

# ASTRONOMICAL EFFEMERIS

FOR THE YEAR

1917

ADAPTED TO THE MERIDIAN

OF

H. THE MAJESTY'S OBSERVATORY

TRIVANDRUM.

---

PUBLISHED BY ORDER OF THE GOVERNMENT OF  
H. H. THE MAHARAJA OF TRAVANCORE.

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PRINTED BY THE SUPERINTENDENT GOVERNMENT PRESS  
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104	19	10	9.53	2.53
107	6 "	9	9.36	6.36
"	30 "	5	40.3	39.3
119	8 "	4	11.7	12.7
126	11	6	56	51
	25	5	26.3	26.0
128	7	4	120.0.5	20.5
130	17	4	2.1	28.1
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133	7	4	219	319
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136	5	7	45	54
	12	10	1.8	1.68
139	16	5	55.3	45.3
142		7	P. M.	A. M.
143	29	2	26	16
	30	2	37	24
	31	2	48	32
144	8	4	57.1	56.1
	24		39.5	29.5
	26		27.1	26.1
	27		25.4	24.4
	28	...	23.8	22.8
	29	2	27	24
	...	4	22.1	21.1
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		4	20.4	19.4
	31	4	19.7	17.7
145	21,22,23	2	20	19
151	1 "	8	35	3
169	"	3	May.	July.



**Dr. ROHANI THIRUNAL M. RAMA VARMA RAJA.**

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the Seismological Society of America, the Royal Photographic Society  
of London, the Royal Astronomical Society of Canada.  
the Astronomical Society of the Pacific, the British  
Astronomical Association, Membre Perpetual de la Societe  
Astronomique de France, Membre Honoraire  
de la Societe Nationale des Professeurs  
de Francais en Angleterre

**ASTRONOMER.**

## PREFATORY NOTE FOR 1917

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The Ephemeris has entered upon the second year of its new existence. The same plan as that outlined in the Ephemeris for 1916 has been followed this year also. A few additions have been made to enhance the usefulness of the Ephemeris to Indian Astronomers. The calculations made in the book will be of much use to those following the Drik-Ganita school.

Thanks are due to Messrs. Srinivasa Row of Trivandrum and Sitarama Sartrial of Tinnevely both eminent Indian Astronomers for their valuable suggestions.

Hints for improvements and corrections of errors, of which a few may remain after all care, will be thankfully received. I take this opportunity to thank Government for their warm support, and my Assistants for their enthusiastic collaboration.

H. H. The Maharaja's  
Observatory, Trivandrum,  
29th December 1916. }

M. RAMA VARMA RAJA,  
*Astronomer.*

## AN EPHEMERIS FOR THE YEAR 1917.

ADAPTED TO THE MERIDIAN OF TRIVANDRUM.

Trivandrum Observatory.

Longitude	5h 7m 59s = $76^{\circ} 59' 45''$ East.
Latitude	= $8^{\circ} 30' 33''$ North.
Deviation of the compass	= $0^{\circ} 42' 19''$ East.
Dip	= $2^{\circ} 30'$ South.
Height above the Sea	= 197 feet.

Trivandrum Mean Time is 5h 7m 59s in advance of G. M. T.,

or 22m 1s behind the Standard Time,

or 13m 1s behind the Madras Time.

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LATITUDES AND LONGITUDES OF SOME IMPORTANT  
STATIONS IN TRAVANCORE.

No.	Stations.	Latitude North.	Longitude East.
1	Kanyakumari.	8° 4'	77° 36·7
2	Suchindram.	8 8·5	77 31·5
3	Kottar.	8 9·5	77 30
4	Colachel.	8 10·2	77 19·5
5	Udayagiri. (Fort)	8 14·5	77 24
6	Thiruvattar.	8 19·6	77 19·7
7	Neyyattinkara.	8 23·4	77 13
8	Pechippara Dam.	8 27	77 20
9	Trivandrum (Fort Temple)	8° 28' 58"	76° 58' 56"
10	Trivandrum (Observatory)	8° 30' 33"	76° 59' 45"
11	Nagercoil.	8 30	77 30
12	Neduvengad.	8 33	77 8
13	Anjengo.	8 40	76 49·4
14	Varkala.	8° 44'	76° 46'
15	Ponmudi (Sanitarium.)	8 45·5	77 9·5
16	Navayikulam.	8 48	76 55
17	Quilon.	8 53·5	76 39·2
18	Shencottah.	8 59	78 0
19	Kottarakara.	9 0	76 49·5
20	Puliyara.	9 1	77 15
21	Kunnathoor.	9 2	76 50
22	Achankoil.	9 5	77 11
23	Kayamcolam.	9 16·2	76 34
24	Mavelickara.	9 14·4	76 36·3
25	Trikunnapuzha.	9 15·4	76 28·3
26	Thamaracolam.	9 18	79 5
27	Chengannore.	9 19·5	76 40·5
28	Thiruvallah.	9 20	76 40
29	Porakad.	9 21·2	76 25·5
30	Ranni.	9 22·6	76 49·7
31	Ambalapuzha.	9 23	76 25·9
32	Sabari Mala.	9 26	77 8·5
33	Changanacherry.	9 26·6	76 36
34	Alleppey.	9 29·6	76 24·5
35	Periyar Dam.	9 32	77 11
36	Peermade.	9 33·2	77 2·5
37	Kottayam.	9° 38'	76° 37'
38	Sherthalai.	9 41·4	76 24·5
39	Vaikom.	9 45·5	76 27·6
40	Cochin.	9 58	76 18·3
41	Edappilli.	10 1·8	76 22
42	Alwaye.	10 6·5	76 25
43	Parur.	10 9·6	76 16·5
44	Cranganore.	10 15·3	76 15·8

## METEOROLOGICAL NOTES.

## TRIVANDRUM.

Mercury at 32°, and Brass at 62° Fah.

Mean Atmospheric pressure at the observatory 29·681 inches.

Do. at the foot of the Observatory 29·800 inches.

Do. at the sea level 29·900 inches.

Highest temperature ever observed 96° Fah on 26th March 1896.

Lowest temperature observed 59°·9 Fah on 10th Dec. 1857.

Mean Maximum temperature of the air in the shade...88°·96 Fah.

Mean Minimum temperature of the air in the shade. 71°·89 Fah.

Mean temperature of the air in the shade ...77°·81 Fah.

Mean temperature of Evaporation in the shade / ...73°·42 Fah.

Mean temperature of the Dew point ...70°·39 Fah.

Mean Vapour pressure ...0·778 inch.

Mean percentage of humidity ...81 cts.

Mean proportion of sky clouded per day (the whole sky=1) .598

Mean duration of bright sunshine per day ...6·92 hrs.

Mean direction of the wind ...W. N. W.

Mean Velocity of the wind per day ...123·09 Miles.

Mean yearly evaporation ...88·54 inches.

\*Mean yearly fall of rain ...65·57 inches.

†Mean number of rainy days in a year ...126.

\* This result is obtained from 78 years' observations (1838—1915).

† Rainfall of less than 1/10 of an inch is not counted as a rainy day.

Average Rainfall at Trivandrum Observatory up to each day of the year, based on the observations of 76 years ending December 1913.

Day.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Day.
	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	Inches.	
1	0.03	0.62	1.17	2.79	7.38	16.39	29.55	36.91	41.49	45.46	56.53	62.83	1
2	0.07	0.62	1.19	2.89	7.60	16.79	29.77	37.03	41.61	45.66	56.85	63.01	2
3	0.09	0.63	1.20	2.98	7.93	17.35	30.08	37.18	41.73	45.84	57.09	63.10	3
4	0.13	0.65	1.22	3.07	8.28	17.85	30.39	37.31	41.81	46.25	57.38	63.22	4
5	0.18	0.67	1.23	3.10	8.46	18.38	30.67	37.47	41.97	46.52	57.68	63.36	5
6	0.19	0.67	1.26	3.17	8.66	19.06	30.94	37.62	42.12	46.80	58.05	63.51	6
7	0.20	0.68	1.28	3.31	8.87	19.72	31.16	37.76	42.28	47.05	58.37	63.61	7
8	0.23	0.70	1.30	3.44	9.05	20.27	31.38	37.92	42.40	47.33	58.59	63.70	8
9	0.23	0.76	1.35	3.54	9.19	20.80	31.68	38.07	42.55	47.59	58.86	63.79	9
10	0.26	0.77	1.36	3.72	9.46	21.35	32.03	38.18	42.74	47.82	58.99	63.87	10
11	0.27	0.78	1.43	3.95	9.65	21.85	32.31	38.29	42.90	48.09	59.30	63.93	11
12	0.29	0.79	1.48	4.05	9.84	22.45	32.50	38.44	43.04	48.46	59.57	64.02	12
13	0.31	0.80	1.54	4.12	9.94	22.84	32.81	38.60	43.20	48.88	59.87	64.17	13
14	0.32	0.82	1.59	4.23	10.07	23.29	33.04	38.77	43.32	49.19	60.11	64.25	14
15	0.33	0.83	1.61	4.33	10.25	23.78	33.29	38.91	43.38	49.53	60.34	64.31	15
16	0.34	0.84	1.66	4.46	10.37	24.20	33.49	39.03	43.51	50.07	60.53	64.40	16
17	0.35	0.86	1.71	4.59	10.53	24.59	33.69	39.17	43.60	50.39	60.76	64.49	17
18	0.36	0.90	1.81	4.81	10.69	25.07	33.91	39.39	43.76	50.90	60.93	64.63	18
19	0.38	0.96	1.88	4.96	11.09	25.64	34.15	39.49	43.88	51.37	61.20	64.68	19
20	0.39	0.98	1.90	5.13	11.28	26.00	34.33	39.61	44.00	51.78	61.52	64.76	20
21	0.42	1.01	1.96	5.26	11.68	26.31	34.56	39.72	44.08	52.16	61.47	64.83	21
22	0.43	1.04	2.00	5.41	11.97	26.64	34.77	39.89	44.08	52.63	61.59	64.85	22
23	0.44	1.06	2.13	5.53	12.40	26.95	35.04	40.11	44.18	53.02	61.74	64.85	23
24	0.45	1.09	2.15	5.72	12.84	27.28	35.31	40.24	44.32	53.41	61.89	64.90	24
25	0.51	1.10	2.19	6.00	13.26	27.68	35.56	40.41	44.45	53.87	62.06	64.96	25
26	0.53	1.11	2.28	6.20	13.67	28.02	35.87	40.56	44.55	54.32	62.20	65.02	26
27	0.56	1.12	2.35	6.43	14.08	28.40	36.10	40.72	44.77	54.67	62.38	65.11	27
28	0.57	1.15	2.39	6.73	14.51	28.71	36.24	40.88	44.96	55.04	62.47	65.14	28
29	0.59		2.47	7.02	14.88	29.04	36.42	41.09	45.14	55.00	62.57	65.16	29
30	0.60		2.58	7.20	15.42	29.36	36.57	41.22	45.26	56.00	62.71	65.22	30
31	0.61		2.67		15.95		36.71	41.31		56.32	..	65.29	31

TABLE I. Monthly and Yearly Average Rainfall at the various Stations in the Travancore District.

No.	Stations.	Number of Years.	Years.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Yearly Average.	Remarks.
<b>I. DEVIKULAM DIVISION.</b>																	
1	Chinnar	7	1909-1915	1.01	0.23	0.15	1.10	1.81	1.81	1.32	1.29	2.30	5.74	4.67	3.19	24.82	Inches.
2	Marayur	...	1915	observed	...	...	4.70	1.92	28.67	7.97	5.05	5.70	3.10	6.54	2.40	6.54	Inches.
3	Munnar	3	1913	0.23	0.87	1.61	5.10	5.49	32.02	53.46	22.38	14.46	9.54	3.80	2.88	151.84	Inches.
4	Devikulam	11	1905	0.54	0.81	1.99	5.05	6.53	20.45	27.90	15.06	10.08	12.61	7.01	1.73	109.76	Inches.
5	Santampara (Puppara)	7	1909	0.85	1.27	1.54	5.17	3.71	12.55	11.17	4.57	4.34	12.37	10.02	3.86	71.42	Inches.
6	Kumzhi	7	1909	0.75	1.20	0.70	2.43	3.89	14.62	15.13	4.65	3.26	8.80	7.16	4.10	66.69	Inches.
7	Peernade (Cutcherry)	7	1909	0.49	1.31	2.86	9.25	15.70	58.39	55.21	21.05	16.16	24.91	12.73	2.95	221.61	Inches.
8	Do.	42	1874	0.46	1.16	2.43	6.11	11.69	48.05	51.29	33.45	18.70	21.38	7.84	1.86	204.42	Inches.
9	Kanjrapally	11	1905	1.58	9.48	4.74	11.31	14.52	30.34	30.33	19.61	12.08	21.57	12.00	3.71	164.79	Inches.
<b>II. KOTTAYAM DIVISION.</b>																	
1	Malayattur	11	1905	0.84	0.61	1.44	5.71	9.95	32.86	33.80	21.64	10.93	15.54	8.31	2.64	144.27	Inches.
2	Parur	33	1883	0.17	0.36	1.22	3.88	9.90	32.73	26.36	14.51	9.01	12.84	5.67	1.20	117.88	Inches.
3	Tiruvalur (Alangad)	31	1885	0.08	0.28	0.58	1.76	4.92	23.53	22.55	11.00	5.22	8.22	3.72	0.80	82.74	Inches.
4	Alwaye P. W. D. Office	4	1912	..	0.07	0.99	1.06	6.54	32.40	33.42	14.16	10.22	16.26	8.52	2.60	126.94	Inches.
5	Perumpavur (Cunnatunad)	31	1885	0.22	0.54	0.97	3.66	5.80	23.30	25.74	13.59	7.31	10.20	5.88	1.08	98.81	Inches.
6	Moorkatupuzha	32	1884	0.31	0.62	1.44	6.04	8.17	28.30	29.00	16.93	9.80	14.83	7.73	2.10	125.27	Inches.
7	Karikod (Iolupuzha)	31	1885	0.51	1.35	2.42	8.62	11.24	29.79	30.52	19.98	11.94	18.07	7.49	1.84	143.77	Inches.
8	Arookutti	11	1905	1.12	0.74	0.93	5.88	7.78	23.92	29.43	13.06	9.56	14.03	7.96	2.49	125.56	Inches.
9	Vaikam	31	1885	0.39	0.54	1.28	3.04	7.78	23.92	20.33	10.12	7.18	10.22	5.41	1.42	92.13	Inches.
10	Pala (Meenachal)	32	1884	0.80	1.24	3.98	10.18	12.61	28.69	27.61	16.66	10.52	17.95	9.44	3.19	142.90	Inches.
11	Chertala	31	1885	0.60	0.70	1.43	3.74	9.16	24.62	21.63	10.17	6.64	11.73	5.92	1.94	98.28	Inches.

TABLE I. Monthly and Yearly Average Rainfall at the various Stations in the Travancore District—(contd.)

No.	Stations.	Number of years.	Years.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Yearly Average.	Remarks.
<b>II. KOTTAYAM DIVISION.</b>																	
<i>contd.</i>																	
12	Ettumanoor	31	1885—1915	0.40	0.34	1.29	6.50	8.82	29.62	25.26	13.47	7.20	10.94	5.25	1.91	111.00	Inches.
13	Kottayam Taluk Cutcherry ...	31	1885	0.38	0.44	2.27	5.52	9.49	27.72	23.59	13.41	9.56	15.56	7.10	2.50	117.54	Inches.
14	Do. Engineer's Office ...	24	1892	0.56	0.70	1.95	5.85	9.09	29.07	25.98	14.80	10.69	15.18	6.29	3.09	123.25	Inches.
15	Changanasseri	31	1885	0.36	0.80	2.23	6.34	9.48	25.67	19.65	10.71	7.64	15.89	7.37	2.89	109.23	Inches.
<b>III. QUILON DIVISION.</b>																	
1	Alleppey Assistant Excise Commissioner's Office	42	1874	0.69	1.58	2.05	4.91	11.40	27.04	20.52	11.65	8.50	14.97	8.78	3.10	115.19	Inches.
2	Do. P. W. D. Office	3	1913	0.04	3.58	0.98	3.03	14.70	19.72	24.81	11.11	13.81	13.81	8.90	2.70	117.50	Inches.
3	Ambalapuzha	31	1885	0.65	0.88	2.11	5.34	8.64	23.12	17.93	8.97	8.32	14.61	7.05	2.15	99.67	Inches.
4	Tiruvalla	32	1884	0.30	0.85	1.38	4.96	9.19	24.80	20.46	10.16	7.19	12.22	6.25	1.99	100.35	Inches.
5	Chengannoor	31	1885	0.71	0.86	2.60	6.64	9.25	23.58	18.76	10.84	8.69	12.86	7.26	2.68	104.73	Inches.
6	Havipad (Kartikapally)	31	1885	0.48	0.61	1.31	3.94	7.84	22.82	16.99	8.41	6.74	13.65	6.04	2.17	91.03	Inches.
7	Palanamitta	11	1905	0.90	1.62	3.08	8.11	10.78	20.85	21.57	13.75	10.76	16.62	10.34	3.13	121.51	Inches.
8	Mavelikara	32	1884	0.52	0.74	1.24	5.23	8.67	26.12	20.30	11.10	8.17	15.29	7.33	2.37	107.08	Inches.
9	Koimbi	11	1905	0.50	2.15	4.48	9.05	11.20	22.37	22.66	13.37	10.74	18.07	11.42	1.85	127.89	Inches.
10	Kayankulam	11	1905	0.71	0.49	1.52	4.77	8.72	22.29	16.61	8.75	7.64	11.94	7.39	1.80	92.63	Inches.
11	Adur (Kunnamt)	31	1885	0.40	1.23	2.16	7.19	8.47	21.55	16.76	10.03	7.54	13.43	6.49	2.17	97.42	Inches.
12	Karunagapalli	31	1885	0.32	0.90	1.26	4.32	8.26	22.24	14.72	7.29	6.95	12.64	5.73	1.73	86.36	Inches.
13	Punalur (Patanapuram)	31	1885	0.32	1.72	3.08	7.30	8.56	21.30	17.80	10.28	8.60	16.75	8.07	2.31	106.49	Inches.
14	Kottarakara	31	1885	0.30	1.12	2.60	7.33	7.85	22.25	15.25	9.02	7.61	14.60	7.13	1.92	97.01	Inches.
15	Ayakkudi	3	1913	0.10	0.73	0.31	1.17	0.38	2.81	7.13	0.13	1.19	9.23	8.03	7.02	38.23	Inches.
15	Aryankavu	11	1905	0.49	1.31	2.59	2.92	5.62	20.89	17.84	10.52	7.82	16.71	10.92	3.61	101.24	Inches.

TABLE I. Monthly and Yearly Average Rainfall at the various Stations in the Travancore District - (contd.)

No.	Station.	Number of Years.	Years.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Yearly Average.	Rem rks.
<b>III. QUILON DIVISION.</b>																	
<i>contd.</i>																	
17.	Shencotta P. W. D. Office	3	1913-1915	0.23	0.61	0.29	2.23	0.64	8.74	8.32	1.45	2.92	11.21	12.96	8.24	57.84	
18.	Do. Taluk Cutcherry	33	1883	1.21	1.50	2.21	3.48	1.92	7.31	5.82	2.32	1.58	7.18	7.22	3.72	45.42	
19.	Quilon Engineer's Office	42	1874	0.39	0.68	1.63	4.88	9.61	20.92	13.94	8.23	7.21	13.49	6.69	1.77	89.19	
20.	Do. Taluk Cutcherry	11	1905	0.61	0.54	1.06	3.76	7.84	15.52	12.55	6.98	6.95	9.69	6.52	1.23	73.25	
21.	Paravoor	(a)	1905	0.14	0.63	1.57	4.91	8.92	21.73	13.97	7.04	5.97	13.77	6.38	1.50	86.83	(a) Excepting 1908 figures for which are not available.
<b>IV. TRIVANDRUM DIVISION.</b>																	
1	Attungal (Shersainkicl)	31	1885	0.41	0.76	1.00	4.23	6.23	17.99	10.56	4.71	4.26	12.00	5.55	1.68	69.68	
2	Nedumangad	31	1885	0.73	1.09	2.03	7.47	7.65	18.15	10.50	5.42	6.15	15.12	9.64	3.02	86.97	
3	Trivandrum	78	1838	0.61	0.57	1.49	4.49	8.78	13.35	7.55	4.61	4.09	10.99	6.40	2.61	65.57	
4	Pangod	11	1905	0.55	0.42	1.70	7.44	7.85	14.82	10.22	4.30	5.83	12.61	8.27	3.33	74.40	
5	Neyyattinkara	31	1885	0.61	0.65	1.35	4.25	6.44	12.75	6.65	2.92	3.44	11.36	7.62	2.89	60.99	(b) Excepting 1913 figures for which are not available.
6	Parassala	(b)	1905	0.55	0.54	1.31	3.91	6.22	10.00	6.11	2.60	4.18	10.43	7.02	2.72	55.39	
<b>V. PADMANABHAPURAM DIVISION.</b>																	
1	Pechippura	3	1913	1.53	0.77	1.76	10.02	7.47	11.51	12.92	2.22	8.17	15.99	13.11	8.05	92.67	
2	P. P. Channel 16th mile	3	1913	0.70	0.10	0.53	2.48	4.97	7.05	8.53	1.74	3.75	9.58	12.07	5.92	57.42	
3	Kaliyal	3	1913	1.22	0.71	1.08	7.16	5.84	8.52	10.46	2.21	6.41	16.49	11.48	4.94	76.52	
4	Kolasekharum	3	1913	1.83	1.18	1.23	7.20	5.72	8.96	10.52	1.81	6.46	16.72	12.32	6.42	79.87	
5	Purtan Dam	3	1913	0.64	0.73	1.82	3.68	5.83	8.55	10.99	1.78	7.51	15.57	13.14	7.12	77.36	

TABLE I. Monthly and Yearly Average Rainfall at the various Stations in the Travancore District--(contd.)

No.	Stations.	Number of Years.	Years.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Yearly Average.	Remarks.
V PADMAFABHAPURAM DIVISION. contd.																	
6	Chorlakod	3	1913--1915	1.15	1.09	2.21	3.94	5.76	8.78	10.10	1.84	5.61	12.59	10.76	5.78	69.61	Inches.
7	Tiruvattar	11	1905	0.58	0.91	1.74	3.93	4.81	10.65	6.07	3.08	3.79	12.59	8.81	3.27	60.23	Inches.
8	Tadikaranconnam	3	1913	1.43	0.83	2.13	6.32	4.28	8.65	9.77	2.16	4.92	13.10	8.35	5.50	67.44	Inches.
9	Seethapal	3	1913	0.93	0.08	0.68	2.86	3.77	5.88	6.54	1.11	2.79	11.03	8.43	7.50	51.60	Inches.
10	Kuzhithura (Vilavankod)	31	1885	0.37	0.62	1.09	3.27	3.44	8.80	4.48	1.75	2.37	8.94	5.81	2.25	43.19	Inches.
11	Mekod	3	1913	1.04	0.96	1.32	3.92	5.30	6.49	9.07	1.34	6.61	10.02	10.79	4.57	61.43	Inches.
12	Mulakumood	3	1913	0.43	0.83	0.60	2.59	5.97	9.86	10.16	1.75	6.21	9.35	8.88	5.26	61.89	Inches.
13	Bhoottapandi (Tovala)	27	1859	0.72	0.63	1.65	3.73	2.29	8.47	4.66	1.96	1.81	9.69	7.12	2.75	45.52	Inches.
14	Anuvamozhi	33	1853	0.74	0.51	1.14	2.91	1.28	4.34	2.16	0.83	0.99	7.78	6.61	2.45	31.77	Inches.
15	Takkala (Kaleulam)	42	1871	0.63	0.85	1.71	4.80	4.82	9.14	4.32	2.37	2.73	10.71	8.65	3.07	53.80	Inches.
16	Eranjal	31	1855	0.30	0.42	0.94	3.31	2.71	8.03	3.31	1.19	1.85	7.53	6.02	2.01	37.97	Inches.
17	Kelchul Salt Factory	10	1906	0.51	0.33	0.51	1.67	3.18	8.63	5.58	1.62	2.69	7.88	6.69	2.93	42.22	Inches.
18	Do. Citcherry	11	1905	0.37	0.20	0.30	2.03	3.75	8.86	4.62	1.26	2.05	7.07	6.11	2.77	39.44	Inches.
19	Nagercoil	21	1892	0.87	0.49	0.69	3.27	2.00	7.10	3.46	1.63	1.44	8.26	7.01	2.76	38.98	Inches.
20	Edalakudi (Agastoesvaram)	21	1855	0.56	0.53	1.06	2.81	1.71	6.05	2.63	1.22	0.99	8.37	6.84	2.77	35.59	Inches.
21	Santapuram	1	1915	1.35	0.55	0.95	3.34	0.55	3.80	9.50	0.65	4.47	4.20	7.90	0.20	36.56	Inches.
22	Rajakamungalam	36	1380	0.70	0.28	1.13	3.03	2.98	7.98	3.58	1.82	1.59	8.40	6.53	2.42	40.49	Inches.
23	Tomaraulam Old Salt Factory	31	1885	0.51	0.34	1.26	2.42	1.48	5.90	2.27	1.17	1.15	8.80	6.63	3.17	35.10	Inches.
24	Do. New Do.	8	1903	0.23	0.21	0.55	0.95	2.10	4.11	2.67	0.64	1.29	7.00	6.80	3.49	30.04	Inches.
25	Variyoor Do.	31	1885	0.71	0.40	1.25	2.40	1.07	4.91	1.85	0.84	0.68	6.99	7.12	2.82	31.04	Inches.
26	Kottaram	3	1913	...	0.09	0.28	0.16	0.86	1.83	2.19	0.36	0.78	7.15	8.04	5.60	27.39	Inches.

**TABLE II. Monthly and Yearly Average Number of Rainy Days in the various Stations in the Travancore District.**

No.	Stations.	Number of Years.	Years.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Yearly Average.	Remarks.
<b>I. DEVIKULAM DIVISION.</b>																	
1	Chinnar	7	1909-1915	1	1		3	3	4	4	3	4	11	7	5	46	
2	Marayur	...	1915 No. obs.	1	1		12	3	12	12	8	18	7	16	7	...	
3	Munnar	...	1913-1915	1	2	5	11	13	25	29	24	19	15	7	7	158	
4	Devikulam	11	1905	1	2	5	9	12	23	25	21	16	19	11	4	148	
5	Santampara (Puppala)	7	1909	2	2	4	9	7	17	19	9	8	17	13	7	114	
6	Kumiziti	7	1909	2	2	2	5	5	18	22	10	8	14	10	5	103	
7	Peermade (Cutcherry)	...	1909	1	2	4	8	15	25	28	22	18	20	14	4	161	
8	Do. Residency	42	1874	1	2	4	10	15	27	28	26	20	21	10	3	167	
9	Kanjirapalli	11	1905	2	3	6	13	15	24	26	23	17	19	13	5	164	
<b>II. KOTTAYAM DIVISION.</b>																	
1	Malayattor	11	1905	1	1	2	7	14	26	29	25	17	18	11	3	154	
2	Parur	33	1883	...	1	2	5	10	24	24	17	11	13	7	1	115	
3	Tiruvalur (Alangad)	31	1885	...	1	1	5	8	24	25	18	11	14	7	2	116	
4	Always P. W. D. Office	4	1912	...	1	1	4	10	25	27	19	12	18	8	3	128	
5	Perumpavur (Cunnatunad)	31	1885	...	1	2	6	8	24	26	21	13	15	7	2	125	
6	Moovatupuzha	32	1884	1	1	3	10	11	24	27	22	15	18	10	3	145	
7	Karikod (Todupuzha)	31	1885	1	2	5	12	14	25	27	23	16	20	10	3	158	
8	Arookutti	11	1905	1	1	2	6	11	23	25	18	14	14	9	3	127	
9	Vaikam	31	1885	...	1	2	6	12	23	26	16	13	13	8	3	120	
10	Pala (Meenachal)	32	1884	1	2	6	13	15	24	26	22	16	19	12	4	160	
11	Chertalla	31	1885	1	1	2	7	13	24	23	18	12	15	10	3	129	

TABLE II. Monthly and Yearly Average Number of Rainy Days in the various Stations in the Travancore District--(contd.)

No.	Station	Number of Years.	Years.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Yearly Average.	Remarks.
<b>II. KOTTAYAM DIVISION.</b>																	
<i>contd.</i>																	
12	Ettumamur	31	1885--1915	1	1	2	8	11	23	24	19	12	15	8	3	127	
13	Kottayam Taluk Cutcherry	31	1885	1	1	3	8	12	24	25	20	14	17	9	4	139	
14	Do. Engineer's Office	21	1892	1	1	3	8	11	23	25	20	14	16	8	3	133	
15	Changanasseri	31	1885	1	1	3	9	12	22	21	15	11	16	10	4	125	
<b>III. QUILON DIVISION.</b>																	
1	Alleppey Assistant Excise Commissioner's Office	42	1874	1	2	4	8	12	24	25	20	15	17	12	4	145	
2	Do. P. W. D. Office	3	1913	..	3	3	4	12	21	27	16	17	15	11	3	132	
3	Ambalapuzha	31	1885	1	2	3	7	11	23	22	16	12	16	10	3	126	
4	Thruvalla	32	1884	1	1	3	9	13	24	24	18	11	17	11	3	138	
5	Chengannur	31	1885	1	2	4	8	12	21	22	17	13	15	11	4	130	
6	Haripad (Kartikapalli)	31	1885	1	1	2	5	11	22	22	15	11	16	9	3	118	
7	Pattanamitta	11	1905	1	3	5	11	12	22	22	18	14	17	13	4	142	
8	Mavelikara	32	1884	1	1	2	7	10	23	23	11	14	16	11	3	129	
9	Komni	11	1905	1	3	6	12	13	22	23	18	15	18	12	3	146	
10	Kayankulam	11	1905	1	1	2	5	11	22	21	15	13	16	10	3	120	
11	Adur (Kunnattur)	31	1885	1	2	4	10	11	22	22	16	12	17	11	3	131	
12	Karuagakupalli	31	1885	1	1	3	7	11	22	19	13	11	14	7	3	111	
13	Punalur (Pattanapuram)	31	1885	1	1	3	10	12	22	23	17	13	18	10	3	137	
14	Kottarakara	31	1885	1	2	4	11	12	23	22	17	13	17	10	3	135	
15	Ayakudi	3	1913	1	1	2	4	1	7	8	1	5	12	13	9	63	
16	Arienkavu	11	1905	1	2	3	6	7	20	22	17	12	16	14	5	125	

TABLE II. Monthly and Yearly Average Number of Rainy Days in the various Stations in the Travancore District--(contd.)

No.	Stations.	Number of Years.	Years.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Yearly Average.	Remarks.
<b>III. QUILON DIVISION.</b>																	
<i>contd.</i>																	
17	Shencottah P. W. D. Office ...	3	1913 - 1915	1	2	1	5	3	13	14	6	7	13	14	8	87	
18	Do. Taluk Cutcherry ...	33	1883	2	2	3	6	3	13	13	5	5	12	11	3	121	
19	Quilon Engineer's Office ...	42	1874	1	1	3	7	12	22	20	16	12	15	9	3	131	
20	Do. Taluk Cutcherry ...	11	1905	1	1	2	8	14	21	22	15	15	18	8	3	168	(a) Excepting 1908 figures for which are not available.
21	Paravoor	10	1905	...	1	3	6	11	20	19	13	6	15			168	
<b>IV. TRIVANDRUM DIVISION.</b>																	
1	Attingal (Cherainkil)	31	1885	1	1	2	7	9	20	18	11	9	14	9	3	104	
2	Nedunangad	31	1885	1	2	4	10	9	20	17	11	10	16	12	5	117	
3	Trivandrum	78	1888	2	1	4	9	13	21	19	14	11	15	12	5	126	
4	Pangod	11	1905	1	1	2	6	9	17	17	9	9	14	11	4	100	
5	Neyyattinkar	31	1885	1	1	2	7	9	17	14	8	7	14	11	3	96	
6	Parassala	10	1905	1	1	2	6	7	12	12	6	8	11	6	3	78	(b) Excepting 1912 figures for which are not available.
<b>V. PADMANABHAPURAM DIVISION.</b>																	
1	Peechipara	3	1913	2	2	3	10	11	17	16	8	11	17	17	7	121	
2	P. P. Channell 16th mile	3	1913	1	1	1	4	7	14	13	4	9	12	15	7	88	
3	Kaliyal	3	1913	2	1	3	10	8	15	16	5	8	14	14	7	103	
4	Kulasekhran	3	1913	2	2	2	10	8	14	14	5	10	16	14	7	104	
5	Lutran Dam	3	1913	1	2	4	7	9	14	16	6	11	17	17	7	111	

TABLE II. Monthly and Yearly Average Number of Rainy Days in the various Stations in the Travancore District--(cont'd.)

No.	Stations.	Number of Years.	Years.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Yearly Average.	Remarks.
<b>V. PADMANABHAPURAM</b>																	
<b>DIVISION — cont'd.</b>																	
6	Chorlakod	3	1913—1915	1	1	3	7	6	14	14	9	10	17	16	6	101	
7	Tiruvattar	11	1905	1	1	3	6	6	14	14	7	7	14	12	4	87	
8	Tadikaranconam	3	1913	1	1	4	8	7	14	16	4	9	16	12	7	99	
9	Seetapal	3	1913	1	1	2	4	3	12	13	3	7	12	12	9	74	
10	Kuzhithora (Vilavankod)	31	1885	1	1	2	5	5	13	9	5	5	12	8	3	69	
11	Mekod	3	1913	2	1	2	5	7	10	13	3	9	12	15	6	85	
12	Mulakumood	3	1913	1	1	2	5	6	13	13	5	8	14	12	7	86	
13	Bhoopandy (Tovala)	27	1889	1	1	3	5	4	13	10	5	4	13	9	3	71	
14	Aruvamozi	33	1883	1	1	2	4	2	9	5	3	3	11	8	3	52	
15	Takkala (Kalculam)	42	1874	1	1	3	6	7	14	10	5	5	13	10	4	79	
16	Eraniyal	31	1885	1	1	2	6	5	13	8	3	5	12	9	3	68	
17	Kolachal Salt Factory	10	1906	1	1	1	4	5	13	11	4	5	10	9	4	66	
18	Do. Cutcherry	11	1905	1	1	1	3	5	12	8	3	4	9	9	3	59	
19	Nagercoil	24	1892	1	1	2	5	3	11	8	3	4	11	9	3	61	
20	Edalakkudi (Agasteeswaram)	31	1885	1	1	2	4	3	10	6	3	3	11	9	3	56	
21	Smtapuram	1	1915	1	1	...	4	1	8	10	2	10	3	10	2	52	
22	Rajakamongelam	36	1880	1	1	2	4	6	13	9	5	4	11	9	4	69	
23	Tannaculam Old Salt Factory	31	1885	1	1	2	3	3	12	6	3	3	10	9	4	57	
24	Do. New	8	1908	1	1	1	1	3	8	6	2	4	10	9	3	43	
25	Variyoor	31	1885	1	1	2	3	2	9	5	2	2	9	8	4	43	
26	Kotiaruru	3	1913	1	1	1	1	1	5	5	1	3	6	8	5	35	

INTERESTING FACTS IN CONNECTION WITH RAINFALL  
IN TRAVANCORE.

Statistics.	Trivandrum.		Peermade Resi- dency (Heaviest)		Chinnar (Least)	
	Year.	Inches.	Year.	Inches.	Year.	Inches.
Heaviest Annual Rainfall ...	1878	105·16	1882	321·95	1912	28·40
Lowest ...	1860	35·09	1898	135·03	1911	19·55
Average of ...	76	65·30	31	203·98		25·62
Maximum Rainfall per day	1883 May 10	14·32	1882 June 28	13·30	1912 Nov. 4.	3·45

## ENGLISH AND CORRESPONDING MALABAR YEARS.

ENGLISH. MALABA	ENGLISH.	ENGLISH. MALABAR.	ENGLISH. MALABAR.
1801..... 976-7	1830..... 1005-6	1859...1034-5	1888.....1063-4
1802..... 977-8	1831 .... 1006-7	1860...1035-6	1889.....1064-5
1803..... 978-9	1832.....1007-8	1861...1036-7	1890.....1065-6
1804..... 979-0	1833.....1008-9	1862...1037-8	1891.....1066-7
1805..... 980-1	1834 ...1009-0	1863...1038-9	1892... 1067-8
1806..... 981-2	1835.....1010-1	1864...1039-0	1893.....1068-9
1807..... 982-3	1836.....1011-2	1865...1040-1	1894.....1069-0
1808..... 983-4	1837.....1012-3	1866...1041-2	1895.....1070-1
1809..... 984-5	1838.....1013-4	1867...1042-3	1896.....1071-2
1810..... 985-6	1839.....1014-5	1868...1043-4	1897.....1072-3
1811..... 986-7	1840.....1015-6	1869...1044-5	1898.....1073-4
1812..... 987-8	1841.....1016-7	1870...1045-6	1899.....1074-5
1813..... 988-9	1842... 1017-8	1871...1046-7	1900.... 1075-6
1814..... 989-0	1843.....1018-9	1872...1047-8	1901... ..1076-7
1815... 990-1	1844... 1019-0	1873...1048-9	1902 .....1077-8
1816..... 991-2	1845.....1020-1	1874...1049-0	1903.....1078-9
1817..... 992-3	1846.....1021-2	1875...1050-1	1904.....1079-0
1818..... 993-4	1847... 1022-3	1876...1051-2	1905.....1080-1
1819..... 994-5	1848.....1023-4	1877...1052-3	1906.....1081-2
1820..... 995-6	1849.....1024-5	1878...1053-4	1907.....1082-3
1821..... 996-7	1850.....1025-6	1879 ..1054-5	1908.....1083-4
1822..... 997-8	1851.....1026-7	1880...1055-6	1909.....1084-5
1823... 998-9	1852.....1027-8	1881...1056-7	1910.....1085-6
1824..... 999-0	1853.... 1028-9	1882...1057-8	1911.....1086-7
1825.....1000-1	1854.....1029-0	1883...1058-9	1912. ....1087-8
1826.....1001-2	1855.....1030-1	1884...1059-0	1913.....1088-9
1827.....1002-3	1856.....1031-2	1885...1060-1	1914.... 1089-0
1828.....1003-4	1857.....1032-3	1886...1061-2	1915 .....1090-1
1829.....1004-5	1858.....1033-4	1887...1062-3	1916... ..1091-2
			1917.....1092-3



ENGLISH AND CORRESPONDING MALABAR MONTHS WITH DATES  
FOR 1917.

English	Day.	Malabar.	1092-93.
January.	1st.	Mon.	18th Dhanu or Markali.
Do.	14th.	Sun.	1st Makaram or Tai
February.	1st.	Thur.	19th Do. Do.
Do.	12th.	Mon.	1st Kumbham or Masi
March.	1st.	Thur.	18th Do. Do.
Do.	14th.	Wed.	1st Meenam or Panguni.
April.	1st.	Sun.	19th Do. Do.
Do.	13th.	Fri.	1st Medam or Chittrai.
May.	1st.	Tues.	19th Do. Do.
Do.	14th.	Mon.	1st Edavom or Vaikasi.
June.	1st.	Fri.	19th Do. Do.
Do.	14th.	Thur.	1st Mithunam or Ani.
July.	1st.	Sun.	18th Do. Do.
Do.	16th.	Mon.	1st Karkatakam or Adi.
August.	1st.	Wed.	17th Do. Do.
Do.	17th.	Fri.	1st Chingam or Avani 1093.
September.	1st.	Sat.	17th Do. Do.
Do.	16th.	Sun.	1st Kanni or Puruttasi.
October.	1st.	Mon.	16th Do. Do.
Do.	17th.	Wed.	1st Thulam or Alpasi.
November.	1st.	Thur.	16th Do. Do.
Do.	16th.	Fri.	1st Vrischikam or Karthigai.
December.	1st.	Sat.	16th Do. Do.
Do.	15th.	Sat.	1st Dhanu or Markali.

MONTH, DAY AND TIME OF THE SUN ENTERING SIGNS OF THE  
ZODIAC—(Ravisankramam.)

The Sun enters.	Date and Month. 1917.	Hour.
Aquarius	20th January.	h m P. M.
Pisces	19th February.	10 13 A. M.
Aries	21st March.	9 45 A. M.
Taurus	20th April.	9 25 P. M.
Gemini	21st May.	9 7 P. M.
Cancer	22nd June.	5 23 A. M.
Leo	23rd July.	4 16 P. M.
Virgo	23rd August.	11 2 P. M.
Libra	23rd September.	8 8 P. M.
Scorpio	24th October.	4 52 A. M.
Sagittarius	23rd November.	1 53 A. M.
Capricornus	22nd December.	2 54 P. M.

NAKSHATRAS.  
OR MOON'S LONGITUDE,

Name of Nakshatras in order.		Duration.	Corresponding Greek Names.
1	Asvini.	° 0 0	<i>Beta</i> Arietis.
2	Bharani.	13 20	41 Arietis.
3	Krittika.	26 40	Eta Tauri (Alcyone).
4	Rohini.	49 0	Alpha Tauri (Aldebaran).
5	Mrigasira.	20	Lambda Orio
6	Ardr.	66 40	Alpha Orionis (Betelguese).
7	Punarvasu.	80 0	Beta Geminorum (Pollux).
8	Pushya.	93 20	Delta Cancri.
9	Aslesha.	106 40	Alpha Cancri.
10	Magha.	120 0	Alpha Leonis (Regulus)
11	Purva Phalguni	133 20	Delta Leonis.
12	Uttara Phalguni,	146 40	Beta Leonis.
13	Hasta.	160 0	Delta Corvi.
14	Chitra	173 20	Alpha Virginis (Spica).
15	Svati.	186 40	Alpha Bootis (Arcturus).
16	Visakha.	200 0	Iota Librae.
17	Anuradha	213 20	Delta Scorpii.
18	Jyeshtha.	226 40	Alpha Scorpii (Antares).
19	Mula.	240 0	Lambda Scorpii.
20	Purva Ashadha.	253 20	Delta Sagittarii.
21	Uttra Ashadha.	266 40	Sigma Sagittarii.
22	Shravana.	280 0	Alpha Aquilae (Altair).
	Dhanishta.	293 20	Alpha Delphini.
24	Satabhisha.	306 40	Lambda Aquarii.
	Purva Bhadrapada.	320 0	Alpha Pegasi.
26	Uttara Bhadrapada	333 20	Alpha Andromedae.
27	Revati.	346 40	Zeta Piscium.

\* The Mean duration of each Nakshatra is 1°01'19" days, or 1 day and nearly 18 minutes. 27 Nakshatras make one Rasi or Sign.

## SYMBOLS AND ABBREVIATIONS.

## SIGNS OF THE PLANETS, etc.

☉ The Sun.	♂ Mars.
☾ The Moon.	♃ Jupiter.
☿ Mercury.	♄ Saturn.
♀ Venus.	♅ Uranus.
or ♂ The Earth.	♆ Neptune.

## SIGNS OF THE ZODIAC.

1. ♈ Aries (Mesham)	0	7. ♎ Libra (Tulam)	180
2. ♉ Taurus (Vrishabham)	30	8. ♏ Scorpio (Vrischikam)	210
3. ♊ Gemini (Mithunam)	60	9. ♐ Sagittarius (Dhanu)	240
4. ♋ Cancer (Karkatakam)	90	10. ♑ Capricornus	(Makaram) 270
5. ♌ Leo (Simham)	120	11. ♒ Aquarius (Kumbham)	300
6. ♍ Virgo (Kanni)	150	12. ♓ Pisces (Minam)	300

## ASPECTS.

- ♌ Conjunction, or having the same Longitude or Right Ascension.  
 ⊥ Quadrature, or differing  $\pm 90^\circ$  in Longitude or Right Ascension.  
 ♂ Opposition, or differing  $180^\circ$  in Longitude or Right Ascension.

## ABBREVIATIONS.

♌	Ascending Node.	h.	Hours of Time.
♎	Descending Node.	m.	Minutes of Time.
N.	North.	s.	Seconds of Time.
S.	South.	Long.	Longitude.
E.	East.	Lat.	Latitude.
W.	West.	Conj.	Conjunction.
R. A.	Right Ascension.	Opp.	Opposition.
Decl.	Declination.	Quad.	Quadrature
G. M. T.	Greenwich Mean Time.	Mer.	Mercury.
Sd. T.	Sidereal Time.	Ven.	Venus.
M. T.	Mean Time.	Mar.	Mars.
Hor. Par.	Horizontal Parallax.	Jup.	Jupiter
°	Degrees	Sat.	Saturn.
	Minutes of Arc.	Ura.	Uranus.
	Seconds of Arc.	Nep.	Neptune.

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OR MOON'S LONGITUDE,

Name of Nakshatras in order.	Duration.	Corresponding Greek Names.
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7	80 0	Beta Geminorum (Pollux).
8	93 20	Delta Cancri.
9	106 40	Alpha Cancri.
10	120 0	Alpha Leonis (Regulus)
11	133 20	Delta Leonis.
12	146 40	Beta Leonis.
13	160 0	Delta Corvi.
14	173 20	Alpha Virginis (Spica).
15	186 40	Alpha Bootis (Arcturus).
16	200 0	Iota Libræ.
17	213 20	Delta Scorpii.
18	226 40	Alpha Scorpii (Antares).
19	240 0	Lambda Scorpii.
20	253 20	Delta Sagittarii.
21	266 40	Sigma Sagittarii.
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23	293 20	Alpha Delphini.
24	306 40	Lambda Aquarii.
	320 0	Alpha Pegasi.
26	333 20	Alpha Andromedæ.
27	346 40	Zeta Pesci

\* The Mean duration of each Nakshatra is 1.01191 days, or 1 day and nearly 18 minutes. 27 Nakshatras make one Rasi or Sign.

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W.	West.	Conj.	Conjunction.
R. A.	Right Ascension.	Opp.	Opposition.
Decl.	Declination.	Quad.	Quadrature
G. M. T.	Greenwich Mean Time.	Mer.	Mercury.
Sd. T.	Sidereal Time.	Ven.	Venus.
M. T.	Mean Time.	Mar.	Mars.
Hor. Par.	Horizontal Parallax.	Jup.	Jupiter
°	Degrees	Sat.	Saturn.
	Minutes of Arc.	Ura.	Uranus.
	Seconds of Arc.	Nep.	Neptune.

## CHRONOLOGICAL NOTES FOR 1917.

Golden Number or Lunar Cycle	18
Epact	6
Solar Cycle	22
Dominical Letter	G.
Roman Indiction	15
Julian Period	6634

## ERAS.

Era of the Creation	5921
Jewish Era (Com. Spt. 17) ...	5678
Mohamadan Era of Hijra (Com. Oct. 17)	1336
Malabar Era (Com. Aug. 17)	1093
Kaliyuga Era (Com. April 13)	5019
Sakabda (Com. April 13)	1840
Ramdan (month of Abstinence observed by the Turks Com. June 21).	

Pingalanama Samvatsara (Com. March 24).

The first day of January of the year 1917 is the 2,421,230th day since the commencement of the Julian Period.

## ASTRONOMICAL NOTES AND CONSTANTS.

The distance of Meena-Mesha-Sampatham from the First Point of Aries on the 1st of January 1917 =	22° 31' 18"
Constant of Nutation =	9'' 21
Constant of Aberration =	20'' 47
Mean Equatorial Horizontal Parallax of the Sun =	8'' 80
Equatorial Horizontal Parallax of the Moon = (used in computation of eclipses.)	57' 2'' 63

The Sun's rectangular equatorial co-ordinates are computed from the longitudes and latitudes by the following formulæ. —

$$\begin{aligned} X &= R \cos \lambda. \\ Y &= R \sin \lambda \cos \omega - 19.3 R B. \\ Z &= R \sin \lambda \sin \omega + 44.5 R B. \end{aligned}$$

The reductions to mean equinox are computed by the formulæ—

$$\Delta X = Y \sec \omega \Delta \lambda \sin 1''$$

$$\Delta Y = -X \cos \omega \Delta \lambda \sin 1'' + Z \Delta \omega \sin 1'' + 9'1 \text{ T R.} \\ \sin (\lambda + 6^\circ).$$

$$\Delta Z = -X \sin \omega \Delta \lambda \sin 1'' - Y \Delta \omega \sin 1'' - 21'0 \text{ T R.} \\ \sin (\lambda + 6^\circ)$$

R = the Sun's distance from the Earth.

$\lambda$  = the Sun's true longitude.

B = the Sun's true latitude in seconds of arc.

$\omega$  = the Obliquity of the ecliptic.

$\Delta \lambda$  = the reduction of longitude for precession and nutation from the beginning of the Besselian fictitious year.

$\Delta \omega$  = the reduction of the mean to the apparent obliquity.

T = the fraction of the year since the beginning of the Besselian fictitious year.

The adopted apparent semidiameter of the Sun at the Earth's mean distance is  $16' 1'' 50$ .

while in the computation of eclipses the value employed is  $15' 59'' 63$

The apparent semidiameter of the Moon is computed from the Moon's equatorial horizontal parallax,  $\pi$ , by the formulæ  
 $S = 0.272506 \pi + 1'' 50$

The Value of the Moon's semidiameter employed in the computation of eclipses is computed from the formulæ.  
 $\text{Sin } S = 0.272274 \sin \pi$

Nutation in Right Ascension =

[Nutation in Long. ( $\Delta L$ )  $\times$  cos obliquity] converted into time.

Long. of Sun's Perigee =

$$281^\circ 13' 15'' + 6189'' 03\text{T} + 1'' 63\text{T}^2 + 0'' 012\text{T}^3$$

The first two terms may be written

$$281^\circ 220833 \times 0.0004706845 \times \text{days.}$$

Moon's Mean Anomaly (according to Hansen) =

$$110^\circ 19' 33'' 64 + 1717915837'' 15\text{T} + 49'' 435 \text{T}^2 \\ + 0'' 050073\text{T}^3.$$

where T is measured in Julian centuries from 1800 Jan. 0.0  
 Newcomb's correction to the above value is

$$-1'' 14 - 29'' 17\text{T} - 3'' 76\text{T}^2.$$

*The Mean Obliquity of the Ecliptic =*

$$23^{\circ} 27' 8'' \cdot 26 - 46'' \cdot 845T - 0'' \cdot 0059T^2 + 0'' \cdot 00181T$$

where T is measured in Julian centuries from 1900 Jan. 0.0.

*Precession in a Tropical year =*

$$50'' \cdot 2564 + 0'' \cdot 000 2225 \times \text{years since } 1900 \cdot 0.$$

*Equation of time = Sun's Apparent R.A. minus R.A. of Mean Sun.*

*Sidereal Time = R. A. of Mean Sun plus M. T.*

*R. A. of Mean Sun =*  $18^{\text{h}} 38^{\text{m}} 45^{\text{s}} \cdot 836 + 864 0184^{\text{s}} \cdot 542T + 0^{\text{s}} \cdot 0929T^2$   
*plus Nutation in R. A.*

where T is measured in Julian centuries from 1900 Jan. 0.0.

*Sidereal Time of Sun's Semi-diameter passing Meridian =*

$$\frac{961^{\text{s}} \cdot 18}{15} \quad \frac{\text{sec. Decl.}}{\text{O's Distance}} \quad \frac{360^{\circ}}{360^{\circ} - \text{O's daily motion in R. A}}$$

*Precession from beginning of Bessel's year, or the instant*

$$\text{when Sun's Mean Long, is } 280^{\circ}, = \text{number of days elapsed} \\ \times \frac{\text{annual precession}}{365 \cdot 2422}$$

*Nutation in Long.*

$\Delta L =$  Product of Annual Precession by

(the Day Number C. diminished by the fraction of the year)

$d L =$  Product of Annual Precession by the Day Number C'

*Apparent Obliquity = Mean Obliquity at date increased by  $\Delta \omega$*

$\Delta \omega =$  Day Number D with sign changed.

$d\omega =$  Day Number D' with sign changed.

to find Lagna =

$$\sin \Theta \cos \omega + \cos \Theta \cot \lambda + \sin \omega \tan = 0.$$

1917.

Mean Noon.	Nutation in R. A. (in time).	THE SUN'S.			THE MOON'S.			
		Horizontal Parallax.	Aberration.	Mean Longitude.	Mean Longitude.	Mean Longitude Ascending Node.	Mean Longitude Perigee.	
1917								
Jan. 1	+ 1 01	8 95	20 82	280 3500	13 0517	290 3476	306 1220	
11	+ 1 04	8 95	20 81	290 2065	144 8157	289 3181	307 2360	
21	+ 1 06	8 94	20 80	300 0630	276 5797	289 2885	308 3500	
31	+ 1 07	8 93	20 77	309 9195	48 3436	288 7590	309 4641	
Feb. 10	+ 1 08	8 92	20 74	319 7759	180 1076	288 2295	310 5781	
20	+ 1 07	8 90	20 70	329 6324	311 8716	287 6999	311 6922	
Mar. 2	+ 1 06	8 88	20 65	339 4889	83 6355	287 1704	312 8062	
12	+ 1 03	8 85	20 59	349 3454	215 3995	286 6408	313 9202	
22	+ 1 01	8 83	20 54	359 2018	347 1635	286 1113	315 0343	
Apr. 1	+ 0 98	8 80	20 48	9 0583	118 9275	285 5817	316 1483	
11	+ 0 97	8 78	20 42	18 9148	250 6914	285 0522	317 2624	
21	+ 0 95	8 75	20 36	28 7712	22 4554	284 5227	318 3764	
May. 1	+ 0 95	8 73	20 31	38 6277	154 2194	283 9931	319 4904	
11	+ 0 95	8 71	20 26	48 4842	285 9833	283 4636	320 6045	
21	+ 0 96	8 69	20 22	58 3407	57 7473	282 9340	321 7185	
31	+ 0 93	8 68	20 19	68 1971	189 5113	282 4045	322 8325	
June. 10	+ 1 00	8 67	20 16	78 0536	321 2752	281 8750	323 9466	
20	+ 1 03	8 66	20 14	87 9101	93 0292	281 3454	325 0606	
30	+ 1 05	8 66	20 13	97 7666	224 8032	280 8159	326 1747	
July. 10	+ 1 07	8 66	20 14	107 6230	356 5672	280 2863	327 2887	
20	+ 1 09	8 66	20 15	117 4795	128 3311	279 7568	328 4028	
30	+ 1 11	8 67	20 17	127 3360	260 0951	279 2273	329 5168	
Aug. 9	+ 1 11	8 68	20 20	137 1925	31 8591	278 6977	330 6308	
19	+ 1 11	8 70	20 23	147 0489	165 6230	278 1682	331 7449	
29	+ 1 09	8 72	20 27	156 9054	295 3870	277 6386	332 8589	
Sept. 8	+ 1 07	8 74	20 32	166 7619	67 1510	277 1091	333 9729	
18	+ 1 05	8 76	20 38	176 6184	198 9150	276 5796	335 0870	
28	+ 1 02	8 79	20 43	186 4748	330 6789	276 0500	336 2010	
Oct. 8	+ 1 00	8 81	20 49	196 3313	102 4429	275 5205	337 3151	
18	+ 0 98	8 84	20 55	206 1878	234 2069	271 9909	338 4291	
28	+ 0 97	8 86	20 61	216 0442	5 9708	274 4614	339 5431	
Nov. 7	+ 0 96	8 88	20 66	225 9007	137 7348	273 9319	340 6572	
17	+ 0 97	8 90	20 71	235 7572	269 4988	273 4023	341 7712	
27	+ 0 99	8 92	20 75	245 6137	41 2627	272 8728	342 8853	
Dec. 7	+ 1 01	8 93	20 78	255 4701	173 0267	272 3432	343 9993	
17	+ 1 04	8 94	20 80	265 3266	304 7907	271 8137	345 1133	
27	+ 1 07	8 95	20 82	275 1831	76 5547	271 2842	346 2274	
37	+ 1 09	8 95	20 82	285 0396	208 3186	270 7546	347 3414	
Mean Obliquity 1917				27 0 20	Daily motion.			
Precession for the year 1917.				50 2603	0 98565	15 17640	0 05295	0 11140
Precession for 1 day.				0 1376				

1917  
1092

## JANUARY

I

FOR TRIVANDRUM MEAN NOON.

Day of Week.	Day of Month.	Malabar Date.	THE SUN'S					Sideral Time of the Semidiameter passing the Meridian.	Equation of Time to be added to Apparent Time.	Sideral Time.
			Apparent.			Semi-diameter.	°			
			Right Ascension.	Declination.						
<i>h</i>	<i>m</i>	<i>s</i>	<i>°</i>	<i>m</i>	<i>s</i>	<i>m</i>	<i>s</i>	<i>h</i>	<i>m</i>	<i>s</i>
Mon.	1	18	18 44 54	S 23 2 58	16 17 54	1 11 03	3 28	18 41 25		
Tues.	2	19	18 49 19	22 58 1	16 17 55	1 10 99	3 57	18 45 22		
Wed.	3	20	18 53 43	22 52 36	16 17 55	1 10 94	4	18 49 18		
Thur.	4	21	18 58 7	22 46 42	16 17 55	1 10 89	4 52	18 53 15		
Frid.	5	22	19 2 31	22 40 23	16 17 54	1 10 83	19	18 57 11		
Sat.	6	23	19 6 54	22 33 36	16 17 52	1 10 77	46	19 1 8		
Sun.	7	24	19 11 17	22 26 22	16 17 50	1 10 71	6 12	19 5 4		
Mon.	8	25	19 15 39	22 18 43	16 17 47	1 10 64	6 38	19 9 1		
Tues.	9	26	19 20 1	22 10 37	16 17 44	1 10 57	7 4	19 12 57		
Wed.	10	27	19 24 22	5	16 17 40	1 10 49	28	19 16 54		
Thur.	11	28	19 28 44	21 53 7	16 17 35	1 10 41	7 53	19 20 51		
Frid.	12	29	19 33 4	21 43 43	16 17 30	1 10 33	8 16	19 24 47		
Sat.	13	30	19 37 23	21 33 54	16 17 24	1 10 25	8 39	19 28 44		
Sun.	14	1	19 41 42	21 23 41	16 17 18	1 10 16	9 2	19 32 40		
Mon.	15	2	19 46 0	21 13 2	16 17 11	1 10 07	9 23	19 36 37		
Tues.	16	3	19 50 13	21 1 58	16 17 03	1 9 97	9 44	19 40 33		
Wed.	17	4	19 54 35	20 50 31	16 16 95	1 9 88	10	19 44 30		
Thur.	18	5	19 58 51	20 38 39	16 16 87	1 9 78	10	19 48 26		
Frid.	19	6	20 3 7	20 26 25	16 16 78	1 9 68	10 44	19 52 23		
Sat.	20	7	20 22	20 13 47	16 16 69	1 9 58	11	19 56 20		
Sun.	21	8	20 11	20 0 46	16 16 59	1 9 47	11 20	20 0 16		
Mon.	22	9	20 15 49	19 47 22	16 16 49	9 37	11 37	20 4 13		
Tues.	23	10	20 20 2	19 33 38	16 16 39	1 9 26	11 53	20 8 9		
Wed.	24	11	20 21 14	19 19 30	16 16 28	1 9 15	12 8	20 12 6		
Thur.	25	12	20 25	19 4 1	16 16 18	1 9 04	12 23	20 16 2		
Frid.	26	13	20 32 36	18 50 11	16 16 06	1 8 93	12 36	20 19 59		
Sat.	27	14	20 36 45	18 35 2	16 15 95	1 8 82	12 49	20 23 56		
Sun.	28	15	20 40 55	18 19 31	16 15 83	1 8 70	13 1	20 27 52		
Mon.	29	16	20 45 2	18 3 41	16 15 70	1 8 59	13 13	20 31 49		
Tues.	30	17	20 49 9	17 47 33	16 15 58	1 8 48	13 23	20 35 46		
Wed.	31	18	20 53 15	S 17 31 5	16 15 44	1 8 36	13 33	20 39 42		

TRIVANDRUM MEAN TIME.

Day	THE SUN'S							Transit of the First Point of Aries.  P. M.
	Rising.	Setting.	Apparent.					
			Longitude at Mid-night.	Longitude at Rising.	Latitude at Mean Noon	Longitude at Mean Noon.	Longitude at Setting.	
<i>h m</i> A. M.	<i>h m</i> P. M.	°	°		°	°	<i>h m s</i>	
1	6 15	5 51	279 48.4	280 4.4	N. 0.63	280 19.0	280 34.0	5 17 43
2	6 16	5 52	280 49.6	281 5.6	0.62	281 20.2	281 35.2	13 47
3	6 16	5 52	281 50.7	282 6.7	0.57	282 21.3	282 36.4	9 51
4	6 17		282 51.9	283 7.9	0.50	283 22.5	283 37.5	5
	6 17	5 53	283 53.0	284 9.0	0.41	284 23.6	284 38.6	1 59
6	6 17	5 54	284 54.2	285 10.2	0.30	285 24.8	285 39.8	4 58 3
	6 18		285 55.3	286 11.3	0.18	286 25.9	286 40.9	4 54
8	6 18	5 55	286 56.4	287 12.4	N. 0.05	287 27.0	287 42.1	4 50 11
9	6 18	5 55	287 57.6	288 13.6	0.07	288 28.1	288 43.2	4 46 15
10	6 19	5 56	288 58.7	289 14.8	0.20	289 29.2	289 44.3	4 42
11	6 19	5 56	289 59.8	290 15.9	0.31	290 30.3	290 45.4	4 38 24
12	6 19	5 57	291 0.9	291 17.0	0.41	291 31.4	291 46.6	4 34 28
13	6 20	5 57	292 2.0	292 18.1	0.48	292 32.5	292 47.8	4 30 32
14	6 20	5 58	293 3.2	293 19.3	0.52	293 33.7	293 48.9	4 26 36
15	6 20	5 58	294 4.2	294 20.4	0.54	294 34.8	294 50.0	4 22 40
16	6 20	5 59	295 5.4	21.5	0.53	295 35.8	295 51.1	4 18 44
17	6 21	5 59	296 6.5	22.6	0.49	296 36.9	296 52.2	4 14 48
18	6 21	6 0	297 7.6	23.7	0.42	297 38.0	297 53.4	4 10
19	6 21	6 0	298 8.6	24.8	0.32	298 39.1	298 54.4	4 6 56
20	6 21	6 1	299 9.6	25.8	0.20	299 40.1	299 55.5	4 3 0
21	6 21	6 1	300 10.7	26.9	0.07	300 41.2	300 56.6	59 4
	6 22	6 1	301 11.8	28.0	N. 0.06	301 42.3	301 57.7	3
23	6 22	6 2	302 12.9	29.1	0.20	302 43.4	302 58.7	3 51 13
24	6 22	6 2	303 13.9	30.1	0.33	303 44.4	303 59.8	3 47 17
25	6 22	6 3	304 14.9	31.1	0.44	304 45.4	305 0.9	3 43 21
26	6 22	6 3	305 16.0	32.2	0.54	305 46.5	306 1.9	3 39 25
27	6 22	6 3	306 17.0	33.2	0.60	306 47.5	307 2.9	8 29
28	6 22	6 4	307 18.0	34.2	0.63	307 48.4	308 3.9	3 31 33
29	6 22	6 4	308 18.9	35.1	0.63	308 49.3	309 4.9	37
30	6 22	6 5	309 19.9	36.1	0.61	309 50.3	310 5.8	3 23 41
31	6 22	6 5	310 20.8	37.0	N. 0.55	310 51.2	311 6.7	3 19 45

TRIVANDRUM MEAN TIME.

Day.	THE MOON'S										Changes.
	Right Ascension.		Declination.		Semidiameter.		Horizontal Parallax.		Age at Mean Noon.		
	Midnight.	Noon.	Mid-night.	Noon.	Mid-night.	Noon.	Mid-night	Noon.			
1	<i>h m. s.</i> 0 41 16	<i>h m. s.</i> 1 6 16	° N.10 6	° N.12 43	15 45	15 39	43	20	<i>d</i> 7.43		O Full Mo <i>d. h. m.</i> S 0 50 P. M.
2	1 30 53	1 56 19	15 10	17 21	15 33	15 27	58	56 38	8.43		
3	2 22 4	2 48 9	19 25	21 10	15 22	15 17	56 15	56 0	9.43		
4	3 14 35	4 1 16	22 40	23	15 12	15 9		25	10.43		
5	4 8 13	4 35 17	24 47	23	15	15 1	14	2	11.43		
6	23	5 29 24	41	25 39	14 55	14	54 50	54 40	12.43		
	5 56 11	39	20	21 42	14 53	14 50	54 31	54 22	13.43		Apogee. <i>d. h. m.</i> 10 1 32 P. M.
8	6 48 39	14 10	23 47	37	14 49	14 47	54 15	54 10	14.43		
9	7 39 8	8 31	21 12	19 34	14 46	14 45	54	54 2	15.43		
10	8 27 19	8 50 35	17 44	15 44	14 44	14 44	53 59	53 59	16.43		
11	9 13 22	9 35 44	13 35	11 15	14 44	14 45	59	51 1	17.43		
12	9 57 45	10 19 31	55	6 27	14 46	14 47		51 10	18.43		
13	10 41 7	11 2 42	N. 3 55	N. 1 20	14 49	14 52	54 15	54	19.43		
14	11 24 20	11 46 10	S 1 16	S. 3 53	14	14 59	54 35	54 52	20.43		
15	12 8 18	12 30 54	6 28	9 2	15 3	15 8	5	28	21.43		
16	12 54 3	13 17 55	11 32	13 56	15 13	15 20	47	56 9	22.43		
17	13 42 36	14 8 15	16 14	18 22	15 26	15 34	56 33	59	23.43		
18	14 35 55	15 2 41	20 19	2	15 41	15 49	27	57 55	24.43		
19	15 31 35	16 1 33	23 29	24 36	15 57	16 5	58 25	58 54	25.43		
2	16 32 31	17 4 17	25 21	25 41	16 12	16 20	59 23	59 50	26.43		
21	17 36 36	18 9 12	25 36	25 3	16 26	16 33	60 15	60 38	27.43		
	18 41 50	19 14 5	24 3	22 37	16 38	16 42	60	61 11	28.43		
	19 45	20 17 0	20 46	18 31	16 45	16 46	61 21	61 26	29.43		
24	20 47 16	21 16 42	16 2	13 16	16 16	16 44	61 26	61 21	0.97		
25	21 45 17	22 13 9	10 17	12	16 42	16 37	61 11	60 56	1.97		
	40 29	23 0	S. 4 1	S. 0 50	16	16 26	60 37	60 15	2.97		
	15	23 59 13	N. 2 19	N. 23	16 19	16	59 50	59 23	3.97		
28	0 25 1	0 50 46	8 21	11 9	16 5	15	58	58 27	4.97		
29	1 16 34	1 42 30	13 47	16 11	15 49	15 42		57 31	5.97		
30			18 32	20 15	15 35	15 28	4	39	6.97		
	3 1 1	1	N.21	N.23 18	15 21	15 15	56 16	55 54	7		

First Quarter.  
*d. h. m.*  
30 6 9 A. M.

TRIVANDRUM MEAN TIME

Day	THE MOON'S								
	Rising	Meridian passage.	Setting.	Longitude.				Latitude.	
				Midnight.	Sun rise.	Noon.	Sun set.	Midnight.	Noon.
<i>h. m.</i> P. M.	<i>h. m.</i> P. M.	<i>h. m.</i> A. M.							
1	0 19	6 37	0 6	13 19.3	16 48.9	20 0.6	23 14.4	N 15.3	N 5 17.3
2	1 4	7 26	0 58	37.0	30 2.0	33 5.5	15.3	15.2	9 0
3	1 51	8 16	1 49	39 35.7	42 56.1	45 58.6	49 4.4	4 55.9	4 45.2
4	2 40	7	2 42	52 17.8	34.9	55 33.4	61 36.3	4 28.2	4 3.1
5	31	9 59	3 34	64 45.8	67 59.6	70 55.2	73 55.3	S 3 45.2	3 20.0
6	4 22	10 51	4 27	77 1.9	50 12.9	53 6.2	56 4.6	2 52.5	2 23.3
	11	11 41	18	89 8.5	92 17.8	8.7	98 5.2	1 52.6	1 20.9
8	6 1	*	6 6	101 7.3	104 15.0	107 4.5	110 0.1	N 0 45.3	N 0 15.4
		A. M.							
9	6 53	0 29	6 52	113 0.5	116 7.0	118 55.5	121 50.3	S 0 17.6	S 0 50.2
10	7 40	1 14	7 34	124 49.9	127 56.3	130 43.9	133 38.9	1 22.4	1 53.6
11	8 25	1 58	8 14	136 37.8	139 44.1	142 31.9	145 27.2	2 23.6	2 52.0
12	9 9	2 39	8 52	148 26.6	151 33.6	154 22.1	157 18.9	3 15.6	3 43.2
13	9 52	3 20	9 29	160 19.1	163 28.2	166 17.8	169 16	4 5.	4 25.1
14	10 37	4 0	10 7	172 18.8	175 30.3	178 22.4	181 24.4	4 42.0	4 55.9
15	11 23	4 42	10 46	184 29.3	187 41.3	190 39.8	193 46.1	6.5	5 13.7
16	* *	26	11 27	196 54.5	200 14.2	203 14.1	206 26.2	17.4	17.2
	A. M.		P. M.						
17	0 13	6 13	0 12	209 35.8	213 4.6	216 9.2	219 26.0	13.1	5 5.0
18	1 6	4	1	222 45.7	226 18.1	229 25.5	232 52.5	4 52.8	4 36.4
19	3	8 0	1 58	236 18.1	239 57.6	243 14.5	256 45.2	4 15.8	3 51.1
20	4	9 1	2 58	250 17.7	254 4.4	257 27.5	261 5.5	3 22.7	2 50.5
21	4 7	10 4	4 2	264 43.7	268 36.9	272 5.7	275 49.3	2 15.2	1 37.2
	9	11 7	7	279 32.7	283 31.7	287 4.0	290 51.5	S 0 57.0	S 0 15.6
		P. M.							
23	6 5	0 9	6 11	294 38.6	298 40.6	302 15.2	306 5.2	N 0 26.4	N 1 8.2
24	3	1 7	7 11	309 52.6	313 1	317 29.6	321 18.9	1 45.6	2 27.2
	51	1	5 9	19	5.2	332 37.2	336	3 3.0	
26	5 42	2 53	5	6	344 1.5	347 29.0	351 10.6	4	4 27.6
27	9 29	43	58	354 46.5	358 36.5	1 58.3	33.4	4 46.0	1.3
28	10 15	4 32	10 51	3.1	12 45.7	16 1.0	19 29.	10.9	15.6
29	11 0	21	11 41	52.2	26 27.4	29 36.4	32 58.2	15.5	11.6
30	11 18	6 12		14.1	39 42.4	12 45.5	46 1.7	3.3	4 51.1
			A. M.						
31	P. M.		0 38	49 41.2	52 33.5	55 31.4	58 42.4	N 1 35	N 16.5

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## FOR TRIVANDRUM MEAN NOON.

Day of Week.	Day of Month.	Malabar Date.	THE SUNS.					Sideral Time of the Semidia-meter passing th Meridian.	Equation of time to be added to Apparent Time.	Sideral Time.			
			Apparent			Semi diameter.	S						
			Right Ascension.	Declination.									
			<i>h</i>	<i>m</i>	<i>s</i>	<i>o</i>	<i>m</i>	<i>s</i>	<i>m</i>	<i>s</i>	<i>h</i>	<i>m</i>	<i>s</i>
Thur.	1	19	20	57	20	S 17 14 19	16 15.31	1 8.25	13 42	20 43 38			
Frid.		20	21	1	24	16 17	16 15.16	1 8.13	13 45	20 47 35			
Sat.	3	21	21		28	16 39 51	16 15 02	1 8.02	13 56	20 51 31			
<b>Sun.</b>	4	22	21	9	31	16 12	16 14.87	1 7.90	14 3	20 25			
Mon.		23	21	13	33	16 0 14	16 14.71	1 77.9	14 5	20 59			
Tues.	6	24	21	17	34	15 46 1	16 14.55	1 7.68	14 13	21 3 21			
Wed		25	21	21	35	15 33	16 14.35	1 7.56	14 17	21 7 18			
Thur.	8	26	21	25	34	15 5 46	16 14.21	1 7.45	14 20	21 11 14			
Fri.	9	27	21	29	33	1 19 45	16 14.03	1 7.34	14 22	21 15 11			
Sat.	10	28	21	33	30	13 30 31	16 13.84	1 7.23	14 23	21 19			
<b>Sun.</b>	11	29	21	37		13 11 0	16 13.66	1 7.12	14 24	21 23 4			
Mon.	12	1	21	41	25	13 51 16	16 13.47	1 7.01	14 24	21 27 0			
Tues.	13	2	21	45	20	13 31 18	16 13.27	1 6.90	14 23	21 30 57			
Wed.	14	3	21	49	15	13 11 7	16 13.07	1 6.79	14 22	21 34 54			
Thur.	15	4	21		9	12 50 42	16 12.56	1 6.68	14 19	21 38 50			
Fri.	16	5	21		2	12 30 6	16 12.65	1 6.58	14 16	21 42 47			
Sat.	17	6	22	0	55	12 9 16	16 12.44	1 6.48	14 12	21 46 43			
<b>Sun.</b>	18	7	22	4	47	11 48 15	16 12.23	1 6.38	14 8	21 50 40			
Mon.	19	8	22	8	39	11 27	16 12.02	1 6.28	14 3	21 54 36			
Dues.	20	9	22	12	30	11 5 41	16 11.80	1 6.18	12 57	21 58 33			
Wed.	21	10	22	16	20	10 44 8	16 11.58	1 6.09	13 51	2 29			
Thur	22	11	22	20	9	10 22 24	16 11.36	1 5.99	13 43	6 26			
Fri.	23	12	22	23	58	10 0 31	16 11.14	1 5.90	13 36	10 22			
	24	13	22		46	9 38 29	16 10.92	1 5.81	13	22 14 19			
<b>Sun</b>	25	14	22	31	34	9 16 19	16 10.69	1 5.73	13 18	22 18 16			
Mon.	26	15	22	35	22	8 54 0	16 10.46	1 5.64	13 9	22 22 12			
T		16	22	39	8	8 31 34	1 10.23	1 5.56	12 59	22 26 9			
Wed.	8	17	22	42	54	S 8 9 0	16 10.00	1 5.48	12 48	30 5			

MAKARAM or TAI

KUMBHAM or MASI

## TRIVANDRUM MEAN TIME

Day.	THE SUN'S							Transit of the First Point of Aries.
	Rising.	Setting.	Apparent.					
			Longitude at Mid-night.	Longitude at Rising.	Latitude at Mean Noon.	Longitude at Mean Noon.	Longitude at Setting.	
1	<i>h m</i> 6 22	<i>h m</i> 6 5	° 311 21·7	311 37·9	N 0·16	° 311 52·1	° 312 7·6	<i>h m s</i> 3 15 49
2	6 22	6	312 22·6	312 35·7	0·35	312 53·0	312 8·5	11 54
3	6 22	6 6	313 23·4	313 39·5	0·24	313 53·5	314 9·4	3 7 55
4	6 22	6 6	314 24·3	314 40·4	N 0·11	314 54·6	315 10·1	3 4
	6 22	6 6	315 25·0	315 41·1	0·02	315 55·4	316 11·0	0 5
6	6 22	6 7	316 25·9	316 42·0	0·14	316 56·2	317 11·8	56 10
7	6 22	7	317 26·7	317 42·5	0·26	317 57·0	318 12·5	14
8	6 21	6	318 27·4	318 43·5	0·36	318 57·7	319 13·2	45 18
9	6 21	6 8	319 28·0	319 44·2	0·44	319 58·4	320 14·0	44 22
10	6 21	6 8	320 28·9	320 44·9	0·50	320 59·1	321 14·6	40 26
11	6 21	6 8	321 29·4	321 45·5	0·53	321 59·7	322 15·3	36 30
12	6 21	6 8	322 30·1	322 46·2	0·53	323 0·4	323 15·9	34
13	6 21	6 8	323 30·8	323 46·8	0·50	324 1·0	324 16·6	28 30
14	6 20	6 9	324 28·8	324 47·4	0·44	325 1·7	325 17·3	24 43
15	6 20	6 9	325 31·9	325 48·0	0·34	326 2·3	326 17·9	20 47
16	6 20	6 9	326 32·6	326 48·6	0·23	327 2·8	327 18·4	16 51
17	6 20	6 9	33·1	327 49·1	S 0·10	328 3·3	328 19·0	12
18	6 19	6 9	328 33·7	328 49·6	N 0·01	329 3·9	329 19·5	8 59
19	6 19	6 9	329 34·2	329 50·1	0·18	330 4·4	330 20·0	5 3
20	6 19	6 10	330 34·7	330 50·6	0·31	331 4·9	331 20·5	1
21	6 18	6 10	331 35·2	331 51·0	0·42	332 5·3	332 21·0	1 11
	6 18	6 10	332 35·7	332 51·5	0·52	333 5·8	333 21·4	1 53 15
23	6 18	6 10	333 36·1	333 51·9	0·59	334 6·2	334 21·8	1 49 19
24	6 17	6 10	334 36·5	334 52·3	0·63	335 6·5	335 22·1	1 45 24
	6 17	6 10	335 36·8	335 52·6	0·63	336 6·8	336 22·4	1 41 28
26	6 17	6 10	336 37·1	336 52·9	0·60	337 7·2	337 22·8	1 37
27.	6 16	6 10	337 37·5	337 53·2	0·55	338	338 23·1	1 33 36
28	6 16	6 10	338 37·8	338 53·5	N 0·17	339 7·8	339 23·4	1 29 40

TRIVANDRUM MEAN TIME.

