	7 14.5	7.7	158	5 6.4	12.1
24	7 32.3	11.9	69	4 1.8	17.5	114	7 22.2	7.2	159	4 54.3	12.3
25	7 44.2	11.1	70	3 44.3	17.6	115	7 29.4	6.7	160	4 42.0	12.5
26	7 55.3	10.4	71	3 26.7	17.9	116	7 36.1	6.3	161	4 29.5	12.8
27	8 5.7	9.6	72	3 8.8	18.0	117	7 42.4	5.7	162	4 16.7	13.0
28	8 15.3	8.8	73	2 50.8	18.1	118	7 48.1	5.2	163	4 3.7	13.2
29	8 24.1	7.9	74	2 32.7	18.2	119	7 53.3	4.7	164	3 50.5	13.4
30	8 32.0	7.2	75	2 14.5	18.4	120	7 58.0	4.1	165	3 37.1	13.6
31	8 39.2	6.3	76	1 56.1	18.3	121	8 2.1	3.7	166	3 23.5	13.8
32	8 45.5	5.5	77	1 37.8	18.5	122	8 5.8	3.1	167	3 9.7	14.0
33	8 51.0	4.6	78	1 19.3	18.4	123	8 8.9	2.7	168	2 55.7	14.1
34	8 55.6	3.9	79	1 0.9	18.4	124	8 11.6	2.1	169	2 41.6	14.2
35	8 59.5	3.0	80	0 42.5	18.4	125	8 13.7	1.6	170	2 27.4	14.4
36	9 2.5	2.1	81	0 24.1	18.4	126	8 15.3	1.1	171	2 13.0	14.5
37	9 4.6	1.3	82	+ 0 5.7	18.2	127	8 16.4	0.6	172	1 58.5	14.6
38	9 5.9	+ 0.5	83	− 0 12.5	18.1	128	8 17.0	− 0.2	173	1 43.9	14.6
39	9 6.4	− 0.4	84	0 30.6	18.1	129	8 17.2	+ 0.4	174	1 29.3	14.8
40	9 6.0	1.1	85	0 48.7	17.9	130	8 16.8	0.9	175	1 14.5	14.8
41	9 4.9	2.0	86	1 6.6	17.7	131	8 15.9	1.4	176	0 59.7	14.9
42	9 2.9	2.8	87	1 24.3	17.5	132	8 14.5	1.9	177	0 44.8	14.9
43	9 0.1	3.5	88	1 41.8	17.4	133	8 12.6	2.3	178	0 29.9	15.0
44	8 56.6	− 4.4	89	1 59.2	17.1	134	8 10.3	+ 2.9	179	− 0 14.9	+14.9
45	8 52.2		90	− 2 16.3		135	− 8 7.4		180	0 0.0	

$$\cot \tfrac{1}{2} v' = \frac{1-e}{1+e} \cos \tfrac{1}{2} M \qquad \text{True Anomaly } v = v' + c \qquad \log \frac{1-e}{1+e} = 9.912513$$

$$r = \frac{p}{1 + e \cos v} \qquad \log p = 0.385199 \qquad \log e = 9.001660$$

TABLE III.

FOR THE ARGUMENTS.

A. For the different Years. The times are referred to the meridian of Washington.

Years.	I.	II.	III.	IV.	V.	VI.	VII.	VIII.	IX	X.
1850	211.657	56.713	165.842	102.528	314.18	353.40	95.93	320.79	250.87	244.27
1851	181.332	153.080	168.538	165.874	347.21	150.42	316.29	196.79	344.54	134.96
1852 *B*	150.924	249.708	171.240	229.392	20.32	307.86	177.25	72.46	78.47	26.33
1853	120.598	346.072	173.933	292.737	53.33	104.88	37.61	308.46	172.14	277.01
1854	90.273	82.437	176.628	356.082	86.35	261.89	257.97	184.46	265.81	167.70
1855	59.947	178.799	179.320	59.426	119.37	58.90	118.33	60.47	359.48	58.38
1856 *B*	29.539	275.429	182.023	122.945	152.48	216.35	339.30	296.13	93.41	309.76
1857	359.213	11.791	184.715	186.289	185.50	13.36	199.65	172.14	187.08	200.44
1858	328.888	108.156	187.410	249.634	218.52	170.38	60.01	48.14	280.75	91.13
1859	298.562	204.518	190.102	312.978	251.54	327.39	280.37	284.15	14.42	341.81
1860 *B*	268.154	301.148	192.805	16.497	284.65	124.84	141.33	159.81	108.34	233.18
1861	237.828	37.511	195.497	79.841	317.67	281.85	1.69	35.81	202.01	123.87
1862	207.503	133.876	198.193	143.187	350.69	78.87	222.06	271.82	295.68	14.55
1863	177.178	230.242	200.888	206.532	23.71	235.89	82.42	147.82	29.35	265.24
1864 *B*	146.769	326.869	203.588	270.050	56.82	33.33	303.38	23.49	123.28	156.61
1865	116.444	63.234	206.283	333.395	89.84	190.35	163.74	259.49	216.95	47.30
1866	86.119	159.599	208.978	36.740	122.86	347.36	24.10	135.50	310.62	297.98
1867	55.793	255.961	211.670	100.084	155.88	144.37	244.46	11.50	44.29	188.67
1868 *B*	25.385	352.591	214.373	163.603	188.99	301.82	105.42	247.17	138.22	80.04
1869	355.060	88.956	217.068	226.948	222.01	98.84	325.78	123.17	231.89	330.72
1870	324.734	185.318	219.760	290.292	255.03	255.85	186.14	359.17	325.56	221.41
1871	294.409	281.683	222.455	353.637	288.05	52.86	46.50	235.18	59.23	112.09
1872 *B*	264.001	18.313	225.158	57.156	321.16	210.31	267.47	110.85	153.15	3.47
1873	233.676	114.678	227.853	120.501	354.18	7.33	127.83	346.85	246.82	254.15
1874	203.350	211.042	230.546	183.846	27.20	164.34	348.19	222.85	340.50	144.84
1875	173.025	307.407	233.241	247.191	60.22	321.36	208.55	98.86	74.17	35.52
1876 *B*	142.617	44.037	235.944	310.710	93.33	118.80	69.51	334.52	168.09	286.90
1877	112.292	140.402	238.639	14.055	126.35	275.82	289.87	210.53	261.76	177.58
1878	81.967	236.767	241.334	77.400	159.37	72.83	150.23	86.53	355.43	68.27
1879	51.642	333.132	244.029	140.745	192.39	229.85	10.59	322.54	89.10	318.95
1880 *B*	21.234	69.762	246.732	204.264	225.50	27.29	231.56	198.20	183.03	210.32
1881	350.908	166.124	249.424	267.608	258.52	184.31	91.92	74.21	276.70	101.01
1882	320.583	262.489	252.119	330.953	291.54	341.32	312.28	310.21	10.37	357.69
1883	290.258	358.856	254.815	34.299	324.56	138.34	172.64	186.22	104.04	242.38
1884 *B*	259.849	95.481	257.514	97.816	357.66	295.78	33.60	61.88	197.97	133.75
1885	229.524	191.848	260.210	161.162	30.69	92.80	253.96	297.88	291.64	24.44
1886	199.198	288.208	262.901	224.505	63.70	249.81	114.32	173.89	25.31	275.12
1887	168.873	24.575	265.597	287.851	96.72	46.83	334.68	49.89	118.98	165.81
1888 *B*	138.465	121.204	268.299	351.370	129.83	204.27	195.64	285.56	212.90	57.18
1889	108.139	217.567	270.992	54.714	162.85	1.29	56.00	161.56	306.57	307.86
1890	77.814	313.932	273.687	118.059	195.87	158.30	276.36	37.57	40.24	198.55
1891	47.489	50.297	276.382	181.404	228.89	315.32	136.72	273.57	133.91	89.23
1892 *B*	17.080	146.924	279.082	244.922	262.00	112.76	357.69	149.24	227.84	340.61
1893	346.755	243.289	281.777	308.267	295.02	269.78	218.05	25.24	321.51	231.29
1894	316.430	339.654	284.472	11.612	328.04	66.79	78.41	261.25	55.18	121.98
1895	286.104	76.016	287.164	74.956	1.06	223.81	298.76	137.25	148.85	12.66
1896 *B*	255.696	172.646	289.867	138.475	34.17	21.25	159.73	12.92	242.78	264.03
1897	225.371	269.013	292.563	201.821	67.19	178.27	20.09	248.92	336.45	154.72
1898	195.045	5.375	295.255	265.165	100.21	335.28	240.45	124.92	70.12	45.40
1899	164.720	101.740	297.950	328.510	133.23	132.30	100.81	0.93	163.79	296.09
1900 *B*	134.311	198.367	300.650	32.028	166.34	289.74	321.77	236.59	257.72	187.46

TABLE III.—*Continued.*

FOR THE ARGUMENTS.

A. For the different Years. The times are referred to the meridian of Washington.

Years.	XI.	XII.	XIII.	XIV.	XV.	XVI.	XVII.	XVIII.	XIX.	XX.
1850	76.0	326.9	217.8	42.9	24.1	198.4	133.2	172.4	17.5	89.3
1851	63.8	48.3	32.9	112.1	199.4	122.2	214.9	18.1	349.9	106.7
1852 *B*	51.6	130.0	208.5	181.6	14.3	46.6	295.8	223.4	322.1	125.1
1853	39.3	211.5	23.6	250.8	189.7	330.3	17.5	69.1	294.5	142.5
1854	27.1	292.9	198.8	320.1	5.0	254.0	99.2	274.7	266.9	159.9
1855	14.9	14.4	13.9	29.3	180.4	177.8	180.9	120.4	239.2	177.2
1856 *B*	2.7	96.1	189.5	98.8	355.2	102.2	261.8	325.7	211.6	195.6
1857	350.5	177.5	4.6	168.0	170.6	25.9	343.5	171.4	183.9	213.0
1858	338.3	259.0	179.8	237.3	345.9	309.6	65.2	17.0	156.3	230.4
1859	326.1	340.5	354.9	306.5	161.3	233.3	146.8	222.7	128.7	247.7
1860 *B*	313.8	62.2	170.5	16.0	336.1	157.8	227.8	68.0	101.0	266.2
1861	301.6	143.6	345.6	85.2	151.5	81.5	309.5	273.6	73.3	283.5
1862	289.4	225.1	160.8	154.5	326.8	5.2	31.1	119.3	45.7	300.9
1863	277.2	306.5	335.9	223.7	142.2	288.9	112.8	325.0	18.1	318.3
1864 *B*	264.9	28.2	151.5	293.2	317.0	213.4	193.7	170.2	350.3	336.7
1865	252.7	109.7	326.6	2.4	132.4	136.1	275.4	15.9	322.7	354.1
1866	240.5	191.1	141.8	71.7	307.7	60.8	357.1	221.6	295.1	11.5
1867	228.3	272.6	316.9	140.9	123.1	344.5	78.8	67.3	267.5	28.8
1868 *B*	216.1	354.3	132.5	210.3	297.9	269.0	159.7	272.6	239.8	47.2
1869	203.8	75.7	307.6	279.6	113.3	192.7	241.4	118.2	212.1	64.6
1870	191.6	157.2	122.8	348.8	288.6	116.4	323.1	323.9	184.5	82.0
1871	179.4	238.7	297.9	58.1	104.0	40.1	41.8	169.6	156.9	99.4
1872 *B*	167.2	320.3	113.5	127.5	278.8	324.6	125.7	14.8	129.2	117.8
1873	155.0	41.8	288.6	196.8	94.2	248.3	207.4	220.5	101.5	135.1
1874	142.8	123.3	103.8	266.0	269.5	172.0	289.1	66.2	73.9	152.5
1875	130.6	204.7	278.9	335.3	84.9	95.7	10.7	271.9	46.3	169.9
1876 *B*	118.3	286.4	94.5	44.7	259.8	20.2	91.7	117.1	18.5	188.3
1877	106.1	7.9	269.6	114.0	75.1	303.9	173.3	322.8	350.9	205.7
1878	93.9	89.3	84.8	183.2	250.5	227.6	255.0	168.5	323.3	223.1
1879	81.7	170.8	259.9	252.5	65.8	151.3	336.7	14.2	295.7	240.4
1880 *B*	69.4	252.5	75.5	321.9	240.7	75.8	57.6	219.4	268.0	258.9
1881	57.2	333.9	250.6	31.2	56.0	359.5	139.3	65.1	240.3	276.2
1882	45.0	55.4	65.8	100.4	231.4	283.2	221.0	270.8	212.7	293.6
1883	32.8	136.8	240.9	169.7	46.7	206.9	302.7	116.5	185.1	311.0
1884 *B*	20.6	218.5	56.5	239.1	221.6	131.4	23.6	321.7	157.3	329.4
1885	8.3	300.0	231.6	308.3	36.9	55.1	105.3	167.4	129.7	346.8
1886	356.1	21.4	46.8	17.6	212.3	338.8	187.0	13.1	102.1	4.1
1887	343.9	102.9	221.9	86.8	27.6	262.5	268.7	218.8	74.4	21.5
1888 *B*	331.7	184.6	37.5	156.3	202.5	187.0	349.6	64.0	46.8	39.9
1889	319.5	266.1	212.6	225.5	17.8	110.7	71.3	269.7	19.1	57.3
1890	307.3	347.5	27.8	294.8	193.2	34.4	152.9	115.4	351.5	74.7
1891	295.1	69.0	202.9	4.0	8.5	318.1	234.6	321.1	323.9	92.0
1892 *B*	282.8	150.7	18.5	73.5	183.4	242.6	315.6	166.3	296.2	110.4
1893	270.6	232.1	193.6	142.7	358.7	166.3	37.2	12.0	268.5	127.8
1894	258.4	313.6	8.8	212.0	174.1	90.0	118.9	217.7	240.9	145.2
1895	246.2	35.0	183.9	281.2	349.5	13.7	200.6	63.3	213.3	162.6
1896 *B*	233.9	116.7	359.5	350.7	166.3	298.2	281.5	268.6	185.5	180.9
1897	221.7	198.2	174.6	59.9	339.7	221.9	3.2	114.3	157.9	198.4
1898	209.5	279.6	349.8	129.2	155.0	145.6	84.9	320.0	130.3	215.7
1899	197.3	1.1	164.9	198.4	330.4	69.3	166.6	165.7	102.7	233.1
1900 *B*	185.1	82.8	340.5	267.8	145.2	353.8	247.5	10.9	75.0	251.5

TABLE III.—*Continued.*

FOR THE ARGUMENTS.

A. For the different Years. The times are referred to the meridian of Washington.

Years.	XXI.	XXII.	XXIII.	XXIV.	XXV.	XXVI.	XXVII.	XXVIII.	XXIX.	XXX.
1850	159	120	81	11	262	229	70	238	135	185
1851	319	156	352	140	125	171	212	285	119	79
1852 *B*	119	192	264	270	348	113	354	334	105	333
1853	279	227	176	39	212	65	136	22	89	227
1854	78	263	87	169	75	357	279	70	73	121
1855	238	299	359	298	298	299	61	117	58	15
1856 *B*	38	335	271	68	161	241	203	166	43	269
1857	198	10	182	197	24	183	345	214	28	163
1858	358	46	94	327	247	125	127	261	12	58
1859	157	82	6	96	110	67	270	309	356	312
1860 *B*	318	117	277	226	334	9	51	358	342	205
1861	117	153	189	355	197	311	194	46	326	100
1862	277	189	101	125	60	253	336	93	310	354
1863	77	225	12	254	283	195	118	141	295	248
1864 *B*	237	260	284	24	147	137	260	190	280	142
1865	37	296	196	153	10	79	43	238	264	36
1866	196	332	107	282	233	21	185	285	249	290
1867	356	8	19	52	96	323	327	333	233	184
1868 *B*	156	43	291	182	320	265	109	22	218	78
1869	316	79	202	311	183	207	251	70	208	332
1870	116	115	114	80	46	149	34	117	187	226
1871	275	151	26	210	269	91	176	165	171	120
1872 *B*	75	186	297	339	133	33	318	214	157	14
1873	235	222	209	109	356	335	100	261	141	268
1874	35	258	121	238	219	277	242	309	125	162
1875	195	293	32	8	82	219	25	357	110	56
1876 *B*	355	329	304	137	305	161	166	46	95	310
1877	154	5	216	267	169	103	309	93	79	204
1878	315	41	127	36	32	45	91	141	64	98
1879	114	76	39	166	255	347	233	189	48	353
1880 *B*	274	112	310	295	118	289	15	238	33	246
1881	74	148	222	65	341	231	157	285	18	141
1882	233	184	133	194	204	173	300	333	2	35
1883	33	219	46	323	67	115	82	21	346	289
1884 *B*	193	255	317	93	291	57	224	69	332	183
1885	353	291	229	223	154	359	6	117	316	77
1886	153	326	140	352	17	301	149	165	300	331
1887	312	2	52	121	240	243	291	213	285	225
1888 *B*	113	38	324	251	104	185	73	261	270	119
1889	272	74	235	20	327	127	215	309	254	13
1890	72	110	147	150	190	69	357	357	239	267
1891	232	145	59	279	53	11	140	45	223	161
1892 *B*	32	181	330	49	277	313	281	93	208	55
1893	192	217	242	178	140	255	64	141	193	309
1894	351	253	154	308	3	197	206	189	177	203
1895	151	288	65	77	226	139	348	236	162	97
1896 *B*	311	324	337	207	90	81	130	285	147	351
1897	111	0	249	336	313	23	272	333	131	245
1898	270	35	160	106	176	325	55	21	116	139
1899	70	71	72	235	39	267	197	68	100	34
1900 *B*	230	107	344	5	262	209	339	117	85	287

TABLE III.—*Continued.*

FOR THE ARGUMENTS.

B. Variations of the Arguments for the different Months. The times are referred to the meridian of Washington.

Months.	I.	II.	III.	IV.	V.	VI.	VII.	VIII.	IX.	X.
January . .	0.000	0.000	0.000	0.000	0.00	0.00	0.00	0.00	0.00	0.00
February . .	357.425	8.184	0.229	5.378	2.80	13.34	18.71	349.47	7.95	21.29
March . . .	355.098	15.576	0.436	10.236	5.34	25.38	35.62	339.96	15.14	40.52
April . . .	352.523	23.760	0.665	15.614	8.14	38.72	54.33	329.43	23.08	61.81
May	350.031	31.680	0.887	20.819	10.86	51.62	72.44	319.23	30.78	82.42
June	347.456	39.864	1.116	26.197	13.66	64.96	91.16	308.70	38.74	103.71
July	344.964	47.784	1.338	31.402	16.38	77.87	109.27	298.51	46.43	124.31
August . . .	342.389	55.968	1.567	36.780	19.18	91.20	127.99	287.98	54.39	145.60
September . .	339.814	64.152	1.796	42.158	21.99	104.54	146.70	277.45	62.34	166.89
October . . .	337.322	72.072	2.018	47.363	24.70	117.44	164.81	267.26	70.04	187.50
November . .	334.747	80.256	2.247	52.741	27.51	130.78	183.53	256.73	78.00	208.79
December . .	332.255	88.178	2.467	57.946	30.22	143.69	201.64	246.54	85.69	229.39

Months.	XI.	XII.	XIII.	XIV.	XV.	XVI.	XVII.	XVIII.	XIX.	XX.
January . .	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
February . .	359.0	6.9	14.9	5.9	344.3	24.1	336.4	346.9	357.7	32.0
March . . .	358.0	13.2	28.3	11.2	330.1	45.9	315.0	335.0	355.5	61.0
April . . .	357.0	20.1	43.2	17.1	314.5	70.0	291.4	321.9	353.2	93.0
May	356.0	26.8	57.6	22.8	299.3	93.3	268.5	309.3	350.9	124.1
June	354.9	33.7	72.4	28.6	283.6	117.4	244.9	296.1	348.6	156.1
July	353.9	40.4	86.8	34.3	268.4	140.7	222.0	283.5	346.3	187.1
August . . .	352.9	47.3	101.7	40.2	252.7	164.8	198.3	270.4	344.0	219.2
September . .	351.9	54.2	116.6	46.1	237.0	188.9	174.7	257.2	341.6	251.2
October . . .	350.9	60.9	130.9	51.8	221.9	212.2	151.8	244.6	339.4	282.3
November . .	349.8	67.8	145.8	57.7	206.2	236.3	128.2	231.5	337.0	314.3
December . .	348.8	74.5	160.2	63.3	191.0	259.6	105.3	218.8	334.8	345.3

Months.	XXI.	XXII.	XXIII.	XXIV.	XXV.	XXVI.	XXVII.	XXVIII.	XXIX.	XXX.
January . .	0	0	0	0	0	0	0	0	0	0
February . .	14	3	352	11	19	355	341	35	29	351
March . . .	26	6	346	21	36	351	325	66	56	343
April . . .	39	9	338	32	55	346	306	100	85	334
May	53	12	331	42	73	341	288	134	113	325
June	66	15	323	53	92	336	270	169	143	316
July	79	18	316	64	110	331	252	202	171	307
August . . .	93	21	309	75	129	326	233	237	200	298
September . .	106	24	301	86	148	321	215	271	229	289
October . . .	120	27	294	97	166	317	197	305	258	281
November . .	133	30	286	108	185	312	179	339	287	272
December . .	146	33	279	118	204	307	161	373	315	263

In Bissextile Years subtract one day from the date in the first two months.