Day.	THE MOON.										Change
	Right Ascension.		Declination.		Semidiameter.		Horizontal Parallax.		Age at Mean Noon.		
	Midnight.	Noon.	Mid-night.	Noon.	Mid-night.	Noon.	Mid-night.	Noon.			
<i>h</i>	<i>h m s</i>		<i>°</i>		<i>"</i>		<i>"</i>	<i>d.</i>			
1	8 55 14	4 22 17	N. 24 22	N. 25 7	15 10	15 5	55 34	55 16	8.97		
2	4 49 21	16 17	25 33	25 41	15 1	14 57	0	54 46	9.97		
3	5 43	6 9 33	25 30	25 2	14 54	14 51	54 34	54 24	10.97	☾ Apogee. <i>d. h. m.</i> 6 1 50 P. M.	
4	6 35 39	1 17	24 16	23 14	14 49	14 47	54 16	54 9	11.97		
5	7 26 24	0	21 57	20 26	14 45	14 44	54 4	54 0	12.97		
6	8 15 3	8 38 36	18 43	16 48	14 44	14 44	53 58	53 57	13.97		
7	9 1 37	9 24 16	14 44	12 31	14 44	14 41	53 58	53 59	14.97		
8	9 46 31	10 8 30	10 11	45	14 45	14 46	54	54 6	15.97	☽ Full Moon. <i>d. h. m.</i> 7 8 36	
9	10 30 17	10 51	15	N. 2 41	14 48	14 50	54 12	54 19	16.97		
10	11 13 36	11 35 21	N. 0 6	S. 2 30	14 52	14 54	54 27	36	17.97		
11	11 57 19	12 19 35	6	10	14 57	15 0	54	0	18.97		
12	12 42 17	13 5 30	10 11	13 36	15 5	15 9	55 14	55 30	19.97		
13	13 29 23	13 54 1	14 55	17 6	15 14	15 19	55 47	56 6	20.97		
14	14 19 30	14 45 54	19 7	20 55	15 24	15 31	56 27	56 50	21.97		
15	15 13 15	15 41 34	22 29	23 17	15 37	15 44	13	57 38	22.97	☾ Last Quarter. <i>d. h. m.</i> 15 7 1 A.	
16	16 10 47	16 40 54	24 45	25 22	15 51	15 58	58 43	58 30	23.97		
17	17 11 36	17 43 51	25 37	25 26	16 5	16 12	58 56	59 22	24.97		
18	18 14 25	18 45 56	24 51	23 50	16 19	16 25	59 47	60 10	25.97	☾ Perigee. <i>d. h. m.</i> 21 6 25 A. M.	
19	19 17 18	19 18 19	22 24	20 34	16 30	16 36	60 31	60 48	26.97		
20	20 18 43	20 48 41	18 23	15 54	16 39	16 42	61 2	61 12	27.97		
21	21 17 57	21 46 36	13 8	10 10	16 43	16 43	61 17	61 17	28.97		
22	22 14 40	22 42 14	7 4	S 3 52	16 42	16 39	61 12	61 2	0.53		
23	23 9 26	23 36 20	S. 0 37	N. 2 35	35	16 30	60 48	60 29	1.53	☽ New Moon <i>d. h. m.</i> 21 11 17 P. M.	
24	0 3 3	0 29 42	N. 43	8 45	16 24	16 18	60 9	42	2.53		
25	56 21	1 23 6	11 36	11 15	16 10	16 3	15	47	3.53		
26	1 49 59	2 17 2	16 41	18 51	15 55	15 47	18	57 49	4.53		
	2 44 15	3 11 39	20 45	22 20	15 39	15 31	20	56 3	5.53		
28	3 39 10	4 6 44	N. 23 36	N. 24 34	15 21	15 18	56 26	56 2	6.53	☽ First Quarter. <i>d. h. m.</i> 28 9 53 P.	

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## TRIVANDRUM MEAN TIME.

Day	THE MOON'S										
	Rising.	Meri dian passage.	Setting.	Longitude.						Latitude.	
				Midnight.	Sun rise.	Noon	Sun set.	Midnight.	Noon.		
h m	h m	h m									
1	1 27	7 55	1 31	61 46.9	65 4.3	67 58.1	71 4.7	N 3	55.1	N 3	31.0
2	2 18	8 47	2 24	74 5.5	77 19.0	80 9.6	83 13.6		4.6		36.5
3	3 10	9 37	3 15	86 11.0	89 21.7	92 10.0	95 11.9		6.8	1	35.8
4	4 0	10 26	4	98 3	101 16.2	104 3.2	107 3.7	N 1	4.1	N 0	31.7
	4 49	11 12	4 50	109 58.1	113 6.1	115 52.3	118 52.3	S 0	0.8	S 5	33.2
6	5 37	11 56	33	121 46.2	124 54.0	127 40.1	130 40.5	1	5.3	1	36.6
	6 22	*	6 14	133 31.2	136 42.4	139 28.9	142 29.9		6.8		35.8
		A. M.									
8	7	0 38	6 52	145 24.3	148 32.7	151 20.7	154 22.8	3	3.0	3	28.3
	51	1 19	7 30	157 15.3	160 28.1	163 17.3	166 21.5	3	51.4	4	12.1
10	8 35	0	8 7	169 18.0	172 29.6	175 20.6	178 26.7	4	30.0	4	44.9
11	9 20	41	8 15	181 25.3	184 39.3	187 32.4	190 41.0	4	56.8		5.3
12	10 8	3 23	9 26	193 42.3	196 59.2	199 55.2	203 7.0		10.4	5	11.9
13	10 58	4 8	10 8	206 11.4	209 32.0	212 31.3	215 47.1		9.7		3.7
14	11 53	4 57	10 55	218 55.4	222 19.1	225 24.0	228 45.1	4	53.8	4	40.1
15	* *	49	11 47	231 4	235 26.2	238 36.0	242 2.4	4	22.7	4	1.4
		A. M.									
16	0 50	6 46	0 13	245 20.1	248 55.8	252 10.1	255 42.5	3	36.5	3	8.3
17	1 49	7 46	1 43	259 5.9	262 47.9	266 7.9	269 46.6	2	36.9	2	2.7
18	2 50	8 47	2 46	273 15.9	277 3.6	280 29.8	284 14.5	1	26.1	S 0	47.6
19	3 41	9 48	3 18	287 49.3	291 42.7	295 13.7	299 3.4	S 0	7.9	N 0	32.3
20	4 45	10 47	4 50	302 42.6	306 40.2	310 14.8	314 8.2	N 1	12.3	1	51.4
21	5 38	11 43	50	317 49.5	321 48.9	325 25.3	329 19.7		28.7	3	3.3
		P. M.									
	6 28	0 37	6 47	333 1.1	337 0.1	340 35.7	344 28.4	3	34.7	4	2.1
23	17	1 29	43	348 7.6	352 3.4	355 35.7	359 24.2	4	25.1	4	43.5
24	8 4	2 20	5 38	2 58.9	6 48.7	10 16.3	13 58.6	4	56.7	5	5.1
25	8 52	3 11	9 33	17 27.2	21 10.0	24 31.0	28 6.1		8.4		6.9
26	9 40	4 3	10 28	31 27.6	2.7	38 16.8	41 44.1		0.9	4	50.7
27	10 30	4 56	11 23	44 55.6	48 25.5	51 33.4	54 53	4	36.7	4	19.2
28	11 21	50	58	1.3	61 21	64 23.2	67 37.1	N 3	58.7	N 3	35.5

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## MARCH

1

## FOR TRIVANDRUM MEAN NOON.

Day of Week.	Day of Month.	Malabar Date.	THE SUN.					Sideral Time of the Semidiameter passing the Meridian.	Equation of Time to be added to Apparent Time.		Sideral Time.		
			Apparent		Semi-diameter.								
			Right Ascension.	Declination.									
Thur.	1	18	<i>h</i> 22	<i>m</i> 46	<i>s</i> 39	S. 7 46 19	16 9.77	<i>m</i> 5.41	<i>m</i> 12	<i>s</i> 37	<i>h</i> 22	<i>m</i> 34	<i>s</i> 2
Frid.		19	22	50	23	23 31	16 9.53	1 5.33	12	25	22		58
Sat.	3	20	22	54		7 0 37	16 9.29	1 5.26	12	13	22	41	
<b>Sun.</b>	4	21	22		51	6 37 38	16 9.05	1	12	0	22	45	51
Mon.		22	23	1	34	6 14 38	16 8.81	1 5.13	11	47		49	48
Tues.	6	23	23		17	50 23	16	1 5.07	11	33	22	53	45
Wed.	7	24	23	9	0	5 28 8	16 8.31	1 5.01	11	19			41
Thur.	8	25	23	12	42	5 4 49	16 8.06	1 4.95	11	4	23	1	38
Frid.	9	26	23	16	24	4 41 25	16 7.80	1 4.90	10	49	23		34
Sat.	10	27	23	20		4 17 59	16 7.54	1 4.84	10	34	23	9	31
<b>Sun.</b>	11	28	23	23	46	3 54 29	16	1 4.80	10	18	23	13	
Mon.	12	29	23			30	16 7.01	1 4.75	10		23	17	21
Tues.	13	30	23	31	6	3 20	16 6.74	1 4.71		46	23	21	26
Wed.	14	1	23	34	46	2 43 42	16 6.47	1 4.67	9	29	23		17
Thur.	15	2	23	38	26	2 20 3	16 6.20	1 4.63	9	12	23	29	14
Fri.	16	3	23	42		1 56 22	16	1 4.59	8	55		33	10
Sat.	17	4	23	45	45	1 32 39	16 5.65	1 4.56	8	38	23	37	
<b>Sun.</b>	18	5	23	49	21	1 8	16	1 4.53	8	21	23	41	3
Mon.	19	6	23			0 44 13	16 5.10	1 4.51	8		23	45	0
Tues.	20	7	23	56	41	0 21 29	16 4.82	1 4.49		45	23	48	56
Wed.	21	8	0		20	N. 0 14	16 4.54	1 4.47	7	27	23		53
Thur.		9	0	3		0 25	16	1.27		9	23	56	49
Frid.	23	10	0		37	0 49 36	16 3.99	1 4.44	6	51	0	0	46
Sat.	24	11	0	11	15	1 13 16	16 3.72	1 4.43	6	33	0	4	43
<b>Sun.</b>	25	12	0	14	51	1 36 53	16 3.45	1 4.42	6	15	0	8	39
Mon.	26	13	0	18	32	0 29	16 3.17	4.42		57	0	12	36
Tues.		14	0		10	24 0	16	1 4.2		43		16	32
Wed.		15	0		18	47 31	16 2.63	1 4.12		20	0	20	29
Thur.	29	16	0		27	3 10 56	16 2.36	1 4.12		2	0	24	
Frid.	30	17	0	33		3 24 18	16 2.09	1 4.43		43	0	28	
	31	18	0	36	43	N 3 57 36	16 1.82	1 4.14	4	25	0		

TRIVANDRUM MEAN TIME.

Day.	THE SUN'S.										Transit of the First Point of Aries.
	Rising.	Setting.	Apparent.							P. M. / A. M.	
			Longitude at Mid-night	Longitude at Rising.	Latitude at Mean Noon.	Longitude at Mean Noon.	Longitude at Setting.				
<i>h m</i>	<i>h m</i>	<i>°</i>				<i>°</i>	<i>°</i>	<i>h m s</i>			
1	6 15	6 10	339 38 0	339 53·7	N. 0·36	340 8·0	340 23·5	1 25 44			
2	6 15	6 10	340 38·1	340 53·8	0·26	341 8·1	341 23·6	1 21 48			
	6 14	6 10	341 38·2	341 53·8	0·15	342 8·2	342 23·8	1 17 52			
4	6 14	6 10	342 38·4	342 54·0	N. 0·02	343 8·4	343 23·9	1 13 56			
5	6 14	6 10	343 38·5	343 54·0	S. 0·11	344 8·4	344 23·9	1 10 0			
6	6 13	6 10	344 38·5	344 54·1	0·22	345 8·5	345 24·0	1 6 4			
7	6 13	6 10	345 38·6	345 54·1	0·32	346 8·5	346 24·0	1 2 9			
8	6 12	6 10	346 38·6	346 54·1	0·40	347 8·5	347 23·9	0 58 13			
9	6 12	6 10	347 38·5	347 54·0	0·46	348 8·4	348 23·9	0 54 17			
10	6 11	6 10	348 38·5	348 53·9	0·49	349 8·3	349 23·8	0 50 21			
11	6 11	6 10	349 38·3	349 53·8	0·49	350 8·2	350 23·6	0 46 25			
12	6 10	10	350 38·2	350 53·6	0·46	351 8·0	351 23·5	0 42 29			
13	6 10	6 10	351 38·0	351 53·4	0·41	352 7·8	352 23·3	0 38 33			
14	6 9	6 10	352 37·8	352 53·1	0·33	353 7·6	353 23·1	0 34 37			
15	6 9	6 10	353 37·6	353 52·9	0·23	354 7·3	354 22·8	0 30 41			
16	6 8	6 10	354 37·3	354 52·7	S. 0·11	355 7·0	355 22·7	0 26 45			
17	6 8	6 10	355 37·2	355 52·5	N. 0·03	356 6·9	356 22·4	0 22 50			
18	6 7	6 10	356 36·9	356 52·1	0·16	357 6·6	357 22·1	0 18 54			
19	6 7	6 10	357 36·5	357 51·8	0·29	358 6·3	358 21·7	0 14 58			
20	6 6	6 10	358 36·1	358 51·4	0·42	359 5·9	359 21·3	0 11 2			
21	6 6	6 10	359 35·7	359 50·9	0·52	0 5·4	0 20·9	0 7 6			
22	6 5	6 10	0 35·3	0 50·5	0·59	1 5·0	1 20·5	0 3 10			
23	6 4	6 10	1 34·9	1 50·0	0·63	2 4·6	2 20·0	A. M. 11 59 14			
24	6 4	6 10	2 34·4	2 49·5	0·64	3 4·1	3 19·5	11 55 18			
25	6 3	6 10	33·9	3 48·9	0·62	4 3·5	4 18·9	11 51			
26	6 3	6 9	4 35·3	4 48·3	0·57	5 2·9	18·2	11 47 26			
27	6 2	6 9	32·7	47·7	0·50	6 2·3	6 17·6	11 43 30			
28	6 2	6 9	6 32·1	6 47·0	0·41	7 1·6	16·9	11 39 35			
29	6 1	6 9	7 31·4	7 46·2	0·30	8 0·9	8 16·2	11 35 39			
30	6 1	6 9	8 30·7	8 45·5	0·18	9 0·2	9 15·5	11 31 43			
31	6 0	6 9	9 29·9	9 44·7	N. 0·06	9 59·4	10 11·7	11			

TRIVANDRUM MEAN TIME.

Day.	THE MOON'S										Changes.
	Right Ascension.		Declination.		Semidiameter.		Horizontal Parallax.		Age at Mean Noon.		
	Midnight.	Noon.	Mid-night.	Noon.	Mid-night.	Noon.	Mid-night.	Noon.			
1	<i>h m s</i> 4 34 14	<i>h m s</i> 5 1 37	° N 25 11	° N 25 30	' 15 12	' 15 6	' 55 40	' 55 19	<i>d</i> 7.53	☾ Apogee. <i>d. h. m.</i> 15 5 2 P. M.	
2	5 28 45	5 55 33	25 29	25 10	15 2	14 57	55 1	54 46	8.53		
3	6 21 57	6 47 51	24 34	23 41	14 53	14 51	54 33	54 22	9.53		
4	7 13 14	7 38 4	22 32	21 10	14 48	14 46	54 13	54 7	10.53		
5	8 2 22	8 26 8	19 34	17 46	14 45	14 45	54 3	54 1	11.53		
6	8 49 25	9 12 15	15 48	13 40	14 45	14 45	54 1	54 2	12.53		
7	9 34 43	9 56 54	11 25	9 3	14 46	14 47	54 5	54 10	13.53		
8	10 18 53	10 40 44	6 35	N 4 3	14 45	14 50	54 15	54 22	14.53	☽ Full Moon. <i>d. h. m.</i> 9 3 6 A. M.	
9	11 2 33	11 24 26	N 1 29	S 1 8	14 53	14 55	54 30	54 39	15.53		
10	11 46 29	12 8 48	S 3 44	6 19	14 58	15 1	54 50	55 0	16.53		
11	12 31 30	12 54 39	5 52	11 20	15 4	15 7	55 12	55 25	17.53		
12	13 18 22	13 42 44	13 42	15 57	15 11	15 15	55 39	55 53	18.53		
13	14 7 50	14 33 43	13 2	19 55	15 20	15 24	56 8	56 24	19.53		
14	15 0 26	15 27 39	21 35	22 59	15 28	15 33	56 41	56 59	20.53		
15	15 56 19	16 25 21	24 6	24 53	15 38	15 44	57 18	57 37	21.53	☾ Last Quarter. <i>d. h. m.</i> 16 5 41 P. M.	
16	16 55 0	17 25 6	25 19	25 22	15 49	15 54	57 57	58 17	22.53		
17	17 55 29	18 25 58	25 2	24 19	16 0	16 5	58 37	58 57	23.53		
18	18 56 21	19 26 29	23 12	21 43	16 11	16 16	59 17	59 35	24.53		
19	19 56 14	20 25 33	19 52	17 42	16 20	16 24	59 52	60 7	25.53		
20	20 54 21	21 22 39	15 15	12 34	16 27	16 30	60 19	60 29	26.53	☾ Perigee. <i>d. h. m.</i> 21 2 20 P. M.	
21	21 50 30	22 17 58	9 40	6 38	16 32	16 33	60 36	60 38	27.53		
22	22 45 7	23 12 3	S 3 30	S 0 20	16 32	16 31	60 37	60 31	28.53		
23	23 38 52	0 5 40	N 2 50	N 5 57	16 28	16 25	60 22	60 9	0.12		
24	0 32 33	0 59 35	8 57	11 48	16 20	16 15	59 52	59 33	1.12	☽ New Moon. <i>d. h. m.</i> 23 9 13 A. M.	
25	1 26 49	1 54 20	14 27	16 53	16 9	16 2	59 10	58 46	2.12		
26	2 22 5	2 50 3	19 2	20 54	15 55	15 48	58 20	57 53	3.12		
27	3 18 13	3 46 28	22 26	23 39	15 41	15 33	57 27	57 0	4.12		
28	4 14 43	4 42 51	24 32	25 4	15 27	15 20	56 35	56 10	5.12		
29	5 10 45	5 38 17	25 17	25 10	15 14	15 8	55 48	55 28	6.12		
30	6 5 21	6 31 54	24 44	24 1	15 3	14 59	55 8	54 23	7.12		
31	6 57 51	7 23 11	N 23 1	N 21 47	14 55	14 52	54 39	54 27	8.12	☽ First Quarter. <i>d. h. m.</i> 30 3 44 P. M.	

TRIVANDRUM MEAN TIME.

Day.	THE MOON'S									
	Rising. •	Meridian passage.	Setting.	Longitude.				Latitude.		
				Midnight.	Sun rise.	Noon.	Sun set.	Midnight,	Noon.	
	<i>h. m.</i> P. M.	<i>h. m.</i> P. M.	<i>h. m.</i> A. M.	°		°	"	"	°	
1	0 13	6 42	0 17	70 39.3	73 53.1	76 50.4	79 59.2		N 3 10.1	N 2 42.7
2	1 5	7 33	1 10	82 57.0	86 6.4	88 59.8	92 5.0		2 13.8	1 43.7
3	1 56	8 22	2 0	94 59.6	98 5.4	100 56.8	103 59.6		1 12.6	N 0 41.1
4	2 45	9 9	2 47	106 52.2	109 56.2	112 46.3	115 47.9		N 0 9.3	S 0 22.5
5	3 33	9 54	3 31	118 39.7	121 43.2	124 32.9	127 34.5		S 0 53.8	1 24.7
6	4 19	10 36	4 13	130 29.4	133 29.8	136 20.5	139 22.9		1 54.5	2 23.2
	5 4	11 18	4 52	142 15.7	145 20.5	148 12.2	151 16.1		2 50.3	3 15.6
8	5 49	11 59	5 30	154 10.5	157 16.2	160 10.5	163 16.3		3 38.9	3 59.9
9	6 33	* •	6 8	166 12.6	169 20.5	172 16.8	175 25.0		4 18.2	4 33.7
10	7 19	A. M. 0 40	6 46	178 23.5	181 33.3	184 32.5	187 43.1		4 46.1	4 55.3
11	8 6	1 23	7 25	190 44.1	193 56.5	196 58.1	200 11.4		5 1.0	5 3.3
12	8 55	2 7	8 8	203 14.8	206 29.5	209 34.4	212 50.6		5 1.8	4 56.8
13	9 48	2 54	8 53	215 56.8	219 14.4	222 22.1	225 41.4		4 47.9	4 35.3
14	10 43	3 45	9 42	228 50.6	232 11.1	235 22.5	238 45.2		4 19.2	3 59.4
15	11 41	4 40	10 36	241 57.8	245 21.9	248 36.9	252 3.6		3 36.3	3 10.1
16	* •	5 37	11 34	255 20.2	258 47.6	262 7.2	265 38.2		2 41.0	2 9.3
17	A. M. 0 39	6 36	P. M. 0 33	268 58.8	272 31.0	275 55.0	279 30.7		1 35.4	S 0 59.7
18	1 37	7 35	1 34	282 55.8	286 32.1	290 1.2	293 41.7		S 0 22.7	N 0 14.9
19	2 32	8 33	2 34	297 11.2	300 52.2	304 25.6	308 10.4		N 0 52.8	1 30.1
20	3 25	9 28	3 32	311 43.9	315 28.1	319 5.7	322 53.8		2 6.3	2 40.6
21	4 15	10 21	4 29	326 30.2	330 16.9	333 56.6	337 46.4		3 12.4	3 41.0
22	5 3	11 13	5 25	341 23.9	345 10.7	348 51.0	352 40.3		4 5.8	4 26.5
23	5 51	P. M. 0 5	6 21	356 16.9	0 1.6	3 40.4	7 27.0		4 42.4	4 53.7
24	6 39	0 57	7 17	11 0.5	14 41.3	18 16.0	21 57.9		4 59.8	1.2
25	7 28	1 50	8 13	25 26.3	29 0.9	32 30.5	36 6.0		4 57.6	4 49.5
26	8 18	2 43	9 10	39 28.1	42 56.2	46 19.1	49 47.0		4 37.2	4 21.2
27	9 11	3 38	10 6	53 3.1	56 23.5	59 40.0	63 1.0		4 1.6	3 39.2
28	10 4	4 32	11 1	66 10.4	69 24.2	72 34.3	75 48.9		3 14.1	2 47.0
29	10 57	5 25	11 53	78 52.4	82 0.0	85 5.2	88 14.4		2 18.3	1 48.2
30	11 49	6 16	* •	91 13.2	94 16.0	97 17.0	100 22.2		1 17.2	N 0 36.0
31	P. M. 0 39	7 4	A. M. 0 41	103 17.5	106 16.7	109 15.3	112 17.8		N 0 14.0	S 0 17.4

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APRIL

I

FOR TRIVANDRUM MEAN NOON.

Day of week.	Day of Month.	Malabar Date.	THE SUN'S				Sidercal Time of the Semidia-meter passing the Meridian	Equation of time to be added to		Sidercal Time.
			Apparent,		Semi-Diameter.	subtracted		from Apparent Time.		
			Right Ascension.	Declination.						
<b>Sun.</b>	1	19	h m s	° ' "	"	m s	m s	h m s		
Mon.	2	20	0 40 22	N 4 20 49	16 1'55	1 4'46	4 7	0 36 15		
Tues.		21	0 44 0	4 43 57	16 1'28	1 4'47	3 49	0 40 12		
		21	0 47 39	0	16 1'00	1 4'49	3 31	0 44 8		
Wed.	4	22	0 51 17	30 0	16 0'73	1 4'52	13	0 48		
Thur.	5	23	0 54 56	5 52 51	16 0'46	1 4'54	55	0 52 1		
Fri.	6	24	0 58 35	6 15 37	16 0'18	1 4'57	38	0 55 58		
Sat	7	25	1 2 15	6 35 17	15 59'91	1 4'60	20	0 59 54		
<b>Sun.</b>	8	26	1 54	0 49	15 59'64	1 4'63	2 3	1 3 51		
Mon.	9	27	1 9 34	23 15	15 59'36	1 4'67	1 46	1 7 47		
Tues.	10	28	1 13 14	7 45 22	15 59'08	1 4'71	1 30	1 11 44		
Wed.	11	29	1 16 54	8 7 43	15 58'81	1 4'75	1 13	1 15 41		
Thurs.	12	30	1 20 34	8 29 46	15 58'53	1 4'79	0 57	1 19 37		
Fri.	13	1	1 24 15	8 51 39	15 58'25	1 4'84	0 41	1 23 34		
Sat.	14	2	1 27 56	9 13 25	15 57'98	1 4'88	0 26	1 27 30		
<b>Sun.</b>	15	3	1 31 38	9 35 1	15 57'70	1 4'93	0 11	1 31 27		
Mon.	16	4	1 35 20	9 56 28	15 57'43	1 4'98	0 4	1 35 23		
Tues.	17	5	1 39 1	10 17 45	15 57'16	1 5'04	0 19	1 39 20		
Wed.	18	6	1 42 43	10 38 52	15 56'89	1 5'10	0 33	1 43 16		
Thurs.	19	7	1 46 26	10 59 49	15 56'63	1 5'15	0 46	1 47 13		
Fri.	20	8	1 50 10	11 20 23	15 56'36	1 5'21	0 59	1 51 9		
Sat.	21	9	1 53 56	11 41 9	15 56'11	1 5'28	1 12	1 55 6		
<b>Sun.</b>	22	10	1 38	12 1 30	15 55'85	1 5'34	1 24	1 59 3		
Mon.	23	11	2 1 23	12 21 42	15 55'59	1 5'41	1 36	2 2 59		
Tues.	24	12	2 5	12 41 42	15 55'34	1 5'48	1 48	2 6 56		
Wed.	25	13	54	13 1 27	15 55'09	1 5'55	1 59	2 10 52		
Thurs.	26	14	2 12 40	13 21 0	15 54'55	1 5'62	9	2 14 49		
Fri.	27	15	2 16 27	13 40 20	15 54'61	1 5'69	2 19	18 45		
Sat.	28	16	2 20 13	13 59 26	15 54'37	1 5'76	29	2 22 42		
<b>Sun.</b>	29	17	2 24 0	14 18 19	15 54'13	1 5'84	38	2 26 38		
Mon	30	18	2 27 48	N14 36 57	15 53'59	1 5'92	2 46	2 30 35		

MEENAM OR PANGUNI.

MEDAM OR CHITHRAL.

TRIVANDRUM MEAN TIM.

Day.	THE SUN'S.										Transit of the first Point of Arics.		
	Rising.	Setting.	Apparent.					Longitude at setting.					
			Longitude at Mid-night.	Longitude at Rising.	Latitude at Mean Noon.	Longitude at Mean Noon.	Longitude at setting.						
1	h m 6 0	h m 6 9	° 10 29.1	° 10 43.9		S. 0.06	° 10 58.6	0 11 13.9	A. M h m s 11 23 51				
2	5 59	6 9	11 28.3	11 43.1		0.17	11 57.8	12 13.1	11 19 56				
3	5 59	6 9	12 27.5	12 42.3		0.27	12 57.0	13 12.2	11 15 59				
4	5 58	6 9	13 26.6	13 41.4		0.35	13 56.1	14 11.3	11 12 3				
5	5 57	6 9	14 25.7	14 40.4		0.41	14 55.2	15 10.3	11 8 7				
6	5 57	6 9	15 24.7	15 39.3		0.45	15 54.1	16 9.3	11 4 11				
	5 56	6 9	16 23.7	16 38.3		0.46	16 53.1	17 8.2	11 0 15				
8	5 56	6 9	17 22.6	17 37.1		0.44	17 51.9	18 7.2	10 56 20				
9	5 55	6 9	18 21.6	18 36.2		0.39	18 51.0	19 6.1	10 52 24				
10	5 55	6 9	19 20.5	19 35.0		0.32	19 49.8	20 4.9	10 48 28				
11	5 54	6 8	20 19.2	20 33.8		0.22	20 48.6	21 3.8	10 44 32				
12	5 54	6 8	21 18.2	21 17.6	S.	0.10	21 47.5	22 2.6	10 40 36				
13	5 53	6 8	22 16.9	22 31.4	N.	0.03	22 46.2	23 1.4	10 36 40				
14	5 53	6 8	23 15.7	23 30.1		0.16	23 45.0	24 0.0	10 32 44				
15	5 52	6 8	24 14.4	24 28.8		0.29	24 43.6	24 58.7	10 28 48				
16	5 52	6 8	13.1	25 27.4		0.41	25 42.3	25 57.4	10 24				
17	5 52	6 8	26 11.8	26 26.1		0.51	26 41.0	26 56.1	10 20 56				
18	5 51	6 8	27 10.5	27 24.8		0.59	27 39.7	27 54.7	10 17 0				
19	5 51	6 8	28 9.0	28 23.3		0.63	28 38.3	28 53.3	10 13 5				
20	5 50	6 8	29 7.6	29 21.9		0.64	29 36.9	29 51.9	10 9 9				
21	5 50	6 8	30 6.2	30 20.5		0.63	30 35.5	30 50.5	10 5 13				
	5 49	6 8	31 4.8	31 19.1		0.59	31 34.1	31 49.0	10 1 17				
23	5 49	6 8	32 3.3	32 17.5		0.52	32 32.5	32 47.5	9 57 21				
24	5 48	6 8	33 1.8	33 16.0		0.42	33 31.0	33 45.9	9 53 25				
25	5 48	6 8	34 0.2	34 14.3		0.30	34 29.3	34 44.3	9 49 29				
26	5 48	6 8	34 58.6	35 12.7		0.18	35 27.7	35 42.9	9 45 33				
27	5 47	6 8	35 57.2	36 11.3	N.	0.05	36 26.3	36 41.1	9 41 37				
28	5 47	6 8	36 55.4	37 9.4	S.	0.07	37 24.4	37 38.4	9 37 41				
29	5 47	6 8	37 53.7	38 7.7		0.19	38 22.8	38 37.7	9 33 45				
30	5 46	6 9	38 52.0	39 6.0	S.	0.30	39 21.1	39 35.0	9 29 50				

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APRIL.

III

TRIVANDRUM MEAN TIME.

Day.	THE MOON'S										Changes.
	Right Ascension.		Declination.		Semidiameter.		Horizontal Parallax.		Age at Mean Noon		
	Midnight	Noon.	Mid-night.	Noon.	Mid-night.	Noon.	Mid-night.	Noon.			
	<i>h. m. s.</i>	<i>h. m. s.</i>			"	"			<i>d.</i>		
1	7 47 55	8 12 2	N 20 18	N 18 38	14 50	14 48	54 19	54 13	9 12		
2	8 35 38	8 58 43	16 47	14 45	14 47	14 47	54 9	54 8	10 12	☾ Apogee <i>d h m</i> 2 0 20 P. M.	
3	9 21 23	9 43 43	12 36	10 19	14 47	14 48	54 9	54 12	11 12		
4	10 5 49	10 27 45	7 55	5 27	14 49	14 51	54 18	54 25	12 12		
5	10 49 38	11 11 34	N 2 55	N 0 21	14 53	14 56	54 33	54 41	13 12		
6	11 33 39	11 55 59	S 2 15	S 4 51	15 0	15 3	54 55	55 7	14 12	☉ Full Moon <i>d h m</i> 7 6 57 P. M.	
7	12 18 41	12 41 51	7 25	9 56	15 6	15 10	55 21	55 35	15 12		
8	13 5 34	13 29 57	12 22	14 42	15 14	15 18	55 49	56 4	16 12	☽ Last Quarter <i>d h m</i> 7 1 20 A. M.	
9	13 55 2	14 20 54	16 52	18 52	15 22	15 26	56 19	56 34	17 12		
10	14 47 34	15 15 3	20 39	22 11	15 30	15 34	56 48	57 3	18 12		
11	15 43 18	16 12 14	23 25	24 21	15 38	15 42	57 18	57 32	19 12		
12	16 41 43	17 11 37	24 56	25 9	15 46	15 50	57 47	58 1	20 12	☽ Perigee <i>d h m</i> 13 8 20 A. M.	
13	17 41 44	18 11 54	24 59	24 26	15 54	15 57	58 14	58 27	21 12		
14	18 41 54	19 11 37	23 31	22 14	16 1	16 4	58 40	58 52	22 12		
15	19 40 55	20 9 43	20 36	18 40	16 7	16 10	59 3	59 14	23 12	☉ New Moon <i>d h m</i> 21 7 9 P. M.	
16	20 37 58	21 5 42	16 27	13 58	16 13	16 15	59 23	59 31	24 12		
17	21 32 57	21 59 47	11 18	8 28	16 16	16 18	59 38	59 43	25 12		
18	22 26 18	22 52 37	S 5 31	S 2 29	16 19	16 19	59 46	59 46	26 12		
19	23 18 48	23 45 0	N 0 35	N 3 38	16 18	16 17	59 44	59 39	27 12		
20	0 11 18	0 37 47	6 38	9 32	16 15	16 12	59 32	59 22	28 12		
21	1 4 34	1 31 42	12 17	14 51	16 9	16 4	59 9	58 53	29 12	☽ First Quarter <i>d h m</i> 29 10 30 A. M.	
22	1 59 11	2 27 3	17 12	19 17	16 0	15 54	58 36	58 17	0 70		
23	2 55 16	3 23 44	21 4	22 33	15 49	15 43	57 56	57 34	1 70		
24	3 52 20	4 20 59	23 41	24 29	15 37	15 30	57 12	56 49	2 70		
25	4 49 31	5 17 48	24 56	25 3	15 25	15 19	56 27	56 6	3 70		
26	5 45 40	6 13 0	24 50	24 18	15 13	15 8	55 45	55 26	4 70		
27	6 39 45	7 5 51	23 29	22 23	15 3	14 59	55 9	54 54	5 70		
28	7 31 14	7 55 58	21 3	19 30	14 56	14 53	54 41	54 31	6 70		
29	8 20 2	8 43 32	17 45	15 50	14 51	14 49	54 24	54 17	7 70	☾ Apogee <i>d h m</i> 30 7 20 A. M.	
30	9 6 30	9 29 2	N 13 46	N 11 34	14 48	14 45	54 14	54 14	8 70		

TRIVANDRUM MEAN TIME.

Day.	THE MOON'S.								
	Rising.	Meridian passage.	Setting.	Longitude.				Latitude.	
				Midnight.	Sun rise.	Noon.	Sun Set.	Midnight.	Noon.
	<i>h., m.</i> P. M.	<i>h. m.</i> P. M.	<i>h. m.</i> A. M.					°	°
1	1 28	7 50	1 27	115 11.1	118 8.4	121 5.5	124 6.9	S 0 48.8	S 1 19.4
2	2 15	8 33	2 10	126 59.3	129 55.7	132 53.0	135 54.5	1 49.0	2 17.5
3	3 0	9 15	2 50	138 47.2	141 44.3	144 42.6	147 45.4	2 44.5	3 9.7
4	3 45	9 56	3 28	150 39.6	153 37.8	156 38.5	159 43.5	3 33.0	3 54.0
	4 29	10 37	4 6	162 39.9	165 40.1	168 43.9	171 51.7	4 12.5	4 20.7
6	15	11 20	4 44	174 51.0	177 54.0	181 1.0	184 12.0	4 41.1	4 50.7
	6 1	* * A. M.	5 24	187 14.3	190 20.1	193 30.9	196 45.2	4 57.0	4 59.7
8	6 51	0 4	6 6	199 50.7	202 59.5	206 13.8	209 31.4	4 58.8	4 54.1
9	7 44	0 51	6 51	212 40.0	215 51.7	219 9.3	222 30.1	4 45.6	4 33.3
10	8 39	1 42	7 40	225 41.6	228 56.0	232 16.6	235 40.2	4 17.4	3 57.9
11	9 36	2 36	8 32	238 54.4	242 11.0	245 34.8	249 0.5	3 35.1	3 9.1
12	10 34	3 32	9 29	252 17.9	255 37.1	259 3.5	262 31.8	2 40.3	2 9.0
13	11 31	4 31	10 28	265 51.8	269 12.9	272 42.6	276 13.6	1 35.7	S 1 0.7
14	* * A. M.	5 29	11 27	279 36.1	282 59.7	286 32.3	290 6.0	S 0 24.7	N 0 12.0
15	0 26	6 26	P. M. 0 26	293 31.2	296 56.9	300 32.8	304 9.3	N 0 48.8	1 25.1
16	1 18	7 20	1 23	307 37.0	311 5.4	314 43.8	318 23.0	0 3	2 33.8
17	2 8	8 12	2 19	321 53.1	325 23.7	329 4.3	332 45.5	3 5.0	3 33.5
18	2 55	9 3	3 13	336 17.3	339 48.8	343 31.4	347 13.5	3 58.6	4 19.9
19	3 42	9 53	4 8	350 46.0	354 17.9	358 0.5	1 42.2	4 37.2	4 49.9
20	4 28	10 44	5 2	5 14.0	8 44.2	12 25.8	16 5.6	4 57.9	5 1.2
21	5 16	11 36	5 58	19 35.0	23 2.6	26 41.0	30 17.1	4 59.8	4 53.6
22	6 6	P. M. 0 29	6 55	33 42.8	37 5.8	40 40.1	44 11.3	4 43.0	4 28.5
23	6 57	1 24	7 51	47 32.2	50 49.9	54 18.7	57 44.2	4 10.0	3 48.2
24	7 51	2 19	8 48	60 59.3	64 11.0	67 34.2	70 53.5	3 23.6	2 56.6
25	8 45	3 14	9 42	74 3.3	77 9.4	80 26.7	83 40.6	2 27.5	1 57.1
26	9 39	4 6	10 33	86 44.9	89 45.8	92 57.9	96 6.9	1 25.5	N 0 53.3
27	10 31	4 56	11 20	99 6.6	102 2.9	105 11.5	108 16.5	N 0 20.8	S 0 11.6
28	11 21	5 44	* * A. M.	111 12.9	114 6.1	117 11.6	120 14.2	S 0 43.7	1 14.9
29	0 9	6 28	0 4	123 8.4	125 59.7	129 3.7	132 5.0	1 45.2	2 14.3
30	0 54	7 10	0 46	134 58.4	137 48.8	140 53.1	143 55.1	S 2 41.9	S 3 7.8

TRIVANDRUM MEAN NO ON.

Day of Week.	Day of Month.	Malabar Date.	THE SUN'S			Sideral Time of the Semidia- meter passing the Meridian.	Equation of time to be subtract- ed from Apparent time.	Sideral time.		
			Apparent		Semi- diameter.					
			Right Ascension.	Declination.						
<i>h</i>	<i>m</i>	<i>s</i>	<i>°</i>	<i>'</i>	<i>"</i>	<i>m</i>	<i>s</i>	<i>h</i>	<i>m</i>	<i>s</i>
Tue.	1	19	2 31 37	N 14 55 21	15 53.66	1 5.90	2 54	2 34 32		
Wed.	2	20	2 35 26	15 13 30	15 53.43	1 6.07	2	2 38 29		
Thur.	3	21	2 39 16	15 31 24	15 53.19	1 6.15	3 9	2 42 25		
Fri.	4	22	2 43 6	15 48 52	15 52.97	1 6.23	3 15	2 46 21		
Sat.	23	23	2 46 57	16 6 26	15 52.74	1 6.31	3 21	2 50 18		
Sun.	6	24	2 50 48	16 23 32	15 52.51	1 6.39	3 27	2 54 14		
Mon.	25	25	54 39	16 40 23	15 52.29	1 6.47	3 32	2 58 11		
Tue.	8	26	2 58 31	16 56 56	15 52.07	1 6.55	3 36	3 2		
Wed.	9	27	3 2 24	17 13 14	15 51.84	1 6.64	3 40	3 6 4		
Thur.	10	28	6 18	17 29 14	15 51.62	1 6.72	3 43	3 10 1		
Fri.	11	29	10 12	17 44 57	15 51.41	1 6.80	3 46	3 13		
Sat.	12	30	14 7	18 0 22	15 51.19	1 6.88	3 47	3 17 54		
Sun.	13	31	3 18 2	18 15 27	15 50.98	1 6.96	3 49	3 21 50		
Mon.	14	1	3 21 58	18 30 16	15 50.77	1 7.04	3 49	3 25 47		
Tue.	15	2	3 25 54	18 44 45	15 50.56	1 7.12	3 49	3 29 43		
Wed.	16	3	3 29 51	18 57 55	15 50.36	1 7.20	3 49	3 33 40		
Thur.	17	4	3 33 49	19 12 48	15 50.16	1 7.28	3 48	3 37 36		
Fri.	18	5	3 37 47	19 26 20	15 49.96	1 7.36	3 46	3 41 33		
Sat.	19	6	3 41 46	19 39 33	15 49.77	1 7.44	3 44	3 45 30		
Sun.	20	7	3 45 45	19 52 24	15 49.58	1 7.52	3 41	3 49 26		
Mon.	21	8	3 49 45	20 4 57	15 49.40	1 7.60	3 38	3 53 23		
Tue.	22	9	3 53 46	20 17 8	15 49.23	1 7.67	3 34	3 57 19		
Wed.	23	10	3 57 47	20 28 59	15 49.05	1 7.75	3 30	4 1 16		
Thur.	24	11	4 1 48	20 40 28	15 48.89	1 7.82	3 25	4 12		
Fri.	25	12	4 5 50	20 51 36	15 48.72	1 7.89	3 20	4 9		
Sat.	26	13	4 9 53	21 2 22	15 48.56	1 7.96	3 15	4 13		
Sun.	27	14	4 13 56	21 12 47	15 48.41	1 8.03	3 7	4 17		
Mon.	28	15	4 17 59	21 2 51	15 48.26	1 8.10	3 0	4 20 59		
Tue.	29	16	4 22 2	21 32 31	15 48.11	1 8.16	53	4 24		
Wed.	30	17	4 26 6	21 41 49	15 47.97	1 8.22	45	4 28		
Thur.	31	18	4 30 11	N 21 45	15 47.83	1 8.28	37	4 32 48		

MEDAM or CHITHRAI

EDAYAM of VAIKASI

## TRIVANDRUM MEAN TIME,

Day.	THE SUN'S										Transit of the First Point of Aries.
	Rising.	Setting.	Apparent.					Longitude at Setting.	A. h m s	M. m s	
			Longitude at Mid-night	Longitude at Rising.	Latitude at Mean Noon.	Longitude at Mean Noon.	Longitude at Setting.				
1	5 46	6 9	39 50.2	40 4.2	S. 0.38	40 19.2	40 34.2	9 24 54			
2	5 46	6 9	40 48.3	41 2.3	0.44	41 17.4	41 32.4	9 21 58			
3	5 45	6 9	41 46.5	42 0.5	0.48	42 15.6	42 30.6	9 18 2			
4	5 45	6 9	42 44.7	42 58.7	0.49	43 13.8	43 28.7	9 14 6			
5	5 45	9 9	43 42.8	43 56.7	0.47	44 11.8	44 26.8	9 10 10			
6	5 44	6 9	44 40.9	44 54.8	0.43	45 9.9	45 24.8	9 6 14			
7	5 44	6 9	45 38.9	45 52.8	0.36	46 7.8	46 22.9	9 2 18			
8	5 44	6 9	46 37.0	46 50.9	0.25	47 6.0	47 20.9	8 58 22			
9	5 44	6 9	47 45.0	47 48.9	0.14	48 3.9	48 18.8	8 54 26			
10	5 43	6 9	48 32.9	48 46.8	S. 0.01	49 1.8	49 16.8	8 50 30			
11	5 43	6 10	49 30.9	49 44.7	N. 0.12	49 59.8	50 14.7	8 46 35			
12	5 43	6 10	50 28.8	50 42.6	0.26	50 57.6	51 12.6	8 42 39			
13	5 43	6 10	51 26.7	51 40.5	0.37	51 55.5	52 10.5	8 38 43			
14	5 43	6 10	52 24.6	52 38.4	0.48	52 53.4	53 8.4	8 34 47			
15	5 42	6 10	53 22.5	53 36.3	0.57	53 51.3	54 6.2	8 30 51			
16	5 42	6 10	54 20.2	54 33.9	0.62	54 49.1	55 4.1	8 26 55			
17	5 42	6 11	55 18.2	55 31.8	0.63	55 47.0	56 1.9	8 22 59			
18	5 42	6 11	56 15.9	56 29.6	0.62	56 44.8	56 59.7	8 19 3			
19	5 42	6 11	57 13.7	57 27.4	0.58	57 42.6	57 57.4	8 15 7			
20	5 42	6 11	58 11.4	58 25.1	0.51	58 40.2	58 55.2	8 11 11			
21	5 42	6 11	59 9.2	59 22.9	0.42	59 38.0	59 52.9	8 7 15			
22	5 41	6 11	60 6.9	60 20.6	0.30	60 35.7	60 50.6	8 3 20			
23	5 41	6 12	61 4.6	61 18.2	0.17	61 33.3	61 47.4	7 59 24			
24	5 41	6 12	62 2.3	62 15.9	N. 0.05	62 31.1	62 46.1	7 55 28			
25	5 41	6 12	63 0.0	63 13.6	S. 0.08	63 28.8	63 43.7	7 51 32			
26	5 41	6 12	63 54.6	64 11.2	0.20	64 26.3	64 41.3	7 47 36			
27	5 41	6 13	64 55.2	65 8.8	0.31	65 23.9	65 38.9	7 43 40			
28	5 41	6 13	65 52.8	66 6.4	0.40	66 21.5	66 36.5	7 39 44			
29	5 41	6 13	66 50.4	67 4.0	0.46	67 19.1	67 34.0	35 48			
30	5 41	6 13	67 47.9	68 1.5	0.51	68 16.5	68 31.5	31 52			
31	5 41	6 13	68 45.4	68 59.0	S. 0.53	69 14.0	69 29.0	27 56			

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III

## TRIVANDBRUM MEAN TIME,

Day.	THE MOON'S										Changes.
	Right Ascension.		Declination.		Semidiameter.		Horizontal Parallax.		Age at Mean Noon.		
	Midnight.	Noon.	Mid-night.	Noon.	Mid-night.	Noon.	Mid-night.	Noon.			
	<i>h m s</i>	<i>h m s</i>	°	°	"	"	"	"			
1	9 51 14	10 13 12	N 9 16	N 6 52	14 49	14 50	54 16	54 21	9.70		
2	10 35 2	10 56 52	N 4 24	N 1 53	14 52	14 55	54 28	54 38	10.70		
3	11 18 47	11 40 55	S 0 41	S 3 15	14 58	15 1	54 49	55 2	11.70		
4	12 3 23	12 26 16	5 49	8 21	15 6	15 10	55 17	55 33	12.70		
5	12 49 43	13 13 49	10 50	13 13	15 14	15 19	55 50	56 9	13.70		
6	13 38 37	14 4 22	15 30	17 37	15 24	15 29	56 27	56 45	14.70	☉ Full Moon. d. h. m. 7 7 51 A. M.	
7	14 30 54	14 58 21	19 32	21 13	15 34	15 39	57 4	57 21	15.70		
8	15 26 40	15 55 47	22 39	23 45	15 43	15 48	57 38	57 54	16.70		
9	16 25 34	16 55 51	24 31	24 55	15 52	15 56	58 9	58 23	17.70	☾ Perigee. d. h. m. 13 11 44 P. M.	
10	17 26 26	17 57 7	24 56	24 34	15 59	16 2	58 35	58 45	18.70		
11	18 27 39	18 57 51	23 48	22 39	16 5	16 6	58 54	59 1	19.70		
12	19 27 34	19 56 42	21 9	19 20	16 8	16 9	59 7	59 12	20.70		
13	20 25 11	20 53 1	17 14	14 53	16 10	16 11	59 15	59 17	21.70		
14	21 20 14	21 46 54	12 20	9 36	16 11	16 11	59 17	59 17	22.70		
15	22 13 7	22 39 0	6 46	S 3 50	16 10	16 9	59 15	59 12	23.70	☾ Last Quarter. d. h. m. 14 6 56 A. M.	
16	23 4 40	23 30 13	S 0 52	N 2 6	16 8	16 7	59 8	59 2	24.70		
17	23 55 49	0 21 32	N 5 3	7 55	16 5	16 2	58 55	58 47	25.70		
18	0 47 31	1 13 50	10 40	13 17	16 0	15 57	58 37	58 26	26.70	☉ New Moon. d. h. m. 21 5 55 A. M.	
19	1 40 32	2 7 40	15 42	17 54	15 53	15 50	58 14	58 0	27.70		
20	2 35 14	3 3 11	19 50	21 30	15 46	15 42	57 45	57 30	28.70		
21	3 31 28	3 59 58	22 51	23 52	15 37	15 32	57 13	56 56	0.25		
22	4 21 24	4 57 2	24 33	24 54	15 27	15 22	56 38	56 20	1.25		
23	5 25 19	5 53 12	24 54	24 35	15 18	15 13	56 2	55 45	2.25		
24	6 20 35	6 47 20	23 57	23 2	15 9	15 4	55 28	54 13	3.25	☾ Apogee. d. h. m. 28 2 32 A. M.	
25	7 13 26	7 38 49	21 50	20 25	15 0	14 57	54 59	54 46	4.25		
26	8 3 30	8 27 30	18 47	16 58	14 54	14 52	54 35	54 26	5.25		
27	8 50 55	9 13 47	14 59	12 52	14 50	14 49	54 20	54 15	6.25		
28	9 36 11	9 58 15	10 38	8 18	14 48	14 49	54 14	54 14	7.25		
29	10 20 5	10 41 47	5 53	N 3 25	14 49	14 51	54 18	54 24	8.25		
30	11 3 28	11 25 14	N 0 54	S 1 38	14 53	14 56	54 32	54 43	9.25	☉ First Quarter. d. h. m. 29 4 41 A. M.	
31	11 47 15	12 9 38	S 4 10	S 6 41	15 0	15 4	54 57	55 12	10.25		

IV

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## TRIVANDRUM MEAN TIME.

Day.	THE MOON'S									
	Rising.	Meridian passage.	Setting.	Longitude.				Latitude.		
				Midnight	Sun rise	Noon	Sun set	Midnight	Noon	
	<i>h m</i> P. M.	<i>h m</i> P. M.	<i>h m</i> A. M.							o
1	1 39	7 52	1 25	146 48.5	149 39.6	152 45.0	155 48.5	S 3 31.5	S 3 53.1	
2	2 24	8 33	2 2	158 43.5	161 36.5	164 44.4	167 50.5	4 12.4	4 29.0	
3	3 8	9 14	2 41	170 48.1	173 43.6	176 55.2	180 4.7	4 42.4	4 53.0	
4	3 51	9 58	3 20	183 5.9	186 4.9	189 20.5	192 34.2	5 0.1	5 3.9	
5	4 43	10 44	4 1	195 39.3	198 42.3	202 2.4	205 20.4	5 3.9	5 0.1	
6	5 35	11 34	4 45	208 29.7	211 36.2	215 1.3	218 23.7	4 52.6	4 41.1	
7	6 30	* * A. M.	5 33	221 37.0	224 47.4	228 16.6	231 42.9	4 25.7	4 6.5	
8	7 23	0 28	6 25	234 59.9	238 13.9	241 46.6	245 16.3	3 43.9	3 17.8	
9	8 27	1 25	7 22	248 36.4	251 53.1	255 28.9	259 1.3	2 48.6	2 16.7	
10	9 26	2 24	8 21	262 23.8	265 42.2	269 20.8	272 55.2	1 42.6	S 1 6.8	
11	10 22	3 24	9 21	276 19.5	279 39.5	283 19.7	286 56.1	S 0 29.7	N 0 7.9	
12	11 15	4 21	10 21	290 21.3	293 42.4	297 23.7	301 1.2	N 0 45.6	1 22.7	
13	* * A. M.	5 16	11 13	304 27.2	307 49.4	311 31.3	315 9.4	1 58.6	2 32.7	
14	0 5	6 9	P. M. 0 14	318 36.0	321 58.3	325 40.9	329 19.3	3 4.7	3 33.7	
15	0 52	6 59	1 7	332 46.1	336 8.0	339 51.1	343 29.4	3 59.5	4 21.5	
16	1 38	7 48	0	346 55.8	350 17.5	354 0.1	357 37.7	4 39.6	4 53.4	
17	2 23	8 37	2 53	1 3.3	4 23.9	8 5.2	11 42.0	5 2.7	5 7.4	
18	3 9	9 27	3 47	15 5.4	18 24.3	22 3.5	25 37.9	7.5	5 3.1	
19	3 57	10 19	4 42	28 59.0	32 15.4	35 51.5	39 22.8	4 54.1	4 41.0	
20	4 47	11 12	5 39	42 40.6	45 53.7	49 26.1	52 53.3	4 24.0	4 3.4	
21	5 39	P. M. 0 7	6 35	56 7.4	59 16.5	62 44.3	66 7.2	3 39.5	3 13.1	
22	6 33	1 2	7 30	69 16.9	72 21.2	44.9	79 3.0	2 44.2	2 13.2	
23	7 28	1 56	8 23	82 8.4	85 8.5	88 27.4	91 41.6	1 41.5	1 8.6	
24	8 21	2 48	9 13	94 42.2	97 38.3	100 52.9	104 3.0	N 0 35.1	N 0 1.6	
25	9 12	3 36	9 58	107 0.0	109 52.8	113 3.8	116 10.7	S 0 31.8	S 1 4.4	
26	10 1	4 22	10 41	119 4.9	121 55.0	125 3.5	128 8.1	1 36.1	6.5	
27	10 48	5	11 21	131 0.4	133 49.1	136 56.3	140 0.2	2 35.5	3 2.7	
28	11 33	5 47	11 59	142 51.4	145 39.6	148 46.6	151 50.7	3 27.9	3 50.8	
29	P. M. 0 17	6 27	* * A. M.	154 42.4	157 31.3	160 39.5	163 45.2	4 11.4	4 29.3	
30	1 1	7 8	0 36	166 38.5	169 29.4	172 40.0	175 48.4	4 44.3	4 56.3	
31	1 46	7 51	1 14	178 44.6	181 38.4	184 52.7	188 5.0	5 5.2	S 5 10.6	

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JUNE

I

FOR TRIVANDRUM MEAN NOON.

Day of Week.	Day of Month.	Malabar Date.	THE SUN'S					Sideral Time of the Semidiameter passing the Meridian.	Equation of time to be subtracted from added to Apparent Time.	Sideral Time.
			Apparent.			Semi-Diameter.				
			Right Ascension.	Declination.						
Frid.	1	19	h m s	° "			m s	m s	h m s.	
Sat.	2	20	4 34 16	N. 21 59 18	15	47-69	1 8-34	2 29	4 36 45	
Sun.	3	21	4 38 22	22 7 28	15	47-56	1 8-40	2 20	4 40 41	
Mon.	4	22	4 42 28	22 15 14	15	47-43	1 8-45	2 11	4 44 35	
Tues.	5	23	4 46 33	22 22 38	15	47-30	1 8-50	2 1	4 48 35	
Wed.	6	24	4 50 40	22 29 38	15	47-18	1 8-55	1 51	4 52 31	
Thur.	7	25	4 54 47	22 36 15	15	47-06	1 8-60	1 41	4 56 28	
Frid.	8	26	4 58 51	22 42 28	15	46-94	1 8-64	1 30	5 0 24	
Sat.	9	27	5 3 2	22 48 16	15	46-82	1 8-68	1 19	5 4 21	
Sun.	10	28	7 10	22 53 42	15	46-71	1 8-72	1 8	5 8 17	
Mon.	11	29	11 18	22 58 43	15	46-60	1 8-75	0 56	5 12 14	
Tues.	12	30	15 26	23 3 20	15	46-49	1 8-78	0 44	5 16 10	
Wed.	13	31	19 35	23 7 32	15	46-38	1 8-81	0 32	5 20 7	
Thur.	14	1	23 44	23 11 20	15	46-29	1 8-83	0 20	5 24 4	
Frid.	15	2	27 53	23 14 41	15	46-19	1 8-86	0 7	5 28 0	
Sat.	16	3	32 2	23 17 42	15	46-10	1 8-88	0 5	31 57	
Sun.	17	4	36 11	23 20 16	15	46-02	1 8-89	0 18	5 35 53	
Mon.	18	5	40 21	23 22 25	15	45-94	1 8-90	0 31	5 39 50	
Tues.	19	6	5 44 31	23 24 11	15	45-87	1 8-91	0 44	5 43 46	
Wed.	20	7	48 40	23 25 35	15	45-80	1 8-92	0 57	5 47 43	
Thur.	21	8	5 52 50	23 26 25	15	45-74	1 8-92	1 10	51 39	
Frid.	22	9	57 0	23 26 55	15	45-68	1 8-92	1 23	55 36	
Sat.	23	10	6 1 9	23 26 56	15	45-63	1 8-92	1 36	5 59 33	
Sun.	24	11	6 5 19	23 26 41	15	45-59	1 8-91	1 49	6 3 29	
Mon.	25	12	6 9 28	23 25 57	15	45-55	1 8-90	2 2	6 7 26	
Tues.	26	13	6 13 38	23 24 47	15	45-51	1 8-89	15	6 11 22	
Wed.	27	14	6 17 47	23 23 14	15	45-48	1 8-87	2 28	6 15 19	
Thur.	28	15	6 21 56	23 21 16	15	45-46	1 8-85	2 41	6 19 15	
Fri.	29	16	6 26 5	23 18 53	15	45-43	1 8-83	2 53	6 23 12	
Sat.	30	17	6 30 14	23 16 6	15	45-41	1 8-80	3 5	6 27 8	
			6 34 23	N. 23 12 55	15	45-40	1 8-77	3 17	6 31 5	

## TRIVANDRUM MEAN TIME.

Day.	THE SUN'S							Transit of the First Point of Aries.	
	Rising.	Setting.	Apparent.						
			Longitude at Mid-night.	Longitude at Rising.	Latitude at Mean Noon.	Longitude at Mean Noon.	Longitude at Setting.		
	<i>h m</i>	<i>h m</i>	<i>o</i>	<i>o</i>	<i>r</i>	<i>°</i>	<i>o</i>	<i>o</i>	<i>A. M.</i>
1	5 41	6 14	69 42.9	69 56.5		S. 0.51	70 11.5	70 26.5	7 24 0
2	5 41	6 14	70 40.3	70 53.9		0.47	71 9.0	71 24.0	7 20 5
3	5 41	6 14	71 37.8	71 51.4		0.40	6.5	72 21.4	7 16 9
4	5 41	6 14	72 35.2	72 48.8		0.30	73 3.9	73 18.8	7 12 13
5	5 42	6 15	73 32.6	73 46.4		0.19	74 1.3	74 16.3	7 8 17
6	5 42	6 15	74 30.0	74 43.6		S. 0.06	74 58.6	75 13.7	7 4 21
7	5 42	6 15	75 27.4	75 41.0		0.07	75 56.0	76 11.1	7 0 25
8	5 42	6 15	76 24.8	76 38.4		0.21	76 53.4	77 8.4	6 56 29
9	5 42	6 16	77 22.1	77 35.7		0.34	77 50.7	78 5.8	6 52 33
10	5 42	6 16	78 19.5	78 33.1		0.46	78 53.1	79 3.1	6 48 37
11	5 42	16	79 16.8	79 30.4		0.55	79 45.4	80 0.5	6 44 41
12	5 42	6 16	80 14.2	80 27.8		0.61	80 42.8	80 57.8	6 40 45
13	5 43	6 17	81 11.5	81 25.1		0.64	81 40.1	81 55.1	6 36 49
14	5 43	6 17	82 8.8	82 22.4		0.63	82 37.4	82 52.4	6 32 54
15	5 43	6 17	83 6.1	83 19.7		0.59	83 34.7	83 49.8	6 28 58
16	5 43	6 17	84 3.5	84 17.1		0.52	84 32.1	84 47.1	6 25 2
17	5 43	6 18	85 0.8	85 14.4		0.43	85 29.3	85 44.5	6 21 6
18	5 43	6 18	85 58.1	86 11.7		0.32	86 26.6	86 41.7	6 17 10
19	5 44	6 18	86 55.3	87 8.9		0.20	87 23.8	87 39.0	6 13 14
20	5 44	6 18	87 52.6	88 6.3		N. 0.07	88 21.1	88 36.3	6 9 18
21	5 44	6 19	88 49.9	89 3.6		S. 0.06	89 18.4	89 33.6	6 5 22
22	5 44	6 19	89 47.2	90 0.9		0.18	90 16.7	90 30.8	6 1 26
23	5 44	6 19	90 44.4	90 58.1		0.31	91 12.9	91 28.1	5 30
24	5 45	6 19	91 41.7	91 55.4		0.41	92 10.2	92 25.3	53 34
25	5 45	6 19	92 38.9	92 52.6		0.48	93 7.4	93 22.6	5 49 39
26	5 45	6 20	93 36.2	93 49.9		0.53	94 4.7	94 19.9	5 45 43
27	5 45	6 20	94 33.4	94 47.1		0.56	95 1.9	95 17.1	5 41 47
28	5 46	6 20	95 30.6	95 44.3		0.56	95 59.1	96 14.3	5 87 51
29	5 46	6 20	96 27.8	96 41.5		0.53	96 56.3	97 11.5	5 33 55
30	5 46	6 20	97 25.0	97 38.7		S. 0.48	97 53.5	98 8.7	5 29 59

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# JUNE

III

## TRIVANDRUM MEAN TIME

Day.	THE MOON'S										Changes.
	Right Ascension.		Declination.		Semidiameter.		Horizontal Parallax.		Age at Mean Noon.		
	Midnight.	Noon.	Midnight.	Noon.	Midnight.	Noon.	Midnight.	Noon.			
	<i>h m s</i>			<i>°</i>		<i>''</i>			<i>d</i>		
1	12 32 28	12 55 55	S 9 10	S 11 36	15 9	15 14	55 20	55 49	11.25		
2	13 0 4	13 45 2	13 56	16 8	15 20	15 26	56 10	56 32	12.25		
3	14 10 55	14 37 45	18 11	20 2	15 32	15 38	56 55	57 18	13.25	☉ Full Moon <i>d. h. m.</i> 5 6 15 P. M.	
4	15 5 35	15 34 22	21 39	22 59	15 44	15 51	57 40	58 3	14.25		
5	16 4 2	16 34 28	24 0	24 40	15 56	16 2	58 24	58 43	15.25		
6	17 5 27	17 36 45	24 56	24 48	16 3	16 10	59 1	59 16	16.25		
7	18 8 7	18 39 19	21 15	23 18	16 14	16 17	59 29	59 39	17.25		
8	19 10 7	19 40 20	21 58	20 17	16 19	16 20	59 46	59 51	18.25		
9	20 9 53	20 38 41	18 16	15 59	16 20	16 20	59 52	59 51	19.25	☾ Perigee. <i>d. h. m.</i> 9 1 20 A. M.	
10	21 6 45	21 34 7	13 29	10 47	16 19	16 18	59 48	59 42	20.25		
11	22 0 52	22 27 7	7 57	S 2	16 16	16 13	59 35	59 26	21.25		
12	22 52 58	23 18 34	S 2 4	N 0 54	16 10	16 7	59 15	59 3	22.25	☾ Last quarter. <i>d. h. m.</i> 12 11 46 A. M.	
13	23 44 1	0 9 29	N 3 51	6 43	16 3	16 0	58 51	58 38	23.25		
14	0 35 3	1 0 50	9 30	12 8	15 56	15 53	58 24	58 10	24.25		
15	1 26 55	1 53 21	14 36	16 52	15 49	15 45	57 56	57 41	25.25		
16	2 20 12	2 45 11	18 54	20 40	15 41	15 36	57 26	57 11	26.25		
17	3 15 5	3 43 1	22 9	23 20	15 32	15 28	56 56	56 41	27.25		
18	4 11 9	4 39 21	24 12	24 44	15 24	15 20	56 26	56 11	28.25	☉ New Moon. <i>d. h. m.</i> 19 6 10 P. M.	
19	5 7 30	5 35 25	24 56	24 49	15 16	15 12	55 56	55 42	29.25		
20	6 2 59	6 30 3	24 22	23 37	15 8	15 5	55 27	55 14	0.74		
21	6 56 32	7 22 23	22 36	21 19	15 1	14 58	55 1	54 49	1.74		
22	7 47 33	8 12 3	19 48	18 5	14 55	14 52	54 39	54 29	2.74		
23	8 35 53	8 59 8	16 12	14 9	14 50	14 48	54 21	54 15	3.74		
24	9 21 52	9 44 9	11 59	9 42	14 17	14 17	54 10	54 8	4.74	☾ Apogee <i>d. h. m.</i> 24 8 14 P. M.	
25	10 6 4	10 27 46	7 21	N 4 55	14 17	14 17	54 8	54 10	5.74		
26	10 49 19	11 10 54	N 2 27	S 0 3	14 48	14 50	54 14	54 20	6.74		
27	11 32 29	11 54 16	S 2 34	4	14 52	14 56	54 29	54 41	7.74		
28	12 16 30	12 39 10	7 32	9 58	15 0	15 4	54 56	55 12	8.74		
29	13 2 23	13 26 21	12 19	14 35	15 9	15 15	55 31	55 52	9.74	☉ First quarter. <i>d. h. m.</i> 27 9 16 P. M.	
30	13 51 6	14 16 47	16 42	18 41	15 21	15 18	56 15	56 40	10.74		

IV

JUNE.

## TRIVANDRUM MEAN TIME.

Day	THE MOON'S									
	Rising.	Meridian passage.	Setting.	Longitude.				Latitude.		
				Midnight.	Sun rise.	Noon.	Sun set.	Midnight.	Noon.	
h m P. M.	h m P. M.	h m A. M.				°		°		
1	2 33	8 35	1 54	191 4.9	194 2.7	197 21.5	200 39.1	S. 5 12.5	S. 5 10.7	
2	3 24	9 23	2 36	203 43.1	206 45.5	210 9.7	213 32.5	5 5.0	4 55.4	
3	4 17	10 15	3 23	216 41.4	219 48.8	223 18.5	226 47.0	4 41.9	4 24.5	
4	5 16	11 12	4 13	230 1.1	233 13.3	236 48.5	240 22.2	4 3.2	3 38.2	
5	6 14	* * A. M.	5 9	243 40.9	246 58.4	250 37.8	254 16.7	3 9.7	2 38.1	
6	7 15	0 12	6 9	257 39.0	261 0.2	264 43.6	268 26.0	2 3.8	1 27.3	
	8 14	1 13	7 10	271 51.3	275 15.3	279 1.3	282 46.1	S. 0 49.1	S. 0 9.9	
8	9 10	2 13	8 12	286 13.3	289 39.0	293 26.4	297 12.2	N. 0 29.7	N. 1 9.0	
9	10 2	3 10	9 12	300 40.1	304 6.2	307 53.8	311 40.1	1 47.2	2 23.6	
10	10 50	4 5	10 9	315 7.0	318 32.5	322 19.1	326 4.4	2 57.7	3 29.0	
11	11 37	4 56	11 4	329 29.9	332 54.0	336 39.0	340 22.2	3 56.8	4 20.8	
12	* * A. M.	5 46	11 56 P. M.	343 45.8	347 7.8	350 50.3	354 31.0	4 40.7	4 56.3	
13	0 22	6 35	0 50	357 52.2	1 12.0	4 51.3	8 29.6	5 7.2	5 13.6	
14	1 7	7 24	1 43	11 47.5	15 4.7	18 40.5	22 15.7	5 15.2	12.4	
15	1 53	8 14	2 36	25 30.7	28 45.5	32 17.2	35 48.8	5.1	4 53.6	
16	2 42	9 6	3 31	39 0.4	42 11.4	45 40.3	49 8.2	4 38.1	4 19.0	
17	3 32	9 59	4 26	52 16.6	55 24.2	58 49.5	62 14.3	3 56.5		
18	4 25	10 53	5 21	65 18.7	68 22.9	71 44.5	75 5.6	3 3.3	3 31.2	
19	5 19	11 47 P. M.	6 15	78 6.6	81 8.1	84 25.4	87 42.9	2 1.8	2 33.4	
20	6 12	0 40	7 6	90 40.8	93 39.0	96 52.9	100 7.0	N. 0 55.2	1 28.8	
21	7 4	1 29	7 53	103 1.9	105 57.2	109 8.0	112 19.7	S. 0 12.9	N. 0 21.0	
22	7 54	2 16	8 37	115 11.5	118 4.3	121 12.6	124 21.8	1 19.5	S. 0 46.6	
23	8 42	3 1	9 18	127 11.7	130 2.8	133 9.1	136 16.7	2 21.6	1 51.2	
24	9 28	3 43	9 57	139 5.3	141 55.6	145 0.5	148 7.4	3 17.1	2 50.4	
25	10 11	4 23	10 33	150 55.5	153 45.6	156 50.6	159 57.7	4 3.9	3 41.7	
26	10 55	5 4	11 11	162 46.4	165 37.3	168 43.4	171 52.4	4 40.3	4 23.5	
27	11 39 P. M.	5 45	11 49 * *	174 42.1	177 34.8	180 43.2	183 54.9	4.9	4 54.2	
28	0 25	6 28	A. M.	156 47.3	189 43.4	192 54.8	196 10.4	5 16.4	5 12.4	
29	1 13	7 13	0 29	199 6.5	202 6.5	205 22.6	208 43.1	13.9	5 17.0	
30	2 4	8 2	1 13	211 43.7	214 48.7	218 10.3	221 36.6	4 56.2	5 7.0	
								S. 4 41.8		

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JULY

I

FOR TRIVANDRUM MEAN NOON.