TABLE III.—*Continued.*

FOR THE ARGUMENTS.

C. Variations of the Arguments in the different Days.   The times are referred to the meridian of Washington.

Days.	I.	II.	III.	IV.	V.	VI.	VII.	VIII.	IX.	X.
1	359.917	0.264	0.007	0.173	0.09	0.43	0.60	359.66	0.26	0.69
2	359.834	0.528	0.015	0.347	0.18	0.86	1.21	359.32	0.51	1.37
3	359.751	0.792	0.022	0.520	0.27	1.29	1.81	358.98	0.77	2.06
4	359.667	1.056	0.030	0.694	0.36	1.72	2.41	358.64	1.03	2.75
5	359.584	1 320	0.037	0.867	0.45	2.15	3.02	358.30	1.28	3.43
6	359.501	1.584	0.044	1.041	0.54	2.58	3.62	357.96	1.54	4.12
7	359.418	1.848	0.052	1.214	0.63	3.01	4.23	357.62	1.80	4.81
8	359.335	2.112	0.059	1.388	0.72	3.44	4.83	357.28	2.05	5.49
9	359.252	2.376	0.067	1.561	0.81	3.87	5.43	356 94	2.31	6.18
10	359.169	2.640	0.074	1.735	0.90	4.30	6.04	356.60	2.57	6.87
20	358.338	5.280	0.148	3.470	1.81	8.60	12.07	353.20	5.13	13.74
30	357.508	7.920	0.222	5.205	2.71	12.91	18.11	349.80	7.70	20.60

Days.	XI.	XII.	XIII.	XIV.	XV.	XVI.	XVII.	XVIII.	XIX.	XX.
1	0.0	0.2	0.5	0.2	359.5	0.8	359.2	359.6	359.9	1.0
2	359.9	0.4	1.0	0.4	359.0	1.6	358.5	359.2	359.8	2.1
3	359.9	0.7	1.4	0.6	358.5	2.3	357.7	358.7	359.8	3.1
4	359.9	0.9	1.9	0.8	358.0	3.1	357.0	358.3	359.7	4.1
5	359.8	1.1	2.4	0.9	357.5	3.9	356.2	357.9	359.6	5.2
6	359.8	1.3	2.9	1.1	357.0	4.7	355.4	357.5	359.5	6.2
7	359.8	1.6	3.4	1.3	356.5	5.4	354.7	357.0	359.5	7.2
8	359.7	1.8	3.8	1.5	356.0	6.2	353.9	356.6	359.4	8.3
9	359.7	2.0	4.3	1.7	355.4	7.0	353.1	356.2	359.3	9.3
10	359.7	2.2	4.8	1.9	354.9	7.8	352.4	355.8	359.2	10.3
20	359.3	4.5	9.6	3.8	349.9	15.5	344.8	351.6	358.5	20.7
30	359.0	6.7	14.4	5.7	344.8	23.3	337.1	347.3	357.7	31.0

Days.	XXI.	XXII.	XXIII.	XXIV.	XXV.	XXVI.	XXVII.	XXVIII.	XXIX.	XXX.
1	0	0	0	0	1	0	359	1	1	0
2	1	0	0	1	1	0	359	2	2	359
3	1	0	359	1	2	0	358	3	3	359
4	2	0	359	1	2	359	358	4	4	359
5	2	0	359	2	3	359	357	6	5	359
6	3	1	359	2	4	359	356	7	6	358
7	3	1	358	.2	4	359	356	8	7	358
8	4	1	358	3	5	359	355	9	8	358
9	4	1	358	3	5	359	355	10	8	357
10	4	1	358	3	6	358	354	11	9	357
20	9	2	355	7	12	357	348	22	19	354
30	13	3	353	10	18	355	342	34	28	351

TABLE III.—*Concluded.*

FOR THE ARGUMENTS.

D. Variations of the Arguments in the different Hours. The times are referred to the meridian of Washington.

Days.	I.	II.	III.	IV.	V́.	VI.	VII.	VIII.	IX.	X.
1	359°.996	0°.011	0°.000	0°.007	0°.00	0°.02	0°.02	359°.99	0°.01	0°.03
2	359.993	0.022	0.001	0.014	0.01	0.04	0.05	359.97	0.02	0.06
3	359.990	0.033	0.001	0.022	0.01	0.05	0.07	359.96	0.03	0.09
4	359.986	0.044	0.001	0.029	0.02	0.07	0.10	359.94	0.04	0.11
5	359.983	0.055	0.001	0.036	0.02	0.09	0.12	359.93	0.05	0.14
6	359.979	0.066	0.002	0.043	0.02	0.11	0.15	359.92	0.06	0.17
7	359.976	0.077	0.002	0.050	0.03	0.13	0.17	359.91	0.07	0.20
8	359.972	0.088	0.002	0.058	0.03 ·	0.14	0.20	359.89	0.08	0.23
9	359.969	0.099	0.003	0.065	0.03	0.16	0.22	359.88	0.09	0.26
10	359.965	0.110	0.003	0.072	0.04	0.18	0.25	359.86	0.10	0.29
20	359.930	0.220	0.006	0.144	0.08	0.36	0.50	359.72	0.21	0.57

TABLE IV.

PERTURBATIONS OF THE CO-ORDINATES IN UNITS OF THE SIXTH DECIMAL.

Terms multiplied with t. Argument $= M$.

Arg.	ξ'	Diff.	η'	Diff.	ζ'	Diff.	Arg.	ξ'	Diff.	η'	Diff.	ζ'	Diff.
0	− 10.69	+3.48	−269.53	+0.26	− 25.56		45	+ 89.07	+0.26	−176.05	+2.95	− 15.10	
1	7.21	3.46	269.27	0.38		+0.10	46	89.33	0.18	173.10	2.94		+1.26
2	3.75	3.45	268.89	0.49			47	89.51	+0.09	170.16	2.92		
3	− 0.30	3.44	268.40	0.59	25.46		48	89.60	0.00	167.24	2.89	13.84	
4	+ 3.14	3.41	267.81	0.71		0.19	49	89.60	−0.07	164.35	2.87		1.31
5	6.55	3.38	267.10	0.71			50	89.53	0.16	161.48	2.85		
6	9.93	3.35	266.29	0.81	25.27		51	89.37	0.24	158.63	2.82	12.53	
7	13.28	3.32	265.37	0.92		0.28	52	89.13	0.32	155.81	2.79		1.34
8	16.60	3.27	264.34	1.03			53	88.81	0.39	153.02	2.75		
9	19.87	3.23	263.21	1.13	24.99		54	88.42	0.47	150.27	2.72	11.19	
10	+ 23.10	+3.19	−261.98	1.23 / +1.33		0.38	55	+ 87.95	−0.55	−147.55	+2.68		1.37
11	26.29	3.13	260.65	1.42			56	87.40	0.62	144.87	2.64		
12	29.42	3.07	259.23	1.52	24.61		57	86.78	0.68	142.23	2.60	9.82	
13	32.49	3.02	257.71	1.62			58	86.10	0.76	139.63	2.56		1.41
14	35.51	2.97	256.09	1.71		0.46	59	85.34	0.82	137.07	2.51		
15	38.48	2.90	254.38	1.79	24.15		60	84.52	0.88	134.56	2.46	8.41	
16	41.38	2.83	252.59	1.89			61	83.64	0.94	132.10	2.42		1.44
17	44.21	2.77	250.70	1.97		0.55	62	82.70	1.00	129.68	2 36		
18	46.98	2.69	248.73	2.05	23.60		63	81.70	1.05	127.32	2.31	6.97	
19	49.67	2.62	246.68	2.14			64	80.65	1.11	125.01	2.26		
20	+ 52.59	+2.54	−244.54	+2.20		0.64	65	+ 79.54	−1.15	−122.75	+2.21		1.46
21	54.83	2.46	242.34	2.27	22.96		66	78.39	1.20	120.54	2.15	5.51	
22	57.29	2.38	240.07	2.35			67	77.19	1.25	118.39	2.10		1.48
23	59.67	2.30	237.72	2.40		0.73	68	75.94	1.31	116.29	2.04		
24	61.97	2.21	235.32	2.46	22.23		69	74.63	1.34	114.25	1.98	4.03	
25	64.18	2.12	232.86	2.53		0.81	70	73.29	1.38	112.27	1.92		1.49
26	66.30	2.04	230.33	2.58			71	71.91	1.41	110.35	1.86		
27	68.34	1.95	227.75	2.63	21.42		72	70.50	1.45	108.49	1.80	2.54	
28	70.29	1.86	225.12	2.68		0.88	73	69.05	1.48	106.69	1.74		
29	72.15	1.76	222.44	2.72			74	67.57	1.51	104.95	1.68		1.50
30	+ 73.91	+1.67	−219.72	+2.76	20.54		75	+ 66.06	−1.54	−103.27	+1.62	− 1.04	
31	75.58	1.57	216.96	2.80		0.96	76	64.52	1.56	101.65	1.56		1.51
32	77.15	1.48	214.16	2.83			77	62.96	1.58	100.09	1.49		
33	78.63	1.39	211.33	2.87	19.58		78	61.38	1.60	98.60	1.43	+ 0.47	
34	80.02	1.30	208.46	2.89		1.03	79	59.78	1.62	97.17	1.37		1.50
35	81.32	1.20	205.57	2.90			80	58.16	1.64	95.80	1.31		
36	82.52	1.10	202.67	2.92	18.55		81	56.62	1.66	94.49	1.25	1.97	
37	83.62	1.01	199.75	2.94		1.09	82	54.86	1.66	93.24	1.19		1.49
38	84.63	0.92	196.81	2.96			83	53.20	1.67	92.05	1.13		
39	85.55	0.82	193.85	2.96	17.46		84	51.53	1.67	90.92	1.07	3.46	
40	+ 86.37	+0.73	−190.89	+2.97		1.15	85	+ 49.86	−1.68	− 89.85	+1.01		1.48
41	87.10	0.63	187.92	2.98			86	48.18	1.69	88.84	0.95		
42	87.73	0.54	184.94	2.97	16.31		87	46.49	1.68	87.89	0.89	4.94	
43	88.27	0.45	181.97	2.96		+1.21	88	44.81	1.69	87.00	0.84		+1.47
44	88.72	+0.35	179.01	2.96			89	43.12	−1.68	86.16	+0.78		
45	+ 89.07		−176.05	+2.96	− 15.10		90	+ 41.44		− 85.38		+ 6.41	

3

TABLE IV.—*Continued.*

PERTURBATIONS OF THE CO-ORDINATES IN UNITS OF THE SIXTH DECIMAL.

Terms multiplied with *t*. Argument $= M$.

Arg.	ξ'	Diff.	η'	Diff.	ζ'	Diff.	Arg.	ξ'	Diff.	η'	Diff.	ζ'	Diff.
90	+ 41.44		− 85.38		+ 6.41		135	− 12.15		− 91.28		+ 24.66	
		−1.68		+0.72		+1.45			−0.47		−0.58		+0.85
91	39.76		84.66				136	12.62		91.86			
		1.68		0.67					0.43		0.58		
92	38.08		83.99				137	13.05		92.44			
		1.67		0.61					0.40		0.58		
93	36.41		83.38		7.86		138	13.45		93.02		25.51	
		1.66		0.56					0.37		0.57		
94	34.75		82.82			1.43	139	13.82		93.59			0.80
		1.65		0.51					0.34		0.58		
95	33.10		82.31				140	14.16		94.17			
		1.63		0.46					0.31		0.56		
96	31.47		81.85		9.29		141	14.47		94.73		26.31	
		1.61		0.41					0.28		0.56		
97	29.86		81.44			1.40	142	14.75		95.29			0.74
		1.61		0.35					0.25		0.55		
98	28.25		81.09				143	15.00		95.84			
		1.59		0.31					0.23		0.55		
99	26.66		80.78		10.69		144	15.23		96.39		27.05	
		1.57		0.26					0.20		0.54		
100	+ 25.09		− 80.52			1.38	145	− 15.43		− 96.93			0.68
		−1.55		+0.21					−0.17		−0.53		
101	23.54		80.31				146	15.60		97.46			
		1.54		0.17					0.14		0.52		
102	22.00		80.14		12.07		147	15.74		97.98		27.73	
		1.51		0.13					0.11		0.51		
103	20.49		80.01			1.35	148	15.85		98.49			0.63
		1.48		0.08					0.08		0.49		
104	19.01		79.93				149	15.93		98.98			
		1.46		+0.04					0.06		0.48		
105	17.55		79.89		13.42		150	15.99		99.46		28.36	
		1.44		0.00					0.04		0.47		
106	16.11		79.89			1.32	151	16.03		99.93			0.56
		1.41		−0.04					−0.01		0.45		
107	14.70		79.93				152	16.04		100.38			
		1.39		0.08					+0.01		0.44		
108	13.31		80.01		14.74		153	16.03		100.82		28.92	
		1.36		0.11					0.03		0.42		
109	11.95		80.12				154	16.00		101.24			
		1.34		0.15		1.28			0.05		0.40		0.51
110	+ 10.61		− 80.27				155	− 15.95		−101.64			
		−1.31		−0.18					+0.07		−0.38		
111	9.30		80.45		16.02		156	15.88		102.02		29.43	
		1.28		0.21					0.09		0.36		
112	8.02		80.66			1.24	157	15.79		102.38			0.45
		1.25		0.24					0.11		0.34		
113	6.77		80.90				158	15.68		102.72			
		1.22		0.28					0.12		0.32		
114	5.55		81.18		17.26		159	15.56		103.04		29.88	
		1.18		0.30					0.14		0.30		
115	4.37		81.48			1.20	160	15.42		103.34			0.38
		1.15		0.33					0.16		0.29		
116	3.22		81.81				161	15.26		103.63			
		1.11		0.35					0.16		0.26		
117	2.11		82.16		18.46		162	15.10		103.89		30.26	
		1.08		0.37					0.18		0.24		
118	+ 1.03		82.53				163	14.92		104.13			
		1.05		0.39					0.20		0.22		
119	− 0.02		82.92			1.15	164	14.72		104.35			0.31
		1.02		0.42					0.20		0.20		
120	− 1.04		− 83.34		19.61		165	− 14.52		−104.55		30.57	
		−0.98		−0.43					+0.22		−0.18		
121	2.02		83.77			1.10	166	14.30		104.73			0.24
		0.95		0.45					0.23		0.15		
122	2.97		84.22				167	14.07		104.88			
		0.91		0.47					0.23		0.13		
123	3.88		84.69		20.71		168	13.84		105.01		30.81	
		0.88		0.49					0.24		0.11		
124	4.76		85.18			1.06	169	13.60		105.12			0.19
		0.85		0.51					0.25		0.08		
125	5.61		85.69				170	13.35		105.20			
		0.81		0.52					0.26		0.06		
126	6.42		86.21		21.77		171	13.09		105.26		31.00	
		0.77		0.53					0.26		0.03		
127	7.19		86.74			1.02	172	12.83		105.29			0.13
		0.74		0.55					0.26		−0.01		
128	7.93		87.29				173	12.57		105.30			
		0.70		0.55					0.26		+0.01		
129	8.63		87.84		22.79		174	12.31		105.29		31.13	
		0.67		0.56					0.26		0.04		
130	− 9.30		− 88.40			0.97	175	− 12.05		−105.25			+0.06
		−0.64		−0.57					+0.26		+0.06		
131	9.94		88.97				176	11.79		105.19			
		0.60		0.57					0.26		0.09		
132	10.54		89.54		23.76		177	11.53		105.10		31.19	
		0.57		0.58					0.26		0.11		
133	11.11		90.12			+0.90	178	11.27		104.99			0.00
		0.54		0.58					0.25		0.14		
134	11.65		90.70				179	11.02		104.85			
		−0.50		−0.58					+0.26		+0.16		
135	− 12.15		− 91.28		+ 24.66		180	− 10.76		−104.69		+ 31.19	

TABLE IV.—Continued.

PERTURBATIONS OF THE CO-ORDINATES IN UNITS OF THE SIXTH DECIMAL.

Terms multiplied with t. Argument $= M$.

Arg.	ξ'	Diff.	η'	Diff.	ζ'	Diff.	Arg.	ξ'	Diff.	η'	Diff.	ζ'	Diff.
180°	− 10.76		−104.69		+ 31.19		225°	− 18.05		− 80.05		+ 23.63	
		+0.25		+0.19					−0.83		+0.65		
181	10.51		104.50				226	18.88		79.40			
		0.24		0.21		−0.07			0.86		0.64		−0.97
182	10.27		104.29				227	19.74		78.76			
		0.24		0.23					0.90		0.62		
183	10.03		104.06		31.12		228	20.64		78.14		22.66	
		0.23		0.25					0.93		0.61		
184	9.80		103.81				229	21.57		77.53			
		0.22		0.28		0.13			0.97		0.60		1.02
185	9.58		103.53				230	22.54		76.93			
		0.21		0.30					1.01		0.58		
186	9.37		103.23		30.99		231	23.55		76.35		21.64	
		0.20		0.32					1.04		0.56		
187	9.17		102.91				232	24.59		75.79			
		0.18		0.35		0.20			1.08		0.54		1.07
188	8.99		102.56				233	25.67		75.25			
		0.18		0.37					1.11		0.52		
189	8.81		102.19		30.79		234	26.78		74.73		20.57	
		0.16		0.39					1.15		0.50		
190	− 8.65		−101.80				235	− 27.93		− 74.23			
		+0.14		+0.40		0.26			−1.18		+0.47		1.11
191	8.51		101.40				236	29.11		73.76			
		0.13		0.43					1.21		0.45		
192	8.38		100.97		30.53		237	30.32		73.31		19.46	
		0.11		0.45					1.25		0.42		
193	8.27		100.52				238	31.57		72.89			
		0.09		0.47		0.32			1.28		0.39		1.15
194	8.18		100.05				239	32.85		72.50			
		0.07		0.48					1.31		0.36		
195	8.11		99.57		30.21		240	34.16		72.14		18.31	
		0.05		0.50					1.34		0.33		
196	8.06		99.07				241	35.50		71.81			
		0.04		0.52		0.39			1.37		0.30		1.20
197	8.02		98.55				242	36.87		71.51			
		+0.02		0.54					1.40		0.26		
198	8.00		98.01		29.82		243	38.27		71.25		17.11	
		0.00		0.56					1.43		0.23		
199	8.00		97.45				244	39.70		71.02			
		−0.03		0.57		0.45			1.46		0.19		1.24
200	− 8.03		− 96.88				245	− 41.16		− 70.83			
		−0.05		+0.59					−1.49		+0.15		
201	8.08		96.29		29.37		246	42.65		70.68		15.87	
		0.08		0.60					1.52		0.11		
202	8.16		95.69				247	44.17		70.57			
		0.10		0.62		0.52			1.55		0.08		1.28
203	8.26		95.07				248	45.72		70.49			
		0.13		0.63					1.58		+0.03		
204	8.39		94.44		28.85		249	47.30		70.46		14.59	
		0.15		0.64					1.60		−0.01		
205	8.54		93.80				250	48.90		70.47			
		0.18		0.65		0.58			1.62		0.05		1.31
206	8.72		93.15				251	50.52		70.52			
		0.21		0.66					1.64		0.09		
207	8.93		92.49		28.27		252	52.16		70.61		13.28	
		0.24		0.67					1.66		0.14		
208	9.17		91.82				253	53.82		70.75			
		0.27		0.68		0.63			1.68		0.18		1.34
209	9.44		91.14				254	55.50		70.93			
		0.29		0.68					1.69		0.24		
210	− 9.73		− 90.46		27.64		255	− 57.19		− 71.17		11.94	
		−0.32		+0.69					−1.71		−0.28		
211	10.05		89.77				256	58.90		71.45			
		0.36		0.70		0.69			1.73		0.34		1.37
212	10.41		89.07				257	60.63		71.79			
		0.39		0.70					1.75		0.39		
213	10.80		88.37		26.95		258	62.38		72.18		10.57	
		0.42		0.70					1.76		0.44		
214	11.22		87.67				259	64.14		72.62			
		0.45		0.71		0.75			1.78		0.49		1.40
215	11.67		86.96				260	65.92		73.11			
		0.48		0.71					1.78		0.55		
216	12.15		86.25		26.20		261	67.70		73.66		9.17	
		0.52		0.70					1.79		0.60		
217	12.67		85.55				262	69.49		74.26			
		0.55		0.71		0.80			1.80		0.66		1.43
218	13.22		84.84				263	71.29		74.92			
		0.59		0.70					1.80		0.71		
219	13.81		84.14		25.40		264	73.09		75.63		7.74	
		0.62		0.70					1.80		0.77		
220	− 14.43		− 83.44				265	− 74.89		− 76.40			
		−0.65		+0.69		0.86			−1.81		−0.83		1.45
221	15.08		82.75				266	76.70		77.23			
		0.69		0.69					1.81		0.89		
222	15.77		82.06		24.54		267	78.51		78.12		6.29	
		0.72		0.68					1.80		0.95		
223	16.49		81.38				268	80.31		79.07			
		0.76		0.67		−0.91			1.80		1.02		−1.46
224	17.25		80.71				269	82.11		80.09			
		−0.80		+0.66					−1.79		−1.07		
225	− 18.05		− 80.05		+ 23.63		270	− 83.90		− 81.16		+ 4.83	

TABLE IV.—*Continued.*

PERTURBATIONS OF THE CO-ORDINATES IN UNITS OF THE SIXTH DECIMAL.

Terms multiplied with t. Argument $= M$.

Arg.	ξ'	Diff.	η'	Diff.	ζ'	Diff.	Arg.	ξ'	Diff.	η'	Diff.	ζ'	Diff.
270°	− 83.90		− 81.16		+ 4.83		315°	−123.58		−185.72		− 16.30	
		−1.78		−1.13					+0.76		−3.06		
271	85.68		82.29			−1.48	316	122.82		188.78			−1.15
		1.78		1.20					0.86		3.05		
272	87.46		83.49				317	121.96		191.83			
		1.77		1.26					0.95		3.03		
273	89.23		84.75		3.35		318	121.01		194.86		17.45	
		1.75		1.32					1.05		3.02		
274	90.98		86.07			1.48	319	119.96		197.88			1.08
		1.73		1.38					1.14		3.00		
275	92.71		87.45				320	118.82		200.88			
		1.72		1.45					1.24		2.98		
276	94.43		88.90		1.87		321	117.58		203.86		18.53	
		1.70		1.51					1.33		2.96		
277	96.13		90.41			1.49	322	116.25		206.82			1.02
		1.68		1.56					1.43		2.93		
278	97.81		91.97				323	114.82		209.75			
		1.65		1.63					1.52		2.90		
279	99.46		93.60		+ 0.38		324	113.30		212.65		19.55	
		1.62		1.69					1.62		2.86		
280	−101.08		− 95.29			1.49	325	−111.68		−215.51			0.95
		−1.60		−1.75					+1.71		−2.83		
281	102.68		97.04				326	109.97		218.34			
		1.56		1.82					1.81		2.78		
282	104.24		98.86		− 1.11		327	108.16		221.12		20.50	
		1.52		1.88					1.90		2.73		
283	105.76		100.74			1.49	328	106.26		223.85			0.88
		1.49		1.94					1.98		2.69		
284	107.25		102.68				329	104.28		226.54			
		1.46		1.99					2.07		2.65		
285	108.71		104.67		2.60		330	102.21		229.19		21.38	
		1.42		2.05					2.16		2.57		
286	110.13		106.72			1.48	331	100.05		231.76			0.81
		1.37		2.12					2.24		2.53		
287	111.50		108.84				332	97.81		234.29			
		1.32		2.17					2.33		2.45		
288	112.82		111.01		4.08		333	95.48		236.74		22.19	
		1.27		2.23					2.41		2.39		
289	114.09		113.24				334	93.07		239.13			
		1.23		2.28					2.49		2.33		
290	−115.32		−115.52			1.46	335	− 90.58		−241.46			0.73
		−1.18		−2.34					+2.57		−2.24		
291	116.50		117.86		5.54		336	88.01		243.70		22.92	
		1.12		2.39					2.65		2.17		
292	117.62		120.25			1.45	337	85.36		245.87			0.64
		1.06		2.44					2.72		2.09		
293	118.68		122.69				338	82.64		247.96			
		1.01		2.49					2.79		2.01		
294	119.69		125.18		6.99		339	79.85		249.97		23.56	
		0.95		2.54					2.86		1.93		
295	120.64		127.72			1.43	340	76.99		251.90			0.56
		0.88		2.59					2.93		1.84		
296	121.52		130.31				341	74.06		253.74			
		0.81		2.64					2.98		1.75		
297	122.33		132.95		8.42		342	71.08		255.49		24.12	
		0.74		2.68					3.04		1.66		
298	123.07		135.63		·		343	68.04		257.15			
		0.68		2.73					3.10		1.56		
299	123.75		138.36			1.41	344	64.94		258.71			0.47
		0.61		2.76					3.16		1.47		
300	−124.36		−141.12		9.83		345	− 61.78		−260.18		24.59	
		−0.53		−2.80					+3.20		−1.37		
301	124.89		143.92			1.38	346	58.58		261.55			0.38
		0.45		2.84					3.25		1.27		
302	125.34		146.76				347	55.33		262.82			
		0.37		2.87					3.29		1.17		
303	125.71		149.63		11.21		348	52.04		263.99		24.97	
		0.29		2.90					3.33		1.06		
304	126.00		152.53			1.34	349	48.71		265.05			0.29
		0.21		2.93					3.36		0.95		
305	126.21		155.46				350	45.35		266.00			
		0.13		2.95					3.39		0.85		
306	126.34		158.41		12.55		351	41.96		266.85		25.26	
		−0.04		2.98					3.41		0.74		
307	126.38		161.39			1.30	352	38.55		267.59			0.19
		+0.03		3.00					3.44		0.64		
308	126.35		164.39				353	35.11		268.23			
		0.13		3.02					3.46		0.52		
309	126.22		167.41		13.85		354	31.65		268.75		25.45	
		0.21		3.03					3.48		0.41		
310	−126.01		−170.44			1.25	355	− 28.17		−269.16			0.10
		+0.30		−3.05					+3.50		−0.29		
311	125.71		173.49				356	24.67		269.45			
		0.39		3.05					3.49		0.19		
312	125.32		176.54		15.10		357	21.18		269.64		25.55	
		0.49		3.05					3.49		−0.08		
313	124.83		179.59			−1.20	358	17.69		269.72			−0.01
		0.58		3.06					3.50		+0.04		
314	124.25		182.65				359	14.19		269.68			
		+0.67		−3.07					+3.50		+0.15		
315	−123.58		−185.72		− 16.30		360	− 10.69		−269.53		− 25.56	

TABLE IV.—*Continued.*

PERTURBATIONS OF THE CO-ORDINATES IN UNITS OF THE SIXTH DECIMAL.

ARGUMENT I.

Arg.	ξ'	Diff.	η'	Diff.	ζ'	Diff.	Arg.	ξ'	Diff.	η	Diff.	ζ'	Diff.
0	− 2528		−15741		− 22		45	− 8406		+13147		+ 19	
		−832		+187					+706		+436		
1	3360		15554				46	7700		13583			
		820		230		0			728		399		+ 2
2	4180		15324				47	6972		13982			
		807		271					747		360		
3	4987		15053		22		48	6225		14342		21	
		790		313					766		319		
4	5777		14740				49	5459		14661			
		772		354		+ 1			782		280		1
5	6549		14386				50	4677		14941			
		752		393					795		238		
6	7301		13993		21		51	3882		15179		22	
		730		432					805		195		
7	8031		13561				52	3077		15374			
		705		469		2			814		154		+ 1
8	8736		13092				53	2263		15528			
		679		504					820		111		
9	9415		12588		19		54	1443		15639		23	
		651		539					825		67		
10	−10066		−12049				55	− 618		+15706			
		−621		+572		2			+828		+24		0
11	10687		11477				56	+ 210		15730			
		590		603					828		− 20		
12	11277		10874		17		57	1038		15710		23	
		557		632					826		62		
13	11834		10242				58	1864		15648			
		523		660		3			821		106		− 1
14	12357		9582				59	2685		15542			
		487		686					813		148		
15	12844		8896		14		60	3498		15394		22	
		449		711					805		191		
16	13293		8185				61	4303		15203			
		411		732		3			794		233		2
17	13704		7453				62	5097		14970			
		372		752					780		274		
18	14076		6701		11		63	5877		14696		20	
		331		771					764		314		
19	14407		5930				64	6641		14382			
		290		786		3			746		353		2
20	−14697		− 5144				65	+ 7387		+14029			
		−248		+799					+727		−392		
21	14945		4345		8		66	8114		13637		18	
		206		810		4			705		429		2
22	15151		3534				67	8819		13208			
		162		820					681		465		
23	15313		2714				68	9500		12743			
		119		827					656		500		
24	15432		1887		− 4		69	10156		12243		16	
		75		832		4			628		534		3
25	15507		1055				70	10784		11709			
		− 31		834					599		565		
26	15538		− 221				71	11383		11144			
		+ 13		834					569		596		
27	15525		+ 613		0		72	11952		10548		13	
		58		832		4			536		625		4
28	15467		1445				73	12488		9923			
		101		828					502		651		
29	15366		2273				74	12990		9272			
		144		820					468		676		
30	−15222		+ 3093		+ 4		75	+13458		+ 8596		9	
		+187		+812		3			+431		−700		4
31	15035		3905				76	13889		7896			
		230		800					394		720		
32	14805		4705				77	14283		7176			
		272		786					355		740		
33	14533		5491		7		78	14638		6436		5	
		312		771		4			316		758		4
34	14221		6262				79	14954		5678			
		353		753					275		772		
35	13868		7015				80	15229		4906			
		392		734					235		786		
36	13476		7749		11		81	15464		4120		+ 1	
		430		711		3			192		796		4
37	13046		8460				82	15656		3324			
		466		688					151		805		
38	12580		9148				83	15807		2519			
		502		662					109		811		
39	12078		9810		14		84	15916		1708		− 3	
		536		634		3			66		815		4
40	−11542		+10444				85	+15982		+ 893			
		+569		+605					+ 23		−817		
41	10973		11049				86	16005		+ 76			
		599		575					− 20		817		
42	10374		11624		17		87	15985		− 741		7	
		629		542		+ 2			63		814		− 4
43	9745		12166				88	15922		1555			
		657		508					105		809		
44	9088		12674				89	15817		2364			
		+682		+473					−147		−803		
45	− 8406		+13147		+ 19		90	+15670		− 3167		− 11	

TABLE IV.—*Continued.*

PERTURBATIONS OF THE CO-ORDINATES IN UNITS OF THE SIXTH DECIMAL.

ARGUMENT 1.

Arg.	ξ'	Diff.	η'	Diff.	ζ'	Diff.
90°	+15670		− 3167		− 11	
		−189		−793		
91	15481		3960			− 4
		230		782		
92	15251		4742			
		271		768		
93	14980		5510		15	
		311		753		
94	14669		6263			4
		349		735		
95	14320		6998			
		387		715		
96	13933		7713		19	
		424		694		
97	13509		8407			3
		459		670		
98	13050		9077			
		493		645		
99	12557		9722		22	
		526		618		
100	+12031		−10340			3
		−557		−589		
101	11474		10929			
		587		559		
102	10887		11488		25	
		615		527		
103	10272		12015			3
		642		494		
104	9630		12509			
		666		459		
105	8964		12968		28	
		689		424		
106	8275		13392			2
		709		387		
107	7566		13779			
		728		349		
108	6838		14128		30	
		745		310		
109	6093		14438			
		759		270		
110	+ 5334		−14708		1	
		−772		−230		
111	4562		14938		31	
		782		190		
112	3780		15128			− 1
		790		148		
113	2990		15276			
		796		106		
114	2194		15382		32	
		801		65		
115	1393		15447			0
		802		− 22		
116	+ 591		15469			
		801		− 19		
117	− 210		15450		32	
		798		62		
118	1008		15388			
		793		103		
119	1801		15285			0
		786		145		
120	− 2587		−15140		32	
		−776		+185		
121	3363		14955			+ 1
		765		226		
122	4128		14729			
		752		265		
123	4880		14464		31	
		735		305		
124	5615		14159			1
		717		342		
125	6332		13817			
		698		379		
126	7030		13438		30	
		677		415		
127	7707		13023			2
		653		450		
128	8360		12573			
		627		483		
129	8987		12090		28	
		600		516		
130	− 9587		−11574			2
		−571		+545		
131	10158		11029			
		541		574		
132	10699		10455		26	
		509		602		
133	11208		9853			+ 2
		476		628		
134	11684		9225			
		−442		+651		
135	−12126		− 8574		− 24	

Arg.	ξ'	Diff.	η'	Diff.	ζ'	Diff.
135°	−12126		− 8574		− 24	
		−406		+673		
136	12532		7901			+ 3
		369		693		
137	12901		7208			
		332		710		
138	13233		6498		21	
		292		727		
139	13525		5771			2
		254		741		
140	13779		5030			
		213		753		
141	13992		4277		19	
		172		762		
142	14164		3515			3
		132		770		
143	14296		2745			
		90		775		
144	14386		1970		16	
		48		779		
145	−14434		− 1191			3
		− 7		+780		
146	14441		− 411			
		+ 35		778		
147	14406		+ 367		13	
		77		774		
148	14329		1141			2
		119		769		
149	14210		1910			
		159		761		
150	14051		2671		11	
		201		751		
151	13850		3422			3
		240		739		
152	13610		4161			
		279		725		
153	13331		4886		8	
		318		708		
154	13013		5594			
		355		690		
155	−12658		+ 6284		1	
		+392		+670		
156	12266		6954		7	
		427		647		
157	11839		7601			2
		46¦		623		
158	11378		8224			
		493		598		
159	10885		8822		5	
		525		570		
160	10360		9392			1
		555		541		
161	9805		9933			
		584		510		
162	9221		10443		4	
		610		478		
163	8611		10921			
		635		445		
164	7976		11366			+ 1
		658		409		
165	− 7318		+11775		3	
		+679		+374		
166	6639		12149			0
		698		337		
167	5941		12486			
		715		298		
168	5226		12784		3	
		731		260		
169	4495		13044			− 1
		744		219		
170	3751		13263			
		755		180		
171	2996		13443		4	
		763		139		
172	2233		13582			1
		770		97		
173	1463		13679			
		774		56		
174	− 689		13735		5	
		776		+ 14		
175	+ 87		+13749			2
		+776		− 28		
176	863		13721			
		774		69		
177	1637		13652		7	
		770		112		
178	2407		13540			− 2
		762		152		
179	3169		13388			
		+753		−193		
180	+ 3922		+13195		− 9	

TABLE IV.—*Continued.*

PERTURBATIONS OF THE CO-ORDINATES IN UNITS OF THE SIXTH DECIMAL.

ARGUMENT 1.

Arg.	ξ'	Diff.	η'	Diff.	ζ'	Diff.	Arg.	ξ'	Diff.	η'	Diff.	ζ'	Diff.
180°	+ 3922		+13195		− 9		225°	+ 5845		−14504		− 44	
		+742		−234		− 2			−751		−345		+ 2
181	4664		12961				226	5094		14849			
		729		274					769		306		
182	5393		12687				227	4325		15155			
		714		313					786		267		
183	6107		12374		11		228	3539		15422		42	
		696		350		3			800		225		2
184	6803		12024				229	2739		15647			
		676		388					813		183		
185	7479		11636				230	1926		15830			
		655		425					823		141		
186	8134		11211		14		231	1103		15971		40	
		632		459		3			830		99		3
187	8766		10752				232	+ 273		16070			
		606		493					836		55		
188	9372		10259				233	− 563		16125			
		579		525					839		− 12		
189	9951		9734		17		234	1402		16137		37	
		550		556					840		+ 32		
190	+10501		+ 9178			4	235	− 2242		−16105			4
		+520		−586					−839		+ 76		
191	11021		8592				236	3081		16029			
		489		613					835		118		
192	11510		7979		21		237	3916		15911		33	
		455		639					830		163		5
193	11965		7340			3	238	4746		15748			
		420		663					821		205		
194	12385		6677				239	5567		15543			
		384		686					811		248		
195	12769		5991		24		240	6378		15295		28	
		347		706					798		290		6
196	13116		5285			4	241	7176		15005			
		309		724					783		332		
197	13425		4561				242	7959		14673			
		270		741					767		372		
198	13695		3820		28		243	8726		14301		22	
		230		755					748		412		6
199	13925		3065			3	244	9474		13889			
		190		768					726		450		
200	+14115		+ 2297				245	−10200		−13439			
		+148		−777					−704		+488		
201	14263		1520		31		246	10904		12951		16	
		106		786					679		524		7
202	14369		+ 734			4	247	11583		12427			
		64		791					651		560		
203	14433		− 57				248	12234		11867			
		+ 22		794					623		593		
204	14455		851		35		249	12857		11274		9	
		− 22		796					592		625		7
205	14433		1647			3	250	13449		10649			
		64		794					561		656		
206	14369		2441				251	14010		9993			
		106		791					527		684		
207	14263		3232		38		252	14537		9309		− 2	
		150		786					491		712		7
208	14113		4018				253	15028		8597			
		191		777					455		737		
209	13922		4795			2	254	15483		7860			
		232		768					417		760		
210	+13690		− 5563		40		255	−15900		− 7100		+ 5	
		−274		−756					−378		+782		7
211	13416		6319			2	256	16278		6318			
		314		741					338		801		
212	13102		7060				257	16616		5517			
		353		725					297		819		
213	12749		7785		42		258	16913		4698		12	
		392		706					254		834		8
214	12357		8491			2	259	17167		3864			
		430		686					212		847		
215	11927		9177				260	17379		3017			
		467		663					169		858		
216	11460		9840		44		261	17548		2159		20	
		502		639					124		866		7
217	10958		10479			− 1	262	17672		1293			
		536		612					80		873		
218	10422		11091				263	17752		− 420			
		568		584					− 35		876		
219	9854		11675		45		264	17787		+ 456		27	
		600		555					+ 9		878		
220	+ 9254		−12230		0		265	−17778		+ 1334			8
		−630		−523					+ 55		+878		
221	8624		12753				266	17723		2212			
		657		491					99		875		
222	7967		13244		45		267	17624		3087		35	
		684		456					144		869		+ 7
223	7283		13700			+ 1	268	17480		3956			
		708		420					188		862		
224	6575		14120				269	17292		4818			
		−730		−384					+232		+853		
225	+ 5845		−14504		− 44		270	−17060		+ 5671		+ 42	

TABLE IV.—*Continued.*

PERTURBATIONS OF THE CO-ORDINATES IN UNITS OF THE SIXTH DECIMAL.

ARGUMENT I.