Day of Week.	Day of Month.	Malabar Date.	THE SUN'S				Sideral Time of the Semi-diameter passing the Meridian.	Equation of Time to be added to Apparent Time.	Sideral Time.
			Apparent.		Semi-diameter.				
			Right Ascension.	Declination.					
<b>Sun.</b>	1	18	<i>h m s</i>	<i>° ' "</i>	<i>° ' "</i>	<i>m s</i>	<i>m s</i>	<i>h m s</i>	
<b>Mon.</b>	2	19	6 38 31	N. 23 9 17	15 45.39	1 8.74	3 29	6 35 2	
<b>Tues.</b>	3	20	6 42 39	23 5 18	15 45.39	1 8.70	3 40	6 38 53	
<b>Wed.</b>	4	21	6 46 47	23 0 53	15 45.38	1 8.66	3 52	6 42 55	
<b>Thur.</b>	5	22	6 50 54	22 56 4	15 45.33	1 8.62	4 3	6 46 51	
<b>Fri.</b>	6	23	6 55 1	22 50 52	15 45.39	1 8.58	4 14	6 50 48	
<b>Sat.</b>	7	24	6 59 8	22 45 15	15 45.39	1 8.53	4 24	6 54 44	
<b>Sun.</b>	8	25	7 3 15	22 39 15	15 45.40	1 8.48	4 34	6 58 41	
<b>Mon.</b>	9	26	7 7 22	22 32 53	15 45.42	1 8.43	4 44	7 2 37	
<b>Tues.</b>	10	27	7 11 27	22 26 4	15 45.43	1 8.37	4 53	7 6 34	
<b>Wed.</b>	11	28	7 15 33	22 18 54	15 45.45	1 8.31	2	7 10 31	
<b>Thur.</b>	12	29	7 19 38	22 11 20	15 45.48	1 8.25	10	7 14 27	
<b>Fri.</b>	13	30	7 23 42	22 3 24	15 45.51	1 8.19	18	7 18 24	
<b>Sat.</b>	14	31	7 27 47	21 55 4	15 45.54	1 8.13	5 26	7 22 20	
<b>Sun.</b>	15	32	7 31 50	21 46 22	15 45.58	1 8.06	5 33	7 26 17	
<b>Mon.</b>	16	1	7 35 53	21 37 19	15 45.62	1 7.99	5 40	7 30 13	
<b>Tues.</b>	17	2	7 39 56	21 27 52	15 45.67	1 7.92	5 46	7 34 10	
<b>Wed.</b>	18	3	7 43 58	21 18 4	15 45.72	1 7.84	5 52	7 38 7	
<b>Thur.</b>	19	4	7 48 0	21 7 54	15 45.79	1 7.77	5 58	7 42 3	
<b>Fri.</b>	20	5	7 52 2	20 57 23	15 45.85	1 7.69	6 2	7 46 0	
<b>Sat.</b>	21	6	7 56 3	20 46 28	15 45.92	1 7.62	6 6	7 49 56	
<b>Sun.</b>	22	7	8 0 3	20 35 14	15 46.00	1 7.54	6 10	7 53 53	
<b>Mon.</b>	23	8	8 4 3	20 23 40	15 46.08	1 7.46	5 13	7 57 49	
<b>Tues.</b>	24	9	8 8 2	20 11 44	15 46.17	1 7.38	6 16	8 1 46	
<b>Wed.</b>	25	10	8 12 0	19 59 28	15 46.26	1 7.29	6 18	8 5 42	
<b>Thur.</b>	26	11	8 15 58	19 46 54	15 46.36	1 7.21	6 19	8 9 39	
<b>Fri.</b>	27	12	8 19 55	19 34 0	15 46.46	1 7.13	6 20	8 13 36	
<b>Sat.</b>	28	13	8 23 52	19 20 44	15 46.56	1 7.04	6 20	8 17 32	
<b>Sun.</b>	29	14	8 27 48	19 7 10	15 46.67	1 6.96	6 19	8 21 29	
<b>Mon.</b>	30	15	8 31 44	18 53 17	15 46.79	1 6.87	6 18	8 25 25	
<b>Tues.</b>	31	16	8 35 38	18 39 3	15 46.90	1 6.79	6 16	8 29 22	
<b>Tues.</b>	31	16	8 39 32	N 18 24 37	15 47.02	1 6.70	6 14	8 33 13	

MITHUNAM OF ANI.

KARKADAKAE OF ADI.

TRIVANDRUM MEAN TIME.

Day.	THE SUN'S							Transit of the First Point of Aries.
	Rising.	Setting.	Apparent.					
			Longitude at Mid-night.	Longitude at Rising.	Latitude at Mean Noon.	Longitude at Mean Noon.	Longitude at setting.	
1	h m	h m	°	°		°	°	A. M. h m s
1	5 46	6 21	98 22.2	98 35.9	S. 0.39	98 50.7	99 59	5 26 3
2	5 47	6 21	99 19.4	99 33.2	0.25	99 47.9	100 3.1	22 7
3	4 47	6 21	100 16.6	100 30.4	0.15	100 45.1	101 0.3	18 11
4	5 47	6 21	101 13.8	101 27.6	S. 0.02	101 42.3	101 57.4	14 15
5	5 47	6 21	102 10.9	102 24.7	N. 0.12	102 39.4	102 54.6	10 19
6	5 47	6 21	103 8.1	103 21.9	0.26	103 36.6	103 51.8	6 24
	5 48	6 21	104 5.3	104 19.1	0.38	104 33.8	104 49.0	25
8	5 48	6 21	105 2.5	105 16.3	0.48	105 31.0	105 46.2	4 58 32
9	5 48	6 21	105 59.7	106 13.5	0.55	106 28.2	106 43.2	4 54 36
10	5 48	6 22	106 56.8	107 10.6	0.59	107 25.3	107 40.5	4 50 40
11	5 49	9 22	107 54.0	108 7.8	0.60	108 22.5	108 37.5	4 46 44
12	5 49	6 22	108 51.3	109 5.1	0.57	109 19.8	109 35.0	4 42 48
13	5 49	6 22	109 48.5	110 2.3	0.52	110 17.0	110 32.2	4 38 52
14	5 49	6 22	110 45.7	110 59.5	0.43	111 14.2	111 29.4	4 34 56
15	5 50	6 22	111 42.9	111 56.7	0.33	112 11.4	112 26.7	4 31 0
16	5 50	6 22	112 40.2	112 54.1	0.20	113 8.7	113 23.9	4 27 4
17	5 50	6 22	113 37.4	113 51.3	N. 0.06	114 5.9	114 21.2	4 23 8
18	5 50	6 22	114 34.7	114 48.6	S. 0.07	115 3.2	115 18.5	4 19 13.
19	5 50	6 22	115 32.0	115 45.9	0.20	116 0.5	116 15.8	4 15 17
20	5 51	6 22	116 29.3	116 43.2	0.32	116 57.8	117 13.1	4 11 21
21	5 51	6 21	117 26.6	117 40.6	0.42	117 55.2	118 10.3	4 7 25
	5 51	6 21	118 23.8	118 37.8	0.50	118 52.4	119 7.6	4 3 29
23	5 51	6 21	119 21.1	119 35.1	0.56	119 49.7	120 5.0	3 59 33
24	5 51	6 21	120 18.5	120 32.5	0.61	120 47.1	121 2.3	3 37
25	5 51	21	121 15.8	121 29.8	0.62	121 44.4	121 59.6	3 51 41
26		6 21	121 13.1	122 27.1	0.61	122 41.7	122 56.9	3 47 45
	5 52	6 21	122 10.4	123 24.4	0.55	123 39.0	123 54.3	3 43 49
28	5 52	6 21	123 7.8	124 21.9	0.48	124 36.4	124 51.6	3 39 53
29	5 52	6 20	124 5.1	125 19.1	0.37	125 33.7	125 49.0	3 35
30	5 52	6 20	125 2.5	126 16.6	0.25	126 31.1	126 46.3	3 32
31	5 52	6 20	126 59.8	127 13.9	S. 0.13	127 28.4	127 43.7	3 28 6

TRIVANDRUM MEAN TIME.

Day.	THE MOON'S.										Changes.
	Right Ascension.		Declination.		Semidiameter.		Horizon Parallax.		Age at Mean Noon		
	Midnight	Noon	Mid-night.	Noon.	Mid-night.	Noon.	Mid-night	Noon.			
	<i>h m s</i>	<i>h. s.</i>	<i>°</i>		<i>°</i>					<i>d.</i>	
1	14 43 27	15 11 8	20 27	21 59	15 35	15 42	57 6	57 32	11.74		
2	15 39 50	16 9 29	23 14	24 11	15 50	15 57	57 59	58 26	12.74	O Full Moon d. h. m. 5 2 48 A.M.	
3	16 39 59	17 11 7	24 45	24 57	16 4	16 10	58 51	59 19	13.74		
4	17 42 40	18 14 24	24 44	24 6	16 16	16 22	59 38	59 57	14.74		
5	18 46 2	19 17 20	23 3	21 35	16 26	16 30	60 14	60 26	15.74		
6	19 48 7	20 18 15	19 46	17 37	16 32	16 33	60 35	60 40	16.74		
7	20 47 40	21 16 21	15 11	12 31	16 34	16 32	60 41	60 38	17.74		
8	21 44 20	22 11 42	9 41	6 44	16 31	16 28	60 32	60 21	18.74	☾ Perigee d. h. m. 6 3 44 P.M.	
9	22 38 31	23 4 56	3 42	0 38	16 25	16 21	60 8	59 53	19.74		
10	23 31 3	23 57 0	2 23	5 22	16 16	16 11	59 35	59 16	20.74		
11	0 22 54	0 48 53	8 14	10 58	16 5	16 0	58 56	58 36	21.74		
12	1 15 0	1 41 21	13 32	15 53	15 54	15 48	58 15	57 55	22.74	☾ Last Quarter d. h. m. 11 5 20 P.M.	
13	2 8 0	2 34 58	18 2	19 55	15 43	15 37	57 34	57 15	23.74		
14	3 2 14	3 29 46	21 31	22 50	15 32	15 27	56 56	56 28	24.74		
15	3 57 31	4 25 22	23 50	24 31	15 23	15 18	56 20	56 4	25.74		
16	4 53 13	5 20 55	24 53	21 56	15 14	15 10	55 48	55 33	26.74		
17	5 48 22	6 15 26	24 39	24 4	15 6	15 3	55 20	55 7	27.74		
18	6 12 0	7 8 2	23 12	22 4	14 59	14 56	54 55	54 44	28.74		
19	7 33 26	7 58 13	20 42	19 6	14 54	14 51	54 34	54 25	0.16	☽ New Moon d. h. m. 19 8 8 A.M.	
20	8 22 22	8 45 55	17 19	15 21	14 49	14 47	54 17	54 11	1.16		
21	9 8 56	9 31 28	13 15	11 2	14 46	14 45	54 6	54 2	2.16		
22	9 53 36	10 15 25	8 44	6 20	14 44	14 44	54 0	53 59	3.16		
23	10 37 0	10 58 29	N. 3 54	N. 1 25	14 45	14 46	54 1	54 4	4.16		
24	11 19 57	11 41 30	S. 1 4	S. 3 34	14 47	14 49	54 9	54 16	5.16	☽ Apogee d. h. m. 22 10 44 A.M.	
25	12 3 16	12 25 21	6 2	8 27	14 51	14 54	54 25	54 45	6.16		
26	12 47 52	13 10 56	10 49	13 6	14 58	15 3	54 51	55 8	7.16		
27	13 34 40	13 59 10	15 16	17 18	15 8	15 14	55 28	55 47	8.16		
28	14 24 31	14 50 48	19 10	20 50	15 20	15 27	56 10	56 35	9.16	☽ First Quarter d. h. m. 27 11 48 A.M.	
29	15 18 3	15 46 15	22 16	23 26	15 34	15 42	57 2	57 29	10.15		
30	16 15 23	16 45 21	24 17	24 47	15 39	15 57	57 58	58 27	11.16		
31	17 15 59	17 47 6	S. 24 55	S. 24 39	16 6	16 13	58 56	59 23	12.16		

TRIVANDRUM MEAN TIME.

Day.	THE MOON'S.								
	Rising.	Meridian passage.	Setting.	Longitude.				Latitude.	
				Midnight.	Sunrise.	Noon.	Sunset.	Midnight	Noon.
	<i>h m</i> P. M.	<i>h m</i> P. M.	<i>h m</i> A. M.					°	°
1	2 59	8 56	2 1	224 42.6	227 53.3	231 21.0	234 54.4	S 4 23.3	S 4 1.1
2	3 57	9 54	2 54	235 5.6	241 22.7	244 56.3	248 36.2	3 25.3	3 5.9
3	4 58	10 55	3 52	251 53.2	255 16.2	258 55.9	262 41.8	2 33.4	1 58.1
4	5 58	11 57	4 53	266 4.1	269 32.3	273 17.3	277 8.4	1 20.6	S 0 41.3
5	6 57	* * A. M.	5 56	280 34.9	284 7.1	287 56.0	291 50.6	S 0 0.9	N 0 39.8
6	7 53	0 58	6 58	295 19.8	298 54.5	302 45.4	306 41.7	N 1 20.0	1 59.1
7	8 44	1 55	7 58	310 11.9	313 47.8	317 38.3	321 34.1	2 36.2	3 0.7
8	9 32	2 49	8 56	325 3.6	328 35.2	332 27.0	336 20.5	3 41.9	4 9.2
9	10 19	3 41	9 51	339 47.6	343 19.4	347 4.9	350 54.7	4 32.1	4 50.6
10	11 5	4 31	10 45	354 18.2	357 46.1	1 27.1	5 12.7	5 4.2	5 12.9
11	11 52	5 21	11 39	8 31.3	11 55.2	15 30.6	19 11.1	5 16.7	5 15.9
12	* * A. M.	6 11	P. M. 0 32	22 25.0	25 44.0	29 14.3	32 49.5	5 10.5	5 0.7
13	0 40	2	1 27	35 58.8	39 13.1	42 38.4	46 8.6	4 46.8	4 29.3
14	1 29	7 55	2 22	49 13.5	52 23.4	55 44.2	59 9.8	4 8.3	3 4.4
15	2 21	8 48	3 16	62 10.8	65 17.4	68 33.7	71 55.1	3 17.9	3 49.1
16	3 13	9 42	4 10	74 52.8	77 56.0	81 8.7	84 26.8	2 18.5	1 46.6
17	7	10 34	5 1	87 21.5	90 21.6	93 31.4	96 46.6	1 13.6	N 0 40.1
18	4 59	11 25	5 49	99 38.8	102 36.5	105 43.8	108 56.5	N 0 6.3	S 0 27.4
19	5 49	P. M. 0 12	6 34	111 46.6	114 42.3	117 47.6	120 58.4	S 1 0.4	1 32.7
20	6 38	0 57	7 15	123 46.9	126 41.5	129 44.8	132 54.1	2 3.8	2 33.3
21	7 24	1 40	7 54	135 41.5	138 35.0	141 37.3	144 45.3	3 1.1	3 26.7
22	8 8	2 21	8 33	147 32.4	150 25.4	153 27.2	156 35.0	3 50.2	4 11.2
23	8 52	3 2	9 10	159 22.1	162 15.2	165 17.3	168 25.7	4 29.4	4 44.8
24	9 36	3 42	9 47	171 13.4	174 7.2	177 10.5	180 20.1	4 57.0	6.2
25	10 20	4 23	10 26	183 9.3	186 4.9	189 10.2	192 22.2	5 12.1	5 14.6
26	11 6	7	11 7	195 13.7	198 12.4	201 20.3	204 35.7	5 13.7	5 9.1
27	11 54	5 53	11 52	207 30.4	210 33.0	213 45.0	217 5.1	5 1.0	4 49.3
28	P. M. 0 46	6 44	* * A. M.	220 4.1	223 11.2	226 28.4	229 54.1	4 33.9	4 15.0
29	1 42	7 38	0 41	232 58.3	236 11.2	239 34.4	243 5.9	3 52.4	3 26.5
30	2 40	8 37	1 35	246 16.9	249 35.9	253 6.0	256 44.6	2 57.4	2 25.3
31	3 40	9 37	2 34	260 1.8	263 27.6	267 4.4	270 50.2	S 1 50.5	S 1 13.3

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# AUGUST

FOR TRIVANDRUM MEAN NOON.

Day of Week.	Day of Month.	Malabar Date.	THE SUN'S					Sideral Time of the Semidiameter passing the Meridian.	Equation of time to be added to Apparent Time.	Sideral Time.							
			Apparent			Semi-diameter.											
			Right Ascension.	Declination.													
			<i>h</i>	<i>m</i>	<i>s</i>	<i>°</i>	<i>'</i>	<i>"</i>	<i>m</i>	<i>s</i>	<i>m</i>	<i>s</i>	<i>h</i>	<i>m</i>	<i>s</i>		
Wed.	1	17	8	43	26	N. 18	9	50	15	47.15	1	6.61	6	11	8	37	1
Thur.	2	18	8	47	19	17	54	45	15	47.27	1	6.53	6	7	8	41	11
Frid.	3	19	8	51	11	17	39	22	15	47.40	1	6.44	6	3.	8	45	8
Sat.	4	20	8	55	3	17	23	43	15	47.53	1	6.35		58	8	49	5
<b>Sun.</b>	5	21	8	58	54	17	7	46	15	47.67	1	6.27		53	8	53	1
Mon.	6	22	9	2	45	16	51	31	15	47.80	1	6.18		47	8	56	58
Tues.		23	9	6	35	16	35	2	15	47.94	1	6.09		40	9	0	54
Wed.	8	24	9	10	24	16	18	5	15	48.09	1	6.01		33	9	4	51
Thur.	9	25	9	14	13	15	1	13	15	48.23	1	5.92		26	9	8	47
Frid.	10	26	9	18	1	15	44	56	15	48.38	1	5.84		17	9	12	44
Sat.	11	27	9	21	48	15	26	23	15	48.53	1	5.76		8	9	16	40
<b>Sun.</b>	12	28	9	25	36	15	8	35	15	48.69	1	5.67	4	59	9	20	37
Mon.	13	29	9	29	23	14	50	32	15	48.85	1	5.59	4	49	9	24	34
Tues	14	30	9	33	9	14	32	16	15	49.02	1	5.51	4	39	9	28	30
Wed.	15	31	9	36	54	14	13	46	15	49.19	1	5.43	4	28	9	32	27
Thur.	16	32	9	40	39	13	55	2	15	49.36	1	5.36	4	16	9	36	23
Frid	17	1	9	44	24	13	36	3	15	49.54	1	5.28	4	4	9	40	20
Sat.	18	2	9	48	8	13	16	52	15	49.73	1	5.21	3	51	9	44	16
<b>Sun.</b>	19	3	9	51	51	12	57	29	15	49.92	1	5.13	3	38	9	48	13
Mon.	20	4	9	55	34	12	37	54	15	50.11	1	5.06	3	25	9	52	9
Tues.	21	5	9	59	16	12	18	6	15	50.31	1	4.99	3	11	9	56	6
Wed.	22	6	10		59	11	58	8	15	50.51	1	4.93		56	10	0	3
Thur.	23	7	10	6	41	11	37	58	15	50.72	1	4.86		41	10		59
Frid.	24	8	10	10	22	11	17	36	15	50.92	1	4.80	2	26	10		56
Sat.	25		10	14	2	10	57	4	15	51.14	1	4.73	2	10	10		11
<b>Sun</b>	26	10	10	17	42	10	36	22	15	51.35	1	4.67	1	53	10	15	49
Mon.	27	11	10	21	22	10	15	29	15	51.57	1	4.62	1	37	10	19	45
Tues	28	12	10	25	1	9	54	27	15	51.79	1	4.56	1	19	10	23	42
Wed.	29	13	10	28	40	9	33	16	15	52.02	1	4.51	1	2	10	27	38
Thur.	30	14	10	32	19	9	11	56	15	52.24	1	4.46	0	44	10	31	35
<b>Frid.</b>	31	15	10	35	57	N. 8	50	26	15	52.47	1	4.41	0	26	10	35	31

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1093 CHINGAM OF AYANI

## TRIVANDRUM MEAN TIME.

Day.	THE SUN'S.							Transit of the First Point of Aries.
	Rising.	Setting.	Apparent					
			Longitude at Mid-night.	Longitude at Rising.	Latitude at Mean Noon.	Longitude at Mean Noon.	Longitude at Setting.	
1	<i>h m</i> 5 52	<i>h m</i> 6 20	<i>° ' "</i> 127 57.2	<i>° ' "</i> 128 11.3	N. 0.01	<i>° ' "</i> 128 25.8	<i>° ' "</i> 128 41.1	<i>A M S</i> 3 24 10
2	5 53	6 20	128 54.6	129 8.7	0.15	129 23.2	129 38.5	8 20 14
3	5 53	6 19	129 52.0	130 6.1	0.26	130 20.6	130 35.8	3 16 18
4	5 53	6 19	130 47.4	131 3.5	0.36	131 18.0	131 33.3	12
5	5 53	6 19	131 46.8	132 0.9	0.44	132 15.4	132 30.7	3 8 26
6	5 53	6 19	132 44.3	132 58.4	0.49	133 12.9	133 28.1	3 4 30
7	5 53	6 18	133 41.7	133 55.8	0.51	134 10.3	134 25.7	3 0 34
8	5 53	6 18	134 39.4	134 53.5	0.49	135 5.1	135 23.1	2 56 38
9	5 53	6 18	135 36.7	135 50.8	0.44	136 5.5	136 20.7	2 52 43
10	5 53	6 17	136 34.4	136 48.5	0.36	137 3.1	137 18.2	48 47
11	5 53	6 17	137 31.8	137 46.0	0.26	138 0.5	138 15.8	2 44 51
12	5 53	6 17	138 29.5	138 43.6	0.14	138 58.1	139 13.4	2 40 55
13	5 53	6 16	139 27.1	139 41.2	N. 0.01	139 55.7	140 10.8	26 59
14	5 53	6 16	140 24.7	140 38.8	S. 0.11	140 53.4	141 8.6	33 3
15	5 53	6 16	141 22.4	141 36.5	0.23	141 51.1	142 6.3	2 29 7
16	5 53	6 15	142 20.1	142 34.2	0.35	142 48.8	143 4.0	25 11
17	5 53	6 15	143 17.8	143 31.9	0.46	143 46.5	144 1	21 15
18	5 53	6 14	144 15.5	144 29.6	0.55	144 44.2	144 59.4	17 19
19	5 53	6 14	145 13.2	145 27.3	0.62	145 41.9	145 57.1	13 23
20	5 53	6 14	146 11.0	146 25.2	0.66	146 39.8	146 54.9	9 28
21	5 53	6 13	147 8.8	147 23.0	0.67	147 37.6	147 52.7	5 22
22	5 53	6 13	148 6.6	148 20.8	0.66	148 35.5	148 50.5	1 36
23	5 53	6 12	149 4.4	149 18.6	0.62	149 33.3	149 45.4	1 57 40
24	5 53	6 12	150 2.3	150 16.6	0.56	150 31.2	150 46.3	1 53 44
25	5 53	6 11	151 0.2	151 14.5	0.46	151 29.1	151 44.0	1 49 48
26	5 53	6 11	151 58.0	152 12.3	0.35	152 26.9	152 41.9	1 45 52
27	5 53	6 10	152 55.9	153 10.2	0.22	153 24.8	153 39.9	1 41 56
28	5 53	6 10	153 54.0	154 8.2	S. 0.10	154 22.9	154 37.8	1 38 0
29	5 53	6 9	154 51.9	155 6.1	N. 0.04	155 20.8	155 25.8	1 34 4
30	5 53	6 9	155 49.9	156 4.1	0.16	156 18.8	156 33.8	1 30 8
31	5 53	6 8	156 47.2	157 2.2	N. 0.27	157 16.9	157 31.7	1 26 13

TRIVANDRUM MEAN TIME.

Day.	THE MOON'S										Changes.
	Right Ascension.		Declination.		Semidiameter.		Horizontal Parallax.		Age at Mean Noon.		
	Midnight.	Noon.	Mid-night.	Noon.	Mid-night.	Noon.	Mid-night.	Noon.			
	<i>h m s</i>	<i>h m s</i>	<i>°</i>	<i>°</i>	<i>''</i>	<i>''</i>	<i>''</i>	<i>''</i>			
1	18 18 30	18 49 55	23 58	22 52	16 20	16 26	59 49	60 13	13.16		
2	19 21 9	19 52 1	21 23	19 31	16 32	16 36	60 34	60 51	14.16		
3	20 22 23	20 52 9	17 18	14 49	16 40	16 42	61 4	61 13	15.16		
4	21 21 20	21 49 54	12 4	9 9	16 43	16 43	61 16	61 15	16.16		
5	22 17 56	22 45 30	6 5	2 57	16 41	16 38	61 9	60 59	17.16		
6	23 12 43	23 39 40	N 0 11	N 3 15	16 34	16 29	60 44	60 26	18.16		
	0 6 20	0 33 15	6 20	9 15	16 24	16 17	60 5	59 42	19.16		
8	1 0 4	1 27 0	11 59	14 32	16 11	16 4	59 17	58 51	20.16		
9	1 54 7	2 21 27	16 51	18 54	15 56	15 49	58 25	57 59	21.16		
10	2 49 0	3 16 44	20 41	22 9	15 42	15 35	57 33	57 9	22.16		
11	3 44 36	4 12 32	23 19	24 10	15 30	15 23	56 45	56 23	23.16		
12	4 40 24	5 8 8	24 41	24 52	15 18	15 13	56 3	55 43	24.16		
13	5 35 36	6 2 42	24 45	24 19	15 8	15 4	55 26	55 10	25.16		
14	6 29 21	6 55 28	23 36	22 36	15 0	14 56	54 56	54 43	26.16		
15	7 21 0	7 45 56	21 22	19 54	14 53	14 51	54 33	54 23	27.16		
16	8 10 16	8 34 1	18 13	16 22	14 48	14 47	54 15	54 8	28.16		
17	8 57 15	9 19 59	14 21	12 13	14 45	14 44	54 3	53 59	29.16		
18	9 42 18	10 4 17	9 58	7 37	14 43	14 43	53 57	53 55	0.52		
19	10 26 1	10 47 35	N 5 13	N 2 46	14 43	14 44	53 55	53 57	1.52		
20	11 9 5	11 30 37	S 0 17	S 2 12	14 44	14 46	54 0	54 4	2.52		
21	11 52 15	12 14 7	4 40	7 6	14 47	14 49	54 10	54 18	3.52		
22	12 36 20	12 55 56	9 29	11 47	14 52	14 55	54 27	54 39	4.52		
23	13 22 5	13 45 50	13 59	16 3	14 59	15 3	54 52	55 7	5.52		
24	14 10 18	14 35 32	17 59	19 44	15 7	15 13	55 24	55 43	6.52		
	15 1 34	15 28 28	21 16	22 31	15 18	15 25	56 4	56 27	7.52		
	15 56 12	16 24 43	23 35	24 19	15 31	15 39	56 52	57 18	8.52		
27	16 53 56	17 23 44	24 42	24 44	15 46	15 53	57 15	58 13	9.52		
28	17 53 58	18 24 26	24 23	23 40	16 1	16 9	58 41	59 9	10.52		
29	18 54 59	19 25 26	22 33	21 3	16 16	16 23	59 36	60 2	11.52		
30	19 55 38	20 25 29	19 11	17 0	16 29	16 35	60 25	60 46	12.52		
31	20 54 56	21 23 58	S 14 31	S 11 48	16 40	16 43	61 3	61 15	13.52		

Full Moon. *d h m*  
 3 10 19 A. M.  
 Perigee. *d h m*  
 4 3 2 A. M.  
 Last quarter. *d h m*  
 10 1 4 A. M.  
 New Moon. *d h m*  
 17 11 29 P. M.  
 Apogee. *d h m*  
 18 5 38 P. M.  
 First quarter. *d h m*  
 26 0 16 A. M.

## TRIVANDRUM MEAN TIME.

Day.	THE MOON'S.								
	Rising.	Meridian passage.	Setting.	Longitude.				Longitude.	
				Midnight.	Sun rise.	Noon.	set.	Midnight.	Noon.
<i>h m</i> P. M.	<i>h m</i> P. M.	<i>h m</i> A. M.							°
1	4 39	10 38	3 36	274 13.7	277 45.8	281 29.2	285 21.5	S. 0 34.8	N. 0 5 0
2	5 36	11 38	4 38	288 50.5	292 28.8	296 16.8	300 14.1	N. 0 45.2	1 25.0
3	6 31	* *	5 40	303 47.2	307 29.3	311 20.7	315 21.0	2 3.8	2 40.5
4	7 22	A. M. 0 35	6 41	318 56.2	322 39.8	326 32.3	330 32.3	3 14.6	3 45.2
5	8 12	1 30	7 39	334 7.9	337 50.6	341 41.6	345 39.3	4 11.8	4 33.9
6	8 59	2 23	8 35	349 12.3	552 51.9	356 39.0	0 32.2	4 51.1	5 3.1
	9 47	3 14	9 31	4 0.7	7 35.3	11 16.9	15 3.4	5 10.0	5 11.9
8	10 36	4 6	10 26	18 26.8	21 55.3	25 30.2	29 9.9	8.7	5 0.9
9	11 26	4 58	11 21	32 27.1	35 49.3	39 17.3	42 50.1	4 48.8	4 32.8
10	* *	5 51	0 17	46 1.0	49 16.8	52 38.6	56 4.5	4 13.1	3 50.4
11	A. M. 0 17	6 44	1 12	59 10.4	62 20.5	65 36.7	68 57.0	3 25.1	2 57.4
12	1 10	7 38	2 6	71 58.0	75 3.3	78 14.9	81 30.5	2 27.9	1 56.9
13	2 3	8 31	2 58	84 27.3	87 29.2	90 37.0	93 48.6	1 24.9	N. 0 52.2
14	2 55	9 21	3 46	96 43.3	99 41.9	102 46.9	105 55.9	N. 0 19.2	S. 0 13.8
15	3 46	10 10	4 32	108 48.4	111 44.9	114 48.0	117 55.2	S. 0 46.3	1 15.1
16	4 34	10 55	5 15	120 46.1	123 41.2	126 43.0	129 48.6	1 49.0	2 18.4
17	5 21	11 39	5 55	132 39.2	135 33.5	138 34.7	141 39.6	2 46.3	3 12.3
18	6 6	P. M. 0 29	6 33	144 29.7	147 23.7	150 24.6	153 29.1	3 36.1	3 57.5
19	6 50	1 1	7 10	156 19.8	159 13.9	162 15.1	165 19.9	4 16.4	4 32.5
20	7 33	1 41	7 47	168 10.9	171 5.7	174 10.5	177 13.2	4 45.7	4 55.9
21	8 17	2 22	8 25	180 5.2	183 0.9	186 4.0	189 10.6	2.7	5 6.4
22	9 3	3 4	9 6	192 4.5	195 1.8	198 6.8	201 15.4	5 6.6	5 3.4
23	9 49	3 49	9 48	204 11.3	207 11.1	210 18.1	213 29.6	4 56.9	4 46.8
24	10 39	4 37	10 34	216 29.0	219 31.8	222 42.9	225 57.6	4 33.4	4 16.5
25	11 32	5 28	11 25	229 0.6	232 7.5	235 22.9	238 41.9	3 56.5	33.3
26	P. M. 0 27	6 24	* * A. M.	241 50.2	245 2.1	248 22.9	251 47.6	7.0	2 38.0
27	1 25	7 21	0 20	255 1.6	258 19.3	261 46.4	265 16.8	6.3	1 52.5
28	2 23	8 21	1 19	268 37.7	272 1.9	275 35.9	279 13.5	S. 0 56.8	S. 0 19.7
29	3 20	9 20	2 19	282 40.9	286 11.8	289 52.6	293 36.5	N. 0 18.3	N. 0 56.6
30	4 15	10 17	3 21	297 10.8	300 47.8	304 34.9	308 24.7	1 34.5	2 11.3
31	7	11 13	4 21	312 4.3	315 46.3	319 38.0	323 31.3	N 2 46.1	N 3 18.4

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# SEPTEMBER.

I

FOR TRIVANDRUM MEAN NOON.

Day of week.	Day of month.	Malabar Date.	THE SUN'S					Sideral Time of the Semidiameter passing the Meridian.	Equation of time to be added to subtracted from Apparent Time.	Sideral Time.
			Apparent			Semi-Diameter.				
			Right Ascension.	Declination.						
Sat.	1	15	h m s	N S	° ' "	° ' "	m s	m s	h m s	
<b>Sun.</b>	2	17	10 39 35	28 49	15 52.69	1 4.36	0 7	10 3 23		
Mon.	3	18	10 43 12	8 7 3	15 52.92	1 4.32	0 12	10 43 25		
Tues	4	19	10 46 51	7 45 10	15 53.15	1 4.23	0 31	10 47 21		
Wed.	5	20	10 50 28	23 8	15 53.38	1 4.24	0 51	10 51 18		
Thur.	6	21	10 54 4	7 1 0	15 53.62	1 4.21	1 10	10 55 14		
Frid	7	22	10 57 41	6 35 58	15 53.85	1 4.17	1 30	10 59 11		
Sat.	8	23	11 1 17	6 16 22	15 54.09	1 4.14	1 50	11 3 7		
<b>Sun</b>	9	24	11 4 54	5 53 53	15 54.32	1 4.11	11	11 7 4		
Mon.	10	25	11 8 30	31 19	15 54.56	1 4.09	31	11 11 0		
Tues	11	26	11 12 5	8 38	15 54.81	1 4.06	2 52	11 14 57		
Wed.	12	27	11 15 41	4 45 52	15 55.05	1 4.04	12	11 18 54		
Thur.	13	28	11 19 17	4 23 42	15 55.30	1 4.03	33	11 22 50		
Frid.	14	29	11 22 52	4 0 6	15 55.55	1 4.01	3 54	11 26 47		
Sat.	15	30	11 26 28	3 37 7	15 55.80	1 4.00	4 14	11 30 43		
<b>Sun.</b>	16	31	11 30 3	3 14 4	15 56.06	1 3.99	4 36	11 34 40		
Mon.	17	1	11 33 39	50 57	15 56.31	1 3.99	4 58	11 38 36		
Tues.	18	2	11 37 14	2 27	15 56.58	1 3.99	19	11 42 33		
Wed.	19	3	11 40 50	2 4	15 56.84	1 3.99	40	11 46 29		
Thur.	20	4	11 44 25	1 41 16	15 57.11	1 3.99	6 1	11 50 26		
Frid.	21	5	11 48 0	1 17 59	15 57.38	1 4.00	6 22	11 54 23		
Sat.	22	6	11 51 36	0 54 39	15 57.65	1 4.01	6 43	11 58 19		
<b>Sun.</b>	23	7	11 55 11	0 31 17	15 57.92	1 4.02	4	12 16		
Mon.	24	8	11 58 47	N O 7 56	15 58.20	1 4.04	7 25	12 6 12		
Tues.	25	9	12 2 23	3 0 15 28	15 58.48	1 4.06	46	12 10 9		
Wed.	26	10	12 5 59	0 38 51	15 58.75	1 4.08	8	12 14 5		
Thur.	27	11	12 9 34	1 2 15	15 59.03	1 4.11	8 28	12 18 2		
Frid.	28	12	12 13 11	1 25 39	15 59.31	1 4.14	8 18	12 21		
Sat.	29	13	12 16 47	1 49 3	15 59.59	1 4.17	9 8	12 25 55		
<b>Sun.</b>	30	14	12 20 23	2 12 24	15 59.86	1 4.20	9 28	12 29 52		
			12 24 0	3 2 35 15	16 0.14	1 4.21	48	12 33 48		

CHINGOM TO AYANI

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SEPTEMBER.

III

TRIVANDRUM MEAN TIME.

Day.	THE MOON'S.										Changes.
	Right Ascension.		Declination.		Semidiameter.		Horizontal Parallax.		Age at Mean Noon.		
	Midnight.	Noon.	Mid-night.	Noon.	Mid-night.	Noon.	Mid-night.	Noon.			
	<i>h. m. s.</i>	<i>d. h. m.</i>	<i>° ' "</i>	<i>° ' "</i>	<i>" "</i>	<i>" "</i>	<i>" "</i>	<i>" "</i>	<i>" "</i>		
1	21 52 33	22 20 47	S 8 52	S 5 48	16 45	16 46	61 23	61 25	14 52		
2	22 48 43	23 16 26	N 2 39	N 0 32	16 45	16 43	61 24	61 16	15 52		
3	23 44 2	0 11 36	N 3 41	6 46	16 40	16 35	61 4	60 48	16 52	Perigee. d. h. m. 1 12 P. M.	
4	0 39 12	1 6 56	9 43	12 29	16 30	16 24	60 28	60 4	17 52		
5	1 34 50	2 2 56	15 3	17 21	16 16	16 9	59 38	59 11	18 52		
6	2 31 13	2 59 40	19 22	21 5	16 1	15 53	58 42	58 13	19 52		
7	3 28 13	3 56 47	22 28	23 31	15 46	15 38	57 44	57 17	20 52		
8	4 25 16	4 53 34	24 14	24 37	15 31	15 24	56 50	56 25	21 52	o Full Moon. d. h. m. 1 53 6 P. M.	
9	5 21 33	5 49 6	24 39	24 23	15 17	15 11	56 1	55 39	22 52		
10	6 16 9	6 42 38	23 49	22 58	15 6	15 1	55 20	55 2	23 52		
11	7 8 29	7 33 42	21 51	20 30	14 57	14 54	54 47	54 34	24 52		
12	7 58 18	8 22 17	18 56	17 12	14 51	14 48	54 23	54 14	25 52	Last Quarter. d. h. m. 8 0 13 P. M.	
13	8 45 43	9 8 38	15 17	13 14	14 46	14 45	54 7	54 2	26 52		
14	9 31 8	9 53 17	11 3	8 46	14 44	14 44	53 59	53 57	27 52		
15	10 15 9	10 36 51	6 25	N 4 0	14 43	14 44	53 57	53 58	28 52		
16	10 58 27	11 20 3	N 1 33	S 0 55	14 45	14 46	54 0	54 4	29 52	Apogee. d. h. m. 14 7 50 P. M.	
17	11 41 44	11 59 57	S 3 23	5 50	14 47	14 49	54 10	54 16	0 85		
18	12 25 47	12 48 18	8 14	10 34	14 51	14 53	54 24	54 32	1 85		
19	13 11 18	13 34 48	12 49	14 56	14 56	14 59	54 42	54 54	2 85		
20	13 58 56	14 23 44	16 55	18 44	15 3	15 6	55 6	55 20	3 85		
21	14 49 14	15 15 27	20 21	21 45	15 10	15 15	55 35	55 52	4 15	New Moon. d. h. m. 16 3 35 P. M.	
22	15 42 21	16 10 1	22 53	23 44	15 20	15 25	56 10	56 29	5 85		
23	16 38 15	17 7 0	24 17	24 31	15 31	15 37	56 50	57 12	6 85		
24	17 36 8	18 5 31	24 24	23 55	15 44	15 50	57 35	57 53	7 85	First Quarter. d. h. m. 24 10 49 A. M.	
25	18 35 0	19 4 28	23 5	21 53	15 56	16 3	58 22	58 47	8 85		
26	19 33 47	20 2 51	20 21	18 29	16 9	16 15	59 11	59 34	9 85		
27	20 31 39	21 0 7	16 20	13 54	16 21	16 27	59 55	60 15	11 85		
28	21 28 17	21 56 11	11 14	8 23	16 32	16 35	60 33	60 47	11 85		
29	22 23 52	22 51 26	S 5 23	S 2 18	16 38	16 40	60 57	61 4	12 85	Perigee. d. h. m. 24 11 14 P. M.	
30	23 18 58	23 46 33	N 0 50	N 3 57	16 40	16 39	61 5	61 3	13 85		

## TRIVANDRUM MEAN TIME.

Day.	THE MOON'S.								
	Rising.	Meridian passage	Setting.	Longitude.				Latitude.	
				Midnight.	Sun rise.	Noon.	Sun set.	Midnight.	Noon.
	<i>h m</i>	<i>h m</i>	<i>h m</i>	°	°	°	°		°
1	P. M. 5 58	* *	A. M. 5 20	327 15.0	330 59.9	334 53.9	338 48.8	N 3 47.3	N 4 12.3
2	6 48	A. M. 0 7	6 18	342 33.4	346 18.5	350 12.1	354 5.2	4 32.6	4 48.2
3	7 37	1 1	7 16	357 48.6	1 31.1	5 19.4	9 10.4	4 58.4	5 3.4
4	8 27	1 54	8 13	12 49.5	16 26.6	20 11.8	23 54.2	5 3.1	4 57.8
5	9 18	2 47	9 10	27 27.6	30 58.2	34 36.4	38 11.5	4 47.6	4 33.3
6	10 11	3 42	10 8	41 37.7	45 1.0	48 31.5	51 58.5	4 14.8	3 53.1
7	11 4	4 37	11 5	55 18.0	58 34.0	61 57.2	65 16.4	3 28.3	3 1.1
8	11 58	5 32	P. M. 0 0	68 29.6	71 39.1	74 55.7	78 8.6	2 32.0	2 1.3
9	* *	6 26	0 54	81 16.0	84 20.1	87 31.2	90 38.5	1 29.7	N 0 57.4
10	A. M. 0 51	7 18	1 44	93 41.7	96 41.4	99 48.3	102 51.9	N 0 21.8	S 0 7.7
11	1 42	8 7	2 30	105 51.6	108 48.2	111 52.2	114 52.7	S 0 39.9	1 11.2
12	2 32	8 54	3 14	117 50.6	120 45.2	123 47.4	126 46.3	1 41.6	2 10.7
13	3 19	9 38	3 54	129 43.0	132 36.6	135 37.9	138 35.6	2 38.3	3 4.1
14	4 5	10 20	4 33	141 32.5	144 25.3	147 27.1	150 24.5	3 27.8	3 49.2
15	4 48	11 0	5 11	153 22.1	156 15.2	159 17.5	162 15.6	4 8.1	4 24.4
16	5 32	11 41	5 48	165 13.9	168 7.9	171 11.3	174 9.8	4 37.8	4 48.2
17	6 16	P. M. 0 22	6 26	177 9.8	180 5.0	183 9.6	186 9.0	4 55.4	4 59.4
18	7 1	1 4	7 6	189 10.9	192 7.6	195 13.8	198 14.9	5 0.1	4 57.3
19	7 48	1 48	7 48	201 18.5	204 17.0	207 25.1	210 27.7	4 51.2	4 41.7
20	8 36	2 35	8 33	213 33.9	216 34.5	219 44.9	222 49.9	4 28.9	4 12.9
21	9 27	3 24	9 21	225 58.6	229 1.9	232 15.1	235 22.7	3 53.7	3 31.5
22	10 21	4 17	10 14	238 35.1	241 41.0	244 58.6	248 9.6	3 6.5	2 38.9
23	11 16	5 13	11 9	251 25.9	254 34.6	257 57.6	261 12.6	2 8.9	1 37.0
24	P. M. 0 12	6 9	* *	264 34.2	267 48.8	271 15.8	274 35.8	S 1 2.3	S 0 28.3
25	1 8	7 6	A. M. 0 7	278 3.0	281 22.9	284 55.9	288 21.0	N 0 7	N 0 43.8
26	2 2	8 3	1 6	291 54.7	295 20.5	298 59.7	302 30.2	1 19.9	1 55.2
27	2 54	8 58	2 5	306 10.6	309 42.1	313 21.2	317 3.3	2 29.3	3 1.2
28	3 44	9 51	3 3	320 49.1	324 25.7	328 15.7	331 55.5	3 30.6	3 56.7
29	4 34	10 44	4 0	335 46.1	339 26.2	343 19.4	347 1.6	4 18.8	4 36.7
30	5 23	11 38	4 57	350 54.1	354 35.5	358 29.3	2 10.9	N 4 49.6	N 4 57.4

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OCTOBER.

I

FOR TRIVANDRUM MEAN NOON.

Day of week.	Day of Month.	Malabar Date.	THE SUN'S				Sideral Time of the Semidia- meter passing the meridian.	Equation of Time to be subtract- ed from Apparent Time.	Sideral Time.				
			Apparent.		Semi- diameter.								
			Right Ascension.	Declination.									
			<i>h</i>	<i>m</i>	<i>s</i>	<i>o</i>	<i>m</i>	<i>s</i>	<i>m</i>	<i>s</i>	<i>h</i>	<i>m</i>	<i>s</i>
Mon.	1	15	12	27	36	S. 2 59 4	16 0.42	1 4.28	10 8		12 37 45		
Tues.	2	16	12	31	3	3 22 22	16 0 69	1 4.32	10 27		12 41 41		
Wed.	3	17	12	34	51	3 45 37	16 0.97	1 4.37	10 46		12 45 38		
Thur.	4	18	12	38	29	4 8 51	16 1.24	1 4.42	11 5		12 49 34		
Frid.	5	19	12	42	7	4 32 1	16 1.51	1 4.47	11 23		12 53 31		
Sat.	6	20	12	45	46	4 55 7	16 1.78	1 4.53	11 41		12 57 27		
Sun.	7	21	12	49	25	5 18 11	16 2.05	1 4.59	11 59		13 1 24		
Mon.	8	22	12	53	5	5 41 11	16 2.32	1 4.65	12 16		13 5 21		
Tues.	9	23	12	56	45	6 4 6	16 2.60	1 4.71	12 33		13 9 17		
Wed.	10	24	13	0	25	6 26 56	16 2.87	1 4.78	12 49		13 13 14		
Thur.	11	25	13	4	6	6 49 42	16 3.14	1 4.85	13 5		13 17 10		
Fri.	12	26	13	7	47	7 12 21	16 3.41	1 4.92	13 20		13 21 7		
Sat.	13	27	13	11	29	7 34 56	16 3.68	1 4.99	13 35		13 25 3		
Sun.	14	28	13	15	11	7 57 24	16 3.96	1 5.07	13 49		13 29 0		
Mon.	15	29	13	18	54	8 19 45	16 4.23	1 5.15	14 3		13 32 56		
Tues.	16	30	13	22	37	8 42 0	16 4.50	1 5.23	14 16		13 36 53		
Wed.	17	1	12	26	21	9 4 32	16 4.78	1 5.32	14 28		13 40 49		
Thur.	18	2	13	30	6	9 26 6	16 5.05	1 5.40	14 40		36 44 46		
Fri.	19	3	13	33	51	9 47 55	16 5.33	1 5.49	14 52		13 48 43		
Sat.	20	4	13	37	37	10 9 38	16 5.60	1 5.58	15 2		13 52 39		
Sun.	21	5	13	41	24	10 31 11	16 5.88	1 5.68	15 13		13 56 36		
Mon.	22	6	13	45	10	10 52 35	16 6.15	1 5.78	15 22		14 0 32		
Tues.	23	7	13	48	57	11 13 48	16 6.43	1 5.88	15 31		14 4 29		
Wed.	24	8	13	52	46	11 34 53	16 6.70	1 5.98	15 39		14 8 25		
Thur.	25	9	13	56	35	11 55 45	16 6.97	1 6.08	15 47		14 12 22		
Fri.	26	10	14	0	25	12 16 27	16 7.24	1 6.19	15 54		14 16 18		
Sat.	27	11	14	4	15	12 36 58	16 7.50	1 6.29	16 0		14 20 15		
Sun.	28	12	14	8	7	12 57 17	16 7.77	1 6.40	16 5		14 24 12		
Mon.	29	13	14	11	58	13 17 23	16 8.03	1 6.51	16 10		14 28 8		
Tues.	30	14	14	15	50	13 37 18	16 8.28	1 6.62	16 14		14 32 5		
Wed.	31	15	14	19	44	S. 13 56 59	16 8.54	1 6.73	16 17		14 36 1		

KANNI or PURATTASI.

THULAM or ALPASI.

## TRIVANDRUM MEAN TIME.

Day.	THE SUN'S.							Transit of the First Point of Aries.  P. M.
	Rising.	Setting.	Apparent.					
			Longitude at Mid-night.	Longitude at Rising.	Latitude at Mean Noon.	Longitude at Mean Noon.	Longitude at Setting.	
<i>h m</i>	<i>h m</i>	°	'	"	°	'	<i>h. m. s.</i>	
1	5 49	5 51	187 1.6	187 16.9	N. 0.33	187 31.0	187 45.5	11 20 24
2	5 49	5 50	188 0.6	188 14.9	0.30	188 30.0	188 44.5	11 16 28
3	5 49	5 49	188 59.6	189 13.9	0.23	189 29.0	189 43.5	11 12 32
4	5 49	5 49	189 58.7	190 13.0	0.13	190 28.2	190 42.6	11 8 36
5	5 49	5 48	190 57.8	191 12.1	N. 0.02	191 27.3	191 41.7	11 4 40
6	5 49	5 48	191 56.9	192 11.2	S. 0.10	192 26.4	192 40.9	11 0 44
7	5 49	5 47	192 56.1	193 10.5	0.23	193 25.7	193 40.1	10 56 48
8	5 49	5 47	193 55.3	194 9.7	0.35	194 24.9	194 39.4	10 52 52
9	5 49	5 46	194 54.7	195 9.0	0.47	195 24.2	195 38.6	10 48 56
10	5 49	5 46	195 54.0	196 8.3	0.58	196 23.6	196 37.9	10 45 0
11	5 49	5 45	196 53.3	197 7.6	0.67	197 22.9	197 37.2	10 41 4
12	5 49	5 45	197 52.7	198 7.1	0.74	198 22.3	198 36.6	10 37 9
13	5 49	5 44	198 52.1	199 6.5	0.79	199 21.7	199 36.0	10 33 13
14	5 49	5 44	199 51.5	200 5.9	0.80	200 21.2	200 35.5	10 29 17
15	5 49	5 43	200 51.0	201 5.4	0.79	201 20.7	201 35.0	10 25 21
16	5 49	5 43	201 50.5	202 4.9	0.76	202 20.2	202 34.5	10 21 25
17	5 49	5 42	202 50.0	203 4.4	0.70	203 19.7	203 34.1	10 17 29
18	5 49	5 42	203 49.6	204 4.0	0.62	204 19.3	204 33.6	10 13 33
19	5 49	5 42	204 49.2	205 3.7	0.50	205 19.0	205 33.3	10 9 37
20	5 49	5 41	205 49.0	206 3.4	0.38	206 18.7	206 33.0	10 5 41
21	5 49	5 41	206 48.7	207 3.1	0.25	207 18.4	207 32.7	10 1 45
22	5 49	5 40	207 48.4	208 2.8	S. 0.13	208 18.1	208 32.4	9 57 49
23	5 49	5 40	208 48.1	209 2.5	0.00	209 17.8	209 32.2	9 53 54
24	5 49	5 40	209 47.9	210 2.4	N. 0.11	210 17.7	210 32.0	9 49 58
25	5 49	5 39	210 47.7	211 2.2	0.20	211 17.5	211 31.8	9 46 2
26	5 49	5 39	211 47.5	212 2.0	0.26	212 17.3	212 31.5	9 42 6
27	5 49	5 39	212 47.3	213 1.8	0.29	213 17.2	213 31.4	9 38 10
28	5 49	5 38	213 47.2	214 1.7	0.29	214 17.1	214 31.3	9 34 14
29	5 50	5 38	214 47.1	215 1.6	0.26	215 17.0	215 31.2	9 30 18
30	5 50	5 38	215 47.0	216 1.6	0.19	216 16.9	216 31.1	9 26 22
31	5 50	5 38	216 47.1	217 1.6	N. 0.09	217 17.0	217 31.1	9 22 26

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III

## TRIVANDRUM MEAN TIME.

Day.	THE MOON'S										Changes.
	Right Ascension.		Declination.		Semidiameter.		Horizontal Parallax.		Age at Mean Noon.		
	Midnight.	Noon.	Mid-night.	Noon.	Mid-night.	Noon.	Mid-night.	Noon.			
	<i>h m s</i>	<i>h m s</i>	<i>° ′</i>	<i>°</i>	<i>"</i>	<i>"</i>	<i>"</i>	<i>"</i>	<i>d</i>		
1	0 14 15	0 42 11	N 7 0	N 9 56	16 37	16 34	60 55	60 43	14·85		
2	1 10 22	1 38 52	12 41	15 14	16 30	16 24	60 27	60 8	15·85		
3	2 7 40	2 36 45	17 32	19 31	16 18	16 11	59 45	59 19	16·85	Full Moon. <i>d. h. m.</i> 1 1 39 A. M.	
4	3 6 2	3 35 25	21 12	22 32	16 4	15 56	59 52	58 24	17·85		
5	4 4 49	4 34 3	23 31	24 8	15 49	15 40	57 56	57 27	18·85		
6	2 59	5 31 29	24 24	24 20	15 33	15 26	57 0	56 33	19·85		
7	5 59 27	6 26 46	23 56	23 14	15 19	15 13	56 8	55 45	20·85		
8	6 53 23	7 19 17	22 16	21 3	15 7	15 2	55 24	55 6	21·85	Last Quarter. <i>d. h. m.</i> 8 3 22 A. M.	
9	7 44 27	8 8 56	19 36	17 57	14 58	14 54	54 49	54 36	22·85		
10	8 32 46	8 56 1	16 8	14 10	14 51	14 49	54 24	54 15	23·85		
11	9 18 46	9 41 7	12 4	9 51	14 47	14 46	54 9	54 5	24·85		
12	10 8	10 24 55	7 34	5 12	14 45	14 45	54 3	54 3	25·85	Apogee. <i>d. h. m.</i> 12 5 38 A. M.	
13	10 46 35	11 8 14	N 2 47	N 0 21	14 46	14 47	54 5	54 9	26·85		
14	11 29 57	11 51 50	S 2 7	S 4 33	14 48	14 50	54 14	54 21	27·85		
15	12 13 58	12 36 29	6 58	9 20	14 52	14 55	54 29	54 38	28·85		
16	12 59 26	13 22 55	11 37	13 49	14 58	15 1	54 48	55 0	0·17	New Moon.	
17	13 47 0	14 11 44	15 52	17 46	15 4	15 7	55 11	55 24	1·17	<i>d. h. m.</i> 16 7 49 A. M.	
18	14 37 10	15 3 17	19 28	20 58	15 11	15 15	55 37	55 51	2·17		
19	15 30 6	15 57 34	22 13	23 11	15 19	15 23	56 5	56 20	3·17		
20	16 25 35	16 54 4	23 52	24 14	15 27	15 31	56 36	56 51	4·17		
21	17 22 52	17 51 52	24 15	23 56	15 35	15 40	57 8	57 24	5·17	First Quarter. <i>d. h. m.</i> 23 7 46 P.M.	
22	18 20 53	18 49 49	23 16	22 16	15 45	15 49	57 41	57 59	6·17		
23	19 18 33	19 46 59	20 56	19 17	15 54	15 59	58 16	58 33	7 17		
24	20 15 5	20 42 49	17 21	15 9	16 4	16 8	58 51	59 7	8·17		
25	21 10 13	21 37 19	12 44	10 6	16 13	16 16	59 23	59 38	9 17		
26	22 4 12	22 30 56	7 19	S 4 25	16 20	16 23	59 51	60 2	10·17		
27	22 57 37	23 24 23	S 1 26	N 1 34	16 2	16 27	60 10	60 16	11·17	Perigee. <i>d. h. m.</i> 28 3 56 A. M.	
28	23 51 18	0 18 29	N 4 34	7 31	16 28	16 27	60 19	60 18	12 17	Full Moon. <i>d. h. m.</i> 30 11 27 A. M.	
29	0 46 1	1 13 58	10 21	13 1	16 26	16 24	60 14	60 6	13·17		
30	1 42 21	2 11 12	15 30	17 43	16 21	16 17	59 55	59 41	14·17		
31	2 40 27	3 10 2	N 19 39	N 21 17	16 12	16 7	59 23	59 2	15·17		

## TRIVANDRUM MEAN TIME.

Day.	THE MOON'S								
	Rising.	Meridian passage	Setting.	Longitude.				Latitude.	
				Midnight.	Sun rise.	Noon.	Sun set.	Midnight.	Noon.
	<i>h m</i>	<i>h m</i>	<i>h m</i>	°	°	°	°	°	°
1	P. M. 6 14	* *	A. M. 5 55	6 3·4	9 42·8	13 35·1	17 14·1	N 5 0·0	N 4 57·5
2	7 5	A. M. 0 32	6 53	21 3·2	24 38·8	28 26·5	32 0·0	4 49·7	4 37·2
3	7 58	1 27	7 52	35 44·1	39 14·0	42 55·2	46 21·7	4 20·3	3 59·4
4	8 53	2 24	8 51	49 59·3	53 22·3	56 56·0	60 15·4	3 35·2	3 8·1
5	9 48	3 21	9 49	63 45·4	67 1·1	70 27·4	73 39·1	2 38·8	2 7·1
6	10 43	4 17	10 45	77 2·3	80 11·2	83 30·4	86 35·9	1 35·4	N 1 2·4
7	11 35	5 11	11 37	89 52·5	92 55·6	96 8·8	99 8·5	N 0 29·1	S 0 4·1
8	* *	6 2	P. M. 0 26	102 20·2	105 18·7	108 27·2	111 22·7	S 0 36·7	1 8·6
9	A. M. 0 27	6 50	1 11	114 30·6	117 25·6	120 31·0	123 23·3	1 39·3	2 8·8
10	1 15	7 35	1 53	126 29·0	129 21·9	132 25·3	135 16·0	2 36·6	3 2·6
11	2 1	8 17	2 32	138 20·4	141 12·4	144 15·1	147 5·1	3 26·4	3 47·9
12	2 46	8 59	3 10	150 9·7	153 1·7	156 4·8	158 55·2	4 7·1	4 28·6
13	3 30	9 39	3 48	162 0·8	164 53·7	167 57·9	170 48·9	4 37·1	4 47·8
14	4 13	10 20	4 26	173 56·4	176 50·9	179 56·7	182 49·6	4 55·3	4 59·5
15	4 58	11 2	5 5	185 59·1	188 55·4	192 3·4	194 57·8	5 0·5	4 58·1
16	5 44	11 46	5 51	198 10·1	201 8·5	204 19·0	207 15·5	4 52·1	4 42·8
17	6 33	P. M. 0 32	6 31	210 30·2	213 31·1	216 43·9	219 42·3	4 30·0	4 14·0
18	7 24	1 22	7 19	223 0·1	226 3·3	229 18·8	232 19·6	3 54·8	3 32·5
19	8 17	2 14	8 11	235 40·0	238 45·7	242 3·8	245 7·1	3 7·4	2 39·6
20	9 12	3 8	9 5	248 30·5	251 38·9	255 0·1	258 5·6	2 9·6	1 37·7
21	10 8	4 4	10 2	261 32·7	264 44·2	268 8·6	271 17·3	S 1 4·2	S 0 29·6
22	11 2	5 0	10 59	274 48·0	275 2·9	281 31·1	284 42·8	N 0 5·9	N 0 41·5
23	11 55	5 55	11 50	285 18·2	291 37·0	295 9·4	298 25·0	1 16·9	1 51·6
24	P. M. 0 47	6 49	* *	302 4·8	305 27·8	309 4·6	312 24·4	2 25·1	2 56·8
25	1 35	7 41	A. M. 0 52	316 8·8	319 36·0	323 17·3	326 40·4	3 26·0	3 52·2
26	2 23	8 32	1 47	330 29·8	334 0·8	337 45·8	341 12·3	4 15·2	4 34·1
27	3 11	9 24	2 43	345 5·0	348 38·9	352 26·7	355 55·2	4 48·6	4 58·6
28	3 59	10 16	3 39	359 49·9	3 25·1	7 13·7	10 42·2	5 3·5	5 3·4
29	4 50	11 11	4 35	14 37·4	18 12·5	21 59·5	25 26·3	4 58·3	4 48·1
30	5 42	* *	5 34	29 19·3	32 51·9	36 35·6	39 59·1	4 53·3	4 14·1
31	6 37	A. M. 0 7	6 33	43 47·6	47 15·9	50 54·6	54 13·2	N 3 51·1	N 3 24·6

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## NOVEMBER.

I

## FOR TRIVANDRUM MEAN NOON.

Day of week.	Days of month.	Malabar Date.	THE SUN'S						Sidereal Time of the Semidiameter passing the Meridian.	Equation of time to be subtracted from Apparent Time.	Sidereal Time.						
			Apparent.			Semi-Diameter.	Right Ascension.	Declination.									
			h	m	s												
Thur.	1	16	14	23	38	S. 14	16	26	16	8.79	1	6.84	16	20	14	39	58
Fri.	2	17	14	27	34	14	35	41	16	9.03	1	6.96	16	21	14	43	54
Sat.	3	18	14	31	30	14	54	41	16	9.27	1	7.07	16	22	14	47	51
<b>Sun.</b>	<b>4</b>	<b>19</b>	<b>14</b>	<b>35</b>	<b>25</b>	<b>15</b>	<b>13</b>	<b>26</b>	<b>16</b>	<b>9.51</b>	<b>1</b>	<b>7.19</b>	<b>16</b>	<b>22</b>	<b>14</b>	<b>51</b>	<b>47</b>
Mon.	5	20	14	39	23	15	31	58	16	9.75	1	7.31	16	21	14	55	44
Tues.	6	21	14	43	21	15	50	13	16	9.98	1	7.43	16	19	14	59	41
Wed.	7	22	14	47	21	16	8	4	16	10.22	1	7.54	16	17	15	3	37
Thur.	8	23	14	51	21	16	24	57	16	10.45	1	7.66	16	13	15	7	34
Fri.	9	24	14	55	21	16	43	24	16	10.67	1	7.78	16	9	15	11	30
Sat.	10	25	14	59	23	17	0	35	16	10.90	1	7.90	16	4	15	15	27
<b>Sun.</b>	<b>11</b>	<b>26</b>	<b>15</b>	<b>3</b>	<b>26</b>	<b>17</b>	<b>17</b>	<b>27</b>	<b>16</b>	<b>11.12</b>	<b>1</b>	<b>8.02</b>	<b>15</b>	<b>58</b>	<b>15</b>	<b>19</b>	<b>23</b>
Mon.	12	27	15	7	29	17	34	2	16	11.34	1	8.14	15	51	15	23	20
Tues.	13	28	15	11	34	17	50	19	16	11.56	1	8.26	15	43	15	27	16
Wed.	14	29	15	15	39	18	6	17	16	11.78	1	8.38	15	34	15	31	13
Thur.	15	30	15	19	44	18	21	57	16	11.99	1	8.49	15	25	15	35	10
Fri.	16	1	15	23	51	18	37	16	16	12.21	1	8.61	15	15	15	39	6
Sat.	17	2	15	27	59	18	52	16	16	12.42	1	8.73	15	3	15	43	3
<b>Sun.</b>	<b>18</b>	<b>3</b>	<b>15</b>	<b>32</b>	<b>8</b>	<b>19</b>	<b>7</b>	<b>55</b>	<b>16</b>	<b>12.63</b>	<b>1</b>	<b>8.85</b>	<b>14</b>	<b>51</b>	<b>15</b>	<b>46</b>	<b>59</b>
Mon.	19	4	15	36	18	19	21	15	16	12.84	1	8.96	14	39	15	50	56
Tues.	20	5	15	40	28	19	35	12	16	13.04	1	9.07	14	25	15	54	52
Wed.	21	6	15	44	38	19	48	50	16	13.24	1	9.19	14	11	15	58	49
Thur.	22	7	15	48	50	20	2	4	16	13.44	1	9.30	13	56	16	2	45
Fri.	23	8	15	53	3	20	14	58	16	13.64	1	9.41	13	40	16	6	42
Sat.	24	9	15	57	16	20	26	28	16	13.82	1	9.52	13	23	16	10	39
<b>Sun.</b>	<b>25</b>	<b>10</b>	<b>16</b>	<b>1</b>	<b>30</b>	<b>20</b>	<b>39</b>	<b>34</b>	<b>16</b>	<b>14.01</b>	<b>1</b>	<b>9.62</b>	<b>13</b>	<b>5</b>	<b>16</b>	<b>14</b>	<b>35</b>
Mon.	26	11	16	5	45	20	51	21	16	14.19	1	9.72	12	47	16	18	32
Tues.	27	12	16	10	0	21	2	4	16	14.37	1	9.82	12	28	16	22	28
Wed.	28	13	16	14	16	21	13	40	16	14.54	1	9.92	12	9	16	26	25
Thur.	29	14	16	18	33	21	24	14	16	14.70	1	10.02	11	43	16	30	21
Fri.	30	15	16	22	51	S. 21	34	23	16	14.86	1	10.11	11	27	16	34	18

## TRIVANDRUM MEAN TIME.

Day.	THE SUN'S.							Transit of the First Point of Aries.
	Rising.	Setting.	Apparent.					
			Longitude at Mid-night.	Longitude at Rising.	Latitude at Mean Noon.	Longitude at Mean Noon	Longitude at Setting.	
	<i>h m</i>	<i>h m</i>	°	°		°	°	P. M. <i>h m s</i>
1	5 50	5 37	217 47.1	218 1.6	S. 0.02	218 17.0	215 31.1	9 18 30
2	5 50	5 37	218 47.1	219 1.7	0.15	219 17.1	219 31.2	9 14 34
3	5 50	5 37	219 47.2	220 1.8	0.28	220 17.2	220 31.3	9 10 39
4	5 51	5 37	220 47.3	221 1.9	0.40	221 17.3	221 31.4	9 6 43
5	5 51	5 36	221 47.4	222 2.1	0.53	222 17.5	222 31.6	9 47
6	5 51	5 36	222 47.6	223 2.3	0.64	223 17.7	223 31.8	8 55 51
	5 51	5 36	223 47.8	224	0.73	224 17.9	224 32.0	8 54
8	5 51	5 36	224 48.0	225	0.80	225 18.1	225 32.3	8 50 59
9	5 52	5 36	225 48.4	226 3.0	0.84	226 18.4	226 32.6	8 47
10	5 52	5 36	226 48.7	3.1	0.86	18.7	227 32.9	8 43
11	5 52	5 36	227 49.0	228 3.7	0.85	228 19.0	228 33.3	8 39 11
12	5 52	5 36	228 49.4	229 4.1	0.81	229 19.5	229 33.7	8 15
13	5 53	5 36	229 49.8	230 4.5	0.76	230 19.9	230 34.1	8 31 19
14	5 53	5 36	230 50.2	231 5.0	0.68	231 20.3	231 34.6	8 27 24
15	5 53	5 36	231 50.7	232	0.56	232 20.9	232 35.1	8 23 28
16	5 54	5 36	232 51.2	233 6.0	0.44	233 21.4	233 35.6	8 19 32
17	5 54	5 36	233 51.7	234 6.6	0.31	234 21.9	234 36.1	8 15 36
18	5 54	5 36	234 52.2	235 7.1	0.17	235 22.4	36.7	8 11 40
19	5 55	5 36	235 52.8	236 7.8	0.04	236 23.1	236 37.2	8 7 44
20	5 55	5 36	236 53.3	237 8.3	N. 0.08	237 23.6	237 37.5	8 3 48
21	5 56	5 36	237 53.9	238 8.9	0.17	238 24.2	238 38.5	59
22	5 56	5 36	238 54.7	239 9.7	0.24	239 24.9	239 39.1	7 55
23	5 56	5 36	239 55.2	240 10.2	0.28	240 25.5	240 39.7	52 0
24	5 57	5 36	240 55.8	241 10.8	0.29	241 26.1	241 40.4	48 4
25	5 57	5 36	241 56.6	242 11.6	0.27	242 26.8	242 41.1	7 44 9
26	5 58	5 36	242 57.3	243 12.3	0.21	243 27.5	243 41.8	7 40 13
27	5 58	5 37	243 58.0	244 13.1	0.12	244 28.3	244 42.6	36 17
28	5 59	5 37	244 58.8	245 13.9	N. 0.02	245 29.1	245 43.3	7 32 21
29	5 59	5 37	245 59.5	246 14.6	S. 0.10	246 29.8	246 44.1	28 25
30	5 59	5 37	247 0.3	247 15.4	0.23	247 30.6	247 44.9	7 24 29

TRIVANDRUM MEAN TIME.

THE MOON'S											
Day.	Right Ascension.		Declination.		Semidiameter.		Horizontal Parallax.		Age at Mean Noon.	Changes.	
	Midnight.	Noon.	Mid-night	Noon.	Mid-night.	Noon.	Mid-night.	Noon.			
1	h. m. s.	h. m. s.	N 22 33	N 23 28	16 0	15 54	58 40	58 16	16.17	Last Quarter. ( d. h. m. 6 10 11 P. M.	
2	3 39 50	4 9 42	24 1	24 13	15 47	15 40	51	57 26	17.17		
3	4 39 29	5 8 56	24 3	23 33	15 34	15 27	57 1	56 36	18.17		
4	5 37	6 6 23								Apogee. ( d. h. m. 8 10 32 P. M.	
5	6 34 6	1 2	22 46	21 41	15 20	15 14	56 12	55 50	19.17		
6	7 27 11	52 32	20 22	18 49	15 9	15 3	55 29	55 11	20.17		
8	8 17 7	8 40 59	17	15 12	14 59	14 55	54 54	54 40	21.17		
9	9 4 15	9 26 58	13 10	11 1	14 52	14 59	54 29	54 20	22.17	New Moon. ( d. h. m. 14 11 36 P. M.	
10	9 49 15	10 11 13	8 47	6 28	14 48	14 47	54 14	54 11	23.17		
11	10 32 57	10 54 35	N 4 6	N 1 41	14 47	14 48	54 10	54 11	24.17		
12	11 16 14	11 37 58	S 0 45	S 3 11	14 49	14 50	54 15	54 21	25.17	First Quarter. ( d. h. m. 22 3 37 A. M.	
13	11 59 57	12 22 14	5 36	7 58	14 58	14 55	54 29	54 39	26.17		
14	12 44 58	13 8 13	10 15	12 32	14 58	15 2	54 51	3	27.17		
15	12 32 5	13 56 38	14 40	16 29	15 5	15 10	55 17	55 32	28.17	Perigee. ( d. h. m. 24 11 38 A. M.	
16	14 21 56	14 47 59	18 29	20 6	15 14	15 18	55 48	56 4	29.17		
17	15 14 48	15 42 22	21 29	22 37	15 22	15 27	56 20	56 36	0.52		
18	16 10 34	16 39 18	23 27	23 58	15 31	15 35	56 51	57 7	1.52	Last Quarter. ( d. h. m. 24 11 38 A. M.	
19	17 8 26	17 37 48	24 9	23 59	15 39	15 43	57 21	57 36	2.52		
20	18 7 13	18 36 31	23 28	22 35	15 47	15 50	57 49	58 2	3.52		
21	19 5 33	19 34 13	21 23	19 52	15 53	15 57	58 14	58 25	4.52	New Moon. ( d. h. m. 23 11 49 P. M.	
22	20 2 26	20 30 10	18 3	15 59	15 59	16 2	58 35	58 45	5.52		
23	20 57 26	21 24 16	13 40	11 11	16 4	16 7	58 53	59 1	6.52		
24	21 50 43	22 16 53	8 31	S 5 45	16 8	16 10	59 8	59 14	7.52	Perigee. ( d. h. m. 24 11 38 A. M.	
25	22 42 54	23 8 51	S 2 54	N 0 1	16 11	16 12	59 19	59 23	8.52		
26	23 34 51	0 1 2	N 2 55	5 47	16 13	16 13	59 25	59 26	9.52		
27	0 27 30	0 54 21	8 35	11 17	16 13	16 12	59 25	59 22	10.52	First Quarter. ( d. h. m. 22 3 37 A. M.	
28	1 21 39	1 49 27	13 48	16 8	16 11	16 9	59 17	59 9	11.52		
29	2 17 47	2 46 36	18 13	20 3	16 6	16 3	59 0	58 49	12.52		
30	3 15 50	3 45 23	21 33	22 44	15 59	15 55	58 35	58 20	13.52	Last Quarter. ( d. h. m. 6 10 11 P. M.	
31	4 15 6	4 44 48	23 33	24 1	15 50	15 45	58 2	57 44	14.52		
32	5 14 18	5 43 25	N 24 8	N 23 53	15 40	15 34	57 24	57 4	15.52		

## TRIVANDRUM MEAN TIME.

Day.	THE MOON'S.								
	Rising.	Meridian passage.	Setting.	Longitude.			Latitude.		
				Midnight.	Sun rise.	Noon.	Sun set.	Midnight.	Noon.
	<i>h m</i> P. M.	<i>h m</i> A. M.	<i>h m</i> A. M.						°
1	7 31	1 4	7 32	57 55.9	61 15.5	64 51 1	68 3.4	N 2 55.3	N 2 23.8
2	8 30	2 2	8 30	71 39.9	74 56.3	78 22.2	81 28.3	1 50.7	1 16.4
3	9 25	2 58	9 26	84 55.1	88 8.2	91 27.7	94 28.0	N 0 41.7	N 0 6.9
4	10 18	3 52	10 17	97 51.4	100 56.4	104 9.7	107 4.9	S 0 27.4	S 1 1.1
5	11 8	4 12	11 5	110 22.8	113 23.1	116 31.5	119 22.3	1 33.5	2 4.4
6	11 55	5 29	11 48	122 36.5	125 33.2	128 38.2	131 26.0	2 33.7	3 1.0
7	*	6 13	P. M. 0 29	134 37.3	137 31.7	140 34.5	143 20.8	3 26.0	3 45.7
8	A. M. 0 41	6 55	1 8	146 30.6	149 23.8	152 26.0	155 11.7	4 8.9	4 26.3
9	1 25	7 36	1 45	158 21.3	161 15.2	164 17.2	167 3.6	4 40.9	4 52.5
10	2 8	8 16	2 23	170 14.2	173 9.2	176 12.7	179 0.7	0.9	6.2
11	2 53	8 58	3 2	182 13.3	185 10.4	188 16.2	191 6.4	8.1	6.5
12	3 39	9 41	3 42	194 21.9	197 21.7	200 30.4	203 23.5	1 5	4 52.9
13	4 27	10 27	4 26	206 42.1	209 45.5	212 57.2	215 53.4	4 40.9	4 25.4
14	5 17	11 15	5 13	219 15.6	222 22.3	225 37.3	228 36.6	4 6.5	3 44.1
15	6 11	P. M. 0 8	6 5	232 2.5	235 12.5	238 30.9	241 33.4	3 19.1	51.2
16	6	1 3	7 0	245 2.6	248 16.4	251 37.4	254 42.7	2 20.6	1 48.0
17	8 2	1 59	7 56	258 15.3	261 31.9	264 56.0	268 3.9	1 13.5	S 0 37.8
18	8 58	2 56	8 54	271 39.4	274 55.8	278 25.5	281 36.0	S 0 1.3	N 0 35.1
19	9 52	3 52	9 52	285 14.2	288 36.7	292 5.4	295 18.2	N 1 12.1	1 47.9
20	10 44	4 45	10 48	298 59.1	302 23.9	305 55.0	309 9.9	2 22.4	2 54.9
21	11 32	5 37	11 42	312 53.3	316 20.9	319 53.7	323 10.7	3 25.0	3 52.3
22	P. M. 0 20	6 27	* *	326 56.3	330 25.9	334 0.7	337 19.5	4 16.1	4 36.3
23	1 6	7 17	A. M. 0 36	341 6.9	344 35.3	348 14.6	351 34.7	4 52.1	3.6
24	1 52	8 7	1 29	355 23.5	358 56.5	2 33.1	5 53.8	5 10.4	5 12.4
25	2 40	8 59	2 21	9 43.0	13 16.2	16 52.7	20 12.9	9.6	1.8
26	3 30	9 53	3 20	24 1.6	27 34.4	31 9.1	34 27.9	4 49.4	4 32.6
27	4 23	10 49	4 17	38 14.6	41 45.3	45 17.5	48 34.5	4 11.6	3 46.9
28	5 18	11 46	5 16	52 17.2	55 45.2	59 13.2	62 26.6	3 13.9	2 48.2
29	6 15	* *	6 15	66 5.1	69 28.7	72 52.3	76 1.6	2 15.4	1 40.9
30	7 11	A. M. 0 43	7 12	79 35.0	82 53.9	86 12.6	89 17.0	N 1 5.4	N 0 29.4

1917  
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DECEMBER.

I

FOR TRIVANDRUM MEAN NOON.