Arg.	ξ'	Diff.	η'	Diff.	ζ'	Diff.	Arg.	ξ'	Diff.	η'	Diff.	ζ'	Diff.
270°	−17060	+276	+ 5671	+840	+ 42		315°	+14682	+454	+ 9975	−764	+ 48	
271	16784	319	6511	826		+ 6	316	15136	414	9211	785		− 6
272	16465	361	7337	809			317	15550	373	8426	805		
273	16104	402	8146	791	48		318	15923	331	7621	822	42	
274	15702	442	8937	770		6	319	16254	288	6799	838		6
275	15260	481	9707	747			320	16542	244	5961	850		
276	14779	519	10454	747	54		321	16786	200	5111	861	36	
277	14260	555	11176	722		5	322	16986	156	4250	870		6
278	13705	590	11872	696			323	17142	110	3380	875		
279	13115		12539	667	59		324	17252		2505	879	30	
		624		636					65		879		
280	−12191	+656	+13175	+605		4	325	+17317	+ 20	+ 1626	−881		7
281	11835	686	13780	571			326	17337	− 25	+ 745	880		
282	11149	715	14351	536	63		327	17312	71	− 135	876	23	
283	10434	742	14887	499		3	328	17241	116	1011	871		6
284	9692	766	15386	461			329	17125	160	1882	863		
285	8926	789	15847	422	66		330	16965	205	2745	853	17	
286	8137	810	16269	382		3	331	16760	249	3598	840		7
287	7327	829	16651	340	•		332	16511	291	4438	825		
288	6498	845	16991	298	69		333	16220	333	5263	809	10	
289	5653		17289				334	15887		6072			
		859		265		1			374		790		6
290	− 4794	+872	+17544	+211			335	+15513	∓414	− 6862	−768		
291	3922	881	17755	166	70		336	15099	453	7630	746	+ 4	
292	3041	889	17921	122		+ 1	337	14646	490	8376	721		5
293	2152	894	18043	77			338	14156	526	9097	693		
294	1258	896	18120	+ 31	71		339	13630	561	9790	665	− 1	
295	362	897	18151	− 14		− 1	340	13069	594	10455	634		5
296	+ 535	895	18137	60			341	12475	626	11089	602		
297	1430	891	18077	105	70		342	11849	656	11691	568	6	
298	2321	884	17972	149		1	343	11193	683	12259	534		5
299	3205		17823	195			344	10510		12793	497		
		875							709				
300	+ 4080	+864	+17628	−239	69		345	+ 9801	−734	−13290	−458	11	
301	4944	850	17389	282		3	346	9067	756	13748	420		4
302	5794	835	17107	324			347	8311	776	14168	380		
303	6629	817	16783	367	66		348	7535	794	14548	338	15	
304	7446	796	16416	408		3	349	6741	809	14886	297		3
305	8242	775	16008	447			350	5932	823	15183	254		
306	9017	751	15561	486	63		351	5109	834	15437	210	18	
307	9768	724	15075	523		4	352	4275	843	15647	167		2
308	10492	696	14552	559			353	3432	850	15814	123		
309	11188		13993	593	59		354	2582	854	15937	79	20	
		667											
310	+11855	+635	+13400	−626		5	355	+ 1728	−857	−16016	− 34		1
311	12490	602	12774	658			356	871	855	16050	+ 11		
312	13092	567	12116	687	54		357	+ 16	854	16039	55	2	
313	13659	530	11429	714		− 6	358	− 838	849	15984	100		− 1
314	14189	+493	10715	−740			359	1687	−841	15884	+143		
315	+14682		+ 9975		+ 48		360	− 2528		−15741		− 2	

TABLE IV.—*Continued.*

PERTURBATIONS OF THE CO-ORDINATES IN UNITS OF THE SIXTH DECIMAL.

ARGUMENT II.

Arg.	ξ'	Diff.	η'	Diff.	ζ'	Diff.	Arg.	ξ'	Diff.	η'	Diff.	ζ'	Diff.
0	+ 3698	+255	−14558	+ 58	− 64		45	+12944	+133	− 8037	+220	−287	
1	3953	253	14500	63		−18	46	13077	128	7817	222		−10
2	4206	252	14437	67	82		47	13205	125	7595	225		
3	4458	251	14370	71		17	48	13330	121	7370	227	297	
4	4709	249	14299	76			49	13451	116	7143	229		9
5	4953	248	14223	80	99		50	13567	113	6914	231		
6	5206	246	14143	85			51	13680	108	6683	233	306	
7	5452	244	14058	88		18	52	13788	104	6450	235		9
8	5696	243	13970	93			53	13892	100	6215	237		
9	5939	241	13877	97	117		54	13992	96	5978	239	315	
10	+ 6180	+239	−13780	+102		17	55	+14088	+ 91	− 5739	+241		7
11	6419	237	13678	105			56	14179	87	5498	242		
12	6656	235	13573	110	134		57	14266	83	5256	244	322	
13	6891	232	13463	113		16	58	14349	78	5012	245		7
14	7123	231	13350	118			59	14427	74	4767	247		
15	7354	228	13232	121	150		60	14501	70	4520	248	329	
16	7582	226	13111	126		17	61	14571	65	4272	250		5
17	7808	224	12985	130			62	14636	60	4022	251		
18	8032	221	12855	133	167		63	14696	57	3771	252	334	
19	8253	219	12722	137			64	14753	52	3519	253		
20	+ 8472	+216	−12585	+142		15	65	+14805	+ 47	− 3266	+254		5
21	8688	214	12443	145	182		66	14852	43	3012	255	339	
22	8902	211	12298	148		16	67	14895	38	2757	255		4
23	9113	208	12150	153			68	14933	34	2502	257		
24	9321	205	11997	156	198		69	14967	29	2245	257	343	
25	9526	202	11841	159		14	70	14996	25	1988	258		3
26	9728	199	11682	164			71	15021	20	1730	258		
27	9927	197	11518	166	212		72	15041	15	1472	259	346	
28	10124	193	11352	170			73	15056	11	1213	259		
29	10317	190	11182	174		15	74	15067	6	954	259		1
30	+10507	+187	−11008	+177	227		75	+15073	+ 2	− 694	+260	347	
31	10694	183	10831	180		13	76	15075	− 3	434	260		− 1
32	10877	181	10651	183			77	15072	− 7	− 174	260		
33	11058	177	10468	186	240		78	15065	12	+ 86	260	348	
34	11235	173	10282	190		13	79	15053	16	346	260		0
35	11408	170	10092	193			80	15037	21	605	259		
36	11578	166	9899	195	253		81	15016	26	865	260	348	
37	11744	163	9704	199		12	· 82	14990	30	1125	260		+ 1
38	11907	160	9505	202			83	14960	35	1384	259		
39	12067	155	9303	204	265		84	14925	39	1642	258	347	
40	+12222	+152	− 9099	+207		12	85	+14886	− 41	+ 1901	+257		1
41	12374	149	8892	210			86	14842	48	2158	257		
42	12523	144	8682	212	277		87	14794	53	2415	256	346	
43	12667	140	8470	215		−10	88	14741	57	2671	256		+ 3
44	12807	137	8255	218			89	14684	− 61	2927	256		
45	+12944		− 8037	+218	−287		90	+14623		+ 3181	+254	−343	

TABLE IV.—*Continued.*

PERTURBATIONS OF THE CO-ORDINATES IN UNITS OF THE SIXTH DECIMAL.

ARGUMENT II.

Arg.	ξ'	Diff.	η'	Diff.	ζ	Diff.	Arg.	ξ'	Diff.	η'	Diff.	ζ	Diff.
90°	+14623	−66	+3181	+254	−343	+4	135°	+7759	−227	+12560	+140	−197	+15
91	14557	71	3435	253			136	7532	229	12700	135		
92	14486	75	3688	251			137	7303	231	12835	131		
93	14411	79	3939	250	339	5	138	7072	234	12966	127	182	16
94	14332	84	4189	249			139	6838	235	13093	124		
95	14248	88	4438	248			140	6603	238	13217	119		
96	14160	92	4686	246	334	6	141	6365	239	13336	116	166	16
97	14068	97	4932	245			142	6126	242	13452	111		
98	13971	101	5177	244			143	5884	243	13563	107		
99	13870	105	5421	241	328	6	144	5641	245	13670	103	150	17
100	+13765	−109	+5662	+240			145	+5396	−246	+13773	+99		
101	13656	113	5902	239			146	5150	248	13872	94		
102	13543	117	6141	236	322	8	147	4902	250	13966	90	133	17
103	13426	122	6377	234			148	4652	251	14056	86		
104	13304	126	6611	232			149	4401	253	14142	82		
105	13178	129	6843	231	314	8	150	4148	253	14224	77	116	17
106	13049	134	7074	228			151	3895	255	14301	73		
107	12915	137	7302	226			152	3640	257	14374	69		
108	12778	141	7528	223	306	9	153	3383	257	14443	64	99	18
109	12637	146	7751	222			154	3126	258	14507	60		
110	+12491	−149	+7973	+219			155	+2868	−259	+14567	+55		
111	12342	152	8192	216	297	10	156	2609	259	14622	51	81	18
112	12190	157	8408	214			157	2350	261	14673	46		
113	12033	160	8622	211			158	2089	261	14719	42		
114	11873	164	8833	209	287	11	159	1828	262	14761	37	63	18
115	11709	167	9042	206			160	1566	262	14798	33		
116	11542	171	9248	203			161	1304	263	14831	29		
117	11371	174	9451	200	276	11	162	1041	263	14860	24	45	18
118	11197	178	9651	197			163	778	263	14884	19		
119	11019	181	9848	195			164	515	263	14903	14		
120	+10838	−185	+10043	+191	265	12	165	+252	−264	+14917	+10	27	18
121	10653	187	10234	188			166	−12	263	14927	6		
122	10466	191	10422	185			167	275	264	14933	+1		
123	10275	194	10607	182	253	13	168	539	263	14934	−4	−9	18
124	10081	197	10789	178			169	802	263	14930	8		
125	9884	200	10967	175			170	1065	263	14922	12		
126	9684	203	11142	172	240	14	171	1328	262	14910	17	+9	19
127	9481	206	11314	169			172	1590	262	14893	22		
128	9275	208	11483	164			173	1852	261	14871	27		
129	9067	212	11647	162	226	14	174	2113	261	14844	31	28	18
130	+8855	−214	+11809	+158			175	−2374	−260	+14813	−35		
131	8641	217	11967	154			176	2634	260	14778	39		
132	8424	219	12121	150	212	+15	177	2894	258	14739	44	46	+18
133	8205	222	12271	147			178	3152	257	14695	49		
134	7983	−224	12418	+144			179	3409	−257	14646	−54		
135	+7759		+12560		−197		180	−3666		+14592		+64	

TABLE IV.—*Continued.*

PERTURBATIONS OF THE CO-ORDINATES IN UNITS OF THE SIXTH DECIMAL.

ARGUMENT 11.

Arg.	ξ′	Diff.	η′	Diff.	ζ′	Diff.	Arg.	ξ′	Diff.	η′	Diff.	ζ′	Diff.
180°	− 3666	−255	+14592	− 57	+ 64		225°	−12966	−134	+ 8052	−221	+ 287	
181	3921	254	14535	63		+ 18	226	13100	129	7831	224		+ 10
182	4175	253	14472	67			227	13229	126	7607	226		
183	4428	252	14405	71	82		228	13355	122	7381	228	297	
184	4680	250	14334	75		17	229	13477	117	7153	230		9
185	4930	249	14259	80			230	13594	114	6923	233		
186	5179	247	14179	84	99		231	13708	109	6690	234	306	
187	5426	245	14095	89		18	232	13817	105	6456	237		9
188	5671	244	14006	93			233	13922	101	6219	238		
189	5915	242	13913	97	117		234	14023	96	5981	240	315	
190	− 6157	−240	+13816	−101		17	235	−14119	− 92	+ 5741	−242		7
191	6397	238	13715	105			236	14211	88	5499	244		
192	6635	236	13610	110	134		237	14299	84	5255	245	322	
193	6871	234	13500	113		16	238	14383	79	5010	247		7
194	7105	232	13387	118			239	14462	75	4763	248		
195	7337	229	13269	122	150		240	14537	70	4515	249	329	
196	7566	228	13147	126		17	241	14607	65	4266	251		5
197	7794	225	13021	130			242	14672	61	4015	252		
198	8019	222	12891	133	167		243	14733	57	3763	253	334	
199	8241	220	12758	138		15	244	14790	52	3510	255		
200	− 8461	−218	+12620	−142			245	−14842	− 48	+ 3255	−255	339	5
201	8679	215	12478	145	182		246	14890	43	3000	256		
202	8894	212	12333	149		16	247	14933	39	2744	257		4
203	9106	209	12184	153			248	14972	34	2487	258		
204	9315	206	12031	157	198		249	15006	29	2229	258	343	
205	9521	204	11874	160		14	250	15035	25	1971	259		3
206	9725	201	11714	164			251	15060	20	1712	260		
207	9926	198	11550	167	212		252	15080	16	1452	260	346	
208	10124	194	11383	171		15	253	15096	11	1192	260		1
209	10318	192	11212	174			254	15107	6	932	260		.
210	−10510	−188	+11038	−178	227		255	−15113	− 2	+ 672	−261	347	
211	10698	185	10860	181		13	256	15115	+ 3	411	261		+ 1
212	10883	182	10679	184			257	15112	8	+ 150	261		
213	11065	178	10495	187	240		258	15104	12	− 111	261	348	
214	11243	175	10308	191		13	259	15092	17	372	261		0
215	11418	171	10117	193			260	15075	22	632	260		
216	11589	168	9924	197	253		261	15053	26	893	261	348	
217	11757	164	9727	200		12	262	15027	30	1153	260		− 1
218	11921	161	9527	202			263	14997	35	1413	260		
219	12082	157	9325	206	265		264	14962	40	1673	260	347	
220	−12239	−153	+ 9119	−208		12	265	−14922	+ 41	− 1931	−259		1
221	12392	149	8911	211			266	14878	49	2190	257		
222	12541	145	8700	214	277		267	14829	53	2447	257	346	
223	12686	142	8486	216		+ 10	268	14776	58	2704	256		− 3
224	12828	−138	8270	−218			269	14718	+ 63	2960	−256		
225	−12966		+ 8052		+ 287		270	−14655		− 3216		+ 343	

TABLE IV.—Continued.

PERTURBATIONS OF THE CO-ORDINATES IN UNITS OF THE SIXTH DECIMAL.

ARGUMENT II.

Arg.	ξ'	Diff.	η'	Diff.	ζ'	Diff.	Arg.	ξ'	Diff.	η'	Diff.	ζ'	Diff.
270°	−14655	+67	−3216	−254	+343		315°	−7737	+228	−12575	−138	+197	
271	14588	71	3470	252		−4	316	7509	230	12713	134		−15
272	14517	76	3722	252	339		317	7279	232	12847	130		
273	14441	80	3974	251		5	318	7047	235	12977	126	182	
274	14361	85	4225	249			319	6812	236	13103	122		16
275	14276	89	4474	248	334		320	6576	239	13225	118		
276	14187	93	4722	247		6	321	6337	240	13343	114	166	
277	14094	98	4969	245			322	6097	243	13457	110		16
278	13996	101	5214	243	328		323	5854	244	13567	106		
279	13895	107	5457	242			324	5610	246	13673	102	150	
280	−13788	+110	−5699	−240		6	325	−5364	+247	−13775	−97		17
281	13678	114	5939	238	322		326	5117	249	13872	93		
282	13564	119	6177	237		8	327	4868	250	13965	89	133	
283	13445	123	6414	234			328	4618	252	14054	85		17
284	13322	126	6648	232	314		329	4366	253	14139	80		
285	13196	131	6880	230		8 ·	330	4113	255	14219	76	116	
286	13065	135	7110	228			331	3858	255	14295	72		17
287	12930	139	7378	226	306		332	3603	257	14367	67		
288	12791	142	7564	223			333	3346	257	14434	63	99	
289	12649	147	7787	221		9	334	3089	259	14497	59		18
290	−12502	+150	−8008	−219	297		335	−2830	+259	−14556	−54		
291	12352	154	8227	216		10	336	2571	260	14610	49	81	
292	12198	158	8443	213			337	2311	261	14659	45		18
293	12040	162	8656	211	287		338	2050	261	14704	41		
294	11878	165	8867	208		11	339	1789	262	14745	37	63	
295	11713	169	9075	205			340	1527	262	14782	32		18
296	11544	172	9280	202	276		341	1265	263	14814	27		
297	11372	175	9482	200			342	1002	263	14841	22	45	
298	11197	179	9682	196		11	343	739	263	14863	18		
299	11018	183	9878	194			344	476	264	14881	14		18
300	−10835	+185	−10072	−191	265		345	−212	+263	−14895	−9	27	
301	10650	189	10263	187		12	346	+51	263	14904	−5		18
302	10461	193	10450	184			347	314	263	14909	−5		
303	10268	195	10634	181	253		348	577	263	14909	0	+9	
304	10073	198	10815	178		13	349	840	263	14904	+5		18
305	9875	202	10993	174			350	1103	263	14895	9		
306	9673	204	11167	171	240		351	1366	262	14882	13	−9	
307	9469	207	11338	167		14	352	1628	261	14864	18		19
308	9262	210	11505	164			353	1889	261	14841	23		
309	9052	213	11669	160	226		354	2150	260	14814	27	28	
310	−8839	+215	−11829	−157		14	355	+2410	+260	−14783	31		18
311	8624	218	11986	153			356	2670	258	14747	+36		
312	8406	221	12139	149	212		357	2928	258	14706	41	46	
313	8185	223	12288	145			358	3186	257	14661	45		−18
314	7962	225	12433	142		−15	359	3443	255	14612	49		
315	−7737		−12575		+197		360	+3698		−14558	+54	−64	

TABLE IV.—Continued.

PERTURBATIONS OF THE CO-ORDINATES IN UNITS OF THE SIXTH DECIMAL.

ARGUMENT III.

Arg.	ξ'	Diff.	η'	Diff.	ζ'	Diff.
0	− 3825	− 61	− 3624	+ 68	+ 18	
1	3886	61	3556	69		
2	3947	59	3487	70		
3	4006	57	3417	70		+ 5
4	4063	57	3347	72		
5	4120	55	3275	72		
6	4175	54	3202	73	23	
7	4229	53	3129	73		
8	4282	51	3054	75		
9	4333	50	2979	75		4
10	− 4383	− 49	− 2902	+ 77		
11	4432	47	2825	78		
12	4479	46	2747	79	27	
13	4525	44	2668	80		
14	4569	43	2588	80		
15	4612	41	2508	81		4
16	4653	40	2427	82		
17	4693	39	2345	82		
18	4732	37	2263	83	31	
19	4769	36	2180	83		
20	− 4805	− 34	− 2096	+ 85		4
21	4839	33	2011	85		
22	4872	31	1926	85		
23	4903	30	1841	86		
24	4933	28	1755	87	35	
25	4961	27	1668	87		
26	4988	25	1581	87		
27	5013	24	1494	88		3
28	5037	22	1406	88		
29	5059	20	1317	89		
30	− 5079	− 19	− 1229	+ 89	38	
31	5098	18	1140	89		
32	5116	16	1051	90		
33	5132	14	961	90		3
34	5146	13	871	90		
35	5159	11	781	90		
36	5170	10	691	90	41	
37	5180	8	600	91		
38	5188	6	510	90		
39	5194	5	419	91		+ 3
40	− 5199	− 4	− 328	+ 90		
41	5203	− 2	238	91		
42	5205	0	147	91	+ 44	
43	5205	+ 1	− 56	91		
44	5204	+ 3	+ 35	91		
45	− 5201		+ 126	+ 91		+ 2

Arg.	ξ'	Diff.	η	Diff.	ζ'	Diff.
45	− 5201	+ 5	+ 126	+ 91		+ 2
46	5196	6	217	90		
47	5190	7	307	91		
48	5183	9	398	90	+ 46	
49	5174	11	488	91		
50	5163	12	579	90		1
51	5151	14	669	90		
52	5137	15	759	89		
53	5122	17	848	90		
54	5105	18	938	89	47	
55	− 5087	+ 20	+ 1027	+ 88		1
56	5067	22	1115	89		
57	5045	23	1204	88		
58	5022	24	1292	87		
59	4998	26	1379	87		
60	4972	27	1466	87	48	
61	4945	29	1553	86		
62	4916	30	1639	86		
63	4886	32	1725	85		+ 1
64	4854	33	1810	84		
65	− 4821	+ 35	+ 1894	+ 84		
66	4786	36	1978	84	49	
67	4750	37	2062	82		
68	4713	39	2144	82		
69	4674	40	2226	82		0
70	4634	41	2308	82		
71	4593	43	2389	81		
72	4550	44	2468	79	49	
73	4506	46	2548	80		
74	4460	47	2626	78		
75	− 4413	+ 48	+ 2704	+ 76		− 1
76	4365	49	2780	76		
77	4316	51	2856	76		
78	4265	52	2932	74	48	
79	4213	53	3006	73		
80	4160	55	3079	72		
81	4105	55	3151	72		1
82	4050	57	3223	72		
83	3993	58	3293	70		
84	3935	60	3363	70	47	
85	− 3875	+ 60	+ 3431	+ 68		− 2
86	3815	61	3499	66		
87	3754	63	3565	66		
88	3691	63	3631	66		
89	3628	65	3695	64		
90	− 3563		+ 3758	+ 63	+ 45	

TABLE IV.—*Continued.*

PERTURBATIONS OF THE CO-ORDINATES IN UNITS OF THE SIXTH DECIMAL.

ARGUMENT III.