Day of week.	Day of Month.	Malabar Date.	THE SUN'S.						Sideral Time of the Semidia- meter passing the Meridian.	Equation of Time to be subtract- ed from Apparent Time.	Sideral Time.					
			Apparent.			Semi- diameter.	Sideral Time of the Semidia- meter passing the Meridian.	Equation of Time to be subtract- ed from Apparent Time.								
			Right Ascension.	Declination.												
Sat.	1	16	h 16	s 9	S. 21	44	8	16	15.01	1	10.20	11	5	16	38	14
<b>Sun.</b>	2	17	16	31 29	21	53	28	16	15.16	1	10.29	10	43	16	42	11
Mon.	3	18	16	35 49	22	2	23	16	15.30	1	19.37	10	20	16	46	8
Tues.	4	19	16	40 8	22	10	52	16	15.44	1	10.45	9	56	16	50	4
Wed.	20	16	44 29	22	18	55	16	15.57	1	10.53	9	32	16	54	1	
Thur.	6	21	16	48 50	22	26	33	16	15.70	1	10.61	9		16	57	57
Frid.	22	16	53 12	22	33	45	16	15.82	1	10.67	8	42	17	1	54	
Sat.	8	23	16	35	22	40	30	16	15.94	1	10.74	8	16	17	5	50
<b>Sun.</b>	9	24	17	1 58	22	46	47	16	16.06	1	10.80	7	49	17	9	47
Mon.	10	25	17	6 22	22	52	39	16	16.17	1	10.86		22	17	13	44
Tues.	11	26	17	10 46	22	58	3	16	16.28	1	10.92	6	55	17	17	40
Wed.	12	27	17	15 10	23	3	0	16	16.38	1	10.97	6	27	17	21	37
Thur.	13	28	17	19 35	23		30	16	16.49	1	11.01	5	59	17	25	33
Frid.	14	29	17	24 0	23	11	28	16	16.58	1	11.05		30	17	29	30
Sat.	15	1	17	28 25	23	15	6	16	16.68	1	11.09		2	17	33	26
<b>Sun.</b>	16		17	50	23	15	12	16	16.77	1	11.13	4	32	17	37	23
Mon.	17	3	17	37 16	23	20	50	16	16.85	1	11.16	4	3	17	41	19
Tues.	18	4	17	41 42	23	23	1	16	16.94	1	11.18	3	34	17	45	16
Wed.	19		17	46 9	23	24	43	16	17.02	1	11.20	3	3	17	49	13
Thur.	20	6	17	50 35	23	25	57	16	17.09	1	11.22	2	34	17	53	9
Frid.	21		17	1	23	26	42	16	17.16	1	11.23	2	4	17	57	6
Sat.	8		17	59 28	23	26	54	16	17.23	1	11.23	1	34	18	1	2
<b>Sun.</b>	23	9	18	3 54	23	26	49	16	17.29	1	11.23	1	5	18	4	59
Mon.	24	10	18	8 21	23	26	10	16	17.34	1	11.23	0	35	18	8	55
Tues.	11		18	12 47	23	25	2	16	17.39	1	11.22	0		18	12	52
Wed.	12		18	17 13	23	23	8	16	17.43	1	11.21	0	25	18	16	48
Thur.	13		18	21 40	23	21	23	16	17.47	1	11.19	0	55	18	20	45
Frid.	25		18	26 6	23	15	52	16	17.50	1	11.17	1	24	18	24	42
Sat.	29		18	32	23	15	52	16	17.52	1	11.15	1	53	18	28	38
<b>Sun.</b>	30		18	34 58	23	12	25	16	17.54	1	11.12	2	22	18	32	35
	31		17	1	23	8	29	16	17.55	1	11.08	2	51	18		

YRISHGAM OR KARTIGAI

DHANU OR MARKALI

## TRIVANDRUM MEAN TIME.

Day.	THE SUN'S							Transit of the First Point of Aries.
	Risi.	Setting.	Apparent.					
			Longitude at Mid-night.	Longitude at Rising.	Latitude at Mean Noon.	Longitude at Mean Noon.	Longitude at Setting.	
1	h 6 m 0	h 5 m 37	248 1.1	248 16.2	S. 0.36	245 31.4	248 45.7	P. M. 7 20 33
2	6 0	5 38	249 1.9	249 17.1	0.49	249 32.2	249 46.5	7 16 37
3	6 0	5 38	250 2.7	250 17.9	0.60	250 33.0	250 47.5	7 12 41
4	6 1	5 38	251 3.6	251 18.9	0.71	251 34.0	251 48.3	7 8 45
	6 2	5 39	252 4.4	252 19.7	0.78	252 34.8	252 49.2	7 4 49
6	6 2	5 39	253 5.3	253 20.6	0.84	253 35.7	253 50.1	7 0 54
	6 3	39	254 6.2	254 21.5	0.85	254 36.6	254 51.1	6 56 58
8	6 3	40	255 7.2	255 22.6	0.85	255 37.6	255 52.1	6 53 2
9	6 4	40	256 8.2	256 23.5	0.82	256 38.6	256 53.1	6 49 6
10	6 4	5 40	257 9.1	257 24.5	0.76	257 39.6	257 54.1	6 45 10
11	6 5	5 41	258 10.1	258 25.6	0.68	258 40.6	258 55.2	6 41 14
12	6 5	5 41	259 11.3	259 26.7	0.58	259 41.7	259 56.2	6 37 18
13	6 6	5 42	260 12.2	260 27.7	0.46	260 42.7	260 57.2	6 33 22
14	6 6	5 42	261 13.2	261 28.8	0.31	261 43.7	261 58.3	6 29 26
15	6 7	42	262 14.4	262 29.9	0.17	262 44.9	262 59.4	6 25 30
16	6 8	5 43	263 15.5	263 31.0	S. 0.04	263 46.0	264 0.6	6 21 34
17	6 8	43	264 16.6	264 32.2	N. 0.09	264 47.1	265 1.7	6 17 38
18	6 9	5 44	265 17.7	265 33.3	0.21	265 48.2	266 2.8	6 13 43
19	6 9	5 44	266 18.8	266 34.4	0.29	266 49.3	267 3.8	6 9 47
20	6 10	5 45	267 19.9	267 35.6	0.35	267 50.4	268 5.1	6 5 51
21	6 10	5 45	268 21.0	268 36.7	0.37	268 51.5	269 6.2	6 1 55
22	6 11	5 46	269 22.1	269 37.8	0.35	269 52.6	270 7.3	57 59
23	6 11	5 46	270 23.2	270 38.9	0.31	270 53.7	271 8.4	5 54 3
24	6 12	5 47	271 24.3	271 40.1	0.23	271 54.8	272 9.6	5 50 7
25	6 12	5 47	272 25.4	272 41.2	0.14	272 55.9	273 10.8	5 46 11
26	6 13	5 48	273 26.6	273 42.4	N. 0.02	273 57.1	274 11.9	5 42 15
27	6 13	5 48	274 27.7	274 43.5	S. 0.12	274 58.2	275 13.0	5 38 19
28	6 14	5 49	275 28.8	275 44.6	0.24	275 59.3	276 14.1	5 34
29	6 14	5 49	276 29.9	276 45.8	0.37	277 0.4	277 15.3	5 30 28
30	6 14	50	277 31.1	277 47.0	0.50	278 1.6	278 16.5	5 26 32
31	6 15	50	278 32.2	278 48.1	S. 0.61	279 2.7	279 17.6	5 22 36

TRIVANDRUM MEAN TIME.

Day.	THE MOON'S										Changes.
	Right Ascension		Declination.		Semi-diameter.		Horizontal Parallax.		Age at Mean Noon.		
	Midnight.	Noon.	Mid-night.	Noon.	Mid-night.	Noon.	Mid-night.	Noon.			
1	<i>h m s</i> 6 11 59	<i>h m s</i> 6 39 52	° N 23 19	° N 22 26	15 29	15 23	56 43	56 22	16-52		
2	7 7 0	7 33 20	21 16	19 52	15 18	15 12	56 2	55 43	17-52	☾ Last Quarter. <i>d. h. m.</i> 6 7 22 P. M.	
3	7 58 51	8 23 35	18 15	16 26	15 7	15 3	55 25	55 8	18-52		
4	8 47 35	9 10 56	14 28	12 23	14 59	14 55	54 53	54 40	19-52		
5	9 33 43	9 56 2	10 11	54	14 53	14 50	54 30	54 22	20-52		
6	10 18 0	10 39 44	5 34	N 3 11	14 49	14 18	54 16	54 13	21-52		
7	11 1 20	11 22 56	N 0 46	S 1 39	14 48	14 49	54 13	54 15	22-52		
8	11 44 38	12 6 34	S 4 4	6 27	14 50	14 52	54 20	54 28	23-52	☾ Apogee. <i>d. h. m.</i> 6 7 26 P. M.	
9	12 28 49	12 51 33	8 47	11 3	14 55	14 58	54 38	54 50	24-52		
10	13 14 49	13 38 45	13 14	15 19	15 2	15 6	55 5	55 21	25-52		
11	14 3 25	14 28 54	17 14	19 0	15 11	15 17	55 39	55 58	26-52		
12	14 55 13	15 22 23	20 33	21 52	15 22	15 28	56 18	56 39	27-52		
13	15 50 21	16 19 4	22 55	23 39	15 33	15 39	56 59	57 20	28-52	☽ New Mo <i>d. h. m.</i> 14 2 25 P. M.	
14	16 15 23	17 18 9	24 4	24 7	15 44	15 49	57 40	57 58	29-52		
15	17 48 10	18 18 15	23 49	23 8	15 54	15 58	58 16	58 32	0-90		
16	18 48 11	19 17 49	6	20 43	16 2	16 5	58 46	58 58	1-90		
17	19 47 0	20 15 40	19 1	17 1	16 8	16 10	59	59 15	2-90		
18	20 43 47	21 11 19	14 46	12 19	16 12	16 12	59 20	59 24	3-90		
19	21 38 21	22 4 56	9 42	6 56	16 13	16 13	59 25	59 24	4-90	☾ Perigee. <i>d. h. m.</i> 19 3 20 A. M.	
20	22 31 10	22 57 9	S 4 6	S 1 13	16 12	16 11	59 23	59 19	5-90		
21	23 23 1	23 48 53	N 1 41	N 4 33	16 10	16 8	59 14	59 9	6-90		
22	0 14 51	0 41 3	7 21	10 3	16	16 5	59 2	58 54	7-90		
23	1 7 34	1 34 29	12 36	14 58	16 2	16 0	58 46	58 36	8-90		
24	2 1 50	2 29 39	17 8	19 4	15 57	15 54	58 26	58 16	9-90		
25	2 57 55	3 26 35	20 42	22 3	15 51	15 47	58 4	57 52	10-90	☽ First Quarter. <i>d. h. m.</i> 21 11 15 A. M.	
26	3 55 32	4 24 40	23 5	23 46	15 41	15 40	57 38	57 25	11-90		
27	4 53 48	5 22 47	24 6	24 6	15 36	15 32	57 10	56	12-90		
28	5 51 26	6 19 37	23 15	23 6	15 28	15 23	56 39	56 24	13-90		
29	6 47 12	11 6	22 8	20 55	15 19	15 15	56 7	55 52	14-90		
30	7 40 16	8 5 41	19 26	17 45	15 10	15 6	55 36	55 21	15-90	☽ Full Moon. <i>d. h. m.</i> 28 3 0 P. M.	
31	8 30 22	8 54 20	N 15 53	N 13 52	15 2	14 59	7	54 54	16-90		

## TRIVANDRUM MEAN TIME.

Day.	THE MOON'S								
	Rising.	Meridian passage.	Setting.	Longitude				Latitude.	
				Midnight	Sun rise	Noon	Sun set	Midnight.	Noon.
	h m P. M.	h m A. M.	h m A. M.						
1	8 6	1 39	8 6	92 45.1	95 59.4	99 12.5	102 12.3	S 0 6.6	S 0 42.0
2	8 53	2 32	8 56	105 35.1	108 44.6	111 53.1	114 49.0	1 16.4	1 49.6
3	9 47	3 21	9 41	118 6.6	121 11.7	124 16.0	127 8.2	2 21.1	2 50.5
4	10 34	4 7	10 24	130 22.0	133 24.3	136 24.8	139 14.2	3 17.8	3 42.7
5	11 19	4 50	11 3	142 25.1	145 25.5	148 28.4	151 11.5	4 4.8	4 24.2
6	* *	5 31	11 41	154 20.2	157 19.3	160 16.3	163 3.8	4 40.6	4 54.1
7	0 3	6 12	0 19	166 12.2	169 11.8	172 8.5	174 56.5	4.4	5 11.4
8	0 46	6 52	0 57	178 5.8	181 6.5	184 4.6	186 54.8	5 15.1	5 15.5
9	1 31	7 34	1 37	190 5.7	193 9.2	196 9.4	199 2.1	12.3	5 5.8
10	2 18	8 18	2 19	202 16.2	205 23.0	208 26.6	211 22.9	4 55.6	4 41.9
11	3 7	9 6	3 4	214 41.0	217 52.4	220 59.5	224 0.5	4 24.8	4 4.3
12	3 59	9 57	3 54	227 22.7	230 38.7	233 50.4	236 55.7	3 40.5	3 13.6
13	4 54	10 51	4 48	240 22.9	243 44.2	247 0.0	250 10.2	43.8	2 11.6
14	5 51	11 48	5 46	253 41.6	257 7.5	260 27.7	263 42.0	1 37.0	S 1 0.8
15	6 49	0 47	6 45	267 17.9	270 48.5	274 11.9	277 29.7	S 0 23.3	N 0 15.0
16	7 45	1 44	7 44	281 9.2	284 43.8	288 9.6	291 30.7	N 0 53.3	1 31.1
17	8 39	2 40	8 42	295 12.5	298 49.4	302 17.4	305 40.4	7.8	2 42.6
18	9 30	3 33	9 38	309 23.9	313 3.0	316 31.5	319 56.0	3 15.0	3 44.6
19	10 18	4 24	10 32	323 39.7	327 19.2	330 18.0	334 12.7	4 10.6	4 32.8
20	11 4	5 14	11 26	337 56.3	341 36.2	345 3.8	348 28.4	4 50.8	5 4.1
21	11 50	6 4	* *	352 10.7	355 49.4	359 16.1	2 39.5	12.9	5 16.8
22	0 37	6 54	0 19	6 20.1	9 58.1	13 22.6	16 44.9	5 16.0	5 10.4
23	1 25	7 46	1 14	20 23.0	23 58.4	27 21.4	30 41.6	5 0.2	4 45.6
24	2 15	8 40	2 9	34 17.4	37 51.4	41 10.9	44 29.3	4 26.9	4 4.4
25	8	9 35	3 6	48 1.8	51 33.1	54 49.8	58	3 38.6	3 10.0
26	4 3	10 32	4 3	61 34.9	65 3.5	68 16.8	71 30.5	2 38.7	2 5.4
27	4 59	11 27	5 0	74 55.5	78 20.7	81 30.8	84 41.1	1 30.9	N 0 55.3
28	5 54	* *	5 55	88 2.5	91 24.6	94 30.8	97 37.2	N 0 19.4	S 0 16.5
29	6 48	0 21	6 46	100 55.4	104 13.8	107 16.4	110 19.9	S 0 51.8	1 26.2
30	7 38	1 12	7 34	113 34.0	116 48.7	119 48.2	122 48.6	1 59.2	2 30.3
31	8 26	1 59	8 18	125 58.0	129 10.8	132 6.7	135 4.5	S 2 59.6	S 3 26.4

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## MERCURY

## TRIVANDRUM.

Day. Jan.	MEAN NOON				MEAN TIME.				
	Right Ascension.	Declina- tion.	Longitude.	Latitude.	Rising.	Meridian passage.	Setting.	Hor. Par.	Semidi meter.
	<i>h. m. s.</i>	<i>o</i>		<i>o</i>	<i>h. m.</i> <i>A. M.</i>	<i>h. m.</i> <i>P. M.</i>	<i>h. m.</i> <i>P. M.</i>		
1	20 7 54	S21 36	299 29·8	S1 21·6	7 40	1 27	7 13	8·54	3·24
2	20 12 33	21 11	300 36·7	1 11·5	40	1 27	7 14	8·76	3·32
3	20 16 48	20 47	301 41·7	1 0·9	40	1 27	7 14	8·99	3·42
4	20 20 38	20	302 37·4	0 48·7	7 40	1 27	7 14	9·23	3·50
5	20 23 58	19 58	303 30·6	0 36 0	7 39	1 26	7 13	9·50	3·60
6	20 26 46	19 34	304 11·9	0 21·7	7 37	1 25	7 13	9·78	3·71
	20 28 58	19 11	304 50·0	S0 6·8	35	1 23	7 11	10·08	3·82
8	20 30 30	18 49	305 13·2	N0 14·0	7 33	1 21	7 9	10·39	3·95
9	20 31 19	18 28	305 32·4	0 27·2	7 29	1 18	7 7	10·71	4·07
10	20 31 24	18 9	305 34·4	0 44·4	7 25	1 14	7 3	11·04	4·19
11	20 30 41	17 52	305 31·8	1 2·7	7 20	1 9	6 58	11·37	4·32
12	20 29 11	17 39	305 10·9	1 21·4	7 15	1 4	6 53	11·70	4·44
13	20 26 53	17 27	304 44·9	1 40·2	8	0 57	6 46	12·02	4·56
14	20 23 48	17 20	304 1·3	1 58·4	7 1	0 50	6 39	12 32	4·68
15	20 20 1	17 14	303 13·0	2 16·4	6 54	0 43	6 32	12·59	4·78
16	20 15 39	17 11	302 10·8	2 32·5	6 46	0 35	6 24	12·83	4·87
17	20 10 46	17 11	301 4·7	2 48·1	6 37	0 26	6 15	13·02	4·94
18	20 5 32	17 13	299 50·8	3 0·5	6 28	0 17	6 6	13·16	4·99
19	20 0 8	17 19	298 34·8	3 12·2	6 19	0 8	57	13·24	5·03
20	19 54 41	17 26	297 18·4	3 20·1	6 9	A. M. 11 58	5 47	13·27	5·04
21	19 49 23	17 33	296 1·8	3 27·0	6 0	11 49	5 38	13·25	5·03
	19 44 21	17 43	294 51·5	3 29·8	5 51	11 40	5 29	13 17	5·00
23	19 39 43	17 54	293 42·9	3 31·6	5 43	11 32	5 21	13·05	4·95
24	19 35 35	18 5	292 45·4	3 30·0	5 35	11 24	5 13	12·90	4·90
25	19 32 0	18 16	291 51·0	3 27·4	5 27	11 16	5 5	12·71	4·82
26	19 29 2	18 27	291 10·1	3 22·2	5 20	11 9	4 58	12·50	4·74
27	19 26 42	18 38	290 32·9	3 16·1	14	11 3	4 52	12·27	4·66
28	19 24 59	18 51	290 9·7	3 8·1	9	10 57	4 45	12·03	4·56
29	19 23 53	19 2	289 50·2	2 59·6	5 4	10 52	4 40	11·79	4·48
30	19 23 23	19 12	289 43·7	2 49·9	5 0	10 48	4 36	11·54	4·38
31	19 23 26	S19 22	289 40·8	N2 39·8	4 56	10 44	4 32	11·30	4·29

## MERCURY

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## TRIVANDRUM

Date.	MEAN NOON.				MEAN TIME.				
	Right Ascension.	Declina- tion.	Longitude.	Latitude.	Rising.	Meridian passage.	Setting.	Hor. Par.	Semidia- meter.
Feb.	<i>h</i>	<i>s</i>			<i>h</i>	<i>m</i>	<i>h</i>	<i>m</i>	
					A. M.	A. M.	P. M.		
1	19 24 2	19 32	289 49.5	N 2 29.1	4 53	10 41	4 29	11.06	4.19
2	19 25 7	19 41	290 1.4	2 18.1	4 50	10 38	4 26	10.53	4.11
8	19 26 39	19 49	290 23.2	2 6.9	4 47	10 35	4 23	10.60	4.02
4	19 28 36	19 57	290 47.	1 55.5	4 45	10 33	4 21	10.25	3.94
5	19 30 58	20 3	291 20.7	1 44.1	4 44	10 31	4 18	10.17	3.86
6	19 33 39	20 8	291 56.0	1 32.7	4 43	10 30	4 17	9.97	3.79
	19 36 40	20 13	292 35.3	1 21.5	4 42	10 29	4 16	9.78	3.71
8	19 39 59	20 16	293 22.5	1 10.3	4 42	10 29	4 16	9.60	3.64
9	10 43 33	20 19	294 12.5	0 59.4	4 41	10 28	4 15	9.42	3.58
10	19 47 23	20 20	295 4.2	0 48.5	4 41	10 28	4 15	9.26	3.51
11	19 51 25	20 20	296 0.5	0 38.0	4 41	10 28	4 15	9.10	3.46
12	19 55 40	20 19	296 58.5	0 27.5	4 42	10 29	4 16	8.95	3.40
13	20 0 6	20 17	298 1.0	0 17.5	4 43	10 29	4 16	8.80	3.34
14	20 4 42	20 14	299 4.4	N 0 7.6	4 43	10 30	4 17	8.67	3.29
15	20 9 27	20 9	300 11.3	S 0 1.8	4 41	10 31	4 18	8.54	3.24
16	20 14 20	20 3	301 19.2	0 11.2	4 45	10 32	4 19	8.42	3.20
17	20 19 21	19 56	302 30.2	0 20.0	4 46	10 33	4 20	8.30	3.15
18	20 24 30	19 48	303 42.1	0 28.8	4 47	10 34	4 21	8.19	3.11
19	20 29 44	19 39	304 56.7	0 37.1	4 47	10 35	4 23	8.08	3.06
20	20 35 5	19 27	306 12.1	0 45.3	4 49	10 37	4 25	7.98	3.03
21	20 40 31	19 16	307 29.9	0 52.9	4 50	10 38	4	7.88	2.99
22	20 46 1	19 3	308 48.4	1 0.5	4	10 40	4 28	7.79	2.96
23	20 51 37	18 48	310 9.1	1 7.5	4 53	10 41	4 29	7.71	2.92
24	20 57 16	18 31	311 30.4	1 14.4	4	10 43	4 31	7.62	2.89
25	21 2 59	18 15	312 53.5	1 20.6	4	10 45	4 33	7.54	2.86
26	21 8 47	17 56	314 17.8	1 8	4 58	10 47	4 36	7.47	2.84
27	21 14 37	17 36	315 43.7	1 32.4	5 0	10 49	4 38	7.39	2.81
28	21 20 30	17 15	317 10.2	1 37.9	5	10 51	4 40	7.33	2.78

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## MERCURY.

## TRIVANDRUM.

Date.	MEAN NOON.				MEAN TIME.				
	Right Ascension.	Declina- tion.	Longi- tude.	Latitude.	Rising.	Meridian passage.	Setting.	Hor. Par.	Semidia- meter.
March									
	<i>h m s</i>	<i>°</i>	<i>°</i>	<i>°</i>	<i>h m</i>	<i>h m</i>	<i>h m</i>		
					A. M.	A. M.	P. M.		
1	21 26 27	S. 16 53	318 38.4	8. 1 42.8	5 4	10 53	4 42	7 26	2.76
2	21 32 26	16 29	320 7.2	1 17.6	5 5	10 55	4 45	7.20	2.74
3	21 39 28	16 4	321 37.8	1 51.8	5 7	10 57	4 47	7.14	2.72
4	21 44 31	15 38	323 8.9	1 55.9	5 9	10 59	4 49	7.08	2.69
5	21 50 39	15 11	324 41.8	1 59.2	5 11	11 1	4 51	7.03	2.67
6	21 56 57	14 42	326 15.2	2 2.5	5 12	11 3	4 54	6.98	2.65
7	22 2 59	13 11	327 50.3	2 5.2	5 15	11 6	4 57	6.93	2.63
8	22 9 12	13 41	329 25.9	2 7.7	5 17	11 8	4 59	6.88	2.61
9	22 15 28	12 8	331 3.3	2 9.5	5 18	11 10	5 2	6.84	2.60
10	22 21 45	12 34	332 41.2	2 11.2	5 21	11 13	5 5	6.80	2.58
11	22 28 6	11 58	334 20.9	2 12.1	5 23	11 15	7	6.76	2.56
12	22 34 28	11 23	336 1.1	2 12.9	5 24	11 17	10	6.72	2.55
13	22 40 53	10 45	337 43.1	2 13.1	5 27	11 20	5 13	6.69	2.54
14	22 47 19	10 5	339 25.6	2 13.0	5 28	11 22	5 16	6.66	2.53
15	22 53 49	9 25	341 10.0	2 11.8	5 30	11 24	5 18	6.63	2.51
16	23 0 21	8 44	342 55.0	2 10.8	5 33	11 27	21	6.60	2.50
17	23 6 55	8 2	344 41.7	2 9.5	5 34	11 29	24	6.58	2.49
18	23 13 32	7 18	346 29.1	2 7.5	5 37	11 32	27	6.56	2.49
19	23 20 11	6 33	348 18.4	4.8	5 39	11 35	5 31	6.55	2.49
20	23 26 54	5 47	350 8.3	2 1.9	5 41	11 37	5 33	6.53	2.48
21	23 33 40	5 0	352 0.1	1 58.2	5 44	11 40	5 36	6.51	2.47
22	23 40 28	4 11	353 52.5	1 54.2	5 46	11 43	5 40	6.50	2.47
23	23 47 20	3 22	355 46.8	1 49.5	5 49	11 46	5 43	6.50	2.47
24	23 54 15	2 32	357 41.7	1 44.5	5 51	11 49	5 47	6.50	2.47
25	0 1 13	1 40	359 38.4	1 38.8	5 54	11 52	5 50	6.50	2.47
26	0 8 14	S. 0 47	1 35.7	1 32.3	5 56	11 55	5 54	6.50	2.47
27	0 15 20	N 0 6	3 34.7	1 25.9	5 59	11 58	58	6.51	2.47
28	0 22 29	1 1	5 34.3	1 18.3	6 1	P. M. 0 2	6 3	6.53	2.48
29	0 29 40	1 55	7 35.4	1 11.0	6 4	0 5	6 6	6.55	2.49
30	0 36 56	2 50	9 36.9	1 2.9	6 6	0 8	6 10	6.58	2.49

## MERCURY.

1817  
1082

## TRIVANDRUM.

Date.	MEAN NOON.				MEAN TIME.				
	Right Ascension.	Declina- tion.	Longi- tude.	Latitude.	Rising.	Meridian passage.	Setting.	Hor Par.	Semidia- meter.
April.	<i>h. m. s.</i>	<i>°</i>			<i>h. m.</i> A. M.	<i>h. m.</i> P. M.	<i>h. m.</i> P. M.		<i>''</i>
1	0 51 35	N 4 43	13 42.8	80 45.0	6 12	0 15	6 18	6.65	2.52
2	0 58 58	5 40	15 46.5	0 35.3	6 16	0 19	6 22	6.69	2.54
3	1 6 24	6 36	17 50.5	0 25.4	6 18	0 22	6 26	7.74	2.56
4	1 13 51	7 33	19 54.5	0 16.0	6 22	0 26	6 30	6.80	2.58
5	1 21 19	8 29	21 58.5	S 0 4.4	6 24	0 29	6 34	6.87	2.61
6	1 28 48	9 25	24 1.6	N 0 6.6	6 27	0 33	6 39	6.95	2.64
7	1 36 15	10 20	26 4.6	0 17.7	6 30	0 36	6 42	7.03	2.67
8	1 43 39	11 15	28 5.6	0 29.0	6 33	0 40	6 47	7.13	2.71
9	1 51 2	12 8	30 6.2	0 40.3	6 36	0 43	6 50	7.24	2.75
10	1 58 21	13 0	32 3.9	0 51.5	6 38	0 46	6 54	7.35	2.79
11	2 5 33	13 50	34 0.7	1 2.8	6 42	0 50	6 58	7.48	.84
12	2 12 40	14 39	35 53.3	1 13.7	6 44	0 53	7 2	7.62	2.89
13	2 19 39	15 26	37 44.9	1 24.5	6 47	0 56	7 5		2.95
14	2 26 29	16 11	39 31.	1 34.7	6 49	0 59	9	7.93	3.01
15	2 33 8	16 53	41 16.9	1 44.8	6 51	1 1	11	8.10	3.07
16	2 39 36	17 33	42 56.0	1 54.0	6 54	1 5	7 16	8.29	3.15
17	2 45 51	18 10	44 33.6	2 3.0	6 56	1 7	7 18	8.49	3.23
18	2 51 52	18 46	46 4.5	2 11.0	6 57	1 9	7 21	8.69	3.30
19	2 57 40	19 17	47 33.6	2 18.7	6 59	1 11	7 23	8.91	3.38
20	3 3 10	19 48	48 53.3	2 24.7	7 0	1 12	7 24	9.14	3.47
21	3 8 24	20 14	50 15.2	2 31.3	1	1 14	7 27	9.39	3.57
22	3 13 22	20 39	51 24.4	2 35.8	1	1 14	7 27	9.64	3.66
23	3 18 0	21 2	52 37.5	2 40.2	2	1 15	7 28	9.90	3.76
24	3 22 20	21 20	53 39.6	2 42.9	7 2	1 15	7 28	10.17	3.86
25	3 26 22	21 37	54 39.6	2 45.3	7 2	1 15	7 28	10.46	3.97
26	3 30 3	21 51	55 31.2	2 46.0	7 1	1 15	7 29	10.75	4.08
27	3 33 23	22 3	56 20.7	2 46.3	7 0	1 14	7 25	11.04	4.19
28	3 36 23	22 11	57 1.7	2 44.1	6 59	1 13	7 27	11.35	4.31
29	3 39 2	22 18	57 40.4	2 42.9	6 58	1 12	7 26	11.66	4.42
30	3 41 18	22 21	58 10.4	N 2 39.1	6 56	1 10	7 24	1.98	4.54

1817  
1082

## MERCURY

TRIVANDRUM.

Day.	MEAN NOON.				MEAN TIME.				
	Right Ascension.	Declina- tion.	Longitude.	Latitude.	Rising.	Meridian passage.	Setting.	Hor. Par.	Semidi- meter.
May.	<i>h m s</i>				<i>h m</i> A. M.	<i>h m</i> P. M.	<i>h m</i> P. M.		
1	3 43 13	N. 22 23	58 35.2	N. 2 34.5	6 54	1 8	7 22	12.30	4.67
2	3 44 46	22 22	58 57.3	2 25.7	6	1 6	20	12.62	4.79
3	3 45 56	22 19	59 14.1	2 22.0	6 50	1 4	7 18	12.94	4.91
4	3 46 46	22 12	59 22.4	13.5	6 46	1 0	14	13.26	5.03
5	3 47 14	22 5	59 28.4	4.4	6 43	0 57	7 11	13.57	5.15
6	3 47 18	21 54	59 26.1	53.6	6 39	0 53	7	13.88	5.27
7	3 47 8	21 42	59 22.2	2 12.3	6 35	0 49	7 3	14.17	5.38
8	3 46 36	21 27	59 10.5	2 29.3	6 31	0 44	6 57	14.46	5.49
9	3 45 45	21 11	58 56.8	2 15.8	6 26	0 39	6 52	14.72	5.59
10	3 44 39	20 52	58 36.7	2 1.0	6 21	0 34	6 47	14.97	5.68
11	3 43 18	20 31	58 14.8	0 45.7	6 16	0 29	6 42	15.20	5.77
12	3 41 44	20 10	57 47.8	0 29.5	6 10	0 23	6 36	15.40	5.84
13	3 39 58	19 47	57 19.1	N. 0 12.9	6	0 18	6 30	15.57	5.90
14	3 38 5	19 23	56 47.5	S. 0 4.2	6	0 12	6 24	15.72	5.96
15	3 36 5	18 58	56 14.7	0 21.6	54	0	6 18	15.83	6.00
16	3 34 1	18 33	55 40.3	0 39.1	48	Noon.	6 12	15.91	6.03
17	3 31 55	18 7	55 5.1	0 56.7	43	A. M. 11 51	6 5	15.95	6.05
18	3 29 50	17 42	54 30.8	1 13.8		11 48	59	15.96	6.05
19	3 27 47	17 18	53 56.2	1 30.9	31	11 42	53	15.94	6.04
20	3 25 50	16 54	53 23.8	1 47.0		11 36	5 47	15.88	6.02
21	3 24 0	16 31	52 52.0	2 2.9		11 30	40	15.80	5.99
22	3 22 18	16 8	52 24.0	2 17.6	15	11 25	35	15.65	5.95
23	3 20 47	15 49	51 56.9	31.9	9	11 19	5 29	15.54	5.90
24	3 19 29	15 30	51 35.0	2 44.7	4	11 14	24	15.38	5.83
	3 18 24	15 13	51 14.4	2 57.1	5	11 9	5 18	15.19	5.76
26	3 17 33	14 59	50 59.8	3 7.7	4 56	11	5 14	14.98	5.68
27	3 16 57	14 47	50 46.9	3 17.9	4 51	11	5 9	14.76	5.60
28	3 16 35	14 36	40.7	3 26.2	4 47	10 56	5 5	14.52	5.50
29	3 16 33	14 28	36.3	3 37.1	4 43	10 52	5 1	14.27	5.41
30	3 16 42	11	38.9	3 40.1	4 39	10 48	4	14.01	5.31
			50 43.4	45.7	4 36	10 45	4 54	13.75	5.22

## MERCURY

1917  
1092

## TRIVANDRUM MEAN TIME.

Date. June.	MEAN NOON.				MEAN TIME.				
	Right Ascension.	Declina- tion.	Longitude.	Latitude.	Rising.	Meridian Passage.	Setting.	Hor. Par.	Semidia. meter.
	h. s	°	° ' "	° ' "	A. M. h. m.	A. M. h. m.	P. M. h. m.		
1	3 17 56	N. 14 17	50 54 8	3 49 5	4 33	10 42	4 51	13 48	5.11
2	3 18 57	14 18	51 5 3	3 52 9	4 30	10 39	4 48	13 20	5 01
3	3 20 16	14 21	51 28 7	3 54 6	4 27	10 36	4 45	12 93	4 90
4	3 21 51	14 26	51 51 0	3 55 8	4 24	10 33	4 42	12 66	4 80
5	3 23 42	14 34	52 19 9	3 55 4	4 22	10 31	4 40	12 38	4 70
6	3 25 48	14 42	52 50 8	3 54 6	4 20	10 29	4 38	12 11	4 59
7	3 28 11	14 53	53 28 1	3 52 5	4 19	10 28	4 37	11 85	4 50
8	3 30 50	15 5	54 7 3	3 50 0	4 17	10 26	4 35	11 58	4 39
9	3 33 45	15 20	54 52 7	3 46 2	4 16	10 25	4 34	11 32	4 30
10	3 36 54	15 35	55 39 8	3 42 0	4 16	10 25	4 34	11 07	4 20
11	3 40 19	15 52	56 32 9	3 36 7	4 15	10 24	4 33	10 82	4 10
12	3 43 59	16 10	57 27 6	3 31 0	4 14	10 24	4 34	10 58	4 01
13	3 47 54	16 30	58 28 0	3 24 4	4 14	10 24	4 34	10 34	3 93
14	3 52 3	16 50	59 30 0	3 17 4	4 14	10 24	4 34	10 11	3 85
15	3 56 29	17 11	60 37 5	3 9 5	4 15	10 25	4 35	9 59	3 76
16	4 1 9	17 33	61 46 5	3 1 3	4 15	10 26	4 35	9 67	3 67
17	4 6 3	17 56	63 0 8	2 52 4	4 15	10 26	4 37	9 46	3 59
18	4 11 13	18 20	64 16 6	2 43 2	4 17	10 28	4 39	9 25	3 51
19	4 16 38	18 44	65 37 6	2 33 3	4 18	10 29	4 40	9 06	3 44
20	4 22 17	19 8	67 0 1	2 23 2	4 19	10 31	4 43	8 87	3 37
21	4 28 13	19 32	68 27 6	2 12 5	4 21	10 33	4 45	8 68	3 29
22	4 34 23	19 57	69 56 6	2 1 6	4 23	10 35	4 47	8 51	3 23
23	4 40 48	20 21	71 30 5	1 50 3	4 25	10 37	4 49	8 34	3 17
24	4 47 29	20 44	73 5 9	1 35 9	4 26	10 39	4 52	8 17	3 10
25	4 54 26	21 8	74 46 2	1 27 2	4 30	10 43	4 56	8 02	3 04
26	5 1 38	21 30	76 27 7	1 16 4	4 33	10 46	4 59	7 87	2 95
27	5 9 3	21 52	78 13 9	1 3 5	4 36	10 49	5 2	7 73	2 93
28	5 16 46	22 13	80 1 5	0 51 5	4 39	10 53	5 7	7 60	2 88
29	5 24 42	22 32	81 53 3	0 39 6	4 43	10 57	5 11	7 48	2 84
30	32 52	N. 22 50	83 46 5	0 27 6	4 47	11 1	5 15	7 36	2 79

## MERCURY.

1917  
1092

## TRIVANDRUM.

Date.	MEAN NOON.				MEAN TIME.				
	Right Ascension.	Declina- tion.	Longitude.	Latitude.	Rising.	Meridian passage	Setting.	Hor. Par.	Semi- diameter.
July.									
	<i>h s.</i>	<i>° ′</i>	<i>°</i>	<i>°</i>	<i>h m</i> <i>A M</i>	<i>h m</i> <i>A M</i>	<i>h m</i> <i>P M</i>	<i>″</i>	<i>″</i>
1	5 41 16	N 23 7	85 43.7	S 0 16.0	4 52	11 6	5 10	7.26	2.76
2	5 49 52	23 21	87 42.0	S 0 4.3	4 56	11 11	26	7.16	2.72
3	5 58 40	23 33	89 43.6	N 0 9.0	5 1	11 16	31	7.07	2.68
4	6 7 33	23 44	91 46.2	0 18.3	5 6	11 21	5 36	6.99	2.65
5	6 16 46	23 52	93 51.4	0 23.3	11	11 26	5 41	6.91	2.62
6	6 26 0	23 57	95 57.5	0 35.5	16	11 31	5 46	6.84	2.60
7	6 35 0	24 0	98 5.3	0 47.9	5 22	11 37	5 52	6.78	2.57
8	6 44 44	24 0	100 13.6	0 57.0	5 27	11 42	5 57	6.73	2.55
9	6 54 11	23 53	102 22.9	1 5.0	5 33	11 38	6 3	6.69	2.53
10	7 3 38	23 52	104 32.4	1 12.9	5 38	11 53	6 8	6.66	2.52
11	7 13 5	23 44	106 41.8	1 19.6	5 44	11 59 P M	6 14	6.63	2.51
12	7 22 29	23 33	108 51.3	1 26.0	5 49	0 4	6 19	6.61	2.50
13	7 31 48	23 19	110 59.9	1 31.2	5 55	0 10	6 25	6.60	2.50
14	7 41 1	23 3	113 8.3	1 36.1	6 1	0 15	6 29	6.59	2.49
15	7 50 8	22 44	115 15.3	1 39.8	6 6	0 20	6 34	6.60	2.50
16	7 59 7	22 22	117 21.9	1 43.2	6 11	0 25	6 39	6.60	2.50
17	8 7 58	22 0	119 26.3	1 45.3	6 16	0 30	6 44	6.61	2.50
18	8 16 39	21 35	121 30.4	1 47.2	6 22	0 35	6 48	6.62	2.51
19	8 25 11	21 8	123 32.1	1 47.9	6 26	0 39	6 52	6.61	2.52
20	8 33 31	20 38	125 33.2	1 48.4	6 31	0 44	6 57	6.67	2.53
21	8 41 43	20 8	127 31.7	1 47.8	6 35	0 48	7 1	6.70	2.54
22	8 49 43	19 36	129 29.6	1 46.9	6 40	0 52	7 4	6.73	2.56
23	8 57 33	19 3	131 24.9	1 45.0	6 44	0 56	7 8	6.77	2.56
24	9 5 13	18 23	133 19.5	1 42.9	6 48	0 59	7 10	6.81	2.58
25	9 12 41	17 53	135 11.3	1 40.0	6 52	1 3	7 14	6.86	2.60
26	9 19 59	17 17	137 2.4	1 36.8	6 55	1 6	7 17	6.91	2.62
27	9 27 7	16 39	138 50.7	1 32.7	6 59	1 9	7 19	6.97	2.64
28	9 34 5	16 1	140 38.4	1 28.5	7 2	1 12	7 22	7.02	2.66
29	9 40 53	15 22	142 23.5	1 23.5	7 6	1 15	7 24	7.07	2.68
30	9 47 32	14 43	144 7.8	1 18.4	7 9	1 18	7 27	7.13	2.7

## MERCURY

1917  
1092-93

## TRIVANDRUM.

Date.	MEAN NOON.				MEAN TIME.				
	Right Ascension	Declination	Longitude.	Latitude.	Rising.	Meridian Passage.	Setting.	Hor. Par.	Semidia- meter.
August									
	<i>h m s</i>	<i>° ' "</i>	<i>° ' "</i>	<i>° ' "</i>	<i>h m</i> A. M.	<i>h m</i> P. M.	<i>h m</i> P. M.	<i>°</i>	<i>°</i>
1	10 0 21	N 13 23	147 30.2	N.1 6.7	7 16	1 24	7 32	7.27	2.76
2	10 6 32	12 43	149 8.5	1 0 1	7 18	1 26	7 34	7.33	2.78
3	10 12 34	12 2	150 46.1	0 53.4	7 21	1 28	7 35	7.41	2.81
4	10 18 28	11 22	152 21.0	0 46.2	7 23	1 30	7 37	7.48	2.84
5	10 24 18	10 41	153 55.2	0 38.8	7 26	1 32	7 38	7.56	2.87
6	10 29 50	10 0	155 26.8	0 31.0	7 27	1 33	7 39	7.65	2.90
7	10 36 19	9 19	156 57.7	0 23.1	7 29	1 35	7 41	7.73	2.93
8	10 40 40	8 38	158 25.9	0 14.8	7 31	1 36	7 41	7.82	2.96
9	10 46 53	7 58	159 53.4	N.0 6.3	7 32	1 37	7 42	7.91	3.00
10	10 50 58	17	161 18.1	S.0 2.5	7 34	1 38	7 42	8.00	3.04
11	10 55 56	6 37	162 42.2	0 11.4	7 35	1 39	7 43	8.10	3.07
12	11 0 47	5 57	164 3.5	0 20.5	7 36	1 40	7 44	8.20	3.11
13	11 5 28	5 18	165 24.0	0 29.7	7 38	1 41	7 44	8.31	3.15
14	11 10 3	4 39	166 41.6	0 39.2	7 39	1 42	7 45	8.42	3.19
15	11 14 29	4 0	167 58.4	0 48.8	40	1 42	7 44	8.53	3.24
16	11 18 48	3 23	169 12.0	0 58.5	7 40	1 42	7 44	8.65	3.28
17	11 23 0	2 45	170 24.9	1 8.3	7 42	1 43	7 44	8.77	3.32
18	11 27 2	2 9	171 34.4	1 18.2	7 42	1 43	7 44	8.90	3.38
19	11 30 46	1 33	172 43.0	1 28.2	7 42	1 43	7 44	9.03	3.43
20	11 34 42	0 57	173 48.0	1 38.2	7 42	1 43	7 44	9.16	3.47
21	11 38 19	N. 0 23	174 52.1	1 48.3	7 42	1 42	7 42	9.31	3.53
22	11 41 46	S. 0 10	175 52.2	1 58.3	42	1 42	7 42	9.45	3.59
23	11 45 5	0 42	176 51.2	2 8.3	7 41	1 41	7 41	9.60	3.64
24	11 48 12	1 13	177 45.7	2 18.2	41	1 40	7 39	9.76	3.70
25	11 51 10	1 44	178 35.1	2 28.1	40	1 39	7 38	9.92	3.76
26	11 53 54	2 12	179 27.5	2 37.8	7 39	1 38	7 37	10.09	3.83
27	11 56 29	2 39	180 14.6	2 47.5	7 38	1 36	7 34	10.27	3.89
28	11 58 50	3 6	180 56.2	2 57.6	7 37	1 35	7 33	10.45	3.96
29	12 0 59	3 29	181 36.3	3 6.3	7 35	1 33	7 31	10.63	4.03
30	12 2 59	3 51	182 10.0	3 15.0	7 33	1 31	7 29	10.83	4.11
31	12 4 52	S. 4 12	182 42.0	S. 3 23.7	7 31	1 28	7 25	11.02	4.18

1917  
1093

## MERCURY

TRIVANDRUM.

Day. Sept.	MEAN NOON.				MEAN TIME.				
	Right Ascension.	Declination.	Longitude.	Latitude.	Rising.	Meridian passage.	Setting.	Hor. Par.	Semidia- meter.
	h m s	°	°	°	A. M.	P. M.	P. M.	"	"
1	12 5 56	S 4 29	183 6.8	S. 3 31.8	7 30	1 27	7 24	11.23	4.26
2	12 2	4 45	183 29.7	3 39.7	7 27	1 24	7 21	11.43	4.34
3	12 7 52	4 58	183 44.6	3 46.8	7 24	1 21	7 18	11.64	4.42
4	12 8 23	9	183 57.3	3 53.6	7 20	1 17	7 14	11.86	4.50
5	12 8 33	5 17	184 1.0	3 59.1	7 16	1 13	7 10	12.07	4.58
6	12 8 24	5 21	184 2.4	4 4.4	7 12	1 9	7 6	12.29	4.67
7	12 7 53	5 22	183 54.0	4 8.0	7 8	1 5	7 2	12.50	4.74
8	12 7 2	5 20	183 42.9	4 11.3	7 3	1 0	6 57	12.70	4.82
9	12 5 48	5 13	183 21.6	4 12.6	6	0 54	6 51	12.90	4.90
10	12 4 12	5 3	182 57.5	4 13.4	6 52	0 49	6 46	13.09	4.97
11	12 2 14	4 49	182 23.2	4 11.7	6 46	0 33	6 40	13.26	5.03
12	11 59 56	4 31	181 46.1	4 9.4	6 40	0 37	6 34	13.41	5.09
13	11 57 18	4 10	180 59.7	4 4.3	6 33	0 30	6 27	13.53	5.13
14	11 54 23	3 44	180 10.7	3 58.4	6 24	0 22	6 20	13.63	5.17
15	11 51 13	3 14	179 14.6	3 49.6	6 18	0 16	6 14	13.69	5.20
16	11 47 52	2 41	178 16.4	3 39.9	6 11	0 9	6 7	13.71	5.20
17	11 44 24	2	177 14.4	3 27.3	6 2	0 1	6 0	13.69	5.20
18	11 40 53	1 27	176 11.2	3 13.8		A. M. 11 54	53	13.63	5.17
19	11 37 25	0 47	175 8.6	2 57.8	47	11 46	45	13.52	5.13
20	11 34 2	S. 0 7	174 6.1	2 41.0	40	11 39	38	13.37	5.05
21	11 30 55	N. 0 33	173 8.9	2 22.5	32	11 32	32	13.18	5.00
22	11 28 7	1 12	172 13.2	2 3.5	26	11 26	5 26	12.95	4.92
23	11 25 50	1 49	171 27.4	1 43.6	18	11 19	20	12.68	4.82
24	11 23 41	2 24	170 44.3	1 23.5	12	11 13	5 14	12.39	4.71
25	11 22 12	2 55	170 14.7	1 3.6		11. 8	9	12.07	4.58
26	11 21 17	3 22	169 48.7	0 43.7	5 1	11 3	5 5	11.74	4.46
27	11 20 59	3 45	169 38.1	0 24.9	4 57	10 59	5 1	11.41	4.33
28	11 21 13	4 3	169 31.5	0 6.3	4 54	10 56	4 58	11.07	4.20
29	11 22 6	4 16	169 41.6	N. 0 10.7	4 51	10 53	4 55	10.73	4.07
30	11 23 34	N. 4 25	169 52.7	N. 0 27.2	4 46	10 49	4 52	10.39	3.95

## MERCURY

1917  
1098

## TRIVANDRUM.

Date.	MEAN NOON.				MEAN TIME.				
	Right Ascension.	Declination.	Longitude.	Latitude.	Rising.	Meridian passage.	Setting.	Hor. Par.	Semidiameter.
Oct.	<i>h m s</i>	<i>°</i>	<i>°</i>	<i>°</i>	<i>h. m.</i> A. M.	<i>h. m.</i> A. M.	<i>h. m.</i> P. M.		
1	11 25 36	N 4 28	170 25.1	N 0 41.6	4 45	10 45	4 51	10.07	
2	11 28 11	4 26	170 58.7	0 55.5	4 43	10 46	4 49	9.76	3.70
3	11 31 17	4 20	171 46.0	1 7.2	4 43	10 46	4 49	9.46	3.59
4	11 34 50	4 9	172 37.1	1 18.3	4 42	10 45	4 48	9.18	3.48
5	11 38 50	3 53	173 39.7	1 27.3	4 42	10 45	4 48	8.92	3.39
6	11 43 11	3 33	174 45.5	1 35.7	4 44	10 46	4 48	8.67	3.29
	11 47 52	3 10	176 0.4	1 42.0	4 45	10 47	4 49	8.44	3.21
8	11 52 52	2 44	177 17.9	1 47.8	4 46	10 48	4 50	8.23	3.12
9	11 58 5	2 14	178 42.4	1 51.7	4 47	10 49	4 51	8.03	3.05
10	12 3 32	1 43	180 8.9	1 55.2	4 50	10 51	4 52	7.85	2.98
11	12 9 "	1 8	181 40.4	1 56.9	4 51	10 52	4 53	7.68	2.91
12	12 14 54	N 0 32	183 13.4	1 58.3	4 53	10 54	4 55	7.53	2.86
13	12 20 47	S 0 6	184 49.8	1 58.4	4 56	10 56	5 56	7.39	2.81
14	12 26 45	0 45	186 27.1	1 58.0	4 58	10 58	4 58	7.26	2.76
15	12 32 47	1	188 6.5	1 56.5	0	11 0	0	7.14	2.72
16	12 38 54	2 6	189 46.6	1 54.7	5 3	11 2	1	7.03	2.67
17	12 45 2	2 49	191 27.8	1 51.9	5 6	11 5	4	6.93	2.63
18	12 51 13	3 31	193 9.5	1 48.9	5 9	11 7		6.84	2.60
19	12 57 25	4 14	194 51.8	1 45.2	11	11 9		6.75	
20	13 3 37	4	196 34.1	1 41.2	14	11 11	5 8	6.68	2.53
21	13 9 50	5 40	198 16.4	1 36.7	17	11 14	5 11	6.61	2.50
22	13-16 3	6 23	199 58.8	1 31.9	5 19	11 16	13	6.54	2.48
23	13 22 17	6	201 40.8	1 26.7	22	11 18	14	6.49	2.46
24	13 28 31	7 49	203 22.8	1 20.3	24	11 20	16	6.43	2.44
25	13 34 44	8 32	205 4.3	1 15.6	28	11 23	5 18	6.39	2.43
26	13 40 58	9 14	206 45.7	1 9.7	30	11 25	20	6.34	2.41
27	13 47 12	9	208 26.4	1	33	11	21	6.30	2.39
28	13 53 24	10 37	210 7.0	0 57.5	5 36	11 30	5 24	6.27	2.33
29	13 59 38	11 18	211 46.8	0 51.2	5 38	11 32	5 26	6.24	2.37
30	14 41	11	213 26.5	0 44.7	5 41	11 34	27	6.21	2.35
31	14 12 4	12 38	215 5.4	N 0 35.1	43	11 36	29	6.18	2.34

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## MERCURY

TRIVANDRUM.

Date. Nov.	MEAN NOON.				MEAN TIME.					
	Right Ascension.	Declin- ation.	Longitude.	Latitude.	Rising.	Meridian passage.	Setting.	Hor. Par.	Semidia- meter.	
1	14 18 17	S. 13 16	216 44.2	N.0 31.5	<i>h.</i> A. 47	<i>m.</i> M. 11 39	<i>h.</i> P. 5 31	<i>m.</i> M. 31	6.16	2.34
2	14 25 29	13 54	218 22.3	0 24.8	49	11 41	33		6.14	2.33
	14 30 43	14 32	220 0.2	0 18.1	51	11 43	35		6.13	2.33
4	14 36 57	15 10	221 37.4	0 11.4	55	11 46	5 37		6.11	2.32
5	14 43 12	15 44	223 14.5	N.0 4.6	57	11 48	39		6.10	2.32
6	14 49 27	16 20	224 50.8	S.0 2.1	6 0	11 50	40		6.10	2.32
7	14 55 43	16 54	226 27.1	0 8.8	6 3	11 53	43		6.09	2.32
8	15 2 0	17 28	228 2.8	0 15.4	6 5	11 55	45		6.09	2.32
9	15 8 17	18 0	229 38.2	0 22.1	6 8	11 57	46		6.09	2.32
10	15 14 36	18 31	231 13.1	0 28.6	6 11	Noon.	49		6.09	2.32
11	15 20 5.	19 2	232 48.0	0 35.1	6 14	P. M. 0 2	5 50		6.10	2.32
12	15 27 15	19 33	234 22.3	0 41.5	6 16	0 4	5 52		6.10	2.32
13	15 33 37	20 1	235 56.5	0 47.9	6 20	0 7	54		6.11	2.32
14	15 40 0	20 29	237 30.2	0 54.1	6 22	0 9	56		6.13	2.33
15	15 46 25	20 56	239 3.0	1 0.3	6 25	0 12	59		6.14	2.34
16	15 52 49	21 22	240 37.1	1 6.2	6	0 14	6 1		6.16	2.34
17	15 59 16	21 47	242 10.2	1 12.1	31	0 17	6 3		6.18	2.35
18	16 5 43	22 11	243 43.0	1 17.8	6 33	0 19	6 5		6.20	2.35
19	16 12 12	22 33	245 15.7	1 23.5	6 35	0 21	6 7		6.22	2.36
20	16 18 42	22 55	246 48.0	1 28.8	6 38	0 24	6 10		6.25	2.37
21	16 25 13	23 15	248 20.3	1 34.1	6 41	0 26	6 11		6.28	2.38
22	16 31 46	23 34	249 52.2	1 39.1	6 44	0 29	6 14		6.31	2.39
23	16 38 20	23	251 24.0	1 44.0	6 46	0 31	6 16		6.35	2.41
24	16 44 54	24 9	252 55.5	1 48.5	6 49	0 34	6 19		6.39	2.43
25	16 51 29	24 25	254 26.9	1 53.0	6 53	0 37	6 21		6.43	2.44
26	16 5	24 39	255 57.9	1 57.0	6 55	0 39	6 23		6.48	2.46
27	17 4	24 52	257 28.9	2 1	6 58	0 42	6 26		6.53	2.48
28	17 11 19	4	258 59.5	4.5	1	0 45	6 29		6 58	2.49
29	17 17 55	25 14	260 30.0	7.9	7 3	0 47	6 31		6.64	2.52
30	17 24 32	S. 25 25	261 53.9	S. 2 10.7	7 6	0 50	6 34		6.70	2.54

## MERCURY

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## TRIVANDRUM.

Date.	MEAN NOON.				MEAN TIME.				
	Right Ascension.	Declina- tion.	Longi- tude.	Lati- tude.	Rising.	Meridian passage.	Setting.	Hor. Par.	Semi- diameter.
Decr.	<i>h m s</i>	<i>°</i>	<i>°</i>	<i>°</i>	<i>h. m.</i> A. M.	<i>h. m.</i> P. M.	<i>h. m.</i> P. M.		<i>"</i>
1	17 31 7	S 25 31	263 29.7	S 2 13.4	7 9	0 53	6 37	6.77	2.57
2	17 37 43	21 37	264 58.9	2 15.6	11	0 55	6 39	6.84	2.60
3	17 44 16	25 42	266 27.9	2 17.7	7 15	0 58	6 41	6.91	2.62
4	17 50 49	25 45	267 55.9	19.0	7 17	1 0	6 43	6.99	2.66
5	17 57 18	25 47	269 23.8	2 20.2	21	1 4	47	7.05	2.69
6	18 3 45	25 48	270 50.5	2 20.6	7 23	1 6	6 49	7.15	2.73
7	18 10 6	25 46	272 16.9	2 20.9	26	1 9	6 52	7.28	2.77
8	18 16 24	25 44	273 41.7	2 20.2	7 24	1 11	6 54	7.39	2.81
9	18 22 36	25 40	275 6.0	2 19.3	30	1 13	6 56	7.50	2.85
10	18 28 43	25 35	276 28.0	17.4	7 31	1 15	6 59	7.63	2.89
11	18 34 39	25 28	277 49.5	18.3	33	1 17	1	7.76	2.94
12	18 40 28	25 20	279 7.8	12.1	7 35	1 19	7	7.91	3.00
13	18 46 6	25 11	280 25.4	2 8.5	7 37	1 21	5	8.06	3.06
14	18 51 32	25 0	281 35.8	2 3.8	7 38	1 22	6	8.23	3.12
15	18 56 43	24 48	282 51.1	1 58.6	40	1 24	8	8.41	3.19
16	19 1 38	24 35	283 57.6	1 52.0	7 40	1 24	8	8.61	3.26
17	19 6 14	24 20	285 2.7	1 44.9	7 40	1	7 10	8.81	3.34
18	19 10 27	24	286 0.2	1 36.2	7 40	1 25	7 10	9.04	3.43
19	19 14 17	23 49	286 55.7	1 27.0	40	1 25	7 10	9.27	3.52
20	19 17 39	23 33	287 41.2	1 16.1	39	1 24	7 9	9.53	3.62
21	19 20 29	23 16	288 24.2	1 4.6	38	1 23	8	9.80	3.72
	19 22 44	22 58	288 54.6	0 51.3	36	1 21	6	10.08	3.82
23	19 24 21	22 40	289 21.5	0 37.4	7 33	1 19		10.35	3.94
24	19 25 14	22 23	289 33.0	0 21.6	30	1 16		10.69	4.06
	19 25 15	6	289 40.4	S 0 5.3	7 26	1 12	6 55	11.00	4.17
26	19 24 44	21 49	289 30.2	N 0 12.6	7 22	1 8	6 54	11.32	4.30
27	19 23 15	21 33	289 15.1	0 31.0	16	1	6 48	11.64	4.42
28	19 20 54	21 18	288 41.6	0 50.2		0	6 42	11.95	4.54
29	19 17 46	21 5	288 3.0	1 9.7	1	0 48	6	12.24	4.65
30	19 13 50	20 53	287 7.8	1 29.0	6 54	0 41	6 28	12.50	4.74
31	19 9 13	S 20 40	286 7.9	N 1 48.3	6 46	0 33	6 20	12.72	4.83

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## VENUS.

## TRIVANDRUM.

Date.	MEAN NOON.				MEAN TIME.				
	Right Ascension.	Declina- tion.	Longitude.	Latitude.	Rising.	Meridian passage.	Setting.	Hor. Par.	Semidia- meter.
Jan.									
	<i>h m s</i>	<i>°</i>	<i>°</i>		<i>h. m.</i>	<i>h. m.</i>	<i>h. m.</i>	<i>"</i>	<i>"</i>
1	16 44 14	S 21 8	252 22.7	N 1 10.8	4 16	10 3	3 50	6.17	5.99
2	16 49 29	21 19	253 37.3	1 8.4	4 17	10 4	3 51	6.15	5.98
3	16 54 47	21 30	254 51.9	1 6.0	4 19	10 6	3 53	6.13	5.96
4	17 0 5	21 40	256 6.5	1 3.6	4 20	10 7	3 54	6.11	5.94
5	17 5 24	21 50	257 21.2	1 1.1	4 22	10 8	3 54	6.09	5.92
6	17 10 43	21 59	258 35.8	0 58.6	4 24	10 10	3 56	6.07	5.90
7	17 16 3	22 7	259 50.5	0 56.1	4 25	10 11	3 57	6.05	5.88
8	17 21 24	22 15	261 5.2	0 53.6	4 27	10 13	3 59	6.03	5.86
9	17 26 46	22 23	262 19.9	0 51.0	4 28	10 14	4 0	6.01	5.84
10	17 32 8	22 30	263 34.6	0 48.5	4 29	10 15	4 1	5.99	5.82
11	17 37 31	22 35	264 49.4	0 45.9	4 31	10 17	4 3	5.98	5.81
12	17 42 55	22 40	266 4.1	0 43.3	4 32	10 18	4 4	5.96	5.79
13	17 48 19	22 45	267 18.9	0 40.6	4 34	10 20	4 6	5.94	5.77
14	17 53 43	22 48	268 33.9	0 38.0	4 35	10 21	4 7	5.92	5.75
15	17 59 7	22 51	269 48.5	0 35.3	4 37	10 23	4 9	5.91	5.74
16	18 4 32	22 54	271 3.3	0 32.6	4 38	10 24	4 10	5.89	5.73
17	18 9 58	22 56	272 18.1	0 29.9	4 40	10 26	4 12	5.87	5.71
18	18 15 23	22	273 32.9	0 27.2	4 42	10 27	4 12	5.86	5.70
19	18 20 48	22 57	274 47.8	0 24.5	4 44	10 29	4 14	5.84	5.68
20	18 26 13	22 57	276 2.6	0 21.8	4 45	10 30	4 15	5.82	5.66
21	18 31 39	22 56	277 17	0 19.1	4 47	10 32	4 17	5.81	5.65
22	18 37 4	22 54	278 32.3	0 16.4	4 48	10 33	4 18	5.79	5.63
23	18 42 29	22 52	279 47.2	0 13.7	4 48	10 34	4 20	5.78	5.62
24	18 47 54	22 49	281 2.1	0 11.0	4 50	10 36	4 22	5.76	5.60
25	18 53 18	22 45	282 17.0	0 8.3	4 51	10 37	4 23	5.75	5.59
26	18 58 42	22 40	283 31.8	0 5.6	4 53	10 39	4 25	5.73	5.57
27	19 4 6	22 35	284 46.7	N 0 2.9	4 54	10 40	4 26	5.72	5.56
28	19 9 30	22	285 1.6	S 0 0.9	4 56	10 42	4 28	5.70	5.54
29	19 14 52	22 22	287 16.5	0 2.3	57	10 43	4 29	5.69	5.53
30	19 20 15	22 15	288 31.3	0 4.9	4 59	10 45	4 31	5.68	5.52
			289 46.2	S 0 7.6	5 0	10 46	4 32		

## VENUS.

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## TRIVANDRUM.

Date. Feb.	MEAN NOON.				MEAN TIME.				
	Right Ascension.	Declina- tion.	Longi- tude.	Lati- tude.	Rising.	Meridian passage.	Setting.	Hor. Par.	Semidia- meter.
1	19 30 57	S 21 59	291 1.0	S 0 10.2	h. m. A. M. 5 2	h. m. A. M. 10 48	h. m. P. M. 4 34	5.65	5.49
2	19 36 19	21 49	292 15.9	0 12.8	3	10 49	4 35	5.63	5.47
3	19 41 38	21 39	293 30.8	0 15.4	4	10 50	4 36		5.46
4	19 46.57	21 28	294 45.7	0 18.0	6	10 52	4 38	5.61	5.45
5	19 52 15	21 17	296 0.5	0 20.5	6	10 53	4 40	5.60	5.44
6	19 57 32	21 6	297 15.4	0 23.0	7	10 54	4 41	5.58	5.42
	20 2 48	20 53	298 30.3	0 25.4	5 9	10 56	4 43		5.41
8	20 8 5	20 40	299 45.2	0 27.8	5 10	10 57	4 44	5.56	5.40
9	20 13 19	20 26	301 0.0	0 30.2	11	10 58	4 45	5.55	5.39
10	20 18 33	20 12	302 11.9	0 32.6	13	11 0	4 47	5.53	5.38
11	20 23 46	19 57	303 29.7	0 34.9	5 14	11 1	4 48	5.52	5.37
12	20 28 57	19 41	304 44.6	0 37.2	5 15	11 2	4 49	5.51	5.36
13	20 34 7	19	305 59.4	0 39.4	15	11 3	4 51	5.50	5.35
14	20 39 16	19 9	307 14.3	0 41.6	17	11 5	4 53	5.49	5.34
15	20 44 24	18 52	308 29.2	0 43.7	18	11 6	4 54	5.48	5.33
16	20 49 31	18 34	309 44.1	0 45.9	5 19	11 7	4 55	5.47	5.32
17	20 54 38	18 15	310 58.9	0 48.0	5 20	11 8	4 56	5.46	5.31
18	20 59 43	17	312 13.8	0 50.1	5 20	11 9	4 58	5.45	5.30
19	21 4 47	17 37	313 28.6	0 52.1	21	11 10	4 59	5.43	5.29
20	21 9 49	17 17	314 43.5	0 54.1	22	11 11	0	5.42	5.27
21	21 14 51	16 57	315 58.3	0 56.0	24	11 13	2	5.41	5.26
22	21 19 52	16 36	317 13.2	0 57.9	5 25	11 14	5 3	5.40	5.25
23	21 24 51	16 15	318 28.0	0 59.6	5 25	11 15	5	5.40	5.25
24	21 29 46	15 53	319 42.9	1 1.4	26	11 16	6	5.39	5.24
25	21 34 44	15 31	320 57.7	1 3.1	5 27	11 17	5 7	5.38	5.23
26	21 39 39	15 9	322 12.5	1 4.8	28	11 18	8	5.37	5.22
27	21 44 37	14 45	323 27.3	1 6.4	28	11 19	10	5.36	5.21
28	21 49 30	S 14 22	324 42.1	S 1 8.0		11 20	5 11	5.35	5.20

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## VENUS.

TRIVANDRUM.

Date. March.	MEAN NOON.				MEAN TIME.					
	Right Ascension.	Declina- tion.	Longitude.	Latitude.	Rising.	Meridian passage.	Setting.	Hor. Par.	Semi- diameter.	
	<i>h.</i> <i>s.</i>				<i>h.</i> <i>m.</i>	<i>h.</i> <i>m.</i>	<i>h.</i> <i>m.</i>			
1	21 54 22	S. 13 58	324 56·8	S. 1 9·5	A. M. 5 29	A. M. 11 20	P. M. 5 11		31	19
2	21 59 14	13 34	327 11·6	1 10·5	30	11 21	12		33	5· 18
3	22 4 4	13 9	328 26·3	1 12·2	30	11 22	14		32	17
4	22 8 54	12 44	329 41·1	1 13·6	32	11 23	5 15		5· 32	17
5	22 13 42	12 19	330 55·8	1 14 8	31	11 24	16		5· 31	5· 16
6	22 18 28	11 54	332 10·6	1 16·0	33	11 25	5 17		30	5· 15
7	22 23 14	11 29	333 25·3	1 17·2	33	11 26	5 19		5· 29	5· 14
8	22 28 0	11 2	334 40·0	1 18·3	33	11 26	5 19		5· 28	5· 13
9	22 32 45	10 35	335 54·7	1 19·3	34	11 27	20		29	13
10	22 37 28	10 8	337 9·4	1 20·3	34	11 28	22		27	12
11	22 42 10	9 41	338 24·0	1 21·1	35	11 29	5 23		26	11
12	22 46 52	9 14	339 38·7	1 22·0	36	11 30	5 24		5· 26	5· 11
13	22 51 32	8 46	340 53·4	1 22·7	36	11 30	24		5· 25	10
14	22 56 13	8 18	342 8·1	1 23·6	36	11 31	26		5· 24	09
15	23 0 53	7 50	343 22·7	1 24·1	37	11 32	27		5· 23	5· 08
16	23 5 31	7 22	344 37·4	1 24·7	5 37	11 32			23	05
17	23 10 9	6 53	345 52·0	1 25·2	5 37	11 33	29		22	07
18	23 14 46	6 25	347 6·6	1 25·7	5 38	11 34	30		22	07
19	23 19 23	56	348 21·2	1 26·0	38	11 34	30		21	5· 06
20	23 23 59	27	349 35·8	1 26·4	5 39	11 35	5 31		20	5· 05
21	23 28 35	4 58	350 50·4	1 26·7	5 39	11 36	33		20	05
22	23 33 11	4 28	352 5·0	1 26·9	39	11 36	33		19	04
23	23 37 46	3 59	353 19·6	1 27·0	5 40	11 37	34		19	04
24	23 42 20	3 29	354 34·2	1 27·1	5 40	11 38	36		18	03
25	23 46 54	3 0	355 48·8	1 27·1	10	11 38	36		5· 18	03
26	23 51 28	30	357 3·3	1 27·0	41	11 39	37		5· 17	5· 03
27	23 56 1	2 0	358 17·8	1 26·8	5 41	11 40	5 39		17	02
28	0 0 31	1 30	359 32·4	1 26·6	41	11 40	39		16	02
29	0	1 1	0 46 8	1 26·4	42	11 41	40		16	5· 02
30	0 9 39	S 0 31	2 1·3	1 26·1	42	11 41	5 40		5· 15	5· 01
31	0 14 12	N. 0 1	3 15·7	S. 1 25·7	5 42	11 42	5 42		5 15	01

## VENUS.

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## TRIVANDRUM.

Date.	MEAN NOON.				MEAN TIME.				
	Right Ascension.	Declination.	Longitude.	Latitude.	Rising.	Meridian passage.	Setting.	Hor. par.	Semidiameter.
April.	<i>h.</i>	<i>1</i>		<i>1</i>	<i>h. m.</i>	<i>h.</i>	<i>h. m.</i>		
					A. M.	A. M.	P. M.		
1	0 18 45	N. 0 29	4 30.2	S.1 25.3	5 43	11 43	5 45	5. 14	00
2	0 23 17	0 59	44.6	1 24.5	5 43	11 43	5 43	5. 14	00
3	0 27 50	1 29	6 59.1	1 24.2	5 43	11 44	45	14	00
4	0 32 22	1 59	13.4	1 23.5	5 43	11 44	5 45	5. 13	4. 99
	0 36	2 29	9 27.8	1 22.8	44	11 45	46	5. 13	4. 99
	0 41 27	2 59	10 42.1	1 22.1	44	11 46	48	5. 12	4. 98
	0 46 0	3 29	11 56.5	1 21.3	5 44	11 46	5 48	5. 12	4. 98
8	0 50 33	3 58	13 10.3	1 20.4	45	11 47	5 49	5. 12	4. 98
9	0 7	4 28	14 25.2	1 19.5	45	11 47	5 49	5. 12	4. 98
10	0 59 40	4 57	15 39.5	1 18.5	45	11 48	5 51	5. 11	4. 97
11	1 4 14	27	16 53.8	1 17.4	5 46	11 49	5 52	5. 11	4. 97
12	1 8 49	5 56	18 8.1	1 16.3	5 46	11 49	5 52	5. 11	4. 97
13	1 13 23	6 26	19 22.4	1 15.1	5 46	11 50	5 54	5. 10	4. 96
14	1 17 58	6 55	20 36.6	1 13.9	5 47	11 51	5 55	5. 10	4. 96
15	1 22 33	7 23	21 50.9	1 12.6	5 47	11 51	5 55	5. 10	4. 96
16	1 27 10		23 5.1	1 11.4	5 48	11 52	5 56	5. 10	4. 96
17	1 31 47	8 21	24 19.4	1 10.0	5 48	11 53	5 58	5. 10	4. 96
18	1 36 24	8 49	25 33.6	1 8.5	5 45	11 53	5 58	5. 09	4. 95
19	1 41 2	9 17	26 47.8	1 7.0	49	11 54	5 59	5. 09	4. 95
20	1 45 41	9 45	28 2.0	1	49	11 55	6 1	5. 09	4. 95
21	1 50 20	10 13	29 16.2	1 3.9	49	11 55	6 1	5. 09	4. 95
22	1 0	10 40	30 30.4	1 3	5 50	11 56	6 2	5. 09	4. 95
23	1 59 41	11 8	31 44.6	1 0.6	5 51	11 57	6 3	5. 09	4. 95
24	2 4 23	11 35	32 58.7	0 59.0	5 51	11 58	6 5	5. 09	4.
25	2 9 6	12 1	34 12.9	0 57.2	51	11 58	6 5	5. 09	4. 95
26	2 13 49	12 28	35 27.0	0 55.4	5 52	11 59	6 8	5. 09	4. 95
27	2 18 33	12 54	36 41.1	0 53.5	5 52	Noon	6 8	5. 09	4. 95
28	2 18	13 20	37 55.1	0 51.6	5 53	P. M. 0 1	6 9	5. 09	4. 95
29	2 28 4	13 46	39 9.2	0 49.7	5 53	0 2	11	09	4. 95
30	2 52	N. 14 11	40 23.2	S.0 47.7	5 53	0 2	6 11	09	4.

1917  
1092

VENUS.

TRIVANDRUM.

Date.	MEAN NOON.				MEAN TIME.				
	Right Ascension.	Declination.	Longitude.	Latitude.	Rising.	Meridian passage.	Setting.	Hor. Par.	Semidiameter.
May.	<i>h.</i>				<i>h. m.</i>	<i>h. m.</i>	<i>h. m.</i>		
1	2 37 40	N. 14 36	41 37.3	S.0 45.8	5 51	6 3	6 12	5.09	4.95
2	2 42 28	15 0	42 51.3	0 43.8		0 4	6 13	5.09	4.95
3	2 47 19	15 25	44	0 41.7	56	0 5	6 14	5.09	4.95
4	2 52 10	15 48	45 19.2	0 39.6	56	0 6	6 16	5.09	4.95
	2 2	16 11	46 33.2	0 37.4	57	0 7	6 17	5.09	4.95
6	3 1 56	16 34	47 47.1	0 35.3	58	0 8	6 18	5.09	4.95
7	3 6 51	16 57	49 1.1	0 33.1	59	0 9	6 19	5.09	4.95
8	11 43	17 19	50 15.0	0 33.0	5 59	0 10	6 21	5.09	4.95
9	3 16 40	17 41	51 28.9	0 28.7	6 0	0 11	6 22	5.09	4.95
10	21 39	18 2	42.8	0 26.5	6 1	0 12	6 23	5.10	4.96
11	3 26 38	18 23	53 56.7	0 24.2	6 2	0 13	6 21	5.10	4.96
12	3 31 38	18 43	55 10.6	0 21.9	6 2	0 14	6 26	5.10	4.96
13	3 36 39	19 3	56 24.5	0 19.6	6 3	0 15	6 27	5.10	4.96
14	3 41 11	19 22	57 38.3	0 17.3	6 4	0 16	6 28	5.10	4.96
15	3 46 45	19 40	58 52.2	0 14.9	6	0 17	6 29	5.11	4.97
16	3 51 49	19 58	60 6.0	0 12.5	6 6	0 18	6 30	5.11	4.97
17	3 56 54	20 16	61 19.9	0 10.1	6 7	0 20	6 33	5.11	4.97
18	4 2 1	20 33	62 33.7	0 7.8	6 8	0 21	6 34	5.12	4.98
19	4 7 9	20 50	63 47.5	0 5.4	6 9	0 22	6 35	5.12	4.98
20	4 12 18	21 6	65 1.3	0 3.0	6 10	0 23	6 36	5.12	4.98
21	4 17 29	21 21	66 15.1	S.0 0.6	6 11	0 24	6 37	5.13	4.99
	4 22 40	21 36	67 28.9	N.0 1.8	6 13	0 26	6 39	5.13	4.99
23	4 27 52	21 50	68 42.7	0 4.2	6 13	0 27	6 41	5.13	4.99
24	4 33 4	22 3	69 56.8	0 6.6	6 14	0 28	6 42	5.14	5.00
25	4 38 18	22 16	71 10.2	0 9.1	6 15	0 29	6 43	5.14	5.00
26	4 43 33	22 28	72 23.9	0 11.5	6 17	0 31	6 45	5.15	5.01
27	4 48 47	22 40	73 37.7	0 13.9	6 18	0 32	6 46	5.15	5.01
28	4 54 4	22 52	74 51.4	0 16.3	6 19	0 33	6 47	5.16	5.02
29	1 59 21	23 2	76 5.1	0 18.7	21	0	6 49	5.16	5.02
30	4 32	23 12	77 18.7	0 21.0	6 21	0 36	6 51	5.17	5.03
31	9	N. 20		N	6 22	0 37	6	17	5.03

# VENUS

1917  
1092

TRIVANDRUM.