Arg.	ξ'	Diff.	η'	Diff.	ζ'	Diff.	Arg.	ξ'	Diff.	η'	Diff.	ζ'	Diff.
90	− 3563	+ 66	+ 3758	+ 62	+ 45		135	+ 103	+ 89	+ 5224	− 1		− 4
91	3497	67	3820	61			136	192	90	5223	3		
92	3430	67	3881	60			137	282	90	5220	5	+ 17	
93	3363	69	3941	58	− 2		138	372	89	5215	6		
94	3294	70	3999	58			139	461	89	5209	8		
95	3224	70	4057	56			140	550	90	5201	9		5
96	3154	72	4113	55	43		141	640	89	5192	11		
97	3082	73	4168	53			142	729	89	5181	13		
98	3009	73	4221	53			143	818	89	5168	14	12	
99	2936	74	4274	51	3		144	907	89	5154	16		
100	2862	+ 75	+ 4325	+ 50			145	+ 995	+ 88	+ 5138	− 17		5
101	2787	76	4375	49			146	1083	88	5121	18		
102	2711	77	4424	47	40		147	1171	88	5103	20		
103	2634	77	4471	46			148	1259	87	5083	22		
104	2557	79	4517	44			149	1346	87	5061	24	7	
105	2478	79	4561	44	3		150	1433	86	5037	25		
106	2399	79	4605	42			151	1519	86	5012	26		
107	2320	81	4647	40			152	1605	86	4986	28		5
108	2239	81	4687	39	37		153	1691	85	4958	29		
109	2158	81	4726	38			154	1776	84	4929	31		
110	− 2077	+ 83	+ 4764	+ 36	3		155	+ 1860	+ 84	+ 4898	− 32		
111	1994	83	4800	35			156	1944	84	4866	34	+ 2	
112	1911	83	4835	33			157	2028	83	4832	35		
113	1828	84	4868	32			158	2111	82	4797	37		5
114	1744	85	4900	31	34		159	2193	82	4760	38		
115	1659	85	4931	29			160	2275	81	4722	40		
116	1574	85	4960	28			161	2356	80	4682	41	− 3	
117	1489	86	4988	26			162	2436	80	4641	42		
118	1403	87	5014	24	4		163	2516	79	4599	44		5
119	1316	86	5038	23			164	2595	78	4555	45		
120	− 1230	+ 87	+ 5061	+ 22	30		165	+ 2673	+ 78	+ 4510	− 47		6
121	1143	88	5083	20			166	2751	76	4463	48		
122	1055	88	5103	19			167	2827	76	4415	49	9	
123	967	88	5122	17	4		168	2903	75	4366	51		
124	879	88	5139	15			169	2978	74	4315	52		
125	791	89	5154	14			170	3052	73	4263	53		5
126	702	89	5168	13	26		171	3125	73	4210	55		
127	613	89	5181	11			172	3198	71	4155	56		
128	524	89	5192	9			173	3269	71	4099	57	14	
129	435	90	5201	8	5		174	3340	69	4042	58		
130	− 345	+ 89	+ 5209	+ 6			175	+ 3409	+ 69	+ 3984	− 60		− 4
131	256	90	5215	5	+ 21		176	3478	67	3924	61		
132	166	89	5220	3			177	3545	67	3863	62		
133	− 77	90	5223	+ 1			178	3612	65	3801	63		
134	+ 13	+ 90	5224	0			179	3677	+ 64	3738	− 64		
135	+ 103		+ 5224		− 4		180	+ 3741		+ 3674		− 18	

TABLE IV.—*Continued.*

PERTURBATIONS OF THE CO-ORDINATES IN UNITS OF THE SIXTH DECIMAL.

ARGUMENT III.

Arg.	ξ'	Diff.	η'	Diff.	ζ'	Diff.	Arg.	ξ'	Diff.	η'	Diff.	ζ'	Diff.
180°	+ 3741	+ 63	+ 3674	66	− 18		225°	+ 5247	− 1	− 64	93		− 2
181	3804	62	3608	66			226	5246	3	157	92		
182	3866	61	3542	68			227	5243	5	249	93		
183	3927	60	3474	69		− 5	228	5238	7	342	92	− 46	
184	3987	59	3405	70			229	5231	8	434	93		
185	4046	57	3335	71			230	5223	9	527	92		
186	4103	56	3264	72	23		231	5214	11	619	92		1
187	4159	55	3192	73			232	5203	13	711	92		
188	4214	54	3119	74			233	5190	15	803	91		
189	4268	52	3045	75		4	234	5175	16	894	92	47	
190	+ 4320	+ 51	+ 2970	75			235	+ 5159	18	− 986	91		
191	4371	50	2895	77			236	5141	19	1077	91		1
192	4421	49	2818	78	27		237	5122	21	1168	90		
193	4470	47	2740	78			238	5101	22	1258	90		
194	4517	46	2662	80			239	5079	24	1348	90		
195	4563	44	2582	80		4	240	5055	26	1438	89	48	
196	4607	43	2502	81			241	5029	27	1527	89		
197	4650	42	2421	81			242	5002	29	1616	88		
198	4692	40	2340	83	31		243	4973	30	1704	88		− 1
199	4732	39	2257	83			244	4943	32	1792	87		
200	+ 4771	+ 37	+ 2174	84			245	+ 4911	34	− 1879	87		
201	4808	36	2090	85		4	246	4877	35	1966	86	49	
202	4844	35	2005	85			247	4842	36	2052	85		
203	4879	33	1920	86			248	4806	38	2137	85		
204	4912	31	1834	86	35		249	4768	39	2222	84		0
205	4943	30	1748	87			250	4729	41	2306	84		
206	4973	29	1661	88			251	4688	43	2390	83		
207	5002	27	1573	88		3	252	4645	44	2473	82	49	
208	5029	25	1485	88			253	4601	45	2555	81		
209	5054	24	1397	89			254	4556	47	2636	80		+ 1
210	+ 5078	+ 22	+ 1308	90	38		255	+ 4509	48	− 2716	80		
211	5100	21	1218	90			256	4461	50	2796	78		
212	5121	20	1128	90			257	4411	51	2874	78		
213	5141	17	1038	91		3	258	4360	52	2952	77	48	
214	5158	16	947	91			259	4308	54	3029	76		
215	5174	15	856	91			260	4254	55	3105	75		
216	5189	13	765	91	41		261	4199	56	3180	74		1
217	5202	11	674	92			262	4143	58	3254	73		
218	5213	10	582	92			263	4085	59	3327	72		
219	5223	8	490	92		3	264	4026	60	3399	71	47	
220	+ 5231	+ 6	+ 398	92			265	+ 3966	61	− 3470	70		
221	5237	5	306	93			266	3905	63	3540	69		+ 2
222	5242	4	213	92	− 44		267	3842	64	3609	67		
223	5246	+ 1	121	93			268	3778	65	3676	67		
224	5247	0	+ 28	92			269	3713	66	3743	65		
225	+ 5247		− 64			− 2	270	+ 3647		− 3808		− 45	

TABLE IV.—*Continued.*

PERTURBATIONS OF THE CO-ORDINATES IN UNITS OF THE SIXTH DECIMAL.

ARGUMENT III.

Arg.	ξ'	Diff.	η'	Diff.	ζ'	Diff.	Arg.	ξ'	Diff.	η'	Diff.	ζ'	Diff.
270°	+ 3647	− 68	− 3808	− 64	− 45		315°	− 149	− 93	− 5286	+ 3		+ 4
271	3579	68	3872	63			316	242	93	5283	5		
272	3511	70	3935	62			317	335	92	5278	7	− 17	
273	3441	71	3997	61		+ 2	318	427	92	5271	8		
274	3370	72	4058	59			319	519	92	5263	10		
275	3298	72	4117	58			320	611	92	5253	12		5
276	3226	74	4175	56	43		321	703	92	5241	13		
277	3152	75	4231	56			322	795	91	5228	14		
278	3077	76	4287	54			323	886	91	5214	17	12	
279	3001	77	4341	52		3	324	977	91	5197	18		
280	+ 2924	− 77	− 4393	− 52			325	− 1068	− 90	− 5179	+ 19		
281	2847	79	4445	50			326	1158	90	5160	21		5
282	2768	79	4495	48	40		327	1248	89	5139	23		
283	2689	81	4543	47			328	1337	89	5116	24		
284	2608	81	4590	46			329	1426	89	5092	26	7	
285	2537	82	4636	44		3	330	1515	88	5066	28		
286	2445	82	4680	43			331	1603	88	5038	29		
287	2363	84	4723	41			332	1691	87	5009	30	5	
288	2279	84	4764	40	37		333	1778	86	4979	32		
289	2195	85	4804	38			334	1864	86	4947	34		
290	+ 2110	− 85	− 4842	− 37		3	335	− 1950	− 86	− 4913	+ 35	− 2	
291	2025	86	4879	35			336	2035	85	4878	36		
292	1939	87	4914	34			337	2120	84	4842	38		
293	1852	87	4948	32			338	2204	83	4804	40		5
294	1765	88	4980	31	34		339	2287	82	4764	41		
295	1677	88	5011	29			340	2369	82	4723	42		
296	1589	89	5040	27			341	2451	81	4681	44	+ 3	
297	1500	89	5067	26		4	342	2532	80	4637	45		
298	1411	90	5093	24			343	2612	79	4592	47		
299	1321	90	5117	23			344	2691	78	4545	48		
300	+ 1231	− 91	− 5140	− 21	30		345	− 2769	− 77	− 4497	+ 49		6
301	1140	90	5161	20			346	2846	77	4448	51		
302	1050	92	5181	18			347	2923	76	4397	52		
303	958	91	5199	16		4	348	2999	74	4345	53	9	
304	867	92	5215	15			349	3073	74	4292	55		
305	775	92	5230	13			350	3147	72	4237	56		
306	683	92	5243	11	26		351	3219	72	4181	57		5
307	591	92	5254	10			352	3291	71	4124	58		
308	499	92	5264	8			353	3362	69	4066	60		
309	406	93	5272	6		5	354	3431	69	4006	61	14	
310	+ 314	− 93	− 5278	− 5			355	− 3500	− 67	− 3945	+ 62		
311	221	92	5283	3			356	3567	66	3883	63	+ 4	
312	129	93	5286	2	− 21		357	3633	65	3820	64		+ 4
313	+ 36	93	5288	0			358	3698	64	3756	66		
314	− 57	− 92	5288	+ 2			359	3762	63	3690	66		
315	− 149		− 5286			+ 4	360	− 3825	− 63	− 3624	+ 66	+ 18	

TABLE IV.—*Continued.*

PERTURBATIONS OF THE CO-ORDINATES IN UNITS OF THE SIXTH DECIMAL.

ARGUMENT IV.

Arg.	ξ'	Diff.	η'	Diff.	ζ'	Diff.	Arg.	ξ'	Diff.	η'	Diff.	ζ'	Diff.
0°	+ 1157	+163	− 3275	+ 71	− 1		45°	+ 1474	−146	+ 2694	+ 61		+ 4
1	1320	159	3204	80			46	1328	148	2755	53		
2	1479	154	3124	87			47	1180	150	2808	45		
3	1633	150	3037	95		− 5	48	1030	153	2853	37	− 6	
4	1783	141	2942	102			49	877	153	2890	29		
5	1927	139	2840	108			50	724	154	2919	21		5
6	2066	132	2732	116	6		51	570	155	2940	13		
7	2198	126	2616	122			52	415	155	2953	+ 4		
8	2324	119	2494	128			53	260	154	2957	− 4	− 1	
9	2443	113	2366	134		4	54	+ 106	153	2953	12		
10	+ 2556	+105	− 2232	+138			55	− 47	−153	+ 2941	− 20		6
11	2661	98	2094	143			56	200	150	2921	28		
12	2759	90	1951	148	10		57	350	148	2893	36		
13	2849	82	1803	151			58	498	146	2857	44		
14	2931	73	1652	156			59	644	143	2813	51	+ 5	
15	3004	66	1496	158		3	60	787	139	2762	59		
16	3070	57	1338	161			61	926	136	2703	66		
17	3127	49	1177	164			62	1062	132	2637	73		5
18	3176	40	1013	166	13		63	1194	127	2564	79		
19	3216	31	847	166			64	1321	122	2485	86		
20	+ 3247	+ 23	− 681	+168		− 2	65	− 1443	−117	+ 2399	− 92	10	
21	3270	14	513	168			66	1560	112	2307	98		
22	3284	+ 5	345	169			67	1672	106	2209	103		
23	3289	− 4	176	168			68	1778	100	2106	109		4
24	3285	12	− 8	167	15		69	1878	94	1997	114		
25	3273	21	+ 159	165			70	1972	87	1883	118		
26	3252	29	324	164			71	2059	81	1765	122	14	
27	3223	38	488	162		0	72	2140	74	1643	127		
28	3185	46	650	159			73	2214	66	1516	129		
29	3139	54	809	156			74	2280	60	1387	132		
30	+ 3085	− 63	+ 965	+153	15		75	− 2340	− 52	+ 1254	−135		4
31	3022	70	1118	148			76	2392	45	1119	137		
32	2952	77	1266	145			77	2437	37	982	139		
33	2875	84	1411	140		+ 2	78	2474	29	843	141	18	
34	2791	91	1551	135			79	2503	22	702	141		
35	2700	98	1686	129			80	2525	14	561	143		
36	2602	105	1815	124	13		81	2539	− 6	418	142		+ 2
37	2497	110	1939	118			82	2545	+ 2	276	142		
38	2387	116	2057	112			83	2543	9	+ 134	141		
39	2271	122	2169	105		3	84	2534	17	− 7	140	20	
40	+ 2149	−126	+ 2274	+ 99			85	− 2517	+ 24	− 147	−138		
41	2023	131	2373	91			86	2493	32	285	137		
42	1891	135	2464	84	− 10		87	2461	39	422	134		0
43	1756	139	2548	77			88	2422	46	556	132		
44	1617	−143	2625	+ 69			89	2376	53	688	−128		
45	+ 1474		+ 2694			+ 4	90	− 2323		− 816		+ 20	

TABLE IV.—Continued.

PERTURBATIONS OF THE CO-ORDINATES IN UNITS OF THE SIXTH DECIMAL.

ARGUMENT IV.

Arg.	ξ'	Diff.	η'	Diff.	ζ'	Diff.
90°	− 2323	+ 60	− 816	−125	+ 20	
91	2263	66	941	121		
92	2197	73	1062	117		
93	2124	79	1179	113		− 1
94	2045	84	1292	107		
95	1961	91	1399	103		
96	1870	95	1502	97	19	
97	1775	100	1599	91		
98	1675	105	1690	85		
99	1570	110	1775	79		2
100	− 1460	+113	− 1854	− 73		
101	1347	117	1927	66		
102	1230	120	1993	59	17	
103	1110	123	2052	52		
104	987	125	2104	45		
105	862	127	2149	38		4
106	735	129	2187	31		
107	606	130	2218	23		
108	476	131	2241	16	13	
109	345	131	2257	8		
110	− 214	+132	− 2265	− 1		
111	− 82	131	2266	+ 6		
112	+ 49	130	2260	14	4	
113	179	129	2246	22		
114	308	127	2224	28	9	
115	435	126	2196	36		
116	561	123	2160	43		
117	684	120	2117	49	5	
118	804	118	2068	57		
119	922	114	2011	63		
120	+ 1036	+110	− 1948	+ 69	+ 4	
121	1146	106	1879	75		
122	1252	101	1804	82		
123	1353	97	1722	87	4	
124	1450	92	1635	92		
125	1542	86	1543	98		
126	1628	80	1445	102	0	
127	1708	75	1343	107		
128	1783	68	1236	110		
129	1851	62	1126	115	4	
130	+ 1913	+ 56	− 1011	+118		
131	1969	49	893	121		
132	2018	42	772	124	− 4	
133	2060	35	648	126		
134	2095	+ 27	522	+128		
135°	+ 2122	+ 21	− 394	+129		− 3
136	2143	13	265	131		
137	2156	+ 6	134	131	− 7	
138	2162	− 1	− 3	132		
139	2161	9	+ 129	131	− 1	
140	2152	16	260	131		
141	2136	24	391	130		
142	2112	31	521	129		
143	2081	38	650	127		
144	2043	45	777	125	8	
145	+ 1998	− 52	+ 902	+122		
146	1946	59	1024	119	0	
147	1887	66	1143	116		
148	1821	72	1259	113		
149	1749	78	1372	109	8	
150	1671	85	1481	104		
151	1586	90	1585	99		
152	1496	96	1684	95		
153	1400	102	1779	89	+ 2	
154	1298	106	1868	84		
155	+ 1192	−111	− 1952	+ 78		
156	1081	116	2030	72	6	
157	965	119	2102	65		
158	846	124	2167	59		
159	722	127	2226	52	3	
160	595	129	2278	45		
161	466	132	2323	38		
162	334	135	2361	31	− 3	
163	199	137	2392	23		
164	+ 62	137	2415	16		
165	− 75	−139	+ 2431	+ 8	4	
166	214	140	2439	0		
167	354	140	2439	− 7	+ 1	
168	494	139	2432	15		
169	633	139	2417	22		
170	772	138	2395	30		
171	910	137	2365	38	5	
172	1047	135	2327	46		
173	1182	132	2281	53		
174	1314	130	2228	60	6	
175	− 1444	−127	+ 2168	− 67		
176	1571	123	2101	75	+ 4	
177	1694	120	2026	81		
178	1814	115	1945	88		
179	1929	−111	1857	− 95		
180	− 2040		+ 1762		+ 10	

TABLE IV.—*Continued.*

PERTURBATIONS OF THE CO-ORDINATES IN UNITS OF THE SIXTH DECIMAL.

ARGUMENT IV.

Arg.	ξ'	Diff.	η'	Diff.	ζ'	Diff.	Arg.	ξ'	Diff.	η'	Diff.	ζ'	Diff.
180°	− 2040	−106	+ 1762	−101	+ 10		225°	+ 88	+172	− 3483	− 8	− 6	
181	2146	101	1661	106			226	260	173	3491	+ 1		
182	2247	95	1555	113			227	433	173	3490	10		
183	2342	89	1442	118	+ 4		228	606	173	3480	18	+ 3	
184	2431	83	1324	122			229	779	172	3462	27		
185	2514	77	1202	126			230	951	171	3435	36	7	
186	2591	70	1074	132			231	1122	170	3399	44		
187	2661	63	942	136	14		232	1292	167	3355	53		
188	2724	57	806	141			233	1459	165	3302	62		
189	2781	48	665	143	3		234	1624	162	3240	70	− 4	
190	− 2829	− 41	+ 522	−146			235	+ 1786	+158	− 3170	+ 78		
191	2870	34	376	149			236	1944	155	3092	86	7	
192	2904	26	227	151	17		237	2099	151	3006	94		
193	2930	17	+ 76	153			238	2250	145	2912	101		
194	2947	10	− 77	154			239	2395	141	2811	109		
195	2957	− 2	231	156	+ 2		240	2536	136	2702	116	11	
196	2959	+ 7	367	155			241	2672	129	2586	123		
197	2952	14	512	156			242	2801	124	2463	130		
198	2938	23	698	155	19		243	2925	117	2333	136	6	
199	2915	32	853	155			244	3042	111	2197	142		
200	− 2883	+ 39	− 1008	−153	0		245	+ 3153	+103	− 2055	+148		
201	2844	48	1161	152			246	3256	96	1907	153	17	
202	2796	55	1313	150			247	3352	88	1754	158		
203	2741	63	1463	147			248	3440	81	1596	162		
204	2678	72	1610	144	19		249	3521	72	1434	167	6	
205	2606	79	1754	141			250	3593	64	1267	170		
206	2527	86	1895	138			251	3657	56	1097	174		
207	2441	94	2033	133	− 2		252	3713	47	923	176	23	
208	2347	100	2166	128			253	3760	38	747	179		
209	2247	108	2294	124			254	3798	29	568	181		
210	− 2139	+114	− 2418	−119	17		255	+ 3827	+ 20	− 387	+183	4	
211	2025	121	2537	113			256	3847	11	204	184		
212	1904	126	2650	107			257	3858	+ 2	− 20	184		
213	1778	133	2757	101	3		258	3860	− 7	+ 164	184	27	
214	1645	137	2858	94			259	3853	17	348	184		
215	1508	143	2952	88			260	3836	26	532	184		
216	1365	148	3040	80	14		261	3810	35	716	182	2	
217	1217	152	3120	73			262	3775	44	898	180		
218	1065	156	3193	66			263	3731	53	1078	179		
219	909	159	3259	58	5		264	3678	62	1257	176	29	
220	− 750	+163	− 3317	− 50			265	+ 3616	− 71	+ 1433	+173		
221	587	166	3367	41			266	3545	79	1606	169	− 1	
222	421	168	3408	34	+ 9		267	3466	88	1775	166		
223	253	169	3442	25			268	3378	96	1941	161		
224	− 84	+172	3467	− 16			269	3282	−104	2102	+157		
225	+ 88		− 3483		− 6		270	+ 3178		+ 2259		− 30	

TABLE IV.—*Continued.*

PERTURBATIONS OF THE CO-ORDINATES IN UNITS OF THE SIXTH DECIMAL.

ARGUMENT IV.