Date.	MEAN NOON.				MEAN TIME.				
	Right Ascension.	Declination.	Longitude.	Latitude.	Rising.	Meridian passage.	Setting.	Hor. Par.	Semidia- meter.
June.	<i>h</i>	<i>s</i>			<i>h</i>	<i>m</i>	<i>h</i>	<i>m</i>	<i>h</i> <sup><i>s</i></sup> <i>m</i>
1	5 15 17	N.23 29	79 46.1	N. 0 25.7	6 24	0 39	6 54		5.18
2	5 20 37	23 36	80 59.5	0 28.1	6 25	0 40	6	5 19	5.04
3	5 25 57	23 44	82 13.4	0 30.4	6 27	0 42	6 57	5.19	5.04
4	5 31 17	23 50	83 27.1	0 32.7	6 28	0 43	6 58	5.20	5.05
5	5 36 39	23 56	84 40.7	0 35.0	6 29	0 44	6 59	5.20	5.05
6	5 42 0	24 0	85 54.3	0 37.3	6 31	0 46	7 1	5.21	5.06
7	5 47 22	24 4	87 7.9	0 39.5	6 32	0 47			5.07
8	5 45	24 8	88 21.5	0 41.7	6 34	0 49	4		5.07
9	5 58 7	24 11	89 35.0	0 43.9	6 35	0 50		5.23	5.08
10	6 3 30	24 13	90 48.6	0 46.1	6 37	0		5.24	5.09
11	6 8 52	24 15	92 11	0 48.3	38	0 53			5.10
12	6 14 15	24 15	93 15.7	0 50.4	6 39	0 54			10
13	6 19 38	24 15	94 29.2	0 52.4	6 41	0 56	11	5.26	11
14	6 25 1	24 14	95 42.8	0 54.5	6 42	0 57	12	5.27	5.12
15	6 30 24	24 12	96 56.3	0 56.5	6 44	0 59	14	5.28	5.13
16	6 35 46	24 10	98 9.8	0 58.5	6 45	1 0	15	5.29	5.14
17	6 41 8	24 8	99 23.3	1 0.4	6 47	1 2	17	5.30	5.15
18	6 46 30	24 4	100 36.9	1 2.3	6 48	1 3	18	5.31	16
19	6 51 51	23 59	101 50.4	1 4.1	6 49	1 4	19	5.31	5.16
20	6 57 12	23 54	103 3.9	1 5.9	6 51	1 6	21	5.32	5.17
21	7 2 32	23 48	104 17.3	1 7.6	6	1 7	22		5.18
22	7 7 52	23 41	105 30.8	1 9.4	6 54	1 9	24	5.34	5.19
23	7 13 11	23 34	106 44.2	1 11.1	6 55	1 10	7 25	5.36	5.21
24	7 18 30	23 27	107	1 12.8	6 56	1 11	26	5.37	5.22
25	7 23 47	23 18	109 11.1	1 14.3	6 58	1 13	28	5.38	5.23
26	7 29 4	23 9	110 24.6	1 15.9	6 59	1 14	29	5.39	5.24
27	7 34 21	22 59	111 38.0	1 17.3	1	1	29	5.40	5.25
28	7 39 36	22 48	112 51.4	1 18.7	3	1 17	31	41	5.26
29	7 44 49	22 37	114 4.7	1 20.0	4	1 18	32	42	
30	7 50 5	N.22 26	115 18.1	N.1 21.4		1 19	33	5.43	5.28

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## VENUS.

## TRIVANDRUM.

Date. July	MEAN NOON.				MEAN TIME.				
	Right Ascension.	Declina- tion.	Longitude.	Latitude.	Rising.	Meridian passage.	Setting.	Hor. Par.	Semidia- meter.
	<i>h. m. s.</i>	<i>°</i>	<i>°</i>	<i>°</i>	<i>h. m.</i> <i>A. M.</i>	<i>h. m.</i> <i>P. M.</i>	<i>h. m.</i> <i>P. M.</i>	<i>"</i>	<i>"</i>
1	7 55 17	N. 22 13	116 31.4	N. 1 22.7	7 7	1 21	7 35	5.44	5.29
2	8 0 28	22 0	117 44.8	1 23.9	8	1 22	7 36	5.46	5.31
3	8 5 39	21 46	118 58.1	1 25.0	9	1 23	7 37	5.47	5.32
4	8 10 48	21 31	120 11.5	1 26.1	7 11	1 24	7 37	5.48	5.33
5	8 15 56	21 16	121 24.7	1 27.1	7 12	1 25	38	5.50	5.35
6	8 21 2	21 0	122 38.0	1 28.1	7 14	1 27	7 40	5.51	5.36
7	8 26 9	20 44	123 51.3	1 28.9	7 15	1 28	7 41	5.52	5.37
8	8 31 13	20 28	125 4.6	1 29.8	7 16	1 29	42	5.54	5.38
9	8 36 16	20 11	126 17.8	1 30.6	7 17	1 30	43	5.55	5.39
10	8 41 19	19 52	127 31.1	1 31.3	7 19	1 31	7 43	5.56	5.40
11	8 46 20	19 34	128 44.3	1 31.9	7 20	1 32	44	5.58	5.42
12	8 51 20	19 15	129 57.5	1 32.5	7 21	1 33	45	5.59	5.43
13	8 56 18	18 55	131 10.7	1 32.9	7 22	1 34	7 46	5.61	5.45
14	9 1 15	18 35	132 23.9	1 33.4	7 24	1 35	7 46	5.62	5.46
15	9 6 12	18 14	133 37.1	1 33.7	7 25	1 36	7 47	5.64	5.48
16	9 11 7	17 53	134 50.3	1 34.0	7 26	1 37	7 48	5.65	5.49
17	9 16 0	17 32	136 3.5	1 34.2	7 27	1 38	7 49	5.67	5.51
18	9 20 52	17 10	137 16.7	1 34.4	7 28	1 39	7 50	5.69	5.53
19	9 25 43	16 48	138 29.8	1 34.4	30	1 40	7 50	5.70	5.54
20	9 30 33	16 25	139 42.9	1 34.5	7 31	1 41	7 51	5.72	5.56
21	9 35 21	16 1	140 56.0	1 34.4	7 32	1 42	52	5.74	5.58
22	9 40 8	15 37	142 9.1	1 34.2	7 33	1 43	53	5.75	5.59
23	9 44 54	15 13	143 22.1	1 34.0	7 33	1 43	7 53	5.77	5.61
24	9 49 40	14 48	144 35.2	1 33.7	7 35	1 44	53	5.79	5.63
25	9 54 23	14 23	145 48.2	1 33.4	7 36	1 45	7 54	5.81	5.65
26	9 59 5	13 58	147 1.3	1 33.0	7 38	1 46	7 54	5.83	5.67
27	10 3 46	13 33	148 14.2	1 32.4	7 38	1 46	54	5.85	5.69
28	10 8 27	13 7	149 27.2	1 31.8	7 39	1 47	7 55	5.87	5.71
29	10 13 6	12 40	150 40.1	1 31.1	7 41	1 48	7	5.88	
30	10 17 43	12 14	151 53.1	1 30.4	7 41	1 48	7 55	5.90	5.73
31	10 22 19	N. 11 46	153 6.0	N. 1 29.7	7 42	1 49	56	5.92	5.75

## VENUS

1917  
1032-93

## TRIVANDRUM.

Date.	MEAN NOON.				MEAN TIME.				
	Right Ascension.	Declina- tion.	Longitude.	Latitude	Rising.	Meridian Passage.	Setting.	Hor. Par.	Semidia- meter.
Aug.	<i>h</i>				<i>h</i>	<i>h</i>	<i>h</i>	<i>h</i>	
1	10 26 55	N. 11 19	154 15.9	N. 1 28.8	A. M. 7 43	P. M. 1 50	P. M. 7 57	5.95	5.78
2	10 31 31	10 51	155 31.7	1 27.8	48	1 50	7 57	5.97	5.80
3	10 36 4	10 23	156 44.5	1 26.8	7 45	1 51		5.99	5.82
4	10 40 36	9 55	157 57.3	1 25.7	7 46	1	55	6.01	5.84
5	10 45 8	9 27	159 10.1	1 24.5	7 46	1	7 58	6.03	5.86
6	10 49 39	8 58	160 22.9	1 23.3	7 48	1 53	58	6.05	5.88
	10 54 10	8 29	161 35.9	1 22.0	48	1 53	7 58	6.07	5.90
8	10 58 39	8 0	162 48.4	1 20.6	49	1 54	7 59	6.10	5.93
9	11 3 58	7 30	164 1.1	1 19.1	7 49	1 54	59	6.12	5.95
10	11 35	7 1	165 13.8	1 17.6	7 51	1	7 59	6.14	5.97
11	11 12 2	6 31	166 26.5	1 16.0		1 55	7 59	6.17	6.00
12	11 16 29	6 1	167 39.1	1 14.4		1 56	8 0	6.19	6.02
13	11 20 54	5 31	168 51.7	1 12.6	52	1 56	8 0	6.21	6.04
14	11 25 20	1	170 4.3	1 10.8	7 54	1 57	8 0	6.24	6.07
15	11 29 45	4 31	171 16.9	1 8.9	7 54	1 57	8 0	6.26	6.08
16	11 34 9	4 1	172 29.4	1 6.9	7 56	1 58	8 0	6.29	6.11
17	11 38 23	3 30	173 41.9	1 4.9	7 56	1 58	8 0	6.32	6.14
18	11 42 56	3 0	174 54.4	1 2.8	7 57	1 59	8 1	6.34	6.16
19	11 47 19	2 29	176 6.9	1 0.6	7 57	1 59	8 1	6.37	6.19
20	11 51 41	1 58	177 19.3	0 58.5	7 59	2 0	8 1	6.39	6.21
21	11 56 3	1 27	178 31.7	0 56.2	7 59	0	8 1	6.42	6.24
22	12 0 25	0 56	179 44.0	0 53.9	7 59	0	8 1	6.45	6.27
23	12 4 47	N. 0 25	180 56.4	0 51.5	8 1	2 1	8 1	6.48	6.30
24	12 9 8	S. 0 6	182 8.7	0 49.0	8 1	1	8 1	6.51	6.33
25	12 12 30	0 37	183 21.0	0 46.5	8 2		8	6.53	6.35
26	12 17 51	1 8	184 33.3	0 43.9	8 2	2	8 2	6.56	6.38
27	12 22 12	1 33	185 45.6	0 41.2	8 4	2 3	8 2	6.59	6.41
28	12 26 33	2 10	186 57.7	0 38.6	8 4	2 3	8	6.62	6.43
29	12 30 54	2 41	188 9.9	0 35.9	8 4	2 3	8 2	6.65	6.46
30	12 35 15	3 12	189 22.0	0 33.1	8 6	2 4	8 2	6.68	6.49
31	12 39 36	S. 3 43	190 34.1	N, 0 30.2	8 6	2 4	8 2	6.72	6.53

## VENUS

1917  
1093

## TRIVANDRUM.

Date. Sept.	MEAN NOON.				MEAN TIME.				
	Right Ascension.	Declina- tion.	Longitude.	Latitude.	Rising	Meridian passage.	Setting.	Hor. par.	Semidia- meter.
	<i>h</i>				<i>h m</i> A. M.	<i>h m</i> P. M.	<i>h m</i> P. M.		
1	12 43 58	4 14	191 46.1	N 0 27.5	8 8	2 5	8 2	6.75	6.56
2	12 45 19	4 45	192 58.1	0 24.4	8 8	2	8 2	6.78	6.59
3	12 52 31	5 15	194 10.0	0 21.4	8 8	2	8 2	6.81	6.62
4	12 57 3	5 46	195 22.0	0 18.3	8 10	6	8 2	6.85	6.66
5	13 1 25	6 17	196 33.9	0 15.3	8 10	6	8 2	6.88	6.69
6	13 5 47	6 47	197 45.5	0 12.2	8 11	2	3	6.91	6.72
7	13 10 10	7 18	198 57.6	0 9.0	8 11	2	8 3	6.95	6.76
8	13 14 24	7 48	200 9.4	0 5.8	8 13	2 8	8 3	6.98	6.78
9	13 18 57	8 18	201 21.1	N 0 2.6	8 13	2 8	8 3	7.02	6.82
10	13 23 21	8 47	202 32.8	S 0 2.1	8 15	9	8 3	7.05	6.85
11	13 27 46	9 17	203 44.4	0 4.0	8 15	2 9	8 3	7.09	6.89
12	13 32 11	9 46	204 56.1	0 7.3	8 15	2 9	8	7.13	6.93
13	13 37	10 16	206 7.6	0 10.7	8 16	2 10	8 4	7.17	6.97
14	13 41 1	10 45	207 19.2	0 14.1	8 16	2 10	8 4	7.20	7.00
15	13 45 30	11 13	208 30.7	0 17.5	8 18	2 11	8 4	7.24	7.04
16	13 49 55	11 42	209 42.2	0 21.0	8 18	2 11	8 4	7.28	7.08
17	13 54 27	12 10	210 53.6	0 24.4	8 19	2 12	8	7.32	7.12
18	13 58	12	212 5.0	0 27.9	8 21	2 13	8	7.36	7.15
19	14	13	213 16.3	0 31.4	8 21	2 13	8	7.40	7.19
20	14	13 33	214 27.8	0 34.9	8 22	2 14	8 6	7.45	7.24
21	14 12	14 1	215 39.0	0 38.4	8 22	2 14	8 6	7.49	7.28
	14 17 1	14	216 50.2	0 42.0	8 24	2 15	8 6	7.53	7.32
23	14 21 34	14 54	218 1.3	0 45.5	8 25	2 16	8	7.58	7.37
	14	15 20	219 12.4	0 49.1	8 25	2 16	8	7.62	7.41
	14 30 43	15 46	220 23.4	0 52.6	8 27	2 17	8 7	7.67	7.45
	14 35 1	16 12	221 34.4	0 56.2	8 27	2 17	8 7	7.71	7.49
	14 56	16 38	222 45.3	0 59.8	8 28	2 18	8 8	7.76	7.54
	14 44 34	17	223 56.2	1 3.4	8 30	2 19	8 8	7.80	7.58
29	14 49 13	17 27	7.0	1 6.9	8 31	2 20	8 9	7.85	7.63
30	14 51	17 51	17.8	S 1 10.5	8 31	2 20	8 9	7.90	7.68

## VENUS

1917  
1093

## TRIVANDRUM.

Day.	MEAN NOON.				MEAN TIME.				
	Right Ascension.	Declina- tion.	Longitude.	Latitude.	Rising.	Meridian passage.	Setting.	Hor. Par.	Semidia- meter.
	<i>h</i>	<i>°</i>	<i>°</i>		<i>h m</i>	<i>h. m.</i>	<i>h. m.</i>		
					<i>A. M.</i>	<i>P. M.</i>	<i>P. M.</i>		
1	14 58 32	S. 18 14	227 28.4	S. 1 14.0	8 32	2 21	8 10	7.95	7.73
2	15 3 14	18 37	228 39.1	1 17.6	8 34	2 22	8 10	8.00	7.78
3	15 7 57	19 0	229 49.6	1 21.1	8 34	2 22	8 10	8.05	7.82
4	15 12 41	19 22	231 0.1	1 24.6	8 35	23	8 11	8.10	7.87
	15 17 24	19 44	232 10.6	1 28.0	8 36	24	8 12	8.15	7.92
6	15 22 10	20 6	233 21.0	1 31.5	8 38	25	8 12	8.21	7.98
7	15 26 57	20 27	234 31.2	1 34.9	8 39	2 26	8 13	8.26	8.03
8	15 31 46	20 47	235 41.5	1 38.4	8 40	27	8 14	8.31	8.08
9	15 36 33	21 7	236 51.6	1 41.7	8 40	27	8 14	8.37	8.14
10	15 41 22	21 26	238 1.7	1 45.1	8 41	2 28	8 15	8.43	8.19
11	15 46 12	21 45	239 11.8	1 48.4	8 43	2 29	8 15	8.48	8.24
12	15 51 4	22 3	240 21.7	1 51.7	8 44	2 30	8 16	8.54	8.30
13	15 55 56	21	241 31.6	1 54.9	8 45	2 31	8 17	8.60	8.36
14	16 0 50	22 38	242 41.4	1 58.1	8 46	2 32	8 18	8.66	8.42
15	16 5 43	22 55	243 51.1	2 1.2	8 47	2 33	8 19	8.72	8.48
16	16 10 38	23 11	245 0.8	4.4	8 49	34	8 19	8.78	8.53
17	16 15 33	23 27	246 10.6	2 7.5	8 50	35	8 20	8.85	8.60
18	16 20 29	23 41	247 19.8	2 10.5	8 51	36	8 21	8.91	8.66
19	16 25 26	23 55	248 29.2	2 13.4	8 52	37	8 22	8.98	8.73
20	16 30 23	24 9	249 38.5	2 16.3	8 53	38	8 23	9.04	8. 9
21	16 35 22	24 22	250 47.6	2 19.1	8 55	2 39	8 23	9.11	8.85
22	16 40 24	24 34	251 56.7	2 21.9	8 56	40	8 24	9.18	8.92
23	16 45 20	24 46	253 5.7	2 24.6	8 57	41	8 25	9.25	8.99
24	16 50 20	24 58	254 14.7	2 27.3	8 58	42	8 26	9.32	9.06
25	16 55 24	8	254	2 29.8	8 59	43	8 27	9.39	9.13
26	17 0 20	25 18	256 32.2	2 32.3	9 0	44	8 28	9.47	9.20
27	17 5 21	25 27	10.6	2 34.7	9 1	2 45	8 29	9.54	9.27
28	17 10 22	35	258 49.0	2 37.1	9 2	2 46	8 30	9.62	9.35
29	17 15 23	43	259 57.2	2 39.3	9 5	2 48	8 31	9.70	9.43
30	17 20 23	51	261 5.4	2 41.5	9 6	49	8 32	9.78	9.51
31	17 25 24	S. 25	262 13.4	S. 2 43.6	9 7	2 50	8 33	9.86	9.58

## VENUS.

TRIVANDRUM.

Date.	MEAN NOON.				MEAN TIME.				
	Right Ascension.	Declin- ation.	Longitude.	Latitude.	Rising.	Meridian Passage	Setting.	Hor. Par.	Semidi- meter.
Nov.	<i>h m s</i>	<i>°</i>	<i>°</i>	<i>°</i>	<i>h m</i> <i>A M</i>	<i>h m</i> <i>P M</i>	<i>h m</i> <i>P M</i>	<i>"</i>	<i>"</i>
1	17 30 25	S. 26 3	263 21	S 2 45.6	9 8	2 51	8 31	9.91	9.66
2	17 35 26	26 7	261 29 0	47.4	9 9	52	8 35	10.02	9.74
3	17 0 26	26 12	265 26 7	49.3	9 10	2 53	8 36	10.11	9.83
4	17 45 26	26 15	266 44.0	51.0	9 11	54	8 37	10.19	9.90
	17 50 25	26 18	267 51.3	52.7	9 12	55	8 38	10.28	9.99
6	17 55 24	26 21	268 55 4	54.1	9 13	2 56	8 39	10.37	10.08
7	18 0 23	26 23	270 5.5	55.5	9 14	57	8 40	10.46	10.17
8	18 5 20	26 24	271 12.2	2 56.8	9 15	58	8 41	10.55	10.25
9	18 10 18	26 24	272 18.9	2 58.1	9 16	2 59	8 42	10.65	10.35
10	18 15 15	26 23	273 25.2	59.0	9 17	3 0	8 43	10.75	10.45
11	18 20 11	26 22	274 31.6	3 0.0	9 18	3 1	8 44	10.84	10.51
12	18 25 5	26 20	275 37.6	3 0.8	9 19	3	8 45	10.94	10.63
13	18 29 59	26 18	276 43.6	3 1.6	9 20	3 3	8 46	11.05	10.74
14	18 34 51	26 15	277 49.2	3 2.0	9 21	3 4	8 47	11.15	10.84
15	18 39 42	26 11	278 54.8	2.5	9 22	3 5	8 48	11.26	10.94
16	18 44 32	26 7	280 0.0	3 2.8	9 23	3 6	8 49	11.37	11.05
17	18 49 20	26 1	281 5.1	3 3.0	9 24	3 7	8 50	11.48	11.16
18	18 54 6	25 56	282 9.8	3 3.0	9 24	3 7	8 50	11.59	11.27
19	18 58 52	25 49	283 14.4	3 2.9	9 25	3 8	8 51	11.71	11.38
20	19 3 35	25 42	284 18.6	3 2.7	9 26	3 9	8 52	11.82	11.49
21	19 5 17	35	285 22.7	3 2.3	9 26	10	8 54	11.94	11.61
22	19 12 57	27	286 26.3	3 1.7	9 26	3 10	8 54	12.07	11.73
23	19 17 35	25 18	287 29.9	3 1.0	9 27	3 11	8 55	12.19	11.85
24	19 22 11	8	288 33.0	3 0.1	9 28	3 12	8 56	12.32	11.98
	19 26 44	24 58	289 36.0	59.1	9 28	3 12	8 56	12.45	12.10
26	19 31 16	24 47	290 38.4	2 57.9	9 29	3 13	8 57	12.59	12.24
	19 35 45	24 36	291 40.7	2 56.6	9 29	3 13	8 57	12.72	12.36
			292 42.4	2 55.1	9 29	3 14	8 59	12.86	12.50
28	19 40 12	24	293 44.0	2 53.4	9 29	3 14	8 59	13.01	12.65
29	19 44 35	24 13	294 44.9	S 2 51.5	9 30	3 15	9 0	13.15	12.78
30	19 48 58	S 24 0							

## VENUS.

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## TRIVANDRUM.

Day. Ecc.	MEAN NOON.				MEAN TIME.				
	Right Ascension.	Declination.	Longitude.	Latitude.	Rising.	Meridian passage.	Setting.	Hor Par.	Semidi meter.
	<i>h</i> <i>s</i>				<i>h</i> <i>m</i> A.    M.	<i>h</i> <i>m</i> P.    M.	<i>h</i> <i>m</i> P.    M.		
1	19 53 16	S 23 47	295 45.8	S 2 49.5	9 30	3 15	9 0	13.30	12.93
2	19 57 33	23 33	296 46.0	2 47.3	9 30	3 15	9 0	13.45	13.07
3	20 1 36	23 19	297 46.0	2 45.0	9 31	3 16	9 1	13.61	13.23
4	20 5 57	23 4	298 44.2	2 42.4	9 31	3 16	9 1	13.77	13.38
	20 10	22 49	299 44.9	2 39.6	9 30	3 16	9 2	13.93	13.54
6	20 14 9	22 33	300 43.0	2 36.6	9 30	3 16	9 2	14.10	13.71
	20 18 11	22 17	301 41.0	2 33.5	9 30	3 16	9 2	14.27	13.87
8	20 22 11	22 1	302 38.7	2 30.0	9 30	3 16	9 2	14.44	14.04
9	20 26 5	21 44	303 36.0	2 26.5	9 30	16	9 2	14.62	14.21
10	20 29 58	21 27	304 32.3	2 22.7	9 29	16	9 3	14.81	14.40
11	20 33 47	21 9	305 28.5	2 18.7	9 29	3 16	9 3	14.99	14.57
12	20 37 22	20 51	306 23.7	2 14.5	9 29	3 16	9 3	15.18	14.75
13	20 41 14	20 33	307 18.8	2 10.1	9 29	3 16	9 3	15.38	14.95
14	20 44 52	20 14	308 12.8	2 4	9 27	3 15	9 3	15.58	15.14
15	20 48 27	19 55	309 6.6	0.5	9 27	3 15	9 3	15.79	15.35
16	20 51 56	19 36	309 59.3	1 55.4	9 26	3 14	9 2	16.00	15.55
17	20 55 23	19 17	310 51.7	1 50.1	9 26	3 14	9 2	16.22	15.77
18	20 58 47	18 57	311 42.9	1 44.5	9	3 13	9 1	16.44	15.98
19	21 2 6	18 37	312 33.9	1 38.7	9 25	3 13	9 1	16.66	16.19
20	21 5 26	18 17	313 23.6	1 32.6	9 23	3 12	9 1	16.90	16.43
21	21 8 29	17 57	314 12.9	1 26.3	9 22	3 11	9 0	17.13	16.68
22	21 11 35	17 36	315 0.7	1 19.7	9 21	3 10	8 59	17.38	16.89
23	21 14 36	17 16	315 48.3	1 12.9	9 20	3 9	8 58	17.63	17.14
24	21 17 32	16 55	316 34.4	1 5.8	9 18	3 8	8 58	17.88	17.38
25	21 20 24	16 34	317 20.1	0 58.5	9 17	3 7	8 57	18.15	17.64
26	21 23 9	16 13	318 4.1	0 50.9	9 16	3 6	8 56	18.42	17.90
27	21 25 51	15 52	318 47.7	0 43.0	9 15	3 5	8 55	18.69	18.17
28	21 28 25	15 31	319 29.5	0 41.8	9 13	3 3	8 53	18.97	18.44
29	21 30 57	15 10	320 10.8	0 26.4	9 11	3 2	8 53	19.26	18.72
30	21 33 21	14 49	320 50.2	0 17.6	9 9	3 0	8 51	19.56	19.01
31	21 35 43	S 14 29	321 29.2	S 0 8.7	9 8	2 59	8 50	19.86	19.30

## MARS.

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## TRIVANDRUM.

Date. January.	MEAN NOON.				MEAN TIME.				
	Right ascension.	Decli- nation.	Longitude.	Latitude.	Rising.	Meridian passage.	Setting.	Hor Par.	Semidia- meter.
	<i>h</i> <i>s</i>			<i>°</i>	<i>h</i> <i>m</i> A. M.	<i>h</i> <i>m</i> P. M.	<i>h</i> <i>m</i> P. M.		
1	19 42 26	S. 22 27	293 33.4	S 13.9	7 15	1 1	6 47	3 76	2.16
	19 45 45	22 19	294 20.3	1 4.0	7 15	1 0	6 46	3.76	2.16
3	19 49 4	22 11	295 7.1	1 4.1	7 14	1 0	6 46	3.76	2.16
4	19 52 23	22 2	295 54.0	1 4.2	7 14	0 59	6 45	3.76	2.16
	19 55 46	21 53	296 40.9	1 4.4	7 13	0 58	6 44	3.76	2.16
	19 59 0	21 44	297 27.8	1 4.5	12	0 58	6 44	3.76	2.16
	20 2 18	21 35	298 14.8	1 4.6	7 12	0 57	6 43	3.75	2.15
5	20 5 36	21 25	299 1.8	1 4.7	7 11	0 56	6 43	3.75	2.15
9	20 8 53	21 15	299 48.8	1 4.8	7 9	0 56	6 43	3.75	2.15
10	20 12 10	21 5	300 35.8	1 4.8	9	0 55	6 42	3.75	2.15
11	20 15 27	20 55	301 22.9	1 4.9	8	0 54	6 41	3.75	2.15
12	20 18 43	20 44	302 9.9	1 5.0	7	0 54	6 41	3.75	2.15
13	20 22 0	20 34	302 57.1	1 5.1	7	0 53	6 40	3.75	2.15
14	20 25 16	20 23	303 44.2	1 5.1	7 6	0	6 39	3.75	2.15
15	20 28 31	20 11	304 31.4	1 5.2	7 5	0 52	6 39	3.75	2.15
16	20 31 46	20 0	305 18.6	1 5.2	7 5	0 51	6 38	3.74	2.15
17	20 35 0	19 49	306 5.8	1 5.3	4	0 50	6 38	3.74	2.15
18	20 38 15	19 37	306 53.0	1 5.3	7 2	0 50	6 38	3.74	2.15
19	20 41 19	19 25	307 40.3	1 5.3	2	0 49	6 37	3.74	2.15
20	20 44 43	19 13	308 27.5	1 5.3	7 1	0 48	6 36	3.74	2.15
21	20 47 56	19 1	309 14.8	1 5.3	7 0	0 47	6 35	3.74	2.15
	20 51 9	18 48	310 2.1	1 5.3	6 59	0 47	6 35	3.74	2.15
23	20 54 21	18 35	310 49.5	1 5.3	6 59	3 46	6 34	3.74	2.15
24	20 57 32	18 22	311 36.8	1 5.3	6 58	0 45	6 34	3.74	2.15
25	21 0 44	18 8	312 24.2	1 5.3	6 56	0 44	6 33	3.73	2.14
26	21 3 55	17 55	313 11.5	1 5.3	6 55	0 44	6 33	3.73	2.14
27	21 5	17 41	313 58.9	1 5.2	6 55	0 43	6 32	3.73	2.14
28	21 10 15	17 27	314 46.3	1 5.2	6 54	0 42	6 31	3.73	2.14
29	21 13 25	17 13	315 33.7	1 5.2	6 53	0 41	6 30	3.73	2.14
30	21 16 34	16 59	316 21.1	1 5.1	6 52	0 41	6 30	3.73	2.14

## MARS.

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## TRIVANDRUM.

Date. Feb.	MEAN NOON.				MEAN TIME.					
	Right ascension.	Declina- tion.	Longitude	Latitude.	Rising.	Meridian passage.	Setting.	Hor. Par.	Semidia- meter.	
	<i>h m s</i>		°		<i>h m</i> A. M.	<i>h m</i> P. M.	<i>h m</i> P. M.	'	'	
1	21 22 50	S 16 30	317 55.9	S 1 5.0	6 50	0 39	6 29	3.73	2.14	
2	21 25 58	16 15	318 43.3	1 4.9	6 49	0 38	6 28	3.73	2.14	
3	21 29 6	16 0	319 30.7	1 4.8	6 48	0 37	6 27	3.73	2.14	
4	21 32 12	15 45	320 18.2	1 4.7	6 47	0 37	6 27	3.73	2.14	
5	21 35 19	15 30	321 5.6	1 4.6	6 47	0 36	6 26	3.72	2.14	
6	21 38 26	15 14	321 53.1	1 4.5	6 46	0 35	6 26	3.72	2.14	
7	21 41 31	14 59	322 40.5	1 4.4	6 44	0 34	6 25	3.72	2.14	
8	21 44 36	14 43	323 27.9	1 4.3	6 43	0 33	6 24	3.72	2.14	
9	21 47 41	14 27	324 15.3	1 4.2	6 42	0 32	6 23	3.72	2.14	
10	21 50 45	14 11	325 2.8	1 4.1	6 41	0 31	6 22	3.72	2.14	
11	21 53 49	13 55	325 50.2	1 4.0	6 40	0 31	6 22	3.72	2.14	
12	21 56 53	13 38	326 37.7	1 3.8	6 40	0 30	6 22	3.72	2.14	
13	21 59 56	13 22	327 25.1	1 3.7	6 38	0 29	6 21	3.72	2.14	
14	22 2 58	13 6	328 12.6	1 3.5	6 37	0 28	6 20	3.72	2.14	
15	22 6 0	12 49	329 0.0	1 3.3	6 36	0 27	6 19	3.72	2.14	
16	22 9 2	12 33	329 47.5	1 3.1	6 35	0 26	6 18	3.72	2.14	
17	22 12 4	12 16	330 34.9	1 3.0	6 34	0 25	6 17	3.72	2.14	
18	22 15 5	11 59	331 22.4	1 2.8	6 33	0 24	6 17	3.71	2.13	
19	22 18 6	11 42	332 9.8	1 2.6	6 31	0 23	6 16	3.71	2.13	
20	22 21 6	11 24	332 57.2	1 2.4	6 30	0 22	6 15	3.71	2.13	
21	22 24 6	11 7	333 44.6	1 2.2	6 29	0 21	6 14	3.71	2.13	
22	22 27 5	10 49	334 32.0	1 1.9	6 28	0 20	6 13	3.71	2.13	
23	22 30 4	10 32	335 19.4	1 1.7	6 27	0 19	6 13	3.71	2.13	
24	22 33 3	10 14	336 6.8	1 1.5	6 25	0 18	6 12	3.71	2.13	
25	22 36 1	9 56	336 54.2	1 1.3	6 24	0 18	6 12	3.71	2.13	
26	22 38 59	9 38	337 41.6	1 1.0	6 24	0 17	6 11	3.71	2.13	
27	22 41 57	9 20	338 28.9	1 0.8	6 23	0 16	6 10	3.71	2.13	
28	22 44 54	S 9 2	339 16.2	S 1 0.5	6 22	0 15	6 10	3.71	2.13	

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## MARS

## TRIVANDRUM.

Date.	MEAN NOON.				MEAN TIME.				
	Right Ascension.	Declination.	Longitude.	Latitude.	Rising.	Meridian Passage.	Setting.	Hor. Par.	Semidia- meter.
March	<i>h. m. s</i>		<i>°</i>	<i>°</i>	<i>h. m.</i>	<i>h m</i>	<i>h m</i>		<i>"</i>
1	22 47 51	S. 8 44	340 3.5	S. 1 0.3	6 20 A. M.	0 14 P. M.	6 9 P. M.	3.71	2.13
2	22 50 49	8 26	340 50.8	1 0.0	6 19	0 13	6 8	3.71	2.13
3	22 53 45	8 8	341 38.1	0 59.8	6 18	0 12	6 7	3.71	2.13
4	22 56 40	7 49	342 25.4	0 59.5	6 17	0 11	6 6	3.71	2.18
5	22 59 36	7 31	343 12.6	0 59.3	6 16	0 10	6 5	3.71	2.13
6	23 2 32	7 13	343 59.8	0 59.0	6 15	0 9	6 5	3.70	2.12
7	23 5 26	6 54	344 47.0	0 58.7	6 13	0 7	6 3	3.70	2.12
8	23 8 21	6 36	345 34.2	0 58.4	6 11	0 6	6 2	3.70	2.12
9	23 11 15	6 17	346 21.3	0 58.1	6 10	0 5	6 1	3.70	2.12
10	23 14 10	5 58	347 8.5	0 57.8	6 9	0 4	6 0	3.70	2.12
11	23 17 3	5 40	347 55.6	0 57.5	6 8	0 3	6 0	3.70	2.12
12	23 19 57	5 21	348 42.7	0 57.1	6 6	0 2	5 59	3.70	2.12
13	23 22 50	5 2	349 29.8	0 56.8	6 5	0 1	5 58	3.70	2.12
14	23 25 43	4 43	350 16.9	0 56.4	6 4	Noon A. M.	5 56	3.70	2.12
15	23 28 36	4 24	351 3.9	0 56.1	6 3	11 59	5 55	3.70	2.12
16	23 31 29	4 5	351 50.9	0 55.7	6 1	11 58	5 54	3.70	2.12
17	23 34 21	3 47	352 37.9	0 55.4	5 59	11 57	5 53	3.70	2.12
18	23 37 14	3 28	353 24.9	0 55.0	5 58	11 56	5 52	3.70	2.12
19	23 40 6	3 9	354 11.8	0 54.6	5 57	11 55	5 51	3.70	2.12
20	23 42 57	2 50	354 58.8	0 54.2	5 56	11 54	5 50	3.70	2.12
21	23 45 50	2 31	355 45.6	0 53.9	5 55	11 53	5 50	3.70	2.12
22	23 48 42	2 12	356 32.5	0 53.5	5 54	11 52	5 48	3.70	2.12
23	23 51 33	1 53	357 19.3	0 53.1	5 52	11 51	5 47	3.70	2.12
24	23 54 24	1 34	358 6.1	0 52.7	5 50	11 49	5 46	3.70	2.12
25	23 57 15	1 15	358 52.8	0 52.3	5 49	11 48	5 45	3.70	2.12
26	0 0 6	C 56	359 39.6	0 51.9	5 48	11 47	5 45	3.70	2.12
27	0 2 57	0 37	0 26.3	0 51.5	5 47	11 46	5 45	3.70	2.12
28	0 5 47	S. 0 18	1 13.0	0 51.0	5 45	11 45	5 44	3.70	2.12
29	0 8 37	N. 0 1	1 59.6	0 50.6	5 44	11 44	5 43	3.70	2.12
30	0 11 28	0 20	2 46.2	0 50.2	5 43	11 43	5 42	3.70	2.12
31	0 14 18	N. 0 39	3 32.8	S. 0 49.8	5 42	11 42	5 41	3.70	2.12

## MARS.

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## TRIVANDRUM.

Date.	MEAN NOON.				MEAN TIME.				
	Right Ascension.	Declina- tion.	Longitude.	Latitude.	Rising.	Meridian passage.	Setting.	Hor. Par.	Semidia- meter.
April	h m s	° ′	° ′	° ′	h m A M	h m A M	h m P. M.	″	″
1	0 17 8	N 0 58	4 19.4	S. 0 49.3	5 41	11 41	5 41	3.70	2.12
2	0 19 58	1 16	5 5.8	0 48.9	5 39	11 40	5 39	3.70	2.12
3	0 22 48	1 35	5 52.3	0 48.4	5 37	11 38	38	3.70	2.12
4	0 25 38	1 54	6 38.6	0 48.0	5 36	11 37	5 37	3.70	2.12
5	0 28 27	2 13	7 25.0	0 47.5	5 35	11 36	5 36	3.70	2.12
6	0 31 17	2 31	8 11.3	0 47.0	5 34	11 35	35	3.70	2.12
7	0 34 7	2 50	8 57.7	0 46.5	5 33	11 34	5 35	3.70	2.12
8	0 36 56	3 9	9 43.9	0 46.1	5 31	11 33	5 34	3.70	2.12
9	0 39 46	3 27	10 30.1	0 45.6	5 30	11 32	5 33	3.70	2.12
10	0 42 35	3 46	11 16.2	0 45.1	5 29	11 31	5 31	3.70	2.12
11	0 45 2	4 4	12 2.4	0 44.6	5 27	11 29	5 30	3.70	2.12
12	0 48 14	4 23	12 48.5	0 44.1	5 26	11 28	5 30	3.70	2.12
13	0 51 4	4 41	13 34.6	0 43.6	5 24	11 27	5 29	3.70	2.12
14	0 53 53	4 59	14 20.7	0 43.1	5 23	11 26	5 28	3.70	2.12
15	0 56 43	5 18	15 6.7	0 42.6	5 22	11 25	27	3.70	2.12
16	0 59 32	5 36	15 52.6	0 42.1	5 21	11 24	5 26	3.70	2.12
17	1 2 22	5 54	16 38.5	0 41.6	5 20	11 23	5 25	3.70	2.12
18	1 5 12	6 12	17 24.3	0 41.1	5 19	11 22	5 25	3.70	2.12
19	1 8 1	6 30	17 10.2	0 40.5	5 17	11 21	5 23	3.70	2.12
20	1 10 51	6 48	18 55.9	0 40.0	5 16	11 19	5 22	3.70	2.12
21	1 13 41	7 5	19 41.6	0 39.4	5 14	11 18	5 21	3.70	2.12
22	1 16 31	7 23	20 27.3	0 38.9	5 13	11 17	5 20	3.70	2.12
23	1 19 21	7 41	21 13.0	0 38.4	5 12	11 16	5 20	3.70	2.12
24	1 22 11	7 58	21 58.6	0 37.9	5 10	11 15	5 19	3.70	2.12
25	1 25 1	8 16	22 44.2	0 37.3	5 9	11 14	5 18	3.70	2.12
26	1 27 51	8 33	23 29.6	0 36.8	5 8	11 13	5 17	3.70	2.12
27	1 30 41	8 50	24 15.1	0 36.2	5 7	11 12	16	3.70	2.12
28	1 33 31		25 0.4	0 35.6	5 6	11 11	5 14	3.70	2.12
29	1 36 21	9 24	25 45.8	0 35.0	5 4	11 9	5 14	3.70	2.12
30	1 39 12	9 41	26 31.0	S 0 34.5	5 2	11 8	5 13	3.70	2.12

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## MARS.

Date		TRIVANDRUM.									
May.		MEAN NOON.				MEAN TIME.					
		Right Ascension.	Declina- tion.	Longitude.	Latitude.	Rising.	Meridian Passage	Setting.	Hor Par.	Semidia- meter.	
		<i>h m s</i>	<i>°</i>	<i>°</i>	<i>°</i>	<i>h m</i> A M	<i>h m</i> A. M.	<i>h m</i> P. M.	<i>'</i>	<i>°</i>	
1		1 42 2	N. 9 58	27 16.3	S 0 33.9	5 1	11 7	5 13	3.70	2.12	
2		1 44 53	10 15	28 1.5	0 33.4	5 0	11 6	5 12	3.70	2.12	
3		1 47 44	10 32	28 46.7	0 32.8	4 59	11 5	5 11	3.70	2.12	
4		1 50 33	10 48	29 31.7	0 32.2	4 58	11 4	5 10	3.70	2.12	
5		1 53 26	11 5	30 16.8	0 31.6	4 57	11 3	5 9	3.70	2.12	
6		1 56 17	11 21	31 1.8	0 31.0	4 55	11 2	5 9	3.70	2.12	
7		1 59 18	11 37	31 46.8	0 30.4	4 54	11 1	5 8	3.70	2.12	
8		2 1 59	11 52	32 31.6	0 29.8	4 53	11 0	5 7	3.70	2.12	
9		2 4 51	12 9	33 16.5	0 29.2	4 52	10 59	5 6	3.70	2.12	
10		2 7 42	12 25	34 1.2	0 28.6	4 50	10 57	5 4	3.71	2.13	
11		2 10 33	12 41	34 46.0	0 28.0	4 49	10 56	5 3	3.71	2.13	
12		2 13 26	12 56	35 30.6	0 27.4	4 47	10 55	5 3	3.71	2.13	
13		2 16 18	13 11	36 15.3	0 26.8	4 46	10 54	5 2	3.71	2.13	
		2 19 10	13 27	36 59.9	0 26.2	4 45	10 53	5 1	3.71	2.13	
15		2 22 3	13 42	37 44.5	0 25.6	4 44	10 52	5 0	3.71	2.13	
16		2 24 55	13 57	38 28.9	0 25.0	4 43	10 51	4 59	3.71	2.13	
17		2 27 48	14 11	39 13.4	0 24.3	4 42	10 50	4 58	3.71	2.13	
18		2 30 41	14 26	39 57.7	0 23.7	4 40	10 49	4 58	3.71	2.13	
19		2 33 34	14 40	40 42.1	0 23.1	4 39	10 48	4 57	3.71	2.13	
20		2 36 28	14 55	41 26.3	0 22.5	4 38	10 47	4 56	3.72	2.14	
21		2 39 21	15 9	42 10.6	0 21.8	4 37	10 46	4 55	3.72	2.14	
		2 42 15	15 23	42 54.8	0 21.2	4 36	10 45	4 54	3.72	2.14	
23		2 45 9	15 37	43 39.0	0 20.6	4 35	10 44	4 53	3.72	2.14	
24		2 48 3	15 50	44 23.0	0 20.0	4 33	10 43	4 53	3.72	2.14	
25		2 50 57	16 4	45 7.1	0 19.3	4 32	10 42	4 52	3.72	2.14	
26		2 53 52	16 17	46 51.0	0 18.7	4 31	10 41	4 51	3.72	2.14	
27		2 56 46	16 30	46 43.9	0 18.0	4 30	10 40	4 50	3.72	2.14	
28		2 59 41	16 43	47 18.0	0 17.4	4 28	10 39	4 49	3.73	2.14	
29		3 2 36	16 56	48 2.0	0 16.7	4 27	10 37	4 47	3.73	2.14	
30		3 5 31	17 9	48 46.3	0 16.1	4 26	10 36	4 46	3.73	2.14	
31		3 8 27	N 17 21	49 30.0	S 0				3.73	2.14	

## MARS.

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## TRIVANDRUM.

Date.	MEAN NOON.				MEAN TIME.				
	Right Ascension.	Declination.	Longitude.	Latitude.	Rising.	Meridian passage.	Setting.	Hor. Par.	Semidia- meter.
June,	<i>h m s</i>	°		°	<i>h m</i> A. M.	<i>h m</i> A. M.	<i>h m</i> P. M.	"	"
1	3 11 22	17 34	50 13.5	S.0 14.8	4 23	10 34	4 43	3.73	2.14
2	3 14 18	17 46	50 57.1	0 14.1	4 22	10 33	4 44	3.73	2.14
3	3 17 13	17 58	51 40.5	0 13.5	4 21	10 32	4 43	3.74	2.15
4	3 20 9	18 10	52 24.0	0 12.8	4 20	10 31	4 42	3.74	2.15
5	3 23 5	18 22	53 7.3	0 12.2	4 19	10 30	4 41	3.74	2.15
6	3 26 1	18 33	53 50.7	0 11.5	4 18	10 29	4 40	3.74	2.15
7	3 28 58	18 45	53 34.0	0 10.8	4 17	10 28	4 39	3.74	2.15
8	3 31 54	18 56	55 17.3	0 10.1	4 15	10 27	4 39	3.75	2.15
9	3 34 50	19 7	56 0.4	0 9.5	4 14	10 26	4 38	3.75	2.15
10	3 37 47	19 17	56 43.5	0 8.8	4 13	10 25	4 37	3.75	2.15
11	3 40 45	20 28	57 26.5	0 8.2	4 12	10 24	4 36	3.75	2.15
12	3 43 42	20 38	58 9.6	0 7.5	4 11	10 23	4 35	3.75	2.15
13	3 46 39	20 48	58 52.5	0 6.8	4 10	10 22	4 34	3.76	2.16
14	3 49 37	20 58	59 35.4	0 6.1	4 9	10 21	4 33	3.76	2.16
15	3 52 34	20 8	60 18.2	0 5.5	4 8	10 20	4 32	3.76	2.16
16	3 55 32	20 17	61 1.1	0 4.8	4 6	10 19	4 32	3.76	2.16
17	3 58 30	20 27	61 43.8	0 4.1	4 5	10 18	4 31	3.77	2.16
18	4 1 28	20 36	62 26.5	0 3.4	4 4	10 17	4 30	3.77	2.16
19	4 4 26	20 45	63 9.0	0 2.8	4 4	10 17	4 30	3.77	2.16
20	4 7 25	20 54	63 51.6	0 2.1	4 3	10 16	4 29	3.77	2.16
21	4 10 23	21 2	64 34.0	0 1.4	4 2	10 15	4 28	3.78	2.17
22	4 13 21	21 10	65 16.5	0 0.7	4 1	10 14	4 27	3.78	2.17
23	4 16 20	21 18	65 58.9	S.0 0.1	4 0	10 13	4 26	3.78	2.17
24	4 19 18	21 26	66 41.3	N.0 0.6	3 59	10 12	4 25	3.78	2.17
25	4 22 17	21 34	67 23.5	0 1.3	3 58	10 11	4 24	3.79	2.18
26	4 25 16	21 42	68 5.7	0 2.0	3 57	10 10	4 23	3.79	2.18
27	4 28 15	21 49	68 47.8	0 2.7	3 55	10 9	4 23	3.79	2.18
28	4 31 13	21 57	69 29.9	0 3.4	3 54	10 8	4 22	3.80	2.18
29	4 34 12	22 4	70 11.6	0 4.1	3 53	10 7	4 21	3.80	2.18
30	4 37 11	N.22 10	70 53.8	N.0 4.8	3 52	10 6	4 20	3.80	2.18

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## MARS

## TRIVANDRUM.

Date.	MEAN NOON.				MEAN TIME.				
	Right Ascension.	Declina- tion.	Longitude.	Latitude.	Rising.	Meridian Passage.	Setting.	Hor. Par.	Semi- diameter.
July.									
	<i>h. m. s.</i>	<i>°</i>	<i>°</i>	<i>°</i>	<i>h m</i>	<i>h m</i>	<i>h m</i>	<i>°</i>	<i>°</i>
					<i>A M</i>	<i>A M</i>	<i>P M</i>		
1	4 40 10	N 22 17	71 35.7	N 0 5.5	3 51	10 5	4 19	3.81	2.19
2	4 43 9	22 23	72 17.6	0 6.2	3 50	10 4	4 18	3.81	2.19
3	4 46 8	22 29	72 59.4	0 6.9	3 49	10 3	4 17	3.81	2.19
4	4 49 7	22 35	73 4.1	0 7.6	3 48	10 2	4 16	3.82	2.19
5	4 52 6	22 40	74 22.7	0 8.2	3 47	10 1	4 15	3.82	2.19
6	4 55 5	22 46	75 4.4	0 8.9	3 46	10	4 14	3.82	2.19
7	4 58 4	22 51	75 45.9	0 9.6	3 45	9 59	4 13	3.83	2.20
8	5 1 3	22 56	76 27.4	0 10.3	3 44	9 58	4 12	3.83	2.20
9	5 4 1	23 1	77 8.9	0 11.0	3 43	9 57	4 11	3.84	2.20
10	5 7 0	23 5	77 50.3	0 11.7	3 42	9 56	4 10	3.84	2.20
11	5 9 59	23 9	78 31.6	0 12.4	3 40	9 55	4 10	3.84	2.20
12	5 12 58	23 14	79 12.9	0 13.1	3 39	9 54	4 9	3.85	2.21
13	5 15 56	23 17	79 54.1	0 13.8	3 38	9 53	4 8	3.85	2.21
14	5 18 55	23 21	80 35.3	0 14.5	3 37	9 52	4 7	3.86	2.22
15	5 21 54	23 25	81 16.3	0 15.2	3 36	9 51	4 6	3.86	2.22
16	5 24 52	23 28	81 57.4	0 15.9	3 36	9 51	4 6	3.87	2.22
17	5 27 50	23 31	82 38.4	0 16.6	3 35	9 50	4 5	3.87	2.22
18	5 30 48	23 34	83 19.4	0 17.3	3 34	9 49	4 4	3.87	2.22
19	5 33 46	23 37	84 0.2	0 18.0	3 33	9 48	4 3	3.88	2.23
20	5 36 44	23 40	84 41.1	0 18.7	3 32	9 47	4 2	3.88	2.23
21	5 39 42	23 42	85 21.3	0 19.4	3 31	9 46	4 1	3.89	2.23
22	5 42 39	23 44	86 2.5	0 20.1	3 30	9 45	4 0	3.89	2.23
23	5 45 37	23 46	86 43.0	0 20.8	3 29	9 44	3 59	3.90	2.24
24	5 48 34	23 47	87 23.6	0 21.6	3 28	9 43	3 58	3.90	2.24
25	5 51 31	23 49	88 4.1	0 22.3	3 27	9 42	3 57	3.91	2.24
26	5 54 28	23 50	88 44.6	0 23.0	3 26	9 41	3 56	3.92	2.25
27	5 57 25	23 51	89 25.0	0 23.7	3 25	9 40	3 55	3.92	2.25
28	6 0 22	23 52	90 5.3	0 24.4	3 24	9 39	3 54	3.93	2.26
29	6 3 18	23 52	90 45.5	0 25.1	3 23	9 38	3 53	3.93	2.26
30	6 6 13	23 52	91 25.8	0 25.8	3 22	9 37	3 52	3.94	2.26
31	6 8	N 23 53	92 5.9	N 0 26.5	3 21	9 36	3 51	3.94	2.26

## MARS.

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## TRIVANDRUM.

Date.	MEAN NOON.				MEAN TIME.				
	Right Ascension.	Declina- tion.	Longitude.	Latitude.	Rising.	Meridian passage.	Setting.	Hor. Par.	Semidia- meter.
Aug.	h. m. s.	°	°	°	h. m. A. M.	h. m. A. M.	h. m. P. M.	"	"
1	6 12 4	N.23 52	92 46.0	N.0 27.2	3 20	9 35	3 50	3.95	2.27
2	6 14 59	23 52	93 26.0	0 27.9	3 19	9 34	3 49	3.96	2.27
3	6 17 54	23 52	94 6.0	0 28.7	3 18	9 33	3 48	3.96	2.27
4	6 20 49	23 51	94 45.9	0 29.4	3 17	9 32	3 47	3.97	2.28
5	6 23 43	23 50	95 25.8	0 30.1	3 16	9 31	3 46	3.97	2.28
6	6 26 37	23 49	96 5.5	0 30.8	3 14	9 29	3 44	3.98	2.28
7	6 29 30	23 48	96 45.3	0 31.5	3 13	9 28	3 43	3.99	2.29
8	6 32 23	23 46	97 24.9	0 32.2	3 12	9 27	3 42	3.99	2.29
9	6 35 17	23 45	98 4.5	0 32.9	3 11	9 26	3 41	4.00	2.30
10	6 38 9	23 43	98 44.1	0 33.6	3 10	9 25	3 40	4.01	2.30
11	6 41 1	23 41	99 23.6	0 34.4	3 9	9 24	3 39	4.02	2.31
12	6 43 53	23 39	100 3.0	0 35.1	3 8	9 23	3 38	4.02	2.31
13	6 46 45	23 36	100 42.5	0 35.8	3 7	9 22	3 37	4.03	2.31
14	6 49 37	23 34	101 21.8	0 36.5	3 6	9 21	3 36	4.04	2.32
15	6 52 28	23 32	102 1.1	0 37.2	3 5	9 20	3 35	4.05	2.32
16	6 55 19	23 29	102 40.1	0 37.9	3 4	9 19	3 34	4.05	2.32
17	6 58 8	23 26	103 19.3	0 38.7	3 3	9 18	3 33	4.06	2.33
18	7 0 58	23 22	103 58.4	0 39.4	3 2	9 17	3 32	4.07	2.34
19	7 3 48	23 19	104 37.5	0 40.1	3 0	9 15	3 30	4.08	2.34
20	7 6 47	23 15	105 16.4	0 40.8	2 59	9 14	3 29	4.08	2.34
21	7 9 25	23 11	105 55.3	0 41.5	2 58	9 13	3 28	4.09	2.35
22	7 12 13	23 7	106 34.2	0 42.2	2 57	9 12	3 27	4.10	2.35
23	7 15 1	23 3	107 12.8	0 43.0	2 56	9 11	3 26	4.11	2.36
24	7 17 48	22 59	107 51.5	0 43.7	2 56	9 10	3 24	4.12	2.36
25	7 20 34	22 54	108 30.2	0 44.4	2 55	9 9	3 23	4.13	2.37
26	7 23 20	22 50	109 8.7	0 45.1	2 53	9 7	3 21	4.14	2.38
27	7 26 6	22 45	109 47.2	0 45.9	2 52	9 6	3 20	4.15	2.38
28	7 28 51	22 40	110 25.6	0 46.6	2 51	9 5	3 19	4.16	2.39
29	7 31 36	22 35	111 4.0	0 47.3	2 50	9 4	3 18	4.17	2.39
30	7 34 20	22 29	111 42.2	0 48.0	2 49	9 3	3 17	4.18	2.40
31	7 37 4	N.22 24	112 20.5	N.0 48.8	2 47	9 1	3 15	4.18	2.40

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## MARS

## TRIVANDRUM.

Date.	MEAN NOON.				MEAN TIME.				
	Right Ascension.	Declina- tion.	Longitude.	Latitude.	Rising.	Meridian passage.	Setting.	Hor. Par.	Semi- diameter.
Septer.	<i>h m s</i>	°	°		<i>h m</i> A. M.	<i>h m</i> A. M.	<i>h m</i> P. M.		'
1	7 39 47	N 22 18	112 58.7	N 0 49.5	2 46	9 0	3 14	4.19	2.41
2	7 42 29	22 12	113 36.8	0 50.2	2 45	8 59	3 13	4.20	2.41
3	7 45 13	22 6	114 14.8	0 50.9	2 44	8 58	3 12	4.21	2.42
4	7 47 54	22 0	114 52.8	0 51.7	2 42	8 56	3 10	4.23	2.43
5	7 50 26	21 54	115 30.6	0 52.4	2 41	8 55	3 9	4.24	2.43
6	7 53 15	21 48	116 8.5	0 53.2	2 40	8 54	3 8	4.25	2.44
7	7 55 57	21 41	116 46.2	0 53.9	2 39	8 53	3 7	4.26	2.45
8	7 58 36	21 35	117 24.0	0 54.6	2 37	8 51	3 5	4.27	2.45
9	8 1 15	21 28	118 1.7	0 55.3	2 37	8 50	3 3	4.28	2.46
10	8 3 54	21 21	118 39.3	0 56.1	2 36	8 49	3 2	4.29	2.46
11	8 6 32	21 14	119 16.7	0 56.8	2 34	8 47	3 0	4.30	2.47
12	8 9 10	21 7	119 54.2	0 57.6	2 33	8 46	2 59	4.31	2.47
13	8 11 47	21 0	120 31.5	0 58.3	2 32	8 45	2 58	4.33	2.49
14	8 14 24	20 52	121 8.9	0 59.1	2 31	8 44	2 57	4.34	2.49
15	8 17 0	20 45	121 46.1	0 59.8	2 29	8 42	2 55	4.35	2.50
16	8 19 35	20 37	122 23.3	1 0.6	2 28	8 41	2 54	4.36	2.50
17	8 22 10	20 30	123 0.3	1 1.3	2 26	8 39	2 52	4.38	2.51
18	8 24 35	20 22	123 37.4	1 2.1	2 25	8 38	2 51	4.39	2.52
19	8 27 18	20 14	124 14.2	1 2.8	2 24	8 37	2 50	4.40	2.53
20	8 29 51	20 6	124 51.1	1 3.6	2 22	8 35	2 48	4.42	2.54
21	8 32 24	19 57	125 27.9	1 4.3	2 21	8 34	2 47	4.43	2.54
22	8 34 57	19 49	126 4.7	1 5.1	2 21	8 33	2 45	4.44	2.55
23	8 37 28	19 41	126 41.2	1 5.8	2 19	8 31	2 43	4.46	2.56
24	8 39 59	19 32	127 17.8	1 6.6	2 18	8 30	2 42	4.47	2.57
25	8 42 29	19 23	127 54.2	1 7.3	2 16	8 28	2 40	4.49	2.58
26	8 44 59	19 15	128 30.7	1 8.1	2 15	8 27	2 39	4.50	2.58
27	8 47 28	19 6	129 7.0	1 8.9	2 13	8 25	2 37	4.51	2.59
28	8 49 57	18 57	129 43.3	1 9.7	2 12	8 24	2 36	4.53	2.60
29	8 52 25	18 48	130 19.4	1 10.4	2 10	8 22	2 34	4.54	2.61
30	8 54 52	N 18 38	130 55.5	N 1 11.2	2 9	8 21	2 33	4.56	2.62

## MARS.

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## TRIVANDRUM.

Date. Oct.	MEAN NOON.				MEAN TIME.				
	Right Ascension.	Declination.	Longitude.	Latitude.	Rising.	Meridian passage	Setting.	Hor. Par.	Semi- diameter
	<i>h.</i>				<i>h m</i> A. M.	<i>h m</i> A. M.	<i>h m</i> P. M.		
1	8 57 19	N 18 29	131 31.4	N 1 11.9	2 8	8 19	2 30	4.58	2.62
2	8 59 45	18 20	132 7.4	1 12.7	2 7	8 18	2 29	4.59	2.63
3	9 12	18 11	132 43.2	1 13.4	5	8 16	2 27	4.61	2.65
4	4 37	18 1	133 19.0	1 14.2	4	8 15	2 26	4.62	2.65
	9 1	17 51	133 54.6	1 15.0	2	8 13	2 24	4.64	2.66
5	9 9 25	17 42	134 30.3	1 15.8	1	8 12	2 23	4.66	2.67
	9 11 48	17 32	135	1 16.6	1 59	8 10	2 21	4.68	2.69
6	9 14 11	17 22	135 41.2	1 17.4	1 58	8 9	2 20	4.69	2.69
7	9 16 33	17 12	135 16.5	1 18.1	1 56	8 7	2 18	4.71	2.70
10	9 18 54	17 3	136 51.8	1 18.9	1 55	6	17	4.	2.72
	9 21 15	16 53	137 26.9	1 19.7	1 54	4	2 14	4.75	2.72
11	9 23 36	16 43	138 2.0	1 20.5	1 52	8 2	2 12	4.76	2.74
12	5	16 32	138 36.9	1 21.3	1 51	8 1	2 11	4.78	2.76
	9 25 14	16 22	139 11.8	1 22.1	1 49	7 59	9	4.80	2.77
13	9 30 35	16 12	139 46.6	1 22.9	1 47	57	7	4.82	2.78
14	9 32 52	16 2	140 21.3	1 23.7	1 46	56	6	4.84	2.79
	9 35 9	15 52	140 55.8	1 24.5	1 44	7 54	4	4.86	2.80
15	37 25	15 41	141 30.4	1 25.3	1 43	53	3	4.88	2.81
16	9 39 41	15 31	142 4.8	1 26.1	1 41	51	1	4.90	2.82
	9 41 57	15 20	142 39.1	1 27.0	1 40	7 49	1 58	4.92	2.83
17	9 44 12	15 10	143 13.1	1 27.8	1 38	7 47	1 56	4.94	2.84
18	46 26	14 59	143 47.3	1 28.	1 37	46	1 55	4.96	2.85
	9 48 40	14 49	144 21.2	1 29.5	1 35	7 44	1 53	4.99	2.86
19	9 50 53	14 38	144 55.1	1 30.3	1 33	42	1 51	5.01	2.88
20		14 28	145 28.7	1 31.1	1 32	41	1 50	5.03	2.89
	54 17	14 17	146 2.4	1 32.1	1 30	7 39	1 48	5.05	2.90
21	28	14 6	146 35.9	1 32.8	1 28		1 46	5.08	2.92
22	59 38		147 9.4	1 33.7	1 26	35	1 44	5.10	2.93
	10 1 48	13 45	147 42.6	1 34.5	1 26	7 34	1 42	5.12	2.94
23	10	13 34	148 15.8	1 35.4	1 24	7 32	1 40	5.15	2.96
24	10 7	N 13 24	148 48.9	N 1 36.2	1 22	70	1 38	5.17	2.97

## MARS.

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## TRIVANDRUM.

Date.	MEAN NOON				MEAN TIME.				
	Right Ascension.	Declination.	Longitude.	Latitude.	Rising.	Meridian passage.	Setting.	Hor. Par.	Semidi- meter.
Nov.	<i>h</i>				<i>h m</i> A. M.	<i>h m</i> A. M.	<i>h m</i> P. M.		
1	10 8 15	N. 13 13	149 21.9	N. 1 37 1	1 20	7 28	1 36	5.20	2.95
2	10 10 22	13	149 54.6	1 38.0	1 18	26	1 34	5.22	3.00
3	10 12 28	12 51	150 26.3	1 38.9	1 17	25	1 33	5.25	3.01
4	10 14 34	12 41	150 59.9	1 39.8	1 15	23	1 31	5.28	3.03
	10 16 40	12 30	151 32.4	1 40.7	1 13	21	1 29	5.30	3.04
6	10 18 44	12 19	152 4.6	1 41.5	1 11	19	1 27		3.06
7	10 20 49	12 8	152 36.9	1 42.4	1 10	17	1 24		3.08
8	10 22 53	11	153 8.9	1 43.3	1 8	15	1 22	5.38	3.09
9	10 24 56	11 47	153 40.9	1 44.2	1	13	1 20	5.41	3.11
10	10 26 58	11 36	154 12.6	1 45.1	1 4	11	1 18	5.44	3.12
11	10 29 0	11 25	154 44.3	1 46.1	1	10	1 17	5.47	3.14
12	10 31 1	11 14	155 15.8	1 47.0	1 1	8	1 15	5.50	3.16
13	10 33 1	11 4	155 47.2	1 47.9	0 59	6	1 13		3.17
14	10 35 0	10 53	156 18.3	1 48.8	0 57	4	1 11	5.56	3.19
15	10 36 58	10 42	156 49.4	1 49.8	0 56	2	1 8	5.59	3.21
16	10 38 56	10 32	157 20.2	1 50.7	0 54	0	1 6	5.62	3.23
17	10 40 53	10 21	157 51.0	1 51.7	0 52	58	1 4	5.65	3.24
18	10 42 50	10 11	158 21.5	1 52.6	0 50		1 2	5.69	
19	10 44 46	10 0	158 52.0	1 53.6	0 48	54	1 0		3.28
20	10 46 40	9 50	159 22.2	1 54.5	0 46	6 52	0 58		3.30
21	10 48 26	9 39	159 52.3	1	0 44	50	0	5.79	3.32
22	10 50 29		160 22.1	1 56.5	0 42	6 48	0 54	5.82	3.34
23	10 52 22	9 18	160 51.9	1 57.5	0 40	6 46		5.86	3.36
24	10 54 15	9 8	161 21.3	1 58.5	0 38	44	0 50	5.89	3.38
25	10 56 6	8 58	161 50.7	1	0	41	0 46	5.93	3.40
26	10 57 56	8 47	162 19.8	0.5	0 34	39	0 44	5.96	3.42
27	10 59 46	8 37	162 48.9	1.5	0 32		0 42	6.00	3.44
28	11 1 35		163 17.6	2 2.5	30	35	0 40	6.04	3.47
29	11 3 23	8 17	163 46.3	2 3.5	0 28	33	3 38	6.08	3.49
30	11 5 11	N. 8 7	164 14.6	N. 4.5	0	6 31	36	6.12	3.51

## MARS.

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## TRIVANDRUM.

Date.	MEAN NOON.				MEAN TIME.				
	Right Ascension.	Declina- tion	Longitude	Latitude	Rising	Meridian Passage	Setting.	Hor. Par.	Semi- diameter.
	<i>h</i>				<i>h</i> <i>m</i> A. M.	<i>h</i> <i>m</i> A. M.	<i>h</i> <i>m</i> P. M.		
1	11 6 57	N 7 57	164 42.9	N 2 5.6	0 24	6 29	0 34	6 16	3.54
2	11 8 43	47	165 10.8	2 6.6	0 21	6 26	0 31	6.20	3.56
	11 10 28		165 38.7	2	19	24	0 29	6.24	3.58
4	11 12 12	23	166 6.1	8.7	0 17	6		6.28	3.60
	11 13 55	18	166 33.6	9.8	0 16	20	0 24	6.32	3.63
	11 15 38	9	167 0.7	2 10.9	0 14	6 18	0 22	9.36	3.65
5	11 17 19	59	167 27.7	2 12.0	11	6 15	0 19	6.41	3.68
	11 19 0	6 50	167 54.3	2 13.1	0 9	13	0 17	6.45	3.70
9	11 20 39	40	168 20.8	2 14.2	0	11	15	6.50	
10	11 22 17	31	168 46.5	2 15.3		9	0 13	6.54	3.75
11	11 23 56	6 22	169 12.3	2 16.4	0	6 6	0 10	6.59	3.78
12	11 32	13	169 38.5	2 17.5	(Midnig.) P. M. { 11 58 }	6 4	0 8	6.63	3.81
13	11 27 8	6 4	170 4.0	2 18.7	11 5	6	6	6.68	3.83
14	11 28 42	55	170 29.0	2 19.8	11 54	59	0 3	6.73	3.86
15	11 30 16	46	170 54.0	2 21.0	11 51	57	Noon. A. M.	6.78	3.89
16	11 31 48	38	171 18.5	2 22.1	11 49	54	11	6.83	3.92
17	11 33 21	29	171 42.9	2 23.3	11 47	52	11	6.88	3.95
18	11 34 51	21	172 6.5	2 24.5	11 44	50	11	6.93	3.98
19	11 36 19	12	172 30.6	2 25.7	11 42	47	11 50	6.99	4.01
	11 37 49	4	172 53.9	2 26.9	11 39	5 45	11 48	7.04	4.04
20	11 39 16	1 56	173 17.1	2 28.1	11 37	5 42	11 45	7.09	4.07
21	11 40 41	4 48	173 39.5	2 29.3	11 35	40	11 43	7.15	4.10
	11 42 6	4 40	174 2.4	2 30.6	11 32	38	11 41	7.20	4.13
	11 43 30	4 33	174 21.4	31.8	11 30	35	11 38	7.26	4.17
26	11 44 52	1 25	174 46.3	2 33.0	11 27	33	11 36		4.20
	11 46 12	1 18	175 7.7	2 34.2	11 25	30	11 33	7.38	4.24
	11 47 32	4 10	175 29.0	2 35.5	11 23	28	11 31	7.44	4.27
28	11 48 50	4 3	175 49.6	2 36.8	11 21	5 25	11 27	7.50	4.30
	11 50 8	3 56	176 10.2	2 38.0	11 18	5 23	11 25	7.56	4.34
30	11 51 23	3 49	176 30.1	2 40.3	11 15	5 20	11 22	7.62	4.37
31	11 37	N 3 43	176 49.9	N 2 40.6	11 13	17	11 19	7.68	4.41

# JUPITER.

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## TRIVANDRUM.

Date.	MEAN NOON.				MEAN TIME.					
	Right Ascension.	Declination.	Longitude.	Latitude.	Rising	Meridian passage.		Setting.	Hor. Par.	Semidia- meter.
Janu.	h.				h. P.	h. P.	m. M.	h. A.	m. M.	
1	1 36 56	N 8 45	25 38.8	S 1 15.3	0 50	6 55	1 5	1.90	20.36	
2	1 37 5	8 46	25 41.4	1 15.0	0 46	6 51	1 0	1.90	20.29	
3	1 37 15	8 48	25 44.0	1 14.6	0 42	6 47	0 56	1.89	20.22	
4	1 37 25	8 49	25 46.	1 14.3	0	6 43	0	1.88	20.15	
5	1 37 36	8 50	25 49.0	1 14.0	0 35	6 40	0 48	1.88	20.08	
6	1 15	8 52		1 13.7	0 31	6 36	0 45	1.87	20.02	
	1 38 1	8	25 56.6	1 13.4	0 27	6 32	0 41	1.87	19.95	
8	1 38 13	8 55	26 0.3	1 13.1	0 23	6 28	0 37	1.86	19.88	
9	1 38 27	8 57	26 4.1	1 12.8	0 20	6 25	0 33	1.85	19.82	
10	1 38 42	8 59	26 8.1	1 12.5	0 15	6 21	0 30	1.85	19.75	
11	1 38 55	9 0	26 12.3	1 12.2	0 12	6 17	0 26	1.84	19.68	
12	1 39 14		26 16.7	1 11.9	0 9	6 14	0 22	1.83	19.62	
13	1 39 31	4	26 21.2	1 11.6	0 5	6 10	0 19	1.83	19.55	
14	1 39 49	9 6	26 26.1	1 11.3	0 1	6 6	0 15	1.82	19.49	
15	1 40 6	9 8	26 31.0	1 11.0	11 58	6 3	0 11	1.82	19.42	
16	1 40 25	9 10	26 36.2	1 10.7	11 54	59	0	1.81	19.36	
17	1 40 45	9 13	26 41.5	10.4	11 51	56	0 4	1.80	19.29	
18	1 41 5	15	26 47.0	1 10.1	11 47	52	0 1	1.80	19.23	
19	1 41 26	9 17	26 52.6	1 9.8	11 42	48	11 54	1.79	19.17	
20	1 41 47	20	26 58.4	1 9.5	11 39	45	11 51	1.79	19.11	
21	1 42 10	9 22	27 4.4	1 9.2	11 35	41	11 47	1.78	19.04	
22	1 42 33	9 24	10.7	1 9.0	11 32	38	11 44	1.77	18.98	
23	1 42 57	9 26	27 17.0	1 8.7	11 28	34	11 40	1.77	18.92	
24	1 43 21	29	27 23.5	1 8.4	11 25	31	11 37	1.76	18.86	
25	1 43 45	31	27 30.2	1 8.1	11 21	5 27	11 33	1.76	18.80	
26	1 44 11	9 31	27 37.1	1 7.9	11 18	24	11 30	1.75	18.74	
27	1 44 37	9 37	27 44.1	1 7.6	11 14	20	11 26	1.75	18.68	
28	1 45 4	9 40	27 51.3	1 7.3	11 11	5 17	11 23	1.74	18.62	
29	1 45 32	9	27 58.6	1 7.0	11 7	5 13	11 19	1.74	18.56	
30	1 45 59	9 45	28 6.2	1 6.8	11 4	5 10	11 16	1.73	18.51	
31	1 46 29	N 9 48	28 13.8	1 6.5	11 0	6	11 12	1.72	18.45	

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TRIVANDRUM.

Date.	MEAN NOON.				MEAN TIME.				
	Right Ascension	Declination.	Longitude.	Latitude.	Rising.	Meridian passage.	Setting.	Hor. Par.	Schmidt meter.
Feb.	<i>h</i>				<i>h m</i> A. M.	<i>h m</i> P. M.	<i>h m</i> P. M.		
1	1 46 58	N. 51	28 21.6	S 1 6.3	10 57	5 3	11 9	1.72	18.30
2	1 47 27	55	28 25.5	1 6.0	10 58	4	11 5	1.71	18.34
3	1 47	58	28 37.7	1	10 50	56	11 2	1.71	18.28
4	1 48 28	10 1	28 45.9	1 4	10 47	4 53	10 59	1.70	18.23
5	1 49	10 4	28 54.2	1	10 43	4	10	1.70	18.17
	1 49 32	10	29 2.7	1	10 40	4 46	10 52	1.69	18.12
	1 50	10 11	11.4	1 4.7	10 36	4 42	10 48	1.69	18.07
8	1 50 58	10 14	29 20.2	1 4.4	10 33	4 39	10 45	1.68	18.01
9	1 51 12	17	29 29.2	1 4.2	10 30	4 36	10 42	1.68	17.96
	1 51 46	10 21	35.2	1 3.9	10 26	4	10 38	1.67	17.91
11	1 52 20	10 24	29 47.4	1	10 23	4	10 35	1.67	17.86
12	1 52 55	10 28	29 56.7	1 3.5	10 20	4 26	10 32	1.66	17.81
	1 53 31	10 31	30 3.2	1 3.3	10 16	4	10 28	1.66	17.76
14	1 54	10 35	30 15.8	1 3.0	10 13	4 19	10 25	1.66	17.71
15	1 54 44	10 38	30 25.5	1 2.8	10 10	4 16	10 22	1.65	17.66
	1 55 21	10 42	30 35.3	1	10 6	4 12	10 18	1.65	17.62
17	1 55 59	10 46	30 45.3	1 2.3	10	4	10 15	1.64	17.57
18	1 56 37	10 49	30 55.3	1 2.1	10 0	4	10 12	1.64	17.52
	57 15	10 53	31 5.4	1 1.9	9 56	4	10 8	1.63	17.48
20	1 57 54	10	31 15.7	1 1.6	9 52	59	10	1.63	17.43
21	1 58 34	11 1	31 26.2	1 1.4	9 49	3 56	10 3	1.63	17.38
	1 59 13	11	31 36.7	1 1.2	9 46	3 53	10 0	1.62	17.34
23	1 59	11 8	31 47.3	1 1.0	9 42	3 49	9 56	1.62	17.30
24	2 50 34	11 12	31 58.0	1 0.8	39	3 46	53	1.61	17.25
	2 1 16	11 16	32 8.9	1 0.6	9 36	3 43	50	1.61	17.21
26	2 1 57	11 20	32 19.9	1 0.4	9 33	3 40	9 47	1.60	17.17
27	2 2 39	11 24	32 30.9	1 0.2	9 29	36	43	1.60	17.13
28	2	N. 11 28	32 42.0	S 1 0.0	9 26	33	46	1.60	17.09

## JUPITER.

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## TRIVANDRUM.