Arg.	ξ'	Diff.	η'	Diff.	ζ'	Diff.	Arg.	ξ'	Diff.	η'	Diff.	ι'	Diff.
270	+ 3178	−112	+ 2259	+152	− 30		315	− 3656	− 53	+ 1254	−180		
271	3066	119	2411	146			316	3709	43	1074	182		+ 5
272	2947	126	2557	140		+ 2	317	3752	35	892	184		
273	2821	134	2697	134			318	3787	25	708	186	+ 10	
274	2687	140	2831	127			319	3812	15	522	186		
275	2547	146	2958	120			320	3827	− 6	336	187		
276	2401	152	3078	113	28		321	3833	+ 3	+ 149	186		3
277	2249	158	3191	106			322	3830	13	− 37	186		
278	2091	162	3297	98			323	3817	22	223	185		
279	1929	168	3395	90		4	324	3795	31	408	184	13	
280	+ 1761	−172	+ 3485	+ 81			325	− 3764	+ 41	− 592	−181		
281	1589	176	3566	74			326	3723	50	773	179		+ 1
282	1413	179	3640	64	24		327	3673	58	952	176		
283	1234	182	3704	56			328	3615	68	1128	173		
284	1052	185	3760	46			329	3547	76	1301	169		
285	867	187	3806	38		5	330	3471	84	1470	165	14	
286	680	189	3844	28			331	3387	91	1635	160		
287	491	190	3872	19			332	3294	100	1795	155		
288	301	191	3891	10	19.		333	3194	108	1950	150		− 1
289	+ 110	191	3901	10			334	3086	115	2100	144		
290	− 81	−191	+ 3902	+ 1		6	335	− 2971	+122	− 2244	−138		
291	272	190	3893	− 9			336	2849	131	2382	132	13	
292	462	189	3874	19			337	2719	135	2514	124		
293	651	187	3847	27			338	2584	141	2648	118		
294	838	185	3810	37	13		339	2443	147	2756	110		2
295	1023	183	3764	46			340	2296	153	2866	103		
296	1206	180	3709	55			341	2143	157	2969	95		
297	1386	176	3645	64		6	342	1986	161	3064	87	11	
298	1562	172	3573	72			343	1825	166	3151	77		
299	1734	168	3492	81			344	1659	169	3228	70		
300	− 1902	−164	+ 3402	90	7		345	− 1490	+172	− 3298	− 62		3
301	2066	158	3304	− 98			346	1318	174	3360	52		
302	2224	152	3199	105			347	1144	177	3412	43		
303	2376	147	3085	114		6	348	967	179	3455	35	8	
304	2523	141	2965	120			349	788	180	3490	25		
305	2664	134	2837	128			350	608	181	3515	17		4
306	2798	127	2703	134	− 1		351	427	181	3532	− 7		
307	2925	119	2562	141			352	246	180	3539	+ 2		
308	3044	112	2416	146			353	− 66	181	3537	10	+ 4	
309	3156	105	2264	152		6	354	+ 115	179	3527	20		
310	− 3261	− 96	+ 2106	158			355	+ 294	+177	− 3507	+ 29		
311	3357	88	1944	−162			356	471	176	3478	38		− 5
312	3445	79	1777	167	+ 5		357	647	173	3440	46		
313	3524	71	1606	171			358	820	170	3394	55		
314	3595	− 61	1432	174			359	990	+167	3339	+ 64		
315	− 3656		+ 1254	−178		+ 5	360	+ 1157		− 3275			− 1

TABLE IV.—*Continued.*

PERTURBATIONS OF THE CO-ORDINATES IN UNITS OF THE SIXTH DECIMAL.

ARGUMENT V.

Arg.	ξ'	Diff.	η'	Diff.	ζ'	Diff.	Arg.	ξ'	Diff.	η	Diff.	ζ'	Diff.
0	+ 647		− 1565		+ 42		45	− 751		− 1519			− 2
		− 32		− 10					− 25		+ 14		
1	615		1575				46	779		1505			
		33		9					24		13		
2	582		1584				47	803		1492			
		33		8					24		15		
3	549		1592			+ 2	48	827		1477		+ 45	
		33		9					23		15		
4	516		1601				49	850		1462			
		33		7					24		15		
5	483		1608				50	874		1447			
		34		8					22		16		
6	449		1616		44		51	896		1431			3
		33		7					23		17		
7	416		1623				52	919		1414			
		34		6					22		17		
8	382		1629				53	941		1397			
		33		6					21		17		
9	349		1635			2	54	962		1380		42	
		34		6					21		18		
10	+ 315		− 1641				55	− 983		− 1362			
		− 34		− 5					− 21		+ 19		
11	281		1646				56	1004		1343			
		33		4					20		19		
12	248		1650		46		57	1024		1324			3
		34		5					20		20		
13	214		1655				58	1044		1304			
		33		3					19		20		
14	181		1658				59	1063		1284			
		34		4					19		21		
15	147		1662			1	60	1082		1263		39	
		33		2					19		21		
16	114		1664				61	1101		1242			
		33		3					18		21		
17	81		1667				62	1119		1221			
		34		2					18		22		
18	47		1669		47		63	1137		1199			
		33		1					17		23		
19	+ 14		1670				64	1154		1176			5
		33		− 1					17		23		
20	− 19		− 1671			1	65	+ 1171		− 1153			
		− 32		0					− 17		+ 23		
21	51		1671				66	1188		1130		34	
		33		0					16		24		
22	84		1671				67	1204		1106			
		32		+ 1					16		24		
23	116		1670				68	1220		1082			
		33		1					15		25		
24	149		1669		48		69	1235		1057			5
		32		2					15		25		
25	181		1667				70	1250		1032			
		31		2					15		25		
26	212		1665				71	1265		1007			
		32		3					15		26		
27	244		1662			+ 1	72	1280		981		29	
		31		3					14		26		
28	275		1659				73	1294		955			
		31		4					13		27		
29	306		1655				74	1307		928			
		30		5					14		27		
30	− 336		− 1650		49		75	− 1321		− 901			6
		− 31		+ 4					− 13		+ 27		
31	367		1646				76	1334		874			
		30		6					12		27		
32	397		1640				77	1346		847			
		29		6					13		28		
33	426		1634			− 1	78	1359		819		23	
		30		7					12		28		
34	456		1627				79	1371		791			
		29		7					11		28		
35	485		1620				80	1382		763			
		28		7					11		28		
36	513		1613		48		81	1393		735			7
		27		8					11		28		
37	542		1605				82	1404		706			
		27		9					11		29		
38	569		1596				83	1415		677			
		28		10					11		29		
39	597		1586				84	1425		648		16	
		27		10					10		29		
40	− 624		− 1576			1	85	− 1435		− 619			
		− 27		+ 10					− 10		+ 29		
41	651		1566				86	1445		590			
		26		11					9		30		
42	677		1555		+ 47		87	1454		560			− 6
		26		12					9		29		
43	703		1543				88	1463		531			
		26		12					9		30		
44	729		1531				89	1472		501			
		− 25		12					− 9		30		
45	− 754		− 1519		+ 12	− 2	90	− 1481		− 471		+ 10	

38

TABLE IV.—*Continued.*

PERTURBATIONS OF THE CO-ORDINATES IN UNITS OF THE SIXTH DECIMAL.

ARGUMENT V.

Arg.	ξ'	Diff.	η'	Diff.	ζ'	Diff.	Arg.	ξ'	Diff.	η'	Diff.	ζ'	Diff.
90°	− 1481	− 8	− 471	+ 30	+ 10		135°	− 1490	+ 10	+ 738	+ 20		− 2
91	1489	8	441	30			136	1480	10	758	21		
92	1497	7	411	29			137	1470	11	779	20		
93	1504	7	382	30		− 6	138	1459	11	799	20	− 24	
94	1511	7	352	30			139	1448	11	818	19		
95	1518	6	322	30			140	1437	12	838	20		
96	1524	7	292	30	+ 4		141	1425	13	857	19		− 1
97	1531	5	262	30			142	1412	13	875	18		
98	1536	6	232	30			143	1399	14	893	18		
99	1542	5	202	30		6	144	1385	14	911	18	25	
100	− 1547	5	− 172	30			145	− 1371	+ 15	+ 929	18		
101	1552	4	142	+ 30			146	1356	15	947	17		
102	1556	5	113	29	− 2		147	1341	15	964	16		0
103	1561	3	83	30			148	1326	16	980	17		
104	1564	4	54	29			149	1310	17	997	16		
105	1568	3	− 25	29		6	150	1293	17	1013	16	25	
106	1571	3	+ 4	29			151	1276	18	1029	16		
107	1574	3	33	29			152	1258	18	1045	15		
108	1577	2	62	29	8		153	1240	18	1060	16		0
109	1579	1	91	29			154	1222	19	1076	14		
110	− 1580	− 2	+ 119	28		5	155	− 1203	+ 20	+ 1090	15		
111	1582	1	147	+ 28			156	1183	20	1105	15	25	
112	1583	0	175	28			157	1163	20	1120	14		
113	1583	− 1	203	28			158	1143	21	1134	14		
114	1584	+ 1	230	27	13		159	1122	21	1148	13		0
115	1583	0	257	27			160	1101	22	1161	14		
116	1583	1	284	27			161	1079	22	1175	13		
117	1582	1	311	27		4	162	1057	22	1188	13	25	
118	1581	2	337	26			163	1035	23	1201	13		
119	1579	2	363	26			164	1012	24	1213	12		
120	− 1577	+ 3	+ 389	26	17		165	− 988	+ 23	+ 1226	13		0
121	1574	3	414	+ 25			166	965	24	1238	+ 12		
122	1571	4	440	26			167	941	25	1251	13		
123	1567	4	465	25		3	168	916	24	1262	11	25	
124	1563	4	489	24			169	892	25	1274	12		
125	1559	5	513	24			170	867	26	1286	12		
126	1554	5	537	24	20		171	841	26	1297	11		0
127	1549	6	561	24			172	815	25	1308	11		
128	1543	6	584	23			173	790	27	1319	11		
129	1537	7	607	23		2	174	763	26	1329	10	25	
130	− 1530	+ 7	+ 630	23			175	− 737	+ 27	+ 1340	11		0
131	1523	8	652	+ 22			176	710	27	1350	+ 10		
132	1515	8	674	22	− 22		177	683	27	1360	10		
133	1507	8	696	22			178	656	27	1370	10		
134	1499	9	717	21			179	629	28	1380	10		
135	− 1490	+ 9	+ 738	+ 21		− 2	180	− 601		+ 1389	+ 9	− 25	

TABLE IV.—*Continued.*

PERTURBATIONS OF THE CO-ORDINATES IN UNITS OF THE SIXTH DECIMAL.

ARGUMENT V.

Arg.	ξ'	Diff.	η'	Diff.	ζ'	Diff.	Arg.	ξ'	Diff.	η'	Diff.	ζ'	Diff.
180°	− 601	+ 28	+ 1389	+ 10	− 25		225°	+ 621	+ 23	+ 1509	− 8		− 2
181	573	28	1399	9			226	644	23	1501	7		
182	545	28	1408	9			227	667	23	1494	8		
183	517	28	1417	8		− 1	228	690	22	1486	9	− 39	
184	489	28	1425	9			229	712	22	1477	10		
185	461	29	1434	8			230	734	22	1467	10		
186	432	28	1442	8	26		231	756	22	1457	10		− 1
187	404	29	1450	8			232	778	21	1447	11		
188	375	28	1458	7			233	799	21	1436	12		
189	347	29	1465	7		1	234	820	21	1424	12	40	
190	− 318	+ 29	+ 1472	+ 7			235	+ 841	+ 20	+ 1412	− 13		
191	289	29	1479	7			236	861	21	1399	13		
192	260	28	1486	7	27		237	882	20	1386	14		0
193	232	29	1493	6			238	902	20	1372	15		
194	203	29	1499	6			239	922	19	1357	15		
195	174	28	1505	5		2	240	941	20	1342	16	40	
196	146	29	1510	6			241	961	19	1326	16		
197	117	28	1516	5			242	980	19	1310	17		
198	89	29	1521	4	29		243	999	19	1293	18		+ 1
199	60	28	1525	5			244	1018	18	1275	18		
200	− 32	+ 28	+ 1530	+ 4			245	+ 1036	+ 18	+ 1257	− 19		
201	− 4	29	1534	3		2	246	1054	18	1238	19	39	
202	+ 25	28	1537	4			247	1072	18	1219	19		
203	53	27	1541	3			248	1090	18	1200	19		
204	80	28	1544	3	31		249	1108	17	1179	21		1
205	108	28	1547	3			250	1125	18	1158	21		
206	136	27	1549	2			251	1143	17	1137	21		
207	163	28	1551	2		2	252	1160	16	1115	22	38	
208	191	27	1552	1			253	1176	17	1093	22		
209	218	26	1553	1			254	1193	16	1071	22		
210	+ 244	+ 27	+ 1554	+ 1	33		255	+ 1209	+ 17	+ 1047	− 24		3
211	271	27	1554	0			256	1226	15	1023	25		
212	298	26	1554	0			257	1241	16	998	24		
213	324	26	1554	0		2	258	1257	16	974	26	35	
214	350	26	1553	− 1			259	1273	16	948	25		
215	376	25	1551	2			260	1288	15	923	26		
216	401	26	1549	2	35		261	1303	15	897	26		4
217	427	25	1547	2			262	1318	15	870	27		
218	452	25	1544	3			263	1333	15	843	27		
219	477	24	1540	4		2	264	1347	14	816	27	31	
220	+ 501	+ 25	+ 1536	− 4			265	+ 1361	+ 14	+ 788	− 28		
221	526	24	1532	5			266	1375	14	760	28		+ 4
222	550	24	1527	6	− 37		267	1389	14	732	28		
223	574	24	1521	6			268	1403	14	703	29		
224	598	23	1515	− 6			269	1416	13	674	− 29		
225	+ 621		+ 1509			− 2	270	+ 1429	+ 13	+ 645		− 27	

TABLE IV.—*Continued.*

PERTURBATIONS OF THE CO-ORDINATES IN UNITS OF THE SIXTH DECIMAL.

ARGUMENT V.

Arg.	ξ'	Diff.	η'	Diff.	ζ'	Diff.	Arg.	ξ'	Diff.	η'	Diff.	ζ'	Diff.
270	+ 1429	+ 13	+ 645	− 30	− 27		315	+ 1628	− 8	− 726	− 26		+ 5
271	1442	13	615	30			316	1620	9	752	27		
272	1455	12	585	30			317	1611	9	779	26		
273	1467	12	555	30		+ 5	318	1602	10	805	26	+ 18	
274	1479	12	525	30			319	1592	11	831	25		
275	1491	12	494	31			320	1581	11	856	25		
276	1503	12	464	30	22		321	1570	12	881	25		4
277	1514	11	433	31			322	1558	13	906	24		
278	1525	11	402	31			323	1545	14	930	24		
279	1535	10	370	32		6	324	1531	14	954	24	22	
		11		31					14		24		
280	+ 1546	+ 10	+ 339	− 32			325	+ 1517	− 15	− 978	− 23		
281	1556	9	307	31			326	1502	15	1001	23		5
282	1565	10	276	32	16		327	1487	16	1024	23		
283	1575	9	244	32			328	1471	17	1047	22		
284	1584	8	212	32			329	1454	18	1069	22		
285	1592	9	181	31		5	330	1436	18	1091	22	27	
286	1601	8	149	32			331	1418	19	1112	21		
287	1609	7	117	32			332	1399	20	1133	21		
288	1616	7	85	32	11		333	1379	20	1154	21		3
289	1623		53	32			334	1359		1174	20		
		7		32					21		20		
290	+ 1630	+ 6	+ 21	− 31		6	335	+ 1338	− 21	− 1194	− 20		
291	1636	6	− 10	32			336	1317	22	1214	19	30	
292	1642	5	42	31			337	1295	23	1233	19		
293	1647	5	73	32		− 5	338	1272	23	1252	18		
294	1652	5	105	32			339	1249	24	1270	18		4
295	1657	4	137	32			340	1225	24	1288	18		
296	1661	3	168	31		6	341	1201	24	1306	18		
297	1664	3	199	31			342	1176	25	1323	17	34	
298	1667	2	230	31			343	1150	26	1340	17		
299	1669		261	31			344	1124	26	1356	16		
		2		31					27		16		
300	+ 1671	+ 1	− 292	− 30	+ 1		345	+ 1097	− 27	+ 1372	− 16		3
301	1672	+ 1	322	31			346	1070	28	1388	15		
302	1673	0	353	30			347	1042	28	1403	15		
303	1673	0	383	30		6	348	1014	28	1418	15	37	
304	1673	− 1	413	30			349	986	29	1433	14		
305	1672	2	443	30			350	957	30	1447	13		
306	1670	2	472	29	7		351	927	30	1460	14		3
307	1668	3	501	29			352	897	30	1474	13		
308	1665	3	530	29			353	867	30	1487	13		
309	1662		559	29		6	354	837		1499	12	40	
		4		29					31		12		
310	+ 1658	− 5	− 588	− 28			355	+ 806	− 31	− 1511	− 12		
311	1653	5	616	28			356	775	32	1523	12		+ 2
312	1648	5	644	27	+ 13		357	743	32	1534	11		
313	1642	6	671	28			358	711	32	1545	11		
314	1635	7	699	27			359	679	32	1555	10		
315	+ 1628	− 7	− 726	− 27		+ 5	360	+ 647	− 32	− 1565	− 10	+ 42	

TABLE IV.—*Continued.*

PERTURBATIONS OF THE CO-ORDINATES IN UNITS OF THE SIXTH DECIMAL.

ARGUMENT VI.

Arg.	ξ'	Diff.	η'	Diff.	ζ'	Diff.	Arg.	ξ'	Diff.	η'	Diff.	ζ'	Diff.
0°	− 308		+ 364		+ 9		180°	+ 248		− 511		− 9	
		− 23		− 30					+ 50		+ 22		
5	331		334				185	298		489			
		21		29					48		26		
10	352		305		8		190	346		463		8	
		18		30					46		31		
15	370		275				195	392		431			
		16		30					43		36		
20	386		245		6		200	435		395		6	
		14		31					39		41		
25	400		214				205	474		354			
		12		30					35		46		
30	412		184		5		210	509		308		5	
		10		31					31		49		
35	422		153				215	540		259			
		9		31					25		53		
40	431		122		3		220	565		206		3	
		7		31					20		56		
45	438		91				225	585		151			
		5		31					14		58		
50	− 443		+ 60		+ 1		230	+ 599		− 93		− 1	
		− 4		− 32					+ 7		+ 60		
55	447		+ 28				235	606		− 33			
		2		33					+ 1		59		
60	449		− 5		− 1		240	607		+ 26		+ 1	
		− 1		33					− 6		60		
65	450		38				245	601		86			
		+ 1		33					12		59		
70	449		71		3		250	589		145		3	
		4		34					19		57		
75	445		105				255	570		202			
		6		34					24		55		
80	439		139		5		260	546		257		5	
		8		35					31		51		
85	431		174				265	515		308			
		11		34					36		47		
90	420		208		6		270	479		355		6	
		14		35					40		43		
95	406		243				275	439		398			
		17		35					44		38		
100	− 389		− 278		− 8		280	+ 395		+ 436		+ 8	
		+ 20		− 33					− 48		+ 32		
105	369		311				285	347		468			
		23		33					50		27		
110	346		344		9		290	297		495		9	
		26		32					51		20		
115	320		376				295	246		515			
		29		30					53		15		
120	291		406		10		300	193		530		10	
		33		28					53		9		
125	258		434				305	140		539			
		36		25					52		+ 4		
130	222		459		11		310	88		543		11	
		38		23					52		− 2		
135	184		482				315	+ 36		541			
		42		20					49		6		
140	142		502		11		320	− 13		535		11	
		44		16					47		11		
145	98		518				325	60		524			
		46		13					45		15		
150	− 52		− 531		− 11		330	− 105		+ 509		+ 11	
		+ 48		− 8					− 42		− 19		
155	− 4		539				335	141		490			
		49		− 4					38		21		
160	+ 45		543		11		340	185		469		11	
		50		+ 1					35		24		
165	95		542				345	220		445			
		52		5					33		26		
170	147		537		10		350	253		419		10	
		51		11					29		27		
175	198		526				355	282		292			
		+ 50		+ 15					− 26		− 28		
180	+ 248		− 511		− 9		360	− 308		+ 364		+ 9	

TABLE IV.—*Continued.*

PERTURBATIONS OF THE CO-ORDINATES IN UNITS OF THE SIXTH DECIMAL.

ARGUMENT VII.