Date.	MEAN NOON.				MEAN TIME.				
	Right Ascension.	Deci- nation.	Longitude.	Latitude.	Rising.	Meridian passage.	Setting.	Hor. Par.	Semi- diameter.
March.	<i>h</i>				<i>h m</i> A. M.	<i>h m</i> P. M.	<i>h m</i> P. M.		
1	2 4 5	N 11 32	32 53.3	S. 0 59.8	9 23	30	9 37	1	17.05
2	2 4 48	11 36	33 4.6	0 59.6	9 20	27	9 34	1.59	17.01
3	5 32	11 40	33 16.1	0 59.4	9 16	23	9 30	1.59	16.97
4	2 6 16	11 44	33 27.6	0 59.2	9 13	20	9 27	1	16.93
5	2 0	11 49	33 39.1	0 59.0	9 10	3 17	9 24	1.58	16.89
6	2 44	11	33 50.8	0 58.8	9	14	9 21	1.58	16.86
	8 29	11	34 2.6	0 58.7	9 4	11	9 18	1.	16.82
8	2 9 15	12 1	34 14.5	0 58.5	9 0	3	9 14	1.	16.79
9	2 10 1	12	34 26.4	0 58.3		4	11	1	16.75
10	2 10 47	12	34 38.4	58.1	5 54	3 1	9 8	1.56	16.72
11	2 11 33	12 14	34 50.6	0 57.9	8 51	2 58	9 5	1.56	16.68
12	2 12 20	12 18	35 2.8	0 57.7	8 48	2	9 2	1.56	16.65
13	2 13 7	12 22	35 15.1	0 57.6	8 45	52	8 59	1.55	16.62
14	2 13 55	12 26	35 27.4	0 57.4	8 41	49	8 57	1.55	16.58
15	2 14 43	12 31	35 39.5	0 57.3	8 37	45	8 53	1.55	16.55
16	2 15 31	12	35 52.3	0 57.1	8 34	42	3 50	1.54	16.52
	2 16 19	12 39	36 4.8	0 56.9	8 31	39	8 47	1.54	16.49
18	2 17 7	12 44	36 17.4	0 56.7	8 28	2 36	44	1.54	16.46
19	2 17 57	12 48	36 30.1	0 56.6	8	2 33	8 41	1.54	16.43
20	2 18 46	12 52	36 42.9	0 56.4	8 22	2 30	8 38	1.53	16.40
21	2 19 35	12	36	0 56.3	8 19	2 27	8 35	1	16.37
22	2 20 24	13 1	37 8.6	0 56.1	8 16	24	8 32	1.53	16.35
23	2 21 15	13	37° 21.5	0 56.0	8 12	2 20	8 28	1.53	16.32
24	2 22	13 10	37 34.5	0 55.8	8 9	17	8 25	1.52	16.29
25	2 22 56	13 14	37 47.6	0 55.7	8	14	8 22	1.52	16.27
26	2 23 46	13 18	38 0.7	0 55.5	8 3	11	8 19	1.52	16.24
27	2 24 35	13 23	38 13.9	55.4	8 0	8	8 16	1.52	16.22
28	2 25 29	13 27	38 27.2	0 55.2	7 57	2 5	8 13	1.51	16.19
29	2 26 21	13 32	38 40.5	0 55.1	7 54	2 2	8 10	1.51	16.17
30	2 27 12	13 36	38 53.8	0 55.0	7 51	1 59	8 7	1.51	16.15
31	2 28 4	N 13 40	7 1	S. 0 54.9	18	1 56	8 4	1.51	16.12

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## TRIVANDRUM

Date.	MEAN NOON.				MEAN TIME.				
	Right Ascension.	Declination.	Longitude.	Latitude.	Rising	Meridian passage.	Setting.	Hor. Par.	Semidiameter.
April.									
	<i>h.</i>				<i>h.</i>	<i>h.</i>	<i>h.</i>		
1	2 25 57	N. 13 45	39 20.5	S. 0 51.7	A. M. 7 45	P. M. 1 53	P. M. 8 1	1.51	16.10
2	2 29 49	13 49	39 34.0	0 54.6	7 42	1 50	58	1.50	16.08
	2 30 42	13 53	39 47	0 54.4	39	1 47		1.50	16.06
4	2 31 35	13 58	40 1.1	0 54.3	36	1 44		1.50	16.04
5	2 32 28	14 2	40 14.7	0 54.2	7 33	1 41	49	1.50	16.02
6	2 33 21	14	40	0 54.1	7 25	1	46	1.50	16.00
	2 34 15	14 11	40 42.0	0 53.9	7 25	1 34	43	1.49	15.98
8	2 35 8	14 15	40 55.8	0 53.8	22	1 31	40	1.49	15.96
9	2 36 2	14 20	41 9.5	0 53.7	7 19	1 28		1.49	15.95
10	2 36 56	14 24	41 23.3	0 53.6	16	1 25	34	1.49	15.93
11	2 37 49	14 28	41 37.1	0 53.5	13	1	31	1.49	15.91
12	2 38 44	14 33	41 50.9	0 53.4	10	1 19	7 28	1.49	15.90
13	39 38	14	42 4.8	0 53.3		1 16		1.48	15.88
14	2 40 33	14 41	42 18.6	0 53.2	4	1 13		1.48	15.87
15	2 41 28	14 46	42 32.6	0 53.0	1	1 10	7 19	1.48	15.85
16	2 42 22	14 50	42 46.6	0 52.9	6 58	1	7 16	1.48	15.84
17	2 43 18	14 54	43 0.6	0 52.8		1 4	7 13	1.48	15.83
18	2 44 13	14 59	43 14.6		6	1 1	10	1.48	15.82
19	2 45 8	15	43 28.5	0 52.6	6 49	0		1.48	15.80
20	2 46 4	15	43 42.7	0 52.5	6 46	0	4	1.48	15.79
21	2 46 59	15 12	43 56.8	0 52.4	43	0	1	1.48	15.78
	2 47 55	15 16	44 10.9	0 52.3	6 46	0 49	58	1.47	15.77
	2 48 51	15 20	44 25.1	0 52.2	37	0 46		1.47	15.76
24	2 49 47	15 24	44 39.2	0 52.2	6 34	0 43	6	1.47	15.75
25	2 50 43	15	44 53.4	0 52.1	6 31	0 40	49	1.47	15.74
26	2 51 39	15	45 7.5	0 52.0	6 28	0	6 46	1.47	15.73
	2 52 35	15	45 21.7	0 51.9	24	0 34	6 44	1.47	15.73
	2 53 32	15 41	45 35.9	51.8	6 21	0 31	6 41	1.47	15.72
9	2 54 28	15 45	45 50.1	0 51.7	6 18	0 28	6 38	1.47	15.71
30	2 55 25	N. 15 50	46 4.3	0 51.7	6 15	0 25	6 35	1.47	15.71

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## TRIVANDRUM.

Date. May.	MEAN NOON				MEAN TIME.				
	Right Ascension.	Declina- tion.	Longitude.	Latitude.	Rising.	Meridian Passage.	Setting	Hor. Par.	Semi- diameter.
1	<i>h. m.</i> 2 56 21	N 15 54	46 15.6	S 0 51.6	<i>h. m.</i> A. M. 6 12	<i>h. m.</i> P. M. 0 22	<i>h. m.</i> P. M. 6 32	1.47	15.70
2	2 57 18	15 58	46 22.5	51.5	9	0 19	29	1.47	15.70
	2 58 15	16	46 47.1	0 51.4	6	16	26	1.47	15.69
4	2 59 12	16	47 1	0 51.4	6 3	0 13	6 23	1.47	15.69
5	3 0 8	16 10	47 15.5	0 51.3	6 0	0 10	20	1.47	15.68
6	1	16 14	47 29.7	51.2			17	1.47	15.68
	3 2	16 18	47 44.0	0 51.1	51	1	14	1.47	15.68
8		16	47	0 51.1	51	0 1	6 11	1.47	15.68
	3 3 56	16	48 12	51.0	18	A. M. 11 58	6 8	1.47	15.68
10	3 4	16	48 7	0 51.0	45	11		1.47	15.68
11	3 5 50	16 31	48 11.0	0 50.9	42	11 52		1.47	15.67
12	17	16 38	48	50.8		11 49	59	1.47	15.67
13	3 44	16 42	49 9.5	0 50.7	36	11 46	56	1.47	15.68
14	3 8 42	16 46	49 23.7	0 50.7	33	11 43	53	1.47	15.68
15	9 39	16 50	49 37.9	0 50.6	30	11 40	50	1.47	15.68
16	3 10 36	16 54	49 1	0 50.6		11 37	47	1.47	15.68
17	3 11 33	16	4	0 50.5	24	11 34	44	1.47	15.68
18	3 12 30	17 1	29.5	0 50.5	21	11 31	41	1.47	15.69
19	3 13 27	17	34.7	50.4	18	11 28	38	1.47	15.69
20	3 14 25	17	50 48.9	0 50.4	15	11 25		1.47	15.69
21	3 15 22	17 13	51 3.1	0 50.3	11	1 22	33	1.47	15.70
22	3 16 19	17 17	51 17.2	0 50.3	8	11 19	30	1.47	15.70
23	3 17 16	17 20	51 31.3	0 50.2		11 16	27	1.47	15.71
24	3 18 13	17 24	51 45.4	0 50.2		11 13	24	1.47	15.72
	3 19 10	17 28	51 59.5	0 50.1	4 59	11 10	21	1.47	15.72
26	3 20	17 31	13	0 50.1	4	11 7	18	1.47	15.73
	21 4	17 35	27.6	0 50.1	4	11 4	15	1.47	15.74
28	3 22 1	17	41.6	0 50.1	4 50	11 1	12	1.47	15.75
29	3 22 58	17 42	55.6	0 50.0	4 47	10 58	9	1.47	15.76
30	23 54	17 46	9.5	0 50.0	4 44	10 55		1.47	15.77
31	3 24 51	N 17 49	53	S 0 49.9	4 41	10 52	3	1.47	15.78

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## TRIVANDRUM.

Date. June.	MEAN NOON.				MEAN TIME.				
	Right Ascension.	Declination.	Longitude.	Latitude. ●	Rising.	Meridian passage.	Setting.	Hor. Par.	Semi- diameter.
	<i>h</i> <i>m</i>				<i>h</i> <i>m</i> A. M.	<i>h</i> <i>m</i> A. M.	<i>h</i> <i>m</i> P. M.		
1	3 25 48	N 17 53	53 37.4	S. 0 49.9	4 38	10 49	5 0	1.48	15.79
2	3 26 44	17 56	53 51.3	0 49.8	4 35	10 46		1.48	15.80
3	3 27 41	17 59	54 5.2	0 49.8	4 32	10 43	4	1.48	15.81
4	3 28 37	18 3	54 19.1	0 49.8	4 29	10 40	4 51	1.48	15.82
5	3 29 33	18 6	54 32.8	0 49.8	4 26	10 37	4 48	1.48	15.83
6	3 30 29	18 10	54 46.6	0 49.7	4 23	10 34	4 45	1.48	15.85
7	3 31 25	18 13	55 0.3	0 49.7	4 21	10 32	4 43	1.48	15.86
8	3 32 21	18 16	55 14.1	0 49.7	4 18	10 29	4 40	1.48	15.87
9	3 33 17	18 20	27.7	C 49.7	4 15	10 26	4	1.49	15.89
10	3 34 13	18 23	55 41.3	0 49.7	4 11	10 22	4 33	1.49	15.90
11	3 35 9	18 26	55 54.9	C 49.7	4 8	10 19	4 30	1.49	15.92
12	3 36 4	18 29	56 8.4	0 49.6	4	10 16	4 27	1.49	15.94
13	3 36 59	18 32	21.9	0 49.6	4	10 13	4 24	1.49	15.95
14	3 37 55	18 35	56 35.4	0 49.6	3 59	10 10	4 21	1.49	15.97
15	3 38 50	18 39	56 48.8	0 49.6	3 56	10	4 18	1.49	15.99
16	3 39 45	18 42	2.2	0 49.6	3 52	10 4	4 16	1.50	16.01
17	3 40 39	18 45	57 15.6	0 49.5	3 49	10 1	4 13	1.50	16.03
18	3 41 34	18 48	57 28.9	0 49.5	3 46	9 58	4 10	1.50	16.04
19	3 42 29	18 51	57 42.1	0 49.5	3 43	9	4	1.50	16.06
20	3 43 23	18 54	57 55.3	0 49.5	3 40	9 52	4 4	1.50	16.08
21	3 44 18	18	58 8.4	0 49.5	3 37	9 49	4 1	1.51	16.10
	3 45 11	18 59	58 21.5	0 49.5	3 34	9 46	3 58	1.51	16.13
23	3 46 6	19 2	58 34.4	0 49.5	3 31	9 43	3 55	1.51	16.15
24	3 46 59	19	58 47.5	0 49.5	3 28	9 40	3	1.51	16.17
25	3 47 52	19 8	59 0.4	0 49.5	3 25	9 37	3 49	1.51	16.19
26	3 48 46	19 11	59 13.3	0 49.5	3 22	9 34	3 46	1.52	16.22
27	3 49 38	19 13	59 26.0	0 49.5	3 19	9 31	3 43	1.52	16.24
28	3 50 31	19 16	59 38.8	0 49.5	3 16	9 28	3 40	1.52	16.27
29	3 51 24	19 19	59 51.4	0 49.5	3 13	9	37	1.52	16.29
30	3 52 16	N 19 22	60 4.1	S. 0 49.6	3 10	9 22	3 34	1.53	16.32

## JUPITER.

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## TRIVANDRUM.

Date. July.	MEAN NOON.				MEAN TIME.				
	Right Ascension.	Decli- nation.	Longitude.	Latitude.	Rising.	Meri- dian passage.	Setting.	Hor. Par.	Semidia- meter.
	<i>h</i>				<i>h m</i>	<i>h m</i>	<i>h m</i>		
					A. M.	A. M.	P. M.		
1	3 53 8	N 19 24	60 16.6	S 0 49.6	3 7	9 19	3 31	1	16.34
2	3 54 0	19 27	60 29.1	0 49.6	3 4	16	3 28	1.53	16.37
3	3 54 51	19 29	60 41.5	0 49.6	1	9 13	3 25	1.53	16.40
4	3 55 42	19 32	60 53.9	0 49.6	2 58	9 10	3 22	1.54	16.43
5	3 56 33	19 35	61 6.1	0 49.6	54	9 6	3 18	1.54	16.45
6	3 57 24	19 38	61 18.4	0 49.6	2 51	9 3	3 15	1.54	16.48
	3 58 14	19 40	61 30.4	0 49.6	2 48	9 0	3 12	1.54	16.51
8	3 59 5	19 43	61 42.5	0 49.6	2 45	8	9	1	16.54
9	3 59 55	19 45	61	0 49.7	2 42	8 54	6	1 55	16.57
10	4 0 44	19 47	62 6.	0 49.7	2 39	8 51	3 3	1 55	16.60
11	4 1 34	19 50	62 18.3	0 49.7	2 36	8 48	3 0	1.56	16.64
12	4 2 24	19 52	62 30.1	0 49.7	2 33	8 45	2 57	1.56	16.67
13	4 3 12	19 54	62 41.7	0 49.7	2 30	8 42	2 54	1.56	16.70
14	4 4 1	19 56	62 53.3	0 49.8	2 26	8 38	2 50	1 56	16.73
15	4 4 49	19 58	63 4.9	0 49.8	2 23	8 35	2 47	1.57	16.77
16	4 5 36	20 1	63 16.4	0 49.8	2 20	8 32	2 44	1.57	16.80
17	4 6 24	20 3	63 27.6	0 49.8	2 17	8 29	2 41	1.57	16.84
18	4 7 11	20	63 38.9	0 49.9	2 14	8 26	2 38	1.58	16.87
19	4 7 57	20 7	63 50.0	0 49.9	2 11	8 23	2 35	1.58	16.91
20	4 8 44	20 9	64 1.1	0 50.0	2	8 20	2 32	1.58	16.95
21	4 9 30	20 11	64 12.1	0 50.0	2 3	8 16	2 29	1.59	16.98
22	4 10 15	20 13	64 23.1	0 50.0	0	8 13	2 26	1.59	17.02
23	4 11 0	20 15	64 33.8	0 50.0	1	8 10	2 23	1.59	17.06
24	4 11 46	20 17	64 44.	0 50.1	1 54	8	2 20	1.60	17.10
25	4 12 31	20 19	64 55.1	0 50.1	1 51	8 4	2 17	1.60	17.14
26	4 13 15	20 20	65 5.6	0 50.2	1 47	8 0	2 13	1.61	17.18
27	4 13 58	20 22	65 15.9	0 50.2	1 44		2 10	1.61	17.22
28	4 14 41	20 24	65 26.3	0 50.3	1 41	54		1 61	17.26
29	4 15 24	20 26	65 36.4	0 50.3	1 38	51	4	1.62	17.30
30	4 16 6	20 27	65 46	0 50.3	1 35	48	1	1.62	17.34
31	4 16 48	N 20 29	65	S 0 50.3	1 31	7 44	1 57	1.63	17.39

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## TRIVANDRUM.

Date.	MEAN NOON.				MEAN TIME.				
	Right Ascension	Declination.	Longitude	Latitude.	Rising.	Meridian passage.	Setting.	Hor. Par.	Semidi- meter.
Aug.	<i>h m s</i>	<i>° ' "</i>	<i>° ' "</i>	<i>° ' "</i>	<i>h m</i> A. M.	<i>h m</i> A. M.	<i>h m</i> P. M.	<i>"</i>	<i>"</i>
1	4 17 30	N 20 31	66 6 4	S 0 50 4	1 28	7 41	1 54	1 63	17 43
2	4 18 11	20 32	66 15 6	0 50 4	1 25	38	1 51	1 63	17 47
3	4 18 51	20 34	66 25 8	0 50 5	1 22	35	1 48	1 64	17 52
4	4 19 32	20 36	66 35 2	0 50 5	1 18	31	1 44	1 64	17 56
5	4 20 12	20 37	66 44 7	0 50 6	1 15	28	1 41	1 65	17 61
6	4 20 51	20 39	66 53 9	0 50 6	1 12	7 25	1 38	1 65	17 65
7	4 21 29	20 40	67 3 1	0 50 7	1 8	21	1 34	1 65	17 70
8	4 22 7	20 42	67 12 1	0 50 7	1 5	18	1 31	1 66	17 74
9	4 22 45	20 43	67 21 1	0 50 8	1 2	7 15	1 28	1 66	17 79
10	4 23 22	20 44	67 29 8	0 50 8	0 59	12	1 25	1 67	17 84
11	4 23 58	20 46	67 38 5	0 50 9	0 55	8	1 21	1 67	17 89
12	4 24 34	20 47	67 47 0	0 51 0	0 52		1 18	1 68	17 94
13	4 25 10	20 48	67 55 5	0 51 1	0 49	7 2	1 15	1 68	17 99
14	4 25 45	20 50	68 3 7	0 51 1	0 45	6 55	1 11	1 69	18 04
15	4 26 19	20 51	68 11 9	0 51 2	0 42	6 55	1 8	1 69	18 09
16	4 26 53	20	68 19 8	0 51 2	0 38	6 51	1 4	1 70	18 14
17	4 27 27	20	68 27 7	0 51 3	0 35	6 48	1 1	1 70	18 19
18	4 28 0	20 51	68 35 4	0 51 3	0 32	6 45	0 58	1 71	18 24
19	4 28 31	20 55	68 43 1	0 51 4	0 28	6 41	0 54	1 71	18 29
20	4 29 2	20 56	68 50 4	0 51 5	0 25	6 38	0 51	1 72	18 35
21	4 29 33	20 57	68 57 7	0 51 6	0 21	31	0 47	1 72	18 40
22	4 30 3	20 59	69 4 8	0 51 6	0 18	6 31	0 44	1 73	18 45
23	4 30 33	20 59	69 11 9	0 51 7	0 15	6 28	0 41	1 73	18 51
24	4 31 1	21 0	69 18 7	0 51 7	0 11	6 24	0 37	1 74	18 56
25	4 31 30	21 1	69 25 5	0 51 8	0 8	6 21	0 34	1 74	18 62
26	4 31 59	21 2	69 31 9	0 51 8	0 4	6 17	0 30	1 75	18 68
27	4 32 26	21	69 38 3	0 51 9	(0 1) P. M. (11 57)	6 14	0 27	1	18 73
28	4 32 53	21 4	69 44 5	0 52 0	11 54	6 10	0 23	1 76	18 79
29	4 33 18	21 5	69 50 6	0 52 1	11 50	6	0 20	1 76	18 85
30	4 33 43	21 6	69 56 5	0 52 1	11 47	6 3	0 16	1 77	18 90
31	4 34	N 21 6	70 2 3	S 0 52 2	11 43	6 0	0 13	1 77	18 96

## JUPITER

## TRIVANDRUM.

Date. Sept.	MEAN NOON.				MEAN TIME.				
	Right Ascension	Declina- tion.	Longitude.	Latitude.	Rising.	Meridian passage.	Setting.	Hor Par.	Semidi meter.
	<i>h m</i>				<i>h m</i>	<i>h m</i>	<i>h m</i>		
1	4 34 32	N 21 7	70 7.6	S. 0 52.3	11 40	5 56	0 9	1.78	19.02
2	4 34 55	21 8	70 13.1	0 52.4	11 36	53	0 6	1.78	19.09
	4 35 17	21 9	70 18.3	0 52.4	11 32	49	0 2	1.79	19.14
4	4 35 39	21 9	70 23.5	0 52.5	11 29	45	A. M. 11 58	1.79	19.20
	4 36 0	21 10	70 25.5	0 52.5	11 25	42	11 55	1.80	19.26
6	4 36 20	21 10	70 33.3	0 52.6	11 22	5 38	11 51	1.81	19.32
7	4 36 40	21 11	70 37.8	0 52.7	11 18	35	11 48	1.81	19.38
8	4 36 59	21 12	70 42.2	0 52.8	11 14	31	11 44	1.82	19.44
9	4 37 17	21 12	70 46.3	0 52.8	11 11	27	11 40	1.82	19.50
10	4 37 34	21 13	70 50.4	0 52.9	11 7	24	11 37	1.83	19.56
11	4 37 50	21 13	70 54.2	0 53.0	11 3	5 20	11 33	1.83	19.62
12	4 38 6	21 13	70 57.9	0 53.1	11 0	5 16	11 29	1.84	19.68
13	4 38 20	21 14	71 1.3	0 53.1	10 56	13	11 26	1.85	19.75
14	4 38 34	21 14	71 4.	0 53.2	10 52	9	11 22	1.85	19.81
15	4 38 47	21 15	71 7.7	0 53.3	10 49	5	11 18	1.86	19.87
16	4 39 0	21 15	71 10.7	0 53.4	10 45	2	11 15	1.86	19.93
17	4 39 12	21 15	71 13.4	0 53.4	10 41	4 58	11 11	1.87	20.00
18	4 39 23	21 15	16.0	0 53.5	10 37	4 54	11 7	1.88	20.06
19	4 39 32	21 16	71 18.2	0 53.5	10 31	4 50	11 3	1.88	20.12
20	4 39 41	21 16	71 20.4	0 53.6	10 30	4 47	11 0	1.89	20.19
21	4 39 51	21 16	71 22.3	0 53.7	10 26	4 43	10 56	1.89	20.25
	4 39 58	21 16	71 24.1	0 53.8	10	4 39	10 52	1.90	20.31
23	4 40 5	21 16	71 25.6	0 53.8	10 15	4 35	10 48	1.90	20.38
24	4 40 10	21 17	71 27.1	0 53.9	10 15	4 31	10 45	1.91	20.44
	4 40 15	21 17	71 28.2	0 54.0	10 11	4 28	10 41	1.92	20.50
26	4 40 19	21 17	71 29.2	0 54.1	10 7	4 24	10 37	1.92	20.57
	4 40 23	21 17	71 29.9	0 54.1	10	4 20	10 33	1.93	20.63
28	4 40 26	21 17	71 30.6	0 54.2	9 59	4 16	10 29	1.94	20.70
29	4 40 27	21 17	71 30.9	0 54.2	9 55	4 12	10 25	1.94	20.76
30	4 40 28	N 21 17	71 31.2	S. 0 54.3	9 51	4 8	10 21	1.95	20.82

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## TRIVANDRUM.

Date.	MEAN NOON.				MEAN TIME.				
	Right Ascension.	Declina- tion.	Longitude.	Latitude.	Rising.	Meridian Passage.	Setting	Hor. Par.	Semidia- meter.
Oct.	<i>h m s</i>				<i>h m</i> P. M.	<i>h m</i> A. M.	<i>h m</i> A. M.		
1	4 40 27	N 21 17	71 31.0	80 54.3	9 47	4 4	10 17	1.95	20.89
2	4 40 26	21 16	71 30.8	0 54.4	9 48	4 0	10 13	1.96	20.95
3	4 40 21	21 16	71 30.4	0 54.5	9 39	56	10 9	1.96	21.01
4	4 40 22	21 16	71 29.8	0 54.5	9 35	3 52	10	1.97	21.07
5	4 40 19	21 16	71 28.9	0 54.6	9 31	3 48	10 1	1.98	21.14
6	4 40 14	21 16	71 27.9	0 54.7	9 27	44	9 57	1.98	21.20
	4 40 9	21 16	71 26.7	0 54.7	9 23	3 40	9 53	1.99	21.26
8	4 40 3	21 15	71 5.3	0 54.8	9 19	3 36	9 49	1.99	21.32
9	4 39 56	21 15	71 23.6	0 54.8	9 15	3 32	9 45	2.00	21.38
10	4 39 48	21 15	71 21.8	0 54.9	9 11	3 25	9 41	2.00	21.44
11	4 39 40	21 14	71 19.7	0 55.0	9 7	3 24	9 37	2.01	21.50
12	4 39 30	21 14	71 17.5	0 55.0	9 3	3 20	9 33	2.02	21.56
13	4 39 20	21 14	71 15.0	0 55.0	8 59	3 16	9 29	2.02	21.62
14	4 39 8	21 13	71 12.4	0 55.0	8 55	3 12	9	2.03	21.68
15	4 38 56	21 13	71 9.5	0 55.1	8 50	3 8	9 21	2.03	21.74
16	4 38 43	21 12	71 6.5	0 55.1	8 46	3 3	9 16	2.04	21.80
17	4 38 30	21 12	71 3.3	0 55.2	8 42	2 59	9 12	2.04	21.85
18	4 38 16	21 11	70 59.9	0 55.2	8 38	55	9 8	2.05	21.91
19	4 38 0	21 11	70 56.3	0 55.2	8 34	51	9 4	2.05	21.96
20	4 37 44	21 10	70 52.5	0 55.2	8 30	47	9 0	2.06	22.02
21	4 37 27	21 10	70 48.5	0 55.3	8	43	8 56	2.06	22.07
22	4 37 9	21 9	70 44.4	0 55.3	8 21	38	8 51	2.07	22.13
23	4 36 52	21 8	70 39.9	0 55.3	8 17	34	8 47	2.07	22.18
24	4 36 32	21 8	70 35.4	0 55.3	8 13	30	8 43	2.08	22.23
	4 36 12	21	70 30.7	0 55.3	8 8	26	8 39	2.08	22.28
26	4 35 52	21 6	70 25.9	0 55.3	8 4	21	8 31	2.09	22.33
27	4 35 31	21 6	70 20.8	0 55.3	8 0	17	8 30	2.09	22.38
28	4 35 8	21 5	70 15.6	0 55.3		13	8 26	2.10	22.43
29	4 34 46	21 4	70 10.2	0 55.3	7 51	8	8 21	2.10	22.47
30	4 34 22	21 3	70 4.7	0 55.3	7 47	4	8 17	2.11	22.52
31	4 34 1	N 21	69 59.0	80 55.3	42	0	8 13	2.11	22.56

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TRIVANDRUM.

Date. Nov.	MEAN NOON				MEAN TIME.				
	Right Ascension	Declina- tion.	Longitude.	Latitude.	Rising.	Meridian passage.	Setting.	Hor. Par.	Semidia- meter.
	<i>h.</i>	<i>o</i>			<i>h. m.</i> P. M.	<i>h. m.</i> A. M.	<i>h. m.</i> A. M.		
1	4 33 33	N 21 2	69 53.2	S 0 55.3	7 38	1 55	8 8	2.11	22.60
2	4 33 8	21 1	69 47.2	0 55.3	7 34	1 51	8 4	2.12	22.64
3	4 32 42	21 0	69 41.1	0 55.3	7 29	1 47	8 0	2.12	22.68
4	4 32 15	20 59	69 34.8	0 55.3		1 42	7	2.12	22.72
5	4 31 48	20 58	69 28.4	0 55.2	7 21	1 38	51	2.13	22.76
6	4 31 20	20 57	69 21.8	0 55.2	7 16	1 34	7 47	2.13	22.80
7	4 30 51	20 56	69 15.1	0 55.2	7 12	1 29	7 42	2.13	22.83
8	4 30 22	20 55	69 8.3	0 55.2	7	1 25	7 38	2.14	22.86
9	4 29 53	20 54	69 1.3	0 55.1	7 3	1 20	7 33	2.14	22.90
10	4 29 24	20 53	68 54.2	0 55.1	6 58	1 16	7 29	2.14	22.93
11	4 28 53	20 52	68 47.0	0 55.0	6 54	1 11	7 24	2.15	22.95
12	4 28 23	20 51	68 39.8	0 55.0	6 50	1	7 20	2.15	22.98
13	4 27 51	20 50	68 32.4	0 54.9	6 45	1 3	7 16	2.15	23.01
14	4 27 20	20 49	68 24.9	0 54.8	6 41	0 55	7 11	2.15	23.03
15	4 26 47	20 48	68 17.4	0 54.7	6 36	0 54	7	2.16	23.05
16	4 26 15	20 46	68 9.7	0 54.7	6 32	0 49		2.16	23.07
17	4 25 42	20 45	68 1.9	0 54.6	6 27	0 45	6 58	2.16	23.09
18	4 25 9	20 44	67 54.2	0 54.5	6 23	0 40	6 53	2.16	23.11
19	4 24 36	20 43	67 46.3	0 54.4	6 18	0 36	6 49	2.16	23.13
20	4 24 2	20 42	67 38.4	0 54.3	6 14	0 31	6 44	2.16	23.14
21	4 23 29	20 41	67 30.4	0 54.2	6 9	0 27	6 40	2.16	23.15
22	4 22 55	20 39	67 22.4	0 54.1	6	0 22	6	2.17	23.16
23	4 22 20	20 38	67 14.3	0 54.0	6 0	0 18	6 31	2.17	23.17
24	4 21 46	20 37	67 6.2	0 53.9	56	0 13	6 26	2.17	23.18
25	4 21 12	20 36	66 58.1	0 53.8	51	0 9	6 22	2.17	23.18
26	4 20 37	20 34	66 49.9	0	47	0 4	6 17	2.17	23.18
27	4 20 3	20 33	66 41.7	0 53.6	5 42	{ midnight P. M. 11 55}	6 13	2.17	23.19
28	4 19 25	20 32	66 33.6	0 53.5	5 38	11 51	6 8	2.17	23.19
29	4 18 54	20 31	66 25.4	0 53.3	5 33	11 46	6 4	2.17	23.18
30	4 18 19	N 20 29	66 17.2	S 0 53.2	5 29	11 42	5 59	2.17	23.18

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TRIVANDRUM.

Date. Dec.	MEAN NOON.				MEAN TIME.				
	Right Ascension.	Decli- nation.	Longitude.	Latitude.	Rising.	Meridian Passage.	Setting.	Hor Par.	Semidia- meter.
	<i>h</i> <i>s</i>				<i>h</i> <i>m</i> P.   M.	<i>h</i> <i>m</i> P.   M.	<i>h</i> <i>m</i> A.   M.		
1	4 17 45	N 20 28	66 9.0	S 0 53.1	5 24	11 37	5 55	2.17	23.18
2	4 17 11	20 27	66 0.9	0 53.0	20	11 33	50	2.17	23.18
3	4 16 36	20 26	65 51.7	0 52.8	15	11 28	46	2.17	23.16
4	4 16 2	20 24	65 44.7	0 52.7	5 11	11 24	41	2.16	23.15
5	4 15 28	20 23	65 36.6	0 52.5	6	11 19	37	2.16	23.13
6	4 14 54	20 22	65 28.6	0 52.4	2	11 15	32	2.16	23.12
	4 14 21	20 21	65 20.6	0 52.2	4 57	11 10	28	2.16	23.10
8	4 13 47	20 19	65 11.7	0 52.0	4 53	11 6	23	2.16	23.08
9	4 13 14	20 18	65 4.8	0 51.8	4 48	11 1	19	2.16	23.06
10	4 12 41	20 17	64 57.0	0 51.7	4 44	10 57	14	2.15	23.04
11	4 12 9	20 16	64 49.2	0 51.5	4 39	10	10	2.15	23.02
12	4 11 36	20 14	64 41.5	0 51.3	4 35	10 48	5	2.15	22.99
13	4 11 4	20 13	64 33.9	0 51.1	4 31	10 44	1	2.15	22.97
14	4 10 33	20 12	64 26.5	0 50.9	4 26	10 39	4	2.14	22.94
15	4 10 2	20 11	64 19.0	0 50.7	4 22	10 35	4 52	2.14	22.91
16	4 9 31	20 10	64 11.7	0 50.6	4 17	10 30	4 48	2.14	22.88
17	4 9 0	20 9	64 4.5	0 50.4	4 13	10 26	4 43	2.14	22.85
18	4 8 30	20 7	63 57.5	0 50.2	4 8	10 21	4 39	2.13	22.81
19	4 8 1	20 6	63 50.5	0 50.0	4 4	10 17	4 34	2.13	22.77
20	4 7 32	20 5	63 43.7	0 49.8	4 1	10 13	4 30	2.13	22.74
21	4 4	20 4	63 36.9	0 49.5	56	10 8	4	2.12	22.70
	4 6 37	20 3	63 30.4	0 49.3	52	10 4	4 20	2.12	22.66
23	4 6 10	20 2	63 23.9	0 49.1	3 47	9 59	4 16	2.11	22.62
24	4 5 43	20 1	63 17.6	0 48.9	3 43	9 55	4 11	2.11	22.57
25	4 17	20 0	63 11.4	0 48.7	3 39	9 51	4 7	2.10	22.53
26	4 4 51	19 59	63 5.5	0 48.5	3 34	9 46	4 3	2.10	22.48
27	4 4 26	19 58	62 59.5	0 48.2	3 30	9 42	3 58	2.09	22.44
28	4 4 3	19 57	62 53.8	0 48.0	3 26	9 38	3 54	2.09	22.39
29	4 3 39	19	62 48.2	0 47.8	21	9 33	3 50	2.08	22.34
30	4 3 17	19 56	62 42.9	0 47.6	3 17	9 29	3 45	2.08	22.29
31	4 2 55	N 19 55	62 37.6	S 0 47.3	3 13	9 25	3 41	2.08	22.24

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## SATURN.

## TRIVANDRUM.

Date. Jan.	MEAN NOON.				MEAN TIME.				
	Right Ascension.	Declina- tion,	Longitude.	Latitude.	Rising.	Meridian passage.	Setting.	Hor. Par.	Semidia- meter.
1	<i>h. m. s.</i> 5 2 29	<sup>o</sup> N. 20 39	<sup>o</sup> 118 27.8	<sup>o</sup> N. 0 10.3	<i>h. m.</i> P. M. 7 6	<i>h. m.</i> A. M. 1 23	<i>h. m.</i> A. M. 7 36	1.09	9.54
2	2 10	20 40	118 23.2	0 10.4	1	1 19	32	1.09	9.55
3	8 1 51	20 41	118 18.6	0 10.6	6 57	1 14	7 27	1.09	9.55
4	8 1 31	20 42	118 13.9	0 10.7	6	1 10	7 23	1.09	9.56
	8 1 12	20 43	118 9.2	0 10.8	6 49	1 6	19	1.09	9.56
6	8 0 52	20 44	118 4.5	0 10.9	6 44	1 2	15	1.09	9.57
7	8 0 32	20 45	117	0 11.0	6 40	0 57	10	1.09	9.57
8	8 0 12	20 46	117 54.9	C 11.1	6 36	0 53	6	1.09	9.57
9	7 59 52	20 47	117 50.1	0 11.2	6 32	0 49	2	1.09	9.58
10	7 59 32	20 48	117 45.2	0 11.3	6 27	0 45	6 58	1.09	9.58
11	7 59 11	20 49	117 40.3	0 11.5	6 23	0 40	6 53	1.09	9.58
12	7 58 51	20 50	117 35.4	0 11.6	6 19	36	6 49	1.09	9.58
13	58 31	20 52	117 30.5	0 11.7	6 15	0 32	6 45	1.09	9.59
14	58 10	20 53	117 25.6	0 11.8	6 10	0 28	6 41	1.09	9.59
15	49	20 54	117 20.7	0 11.9	6 6	0 23	6 36	1.09	9.59
16	57 29	20 55	117 15.8	0 12.0	6 2	0 19	6 32	1.09	9.59
17	8	20 56	117 10.8	0 12.1	5 57	0 15	6 28	1.09	9.59
18	56 47	20 57	117 5.9	0 12.2	53	0 10	6 23	1.09	9.59
19	7 56 27	20 58	117 0.9	0 12.3	5 49	0 6	6 19	1.09	9.59
20	7 56 6	20 59	116 56.0	0 12.4	5 45	{ 0 2 P. M. 11 58	6 15	1.09	9.59
21	7 55 45	21 0	116 51.0	0 12.5	5 40	11 53	6 11	1.09	9.59
22	7 55 25	21 1	116 46.1	0 12.6	5 36	11 49	6 6	1.09	9.58
23	7 55 4	21 2	116 41.2	0 12.8	5 32	11 45	6 2	1.09	9.58
24	7 54 44	21 3	116 36.3	0 12.9	5 28	11 41	58	1.09	9.58
25	7 54 23	21 4	116 31.4	0 13.0	5 23	11 36	5 54	1.09	9.58
26	7 54 3	21 5	116 26.6	0 13.1	5 19	11 32	5 49	1.09	9.57
27	7 53 43	21 6	116 21.8	0 13.2	5 15	11 28	5 45	1.09	9.57
28	7 53 22	21 7	116 16.0	0 13.3	5 11	11 24	5 41	1.09	9.57
29	7 53 2	21 8	116 12.0	0 13.4	6	11 19	37	1.09	9.56
30	7 52 43	21 9	116 7.5	0 13.5	5 2	11 15	5 32	1.09	9.56
31	52 23	N. 21 10	116 2.8	N. 0 13.6	4 58	11 11	5 28	1.09	9.55

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## TRIVANDRUM.

Date. Feb.	MEAN NOON.				MEAN TIME.				
	Right Ascension.	Declina- tion.	Longitude.	Latitude.	Rising	Meridian Passage.	Setting.	Hor. Par.	Semidia- meter.
1	<i>h</i> 3	N 21 11	115 55.2	N 0 13.7	<i>h m</i> P. M. 4 53	<i>h m</i> P. M. 11 6	<i>h m</i> A. M. 5 21	1.08	9.55
2	7 51 44	21 12	115 53.5	0 13.8	4 49	11 2	19	1.08	9.54
3	7 51 25	21 13	115 49.0	0 13.9	4 45	10 58	15	1.08	9.53
4	7 51 6	21 14	115 44.4	0 14.0	4 41	10 54	5 11	1.08	9.52
5	50 47	21 15	115 39.9	0 14.1	4 37	10 50		1.08	9.52
6	7 50 28	21 16	115 35.4	0 14.2	4 32	10 45	3	1.08	9.51
7	7 50 10	21 17	115 31.1	0 14.3	4 28	10 41	4 58	1.08	9.50
8	7 49 52	21 18	115 26.7	0 14.4	4 24	10 37	4 54	1.08	9.49
9	49 31	21 19	115 22.5	0 14.5	4 20	10 33	4 50	1.08	9.48
10	7 49 16	21 19	115 18.3	0 14.6	4 15	10 28	4 46	1.08	9.48
11	7 48 58	21 20	115 14.2	0 14.6	4 11	10 24	4 41	1.08	9.48
12	7 48 41	21 21	115 10.1	0 14.7	4	10 20	4	1.08	9.47
13	7 48 24	21 22	115 6.1	0 14.8	4	10 16	4 33	1.07	9.46
14	7 48 8	21 23	115 2.1	0 14.9	3 59	10 12	4 29	1.07	9.45
15	7 47 52	21 24	114 58.3	0 15 0	3 54	10 7	4 25	1.07	9.44
16	47 35	21 24	114 54.4	0 15.1	3 50	10	4 20	1.07	9.43
17	7 47 20	21 25	114 50.8	0 15.2	3 46	9 59	4 16	1.07	9.42
18	7 47 4	21 26	114 47.1	0 15.3	3 42	9 55	12	1.07	9.41
19	7 46 49	21 27	114 43.5	0 15.4	3 38	9 51	4 8	1.07	9.40
20	7 46 35	21 27	114 40.0	0 15.5	3 33	9 46	4 4	1.07	9.38
21	46 20	21 28	114 36.7	0 15.5	3 29	9 42	3 59	1.06	9.37
22	7 46 6	21 29	114 33.3	0 15.6	3 25	9 38	3	1.06	9.26
23	7 45 53	21 29	114 30.1	0 15.7	3 21	9 34	3 51	1.06	9.35
24	7 45 39	21 30	114 26.9	0 15.8	3 17	9 30	3	1.06	9.34
25	7 45 27	21 31	114 23.6	0 15.9	3 13	9 26	3 43	1.06	9.32
26	7 45 14	21 31	114 20.5	0 16.0	3 8	9 21	3 39	1.06	9.31
27	7 45 2	21 32	114 18.0	0 16.0	3 4	9 17	3 34	1.06	9.30
28	7 44 50	N 21 32	114 15.2	N 0 16 1	3 0	9 13	30	1.05	9.29

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## TRIVANDRUM.

Date. March.	MEAN NOON.				MEAN TIME.				
	Right ascen. ion.	Declination.	Longitude.	Latitude.	Rising.	Meridian passage.	Setting.	Hor. Par.	Semidia- meter.
	<i>h</i> <i>s</i>				<i>h</i> <i>m</i>	<i>h</i> <i>m</i>	<i>h</i> <i>m</i>		
1	7 44 39	N. 21 33	114 12.5	N 0 16.2	2 56 P. M.	9 9 P. M.	3 26 A. M.	1.05	9.27
	7 44 28	21 33	114 9.9	0 16.3	2 52	9 5	3 22	1.05	9.26
3	44 18	21 34	114 7.5	0 16.4	2 48	9 1	3 18	1.05	9.25
4	44 8	21 34	114 5.1	0 16.5	2 44	8 57	3 11	1.05	9.23
5	43 58	21 35	114 2.9	0 16.5	2 40	8 53	3 10	1.05	9.22
6	7 43 49	21 35	114 0.7	0 16.6	2 36	8 49	3 6	1.05	9.20
7	7 43 40	21 36	113 58.6	0 16.7	2 32	8 45	3 2	1.04	9.19
8	7 43 32	21 36	113 56.5	0 16.8	2 28	8 41	2 58	1.04	9.18
9	7 43 24	21 37	113 54.	0 16.8	2 23	8 36	2 54	1.04	9.16
10	7 43 16	21 37	113 52.9	0 16.9	2 19	8 32	49	1.04	9.15
11	7 43 9	21 37	113 51.3	17.0	2 15	8 28	45	1.04	9.13
12	7 43 3	21 38	113 49.7	0 17.1	2 11	8 24	41	1.04	9.12
13	7 42 56	21 38	113 48.3	0 17.1	2 7	8 20	37	1.03	9.10
14	7 42 51	21 38	113 46.9	0 17.2	2 3	8 16	33	1.03	9.09
15	7 42 46	21 39	113 45.7	0 17	1 58	8 12	2 29	1.03	9.07
16	7 42 41	21 39	113 44.5	0 17.4	1 54	8 8	2 26	1.03	9.05
17	7 42 36	21 39	113 43.6	0 17.4	1 50	8 4	2 22	1.03	9.04
18	7 42 33	21 39	113 42.6	0 17.5	1 46	8 0	2 18	1.03	9.02
19	7 42 29	21 40	113 41.8	0 17.5	1 42	7 56	2 14	1.02	9.01
20	42 26	21 40	113 41.0	0 17.6	1 38	7 52	2 10	1.02	8.99
21	7 42 24	21 40	113 40.5	0 17.7	1 34	48	2 6	1.02	8.98
22	7 42 22	21 40	113 40.0	0 17.8	1 30	7 44	2 2	1.02	8.96
23	7 42 20	21 40	113 39.7	0 17.9	1 26	7 40	1 58	1.02	8.94
24	7 42 19	21 40	113 39.4	0 18.0	1 22	36	1 54	1.01	8.93
	7 42 19	21 40	113 39.3	0 18.0	1 19	7 33	1 50	1.01	8.91
26	7 42 19	21 40	113 39.2	0 18.1	1 15	7 29	1 47	1.01	8.90
27	7 42 19	21 41	113 39.4	0 18.1	1 11	7 25	1 43	1.01	8.88
28	42 20	21 41	113 39.6	0 18.2	1 7	21	1 39	1.01	8.86
29	42 21	21 41	113 39.8	0 18.2	1 3	17	1 35	1.01	8.85
30	42 23	21 41	113 40.2	0 18.3	0 59	7 13	1 31	1.00	8.83
31	7 42 25	N 21 41	113 40.8	N 0 18.4	0 55	9	1 27	1.00	8.82

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TRIVANDRUM.

Date.	MEAN NOON.				MEAN TIME.				
	Right Ascension.	Declination.	Longitude.	Latitude.	Rising.	Meridian Passage.	Setting	Hor. Par.	Semidiameter.
April.	<i>h</i>				<i>h m</i>	<i>h m</i>	<i>h m</i>		
1					<i>P M</i>	<i>P M</i>	<i>A M</i>		
2	7 42 28	N. 21 41	113 41.4	N 0 18.5	0 51	7 5	1 23	1.00	8.50
3	7 42 31	21 40	113 42.1	0 18	0 47	1	1 19	1.00	8.78
	42 35	21 40	113 43.0	0 18.6	0 43	6	1 15	1.00	8.77
4	7 42 39	21 40	113 44.0	0 18.6	0 40	6 54	1 11	0.99	8.75
5	42 44	21 40	113 45.1	0 18.7	0 36	6 50	1 8	0.99	8.73
6	7 42 49	21 40	113 46.3	0 18.7	0 32	6 46	1 4	0.99	8.72
8	7 42 54	21 40	113 47.6	0 18.8	0 28	42	1 0	0.99	8.70
9	13 0	21 40	113 49.0	0 18.9	0 24	6 38	0	0.99	8.68
	7 43 7	21 39	113 50.5	0 19.0	0 20	6 34	0 52	0.98	8.67
10	43 13	21 39	113 52.1	0 19.0	0 17	6 31	0 48	0.98	8.65
11	43 21	21 39	113 53.8	0 19.1	0 13	6 27	0 45	0.98	8.64
12	7 43 28	21 39	113	0 19.1	0 9	6	0 41	0.98	8.62
13	13 37	21 38	113 57.6	0 19.2	0 6	6 19	0 37	0.98	8.60
14	7 43 45	21 38	113 59.7	0 19.2	0 2	15	0 32	0.98	8.59
15	7 43 54	21 38	114 1.8	0 19.3	<sup>A M</sup> 11 59	6 12	0 28	0.97	8.57
16	7 44 4	21 38	114 4.0	0 19.4	11 55	6 8	0	0.97	
17	44 11	21 37	114 6.3	0 19.5	11 51	6 4	0 21	0.97	8.54
18	44 24	21	114 8.8	0 19.5	11 47	6 0	0 17	0.97	8.53
19	7 44 35	21 36	114 11.4	0 19.6	11 44		0 13	0.97	8.51
20	44 46	21 36	114 14.0	0 19.6	11 40	5 53	0 10	0.97	8.49
21	7 44 58	21 36	114 16.7	0 19.7	11 36	5 49	0 6	0.96	8.48
22	45 10	21 35	114 19.6	0 19.7	11 32	45	0 2	0.96	8.47
23	7 45 23	21 35	114 22.6	0 19.8	11 29		<sup>P M</sup> 11 58	0.96	8.45
24	7 45 36	21 34	114 25.6	0 19.8	11	5 38	11 51	0.96	8.43
25	7 45 49	21 34	114 28.7	0 19.9	11 21	34	11 47	0.96	8.42
26	46 3	21 33	114 32.0	0 19.9	11 18	31	11 41	0.95	8.40
	46 17	21 33	114 35.3	0 20.0	11 14	27	11 36	0.95	8.39
28	46 32	21 32	114 38.8	0 20.1	11 10	23	11 30	0.95	8.37
29	7 46 47	21 32	114 42.3	0 20.2	11 6	19	11 24	0.95	8.36
30	7 47 2	N 21 31	114 45.9	N 0 20.2	11 3	16	11 19	0.95	8.35

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TRIVANDRUM.

Date. - May.	MEAN NOON.				MEAN TIME.				
	Right Ascension.	Declina- tion.	Longitude.	Latitude.	Rising.	Meridian passage.	Setting.	Hor. Par.	Semidia- meter.
	<i>h</i> <i>s</i>				<i>h</i> <i>m</i> A. M.	<i>h</i> <i>m</i> P. M.	<i>h</i> <i>m</i> P. M.		
1	7 47 18	N.21 30	114 49.6	N. 0 20.3	10 59	5 12	11 25	0.95	8.33
2	7 47 31	21 30	114 53.4	0 20.3	10 55	8	11 21	0.94	8.32
3	7 47 50	21 29	114 57.3	0 20.4	10 52	5	11 18	0.94	8.30
4	7 48 7	21 28	115 1.3	0 20.4	10 48	1	11 14	0.94	8.29
5	7 48 21	21 28	115 5.4	0 20.5	10 45	4 58	11 11	0.94	8.27
6	7 48 42	21 27	115 9.5	0 20.5	10 41	4 54	11 7	0.94	8.26
	7 49 0	21 26	115 13.7	0 20.6	10 37	4 50	11 3	0.94	8.25
8	7 49 18	21 26	115 18.1	0 20.6	10 34	4 47	11 0	0.94	8.23
9	7 49 37	21 25	115 22.5	0 20.7	10 30	4 43	10 56	0.93	8.22
10	7 49 56	21 24	115 26.9	0 20.8	10 26	4 39	10 52	0.93	8.21
11	7 50 15	21 23	115 31.5	0 20.9	10 23	4 36	10 49	0.93	8.19
12	7 50 35	21 23	115 36.2	0 20.9	10 19	4 32	10 45	0.93	8.18
13	7 50 55	21	115 40.9	0 21.0	10 16	4 29	10 42	0.93	8.17
14	7 51 15	21 21	115 45.8	0 21.0	10 12	4 25	10 38	0.93	8.16
15	7 51 36	21 20	115 50.7	0 21.1	10 8	4 21	10 34	0.92	8.14
16	7 51 57	21 19	115 55.6	0 21.1	10 5	4 18	10 31	0.92	8.13
17	7 52 18	21 18	116 0.6	0 21.2	10 1	4 14	10 27	0.92	8.12
18	7 52 40	21 17	116 5.8	0 21.2	9 58	4 11	10 24	0.92	8.10
19	7 53 2	21 16	116 11.0	0 21.3	54	4 7	10 20	0.92	8.09
20	7 53 21	21 15	116 16.3	0 21.4	9 51	4 4	10 17	0.92	8.08
21	7 53 46	21 15	116 21.6	0 21.5	9 47	4 0	10 13	0.92	8.07
	54 9	21 14	116 27.0	0 21.5	9 43	3 56	10 9	0.92	8.06
23	54 32	21 13	116 32.4	0 21.6	9 40	3 53	10 6	0.91	8.05
24	7 54 56	21 12	116 38.0	0 21.6	9 36	3 49	10 2	0.91	8.04
25	7 55 19	21 11	116 43.6	0 21.7	9 33	3 46	9 59	0.91	8.02
26	7 55 43	21 10	116 49.3	0 21.7	9 29	3 42	9	0.91	8.01
	7 56 8	21 8	116 55.1	0 21.8	9 26	3 39	9 52	0.91	8.00
	7 56 32	21 7	117 0.9	0 21.8	9	3 35	9 48	0.91	7.99
29	7 56 57	21 6	117 6.8	0 21.9	9 19	3 32	9 45	0.91	7.98
30	7 57 22	21	117 12.7	0 22.0	9 15	3 28	9 41	0.91	7.97
31	7 57 47	N.21 4	117 18.7	N.0 22.1	9 12	3	9 38	0.90	7.96

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## TRIVANDRUM.

Date. June.	MEAN NOON.				MEAN TIME.				
	Right Ascension.	Declina- tion.	Longitude.	Latitude	Rising.	Meridian Passage.	Setting.	Hor. Par.	Semidia- meter.
	<i>h</i>	<i>s</i>			<i>h</i>	<i>h</i>	<i>h</i>		
1	7 58 13	N. 21 3	117 24.8	N. 0 22.1	A. M. 9 8	P. M. 3 21	P. M. 9 34	0.90	7.95
2	7 58 33	21 2	117 30.9	0 22.2	9 5	3 18	9 31	0.90	7.94
3	7 59 4	21 1	117 37.1	0 22.2	9 1	3 14	9 27	0.90	7.93
4	7 59 31	21 0	117 43.3	0 22.3	8 58	3 11	9 24	0.90	7.92
5	7 59 57	20 58	117 49.6	0 22.3	8 54	3	9 20	0.90	7.91
6	8 0 24	20 57	117 56.0	0 22.4	8 51	3 4	9 17	0.90	7.90
7	8 0 51	20 56	118 2.3	0 22.4	8 47	3 0	9 13	0.90	7.89
8	8 1 18	20 55	118 8.7	0 22.5	8 44	2 57	9 10	0.90	7.89
9	8 1 45	20 53	118 15.2	0 22.6	8 40	2 53	9 6	0.89	7.88
10	8 2 13	20 52	118 21.8	0 22.7	8 37	2 50	9 3	0.89	7.87
11	8 2 40	20 51	118 28.4	0 22.7	8 33	2 46	8 59	0.89	7.86
12	8 3 8	20 50	118 35.1	0 22.8	8 30	2 43	8 56	0.89	7.85
13	8 3 36	20 48	118 41.8	0 22.8	8 26	2 39	8 52	0.89	7.84
14	8 4 5	20 47	118 48.6	0 22.9	8 23	2 36	8 49	0.89	7.83
15	8 4 33	20 46	118 55.4	0 23.0	8 19	2	8 45	0.89	7.83
16	8 5 2	20 44	119	0 23.1	8 16	2 29	8 42	0.89	7.82
17	8 5 31	20 43	119 9.0	0 23.1	8 13	2 26	8 39	0.89	7.81
18	8 5 59	20 42	119 15.9	0 23.2	8 9	2 22	8 35	0.89	7.80
19	8 6 28	20 40	119 22.9	0 23.2	8 6	2 19	8 32	0.89	7.80
20	8 6 58	20 39	119 29.9	0 23.3	8 2	2 15	8 28	0.89	7.79
21	8 7 28	20 37	119 36.9	0 23.4	7	2 12	8 25	0.89	7.78
22	8 7 57	20 36	119 44.0	0 23.5	7	8	8 21	0.88	7.78
23	8 8 27	20 35	119 51.1	0 23.5	7		8 18	0.88	7.77
24	8 8 57	20 33	119 58.3	0 23.6	7 48	1	8 14	0.88	
25	8 9 27	20 32	120 5.5	0 23.6	45	1 58	8 11	0.88	7.76
26	8 9 57	20 30	120 12.8	0 23.7	42	1 55	8 8	0.88	
27	8 10 27	20 29	120 20.0	0 23.8	38	1 51	8 4	0.88	7.75
28	8 10 58	20 27	120 27.3	0 23.9		1 48	8 1	0.88	7.74
29	8 11 29	20 26	120 34.5	0 23.9	7 31	1 44		0.88	7.74
30	8 11 59	N. 20 21	120 41.9	N. 0 24.0	7	1 41	7 51	0.88	7.73

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## TRIVANDRUM.

Day.	MEAN NOON.				MEAN TIME.				
	Right Ascension.	Declina- tion.	Longitude.	Latitude.	Rising.	Meridian passage.	Setting.	Hor. Par.	Semidia- meter.
July.	<i>h</i> <i>s</i>				<i>h</i> <i>m</i> A. M.	<i>h.</i> <i>m.</i> P. M.	<i>h.</i> <i>m.</i> P. M.		
1	8 12 30	N. 20 23	120 49.3	N. 0 24 1	7 21	1 37	7 50	0.88	7.73
2	8 13 1	20 21	120 56.7	0 24.2	7 21	34	7 47	0.88	7.72
3	8 13 32	20 20	121 4.1	0 24.2	7 18	1 3	44	0.88	7.72
4	8 14 3	20 18	121 11.6	0 24.3	7 14	1 27	7 40	0.88	7.71
5	8 14 34	20 16	121 19.0	0 24.3	7 11	1 21	37	0.87	7.71
6	8 15 5	20 15	121 26.5	0 24.4	7 7	1 20	33	0.87	7.71
7	8 15 36	20 13	121 34.0	0 24.4	7 4	1 17	30	0.87	7.70
8	8 16 8	20 12	121 41.6	0 24.6	7 1	1 14		0.87	7.70
9	8 16 39	20 10	121 49.2	0 24.6	6 57	1 10	7 23	0.87	7.70
10	8 17 11	20 8	121 56.8	0 24.7	6 54	1 7	7 20	0.87	7.69
11	8 17 42	20 7	122 4.4	0 24.8	6 56	1 3	7 16	0.87	7.69
12	8 18 14	20 5	122 12.0	0 24.9	6 48	1 0	7 12	0.87	7.69
13	8 18 46	20 3	122 19.6	0 25.0	6 45	0	9	0.87	7.68
14	8 19 18	20 2	122 27.3	0 25.1	6 41	0 53	7 5	0.87	7.68
15	8 19 50	20 0	122 34.9	0 25.1	6 38	0 50	7 2	0.87	7.68
16	8 20 21	19 58	122 42.6	0 25.2	6 34	0 46	6 58	0.87	7.68
17	8 20 53	19 57	122 50.3	0 25.3	6 31	0 43	6 55	0.87	7.67
18	8 21 25	19 55	122 58.0	0 25.4	6 28	0 40	6 52	0.87	7.67
19	8 21 57	19 53	123	0 25.5	6 24	0 36	6 48	0.87	7.67
20	8 22 29	19 52	123 13.5	0 25.5	6 21	0 33	6 45	0.87	8.67
21	8 23 1	19 50	123 21.2	0 25.6	6 17	0 29	6 41	0.87	7.67
22	8 23 33	19 48	123 28.9	0 25.7	6 14	0 26	6 38	0.87	7.67
23	8 24 6	19 46	123 36.6	0 25.8	6 10	0 22	6 34	0.87	7.67
24	8 24 38	19 45	123 44.4	0 25.9	6 7	0 19	6 31	0.87	7.67
25	8 25 10	19 43	123 52.1	0 26.0	6 4	0 16	6 28	0.87	7.67
26	8 25 44	19 41	123 59.9	0 26.0	6 0	0 12	6 24	0.87	7.66
27	8 26 14	19 39	124 7.6	0 26.1	5	0 9	6 21	0.87	7.66
28	8 26 46	19 38	124 15.4	0 26.2	5 53	0 5	6 17	0.87	7.66
29	8 27 18	19 36	124 23.1	0 26.3	50	0 2	6 11	0.87	7.66
30	8 27 50	19 34	124 30.9	0 26.4	5 47	A. M. 11 59	6 7	0.87	7.67
31	8 28 22	N. 19 32	124 38.6	N. 26.5	13	11	4	0.87	7.67

## SATURN

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TRIVANDRUM.

Date. Aug.	MEAN NOON.				MEAN TIME.				
	Right Ascension.	Declina- tion	Longitude.	Latitude.	Rising.	Meridian passage	Setting.	Hor. Par.	Semi- diameter
	<i>h m s</i>	<i>° ′</i>	<i>°</i>	<i>°</i>	<i>h m</i> A M	<i>h m</i> A M	<i>h m</i> P M	<i>″</i>	<i>″</i>
1	8 28 54	N 19 31	124 46.4	N 0 26.5	5 40	11 52	6 4	0.87	7.67
2	8 29 26	19 29	124 54.1	0 26.6	5 36	11 48	6 0	0.87	7.67
3	8 29 58	19 27	125 1.8	0 26.7	5 33	11 45	5 57	0.87	7.67
4	8 30 30	19	125 9.5	0 26.8	5 30	11 42	5 54	0.87	7.67
5	8 31 1	19 24	125 17.3	0 26.9	5 26	11 38	5 50	0.87	7.67
6	8 31 33	19	125 25.0	0 27.0	5 23	11 35	5 47	0.87	7.67
7	8 32 5	19 20	125 32.7	0 27.1	5 19	11 31	5 43	0.87	7.67
8	8 32 37	19 18	125 40.3	0 27.2	5 16	11 28	5 40	0.87	7.68
9	8 33 8	19 16	125 48.0	0 27.3	5 13	11 25	5 37	0.87	7.68
10	8 33 40	19 15	125 55.6	0 27.3	5 9	11 21	5 33	0.87	7.68
11	8 34 11	19 13	126 3.3	0 27.4	5 6	11 18	5 30	0.87	7.68
12	8 34 43	19 11	126 10.9	0 27.5	5 2	11 14	5 26	0.87	7.68
13	8 35 14	19 9	126 18.6	0 27.6	4 59	11 11	5 23	0.87	7.69
14	8 35 45	19 7	126 26.1	0 27.7	4 56	11 8	5 20	0.87	7.69
15	8 36 16	19 6	126 33.7	0 27.8	4 52	11 4	5 16	0.87	7.70
16	8 36 49	19 4	126 41.2	0 27.9	4 49	11 1	5 13	0.87	7.70
17	8 37 18	19 2	126 48.8	0 28.0	4 45	10 57	5 9	0.87	7.70
18	8 37 49	19 0	126 56.3	0 28.1	4 42	10 54	5 6	0.87	7.71
19	8 38 20	18 58	127 3.9	0 28.2	4 39	10 51	5 3	0.87	7.71
20	8 38 51	18	127 11.3	0 28.3	4 35	10 47	5 59	0.88	7.71
21	8 39 21	18	127 18.8	0 28.4	4 32	10 44	5 16	0.88	7.72
22	8 39 52	18 53	127 26.2	0 28.5	4 28	10 40	5 52	0.88	7.72
23	8 40 22	18 51	127 33.6	0 28.6	4 25	10 37	5 49	0.88	7.73
24	8 40 52	18 49	127 40.9	0 28.7	4 21	10 33	5 45	0.88	7.73
25	8 41 23	18 48	127 48.3	0 28.8	4 18	10 30	5 42	0.88	7.74
26	8 41 53	18 46	127 55.6	0 28.9	4 14	10 26	5 38	0.88	7.74
27	8 42 22	18 44	128 2.9	0 29.1	4 11	10 23	5 35	0.88	7.75
28	8 42 52	18 42	128 8.1	0 29.2	4 8	10 20	5 32	0.88	7.75
29	8 43 21	18 40	128 17.4	0 29.3	4 4	10 16	5 28	0.88	7.76
30	8 43 51	18 39	128 22.5	0 29.4	4 1	10 13	5 25	0.88	7.76
31	8 44 20	N 11 37	128 31.6	N 0 29.5	3 58	10 9	5 21	0.88	7.77

## SATURN

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## TRIVANDRUM.

Date. Sept.	MEAN NOON.				MEAN TIME.				
	Right Ascension.	Declina- tion.	Longi- tude.	Latitude.	Rising.	Meridian passage.	Setting.	Hor. Par.	Semi- diameter
	<i>h</i>	<i>°</i>			<i>h. m.</i> A. M.	<i>h. m.</i> A. M.	<i>h. m.</i> P. M.		
1	8 41 49	N 18 35	125 38.7	N 0 29.6	3 55	10 6	4 17	0.55	7.78
2	8 45 18	18 33	128 45.8	0 29.7	3 51	10 2	4 13	0.55	7.78
3	8 45 47	18 32	128 52.8	0 29.8	48	9 59	4 10	0.58	7.79
4	8 46 15	18 30	128 59.8	0 29.9	3 44	9 55	4 6	0.58	7.80
5	8 46 44	18 28	129 6.7	0 30.0	3 41	9 52	4 3	0.59	7.80
	8 47 12	18 26	129 13.6	0 30.2	38	9 49	4 0	0.59	7.81
7	8 47 40	18	1 2 07.5	0 30.3	34	9 45	3 56	0.59	7.82
8	8 48 8	18 23	129 27.4	0 30.4	3 31	9 42	3 53	0.59	7.83
9	8 48 35	18 21	129 34.1	0 30.5	3 27	9 38	3 49	0.59	7.83
10	8 49 3	18 20	129 40.8	0 30.6	3 24	9 35	3 46	0.59	7.84
11	8 49 3	18 18	129 47.4	0 30.7	3 20	9 31	3 42	0.59	7.85
12	8 49 57	18 16	129 54.1	0 30.9	3 17	9 28	3 39	0.59	7.86
13	8 50 24	18 15	130 0.6	0 31.0	3 13	9 24	3	0.59	7.87
14	8 50 50	18 13	130 7.2	0 31.1	3 10	9 21	3 32	0.90	7.87
15	8 51 17	18 11	130 13.6	0 31.2	3 6	9 17	3 28	0.90	7.88
16	8 51 43	18 10	130 20.1	0 31.3	3 3	9 14	3 25	0.90	7.89
17	8 52 9	18 8	130 26.	0 31.4	2 59	9 10	3 21	0.90	7.9
18	8 52 35	18 7	130 32.8	0 31.6	2 56	9 7	3 18	0.90	7.91
19	8 53 0	18 5	130 39.0	0 31.7	52	9 3	3 14	0.90	7.92
20	8 53 26	18 3	130 45.2	0 31.8	2 49	9 0	3 11	0.90	7.93
21	8 53 50	18 2	130 51.3	0 31.9	2 45	8 56	3 7	0.90	7.94
22	8 54 15	18 0	130 57.4	0 32.1	2 42	8 53	3 4	0.90	7.95
23	8 54 40	17 59	131 3.3	0 32.2	2 38	8 49	3 0	0.90	7.96
24	8 54	17 57	131 9.3	0 32.4	35	8 46	2 57	0.91	7.97
25	8 55 28	17 56	131 15.2	0 32.5	31	8 42	2 53	0.91	7.98
26	8 55 51	17 54	131 21.1	0 32.6	2 28	8 39	2 50	0.91	7.99
27	8 56 15	17 53	131 26.8	0 32.7	2 24	8 35	2 46	0.91	8.00
28	8 56 38	17 51	131 32.5	0 32.9	2 20	8 31	2 42	0.91	8.01
29	8 57 1	17 50	131 38.0	0 33.0	2 17	8 28	2 39	0.91	8.02
30	8 57 23	N 17 49	131 43.6	N 0 33.2	2 13	8 24	2 35	0.91	8.04

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## TRIVANDRUM.

Date	MEAN NOON.				MEAN TIME.				
	Right Ascension	Declination.	Longitude.	Latitude.	Rising.	Meridian Passage.	Setting	Hor. Par	Semilia- meter.
Oct.									
	<i>h m s</i>		<i>°</i>	<i>°</i>	<i>h m</i> A M.	<i>h m</i> A M.	<i>h m</i> P M.	<i>"</i>	<i>'</i>
1	8 57 45	N 17 47	131 19.1	N. 0 33.3	2 10	8 21	2 32	0.91	8 05
2	8 58 7	17 46	131 51.6	0 33.4	2 6	8 17	2 28	0.92	8 06
3	8 58 29	17 44	131 59.8	0 33.5	2 3	8 14	2 25	0.92	8 07
4	8 58 50	17 43	132 5.1	0 33.7	1 59	8 10	2 21	0.92	8 08
5	8 59 12	17 42	132 10.2	0 33.8	1 55	8 6	2 17	0.92	8 09
6	8 59 32	17 40	132 15.4	0 34.0	1 52	8 3	2 14	0.92	8 11
7	8 59 53	17 39	132 20.4	0 34.1	1 48	7 59	2 10	0.92	8 12
8	9 0 13	17 38	132 25.4	0 34.3	1 45	7 56	2 7	0.92	8 13
9	9 0 33	17 37	132 30.3	0 34.4	1 41	7 52	2 1	0.93	8 14
10	9 0 52	17 35	132 35.1	0 34.5	1 37	7 48	1 59	0.93	8 16
11	9 1 11	17 34	132 39.7	0 34.6	1 34	7 45	1 56	0.93	8 17
12	9 1 30	17 33	132 44.4	0 34.8	1 30	41	1 52	0.93	8 18
13	9 1 49	17 32	132 48.9	0 34.9	1 27	7 38	1 49	0.93	8 19
14	9 2 7	17 31	132 53.4	0 35.1	1 23	7 34	1 45	0.93	8 21
15	9 2 25	17 30	132 57.8	0 35.2	1 19	7 30	1 41	0.93	8 22
16	9 2 42	17 29	133 2.1	0 35.4	1 16	7 27	1 38	0.94	8 23
17	9 2 59	17 28	133 6.2	0 35.5	1 12	7 23	1 34	0.94	8 25
18	9 3 16	17 27	133 10.4	0 35.7	1 8	19	1 30	0.94	8 26
19	9 3 32	17 26	133 14.4	0 35.8	1 5	7 16	1 27	0.94	8 28
20	9 3 48	17 25	133 18.4	0 36.0	1 1	7 12	1 23	0.94	8 29
21	9 4 4	17 24	133 22.1	0 36.1	0 57	7 8	1 19	0.94	8 30
22	9 4 19	17 23	133 25.9	0 36.3	0 54	5	1 16	0.94	8 32
23	9 4 34	17 22	133 29.5	0 36.4	0 50	1	1 12	0.95	8 33
24	9 4 48	17 21	133 33.1	0 36.6	0 46	6 57	1 8	0.95	8 35
25	9 5 3	17 20	133 36.6	0 36.7	0 43	6 54	1 5	0.95	8 36
26	9 5 16	17 19	133 40.0	0 36.9	0 39	6 50	1 1	0.95	8 38
27	9 5 30	17 18	133 43.2	0 37.1	0 35	6 46	0 57	0.95	8 39
28	9 5 43	17 18	133 46.4	0 37.3	0 31	6 42	0 53	0.95	8 40
29	9 5 55	17 17	133 49.5	0 37.4	0 28	6 39	0 50	0.96	8 42
30	9 6 7	17 16	133 52.5	0 37.6	0 24	6 35	0 46	0.96	8 44
31	9 6 19	N 17 16	133 55.3	N. 0 37.7	0 20	6 31	0 42	0.96	8 45

## SATURN

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## TRIVANDRUM.

Date.	MEAN NOON.				MEAN TIME.				
	Right Ascension.	Declina- tion.	Longitude.	Latitude.	Rising.	Meridian Passage	Setting.	Hor. Far.	Semidia- meter.
Nov.	h. s	°	° "	° "	h. m. A. M.	h. m. A. M.	h. m. P. M.		"
1	9 6 30	N. 17 15	133 58 1	N. 0 37.9	0 17	6 23	0 39	0.96	8.47
2	9 6 41	17 14	134 0.8	0 37.0	0 13	6 24	0 35	0.96	8.48
3	9 6 52	17 14	134 3.4	0 36.2	0 9	6 20	0 31	0.97	8.50
4	9 7 2	17 13	134 5.7	0 35.4	0 5	6 16	0 27	0.97	8.51
5	9 7 11	17 13	134 8 1	0 35.6	{ 0 2 } P. M. } 11 53	6 13	0 24	0.97	8.53
6	9 7 21	17 12	134 10.3	0 35.7	11 54	6 9	0 20	0.97	8.54
7	9 7 30	17 12	134 12.5	0 35.9	11 50	6 5	0 16	0.97	8.56
8	9 7 38	17 11	134 14.5	0 36.0	11 46	6 1	0 12	0.97	8.57
9	9 7 46	17 11	134 16.5	0 36.2	11 43	5 57	0 8	0.98	8.59
10	9 7 53	17 10	134 18.2	0 36.3	11 39	54	0 5	0.98	8.61
11	9 8 0	17 10	134 20.0	0 36.5	11 35	50	0 1	0.98	8.62
12	9 8 7	17 10	134 21.6	0 36.7	11 31	46	A. M. 11 57	0.98	8.64
13	9 8 13	17 9	134 23.2	0 36.9	11 27	5 42	11 53	0.98	8.65
14	9 8 19	17 9	134 24.5	0 40.0	11 23	5 38	11 49	0.98	8.67
15	9 8 24	17 9	134 25.8	0 40.2	11 20	34	11 45	0.99	8.68
16	9 8 29	17 9	134 27.0	0 40.4	11 16	31	11 42	0.99	8.70
17	9 8 34	17 9	134 2 1	0 40.6	11 12	27	11 38	0.99	8.72
18	9 8 35	17 9	134 23.9	0 40.7	11 8	23	11 34	0.99	8.73
19	9 8 41	17 9	134 25.8	0 40.9	11 4	5 19	11 30	0.99	8.75
20	9 8 44	17 8	134 30.5	0 41.0	11 0	5 15	11 26	1.00	8.76
21	9 8 47	17 8	134 31.2	0 41.2	10 56	5 11	11 22	1.00	8.78
22	9 8 49	17 8	134 31.6	0 1	10 52	7	11 18	1.00	8.80
23	9 8 51	17 9	134 32.0	0 41.6	10 48	3	11 14	1.00	8.81
24	9 8 52	17 9	134 32.2	0 41.7	10 45	4 59	11 10	1.00	8.83
25	9 8 53	17	134 32.4	0 41.9	10 41	4 56	11	1.00	8.84
26	9 8 54	17 9	134 32.4	0 42.1	10 37	4 52	11 3	1.01	8.86
27	9 8 53	17 9	134 32.4	0 42.3	10 33	4 48	10 53	1.01	8.88
28	9 8 53	17 9	134 32.2	0 42.4	10 29	4 44	10 55	1.01	8.89
29	9 8 52	17 10	134 31.9	0 42.6	10 25	4 40	10 51	1.01	8.91
30	9 8 51	N 17 1	134 31	N 0 42.8	10 21	4 36	10 47	1.01	8.92

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# URANUS

TRIVANDRUM.