Arg.	ξ'	Diff.	η'	Diff.	ζ'	Diff.	Arg.	ξ'	Diff.	η'	Diff.	ζ'	Diff.
0	− 196	+ 41	− 464	− 16	+ 3		180	+ 194	− 41	+ 464	+ 15	− 3	
5	155	43	480	11			185	153	43	479	12		
10	112	43	491	8	3		190	110	43	491	7	3	
15	69	44	499	− 5			195	67	44	498	+ 4		
20	− 25	45	504	0	3		200	+ 23	44	502	0	3	
25	+ 20	44	504	+ 4			205	− 21	44	502	− 3		
30	64	43	500	7	3		210	65	43	499	8	3	
35	107	43	493	11			215	108	42	491	11		
40	150	42	482	15	2		220	150	42	480	15	2	
45	192	40	467	19			225	192	40	465	18		
50	+ 232	+ 38	− 448	+ 22	+ 2		230	− 232	− 38	+ 447	− 22	− 2	
55	270	37	426	25			235	270	36	425	25		
60	307	34	401	28	2		240	306	34	400	28	2	
65	341	31	373	31			245	340	31	372	31		
70	372	29	342	33	2		250	371	28	341	33	2	
75	401	26	309	36			255	399	26	308	36		
80	427	22	273	39	1		260	425	22	272	38	1	
85	449	19	234	40			265	447	19	234	40		
90	468	15	194	41	+ 1		270	466	15	194	41	− 1	
95	483	11	153	43			275	481	11	153	42		
100	+ 494	+ 8	− 110	+ 43	0		280	− 492	− 8	+ 111	− 43	0	
105	502	+ 4	67	44			285	500	− 5	68	44		
110	506	0	− 23	44	0		290	505	0	+ 24	43	0	
115	506	− 4	+ 21	44			295	505	+ 4	− 19	44		
120	502	7	65	43	− 1		300	501	7	63	43	+ 1	
125	495	12	108	42			305	494	11	106	43		
130	483	15	150	42	1		310	483	15	149	41	1	
135	468	19	192	40			315	468	18	190	40		
140	449	22	232	38	1		320	450	22	230	38	1	
145	427	25	270	36			325	428	25	268	36		
150	+ 402	− 28	+ 306	+ 34	− 2		330	− 403	+ 28	− 304	− 34	+ 2	
155	374	32	340	31			335	375	31	338	31		
160	342	34	371	28	2		340	344	34	369	29	2	
165	308	36	399	25			345	310	36	398	25		
170	272	38	421	22	2		350	274	38	423	23	2	
175	234	− 40	446	+ 18			355	236	+ 40	446	− 18		
180	+ 194		+ 464		− 3		360	− 196		− 464		+ 3	

TABLE IV.—*Continued.*

PERTURBATIONS OF THE CO-ORDINATES IN UNITS OF THE SIXTH DECIMAL.

ARGUMENT VIII.

Arg.	ξ'	Diff.	η'	Diff.	ζ'	Diff.	Arg.	ξ'	Diff.	η'	Diff.	ζ'	Diff.
0°	+ 24	+ 6	+ 122	− 2	+ 8		180°	− 17	− 10	− 143	0	− 8	
5	30	7	120	1			185	27	10	143	+ 1		
10	37	7	119	0	8		190	37	11	142	1	8	
15	44	8	119	1			195	48	12	141	2		
20	52	9	118	1	7		200	60	13	139	3	7	
25	61	9	117	2			205	73	13	136	4		
30	70	11	115	3	6		210	86	13	132	6	6	
35	81	11	112	4			215	99	13	126	7		
40	92	12	108	5	6		220	112	13	119	9	6	
45	104		103	7			225	125	13	110	11		
50	+ 115	11	+ 96	− 10	+ 5		230	− 138	13	− 99	+ 13	− 5	
		+ 12							− 11				
55	127	11	86	11			235	149	11	86	15		
60	138	9	75	12	3		240	160	8	71	17	3	
65	147	8	63	14			245	168	7	54	17		
70	155	7	49	16	2		250	175	4	37	19	2	
75	162	4	33	17			255	179	− 1	− 18	19		
80	166	+ 2	+ 16	17	+ 1		260	180	+ 2	+ 1	20	− 1	
85	168	0	− 1	17.			265	178	3	21	19		
90	168	− 3	19	18	1		270	175	7	40	19	+ 1	
95	165	5	36	17			275	168	8	59	17		
100	+ 160	− 7	− 53	17	− 2		280	− 160	+ 11	+ 76	+ 15	+ 2	
				− 16									
105	153	9	69	15			285	149	13	91	14		
110	144	10	84	13	3		290	136	14	105	11	3	
115	134	11	97	11			295	122	15	116	9		
120	123	13	108	9	5		300	107	15	125	6	5	
125	110	13	117	8			305	92	15	131	5		
130	97	13	125	7	6		310	77	14	136	2	6	
135	84	13	132	4			315	63	14	138	+ 1		
140	71	13	136	3	6		320	49	13	139	− 1	6	
145	59	12	139	3			325	36	12	138	1		
150	+ 47	− 12	− 142	− 1	7		330	− 24	+ 10	+ 137	− 3	+ 7	
155	35	11	143	0			335	14	9	134	3		
160	24	10	143	− 1	8		340	− 5	8	131	3	8	
165	14	11	144	0			345	+ 3	8	128	2		
170	+ 3	10	144	+ 1	8		350	11	6	126	2	8	
175	− 7	− 10	143	0			355	17	+ 7	124	− 2		
180	− 17		− 143		− 8		360	+ 24		+ 122		+ 8	

TABLE IV.—*Continued.*

PERTURBATIONS OF THE CO-ORDINATES IN UNITS OF THE SIXTH DECIMAL.

ARGUMENT IX.

Arg.	ξ'	Diff.	η'	Diff	ζ'	Diff.	Arg.	ξ'	Diff.	η'	Diff.	ζ'	Diff.
0	+ 183	+ 3	+ 18	+ 16	+ 1		180	− 157	− 1	+ 18	− 11	+ 1	
5	180	4	34	16			185	158	0	+ 7	12		
10	176	6	50	16	3		190	158	+ 1	− 5	11	0	
15	170	7	66	15			195	157	2	16	12		
20	163	9	81	14	5		200	155	3	28	11	− 1	
25	154	10	95	12			205	152	4	39	12		
30	144	11	107	12	7		210	148	5	51	11	2	
35	133	12	119	10			215	143	6	62	11		
40	121	13	129	9	8		220	137	7	73	11	3	
45	108	13	138	8			225	130	8	84	11		
50	+ 95	− 14	+ 146	+ 7	+ 9		230	− 122	+ 9	− 95	− 11	− 4	
55	81	15	153	5			235	113	10	106	10		
60	66	14	158	4	10		240	103	12	116	9	6	
65	52	15	162	3			245	91	12	125	8		
70	37	15	165	+ 1	11		250	79	13	133	8	7	
75	22	14	166	0			255	66	15	141	6		
80	+ 8	14	166	− 1	11		260	51	15	147	5	7	
85	− 6	14	165	2			265	36	16	152	4		
90	20	13	163	3	10		270	20	16	156	2	8	
95	33	13	160	4			275	− 4	16	158	− 1		
100	− 46	− 12	+ 156	− 4	+ 10		280	+ 12	+ 17	− 159	0	− 8	
105	58	12	152	6			285	29	17	159	+ 3		
110	70	11	146	6	9		290	46	17	156	4	8	
115	81	10	140	7			295	63	17	152	5		
120	91	10	133	8	8		300	80	16	147	8	8	
125	101	9	125	8			305	96	15	139	9		
130	110	8	117	8	7		310	111	14	130	10	7	
135	118	7	109	9			315	125	12	120	12		
140	125	7	100	10	5		320	137	12	108	13	6	
145	132	6	90	9			325	149	10	95	14		
150	− 138	− 5	+ 81	− 10	+ 4		330	+ 159	+ 8	− 81	+ 16	− 5	
155	143	4	71	10			335	167	7	65	16		
160	147	4	61	11	3		340	174	5	49	16	3	
165	151	3	50	10			345	179	3	33	17		
170	154	2	40	11	2		350	182	+ 1	− 16	17	− 1	
175	156	− 1	29	−11			355	183	0	+ 1	17		
180	− 157		+ 18		+ 1		360	+ 183		+ 18	+ 17	+ 1	

TABLE IV.—*Continued.*

PERTURBATIONS OF THE CO-ORDINATES IN UNITS OF THE SIXTH DECIMAL.

ARGUMENT X.

Arg.	ξ'	Diff.	η'	Diff.	Arg.	ξ'	Diff.	η'	Diff.
0	-38	-5	+60	-3	180	+37	+5	-63	+4
5	43	4	57	4	185	42	5	59	4
10	47	5	53	4	190	47	5	55	4
15	52	4	49	5	195	52	4	51	5
20	56	3	44	5	200	56	4	46	5
25	59	3	39	5	205	60	4	41	5
30	62	3	34	6	210	64	3	36	5
35	65	2	28	5	215	67	2	30	6
40	67	2	23	6	220	69	2	24	6
45	69	1	17	6	225	71	1	18	6
50	-70	-1	+11	-6	230	+72	+1	-11	+6
55	71	0	+5	6	235	73	0	-5	6
60	71	+1	-1	6	240	73	0	+1	7
65	70	1	7	6	245	73	-1	8	6
70	69	1	13	6	250	72	2	14	6
75	68	2	19	6	255	70	2	20	6
80	66	2	25	6	260	68	3	26	6
85	64	3	30	5	265	65	3	32	6
90	61	3	36	6	270	62	3	38	6
95	58	4	41	5	275	59	4	43	5
100	-54	+4	-46	-4	280	+55	-5	+48	+5
105	50	4	50	5	285	50	5	53	4
110	46	5	55	3	290	45	5	57	4
115	41	5	58	4	295	40	6	61	3
120	36	6	62	3	300	34	6	64	2
125	30	5	65	2	305	28	6	66	2
130	25	6	67	2	310	22	6	68	2
135	19	6	69	2	315	16	6	70	1
140	13	7	71	-1	320	10	6	71	+1
145	-6	6	72	0	325	+4	6	72	0
150	0	+6	+72	0	330	-2	-7	+72	-1
155	+6	7	72	+1	335	9	6	71	1
160	13	6	71	1	340	15	6	70	2
165	19	6	70	2	345	21	6	68	2
170	25	6	68	3	350	27	5	66	3
175	31	+6	65	+2	355	32	-6	63	-3
180	+37		-63		360	-38		+60	

ARGUMENT XI.

Arg.	ξ'	Diff.	η'	Diff.	Arg.	ξ'	Diff.	η'	Diff.
0	-27	+14	-94	+1	180	+27	+3	+2	-2
5	-13	14	95	-1	185	30	2	0	3
10	+1	13	94	4	190	32	2	-3	3
15	14	12	90	6	195	34	2	6	4
20	26	10	84	7	200	36	2	10	5
25	36	8	77	9	205	38	2	15	5
30	44	6	68	10	210	40	+1	20	5
35	50	4	58	10	215	41	0	25	5
40	54	+1	48	11	220	41	0	31	6
45	55	0	37	10	225	41	-1	37	6
50	+55	-2	+27	-9	230	+40	-3	-41	-7
55	53	3	18	8	235	37	3	51	8
60	50	5	10	6	240	34	5	59	7
65	45	5	+4	6	245	29	7	66	6
70	40	6	-2	4	250	22	8	72	6
75	34	6	6	2	255	14	9	78	4
80	28	6	8	1	260	+5	10	82	3
85	22	6	9	-1	265	-5	11	85	-2
90	16	4	10	+1	270	16	12	87	+1
95	12	4	9	2	275	28	13	86	2
100	+8	-3	-7	+2	280	-41	-12	-84	+5
105	5	2	5	3	285	53	12	79	7
110	3	-2	-2	3	290	65	11	72	9
115	1	0	+1	2	295	76	9	63	12
120	1	+1	3	2	300	85	7	51	13
125	2	1	5	2	305	92	6	38	14
130	3	2	7	2	310	98	3	24	15
135	5	2	9	+1	315	101	-1	-9	16
140	7	2	10	0	320	102	+2	+7	16
145	9	3	10	0	325	100	5	23	15
150	+12	+2	+10	0	330	-95	+7	+38	+14
155	14	3	10	-1	335	88	9	52	13
160	17	3	9	1	340	79	11	65	11
165	20	2	8	2	345	68	13	76	9
170	22	3	6	2	350	55	14	85	6
175	25	+2	4	-2	355	41	+14	91	+3
180	+27		+2		360	-27		+94	

TABLE IV.—*Continued.*

PERTURBATIONS OF THE CO-ORDINATES IN UNITS OF THE SIXTH DECIMAL.

ARGUMENT XII.

Arg.	ξ'	Diff.	η'	Diff.
0	+ 3		+ 12	
		− 7		− 1
10	− 4		11	
		5		4
20	9		7	
		3		6
30	12		+ 1	
		− 1		6
40	13		− 5	
		+ 2		6
50	11		11	
		4		4
60	7		15	
		6		− 3
70	− 1		18	
		6		0
80	+ 5		18	
		6		+ 2
90	11		16	
		6		+ 4
100	+ 17		− 12	
		+ 4		5
110	21		− 7	
		+ 1		7
120	22		0	
		0		7
130	22		+ 7	
		− 2		7
140	20		14	
		4		6
150	16		20	
		6		4
160	10		24	
		6		3
170	+ 4		27	
		7		+ 1
180	− 3		28	
		7		− 1
190	10		27	
		7		3
200	− 17		+ 24	
		− 5		− 6
210	22		18	
		4		6
220	26		12	
		− 2		8
230	28		+ 4	
		0		9
240	28		− 5	
		+ 3		8
250	25		13	
		6		6
260	19		19	
		7		4
270	12		23	
		9		− 2
280	− 3		25	
		8		+ 1
290	+ 5		24	
		7		4
300	+ 12		− 20	
		+ 5		+ 6
310	17		14	
		+ 2		7
320	19		− 7	
		− 1		7
330	18		0	
		3		6
340	15		+ 6	
		5		4
350	10		10	
		− 7		+ 2
360	+ 3		+ 12	

ARGUMENT XIII.

Arg.	ξ'	Diff.	η'	Diff.
0	+ 13		+ 12	
		− 3		+ 2
10	10		14	
		2		1
20	8		15	
		3		1
30	5		16	
		3		+ 1
40	+ 2		17	
		3		0
50	− 1		17	
		3		− 1
60	4		16	
		3		1
70	7		15	
		2		2
80	9		13	
		2		1
90	11		12	
		2		2
100	− 13		+ 10	
		− 1		− 3
110	14		7	
		1		2
120	15		5	
		− 1		3
130	16		+ 2	
		0		2
140	16		0	
		. 0		3
150	16		3	
		+ 1		3
160	15		5	
		1		2
170	14		8	
		1		3
180	13		10	
		2		2
190	11		12	
		2		2
200	− 9		14	
		+ 3		− 1
210	6		15	
		2		1
220	4		16	
		3		− 1
230	− 1		17	
		3		0
240	+ 2		17	
		3		0
250	5		17	
		3		+ 1
260	8		16	
		3		2
270	11		14	
		2		2
280	13		12	
		2		3
290	15		9	
		2		3
300	+ 17		− 6	
		+ 1		+ 3
310	18		− 3	
		0		3
320	18		0	
		0		4
330	18		+ 4	
		− 1		3
340	17		7	
		2		3
350	15		10	
		− 2		+ 2
360	+ 13		+ 12	

ARGUMENT XIV.

Arg.	ξ'	Diff.	η'	Diff.
0	+ 3		+ 23	
		+ 4		0
10	7		23	
		3		0
20	10		23	
		4		− 1
30	14		22	
		3		2
40	17		20	
		2		3
50	19		17	
		2		3
60	21		14	
		+ 2		4
70	23		10	
		0		4
80	23		6	
		0		4
90	23		+ 2	
		− 1		5
100	+ 22		− 3	
		− 2		− 4
110	20		7	
		2		4
120	18		11	
		3		3
130	15		14	
		4		3
140	11		17	
		4		3
150	7		20	
		4		2
160	+ 3		22	
		4		− 1
170	− 1		23	
		4		0
180	5		23	
		4		0
190	9		23	
		4		+ 1
200	− 13		− 22	
		− 3		+ 2
210	16		20	
		2		2
220	18		18	
		2		3
230	20		15	
		1		3
240	21		12	
		− 1		3
250	22		9	
		0		4
260	22		5	
		+ 1		3
270	21		− 2	
		1		4
280	20		+ 2	
		2		4
290	18		6	
		2		3
300	− 16		+ 9	
		+ 3		+ 4
310	13		13	
		3		3
320	10		16	
		3		3
330	7		19	
		3		2
340	− 4		21	
		4		1
350	0		22	
		+ 3		+ 1
360	+ 3		+ 23	

TABLE IV.—*Continued.*

PERTURBATIONS OF THE CO-ORDINATES IN UNITS OF THE SIXTH DECIMAL.

ARGUMENT XV.

Arg.	ξ'	Diff.	η'	Diff.	ζ'	Diff.
0	− 368		−1498		− 1	
5	498	−130	1461	+ 37		
10	623	125	1412	49	1	
15	744	121	1352	60		
20	859	115	1283	69	1	
25	968	109	1203	80		
30	1069	101	1114	89	1	
35	1163	94	1017	97		
40	1247	84	912	105	− 1	
45	1322	75	800	112		
50	−1387	65	− 682	118	0	
55	1441	− 54	559	+123		
60	1484	43	431	128	0	
65	1516	32	300	131		
70	1537	21	167	133	0	
75	1545	− 8	− 33	134		
80	1542	+ 3	+ 101	134	0	
85	1528	14	235	134		
90	1501	27	367	132	+ 1	
95	1463	38	496	129		
100	−1415	48	+ 622	126	+ 1	
105	1355	+ 60	743	+121		
110	1285	70	858	115	1	
115	1205	80	966	108		
120	1116	89	1067	101	1	
125	1018	98	1160	93		
130	913	105	1245	85	1	
135	801	112	1319	74		
140	683	118	1384	65	1	
145	559	124	1438	54		
150	− 432	127	+1481	43	+ 2	
155	301	+131	1513	+ 32		
160	167	134	1534	21	2	
165	− 33	134	1542	+ 8		
170	+ 102	135	1540	− 2	1	
175	236	134	1525	15		
180	+ 368	+132	+1498	− 27	+ 1	

ARGUMENT XVI.

Arg.	ξ'	Diff.	η'	Diff.	ζ'	Diff.
0	+ 196		− 347		0	
5	225	+ 29	328	+ 19		
10	253	28	307	21		
15	279	26	284	23		
20	303	24	259	25		
25	324	21	231	28		
30	343	19	202	29		
35	359	16	172	30		
40	373	14	140	32		
45	384	11	107	33		
50	+ 392	8	− 73	34	0	
55	396	+ 4	38	35		
60	398	+ 2	− 4	34		
65	397	− 1	+ 31	35		
70	393	4	65	34		
75	386	7	99	34		
80	376	10	133	34		
85	363	13	165	34		
90	347	16	196	32		
95	328	19	225	31		
100	+ 307	21	+ 253	29	0	
105	284	− 23	279	28		
110	259	25	303	+ 26		
115	231	28	324	24		
120	202	29	343	21		
125	171	31	359	19		
130	139	32	373	16		
135	106	33	384	14		
140	73	33	392	11		
145	38	35	396	8		
150	+ 3	35	+ 398	4	0	
155	− 31	− 34	397	+ 2		
160	66	35	393	− 1		
165	100	34	385	4		
170	133	33	375	8		
175	165	32	362	10		
180	− 196	− 31	+ 347	13	0	
				− 15		

From the Arguments $>180°$ subtract $180°$, and reverse the sign of ξ', η', ζ'.

TABLE IV.—*Continued.*

PERTURBATIONS OF THE CO-ORDINATES IN UNITS OF THE SIXTH DECIMAL.

ARGUMENT XVII.

Arg.	ξ'	Diff.	η'	Diff.	ζ'	Diff.
0	− 41	− 14	− 166	+ 4	0	
5	55	14	162	6		
10	69	13	156	6		
15	82	13	150	6		
20	95	12	142	8		
25	107	11	133	9		
30	118	11	123	10		
35	129	9	113	10		
40	138	8	101	12		
45	146	7	89	12		
50	− 153	− 6	− 76	13	0	
55	159	5	62	+ 14		
60	164	4	48	14		
65	168	2	33	15		
70	170	− 1	19	14		
75	171	+ 1	− 4	15		
80	170	1	+ 11	15		
85	169	3	26	15		
90	166	4	40	14		
95	162	5	55	15		
100	− 157	+ 7	+ 69	14	0	
105	150	8	82	+ 13		
110	142	9	95	13		
115	133	9	107	12		
120	124	11	118	11		
125	113	12	128	10		
130	101	12	138	10		
135	89	13	146	8		
140	76	14	153	7		
145	62	14	159	6		
150	− 48	+ 15	+ 164	5	0	
155	33	14	168	+ 4		
160	19	15	170	2		
165	− 4	15	171	+ 1		
170	+ 11	15	170	− 1		
175	26	+ 15	169	1		
180	+ 41		+ 166	− 3	0	

ARGUMENT XVIII.