Date	MEAN NOON.				MEAN TIME					Semidia- meter.
	Right Ascension.	Declina- tion.	Longitude.	Latitude.	Rising.	Meridian Passage.	Setting.	Hor. Par.		
1	h m s 21 20 56	S. 16 13	317 31.5	S. 0 40.7	h m A. M. 8 49	h m P. M. 2 39	h m P. M. 8 29	0.43	1.62	
2	21 21 7	16 12	317 37.5	0 40.7	8 46	2 36	8 26	0.43	1.62	
3	21 21 19	16 11	317 40.5	0 40.6	8 42	2 32	8 22	0.43	1.62	
4	21 21 31	16 10	317 43.5	0 40.6	8 38	2 28	18	0.42	1.62	
5	21 21 43	16 9	317 46.5	0 40.6	8 34	2 24	8 14	0.42	1.62	
6	21 21 55	16 8	317 49.5	0 40.6	8 31	2 21	8 11	0.42	1.62	
	21 22	16 7	317 52.6	0 40.6	8 27	2 17	8 7	0.42	1.61	
8	21 22 19	16 6	317 55.7	0 40.6	8 23	2 13	8 3	0.42	1.61	
9	21 22 31	16 5	317 58.8	0 40.5	8 19	2 9	7 59	0.42	1.61	
10	21 22 44	16 4	318 1.9	0 40.5	8 16	6	7 56	0.42	1.61	
11	21 22 56	16 3	318 5.1	0 40.5	8 12	2 2	7 52	0.42	1.61	
12	21 23 9	16 2	318 8.3	0 40.5	8 8	1 58	7 48	0.42	1.61	
13	21 23 22	16 1	318 11.5	0 40.5	8 4	1 54	7 44	0.42	1.61	
14	21 23 35	16 0	318 14.7	0 40.5	8 1	1 51	7 41	0.42	1.61	
15	21 23 47	15 59	318 18.0	0 40.5	7 57	1 47	7 37	0.42	1.61	
16	21 24 0	15 58	318 21.2	0 40.5	7 53	1 43	33	0.42	1.61	
17	21 24 13	15 57	318 24.6	0 40.4	49	1 39	7 29	0.42	1.61	
18	21 24 26	15 56	318 27.9	0 40.4	7 46	1 36	7 26	0.42	1.61	
19	21 24 39	15 55	318 31.2	0 40.4	7 42	1 32	7 22	0.42	1.60	
20	21 24 52	15 54	318 34.5	0 40.4	7 38	1 28	7 18	0.42	1.60	
21	21 25 5	15 53	318 37.9	0 40.4	7 34	1 24	7 14	0.42	1.60	
22	21 25 19	15 52	318 41.2	0 40.4	7 31	1 21	7 11	0.42	1.60	
23	21 25 32	15 51	318 44.6	0 40.4	7 27	1 17	7 7	0.42	1.60	
24	21 25 45	15 50	318 48.0	0 40.4	7 24	1 14	7 4	0.42	1.60	
25	21 25 59	15 49	318 51.4	0 40.4	7 20	1 10	7 0	0.42	1.60	
26	21 26 12	15 48	318 54.8	0 40.4	7 17	1 7	6 57	0.42	1.60	
27	21 26 26	15 47	318 58.3	0 40.4	7 13	1 3	6 53	0.42	1.60	
28	21 26 39	15 46	319 1.7	0 40.4	7 9	0 59	6 49	0.42	1.60	
29	21 26 53	15 45	319 5.1	0 40.4	7 5	0 55	6 45	0.42	1.60	
30	21 27 6	15 44	319 8.5	0 40.4	7 2	0 52	6 42	0.42	1.60	
31	21 27	43	319 12.0	S. 0 40.4	6 58	0 48	6 38	0.42	1.60	

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## TRIVANDRUM

Date	MEAN NOON.				MEAN TIME.				
	Right Ascension.	Declina- tion.	Longitude	Latitude	Rising.	Meridian passage	Setting	Hor. Par.	Semidi meter.
Feb									
	<i>h m s</i>	<i>°</i>	<i>°</i>		<i>h m</i> A. M.	<i>h m</i> P. M.	<i>h m</i> P. M.		
1	21 27 34	15 42	319 15 5	0 40 4	6 7 2	0 44	6 24	0 42	1 60
2	21 27 43	15 40	319 19 0	0 40 4	6 50	0 40	6 30	0 42	1 60
3	21 28 2	15 39	319 22 4	0 40 4	6	0 37	6 27	0 42	1 60
4	21 28 15	15 38	319 27 0	0 40 4	6 43	0 33	6 23	0 42	1 60
5	21 28 29	15 37	319 29 3	0 40 4	6 39	0 29	6 19	0 42	1 60
6	21 28 43	15 36	319 32 5	0 40 4	6 35	0 25	6 15	0 42	1 60
7	21 28 57	15 35	319 36 3	0 40 4	6 32	0 22	6 12	0 42	0 60
8	21 29 10	15 34	319 39 8	0 40 4	6 28	0 18	6 8	0 42	1 60
9	21 29 24	15 33	319 43 3	0 40 4	6 24	0 14	6 4	0 42	1 60
10	21 29 38	15 32	319 46 8	0 40 4	6 20	0 10	6 0	0 42	1 60
11	21 29 52	15 31	3 9 50 2	0 40 4	6 17	0 7	5 57	0 42	1 60
12	21 30 5	15 30	319 53 7	0 40 4	6 13	0 3	5 53	0 42	1 60
13	21 30 18	15 29	319 57 2	0 40 4	6 9	11 50	5 49	0 42	1 60
14	21 30 31	15 27	320 0 7	0 40 4	6 6	11 56	46	0 42	1 60
15	21 30 45	15 26	320 4 1	0 40 4	6 2	11 52	5 42	0 42	1 60
16	21 30 59	15 25	320 7 6	0 40 4	5 59	11 49	5 39	0 42	1 60
17	21 31 13	15 24	320 11 0	0 40 4	5 54	11 47	5 36	0 42	1 60
18	21 31 27	15 23	320 14 5	0 40 4	5	11 41	5 32	0 42	1 60
19	21 31 41	15 22	320 17 9	0 40 4	5 46	11 37	5 28	0 42	1 60
20	21 31 54	15 21	320 21	0 40 4	5 43	11 34	5 25	0 42	1 60
21	21 32 7	15 20	320 24 8	0 40 4	29	11 30	5 21	0 42	1 60
22	21 32 20	15 18	320 28 2	0 40 5	5 35	11 26	5 17	0 42	1 60
23	21 32 34	15 17	320 31 6	0 40 5	5 31	11 22	5 13	0 42	1 60
24	21 32 48	15 16	320 35 0	0 40 5	5 28	11 19	5 10	0 42	1 60
25	21 33 1	15 15	320 38 4	0 40 5	5 24	11 15	5 6	0 42	1 60
26	21 33 14	15 14	320 41 8	0 40 5	5 20	11 11	5 2	0 42	1 60
27	21 33 28	15 13	320 45 1	0 40 5	5 16	11 7	4 58	0 42	1 60
28	21 33 41	15 12	320 48 5	0 40 5	5 13	11 4	4 55	0 42	1 60

## URANUS

TRIVANDRUM.

Date March.	MEAN NOON.				MEAN TIME.				
	Right Ascension.	Declination.	Longitude	Latitude.	Rising.	Meridian passage.	Setting.	Hor. Par.	Semidia- meter.
	h m s				h m A. M.	h m A. M.	h m P. M.	"	
1	21 33 54	S 15 11	320 51.8	S. 0 40.5	5 9	11 0	4 51	0.42	1.61
2	21 34 7	15 10	320 55.2	0 40.6	5	10 56	4 47	0.42	1.61
3	21 34 20	15 9	320 58.5	0 40.6	1	10 52	4 43	0.42	1.61
4	21 34 33	15 8	321 1.8	0 40.6	4 53	10 49	4 40	0.42	1.61
5	21 34 46	15 7	321 5.0	0 40.6	4 54	10 45	4 36	0.42	1.61
6	21 34 59	15 6	321 8.3	0 40.6	4 50	10 41	4 32	0.42	1.61
7	21 35 12	15 5	321 11.5	0 40.6	4 46	10 37	4 28	0.42	1.61
8	21 35 24	15 4	321 14.7	0 40.7	4 43	10 34	4 25	0.42	1.61
9	21 35 36	15 3	321 17.9	0 40.7	4 39	10 30	4 21	0.42	1.61
10	21 35 48	15 2	321 21.1	0 40.7	4 35	10 26	4 17	0.42	1.61
11	21 36 1	15 1	321 24.2	0 40.7	4 32	10 23	4 14	0.42	1.61
12	21 36 13	15 0	321 27.4	0 40.7	4 28	10 19	4 10	0.42	1.61
13	21 36 25	14 59	321 30.4	0 40.7	4 25	10 16	4 7	0.42	1.61
14	21 36 33	14 57	321 33.7	0 40.8	4 21	10 12	4 3	0.42	1.61
15	21 36 50	14 57	321 36.7	0 40.8	4 17	10 8	3 59	0.42	1.61
16	21 37 3	14 56	321 39.8	0 40.8	4 14	10 5	3 56	0.42	1.61
17	21 37 15	14 55	321 42.9	0 40.8	4 10	10 1	3 52	0.42	1.61
18	21 37 27	14 54	321 45.9	0 40.9	4 6	9 57	3 48	0.42	1.61
19	21 37 39	14	321 48.7	0 40.9	4 2	9 53	3 44	0.42	1.61
20	21 37 50	14	321 51.7	0 40.9	3 59	9 50	3 41	0.42	1.62
21	21 38 1	14 51	321 54.6	0 40.9	3 55	9 46	3 37	0.42	1.62
22	21 38 13	14 50	321 57.5	0 41.0	3 51	9 42	3 33	0.42	1.62
23	21 38 24	14 50	322 0.3	0 41.0	3 48	9 38	3 28	0.42	1.62
24	21 38 35	14 49	322 3.2	0 41.0	3 45	9 35	3 25	0.42	1.62
25	21 38 46	14 48	322 6.0	0 41.0	3 40	9 31	3 22	0.43	1.62
26	21 38 57	14 47	322 8.8	0 41.1	3 36	9 27	3 18	0.43	1.62
27	21 39 8	14 46	322 11.5	0 41.1	3 32	9 23	3 14	0.43	1.62
28	21 39 18	14 45	322 14.2	0 41.1	3 29	9 20	3 11	0.43	1.62
29	21 39 28	14 44	322 16.8	0 41.1	3 25	9 16	3 7	0.43	1.62
30	21 39 38	14 43	322 19.5	0 41.2	3 21	9 12	3 3	0.43	1.62
31	21 39 49	S 14 43	322 22.2	S. 0 41.2	3 17	8	2 59	0.43	1.62

## URANUS.

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## TRIVANDRUM.

Date.	MEAN NOON.				MEAN TIME.				
	Right Ascension.	Declination.	Longitude.	Latitude.	Rising.	Meridian passage.	Setting.	Hor. Far.	Semidia- meter.
April.									
	<i>h m s</i>	<i>°</i>	<i>°</i>	<i>°</i>	<i>h. m.</i> A. M.	<i>h. m.</i> A. M.	<i>h. m.</i> P. M.	<i>"</i>	<i>"</i>
1	21 39 59	S 14	322 24.8	S 0 41.2	3 14	9 5	2 56	0.43	1.63
2	21 40 9	11 41	322 27.3	0 41.2	3 10	9 1	2 52	0.43	1.63
3	21 40 19	14 40	322 29.8	0 41.3	3 5	8 56	2 47	0.43	1.63
4	21 40 29	14 40	322 32.2	0 41.3	3 1	8 52	2 43	0.43	1.63
5	21 40 38	14 39	322 34.7	0 41.3	2 58	8 49	2 40	0.43	1.63
6	21 40 47	14 38	322 37.1	0 41.3	2 54	8 45	2 36	0.43	1.63
7	21 40 56	14 37	322 39.5	0 41.4	2 50	8 41	2 32	0.43	1.63
8	21 41 6	14 37	322 41.8	0 41.4	2 46	8 37	2 28	0.43	1.63
9	21 41 15	14 36	322 44.1	0 41.5	2 43	8 34	2 25	0.43	1.63
10	21 41 24	14 35	322 46.3	0 41.5	2 39	8 30	2 21	0.43	1.63
11	21 41 33	14 34	322 48.6	0 41.5	2 35	8 26	2 17	0.43	1.63
12	21 41 41	14 34	322 50.8	0 41.5	2 31	8 22	2 13	0.43	1.63
13	21 41 50	14 33	322 53.0	0 41.6	2 28	8 19	2 10	0.43	1.64
14	21 41 58	14 32	322 55.0	0 41.6	2 24	8 15	2 6	0.43	1.64
15	21 42 6	14 31	322 57.1	0 41.7	20	8 11	2 2	0.43	1.64
16	21 42 14	14 31	322 59.1	0 41.7	2 16	8 7	1 58	0.43	1.64
17	21 42 22	14 30	323 1.1	0 41.7	2 13	8 4	1 55	0.43	1.64
18	21 42 29	14 29	323 3.0	0 41.7	2 9	8 0	1 51	0.43	1.64
19	21 42 36	14 29	323 4.9	0 41.8	2 5	7 56	1 47	0.43	1.64
20	21 42 45	14 28	323 6.7	0 41.8	2 1	7 52	1 43	0.43	1.64
21	21 42 52	14 28	323 8.6	0 41.9	1 58	7 49	1 40	0.43	1.65
22	21 42 59	14 27	323 10.3	0 41.9	1 54	7 45	1 36	0.43	1.65
23	21 43 6	14 27	323 12.0	0 41.9	1 49	40	1 31	0.43	1.65
24	21 43 12	14 26	323 13.7	0 41.9	1 45	7 36	1 27	0.43	1.65
25	21 43 19	14 26	323 15.4	0 42.0	1 42	7 33	1 24	0.43	1.65
26	21 43 25	14 25	323 17.0	0 42.0	1 38	7 29	1 20	0.43	1.65
27	21 43 31	14 25	323 18.6	0 42.1	1 34	7 25	1 16	0.43	1.65
28	21 43 37	14 24	323 20.0	0 42.1	1 30	7 21	1 12	0.43	1.65
29	21 43 43	14 24	323 21.5	0 42.2	1 27	18	1 9	0.43	1.66
30	21 43 49	S. 14 24	323 22.9	S 0 42.2	1 23	7 14	1	0.43	1.66

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## URANUS.

TRIVANDRUM.

Date. May.	MEAN NOON.				MEAN TIME.				
	Right Ascension.	Declina- tion.	Longitude.	Latitude.	Rising.	Meridian passage.	Setting.	Hor. Par.	Semi- diameter.
	<i>h.</i> <i>s.</i>	<i>°</i>			<i>h.</i> <i>m.</i> A. M.	<i>h.</i> <i>m.</i> A. M.	<i>h.</i> <i>m.</i> P. M.		
1	21 43 54	S. 14 23	323 24.7	0 42.2	1 19	7 0	1 1	0.43	1.66
2	21 43 59	14 23	323 25.6	0 42.2	1 15	7 6	0 57	0.43	1.66
3	21 44 4	14 23	323 26.9	0 42.3	1 12	7 3	0 54	0.44	1.66
4	21 44 8	14 22	323 28.1	0 42.3	1 8	6 59	0 50	0.44	1.66
5	21 44 13	14 22	323 29.3	0 42.4	1	6 45	0 45	0.44	1.66
6	21 44 17	14 21	323 30.4	0 42.4	0 59	6 50	0 41	0.44	1.66
7	21 44 22	14 21	323 31.5	0 42.5	0 56	6 47	0 38	0.44	1.67
8	21 44 25	14 21	323 32.5	0 42.5	0 52	6 43	0 34	0.44	1.67
9	21 44 29	14 20	323 33	0 42.5	0 48	6 39	0 30	0.44	1.67
10	21 44 33	14 20	323 34.4	0 42.5	0 44	6 35	0 26	0.44	1.67
11	21 44 37	14 20	323 35.3	0 42.6	0 41	6 32	0 23	0.44	1.68
12	21 44 40	14 20	323 36.1	0 42.6	0 37	6 28	0 19	0.44	1.68
13	21 44 43	14 19	323 37.0	0 42.7	0 33	6 24	0 15	0.44	1.68
14	21 44 46	14 19	323 37.8	0 42.7	0	6 20	0 11	0.44	1.68
15	21 44 49	14 19	323 38.5	0 42.8	0	6 16	0 7	0.44	1.68
16	21 44 51	14 19	323 39.1	0 42.8	0 21	6 12	0 3	0.44	1.68
17	21 44 54	14 19	323 3	0 42.9	0 17	6 9	Noon	0.44	1.68
18	21 44 56	14 19	323 40.2	0	0 14	6 5	A. M. 11 56	0.44	1.68
19	21 44 59	14 19	323 40.8	0 42.9	0 10	6 1	11 52	0.44	1.69
20	21 45 1	14 19	323 41.2	0 42.9	0 6	57	11 48	0.44	1.69
21	21 45 3	14 18	323 41.6	0 43.0	0 2	5 53	11 44	0.44	1.69
22	21 45 5	14 18	323 41.9	0 43.0	11 59	5 49	11 40	0.44	1.69
23	21 45 6	14 18	323 42.3	0 43.1	11 56	5 45	11 36	0.44	1.69
24	21 45 7	14 18	323 42.6	0 43.1	11 46	41	11 32	0.45	1.69
25	21 45 8	14 18	323 42.8	0 43.2	11 42	5 37	11 28	0.45	1.69
26	21 45 9	14 18	323 42.9	0 43.2	11 38	5 33	11 24	0.45	1.69
27	21 45 9	14 18	323 43.1	0 43.3	11 34	5 29	11 20	0.45	1.69
28	21 45 9	14 18	323 43.1	0 43.3	11 31	5 25	11 16	0.45	1.70
29	21 45 9	14 18	323 43.1	0 43.3	11 27	5 22	11 13	0.45	1.70
30	21 45 9	14 18	323 43.1	0 43.3	11 23	5 18	11 9	0.45	1.70
31	21 45 9	S. 14 18	323 43.0	3. 0 43.4	11 19	5 14	11 5	0.45	1.70

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## TRIVANDRUM.

Date.	MEAN NOON.				MEAN TIME.				
	Right Ascension.	Declina- tion.	Longi- tude.	Lati- tude.	Rising.	Meridian passage.	Setting.	Hor. Par.	Semidi- meter.
June.	<i>h m s</i>	<i>°</i>	<i>° ′</i>	<i>°</i>	<i>h. m.</i> P. M.	<i>h. m.</i> A. M.	<i>h. m.</i> A. M.	<i>″</i>	
1	21 45 8	14 18	323 42.8	S 0 43.4	11 15	5 10	11 1	0.45	1.71
2	21 45 7	14 19	323 42.6	0 43.5	11 11	6	10 57	0.45	1.71
3	21 45 7	14 19	323 42.4	0 43.5	11 7	2	10 53	0.45	1.71
4	21 45 6	14 19	323 42.2	0 43.6	11 3	4 58	10 49	0.45	1.71
5	21 45 5	14 19	323 41.9	0 43.6	10 59	4 54	10 45	0.45	1.71
6	21 45 3	14 19	323 41.5	0 43.6	10 55	4 50	10 41	0.45	1.71
	21 45 1	14 19	323 41.1	0 43.6	10 51	4 46	10 37	0.45	1.71
8	21 44 59	14 19	323 40.6	0 43.7	10 47	4 42	10 33	0.45	1.71
9	21 44 57	14 19	323 40.1	0 43.7	10 43	4 38	10 29	0.45	1.71
10	21 44 55	14 20	323 39.5	0 43.5	10 39	4 34	10 25	0.45	1.71
11	21 44 53	14 20	323 38.9	0 43.8	10 35	4 30	10 21	0.45	1.71
12	21 44 51	14 20	323 38.2	0 43.9	10 31	4 26	10 17	0.45	1.72
13	21 44 48	14 20	323 37.5	0 43.9	10 27	4 22	10 13	0.45	1.72
14	21 44 46	14 21	323 36.8	0 43.9	10 23	4 18	10 9	0.45	1.72
15	21 44 43	14 21	323 36.1	0 43.9	10 19	4 14	10 5	0.45	1.72
16	21 44 40	14 21	323 35.2	0 44.0	10 15	4 10	10 1	0	1.72
17	21 44 37	14 22	323 34.3	0 44.0	10 11	4 6	9 57	0	1.72
18	21 44 33	14	323 33.4	0 44.1	10 7	4 2	9 53	0.45	1.73
19	21 44 29	14 23	323 32.4	0 44.1	10 3	3 58	9 49	0.45	1.73
20	21 44 25	14 23	323 31.4	0 44.2	9 59	3 54	9 45	0.45	1.73
21	21 44 21	14 23	323 30.3	0 44.2	9 55	3 50	9 41	0.45	1.73
22	21 44 16	14 24	323 29.2	0 44.2	9 51	3 46	9 37	0.45	1.73
23	21 44 12	14 24	323 28.1	0 44.2	9 47	3 42	9 33	0.45	1.73
24	21 44 8	14 24	323 26.9	0 44.3	9 43	3 38	9 29	0.45	1.73
25	21 44 3	14 25	323 25.7	0 44.3	9 39	3 34	9 25	0.45	1.73
26	21 43 58	14 25	323 24.4	0 44.4	9 35	3 30		0.46	
27	21 43 53	14 26	323 23.1	0 44.4	9 31	3	9 17	0.46	1.73
28	21 43 48	14 26		21.8 0 44.4	9 27	22	9 13	0.46	
29	21 43 43	14 27	323 20.4	0 44.4	9 23	3 18	9 9	0.46	1.74
30	21 43 38	S. 11 27	323 18.9	S 0 44.5	9 19	3 14	9 5	0.46	1.74

## URANUS.

## TRIVANDRUM.

Date. July.	MEAN NOON.				MEAN TIME.				
	Right Ascension.	Declina- tion.	Longi- tude.	Lati- tude.	Rising.	Meridian passage.	Setting.	Hor. Par.	Semi- diameter.
	<i>h m s</i>	<i>°</i>	<i>°</i>	<i>°</i>	<i>h. m.</i> <i>P. M.</i>	<i>h. m.</i> <i>A. M.</i>	<i>h. m.</i> <i>A. M.</i>		
1	21 43 31	S 14 25	323 17.5	S 0 44.5	9 15	3 10	9 1	0.46	1.74
2	21 43 25	14 28	323 16.0	0 44.5	9 11	3 6	8 57	0.46	1.74
3	21 43 19	14 29	323 14.4	0 44.5	9 7	3 2	8 53	0.46	1.74
4	21 43 13	14 29	323 12.8	0 44.6	9 3	2 58	8 49	0.46	1.74
	21 43 7	14 30	323 11.2	0 44.6	8 59	2 54	8 45	0.46	1.74
6	21 43 1	14 30	323 9.6	0 44.7	8 55	2 50	8 41	0.46	1
7	21 42 55	14 31	323 8.0	0 44.7	8 51	2 46	8 37	0.46	1.75
8	21 42 48	14 32	323 6.3	0 44.7	8 47	2 42	8 33	0.46	1.75
9	21 42 41	14 32	323 4.5	0 44.7	8 43	2 35	8 29	0.46	1.75
10	21 42 34	14 33	323 2.7	0 44.8	8 39	2 31	8 25	0.46	1.75
11	21 42 27	14 34	323 0.9	0 44.8	8 35	2 30	8 21	0.46	1.75
12	21 42 20	14 34	322 59.1	0 44.8	8 30	2 26	8 17	0.46	1.75
13	21 42 13	14	322 57.2	0 44.8	8 26	2 21	8 12	0.46	1.75
14	21 42 5	14 35	322 55.3	0 44.9	8 22	2 17	8 8	0.46	1.75
15	21 41 57	14 36	322 53.4	0 44.9	8 18	2 13	8 4	0.46	1.75
16	21 41 49	14 37	322 51.4	0 44.9	8 14	2 9	8 0	0.46	1.75
17	21 41 40	14 37	322 49.4	0 44.9	8 10	2 5	7 56	0.46	1.75
18	21 41 31	14 38	322 47.4	0 45.0	8 6	2 1	7 52	0.46	1.76
19	21 41 24	14 39	322 45.4	0 45.0	8 2	1 57	7 48	0.46	1.76
20	21 41 17	14 40	322 43.3	45.0	55	1	7 44	0.46	1.76
21	21 41 10	14 40	322 41	0 45.0	54	1 49	40	0.46	1.76
	21 41 3	14 41	322 39.1	0 45.0	50	1 45	7 36	0.46	1.76
23	21 40	14 42	322 37.0	0 45.0	46	1 41	7 32	0.46	1.76
24	21 40 17	14 43	322 34.8	0 45.1	42	1 37	7 28	0.46	1.76
	21 40 38	14 43	322 32.7	0 45.1	38	1 33	7 24	0.46	1.76
	21 40 29	14 44	322 30.5	0 45.1	34	1 29	7 20	0.46	1.76
	21 40 21	14 45	322 28.3	0 45.1	30	1	16	0.46	1.76
28	21 40 12	14 46	322 26.0	0 45.1	7 25	1 21	7 12	0.46	1.76
29	21 40 3	14 46	322 23.8	0 45.1	7 21	1 16	7	0.46	1.76
30	21 39 54	14 47	322 21.5	45.2	17	1 12	3	0.46	1.76
31	21 39 45	S. 14 48	322 19.2	S 0 45.2	7 13	1 8	6 59	0.46	1.76

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## TRIVANDRUM.

Date.	MEAN NOON.				MEAN TIME.				
	Right Ascension.	Declination.	Longitude.	Latitude.	Rising.	Meridian passage.	Setting.	Hor. Par.	Semidiameter.
August									
	<i>h</i>				<i>h. m.</i>	<i>h. m.</i>	<i>h. m.</i>		
					P. M.	A. M.	A. M.		
1	21 39 36	S. 14 49	322 16.9	S.0 45.2	7 9	1 4	6 55	0.46	1.76
2	21 39 27	14 49	322 14.6	0 45.2	7 5	1 6	6 51	0.46	1.76
3	21 39 18	14 50	322 12.3	0 45.2	7 2	0 56	6 47	0.46	1.77
4	21 39 9	14 51	322 10.0	0 45.2	6 57	0 52	6 42	0.46	1.77
	21 39 0	14 52	322 7.6	0 45.2	6 53	0 48	6 39	0.46	1.77
6	21 38 50	14 52	322 5.3	0 45.2	6 49	0 44	6 35	0.46	1.77
	21 38 41	14 53	322 2.9	0 45.3	6 45	0 40	6 31	0.46	1.77
8	21 38 32	14 54	322 0.6	0 45.3	6 41	0 36	6 27	0.46	1.77
9	21 38 23	14 55	321 58.2	0 45.3	6 36	0 32	6 23	0.46	1.77
10	21 38 13	14 55	321 55.7	0 45.3	6 32	0 27	6 18	0.46	1.77
11	21 38 4	14 56	321 53.4	0 45.3	6 28	0 23	6 14	0.46	1.77
12	21 37 55	14 57	321 51.0	0 45.3	6 24	0 19	6 10	0.46	1.77
13	21 37 46	14 58	321 48.6	0 45.3	6 20	0 15	6 6	0.46	1.77
14	21 37 36	14 58	321 46.3	0 45.3	6 16	0 11	6 2	0.46	1.77
15	21 37 27	14 59	321 43.0	0 45.3	6 12	0 7	58	0.46	1.77
						{ 0 3 } P. M.			
16	21 18	15 0	321 41	0 55.3	6 8	11 59	54	0.46	1.77
17	21 37 8	15 1	321 39.1	0 45.3	6 4	11 55	50	0.46	1.77
18	21 36 59	15 1	321 36.7	0 45.3	6 0	11 51	46	0.46	1.77
19	21 36 49	15 2	321 34.3	0 45.3	56	11 47	42	0.46	1.77
20	21 36 40	15 3	321 31.9	0 45.3	52	11 43	38	0.46	1.77
21	21 36 31	15 4	321 29.5	0 45.3	47	11 38	34	0.46	1.77
	21 36 21	15 4	321 27.2	0 45.3	43	11 34	29	0.46	1.77
23	21 36 12	15 5	321 24.8	0 45.3	5 39	11 30		0.46	1.77
24	21 36 3	15 6	321 22.5	0 45.3	35	11 26	21	0.46	1.77
	21 35 54	15 7	321 20.1	0 45.3	31	11 22	17	0.46	1.77
26	21 35 44	15 7	321 17.8	0 45.3	27	11 18	13	0.46	1.77
27	21 35 35	15 8	321 15.4	0 45.3	23	11 14	9	0.46	1.76
28	21 35 26	15 9	321 13.1	0 45.3	5 19	11 10	5 5	0.46	1.76
29	21 35 17	15 10	321 10.8	0 45.3	5 15	11 6	5 1	0.46	1.76
30	21 35 8	15 10	321 8.6	0 45.3	5 11	11 2	4 57	0.46	76
31	21 34 59	S. 15 11	321 6.3	S.0 45.3	5 7	10 58	4 53	0.46	1.76

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## URANUS.

TRIVANDRUM.

Date. Sept.	MEAN NOON.				MEAN TIME.				
	Right Ascension.	Declina- tion.	Longitude	Latitude.	Rising.	Meridian passage.	Setting.	Hor. Par.	Semidi meter.
	<i>h m s</i>				<i>h. m.</i> P. M.	<i>h. m.</i> P. M.	<i>h. m.</i> A. M.		
1	21 34 50	S. 15 12	321 41	S. 0 45.3	5 3	10 54	4 49	0.46	1.76
2	21 34 41	15 13	321 1.8	0 45.2	4 58	10 49	4 45	0.46	1.76
3	21 34 33	15 13	320 59.6	0 45.2	4 54	10 45	4 40	0.46	1.76
4	21 34 2	15 14	320 57.4	0 45.2	4 50	10 41	4 36	0.46	1.76
5	21 34 16	15 15	320 55.2	0 45.2	4 46	10 37	4 32	0.46	1.76
6	21 34 8	15 16	320 53.0	0 45.2	4 42	10 33	4 28	0.46	1.76
	21 33 59	15 16	320 50.8	0 45.2	4 38	10 29	4 24	0.46	1.76
8	21 33 51	15 17	320 48.7	0 45.2	4 34	10 25	4 20	0.46	1.76
9	21 33 43	15 18	320 46.6	0 45.2	4 30	10 21	4 16	0.46	1.76
10	21 33 35	15 18	320 44.6	0 45.1		10 17	4 12	0.46	1.76
11	21 33 26	15 19	320 42.6	0 45.1	4 22	10 13	4 8	0.46	1.76
12	21 33 18	15 19	320 40.5	0 45.1	4 18	10 9	4 4	0.46	1.76
13	21 33 10	15 20	320 38.5	0 45.1	4 14	10 5	4 0	0.46	1.76
14	21 33 2	15 21	320 36.5	0 45.1	4 10	10 1	3 56	0.46	1.76
15	21 32 54	15 21	320 34.6	0 45.1	4 6	9 57	3 52	0.46	1.76
16	21 32 46	15 22	320 32.7	0 45.0	4 2	9 53	3 48	0.46	1.75
17	21 32 39	15 23	32 30.9	0 45.0	3 58	9 49	3 44	0.46	1.75
18	21 32 32	15 23	320 29.0	0 45.0	3 53	9 44	3 40	0.46	1.75
19	21 32 24	15 24	320 27.2	0 45.0	3 49	9 40	3 35	0.46	1.75
20	21 32 17	15 24	320 25.4	0 45.0	3 45	9 36	3 31	0.46	1.75
21	21 32 11	15 25	320 23.7	0 45.0	3 41	9 32	27	0.46	1.75
22	21 32 4	15	320 21.9	0 44.9	3 37	9 28	23	0.46	1.75
23	21 31 58	15 26	320 20.2	0 44.9	3 34	9 24	3 19	0.46	1.75
24	21 31 51	15 26	320 18.5	0 44.9	3 30	9 20	3 14	0.46	1.74
25	21 31 45	15 27	320 16.9	0 44.9	3 26	9 16	10	0.46	1.74
	21 31 39	15 27	320 15.3	0 44.8	3 22	12	3 6	0.46	1.74
27	21 31 32	15 28	320 13.5	0 44.8	3 18	9 8	3 2	0.46	1.74
28	21 31 26	15 28	320 12.3	0 44.8	3 14	9 4	2 58	0.46	1.74
29	21 31 21	15 29	320 10.9	0 44.8	3 10	9 0	2 54	0.46	1.74
30	21 31 15	S. 15 29	320 9.4	S 0 44.7	3 6	8 56	2 50	0.46	1.74

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TRIVANDRUM.

Date Oct.	MEAN NOON.				MEAN TIME.				
	Right Ascension.	Declina- tion.	Longi- tude.	Lati- tude.	Rising	Meridian pass.gc.	Setting.	Hor. Par.	Semidia- meter.
	<i>h</i> <i>s</i>				<i>h.</i> <i>m.</i> <i>P.</i> <i>M.</i>	<i>h.</i> <i>m.</i> <i>P.</i> <i>M.</i>	<i>h.</i> <i>m.</i> <i>A.</i> <i>M.</i>		
1	21 31 10	S 15 30	320 5·1	S 0 44·7	3 2	8 42	2 46	0·46	1·74
2	21 31 4	15 30	320 6·7	0 44·7	58	8 48	2 42	0·46	1·74
3	21 30 59	15 30	320 5·4	0 44·6	54	8 44	2 38	0·46	1·74
4	21 30 54	15 31	320 4·1	0 44·6	50	8 40	34	0·46	1·74
5	21 30 49	15 31	320 2·9	0 44·6	2 46	8 36	30	0·46	1·74
6	21 30 44	15 31	320 1·7	0 44·6	2 42	8 32	2 26	0·45	1·73
	21 30 40	15 31	320 0·6	0 44·5	3°	8 28	22	0·45	1·73
8	21 30 36	15 32	319 59·5	0 44·5	2 34	8 24	18	0·45	1·
9	21 30 31	15 32	319 58·5	0 44·4	30	8 20	14	0·45	1·73
10	21 30 27	15 32	319 57·5	0 44·4	26	8 16	2 10	0·45	1·73
11	21 30 24	15 32	319 56·6	0 44·4	22	8 12	2 6	0·45	1
12	21 30 20	15 33	319 55·6	0 44·4	18	8 8	2 2	0·45	1·73
13	21 30 17	15 33	319 54·8	0 44·3	2 14	8 4	1 58	0·45	1·73
14	21 30 13	15 33	319 54·0	0 44·3	2 10	8 0	1 54	0·45	1·72
15	21 30 10	15 33	319 53·2	0 44·3	6		1 50	0·45	1·72
16	21 30 7	15 34	319 52·4	0 44·3	2	52	1 46	0·45	1·72
17	21 30 4	15 34	319 51·8	0 44·2	1 55	7 48	1 42	0·45	1·72
18	21 30 1	15 31	319 51·1	0 44·2	1 54	44	1 38	0·45	1
19	21 29 59	15 34	319 50·6	0 44·1	1 50	40	1 34	0·45	1
20	21 29 57	15 35	319 50·1	0 44·1	1 46	7 36	1 30	0·45	1
21	21 29 55	15	319 49·7	0 44·1	1 42	32	1 26	0·45	1·72
	21 29 53	15 35	319 49·2	0 44·1	1 38	28	1 22	0·45	1·71
23	21 29 52	15 35	319 48·9	0 44·0	1 34	7 24	1 18	0·45	1·71
24	21 29 51	15 35	319 48·5	0 44·0	1 30	20	1 14	0·45	1·71
	21 29 49	15 35	319 48·2	0 43·9	1 26	16	1 10	0·45	1·71
	21 29 48	15 35	319 47·9	0 43·9	1 22	12	1 6	0·45	1·70
	21 29 48	15	319 47·8	0 43·9	1 18		1 2	0·45	1
28	21 29 47	15 35	319	0 43·9	1 14	8	0 58	0·45	1·70
29	21 29 47	15 35	319 47·6	0 43·8	1 11	4	0 54	0·45	1·70
30	21 29 46	15 35	319 47·5	0 43·8	1 7	6	0 51	0·45	1·70
31	21 29 46	S. 15	319 47·6	S. 0 43·8	1 3	6 53	0 47	0·45	1·70

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## TRIVANDRUM.

Date. Nov.	MEAN NOON.				MEAN TIME.				
	Right Ascension.	Declina- tion.	Longitude.	Latitude.	Rising.	Meri- dian passage.	Setting.	Hor. par.	Semidia- meter.
	<i>h.</i>	<i>s.</i>			<i>h.</i>	<i>h.</i>	<i>h. m.</i>		
					P. M.	M.	P. M.		
1	21 29 47	S. 15 35	319 47.7	S.0 43.7	6 59	6 49	0 43	0.44	1.69
2	21 29 47	15 35	319 47.8	0 43.7	0	6 45	0 39	0.44	1.69
3	21 29 48	15 35	319 48.0	0 43.7	0 51	6 41	0 35	0.44	1.69
4	21 29 49	15 35	319 48.2	0 43.7	0 47	6 37	0 31	0.44	1.69
5	21 29 50	15 34	319 48.5	0 43.6	0 43	6 33	0 27	0.44	1.69
6	21 29 52	15 34	319 48.8	0 43.6	0 39	6 29	0 23	0.44	1.69
	21 29 53	15 34	319 49.1	0 43.5	0 35	6 25	0 19	0.44	1.69
8	21 29 55	15 34	319 49.6	0 43.5	0 31	6 21	0 15	0.44	1.69
9	21 29 57	15 33	319 50.1	0 43.5	0 27	6 17	0 11	0.44	1.69
10	21 29 59	15 33	319 50.6	0 43.5	0 24	6 14	0 7	0.44	1.69
11	21 30 1	15 33	319 51.2	0 43.4	0 20	6 10	0 4	0.44	1.68
12	21 30 4	15 33	319 51.9	0 43.4	0 16	6 6	midnight P. M.	0.44	1.68
13	21 30 7	15 32	319 52.6	0 43.3	0 12	6 2	{ 11 56 }	0.44	1.68
14	21 30 10	15 32	319 53.3	0 43.3	0 8	5 55	{ 11 52 }	0.44	1.68
15	21 30 13	15 32	319 54.1	0 43.3	4	54	11 18 11 44	0.44	1.67
16	21 30 16	15 32	319 54.9	0 43.3	Noon	5 50		0.44	1.67
17	21 30 19	15 31	319 55.5	0 43.2	A. M. 11 56	5 46	11 40	0.44	1.67
18	21 30 22	15 31	319 56.7	0 43.2	11	43	11 36	0.44	1.67
19	21 30 25	15 31	319 57.7	0 43.1	11 49	5 29	11 33	0.44	1.67
20	21 30 29	15 30	319 58.5	0 43.1	11 45	5 25	1 29	0.44	1.67
21	21 30 34	15 30	319 59.9	0 43.1	11 41	5 21	11 25	0.44	1.67
22	21 30 38	15 29	320 1.0	0 43.1	11 37	5 17	11 21	0.44	1.67
23	21 30 43	15 29	320 2.2	0 43.0	11 33	5 13	11 17	0.44	1.66
24	21 30 48	15 29	320 3.4	0 43.0	11 29	5 9	11 13	0.43	1.66
25	21 30 53	15 28	320 4.7	0 42.9	11 25	5	11 9	0.43	1.66
26	21 30 58	15 28	320 6.0		11 21	12	11	0.43	1.66
27	21 31 3	15 28	320		11 18	8	11 2	0.43	1.66
28	21 31 9	15 27	320 8.5	0 42	11 14		10 58	0.43	1.66
29	21 31 15	15 27	320 10.3	0	11 10	0	10 54	0.43	1.66
30	21 31 21	S. 15 26	320 11.9	S.0 42.8	11 7	4 57	10 50 10 47	0.43	1.66

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TRIVANDRUM.									
Date	MEAN NOON.				MEAN TIME.				
Dec.	Right Ascension.	Declination.	Longitude.	Latitude.	Rising.	Meridian Passage.	Setting.	Hor. Par.	Semidiameter.
	<i>h m s</i>		<sup>o</sup>	<sup>o</sup>	<i>h m</i> A. M.	<i>h m</i> P. M.	<i>h m</i> P. M.		
1	21 31 27	S. 15 26	320 13.5	S 0 42.7	11 3	4 53	10 43	0.43	1.65
2	21 31 33	15 25	320 15.1	0 42.7	10 58	4 49	10 40	0.43	1.65
3	21 31 40	15 24	320 16.7	0 42.7	10 54	4 45	10 36	0.43	1.65
4	21 31 46	15 24	320 18.3	0 42.7	10 50	4 41	10 32	0.43	1.65
5	21 31 53	15 23	320 20.1	0 42.6	10 46	4 37	10 28	0.43	1.65
6	21 32 0	15 22	320 21.9	0 42.6	10 42	4 33	10 24	0.43	1.65
7	21 32 7	15	320 23.8	0 42.5	10 38	4 29	10 20	0.43	1.64
8	21 32 15	15 21	320 25.7	0 42.5	10 35	4 26	10 17	0.43	1.64
9	21 32 22	15 21	320 27.6	0 42.5	10 31	4 22	10 13	0.43	1.64
10	21 32 30	15 20	320 29.6	0 42.5	10 27	4 18	10 9	0.43	1.64
11	21 32 38	15 19	320 31.7	0 42.4	10 23	4 14	10 5	0.43	1.64
12	21 32 46	15 19	320 33.7	0 42.4	10 20	4 11	10 2	0.43	1.64
13	21 32 54	15 18	320 35.8	0 42.4	10 16	4 7	9 58	0.43	1.64
14	21 33 2	15 17	320 37.9	0 42.4	10 12	4 3	9 54	0.43	1.64
15	21 33 11	15 16	320 40.1	0 42.3	10 8	59	9 50	0.43	1.64
16	21 33 19	15 16	320 42.3	0 42.3	10 5	3 56	9 47	0.43	1.64
17	21 33 28	15 15	320 44.6	0 42.3	10 1	3 52	9 43	0.43	1.63
18	21 33 37	15 14	320 46.9	0 42.3	9 57	3 48	9 39	0.43	1.63
19	21 33 46	15 13	320 49.3	0 42.2	9 53	3 44	35	0.43	1.63
20	21 33 56	15 13	320 51.7	0 42.2	9 50	3 41	32	0.43	1.63
21	21 34	15 12	320 54.1	0 42.2	9 46	3 37	9 28	0.43	1.63
22	21 34 15	15 11	320 56.5	0 42.2	9 42	33	9 24	0.43	1.63
23	21 34 24	15 10	320 59.0	0 42.1	9 38	29	9 20	0.43	1.63
24	21 34 34	15 10	321 1.5	0 42.1	9 34	3 25	9 16	0.43	1.62
25	21 34 44	15 9	321 4.1	0 42.1	9 30	3 21	9 12	0.43	1.62
26	21 34 52	15 8	321 6.7	0 42.1	9 26	3 17	8	0.43	1.62
27	21 35 0	15 7	321 9.4	0 42.0	9 22	3 13	9 4	0.43	1.62
28	21 35 8	15 6	321 12.0	0 42.0	9 19	3 10	9 1	0.43	1.62
29	21 35 26	15	321 14.7	0 42.0	9 15	3 6	8	0.43	1.62
30	21 35 37	15 4	321 17.4	0 42.0	9 11	3 2	5 53	0.43	1.62
31	21 35 48	S. 15 3	321 20.2	S 0 41.9	9 7	2 58	8 49	0.43	1.62

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## NEPTUNE.

## TRIVANDRUM.

Date.		MEAN NOON.				MEAN TIME.				
Jan	Right Ascension.	Declination.	Longitude.	Latitude.	Rising.	Meridian passage.	Setting.	Hor. Par.	Semidiameter.	
	<i>h.</i>				<i>h. m.</i>	<i>h. m.</i>	<i>h. m.</i>			
					<i>P. M.</i>	<i>A. M.</i>	<i>A. M.</i>			
1	8 25 34	N.19 0	124 7.0	S. 0 14.4	30	1 46	7 58	0.30	1.33	
	8 25 28	19 1	124 5.5	0 14.4	7 26	1 42	7 54	0.30	1.33	
3	8 25 21	19 1	124 4.0	0 14.3		1 38	7 50	0.30	1.33	
4	8 25 15	19 1	124 2.4	0 14.3	7 18	1 34	7 46	0.30	1.33	
5	8 25 8	19 2	124 0.8	0 14.3	7 14	1 30	7 42	0.30	1.33	
6	8 2	19 2	123 59.3	0 14.3	7 10	1 26	7 38	0.30	1.33	
7	8 24 55	19 2	123 57.7	0 14.3	7 6	1 22	7 34	0.30	1.33	
8	8 24 48	19 3	123 57.1	0 14.3	7	1 18	7 30	0.30	1.33	
9	8 24 41	19 3	123 51.5	0 14.3	6 58	1 14	7 26	0.30	1.33	
10	8 24 35	19 4	123 52.9	0 14.3	6 54	1 10	7 22	0.30	1.33	
11	8 24 28	19 4	123 51.2	0 14.3	6 50	1 6	7 18	0.30	1.33	
12	8 24 21	19	123 49.6	0 14.3	6 46	1 2	7 14	0.30	1.33	
13	8 24 14	19	123 47.9	0 14.3	6 41	0 58	7 10	0.30	1.33	
14	8 24 7	19 6	123 46.3	0 14.3	6 37	0 53	7	0.30	1.33	
15	8 24 1	19 6	123 44.6	0 14.2	6 33	0 49	7 1	0.30	1.33	
16	8 23 54	19 6	123 42.9	0 14.2	6 29	0 45	6 57	0.30	1.33	
17	8 23 47	19	123 41.3	0 14.2	6 25	0 41	6 53	0.30	1.33	
18	8 23 40	19 7	123 39.7	0 14.2	6 21	0 37	6 49	0.30	1.33	
19	8 23 34	19 7	123 38.0	0 14.2	6 17	0 33	45	0.30	1.33	
20	8 23 27	19 8	123 36.3	0 14.2	6 13	0 29	41	0.30	1.33	
21	8 23 20	19 8	123 34.6	0 14.2	6 9	0 25	6 37	0.30	1.33	
22	8 23 13	19	123 32.9	0 14.2	6 5	0 21	6 33	0.30	1.33	
23	8 23 6	19 9	123 31.2	0 14.1	6 1	0 17	6 29	0.30	1.33	
24	8 22 59	19 9	123 29.5	0 14.1	57	0 13	6 25	0.30	1.33	
	8 22 52	19 10	123 27.8	0 14.1	5 53	0 9	21	0.30	1.33	
26	8 22 45	19 10	123 27.1	0 14.1	49	0 5	6 17	0.30	1.33	
27	8 22 38	19 10	123 25.4	0 14.1	5 45	0 1	6 13	0.30	1.33	
						(11 57)				
28	8 22 31	19 11	123 23.8	0 14.1	5 41	11 53	6 9	0.30	1.33	
29	8 22 27	19 11	123 22.1	0 14.1	5 37	11 49	6	0.30	1.33	
30	8 22 20	19 12	123 20.4	0 14.1	5 33	11 45	6 1	0.30	1.33	
31	8 22 10	N.19 12	123 18.7	S. 0 14.1	29	11 41			1.33	

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## TRIVANDRUM.

Date.	MEAN NOON.				MEAN TIME.				
	Right Ascension.	Declination.	Longitude.	Latitude.	Rising.	Meridian Passage.	Setting.	Hor. Par.	Semidia- meter.
Feb									
	<i>h.</i> <i>s</i>				<i>h. m.</i> <i>P. M.</i>	<i>h. m.</i> <i>P. M.</i>	<i>h. m.</i> <i>A. M.</i>		
1	8 22 3	N. 19 13	123 16.0	S. 0 14.0	5 25	11 37	5 53	0.30	1.33
2	8 21 56	19 13	123 14.3	0 14.0	5 20	11 32	5 49	0.30	1.33
3	8 21 49	19 14	123 12.7	0 14.0	5 16	11 28	5 44	0.30	1.33
4	8 21 43	19 14	123 11.0	0 14.0	5 12	11 24	5 40	0.30	1.33
5	8 21 36	19 14	123 9.4	0 14.0	5 8	11 20	5 36	0.30	1.33
6	8 21 29	19 15	123 7.7	0 14.0	5 4	11 16	5 32	0.30	1.33
	8 21 22	19 15	123 6.1	0 13.9	5 0	11 12	5 28	0.30	1.33
8	8 21 16	19 15	123 4.4	0 13.9	4 56	11 8	5 24	0.30	1.33
9	8 21 10	19 16	123 2.8	0 13.9	4 52	11 4	5 20	0.30	1.33
	8 21 3	19 16	123 1.2	0 13.9	4 48	11 0	5 16	0.30	1.33
10	8 20 57	19 17	122 59.7	0 13.9	4 44	10 56	5 12	0.30	1.32
11	8 20 50	19 17	122 58.1	0 13.9	4 40	10 52	5 8	0.30	1.32
12	8 20 44	19 17	122 56.6	0 13.9	4 36	10 48	4	0.30	1.33
13	8 20 38	19 18	122 55.0	0 13.9	4 32	10 44	5 0	0.30	1.33
14	8 20 31	19 18	122 53.5	0 13.8	4 28	10 40	4 56	0.30	1.33
15	8 20 25	19 18	122 51.9	0 13.8	4 24	10 36	4 52	0.20	1.33
16	8 20 19	19 19	122 50.4	0 13.8	4 20	10 32	4 48	0.30	1.33
17	8 20 13	19 19	122 49.0	0 13.8	4 16	10 28	4 44	0.30	1.33
18	8 20 6	19 20	122 47.5	0 13.8	4 12	10 24	4 40	0.30	1.33
19	8 20 0	19 20	122 46.0	0 13.8	4 8	10 20	4 36	0.30	1.33
20	8 20 54	19 20	122 44.6	0 13.8	4 4	10 16	4 32	0.30	1.33
21	8 20 48	19 21	122 43.2	0 13.7	4 0	10 12	4 28	0.30	1.33
22	8 20 42	19 21	122 41.8	0 13.7	3 56	10 8	4 24	0.30	1.33
23	8 19 37	19 21	122 40.4	0 13.7	3 52	10 4	4 20	0.30	1.32
24	8 19 32	19 21	122 39.1	0 13.7	3 48	10 0	4 16	0.30	1.32
25	8 19 26	19 22	122 37.7	0 13.7	3 44	9 56	4 12	0.30	1.32
26	8 19 20	19 22	122 36.4	0 13.7	3 40	9 52	4 8	0.30	1.32
27	8 19 15	N. 19 22	122 35.1	S. 0 13.6	3 36	9 48	4 4	0.30	1.32

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## TRIVANDRUM.

Date.	MEAN NOON.				MEAN TIME.				
March.	Right Ascension.	Declina- tion.	Longitude.	Latitude.	Rising.	Meridian passage.	Setting.	Hor. Par.	Semi- diameter.
	<i>h m s</i>				<i>h m</i>	<i>h m</i>	<i>h m</i>		
1	8 19 10	N 19 22	122 33.8	S 0 13.6	P. M. 3 32	P. M. 9 44	A. M. 4 0	0.30	1.32
2	8 19 5	19 23	122 32.5	0 13 6	3 28	9 40	3 56	0.30	1.32
3	8 19 0	19 23	122 31.3	0 13.6	3 21	9 36	3	0.30	1.32
4	8 18 55	19 23	122 30.1	0 13.6	3 20	9 32	3 45	0.30	1.32
5	8 18 50	19 24	122 29.0	0 13 6	3 16	9 28	3 44	0.30	1.32
6	8 18 46	19 24	122 27.8	0 13.5	3 12	9 24	3 40	0.30	1.32
7	8 18 41	19 25	122 26.7	0 13.5	3 8	9 20	3 36	0.30	1.32
8	8 18 36	19 25	122 25.5	0 13.5	3 4	9 16	3 32	0.30	1.32
9	8 18 32	19 25	122 24	13.5	3 0	9 12	3 28	0.30	1.32
10	8 18 28	19 26	122 23.4	0 13.5	2 56	9 8	3 24	0.30	1.32
11	8 18 23	19 26	122 22.4	0 13.5	2 52	9 4	3 20	0.30	1.32
12	8 18 19	19 26	122 21.4	0 13.4	2 48	9 0	3 16	0.30	1.32
13	8 18 15	19 26	122 20.5	0 13.4	2 44	8 56	3 12	0.30	1.32
14	8 18 12	19 26	122 19.5	0 13.4	2 40	8 52	3 8	0.30	1.32
15	8 18 8	19 26	122 18.6	0 13.4	2 36	8 48	3 4	0.30	1.32
16	8 18 4	19 26	122 17.7	0 13.4	2 32	8 44	3 0	0.30	1.31
17	8 18 1	19 26	122 16.9	0 13.4	2 28	8 40	2 56	0.30	1.31
18	8 17 57	19 27	122 16.0	0 13.3	2 24	8 36	2 52	0.30	1.31
19	8 17 54	19 27	122 15.2	0 13.3	2 20	8 32	2 48	0.30	1.31
20	8 17 50	19 27	122 14.4	0 13.3	2 16	8 28	2 44	0.30	1.31
21	8 17 47	19 27	122 13.6	0 13.3	2 12	8 24	2 40	0.30	1.31
22	8 17 44	19 28	122 12.9	0 13.3	2 8	8 20	2 36	0.30	1.31
23	8 17 41	19 28	122 12.2	0 13.3	2 4	8 16	2 32	0.30	1.31
24	8 17 38	19 28	122 11.5	0 13.2	2 0	8 12	2 28	0.30	1.31
25	8 17 36	19 28	122 10.9	0 13.2	1 56	8 8	2 24	0.30	1.31
26	8 17 33	19 29	122 10.3	0 13.2	1 52	8 4	2 20	0.30	1.31
27	8 17 31	19 29	122 9.8	0 13.2	1 48	8 0	2 16	0.30	1.31
28	8 17 28	19 29	122 9.3	0 13.2	1 44	7 56	2 12	0.30	1.31
29	8 17 26	19 29	122 8.8	0 13.2	1 40	7 52	2 8	0.30	1.31
30	8 17 25	19 29	122 8.3	0 13.1	1 36	7 48	2 4	0.30	1.31
31	8 17 23	19 29	122 7.9	S 0 13.1	1 32	7 44	0	0.30	1.31

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TRIVANDRUM.

Date.	MEAN NOON.				MEAN TIME.				
	Right Ascension	Declination.	Longitude.	Latitude.	Rising.	Meridian passage.	Setting.	Hor. Par.	Semidiameter.
1	<i>h m s</i> 8 17 21	N 19 29	122 7.5	3.0 13.1	<i>h m</i> P M 1 23	<i>h m</i> P M. 7 40	<i>h m</i> A. M. 1 56	0.30	1.30
2	8 17 20	19 29	122 7.2	0 13.1	1 24	7 36	1 52	0.30	1.30
3	8 17 19	19 29	122 6.8	0 13.1	1 20	7 32	1 48	0.30	1.30
4	8 17 17	19 29	122 6.5	0 13.1	1 16	7 28	1 44	0.30	1.30
	8 17 16	19 29	122 6.2	0 13.0	1 12	7 24	1 40	0.30	1.30
6	8 17 16	19 29	122 6.0	0 13.0	1 8	7 20	1 36	0.30	1.30
8	8 17 15	19 30	122 5.7	0 13.0	1 4	7 16	1 32	0.30	1.30
	8 17 14	19 30	122 5.6	0 13.0	1 0	7 12	1 28	0.30	1.30
9	8 17 13	19 30	122 4	12.9	0		1 24	0.30	1.30
10	8 17 13	19 30	122 5.4	0 12.9	0 52	4	1 20	0.30	1.30
11	8 17 13	19 30	122 5.3	0 12.9	0 48	0	1 16	0.30	1.30
12	8 17 12	19 30	122 5.3	0 12.9	0 45	6 57	1 12	0.30	1.30
13	8 17 12	19	122 5.3	0 12.9	0 41	6 53	1 9	0.29	1.29
14	8 17 12	19 30	122 5.3	0 12.9	0 37	6 49	1 5	0.29	1.29
15	8 17 13	19 30	122 5.4	0 12.8	0 33	6 45	1 1	0.29	1.29
16	8 17 13	19 30	122 5.5	0 12.8	0 29	6 41	0 57	0.29	1.29
17	8 17 13	19 30	122 5.6	0 12.8	0 25	6 37	0 53	0.29	1.29
18	8 17 14	19 30	122 5.8	0 12.8	0 21	6 33	0 49	0.29	1.29
19	8 17 15	19 30	122 6.0	0 12.8	0 17	6 29	0 45	0.29	1.29
20	8 17 16	19 30	122 6.2	0 12.8	0 13	6 25	0 41	0.29	1.29
21	8 17 17	19 30	122 6.5	0 12.7	0 9	6 21	0 37	0.29	1.29
22	8 17 18	19 30	122 6.7	0 12.7	0 5	6 17	0 33	0.29	1.29
	8 17 20	19 29	122 7.0	0 12.7	0 1	6 13	0 29	0.29	1.29
24	8 17 21	19 29	122 7.4	0 12.7	<i>A. M.</i> 11 58	6 10	0	0.29	1.29
25	8 17 23	19 29	122 7.8	0 12.6	11 54	6 6	0 22	0.29	1.29
26	8 17 25	19 29	122 8.2	0 12.6	11 50	6 2	0 18	0.29	1.29
27	8 17 27	19 29	122 8.7	0 12.6	11 46	58	0 14	0.29	1.29
28	8 17 29	19 29	122 9.2	0 12.6	11 42	54	0 10	0.29	1.29
29	8 17 31	19 29	122 9.7	0 12.6	11 38	5 50	0 6	0.29	1.28
30	8 17 33	N 19 29	122 10.3	S 0 12.6	11 34	5 46	<i>P M</i> 0 2	0.29	1.28

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## TRIVANDRUM.

Date.	MEAN NOON.				MEAN TIME.				
	Right Ascension.	Declination.	Longitude.	Latitude.	Rising.	Meridian Passage.	Setting	Hor. Par.	Semi- diameter.
May.									
	<i>h.</i>			<i>°</i>	<i>h m</i>	<i>h m</i>	<i>h m</i>		<i>''</i>
					<i>A M</i>	<i>P M</i>	<i>P M</i>		
1	8 17 35	N 19 29	122 10.9	S 0 12.5	11 30	5 42	11 54	0.29	1.28
2	8 17 37	19 29	122 11.5	0 12.5	11 26	5 38	11 50	0.29	1.28
3	8 17 40	19 29	122 12.2	0 12.5	11 22	5 34	11 46	0.29	1.28
4	8 17 43	19 29	122 12.9	0 12.5	11 18	5 30	11 42	0.29	1.28
5	8 17 46	19 28	122 13.6	0 12.5	11 14	5 26	11 38	0.29	1.28
6	8 17 49	19 28	122 14.3	0 12.5	11 11	5 23	11 35	0.29	1.28
7	8 17 52	19 28	122 15.1	0 12.4	11 7	5 19	11 31	0.29	1.28
8	8 17 55	19 28	122 15.9	0 12.4	11 3	5 15	11 27	0.29	1.28
9	8 17 59	19 27	122 16.7	0 12.4	10 59	5 11	11 23	0.29	1.28
10	8 18 2	19 27	122 17.6	0 12.4	10 55	5 7	11 19	0.29	1.28
11	8 18 6	19 27	122 18.5	0 12.4	10 51	5 3	11 15	0.29	1.27
12	8 18 10	19 27	122 19.4	0 12.4	10 47	4 59	11 11	0.29	1.27
13	8 18 14	19 26	122 20.4	0 12.3	10 43	4 55	11 7	0.29	1.27
14	8 18 19	19 26	122 21.4	0 12.3	10 40	4 52	11 4	0.29	1.27
15	8 18 23	19 26	122 22.5	0 12.3	10 36	4 48	11 0	0.29	1.27
16	8 18 27	19 26	122 23.5	0 12.3	10 32	4 44	10 56	0.29	1.27
17	8 18 32	19 26	122 24.6	0 12.3	10 28	4 40	10 52	0.29	1.27
18	8 18 36	19 26	122 25.7	0 12.3	10 25	4 37	10 49	0.29	1.27
19	8 18 41	19 26	122 26.9	0 12.2	10 21	4 33	10 45	0.29	1.27
20	8 18 46	19	122 28.1	0 12.2	10 17	4 29	10 41	0.29	1.27
21	8 18 51	19	122 29.3	0 12.2	10 13	4 25	10 37	0.29	1.27
	8 18 56	19 24	122 30.5	0 12.2	10 9	4 21	10 33	0.29	1.27
23	8 19 1	19	122 31.8	0 12.2	10 5	4 17	10 29	0.29	1.27
24	8 19 6	19 24	122 33.0	0 12.2	10 1	4 13	10 25	0.29	1.27
	8 19 11	19 23	122 34.3	0 12.1	9 57	4 9	10 21	0.29	1.27
	8 19 17	19 23	122 35.6	0 12.1	9 54	4 6	10 18	0.29	1.27
	8 19 23	19 23	122 37.0	0 12.1	9 50	4 2	10 14	0.29	1.26
28	8 19 29	19 23	122 38.4	0 12.1	9 46	3 58	10 10	0.29	1.26
29	8 19 35	19 22	122 39.8	0 12.1	9 42	3 54	10 6	0.29	1.26
30	8 19 41	19 22	122 41.2	0 12.1	9 39	3 51	10 3	0.29	1.26
	8 19 47	N 19 22	122 42.7	S 0 12.0	9 35	47	9 59	0.29	26

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## TRIVANDRUM.

Date.	MEAN NOON.				MEAN TIME.				
	Right Ascension.	Declination.	Longitude.	Latitude.	Rising.	Meridian passage.	Setting.	Hor. Par.	Semidia- meter.
June.	<i>h</i> <i>s</i>				<i>h</i> <i>m</i> A.   M.	<i>h</i> <i>m</i> P.   M.	<i>h</i> <i>m</i> P.   M.		
1	8 19 53	N 19 22	122 44.2	S. 0 12.0	9 31	3 43	9 55	0.29	1.26
2	8 19 59	19 21	122 45.7	0 12.0	9 27	3 39	9 51	0.29	1.26
3	8 20 5	19 21	122 47.2	0 12.0	9 23	3 35	9 47	0.29	1.26
4	8 20 12	19 21	122 48.8	0 12.0	9 19	3 31	9 43	0.29	1.26
5	8 20 18	19 20	122 50.4	0 12.0	9 15	3 27	9 39	0.29	1.26
6	8 20 25	19 20	122 52.0	0 11.9	9 11	3 23	9 35	0.29	1.26
7	8 20 32	19 19	122 53.6	0 11.9	9 8	3 20	9 32	0.29	1.26
8	8 20 39	19 19	122 55.3	0 11.9	9 4	3 16	9 28	0.29	1.26
9	8 20 46	19 19	122 56.9	0 11.9	9 0	3 12	9 24	0.29	1.26
10	8 20 53	19 18	122 58.6	0 11.9	8 56	3 8	9 20	0.29	1.26
11	8 21 0	19 18	123 0.3	0 11.9	8 53	3 5	9 17	0.29	1.26
12	8 21 7	19 18	123 2.0	0 11.8	8 49	3 1	9 13	0.29	1.26
13	8 21 14	19 17	123 3.8	0 11.8	8 45	2 57	9 9	0.29	1.26
14	8 21 21	19 17	123 5.6	0 11.8	8 41	2 53	9 5	0.29	1.26
15	8 21 28	19 16	123 7.4	0 11.8	8 37	2 49	9 1	0.99	1.26
16	8 21 35	19 16	123 9.2	0 11.8	8 33	2 45	8 57	0.29	1.25
17	8 21 42	19 16	123 11.0	0 11.8	8 29	2 41	8 53	0.29	1.25
18	8 21 50	19 15	123 12.9	0 11.7	8 25	2 37	8 49	0.29	1.25
19	8 21 58	19 15	123 14.8	0 11.7	8 22	34	8 46	0.29	1.25
20	8 22 6	19 15	123 16.7	0 11.7	8 18	30	8 42	0.28	1.25
21	8 22 14	19 14	123 18.6	0 11.7	8 14	26	8 38	0.28	1.25
22	8 22 22	19 11	123 20.5	0 11.7	8 10	22	8 34	0.28	1.25
23	8 22 30	19 13	123 22.4	0 11.7	8 7	19	8 31	0.28	1.25
24	8 22 38	19 13	123 24.4	0 11.7	8 3	2 15	8 27	0.28	1.25
25	8 22 46	19 12	123 26.3	0 11.7	59	11	8 23	0.28	1.25
26	8 22 54	19 12	123 28.3	0 11.6	7 55	7	8 19	0.28	1.25
27	8 23 3	19 11	123 30.3	0 11.6	7 52	4	8 16	0.28	1.25
28	8 23 11	19 11	123 32.4	0 11.6	7 48	0	8 12	0.28	1.25
29	8 23 19	19 10	123 34.4	0 11.6	44	1 56	8 8	0.28	1.25
30	8 23 27	N 19 10	123 36.4	S. 0 11.6	40	1 52	8 4	0.28	1.25

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## NEPTUNE.

## TRIVANDRUM.

Date. July.	MEAN NOON.				MEAN TIME.				
	Right Ascension.	Declination.	Longitude.	Latitude.	Rising.	Meridian passage.	Setting.	Hor. Par.	Semidia- meter.
	<i>h m s</i>		<sup>o</sup>		<i>h m</i> A. M.	<i>h m</i> P. M.	<i>h m</i> P. M.		<sup>"</sup>
1	8 23 35	N 13 9	123 39.4	S 0 11.5	7 37	1 49	8 1	0.28	1.25
2	8 23 44	19 9	123 40.5	0 11.5	7 33	1 45	7 57	0.28	1.25
3	8 23 52	19 8	123 42.6	0 11.5	7 29	1 41	7 53	0.28	1.25
4	8 24 1	19 8	123 44.7	0 11.5	7 25	1 37	7 49	0.28	1.25
5	8 24 10	19 7	123 46.8	0 11.5	7 22	1 34	7 46	0.28	1.25
6	8 24 19	19 7	123 48.9	0 11.5	18	1 30	7 42	0.28	1.25
	8 24 27	19 6	123 51.0	0 11.5	7 14	1 26	7 38	0.28	1.25
8	8 24 36	19 6	123 53.2	0 11.5	7 10	1 22	7 34	0.28	1.25
9	8 24 45	19	123 55.3	0 11.5	7 6	1 18	7 30	0.28	1.25
10	8 24 54	19	123 57.5	0 11.4	7 2	1 14	26	0.28	1.25
11	8 25 3	19 4	123 59.6	0 11.4	6 58	1 10	7 22	0.28	1.25
12	8 25 12	19 4	124 1.8	0 11.4	6 54	1 6	18	0.28	1.25
13	8 25 21	19 3	124 3.9	0 11.4	6 51	1 3	7 15	0.28	1.25
14	8 25 30	19 3	124 6.1	0 11.4	6 47	0 59	7 11	0.28	1.25
15	8 25 39	19 2	124 8.2	0 11.4	6 43	0 55	7 7	0.28	1.25
16	8 25 48	19 2	124 10.4	0 11.4	6 39	51	3	0.28	1.25
17	8 25 57	19 1	124 13.6	0 11.4	6 36	0 45	7 0	0.28	1.25
18	8 26 6	19 1	124 14.8	0 11.3	6 32	0 44	6 56	0.28	1.25
19	8 26 15	19 0	124 17.0	0 11.3	6 28	0 40	6 52	0.28	1.25
20	8 26 24	19 0	124 19.2	0 11.3	6 24	0 36	6 48	0.28	1.25
21	8 26 33	18 59	124 21.4	0 11.3	21	0 33	6 45	0.28	1.25
22	8 26 42	18 59	124 23.7	0 11.3	6 17	0 29	6 41	0.28	1.25
23	8 26 51	18 58	124 25.9	0 11.3	6 13	0 25	6 37	0.28	1.25
24	8 27 0	18 58	124 28.1	0 11.3	6 9	0 21	6 33	0.28	1.25
	8 27 9	18 57	124 30.3	0 11.3	6	0 18	30	0.28	1.25
26	8 27 19	18 57	124 32.6	0 11.3	2	0 14	6 26	0.28	1.25
	8 27 28	18 56	124 34.8	0 11.3	58	0 10	22	0.28	1.25
	8 27 37	18 56	124 37.0	0 11.2	54	0 6	6 18	0.28	1.25
25	8 27 46	18	124 39.2	0 11.2	5 50	0 2	6 14	0.28	1.25
29	8 27 56	18	124 41.5	0 11.2	46	A. M.	6 10	0.28	1.25
30	8 28 5	N 13 54	124 43.7	S 0 11.2	43	11 55	6	0.28	1.25
1	8 28 5	8 17 25							



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## TRIVANDRUM.

Date. Sept.	MEAN NOON.				MEAN TIME.						
	Right Ascension.	Declina- tion.	Longi- tude.	Latitude.	Rising	Meridian passage.	Setting.	Hor. Par.	Semidia- meter.		
	<i>h. m. s.</i>				<i>h. m.</i>	<i>h. m.</i>	<i>h. m.</i>				
1	8 32 43	N 18 38	125 51.6	S 0 10.9	3 42	9 54	4 6	0.28	1.25		
2	8 32 51	18 38	125 51.6	0 10.9	3 39	9 50	4 1	0.28	1.25		
3	8 32 59	18 37	125 55.5	0 10.9	3 35	9 46	3 57	0.28	1.25		
4	8 33 7	18 37	125 57.4	0 10.9	3 32	9 43	3 54	0.28	1.25		
5	8 33 14	18 36	125 59.2	0 10.9	3 28	9 39	3 50	0.28	1.25		
6	8 33 21	18 36	126 1.1	0 10.9	3 24	9 35	3 46	0.28	1.25		
7	8 33 29	18 35	126 2.9	0 10.9	3 20	9 31	3 42	0.28	1.25		
8	8 33 37	18 35	126 4.8	0 10.9	3 16	9 27	3 38	0.29	1.25		
9	8 33 44	18 34	126 6.5	0 10.9	3 12	9 23	3 34	0.29	1.25		
10	8 33 51	18 34	126 8.3	0 10.9	3 8	9 19	3 30	0.29	1.25		
11	8 33 59	18 33	126 10.0	0 10.9	3 4	9 15	3 26	0.29	1.25		
12	8 34 7	18 33	126 11.5	0 10.8	3 1	9 12	3 23	0.29	1.25		
13	8 34 14	18 33	126 13.5	0 10.8	2 57	9 8	3 19	0.29	1.25		
14	8 34 21	18 32	126 15.3	0 10.8	2 53	9 4	3 15	0.29	1.25		
15	8 34 28	18 32	126 17.0	0 10.8	2 49	9 0	3 11	0.29	1.25		
16	8 34 35	18 22	126 18.7	0 10.8	2 46	8 57	3 8	0.29	1.25		
17	8 34 41	18 31	126 20.3	0 10.8	2 42	8 53	3 4	0.29	1.25		
18	8 34 47	18 31	126 21.9	0 10.8	2 38	8 49	3 0	0.29	1.25		
19	8 34 54	18 30	126 23.5	0 10.8	2 34	8 45	2 56	0.29	1.25		
20	8 35 1	18 30	126 25.1	0 10.8	2 30	8 41	52	0.29	1.25		
21	8 35 7	18 30	126 26.6	0 10.8	2 26	8 37	48	0.29	1.25		
22	8 35 13	18 29	126 28.1	0 10.8	2 22	8 33	44	0.29	1.25		
23	8 35 20	18 29	126 29.6	0 10.8	2 18	8 29	2 40	0.29	1.25		
24	8 35 26	18 29	126 31.1	0 10.8	2 15	8 26	2 37	0.29	1.25		
25	8 35 32	18 28	126 32.5	0 10.8	2 11	8 22	2 33	0.29	1.25		
26	8 35 39	18 28	126 34.0	0 10.8	2 7	8 18	2 29	0.29	1.25		
27	8 35 44	18 27	126 35.3	0 10.8	2 3	8 14	2 25	0.29	1.25		
28	8 35 49	18 27	126 36.7	0 10.7	2 0	8 11	22	0.29	1.27		
29	8 35 54	18 27	126 38.0	0 10.7	1 56	8 7	2 18	0.29	1.27		
30	8 35 59	N 18 26	126 39.3	S 0 10.7	1 52	8 3	2 14	0.29	1.27		

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# NEPTUNE.

TRIVANDRUM.