Arg.	ξ'	Diff.	η'	Diff.	ζ'	Diff.
0	+ 40	− 19	− 105	− 5	− 1	
10	21	20	110	− 2		
20	+ 1	19	112	+ 1	− 2	
30	− 18	19	111	5	+ 1	
40	37	18	106	8		
50	55	16	98	11		
60	71	14	87	14		
70	85	12	73	16		
80	97	8	57	17		
90	105	5	40	19		
100	− 110	− 2	− 21	+ 20	− 1	
110	112	+ 1	− 1	19		
120	111	5	+ 18	19	0	
130	106	8	37	18		
140	98	11	55	16	0	
150	87	14	71	14		
160	73	16	85	11	0	
170	57	+ 17	96	+ 9		
180	− 40		+ 105		+ 1	

ARGUMENT XIX.

Arg.	ξ'	Diff.	η'	Diff.	ι	Diff.
0	+ 102	− 12	+ 62	− 17	− 2	
10	90	15	79	14		
20	75	17	93	11	2	
30	58	18	104	8		
40	40	20	112	5	2	
50	+ 20	21	117	− 1		
60	− 1	20	118	+ 3	2	
70	21	20	115	6		
80	41	19	109	9	2	
90	60	17	100	12		
100	− 77	− 14	− 88	+ 15	− 1	
110	91	12	73	18		
120	103	8	55	18	0	
130	111	5	37	20		
140	116	− 2	− 17	21	+ 1	
150	118	+ 2	+ 4	20		
160	116	5	24	20	1	
170	111	+ 9	44	+ 18		
180	− 102		+ 62		+ 2	

From the Arguments $> 180°$ subtract $180°$, and reverse the sign of ξ', η', ζ'.

TABLE IV.—*Continued.*

PERTURBATIONS OF THE CO-ORDINATES IN UNITS OF THE SIXTH DECIMAL.

ARGUMENT XX.

Arg.	ξ'	Diff.	η'	Diff.	ζ'	Diff.
0	+ 22		− 42		0	
		+ 7		+ 4		
10	29		38			
		7		6		
20	36		32			
		5		7		
30	41		25			
		3		7		
40	44		18			
		3		8		
50	47		10			
		+ 1		8		
60	48		− 2			
		0		8		
70	48		+ 6			
		− 2		8		
80	46		14			
		4		8		
90	42		22			
		4		7		
100	+ 38		+ 29		0	
		− 6		+ 6		
110	32		35			
		7		5		
120	25		40			
		7		4		
130	18		44			
		8		2		
140	10		46			
		8		+ 1		
150	+ 2		47			
		9		0		
160	− 7		47			
		8		− 2		
170	15		45			
		− 7		− 3		
180	− 22		+ 42		0	

ARGUMENT XXII.

Arg.	ξ'	Diff.	η	Diff.	ζ'	Diff.
0	− 26		− 18		0	
		− 2		+ 5		
10	28		13			
		− 2		5		
20	30		8			
		0		5		
30	30		− 3			
		0		6		
40	30		+ 3			
		+ 1		5		
50	29		8			
		2		5		
60	27		13			
		3		5		
70	24		18			
		4		4		
80	20		22			
		4		4		
90	16		26			
		5		2		
100	− 11		+ 28		0	
		+ 5		+ 2		
110	− 6		30			
		6		+ 1		
120	0		31			
		5		0		
130	+ 5		31			
		5		− 1		
140	10		30			
		5		2		
150	15		28			
		5		2		
160	19		26			
		4		4		
170	23		22			
		+ 3		− 4		
180	+ 26		+ 18		0	

ARGUMENT XXI.

Arg.	ξ'	Diff.	η'	Diff.	ζ'	Diff.
0	− 13		+ 1		+ 4	
		+ 9		− 12		
10	− 4		− 11			
		9		13		
20	+ 5		24		3	
		10		11		
30	15		35			
		9		11		
40	24		46		+ 1	
		8		9		
50	32		55			
		7		8		
60	39		63		− 1	
		6		5		
70	45		68			
		5		4		
80	50		72		3	
		3		− 1		
90	53		73			
		+ 1		+ 1		
100	+ 54		− 72		− 5	
		0		+ 3		
110	54		69			
		− 2		5		
120	52		64		6	
		3		7		
130	49		57			
		5		9		
140	44		48		6	
		6		10		
150	38		38			
		8		12		
160	30		26		5	
		8		12		
170	22		14			
		− 9		+ 13		
180	+ 13		− 1		− 4	

ARGUMENT XXIII.

Arg.	ξ'	Diff.	η'	Diff.	ζ'	Diff.
0	− 6		+ 67		0	
		+ 12		+ 1		
10	+ 6		68			
		12		− 2		
20	18		66			
		11		4		
30	29		62			
		10		6		
40	39		56			
		9		8		
50	48		48			
		8		9		
60	56		39			
		6		10		
70	62		29			
		4		11		
80	66		18			
		+ 2		11		
90	68		+ 7			
		0		12		
100	+ 68		− 5		0	
		− 2		− 12		
110	66		17			
		4		11		
120	62		28			
		6		10		
130	56		38			
		8		9		
140	48		47			
		9		8		
150	39		55			
		11		6		
160	28		61			
		11		4		
170	17		65			
		− 11		− 2		
180	+ 6		− 67		0	

From the Arguments > 180° subtract 180°, and reverse the sign of ξ', η', ζ'.

7

TABLE IV.—*Concluded.*

PERTURBATIONS OF THE CO-ORDINATES IN UNITS OF THE SIXTH DECIMAL.

ARGUMENT XXIV.

Arg.	ξ'	η'	ζ'
0°	+ 17	− 20	− 1
20	18	24	2
40	17	26	3
60	14	25	3
80	10	20	4
100	+ 4	13	3
120	− 2	− 5	2
140	8	+ 4	− 1
160	13	13	0
180	− 17	+ 20	+ 1

ARGUMENT XXVII.

Arg.	ξ'	η'	ζ'
0°	+ 1	+ 17	0
20	7	15	
40	12	12	
60	15	7	
80	17	+ 2	
100	16	− 4	
120	14	9	
140	10	14	
160	+ 5	16	
180	− 1	+ 17	0

ARGUMENT XXX.

Arg.	ξ'	η'	ζ'
0°	− 5	− 6	0
20	− 7	4	
40	8	− 1	
60	8	+ 2	
80	7	4	
100	5	6	
120	− 3	8	
140	0	8	
160	+ 3	7	
180	+ 5	+ 6	0

ARGUMENT XXV.

Arg.	ξ'	η'	ζ'
0°	+ 5	+ 5	+ 1
20	11	8	1
40	15	9	1
60	17	9	+ 1
80	17	8	0
100	15	6	0
120	12	4	− 1
140	7	+ 1	1
160	+ 1	− 3	1
180	− 5	− 5	− 1

ARGUMENT XXVIII.

Arg.	ξ'	η	ζ'
0°	− 4	− 10	0
20	0	11	
40	+ 3	10	
60	7	8	
80	9	6	
100	11	− 2	
120	11	+ 2	
140	9	5	
160	7	8	
180	+ 4	+ 10	0

ARGUMENT XXVI.

Arg.	ξ'	η'	ζ
0°	− 1	− 23	0
20	9	21	
40	15	17	
60	20	11	
80	23	− 3	
100	22	+ 5	
120	19	12	
140	14	18	
160	− 7	22	
180	+ 1	+ 23	0

ARGUMENT XXIX.

Arg.	ξ'	η'	ζ'
0°	− 5	+ 8	0
20	7	6	
40	9	+ 3	
60	9	0	
80	8	− 3	
100	7	6	
120	4	8	
140	− 1	9	
160	+ 2	9	
180	+ 5	− 8	0

From the Arguments $> 180°$ subtract 180°, and reverse the sign of ξ', η', ζ'.

TABLE V.

LOGARITHMS FOR REFERRING THE PERTURBATIONS TO THE EQUATOR.

Mean Equinox of the beginning of the Year.

Year.	$\cos(x_1 x)$	$\cos(y_1 x)$	$\cos(z_1 x)$	$\cos(x_1 y)$	$\cos(y_1 y)$	$\cos(z_1 y)$	$\cos(x_1 z)$	$\cos(y_1 z)$	$\cos(z_1 z)$
1850	9.862239	9.833908	8.820053	9.793784n	9.844007	9.549470n	9.459233n	9.336366	9.969772
1851	9.862338	9.833796	8.819976	9.793671n	9.844102	9.549452n	9.459126n	9.336499	9.969774
1852 B	9.862437	9.833683	8.819899	9.793557n	9.844196	9.549434n	9.459020n	9.336631	9.969777
1853	9.862536	9.833571	8.819823	9.793444n	9.844290	9.549416n	9.458913n	9.336764	9.969780
1854	9.862635	9.833458	8.819746	9.793330n	9.844384	9.549398n	9.458806n	9.336896	9.969783
1855	9.862734	9.833346	8.819669	9.793217n	9.844479	9.549380n	9.458700n	9.337029	9.969786
1856 B	9.862833	9.833233	8.819592	9.793103n	9.844573	9.549362n	9.458593n	9.337161	9.969789
1857	9.862932	9.833120	8.819515	9.792990u	9.844667	9.549344n	9.458486n	9.337293	9.969792
1858	9.863031	9.833007	8.819438	9.792876n	9.844761	9.549326n	9.458379n	9.337425	9.969795
1859	9.863130	9.832896	8.819362	9.792763n	9.844855	9.549308n	9.458272n	9.337557	9.969798
1860 B	9.863229	9.832781	8.819285	9.792649n	9.844949	9.549290n	9.458165n	9.337689	9.969801
1861	9.863328	9.832668	8.819208	9.792535n	9.845043	9.549272n	9.458058n	9.337821	9.969804
1862	9.863426	9.832555	8.819131	9.792421n	9.845137	9.549254n	9.457951n	9.337952	9.969807
1863	9.863525	9.832442	8.819054	9.792307n	9.845231	9.549236n	9.457844n	9.338084	9.969810
1864 B	9.863624	9.832329	8.818977	9.792193n	9.845325	9.549218n	9.457737n	9.338216	9.969813
1865	9.863722	9.832216	8.818900	9.792079n	9.845419	9.549200n	9.457630n	9.338348	9.969816
1866	9.863820	9.832103	8.818823	9.791965n	9.845512	9.549183n	9.457522n	9.338479	9.969819
1867	9.863918	9.831990	8.818747	9.791851n	9.845606	9.549162n	9.457415n	9.338611	9.969822
1868 B	9.864016	9.831876	8.818670	9.791737n	9.845700	9.549142n	9.457307n	9.338742	9.969825
1869	9.864114	9.831763	8.818593	9.791623n	9.845794	9.549126n	9.457200n	9.338873	9.969828
1870	9.864213	9.831649	8.818516	9.791508n	9.845887	9.549111n	9.457092n	9.339004	9.969831
1871	9.864311	9.831536	8.818440	9.791393n	9.845981	9.549093n	9.456985n	9.339135	9.969834
1872 B	9.864409	9.831422	8.818363	9.791279n	9.846074	9.549075n	9.456877n	9.339266	9.969837
1873	9.864507	9.831309	8.818286	9.791165n	9.846168	9.549057n	9.456769n	9.339397	9.969840
1874	9.864606	9.831195	8.818209	9.791050n	9.846261	9.549039n	9.456661n	9.339527	9.969843
1875	9.864704	9.831081	8.818133	9.790936n	9.846355	9.549021n	9.456553n	9.339658	9.969846
1876 B	9.864802	9.830967	8.818056	9.790821n	9.846448	9.549003n	9.456445n	9.339788	9.969849
1877	9.864900	9.830853	8.817979	9.790706n	9.846541	9.548985n	9.456337n	9.339919	9.969852
1878	9.864999	9.830739	8.817902	9.790591n	9.846634	9.548967n	9.456229n	9.340049	9.969855
1879	9.865097	9.830625	8.817825	9.790477n	9.846728	9.548949n	9.456121n	9.340180	9.969858
1880 B	9.865195	9.830511	8.817748	9.790362n	9.846821	9.548931n	9.456013n	9.340310	9.969861
1881	9.865293	9.830397	8.817672	9.790247n	9.846914	9.548913n	9.455905n	9.340440	9.969864
1882	9.865390	9.830283	8.817594	9.790132n	9.847007	9.548896n	9.455797n	9.340570	9.969867
1883	9.865487	9.830169	8.817517	9.790017n	9.847100	9.548878n	9.455689n	9.340700	9.969869
1884 B	9.865585	9.830055	8.817440	9.789902n	9.847193	9.548860n	9.455581n	9.340830	9.969872
1885	9.865682	9.829941	8.817363	9.789787n	9.847286	9.548842n	9.455473n	9.340960	9.969875
1886	9.865780	9.829826	8.817285	9.789672n	9.847379	9.548825n	9.455364n	9.341090	9.969878
1887	9.865877	9.829712	8.817208	9.789557n	9.847472	9.548807n	9.455256n	9.341220	9.969881
1888 B	9.865975	9.829597	8.817130	9.789442n	9.847565	9.548789n	9.455148n	9.341350	9.969884
1889	9.866072	9.829483	8.817053	9.789327n	9.847658	9.548771n	9.455040n	9.341480	9.969887
1890	9.866170	9.829368	8.816975	9.789211n	9.847750	9.548754n	9.454931n	9.341609	9.969890
1891	9.866267	9.829253	8.816898	9.789096n	9.847843	9.548736n	9.454823n	9.341739	9.969893
1892 B	9.866365	9.829139	8.816820	9.788980n	9.847935	9.548718n	9.454714n	9.341868	9.969896
1893	9.866462	9.829025	8.816743	9.788865n	9.848028	9.548700n	9.454606n	9.341998	9.969849
1894	9.866559	9.828910	8.816665	9.788749n	9.848120	9.548683n	9.454497n	9.342127	9.969902
1895	9.866650	9.828796	8.816588	9.788634n	9.848213	9.548665n	9.454389n	9.342257	9.969905
1896 B	9.866754	9.828681	8.816510	9.788518n	9.848305	9.548647n	9.454280n	9.342386	9.969908
1897	9.866851	9.828566	8.816433	9.788402n	9.848398	9.548629n	9.454172n	9.342515	9.969911
1898	9.866948	9.828451	8.816355	9.788286n	9.848490	9.548612n	9.454063n	9.342644	9.969914
1899	9.867045	9.828386	8.816278	9.788170n	9.848583	9.548594n	9.453958n	9.342774	9.969917
1900 B	9.867143	9.828221	8.816200	9.788054n	9.848675	9.548576n	9.453849n	9.342903	9.969920

TABLE VI.

CONSTANTS FOR THE EQUATOR.

Equator and mean Equinox at the beginning of the Year.

Year.	A'	B'	C'	log sin a	log sin b	log sin c
	° ′ ″	° ′ ″	° ′ ″			
1850	46 52 2.4	318 18 19.9	307 0 4.4	9.999051	9.970859	9.556891
1851	46 52 52.5	318 19 8.8	307 0 58.9	9.999051	9.970861	9.556871
1852 B	46 53 42.8	318 19 57.9	307 1 53.6	9.999051	9.970864	9.556851
1853	46 54 33.0	318 20 46.8	307 2 48.1	9.999052	9.970866	9.556831
1854	46 55 23.1	318 21 35.8	307 3 42.7	9.999052	9.970869	9.556811
1855	46 56 13.2	318 24 24.7	307 4 37.2	9.999052	9.970871	9.556791
1856 B	46 57 3.5	318 23 13.8	307 5 31.9	9.999053	9.970874	9.556771
1857	46 57 53.7	318 24 2.7	307 6 26.5	9.999053	9.970876	9.556751
1858	46 58 43.8	318 24 51.7	307 7 21.0	9.999053	9.970879	9.556731
1859	46 59 34.0	318 25 40.6	307 8 15.6	9.999053	9.970881	9.556711
1860 B	47 0 24.2	318 26 29.7	307 9 10.3	9.999053	9.970884	9.556691
1861	47 1 14.4	318 27 18.6	307 10 4.8	9.999054	9.970886	9.556671
1862	47 2 4.5	318 28 7.6	307 10 59.4	3.999054	9.970889	9.556651
1863	47 2 54.6	318 28 56.5	307 11 54.0	9.999054	9.970891	9.556631
1864 B	47 3 44.9	318 29 45.6	307 12 48.7	9.999054	9.970894	9.556611
1865	47 4 35.0	318 30 34.6	307 13 43.3	9.999055	9.970897	9.556591
1866	47 5 25.2	318 31 23.5	307 14 37.9	9.999055	9.970900	9.556572
1867	47 6 17.3	318 32 12.4	307 15 32.5	9.999055	9.970902	9.556552
1868 B	47 7 7.6	318 33 1.5	307 16 27.2	9.999055	9.970905	9.556532
1869	47 7 57.7	318 33 50.5	307 17 21.8	9.999056	9.970908	9.556512
1870	47 8 45.9	318 34 39.4	307 18 16.4	9.999056	9.970910	9.556492
1871	47 9 36.0	318 25 28.4	307 19 11.0	9.999056	9.970912	9.556472
1872 B	47 10 26.2	318 36 17.5	307 20 5.8	9.999056	9.970915	9.556452
1873	47 11 16.4	318 37 6.4	307 21 0.4	9.999057	9.970917	9.556432
1874	47 12 6.5	318 37 55.4	307 21 55.0	9.999057	9.970920	9.556413
1875	47 12 56.6	318 38 44.4	307 22 49.6	9.999057	9.970922	9.556393
1876 B	47 13 46.9	318 39 33.5	307 23 44.3	9.999057	9.970925	9.556373
1877	47 14 37.0	318 40 22.4	307 24 39.0	9.999058	9.970928	9 556353
1878	47 15 27.2	318 41 11.4	307 25 33.6	9.999058	9.970930	9.556333
1879	47 16 17.3	318 42 0.4	307 26 18.2	9.999058	9.970933	9.556313
1880 B	47 17 7.5	318 42 49.4	307 27 12.9	9.999059	9.970935	9.556293
1881	47 17 57.7	318 43 38.4	307 28 7.5	9.999059	9.970938	9.556273
1882	47 18 47.8	318 44 27.4	307 29 12.2	9.999060	9.970941	9.556254
1883	47 19 37.9	318 45 16.4	307 30 6.8	9.999060	9.970943	9.556234
1884 B	47 20 28.2	318 46 5.5	307 31 1.6	9.999060	9.970946	9.556214
1885	47 21 18.3	318 46 54.4	307 31 56.2	9.999061	9.970948	9.556194
1886	47 22 8.4	318 47 43.4	307 32 50.9	9.999061	9.970954	9.556175
1887	47 22 58.5	318 48 32.4	307 33 45.5	9.999061	9.970953	9.556155
1888 B	47 23 48.8	318 49 21.5	307 34 40.3	9.999062	9.970956	9.556135
1889	47 24 38.9	318 50 10.5	307 35 34.9	9.999062	9.970958	9.556115
1890	47 25 29.0	318 50 59.5	307 36 29.5	9.999063	9.970961	9.556096
1891	47 26 19.1	318 51 48.4	307 37 24.2	9.999063	9.970963	9.556076
1892 B	47 27 9.4	318 52 37.5	307 38 19.0	9.999064	9.970966	9.556056
1893	47 27 59.5	318 53 26.5	307 39 13.6	9.999064	9.970968	9.556036
1894	47 28 49.6	318 54 15.5	307 40 8.3	9.999065	9.970971	9.556017
1895	47 29 39.7	318 55 4 5	307 41 2.9	9.999065	9.970974	9.555997
1896 B	47 30 30.0	318 55 53.6	307 41 57.7	9.999066	9.970976	9.555977
1897	47 31 20.1	318 56 42.6	307 42 51.3	9.999066	9.970979	9.555957
1898	47 32 10.2	318 57 31.6	307 43 47.0	9.999067	9.970982	9.555938
1899	47 33 0.3	318 58 20.6	307 44 41.6	9.999067	9.970985	9.555918
1900 B	47 33 50.5	318 59 9.7	307 45 36.4	9.999068	9.970987	9.555898