Date. Oct.	MEAN NOON				MEAN TIME.				
	Right Ascension.	Declina- tion.	Longitude.	Latitude.	Rising.	Meridian Passage.	Setting	Hor. Par.	Semi- diameter.
	<i>h. m.</i>				<i>h. m.</i> A. M.	<i>h. m.</i> A. M.	<i>h. m.</i> P. M.		
1	8 36 4	N 18 26	126 40.6	S 0 10.7	1 45	7 59	2 10	0.29	1.27
2	8 36 10	18 26	126 41.9	0 10.7	1 44		6	0.29	1.27
3	8 36 14	18 26	126 43.2	0 10.7	1 40	51	2	0.29	1.27
4	8 36 19	18 25	126 44.4	0 10.7	1 36	7 47	1 58	0.29	1.27
5	8 36 24	18 25	126 45.5	0 10.7	1 32	13	1 54	0.29	1.27
6	8 36 29	18 25	126 46.7	0 10.7	1 29	40	1 51	0.29	1.27
	8 36 33	18 25	126 47.8	0 10.7	1 25	36	1 47	0.29	1.27
8	8 36 38	18 24	126 48.9	0 10.7	1 21	32	1 43	0.29	1.27
9	8 36 42	18 24	126 49.9	0 10.7	1 17	28	1 39	0.29	1.27
10	8 36 47	18 24	126 50.9	0 10.7	1 14	7 25	1 36	0.29	1.27
11	8 36 50	18 24	126 51.9	0 10.7	1 10	7 21	1 32	0.29	1.27
12	8 36 54	18 23	126 52.9	0 10.7	1 6	17	1 28	0.29	1.27
	8 36 58	18 23	126 53.8	0 10.7	1 2	7 13	1 24	0.29	1.27
13	8 36 58	18 23	126 54.7	0 10.7	0 58	9	1 20	0.29	1.28
14	8 37 2	18 23	126 55.5	0 10.7	0 54	7	1 16	0.29	1.28
15	8 37 5	18 23							
	8 37 9	18 22	126 56.4	0 10.6	0 50	7 1	1 12	0.29	1.28
16	8 37 9	18 22	126 57.2	0 10.6	0 46	6 57	1 8	0.29	1.28
17	8 37 12	18 22	126 58.0	0 10.6	0 43	6 54	1 5	0.29	1.28
18	8 37 16	18 22							
	8 37 19	18 22	126 58.8	0 10.6	0 39	6 50	1 1	0.29	1.27
19	8 37 19	18 22	126 59.5	0 10.6	0 35	6 46	0 57	0.29	1.28
20	8 37 22	18 21	127 0.1	0 10.6	0 31	6 42	0 53	0.29	1.28
21	8 37 25	18 21							
	8 37 25	18 21	127 0.8	0 10.6	0 27	6 38	0 49	0.29	1.28
22	8 37 28	18 21	127 1.4	0 10.6	0 23	6 34	0 45	0.29	1.28
23	8 37 30	18 21	127 2.0	0 10.6	0 19	6 30	0 41	0.29	1.28
24	8 37 32	18 21							
	8 37 34	18 21	127	0 10.6	0 15	6 26	0 37	0.	1.28
25	8 37 34	18 21	127 3.0	0 10.6	0 11	6 22	0 33	0.29	1.28
26	8 37 37	18 21	127 3.4	0 10.6	0 7	6 18	0 29	0.29	1.28
27	8 37 39	18 21							
	8 37 39	18 21	127 3.9	0 10.6	0 3	6 14	0 25	0.29	1.28
28	8 37 40	18 20	127 4.3	0 10.6	11 56	6 10	0 21	0.29	1.28
29	8 37 42	18 20	127 4.7	0 10.6	11 52	6 7	0 17	0.29	1.29
30	8 37 44	18 20							
	8 37 44	18 20	127 5.0	S 0 10.5	11 48	6 3	0 13	0.29	1.29

## NEPTUNE.

1197  
1093

## TRIVANDRUM.

Date.	MEAN NOON				MEAN TIME.				
	Right Ascension.	Declina- tion.	Longitude.	Latitude.	Rising.	Meridian passage.	Setting.	Hor. Par.	Semidia- meter.
Nov.	<i>h</i> <i>s</i>				<i>h</i> <i>m</i> P. M.	<i>h</i> <i>m</i> A. M.	<i>h</i> <i>m</i> P. M.		
1	8 37 46	N. 18 20	127 5.3	S. 0 10.6	11 44	59	0 10	0.29	1.29
2	8 37 48	18 20	127 5.6	0 10.6	11 40		0 6	0.29	1.29
3	8 37 49	18 20	177 7.9	0 10.5	11 36	51	0 2	0.29	1.29
4	8 37 49	18 20	127 6.1	0 10.5	11 32	47	11 58	0.29	1.29
	8 37 50	18 20	127 6.3	0 10.5	11 28	43	11 54	0.29	1.29
6	8 37 50	18 20	127 6.4	0 10.5	11 24	39	11 50	0.29	1.29
7	8 37 51	18 20	127 6.5	0 10.5	11 20	5 35	11 46	0.29	1.29
8	8 37 51	18 20	127 6.5	0 10.5	11 16	31	11 42	0.29	1.29
9	8 37 51	18 20	127 6.6	0 10.5	11 12	27	11 38	0.29	1.29
10	8 37 52	18 20	127 6.6	0 10.5	11 9	23	11 34	0.29	1.29
11	8 37 52	18 20	127 6.6	0 10.5	11 5	20	11 31	0.29	1.30
12	8 37 52	18 20	127 6.5	0 10.5	11 1	16	11 27	0.29	1.30
13	8 37 51	18 20	127 6.4	0 10.5	10 57	12	11 23	0.29	1.30
14	8 37 51	18 20	127 6.3	0 10.5	10 53	8	11 19	0.29	1.30
15	8 37 50	18 20	127 6.1	0 10.5	10 49	4	11 15	0.30	1.30
16	8 37 49	18 20	127 5.9	0 10.5	10 45	0	11 11	0.30	1.30
17	8 37 48	18 20	127 5.6	0 10.5	10 41	4 56	11 7	0.30	1.30
18	8 37 46	18 20	127 5.4	0 10.5	10 37	4 52	11 3	0.30	1.30
19	8 37 45	18 20	127 5.1	0 10.5	10 33	4 48	10 59	0.30	1.30
20	8 37 44	18 20	127 4.8	0 10.5	10 29	4 44	10 55	0.30	1.30
21	8 37 42	18 21	127 4.4	0 10.5	10 25	40	10 51	0.30	1.30
22	37 41	18 21	127 4.0	0 10.5	10 21	4 36	10 47	0.30	1.30
23	37 39	18 21	127 3.5	0 10.4	10 17	4 32	10 43	0.30	1.30
24	8 37 37	18 21	127 3.0	0 10.4	10 13	4 28	10 39	0.30	1.30
25	8 37 35	18 21	127 2.5	0 10.4	10 9	4 24	10 35	0.30	1.30
26	8 37 33	18 21	127 2.0	0 10.4	10 5	4 20	10 31	0.30	1.30
27	8 37	18 21	127 1.4	0 10.4	10 1	4 16	10 27	0.30	1.31
28	8 37 28	18 21	127 0.8	0 10.4	9 57	4 12	10 23	0.30	1.31
29	8 37 26	18 22	127 0.2	0 10.4	9 53	4 8	10 19	0.30	1.31
30	8 37 24	18 22	126 59.5	S. 0 10.4	9 50	4 4	10 15	0.30	1.31

## NEPTUNE.

1917  
1093

## TRIVANDRUM.

Date. Dec.	MEAN NOON.				MEAN TIME.				
	Right Ascension.	Declination.	Longitude.	Latitude.	Rising.	Meridian passage	Setting.	Hor. Par.	Semi- diameter.
	<i>h.</i>				<i>h m</i> P. M.	<i>h m</i> A. M.	<i>h m</i> A. M.		
1	8 37 21	N 18	126 58.8	S 0 10.4	9 46	4 1	10 12	0.30	1.31
2	8 18	18 22	126 58.1	0 10.4	9 42	3 57	10 8	0.30	1.31
3	8 37 15	18	126 57.3	0 10.4	9 38	3 53	10 4	0.30	1.31
4	8 37 11	18 23	126 56.6	0 10.4	9 34	4 0	10 0	0.30	1.31
	8 8	18 23	126 55.8	0 10.4	9 30	3 45	9 56	0.30	1.31
	8 37 5	18 23	126 55.0	0 10.4	9 26	3 41	5 2	0.30	1.31
7	8 37	18 24	126 54.1	0 10.4	9 22	3 37	9 48	0.30	1.31
8	8 36 58	18 24	126	0 10.4	9 18	3 33	9 44	0.30	1.31
9	8 36 54	18 24	126 52.2	0 10.3	9 14	3 29	9 40	0.30	1.32
10	8 36 50	18 24	126 51.3	0 10.3	9 10	3 25	9 36	0.30	1.32
11	8 36 46	18 25	126	0 10.3	9 6	3 21	9 32	0.30	1.32
12	8 36 42	18	126 49.3	0 10.3	9 2	3 17	9 28	0.30	1.32
13	8 36 38	18	126 48.2	0 10.3	58	3 13	9 24	0.30	1.32
14	8 36 34	18	126 47.1	0 10.3	8 54	3 9	9 20	0.30	1.32
15	8 36 29	18 26	126 46.0	0 10.3	8 50	3	9 16	0.30	1.32
16	8 36 25	18 26	126 44.9	0 10.3	8 46	3 1	9 12	0.30	1.32
17	8 36 20	18 26	126 43.7	0 10.3	8 42	2 57	9 8	0.30	1.32
18	8 36 15	18	126 42.5	0 10.3	8 38	2 53	9 4	0.30	1.32
19	8 36 10	18	126 41.3	0 10.3	8 34	2 49	9 0	0.30	1.32
20	8 36 5	18 27	126 40.1	0 10.3	8 30	45	8 56	0.30	1.32
21	8 36 0	18 28	126 38.9	0 10.3	8 26	2 41	8 52	0.30	1.32
22	8 35 55	18 28	126 37.7	0 10.3	8 22	37	8 48	0.30	1.32
23	8 50	18 29	126 36.4	0 10.2	5	33	8 44	0.30	1.32
24	8 45	18 29	126 35.1	10.2	8 13	2 28	8 39	0.30	1.32
25	8 35 39	18 29	126 33.8	0 10.2	9	2 24	8 35	0.30	1.32
26	8 35 33	18 30	126 32.4	0 10.2	5	2 20	8 31	0.30	1.32
27	8 35 27	18 30	126 31.0	0 10.2	8 1	2 16	8 27	0.30	1.32
28	8 35 22	18 30	126 29.6	0 10.2	7 57	2 12	8 23	0.30	1.32
29	8 35 16	18 30	126 28.2	0 10.2	53	5	19	0.30	1.32
30	11	18 31	126 26.8	0 10.2	7 49	4	8 15	0.30	1.32
31	8 35	N 18 31	126 25.3	S 0 10.2	7 45	0	8 11	0.30	1.32

PRECESSION, NUTATION, &c., 1917.

MEAN NO JN.	LONGITUDE.			Apparent Obliquity.	OBLIQUITY.	
	Precession from 1917·0	Nutation.			Nutation.	
		$\Delta L$	$dL$		$\Delta \omega$	$d\omega$
Jan.						
		+		23    27	+	
1	0·08	16·48	·10	3·04	2·74	+ ·06
2	0·22	16·53	·15	3·04	2·74	+ ·02
3	0·36	16·58	-- ·15	3·03	2·74	·02
4	0·49	16·63	-- ·11	3·03	2·74	·06
	0·63	16·65	-- ·04	3·04	2·75	-- ·09
6	0·77	16·72	+ ·04	3·04	2·75	·10
7	0·90	16·77	+ ·12	3·04	2·75	-- ·05
8	1·04	16·82	+ ·17	3·04	2·75	-- ·06
9	1·18	16·86	+ ·20	3·04	2·76	-- ·02
10	1·32	16·91	+ ·19	3·04	2·76	+ ·01
11	1·45	16·95	+ ·15	3·05	2·76	+ ·05
12	1·59	16·99	+ ·07	3·05	2·77	+ ·08
13	1·73	17·03	-- ·02	3·05	2·78	+ ·09
14	1·87	17·07	·12	3·06	2·78	+ ·09
15	2·00	17·11	·21	3·07	2·79	+ ·07
16	2·14	17·15	·28	3·07	2·80	+ ·04
17	2·28	17·18	·30	3·08	2·80	·01
18	2·42	17·22	·27	3·09	2·81	-- ·05
19	2·55	17·25	-- ·20	3·09	2·82	-- ·08
20	2·69	17·28	·08	3·10	2·83	·10
21	2·83	17·31	+ ·05	3·11	2·84	-- ·09
22	2·97	17·34	+ ·16	3·12	2·85	-- ·06
23	3·10	17·37	+ ·23	3·12	2·86	·02
24	3·24	17·40	+ ·24	3·13	2·87	+ ·03
25	3·38	17·42	+ ·20	3·14	2·88	+ ·08
26	3·52	17·44	+ ·12	3·15	2·89	+ ·10
27	3·66	17·46	+ ·02	3·16	2·90	+ ·10
28	3·79	17·48	·07	3·17	2·91	+ ·08
29	3·93	17·50	·13	3·18	2·92	+ ·04
30	4·07	17·52	·14	3·19	2·93	·01
31	4·21	17·53	·11	3·20	2·94	·05

## PRECESSION, NUTATION, &amp;c., 1917

MEAN NOON.  Feb.	LONGITUDE.			Apparent Obliquity.	OBLIQUITY.	
	Precession. from 1917-0	Nut.			Nutation.	
		$\Delta L$	$d L$		$\Delta \omega$	$d \omega$
				0		
		+		23	+	
1	4.34	17.55	- .05	3.21	2.96	- .08
2	4.48	17.56	+ .03	3.22	2.97	- .09
3	4.62	17.57	+ .11	3.23	2.98	- .09
4	4.76	17.58	+ .17	3.24	2.99	.08
5	4.89	17.58	+ .21	3.25	3.00	- .03
6	5.03	17.59	+ .21	3.26	3.02	.00
	5.17	17.	+ .17	3.28	3.03	+ .04
8	5.31	17.59	+ .11	3.29	3.04	+ .07
9	5.44	17.59	+ .02	3.30	3.05	+ .08
10	5.58	17.59	- .08	3.30	3.06	+ .09
11		17.59	- .18	3.31	3.07	+ .08
12	5.86	17.58	- .25	3.32	3.08	+ .05
13	5.99	17.58	.29	3.33	3.09	+ .01
14	6.13	17.57	.29	3.34	3.11	.04
15	6.27	17.56	.23	3.35	3.12	.07
16	6.41	17.55	.13	3.36	3.13	10
17	6.	17.54	- .01	3.37	3.14	10
18	6.08	17.52	+ .11	3.38	3.14	- .07
19	6.22	17.51	+ .10	3.39	3.15	- .03
20	6.36	17.49	+ .22	3.39	3.16	+ .02
21	7.10	17.47	+ .20	3.40	3.17	+ .06
22	7.23	17.45	+ .13	3.41	3.18	+ .09
	7.37	17.43	+ .04	3.41	3.19	+ .10
24	7.51	17.41	- .06	3.42	3.19	+ .09
	7.65	17.39	- .12	3.43	3.20	+ .05
26	7.78	17.36	- .13	3.43	3.21	+ .01
27	7.92	17.34	.13	3.44	3.21	.04
		17.31	.07	3.44	3.22	- .08

## PRECESSION, NUTATION, &amp;c., 1917.

MEAN NOON.  March.	LONGITUDE.			Apparent Obliquity.	OBLIQUITY.	
	Precession from 1917.0	Nutation.			Nutation.	
		$\Delta L$	$d L$		$\Delta \omega$	$d \omega$
		+		23° 27'	+	
	"	"	"	"		
1	8.20	17.29	+01	3.44	3.22	-09
	8.33	17.26	+10	3.44	3.23	-09
3	8.47	17.23	+17	3.45	3.23	-09
4	8.61	17.20	+21	3.45	3.23	-04
5	8.75	17.17	+22	3.45	3.24	-01
6	8.88	17.13	+20	3.45	3.24	+02
7	9.02	17.10	+14	3.45	3.24	+06
8	9.16	17.07	+06	3.45	3.24	+08
9	9.30	17.03	-04	3.45	3.24	+09
10	9.43	17.00	-13	3.45	3.24	+08
11	9.57	16.96	-22	3.45	3.24	+06
12	9.71	16.92	-27	3.44	3.24	+02
13	9.85	16.89	-28	3.44	3.23	-02
14	9.99	16.85	-24	3.43	3.23	-06
15	10.12	16.81	-16	3.43	3.23	-09
16	10.26	16.77	-05	3.42	3.22	-10
17	10.40	16.74	+07	3.42	3.22	-08
18	10.54	16.70	+16	3.41	3.21	-05
19	10.67	16.66	+20	3.40	3.21	00
20	10.81	16.62	+20	3.39	3.20	+05
21	10.95	16.58	+14	3.38	3.19	+09
22	11.09	16.54	+05	3.37	3.18	+10
23	11.22	16.50	-04	3.36	3.17	+09
24	11.36	16.46	-12	3.35	3.16	+06
25	11.50	16.43	-16	3.34	3.15	+02
26	11.64	16.39	-15	3.33	3.14	03
27	11.77	16.35	10	3.32	3.13	-07
28	11.91	16.31	-02	3.30	3.12	09
29	12.05	16.27	+07	3.29	3.10	-09
30	12.19	16.24	+15	3.27	3.09	-08
31	12.32	16.20	+20	3.26	3.08	-05

## PRECESSION NUTATION &amp; c., 1917.

MEAN NOON April,	LONGITUDE.			Apparent Obliquity.	OBLIQUITY,	
	Precession from 1917·0	Nutation.			Nutation.	
		$\Delta$ L.	d L.		$\Delta$ $\omega$	d $\omega$
		+		23 27	+	
1	12·46	16·16	+ ·22	3·24	3·06	- ·02
2	12·60	16·13	+ ·21	3·23	3·05	+ ·02
3	12·74	16·09	+ ·17	3·21	3·03	+ ·05
4	12·88	16·06	+ ·09	3·19	3·01	+ ·08
	13·01	16·02	·00	3·17	3·00	+ ·09
6	13 15	15·99	- ·10	3·15	2·98	+ ·08
7	13·29	15·96	- ·18	3·13	2·96	+ ·07
8	13·43	15·93	- ·25	3·11	2·94	+ ·03
	13·56	15·90	- ·27	3·09	2·92	- ·01
10	13·70	15·87	- ·24	3·07	2·90	- ·05
11	13·84	15·84	- ·18	3·05	2·88	- ·03
12	13·98	15·81	- ·07	3·03	2·86	- ·10
13	14·11	15·78	+ ·04	3·00	2·84	- ·09
14	14 25	15·76	+ ·14	2·98	2·82	- ·06
15	14·39	15·73	+ ·20	2·96	2·80	- ·02
16	14·53	15·71	+ ·21	2·93	2·77	+ ·03
17	14·66	15·69	+ ·16	2·91	2·75	+ ·07
18	14·80	15·67	+ ·08	2·89	2·73	+ ·10
19	14·94	15·65	- ·03	2·86	2·70	+ ·10
20	15·03	15·63	- ·11	2·83	2·68	+ ·08
21	15·21	15·61	- ·17	2·81	2·66	+ ·04
	15·35	15·59	- ·17	2·79	2·63	- ·01
23	15·49	15·58	- ·13	2·76	2·61	- ·05
24	15·63	15·56	- ·06	2·73	2·58	- ·05
25	15·76	15·55	+ ·03	2·71	2·56	- ·09
26	15·90	15·54	+ ·12	2·68	2·53	- ·09
27	16·04	15·53	+ ·19	2·65	2·51	- ·06
28	16·18	15·52	+ ·22	2·62	2·48	- ·03
29	16·32	15·52	+ ·22	2·60	2·45	+ ·01
30	16·45	15·51	+ ·18	2·57	2·43	+ ·04

## PRECESSION, NUTATION &amp;c., 1917.

MEAN NOON.  MAY.	Longitude				Apparent Obliquity.	Obliquity			
	Precession from 1917.0	Nutation.		$\Delta$		Nutation.		$\omega$	
		$\Delta$	L			d	L		$\omega$
		+	"		°	+			
					23 27	"			
1	16.59	15.50	+ .11	2.51	2.40	+ .07			
2	16.73	15.50	+ .03	2.51	.37	+ .09			
3	16.87	15.50	- .07	2.49	.35	+ .09			
4	17.00	15.50	- .16	2.46	2.32	+ .07			
	17.14	15.50	- .23	2.43	2.30	+ .05			
6	17.28	15.50	- .26	2.40	2.27	+ .01			
7	17.42	15.51	-	2.38	2.24	- .04			
8	17.55	15.51	- .19	2.35	2.21	- .07			
9	17.69	15.52	- .10	2.32	2.19	.09			
10	17.83	15.53	+ .02	2.29	2.16	- .09			
11	17.97	15.54	+ .12	2.26	2.11	- .07			
12	18.10	15.55	+ .20	2.24	2.11	.03			
13	18.24	15.56	+ .22	2.21	2.08	+			
14	18.38	15.57	+ .19	2.18	2.06	+ .06			
15	18.52	15.59	+ .11	2.16	2.03	+ .09			
16	18.65	15.60	+ .01	2.13	2.01	+ .10			
17	18.79	15.62	- .09	2.10	1.98	+ .08			
18	18.93	15.64	- .16	2.08	1.96	+ .05			
19	19.07	15.66	- .18	2.05	1.93	.00			
20	19.20	15.68	- .15	2.02	1.91	- .04			
21	19.34	15.70	- .09	2.00	1.88	- .08			
22	19.48	15.73	.00	1.97	1.86	.09			
23	19.62	15.75	+ .09	1.95	1.85	.09			
24	19.76	15.78	+ .16	1.92	1.81	.07			
25	19.89	15.80	+ .21	1.90	1.79	- .04			
26	20.03	15.83	+ .22	1.87	1.76	.00			
27	20.17	15.86	+ .19	1.85	1.74	+ .03			
28	20.31	15.89	+ .13	1.83	1.72	+ .06			
29	20.44	15.92	+ .05	1.81	1.70	+ .08			
30	20.58	15.95	- .05	1.78	1.68	+ .09			
31	20.72	15.99	- .14	1.76	1.66	+ .08			

## PRECESSION, NUTATION, &amp;c., 1917.

MEAN NOON.	LONGITUDE.			Apparent Obliquity	OBLIQUITY.	
	Precession from 1917.0	Nutation			Nutation.	
		$\Delta L$	$d L$		$\Delta \omega$	$d \omega$
June.						
		+		23 27	+	
1	20.86	16.02	-	1.74	1.64	+ .05
2	20.99	16.05	- .26	1.72	1.62	+ .02
3	21.13	16.09	- .27	1.70	1.60	- .02
4	21.27	16.13	-	1.68	1.58	- .06
5	21.41	16.16	- .14	1.66	1.56	- .09
6	21.54	16.20	- .02	1.64	1.55	- .10
7	21.68	16.24	+ .09	1.62	1.53	- .08
8	21.82	16.28	+ .18	1.60	1.51	- .05
9	21.96	16.32	+ .23	1.59	1.49	.00
10	22.09	16.36	+ .22	1.57	1.48	+ .05
11	22.23	16.40	+ .16	1.55	1.46	+ .03
12	22.37	16.44	+ .06	1.54	1.45	+ .10
13	22.51	16.48	.05	1.52	1.44	+ .09
14	22.65	16.52	- .13	1.51	1.42	+ .06
15	22.78	16.56	- .17	1.50	1.41	+ .02
16	22.92	16.60	- .16	1.48	1.40	- .03
17	23.06	16.65	- .11	1.47	1.39	- .07
18	23.20	16.69	- .03	1.46	1.38	- .09
19	23.33	16.73	+ .06	1.44	1.37	- .09
20	23.47	16.77	+ .14	1.43	1.36	- .08
21	23.61	16.82	+ .20	1.42	1.35	- .05
22	23.75	16.86	+	1.41	1.34	.01
23	23.88	16.90	+ .20	1.40	1.33	+ .02
24	24.02	16.94	+ .15	1.40	1.32	+ .05
25	24.16	16.99	+ .07	1.39	1.32	+ .08
26	24.30	17.03	- .02	1.38	1.31	+ .09
27	24.43	17.07	- .12	1.37	1.31	+ .08
28	24.57	17.11	- .20	1.37	1.30	+ .06
29	24.71	17.15	- .25	1.36	1.29	+ .03
30	24.85	17.20	- .28	1.36	1.29	.00

## PRECESSION, NUTATION, &amp; c., 1917.

MEAN NOON.	LONGITUDE.			Apparent obliquity.	OBLIQUITY.	
	Precession from 1917.0	Nutation.			Nutation.	
		$\Delta L$	$d L$		$\Delta \omega$	$d \omega$
July.		+		°	+	
				23 27		
				"		
1	24.98	17.24	.26	1.35	1.29	- .05
2	25.12	17.28	.13	1.35	1.29	- .08
3	25.26	17.32	.08	1.35	1.29	- .09
4	25.40	17.36	+ .05	1.34	1.28	- .09
5	25.53	17.40	+ .15	1.34	1.28	- .06
6	25.67	17.43	+ .21	1.34	1.28	- .02
7	25.81	17.47	+ .23	1.34	1.28	+ .03
8	25.95	17.51	+ .19	1.34	1.28	+ .07
9	26.09	17.54	+ .11	1.34	1.28	+ .10
10	26.22	17.58	.00	1.34	1.28	+ .10
11	26.36	17.62	- .09	1.34	1.29	+ .07
12	26.50	17.65	.15	1.34	1.29	+ .03
13	26.64	17.68	- .15	1.34	1.29	- .01
14	26.77	17.71	- .12	1.34	1.30	- .06
15	26.91	17.75	- .05	1.34	1.30	- .09
16	27.05	17.78	+ .04	1.35	1.30	- .10
17	27.19	17.80	+ .13	1.35	1.31	- .09
18	27.32	17.83	+ .19	1.36	1.31	- .06
19	27.46	17.86	+ .22	1.36	1.32	- .03
20	27.60	17.89	+ .22	1.37	1.33	+ .01
21	27.74	17.91	+ .16	1.37	1.33	+ .05
22	27.87	17.94	+ .10	1.37	1.34	+ .07
23	28.01	17.96	+ .01	1.38	1.34	+ .09
24	28.15	17.98	- .09	1.39	1.35	+ .09
25	28.29	18.00	.18	1.39	1.36	+ .07
26	28.43	18.02	- .25	1.40	1.37	+ .04
27	28.56	18.04	- .29	1.41	1.38	.00
28	28.70	18.05	- .28	1.41	1.38	.04
29	28.84	18.07	.22	1.42	1.39	- .07
30	28.98	18.08	.13	1.43	1.40	- .09
31	29.11	18.10	.01	1.44	1.41	- .09

## PRECESSION, NUTATION, &amp;c., 1917.

MEAN NOON.  August.	LONGITUDE.			Apparent Obliquity.	OBLIQUITY.	
	Procession from 1917.0	Nutation.			Nutation.	
		$\Delta L$	$d L$		$\Delta \omega$	$d \omega$
		+	+	° 23 27	+	
1	29.25	18.11	+10	1.44	1.42	- .07
2	29.39	18.12	+18	1.45	1.43	- .03
3	29.53	18.12	+21	1.46	1.44	+ .02
4	29.66	18.13	+19	1.47	1.45	+ .06
5	29.80	18.14	+13	1.48	1.46	+ .09
6	29.94	18.14	+04	1.48	1.47	+ .10
7	30.08	18.15	-06	1.49	1.48	+ .08
8	30.21	18.15	-12	1.50	1.49	+ .05
9	30.35	18.15	-15	1.51	1.50	00
10	30.49	18.15	12	1.52	1.51	- .04
11	30.63	18.15	-06	1.53	1.52	- .08
12	30.76	18.14	+03	1.53	1.53	- .09
13	30.90	18.14	+11	1.54	1.54	.09
14	31.04	18.13	+18	1.55	1.54	- .07
15	31.18	18.12	+23	1.56	1.55	.04
16	31.31	18.11	+23	1.57	1.56	00
17	31.45	18.10	+20	1.58	1.57	+ .04
18	31.59	18.09	+13	1.58	1.58	+ .06
19	31.73	18.08	+05	1.59	1.59	+ .08
20	31.86	18.06	.05	1.60	1.60	+ .09
21	32.00	18.05	-14	1.61	1.61	+ .07
22	32.14	18.03	-22	1.61	1.62	+ .05
23	32.28	18.01	-27	1.62	1.62	+ .02
24	32.42	17.99	-28	1.63	1.63	- .02
25	32.55	17.97	.24	1.63	1.64	- .06
26	32.69	17.95	-17	1.64	1.65	- .09
27	32.83	17.92	-06	1.64	1.65	.09
28	32.97	17.90	+04	1.65	1.66	- .08
29	33.10	17.87	+14	1.65	1.67	.05
30	33.24	17.85	+18	1.66	1.67	00
31	33.38	17.82	+18	1.66	1.68	05

## PRECESSION, NUTATION, &amp;c., 1917.

MEAN NOON	LONGITUDE.			Apparent Obliquity.	OBLIQUITY.		
	Precession from 1917.0	Nutation.			Nutation.		
		$\Delta L$	$d L$		$\Delta \omega$	$d \omega$	
Sept.		+	+	° 23	' 27	+	
1	33.52	17.79	+13	1.66		1.68	+08
2	33.65	17.76	+05	1.67		1.68	+10
3	33.79	17.73	-04	1.67		1.69	+09
4	33.93	17.70	-12	1.67		1.69	+06
5	34.07	17.66	-15	1.67		1.69	+02
6	34.20	17.63	-14	1.67		1.70	-03
7	34.34	17.60	-08	1.67		1.70	-07
8	34.48	17.56	+01	1.67		1.70	-09
9	34.62	17.52	+10	1.67		1.70	-09
10	34.75	17.49	+18	1.67		1.70	-08
11	34.89	17.45	+23	1.67		1.70	-05
12	35.03	17.41	+24	1.67		1.70	-01
13	35.17	17.37	+22	1.67		1.70	+03
14	35.30	17.33	+17	1.66		1.70	+06
15	35.44	17.30	+09	1.66		1.69	+08
16	35.58	17.26	-01	1.65		1.69	+09
17	35.72	17.22	-10	1.65		1.69	+08
18	35.86	17.17	-19	1.64		1.68	+06
19	35.99	17.13	-24	1.63		1.68	+03
20	36.13	17.09	-27	1.63		1.67	-01
21	36.27	17.05	-25	1.62		1.66	-05
22	36.41	17.01	-19	1.61		1.66	-08
23	36.54	16.97	-10	1.60		1.65	-09
24	36.68	16.93	+01	1.59		1.64	-09
25	36.82	16.88	+10	1.58		1.63	-06
26	36.96	16.84	+16	1.57		1.62	-02
27	37.09	16.80	+17	1.56		1.61	+03
28	37.23	16.76	+14	1.55		1.60	+07
29	37.37	16.72	+06	1.54		1.59	+10
30	37.51	16.68	-04	1.52		1.58	+10

## PRECESSION, NUTATION, &amp;c. 1917.

MEAN NOON. October.	LONGITUDE.			Apparent obliquity.	OBLIQUITY.	
	Precession from 1917.0	Nutation.			Nutation.	
		$\Delta$ L	d L		$\Delta$ $\omega$	d $\omega$
		+		" 23 27	+	
1	37.64	16.64	- .11	1.51	1.56	+ .01
2	37.78	16.60	- .26	1.49	1.55	+ .03
3	37.92	16.56	- .26	1.48	1.54	- .01
4	38.06	16.52	- .11	1.46	1.52	- .06
5	38.19	16.58	- .03	1.45	1.51	- .02
6	38.33	16.44	+ .07	1.43	1.49	- .02
7	38.47	16.40	+ .16	1.41	1.47	- .03
8	38.61	19.37	+ .22	1.39	1.45	- .06
9	38.75	16.33	+ .25	1.37	1.44	- .02
10	38.88	16.30	+ .24	1.35	1.42	+ .02
11	39.02	16.26	+ .20	1.33	1.40	+ .05
12	39.16	16.23	+ .12	1.31	1.38	+ .07
13	39.30	16.20	+ .03	1.29	1.36	+ .03
14	39.43	16.16	- .06	1.27	1.34	+ .08
15	39.57	16.13	- .15	1.25	1.32	+ .07
16	39.71	16.10	- .22	1.22	1.30	+ .04
17	39.85	16.07	- .25	1.20	1.28	.00
18	39.98	16.05	- .24	1.18	1.25	- .04
19	40.12	16.02	- .20	1.15	1.23	- .07
20	40.26	16.00	- .11	1.13	1.21	- .09
21	40.40	15.97	+ .01	1.10	1.18	- .09
22	40.53	15.95	+ .09	1.08	1.16	- .07
23	40.67	15.93	+ .15	1.05	1.13	- .03
24	40.81	15.91	+ .13	1.02	1.11	+ .02
25	40.95	15.89	+ .15	1.00	1.08	+ .06
26	41.08	15.87	+ .08	0.97	1.06	+ .03
27	41.22	15.85	- .01	0.94	1.03	+ .10
28	41.36	15.84	- .10	0.91	1.00	+ .08
29	41.50	15.83	- .17	0.89	0.98	+ .05
30	41.63	15.82	- .18	0.86	0.95	+ .01
31	41.77	15.80	.15	0.83	0.92	- .04

## PRECESSION, NUTATION, &amp;c., 1917.

MEAN NOON.	LONGITUDE.			Apparent Obliquity.	OBLIQUITY.	
	Precession from 1917.0	Nutation.			Nutation.	
		$\Delta L$	$d L$		$\Delta \omega$	$d \omega$
November.						
		+			+	
				23 27		
1	41.91	15.80	-.07	0.80	0.90	-.05
2	42.05	15.79	+.02	0.77	0.87	-.09
3	42.19	15.78	+.12	0.74	0.84	-.09
4	42.32	15.78	+.20	0.72	0.81	-.07
5	42.46	15.78	+.24	0.69	0.79	-.04
6	42.60	15.78	+.24	0.66	0.76	+.01
7	42.74	15.78	+.21	0.63	0.73	+.01
8	42.87	15.78	+.15	0.60	0.70	+.07
9	43.01	15.78	+.06	0.57	0.67	+.05
10	43.15	15.79	.04	0.54	0.65	+.05
11	43.29	15.80	.13	0.51	0.62	+.07
12	43.42	15.80	.20	0.48	0.59	+.05
13	43.56	15.81	.24	0.45	0.56	+.01
14	43.70	15.83	.24	0.42	0.53	-.03
15	43.84	15.84	-.21	0.39	0.51	-.06
16	43.97	15.86	-.13	0.37	0.48	-.09
17	44.11	15.87	-.03	0.34	0.45	-.09
18	44.25	15.89	+.07	0.31	0.42	-.05
19	44.39	15.91	+.15	0.28	0.40	-.04
20	44.52	15.93	+.19	0.25	0.37	.00
21	44.66	15.95	+.18	0.23	0.35	+.05
22	44.80	15.98	+.12	0.20	0.32	+.05
23	44.94	16.00	+.03	0.17	0.29	+.10
24	45.08	16.03	-.07	0.14	0.27	+.09
25	45.21	16.06	-.15	0.12	0.24	+.06
26	45.35	16.09	-.19	0.09	0.22	+.02
27	45.49	16.12	.17	0.07	0.19	-.03
28	45.63	16.15	.11	0.04	0.17	-.07
29	45.76	16.19	-.02	0.02	0.15	-.07
30	45.90	16.22	+.08	0.00	0.12	-.05

## PRECESSION, NUTATION, &amp;c., 1917

MEAN NOON.	LONGITUDE			Apparent obliquity.	OBLIQUITY.	
	Precession from 1917.0	Nutation.			Nutation.	
		$\Delta L$	$d L$		$\Delta \omega$	$d \omega$
Dec.						
		+	+	23 26	+	
1	46.04	16.25	+ .17	59.97	0.10	.08
2	46.18	16.29	+ .23	59.95	0.08	— .05
3	46.31	16.33	+ .24	59.92	0.06	— .01
4	46.45	16.37	+	59.90	0.04	+ .03
5	46.59	16.41	+ .16	59.88	0.02	+ .06
6	46.73	16.45	+ .08	59.86	0.01	+ .08
7	46.86	16.49	— .01	59.84	0.04	+ .03
8	47.00	16.53	.11	59.82	0.06	+ .08
9	47.14	16.58	— .18	59.80	0.07	+ .05
10	47.28	16.62	— .24	59.78	0.09	+ .02
11	47.41	16.67	.25	59.77	0.11	— .01
12	47.55	16.71	— .23	59.75	0.12	— .05
13	47.69	16.76	— .16	59.73	0.14	— .08
14	47.83	16.81	— .07	59.72	0.15	— .09
15	47.96	16.85	+ .04	59.70	0.16	— .05
16	48.10	16.90	+ .13	59.69	0.18	— .06
17	48.24	16.95	+ .19	59.67	0.19	— .02
18	48.38	17.00	+ .20	59.66	0.20	+ .03
19	48.52	17.04	+ .16	59.65	0.21	+ .07
20	48.65	17.09	+ .07	59.63	0.22	+ .09
21	48.79	17.14	.03	59.62	0.23	+ .09
22	48.93	17.19	.12	59.61	0.23	+ .07
23	49.07	17.24	— .17	59.60	0.24	+ .03
24	49.20	17.29	— .18	59.59	0.25	— .02
25	49.34	17.34	— .13	59.59	0.26	— .06
26	49.48	17.39	— .05	59.58	0.26	— .09
27	49.62	17.43	+ .05	59.57	0.27	— .10
28	49.75	17.48	+ .14	59.57	0.27	— .08
29	49.89	17.53	+ .21	59.56	0.27	— .06
30	50.03	17.58	+ .24	59.56	0.28	— .02
31	50.17	17.62	+ .23	59.55	0.28	+ .02

## PHENOMENA.

d. h. m.			d. h. m.				
JAN.	2 2 55	A. M.	Jup. conjunction with Moon. Jup. 6° 5' S.	MAR.	19 2 41	A. M.	Mer. conjunction with Ven. Mer. 0° 13' S.
	3 8 8	A. M.	Mer. greatest elong 19. 22 E.		20 6 32	P. M.	Ura. conjunction with Moon. Ura. 2° 52' S.
	4 4 8	P. M.	Earth in Perihelion.		21 9 45	A. M.	Sun. enters sign Aries, Equinox.
	7 10 8	P. M.	Mer. in ascending Node.		22 10 20	P. M.	Ven. conjunction with Moon. Ven. 6° 40' S.
	8 0 53	P. M.	Moon. eclipsed invisible at Trivandrum.		23 2 35	A. M.	Mer. conjunction with Moon. Mer. 7° 13' S.
	9 10 12	A. M.	Sat. conjunction with Moon. Sat. 0° 58' N.		23 19	A. M.	Mars. conjunction with Moon. Mars. 6° 12' S.
	9 10 39	P. M.	Nep. conjunction with Moor. Nep. 1° 6' N.		24 0 49	P. M.	Mer. conjunction with Mars. Mer. 0° 56' S.
	10 3 8	A. M.	Mer. Stationary.		26 0 34	A. M.	Jup. conjunction with Moon. Jup. 5° 51' S.
	12 1 8	P. M.	Mer. in Perihelion.		26 4 8	A. M.	Sat. Stationary.
	17 1 8	P. M.	Jup. quadrature with Sun.		28 11 8	A. M.	Ven. greatest Hel. Lat. S.
	18 0 8	A. M.	Sat. opposition with Sun.		29 10 8	P. M.	Mer. sup. conjunction with Sun
	19 11 8	A. M.	Mer. inferior conjunction with Sun.		31 1 10	P. M.	Ven. conjunction with Mars. Ven. 0° 39' S.
	21 8 59	P. M.	Ven. conjunction with Moon. Vens. 1° 26' N.		31 9 19	P. M.	Sat. conjunction with Moon. Sat. 1° 1' N.
	22 7 8	P. M.	Mer. greatest Hel. Lat. N.		1 2 41	P. M.	Nep. conjunction with Moon. Nep. 1° 15' N.
	22 10 37	P. M.	Mer. conjunction with Moon. Mer. 3° 13' N.		5 10 8	P. M.	Mer. in ascending Node.
	23 0 36	P. M.	Sun. eclipsed invisible at Trivandrum.		10 0 8	P. M.	Mer. in Perihelion.
	24 3 42	A. M.	Mars. conjunction with Moon. Mars. 3° 14' S.		13 5 8	A. M.	Nep. Stationary.
	24 6 8	A. M.	Nep. opposition with Sun.		14 6 8	P. M.	Sat. Quadrature with Sun.
	24 3 41	P. M.	Ura. conjunction with Moon. Ura. 3° 30' S.		17 0 33	A. M.	Mer. conjunction with Jup. Mer. 3° 0' N.
	27 5 8	A. M.	Mars. greatest Hel. Lat. S.		17 4 10	A. M.	Ura. conjunction with Moon. Ura. 4° 11' S.
	28 2 8	P. M.	Ven. in descending Node.		20 7 8	P. M.	Mer. greatest Hel. Lat. N.
	29 1 25	P. M.	Jup. conjunction with Moon. Jup. 6° 45' S.		21 3 37	A. M.	Mars. conjunction with Moon. Mars. 6° 5' S.
	30 9 8	P. M.	Mer. Stationary.		21 8 54	P. M.	Ven. conjunction with Moon. Ven. 6° 20' S.
	31 2 15	A. M.	Mer. conjunction with Ven. Mer. 2° 52' N.		22 9 2	P. M.	Jup. conjunction with Moon. Jup. 5° 22' S.
	3 3 16	A. M.	Mars. conjunction with Ura. Mars. 0° 26' S.		23 1 8	A. M.	Nep. Quadrature with Sun.
	5 11 54	A. M.	Sat. conjunction with Moon. Sat. 0° 48' N.		23 9 23	A. M.	Mer. conjunction with Moon. Mer. 1° 16' S.
	6 3 17	A. M.	Nep. conjunction with Moon. Nep. 1° 2' N.		25 1 8	A. M.	Mer. greatest elong. 20° 21' E.
	9 5 8	A. M.	Ura. conjunction with Sun.		26 2 8	P. M.	Ven. sup. conjunction with Sun
	12 2 8	P. M.	Mer. greatest elong. 26° 2' W.		27 7 21	A. M.	Sat. conjunction with Moon. Sat. 1° 2' N.
	15 7 8	A. M.	Mer. in descending Node.		28 10 43	P. M.	Nep. conjunction with Moon. Nep. 1° 28' N.
	20 5 53	A. M.	Mer. conjunction with Moon. Mer. 2° 29' S.		6 6 49	A. M.	Ven. conjunction with Jup. Ven. 0° 16' N.
20 9 28	P. M.	Ven. conjunction with Moon. Ven. 3° 25' S.	6 8 8	A. M.	Mer. Stationary.		
20 11 8	P. M.	Mars. in Perihelion.	9 4 8	P. M.	Jup. conjunction with Sun.		
21 5 53	A. M.	Ura. conjunction with Moon. Ura. 3° 38' S.	14 11 35	P. M.	Mer. conjunction with Ven. Mer. 0° 24' N.		
22 5 0	A. M.	Mars. conjunction with Moon. Mars. 5° 10' S.	14 6 8	A. M.	Mer. in descending Node.		
25 3 13	A. M.	Ven. conjunction with Ura. Ven. 0° 23' S.	14 11 2	A. M.	Ura. conjunction with Moon. Ura. 4° 29' S.		
25 1 8	P. M.	Mer. in aphelion.	15 6 8	A. M.	Ura. Quadrature with Sun.		
26 5 15	A. M.	Jup. conjunction with Moon. Jup. 6° 21' S.	17 1 8	A. M.	Mer. In <sup>o</sup> conjunction with Sun		
29 3 8	A. M.	Mars. conjunction with Sun.	19 11 52	P. M.	Mars. conjunction with Moon. Mars. 5° 2' S.		
2 7 3	P. M.	Mer. conjunction with Ura. Mer. 1° 12' S.	20 4 29	P. M.	Jup. conjunction with Moon. Jup. 4° 56' S.		
4 5 8	A. M.	Ven. in aphelion.	20 9 19	P. M.	Mer. conjunction with Moon. Mer. 5° 50' S.		
4 2 57	P. M.	Sat. conjunction with Moon. Sat. 0° 7' N.	21 5 8	P. M.	Ven. in ascending Node.		
5 8 18	A. M.	Nep. conjunction with Moon. Nep. 1° 3' N.	21 8 5	P. M.	Ven. conjunction with Moon. Ven. 2° 56' S.		
17 10 8	P. M.	Mer. greatest Hel. Lat. S.					

## PHENOMENA.

d. h.			d. h.		
MAY.	24	0 8 P. M.	Mer. in aphelion.		
	25	2 56 A. M.	Mer. conjunction with Jup. Mer. 2° 7' S.		
	25	8 P. M.	Sat. conjunction with Moon. Sat. 1 49 N.		
	26	A. M.	Nep. conjunction with Moon. Nep. 1 47 N.		
	29	7 8 A. M.	Mer. Stationary.		
JUNE.	29	4 8 P. M.	Ura. Stationary.		
	8	5 20 P. M.	Mars conjunction with Jup. Mars. 0 41 N.		
	10	4 50 P. M.	Ura. conjunction with Moon. Ura. 4 40 S.		
	12	4 8 A. M.	Mer. at greatest. Elong. 23 31 W		
	13	9 5 P. M.	Mer. greatest Hel. Lat. S.		
	17	10 58 A. M.	Jup. conjunction with Moon. Jup. 4 30 S.		
	17	6 59 P. M.	Mars. conjunction with Moon. Mars. 3 28 S.		
	17	10 49 P. M.	Mer. conjunction with Moon. Mer. 6 1 S.		
	19	6 22 P. M.	Sun eclipsed invisible at Trivandrum.		
	21	1 42 A. M.	Ven. conjunction with Moon. Ven. 1 25 N.		
		5 23 A. M.	Sun enters Sign Cancer, Solstice.		
	22	9 57 A. M.	Sat. conjunction with Moon. Sat. 2 12 N.		
22	10 P. M.	Nep. conjunction with Moon, Nep. 1 56 N			
23	2 8 P. M.	Mars. in ascending Node.			
24	0 5 P. M.	Ven. in Perihelion.			
JULY.	2	9 8 P. M.	Mer. in ascending Node.		
	4	1 8 A. M.	Earth in Aphelion, Middle of the Total Eclipse of the Moon. Visible at Trivandrum.		
	5	4 49 A. M.	Ven. conjunction with Sat. Ven. 1 4 N.		
		3 53 A. M.	Ven. conjunction with Nep. Ven. 1 43 N.		
	7	0 8 P. M.	Mer. in Perihelion.		
	7	11 22 P. M.	Ura. conjunction with Moon. Ura. 4 41 S.		
	12	10 8 P. M.	Mer. Sup. conjunction with Sun		
	15	3 1 A. M.	Jup. conjunction with Moon. Jup. 4 5 S.		
	16	5 8 A. M.	Ven. greatest Hel. Lat N.		
	16	1 49 P. M.	Mars. conjunction with Moon. Mars. 1 26 S.		
	17	6 8 P. M.	Mer. greatest Hel. Lat. N.		
	19	2 20 A. M.	Mer. conjunction with Sat. Mer. 1 25 N.		
19	7 51 A. M.	Sun Eclipsed invisible at Trivandrum.			
19	3 10 P. M.	Mer. conjunction with Nep. Mer. 2 3 N.			
19	11 56 P. M.	Sat. conjunction with Moon. Sat. 2 33 N.			
20	1 A. M.	Nep. conjunction with Moon. Nep. 2 1 N.			
20	4 17 A. M.	Mer. conjunction with Moon. Mer. 4 10 N.			
21	2 21 M	Ven. conjunction with Moon. Ven. 5 23 N.			
28	2 8 A. M.	Sat. conjunction with Sun			
MAY.	28	0 8 P. M.	Nep. conjunction with Sun.		
	30	5 8 P. M.	Sat. conjunction with Nep. Sat. 0° 39' N.		
AUGUST.	4	7 25 A. M.	Ura. conjunction with Moon. Ura. 4 34 S		
	10	5 8 A. M.	Mer. in descending Node.		
	11	4 44 P. M.	Jup. conjunction with Moon. Jup. 3 40 S.		
	14	9 8 A. M.	Mars conjunction with Moon. Mars. 0 42 N.		
	15	9 8 A. M.	Ura. opp. with Sun.		
	16	10 11 A. M.	Nep. conjunction with Moon. Nep. 2 7 N		
	16	1 P. M	Sat. conjunction with Moon. Sat. 2 55 N.		
	20	11 8 A. M.	Mer. in aphelion.		
	20	2 29 P. M.	Mer. conjunction with Moon. Mer. 3 36 N.		
	21	1 0 A. M.	Ven. conjunction with Moon. Venus 6 33 N.		
	23	10 8 A. M.	Mer. greatest Elong. 27 22 E.		
	31	4 39 M.	Ura. conjunction with Moon. Ura. 4 30 S.		
SEPTEMBER.	3	3 8 P. M.	Jup. Quadrature with Sun.		
	5	1 8 P. M.	Mer. Stationary.		
	8	4 55 A. M.	Jup. conjunction with Moon. Jup. 3 14 S.		
9	8 8 P. M.	Mer. greatest Hel. Lat. S.			
10	7 8 A. M.	Venus in descending Node.			
12	5 1 A. M.	Mars. conjunction with Moon. Mars. 2 55 N.			
12	6 M.	Nep. conjunction with Moon. Nep. 2 18 N.			
13	A. M.	Sat. conjunction with Moon. Sat. 3 22 N.			
17	2 14 A. M.	Mer. conjunction with Moon. Mer. 1 31 N.			
19	5 8 A. M.	Mer. Inf. conjunction with Sun.			
20	3 38 A. M.	Ven. conjunction with Moon. Ven. 4 5 N.			
	2 40 M.	Mars. conjunction with Nep. Mars. 1 18 N.			
23	8 9 P. M.	Sun enters sign Libra. Equinox.			
27	1 8 P. M.	Mer. Stationary.			
28	1 22 A. M.	Ura. conjunction with Moon. Ura. 4 33 S.			
28	8 8 P. M.	Mer. in ascending Node.			
30	10 8 P. M.	Jup. Stationary.			
	1 5 8 P. M.	Mars. conjunction with Sat. Mars. 0 40 N			
OCTOBER.	3	11 8 A. M.	Mer. in Perihelion.		
	4	8 8 P. M.	Mer. greatest Elong. 17 55 W.		
		2 35 P. M.	Jup. conjunction with Moon. Jup. 2 57 S.		
	10	2 A. M.	Nep. conjunction with Moon. Nep. 2 36 N.		
	10	2 33 P. M.	Sat. conjunction with Moon. Sat. 3 52 N.		
	10	0 44 A. M.	Mars. conjunction with Moon. Mars. 5 2 N.		
	13	10 8 A. M.	Ven. conjunction with S. Scorpi' Star 0 4 S.		
	13	5 8 P. M.	Mer. great. Hel. Lat. N.		
	14	9 8 P. M.	Ven. in aphelion.		
	15	9 45 A. M.	Mer. conjunction with Moon. Mer. 7 32 N.		

# PHENOMENA.

d. h.			d h m	
	20 1 5	A. M. Ven. conjunction with Moon. Venus 0° 3' S.	3 6 47	P. M. Nep. conjunction with Moon. Nep. 3° 2' N.
OCT.	25 8 41	A. M. Ura. conjunction with Moon. Ura. 4 44 S.	4 10 50	A. M. Sat. conjunction with Moon. Sat. 4 36 N.
	30 9 8	P. M. Ura. Stationary.	7 8	P. M. Mer. greatest Hel. Lat. S.
	31 7 8	A. M. Nep. Quadrature with Sun.	5 45	A. M. Mars. conjunction with Moon. Mars. 8 0 N.
	1 9 33	P. M. Jup. conjunction with Moon. Jup. 2 55 S.		
NOVEMBER.	3 11 8	P. M. Mer. Sup. conjunction with Sun.	12 10 8	A. M. Mars. Quadrature with Sun.
	6 3 8	A. M. Ven. great Hel. Lat. S.	14 2 31	P. M. Sun eclipsed invisible at Trivandrum.
	6 5 8	A. M. Mer. in descending Node.	16 4 50	A. M. Mer. conjunction with Moon. Mer. 2 56 S.
	6 10 24	A. M. Nep. conjunction with Moon. Nep. 2 53 N.	17 11 8	A. M. Mer. greatest elong 20 19 E.
	1 40	Sat. conjunction with Moon. Sat. 4 19 N.	15 6 9	A. M. Ven. conjunction with Moon. Ven. 5 30 S.
	7 10 8	A. M. Sat. Quadrature with Sun.	15 9 55	P. M. Ura. conjunction with Moon. Ura. 5 5 S.
	8 6 44	P. M. Mars. conjunction with Moon. Mars. 6 46 N.	20 54	P. M. Sun enters Sign Capricorn Solstice.
	10 5 8	A. M. Nep. Stationary	25 5 8	A. M. Mer. Stationary.
	13 1 8	A. M. Ura. Quadrature with Sun.	25 4 8	P. M. Mars. greatest Hel. Lat. N.
	15 1 57	P. M. Mer. conjunction with Moon. Mer. 1 48 N.	25 7 8	P. M. Mer. in ascending Node.
	16 10 8	A. M. Mer. in aphelion.	26 3 54	A. M. Jup. conjunction with Moon. Jup. 3 20 S.
	15 7 54	P. M. Ven. conjunction with Moon. Venus 4 4 S.	28 2 54	P. M. Moon eclipsed invisible at Trivandrum
	21 2 51	M. Ura. conjunction with Moon. Ura. 4 57 S.	30 10 8	A. M. Mer. in Perihelion.
	26 9 8	P. M. Sat. Stationary.	31 2 21	A. M. Nep. conjunction with Moon. Nep. 3 1 N.
	29 1 38	A. M. Jup. conjunction with Moon. Jup. 3 7 S.	31 1	P. M. Ven. conjunction with Uranus. Venus 0 36 N.
	29 10 5	A. M. Jup. opp. with Sun.	31 12	M. Sat. conjunction with Moon. Saturn 4 37 N.
	30 2 8	P. M. Ven. greatest Elong 47 18 E.		

## ECLIPSES 1917.

In the year 1917 there will be seven eclipses, four of the sun and three of the Moon.

- I. A Total eclipse of the Moon, January 8 invisible in Travancore.
- II. A partial eclipse of the Sun, January 23 invisible in Travancore.
- III. A partial eclipse of the Sun, June 19, invisible in Travancore.
- IV. A Total eclipse of the Moon, July 5.

Circumstances of the Eclipse.

Moon enters Penumbra	at	h	m	A. M.	} Trivandrum Mean Time.
... .. shadow		0	3.8		
Total eclipse begins		1	0.2		
Middle of the eclipse		1	58.6		
Total eclipse ends		2	46.9		
Moon leaves shadow		3	35.2		
Moon leaves Penumbra	...	4	33.4		
		5	29.3		
First contact of shadow with Moon's Limb		87° to E			
Last contact	...	109° 50' W			
Magnitude of the Eclipse	1.625 (Moon's diameter=1.0)				

- V. A partial eclipse of the Sun July 19" invisible in Travancore.
- VI. An Annular eclipse of the Sun, December 14 invisible in Travancore.
- VII. A Total eclipse of the Moon December 28 invisible in Travancore.

# TABLES

## TABLES.

TABLE I.

FOR CONVERTING INTERVALS OF MEAN SOLAR TIME INTO EQUIVALENT INTERVALS  
OF SIDEREAL TIME.

Hours of Mean Time.	HOURS.		MINUTES.				SECONDS.						
	Equivalents in Sidereal Time.		Minutes of Mean Time.	Equivalents in Sidereal Time.		Minutes of Mean Time.	Equivalents in Sidereal Time.		Seconds of Mean Time.	Equivalents in Sidereal Time.			
	<i>h</i>	<i>m</i>											
1	1	0	9.8565	1	1	0.1643	31	31	5.0925	1	1.0027	31	31.0849
2	2	0	19.7130	2	2	0.3286	32	32	5.2568	2	2.0055	32	32.0576
3	3	0	29.5694	3	3	0.4928	33	33	5.4211	3	3.0082	33	33.0904
4	4	0	39.4259	4	4	0.6571	34	34	5.5853	4	4.0110	34	34.0931
5	5	0	49.2824	5	5	0.8214	35	35	5.7496		5.0137	35	35.0958
6	6	0	59.1388	6	6	0.9857	36	36	5.9139	6	6.0164	36	36.0986
7	7	1	8.0953	7	7	1.1499	37	37	6.0782	7	7.0192	37	37.1013
8	8	1	18.8518	8	8	1.3142	38	38	6.2424	8	8.0219	38	38.1040
9	9	1	28.7083	9	9	1.4785	39	39	6.4067	9	9.0246	39	39.1068
10	10	1	38.5647	10	10	1.6428	40	40	6.5710	10	10.0271	40	40.1095
11	11	1	48.4212	11	11	1.8070	41	41	6.7353	11	11.0301	41	41.1123
12	12	1	58.2777	12	12	1.9713	42	42	6.8995	12	12.0329	42	42.1150
13	13	2	8.1342	13	13	2.1356	43	43	7.0638	13	13.0356	43	43.1177
14	14	2	17.9906	14	14	2.2998	44	44	7.2281	14	14.0383	44	44.1205
15	15	2	27.8471	15	15	2.4641	45	45	7.3924	15	15.0411	45	45.1232
16	16	2	37.7036	16	16	2.6284	46	46	7.5566	16	16.0438	46	46.1259
17	17	2	47.5600	17	17	2.7927	47	47	7.7209	17	17.0465	47	47.1287
18	18	2	57.4165	18	18	2.9569	48	48	7.8852	18	18.0493	48	48.1314
19	19	3	7.2730	19	19	3.1212	49	49	8.0495	19	19.0520	49	49.1342
20	20		17.1295	20	20	3.2855	50	50	8.2137	20	20.0548	50	50.1369
21	21	3	26.9859	21	21	3.4498	51	51	8.3780	21	21.0575	51	51.1396
22	22	3	36.8424	22	22	3.6140	52	52	8.5423	22	22.0602	52	52.1424
23	23	3	46.6989	23	23	3.7783	53	53	8.7066	23	23.0630	53	53.1451
24	24	3	56.5554	24	24	3.9426	54	54	8.8708	24	24.0657	54	54.1479
				25	25	4.1069	55	55	9.0351	25	25.0685	55	55.1506
				26	26	4.2711	56	56	9.1994	26	26.0712	56	56.1533
				27	27	4.4354	57	57	9.3637	27	27.0739	57	57.1561
				28	28	4.5997	58	58	9.5279	28	28.0767	58	58.1588
				29	29	4.7640	59	59	9.6922	29	29.0794	59	59.1615
				30	30	4.9282	60	60	9.8565	30	30.0821	60	60.1643

TABLES.

TABLE I, (contd.)

FOR CONVERTING INTERVALS OF MEAN SOLAR TIME INTO EQUIVALENT INTERVALS OF SIDEREAL TIME.

FRACTIONS OF A SECOND.

Seconds of Mean Time.	Equivalents in Sidereal Time.	Seconds of Mean Time.	Equivalents in Sidereal Time.	Seconds of Mean Time.	Equivalents in Sidereal Time.
0.01	0.01003	0.34	0.34093	0.67	0.67183
0.02	0.02006	0.35	0.35096	0.68	0.68186
0.03	0.03008	0.36	0.36099	0.69	0.69189
0.04	0.04011	0.37	0.37101	0.70	0.70192
0.05	0.05014	0.38	0.38104	0.71	0.71194
0.06	0.06014	0.39	0.39107	0.72	0.72197
0.07	0.07019	0.40	0.40110	0.73	0.73200
0.08	0.08022	0.41	0.41112	0.74	0.74203
0.09	0.09025	0.42	0.42115	0.75	0.75205
0.10	0.10027	0.43	0.43115	0.76	0.76208
0.11	0.11030	0.44	0.44120	0.77	0.77211
0.12	0.12033	0.45	0.45123	0.78	0.78211
0.13	0.13036	0.46	0.46126	0.79	0.79216
0.14	0.14038	0.47	0.47129	0.80	0.80219
0.15	0.15041	0.48	0.48131	0.81	0.81222
0.16	0.16044	0.49	0.49134	0.82	0.82225
0.17	0.17047	0.50	0.50137	0.83	0.83227
0.18	0.18049	0.51	0.51140	0.84	0.84230
0.19	0.19052	0.52	0.52142	0.85	0.85233
0.20	0.20055	0.53	0.53145	0.86	0.86235
0.21	0.21057	0.54	0.54148	0.87	0.87238
0.22	0.22060	0.55	0.55151	0.88	0.88241
0.23	0.23063	0.56	0.56153	0.89	0.89244
0.24	0.24066	0.57	0.57156	0.90	0.90246
0.25	0.25068	0.58	0.58159	0.91	0.91249
0.26	0.26071	0.59	0.59162	0.92	0.92252
0.27	0.27074	0.60	0.60164	0.93	0.93255
0.28	0.28077	0.61	0.61167	0.94	0.94257
0.29	0.29079	0.62	0.62170	0.95	0.95260
0.30	0.30082	0.63	0.63173	0.96	0.96263
0.31	0.31085	0.64	0.64175	0.97	0.97266
0.32	0.32088	0.65	0.65178	0.98	0.98268
0.3	0.33090	0.66	0.66181	0.99	0.99271

This Table is useful for the conversion of Mean Solar into Sidereal Time  
 Sidereal Time required = Sidereal Time at the preceding Mean Noon + the Equivalent to the given mean time  
 EXAMPLE.—To convert 2 h 22 m 25 s. 62 Mean Time at Trivandrum, Jan. 7-1917 into Sidereal Time.

Sidereal Time at the preceding Mean Noon	h	m	s	
	2	22	25	62
The Table gives the Equivalent Sidereal Intervals.			19	54
			2	0
			19	713
			22	3614
			25	069
			0	622
The Sum is the Sidereal Time required.....	21	27	53	02

## TABLES.

TABLE II.

FOR CONVERTING INTERVALS OF SIDEREAL TIME INTO EQUIVALENT INTERVALS OF  
MEAN SOLAR TIME.

HOURS.			MINUTES.			SECONDS.			
Hours of Sidereal Time	Equivalents in Mean Time.		Minutes of Sidereal Time	Equivalents in Mean Time.		Seconds of Sidereal Time	Equivalents in Mean Time.		
	h	m s		m	s		s	s	
1	0	59 50.1704	1	0	59.8362	31	30 54.9214	1	0.9973
2	1	59 40.3409	2	1	59.6723	32	31 54.7576	2	1.9915
3	2	59 30.5113	3	2	59.5085	33	32 54.5937	3	2.9818
4	3	59 20.6818	4	3	59.3447	34	33 54.4299	4	3.9891
5	4	59 10.8522	5	4	59.1809	35	34 54.2661	5	4.9864
6		59 1.0226	6		59.0170	36	35 54.1023	6	5.9836
7	6	58 51.1931	7	6	58.5532	37	36 53.9384		6.9809
8	7	58 41.3635	8	7	58.6894	38	37 53.7746	8	7.9782
9	8	58 31.5340	9	8	58.5256	39	38 53.6108	9	8.9754
10	9	58 21.7044	10	9	58.3617	40	39 53.4470	10	9.9727
11	10	58 11.8748	11	10	58.1979	41	40 53.2831	11	10.9700
12	11	58 2.0453	12	11	58.0341	42	41 53.1193	12	11.9672
13	12	57 52.2157	13	12	57.8703	43	42 52.9555	13	12.9645
14	13	57 42.3862	14	13	57.7064	44	43 52.7917	14	13.9618
15	14	57 32.5566	15	14	57.5426	45	44 52.6278	15	14.9591
16	15	57 22.7270	16	15	57.3788	46	45 52.4640	16	15.9563
17	16	57 12.8975	17	16	57.2150	47	46 52.3002	17	16.9536
18	17	57 3.0679	18	17	57.0511	48	47 52.1364	18	17.9509
19	18	56 53.2384	19	18	56.8873	49	48 51.9725	19	18.9481
20	19	56 43.4088	20	19	56.7235	50	49 51.8087	20	19.9454
21	20	56 33.5792	21	20	56.5597	51	50 51.6449	21	20.9427
22	21	56 23.7497	22	21	56.3958	52	51 51.4810	22	21.9399
23	22	56 13.9202	23	22	56.2320	53	52 51.3172	23	22.9372
24	23	56 4.0906	24	23	56.0682	54	53 51.1534	24	23.9345
			25	24	55.9044	55	54 50.9896	25	24.9318
			26	25	55.7405	56	55 50.8257	26	25.9290
			27	26	55.5767	57	56 50.6619	27	26.9263
			28	27	55.4129	58	57 50.4981	28	27.9236
			29	28	55.2490	59	58 50.3343	29	28.9208
			30	29	55.0852	60	59 50.1704	30	29.9181



TABLES.

TABLE IV.

For converting Time into Space.

TIME.	SPACE.	TIME.	SPACE.	TIME.	SPACE.	TIME.	SPACE.
H.	Deg.	Min. Sec. Thirds	Deg. Min. Sec. Thir.	Min. Sec. Thirds	Deg. Min. Sec. Thir.	For Decimal parts of a Second.	SPACE.
1	15	1	0 15	31	45		
2	30	2	0 30	32	0		
3	45	3	0 45	33	15		
4	60	4	1 0	34	30		
5	75	5	1 15	35	45		
6	90	6	1 30	36	0		
7	105	7	1 45	37	15		
8	120	8	2 0	38	30		
9	135	9	2 15	39	45		
10	150	10	2 30	40	0		
11	165	11	2 45	41	15		1.5
12	180	12	3 0	42	30		3.
13	195	13	3 15	43	45		4.5
14	210	14	3 30	44	0		6.
15	225	15	3 45	45	15		7.5
16	240	16	4 0	46	30		9.
17	255	17	4 15	47	45		10.5
18	270	18	4 30	48	0		12.
19	285	19	4 45	49	15		13.5
20	300	20	5 0	50	30		
21	315	21	5 15	51	45		
22	330	22	5 30	52	0		
23	345	23	5 45	53	15		
24	360	24	6 0	54	30		
25	375	25	6 15	55	45		
26	390	26	6 30	56	0		
27	405	27	6 45	57	15		
28	420	28	7 0	58	30		
29	435	29	7 15	59	45		
30	450	30	7 30	60	0		

TABLE III.

For converting Space into Time.

SPACE.	TIME.	SPACE.	TIME.	SPACE.	TIME.
Deg. Min. Sec. =	H. Min. Sec. Thir. = Sec.	Deg. Min. Sec.	H. Min. Sec. Thir. = Sec.	Deg.	H. Min.
1	0 4	31	2 4	70	4
2	0 8	32	2 8	80	5
3	0 12	33	2 12	90	6
4	0 16	34	2 16	100	6
5	0 20	35	2 20	110	7
6	0 24	36	2 24	120	8
7	0 28	37	2 28	130	8
8	0 32	38	2 32	140	9
9	0 36	39	2 36	150	10
10	0 40	40	2 40	160	10
11	0 44	41	2 44	170	11
12	0 48	42	2 48	180	12
13	0 52	43	2 52	190	12
14	0 56	44	2 56	200	13
15	1 0	45	3 0	210	14
16	1 4	46	3 4	220	14
17	1 8	47	3 8	230	15
18	1 12	48	3 12	240	16
19	1 16	49	3 16	250	16
20	1 20	50	3 20	260	17
21	1 24	51	3 24	270	18
22	1 28	52	3 28	280	18
23	1 32	53	3 32	290	19
24	1 36	54	3 36	300	20
25	1 40	55	3 40	310	20
26	1 44	56	3 44	320	21
27	1 48	57	3 48	330	22
28	1 52	58	3 52	340	22
29	1 56	59	3 56	350	23
30	2 0	60	4 0	360	24

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TABLES.

TABLE V.

TABLE OF REFRACTIONS.

(To be subtracted from the observed Altitude.)

Appar. Altitude.	Refr. Bar. 30 Ther. 50°	Diff. for 1' Alt.	Diff. for + 1 B.	Diff. for - 1° Fa.	Appar. Altitude.	Refr. Bar. 30 Ther. 50°	Diff. for 1' Alt.	Diff. for + 1 B.	Diff. for - 1° Fa.
0	33 51	11.7	7.4	8.1	4	0 11 52	2.2	2.1	1.70
5	32 53	11.3	7.1	7.6	10	11 30	2.1	2.3	1.64
10	31 58	10.9	6.9	7.3	20	11 10	2.0	2.2	1.58
15	31 5	10.5	6.7	7.0	30	10 50	1.9	2.2	1.53
20	30 13	10.1	6.5	6.7	40	10 32	1.8	2.1	1.48
25	29 24	9.7	6.3	6.4	50	10 14	1.7	2.0	1.43
30	28 37	9.4	6.1	6.1	5	0 9 58	1.6	2.0	1.38
35	27 51	9.0	5.9	5.9	10	9 42	1.5	1.9	1.34
40	27 6	8.7	5.8	5.6	20	9 27	1.5	1.9	1.30
45	26 24	8.4	5.6	5.4	30	9 11	1.4	1.8	1.26
50	25 43	8.0	5.5	5.1	40	8 58	1.3	1.8	1.22
55	25 3	7.7	5.3	4.9	50	8 45	1.3	1.7	1.19
0	24 25	7.4	5.2	4.7	6	0 8 32	1.2	1.7	1.15
5	23 48	7.1	5.0	4.6	10	8 20	1.2	1.6	1.11
10	23 13	6.9	4.9	4.5	20	8 9	1.1	1.6	1.09
15	22 40	6.6	4.8	4.4	30	7 58	1.1	1.6	1.06
20	22 8	6.3	4.6	4.2	40	7 47	1.0	1.5	1.03
25	21 37	6.1	4.5	4.0	50	7 37	1.0	1.5	1.00
30	21 7	5.9	4.4	3.9	7	0 7 27	1.0	1.5	0.98
35	20 38	5.7	4.3	3.8	10	7 17	0.9	1.4	.95
40	20 10.	5.5	4.2	3.6	20	7 8	.9	1.4	.93
45	19 43	5.3	4.0	3.5	30	6 59	.8	1.4	.91
50	19 17	5.1	3.9	3.4	40	6 51	.8	1.3	.89
55	18 52	4.9	3.9	3.3	50	6 43	.8	1.3	.87
0	18 29	4.8	3.8	3.2	8	0 6 35	.7	1.3	.85
5	18 5	4.6	3.7	3.1	10	6 28	.7	1.3	.83
10	17 43	4.4	3.6	3.0	20	6 21	.7	1.2	.82
15	17 21	4.3	3.6	2.9	30	6 14	.7	1.2	.80
20	17 0	4.1	3.5	2.8	40	6 7	.7	1.2	.79
25	16 40	4.0	3.4	2.8	50	6 0	.6	1.2	.77
30	16 21	3.9	3.3	2.7	9	0 5 54	.6	1.1	.76
35	16 2	3.7	3.3	2.7	10	5 47	.6	1.1	.74
40	15 43	3.6	3.2	2.6	20	5 41	.6	1.1	.73
45	16 25	3.5	3.2	2.5	30	5 36	.5	1.1	.71
50	15 8	3.4	3.1	2.4	40	5 30	.5	1.1	.71
55	14 51	3.3	3.0	2.3	50	5 25	.5	1.1	.70
0	14 35	3.2	3.0	2.3	10	0 20	.5	1.0	.69
5	14 19	3.1	2.9	2.2	10	15	.5	1.0	.67
10	14 4	3.0	2.9	2.2	20	10	.5	1.0	.65
15	13 50	2.9	2.8	2.1	30	5	.5	1.0	.64
20	13 35	2.8	2.8	2.1	40	5 0	.5	1.0	.63
25	13 21	2.7	2.7	2.0	50	4 56	.4	0.9	.62
30	13 7	2.7	2.7	2.0	11	0 4 51	.4	0.9	.60
35	12 53	2.6	2.6	2.0	10	4 47	.4	0.9	.59
40	12 41	2.5	2.6	1.9	20	4 43	.4	0.9	.58
45	12 28	2.4	2.5	1.9	30	4 39	.4	0.9	.57
50	12 16	2.4	2.5	1.9	40	4 35	.4	0.9	.56
55	12 3	2.3	2.5	1.8	50	4 31	.4	0.9	.55

TABLES.

TABLE V. (contd.)

TABLE OF REFRACTIONS.

(To be subtracted from the observed Altitude.)

Appar. Altitude.	Refr. Bar. 30 Ther. 50°	Diff. for 1' Alt.	Diff. for + 1 B	Diff. for - 1° Fa.	Appar. Altitude	Refr. Bar. 30 Ther. 50°	Diff. for 1' Alt.	Diff. for + 1 B.	Diff. for - 1° a.	
12	0	4 28.1	.38	9.00	556	41	1 6.0	.000	2.24	.131
	10	4 24.4	.37	8.86	.548	42	1 4.6	.038	2.16	.130
	20	4 20.8	.36	8.74	.541	43	1 2.4	.036	2.09	.125
	30	4 17.3	.35	8.63	.533	44	1 0.3	.034	2.02	.120
	40	4 13.9	.33	8.51	.524	45	0 5.1	.034	1.94	.117
	50	4 10.7	.32	8.41	.517	46	56.1	.033	1.88	.112
						47	54.2	.032	1.81	.108
13	0	4 7.5	.31	8.30	.509	48	52.3	.031	1.75	.104
	10	4 4.4	.31	8.20	.503	49	50.5	.030	1.69	.101
	20	4 1.4	.30	8.10	.496					
	30	3 58.4	.30	8.00	.490	50	48.8	.029	1.63	.097
	40	3 55.5	.29	7.89	.482	51	47.1	.028	1.58	.094
	50	3 52.6	.29	7.79	.476	52	45.4	.027	1.52	.090
						53	43.8	.026	1.47	.088
14	0	3 49.9	.28	7.70	.469	54	42.2	.026	1.41	.085
	10	3 47.1	.28	7.61	.464	55	40.8	.025	1.36	.082
	20	3 44.4	.27	7.52	.458	56	39.3	.025	1.31	.079
	30	3 41.8	.26	7.43	.453	57	37.8	.025	1.26	.076
	40	3 39.2	.26	7.34	.448	58	36.4	.024	1.22	.073
	50	3 36.7	.25	7.26	.444	59	35.0	.024	1.17	.070
15	0	3 34.3	.24	7.18	.439	60	33.6	.023	1.12	.067
	30	3 27.3	.22	6.95	.424	61	32.3	.022	1.08	.065
16	0	3 20.6	.21	6.73	.411	62	31.0	.022	1.04	.062
	30	3 14.4	.20	6.51	.399	63	29.7	.021	0.99	.060
17	0	3 8.5	.19	6.31	.386	64	28.4	.021	0.95	.057
	30	3 2.9	.18	6.12	.374	65	27.2	.020	0.91	.055
18	0	2 57.6	.17	5.98	.362	66	25.9	.020	0.87	.052
19	0	2 47.7	.16	5.61	.340	67	24.7	.020	0.83	.050
						68	23.5	.020	0.79	.047
20		2 38.7	.15	5.31	.325	69	22.4	.020	0.75	.045
21		2 30.5	.13	5.04	.30					
22		2 23.2	.12	4.79	.290	70	21.2	.020	0.71	.043
23		2 16.5	.11	4.57	.276	71	19.9	.020	0.67	.040
24		2 10.1	.10	4.35	.264	72	18.8	.019	0.63	.038
25		2 4.2	.09	4.16	.252	73	17.7	.018	0.59	.036
26		1 58.8	.09	3.97	.241	74	16.6	.018	0.56	.033
27		1 53.8	.08	3.81	.230	75	15.5	.018	0.52	.031
28		1 49.1	.08	3.65	.219	76	14.4	.018	0.48	.029
29		1 44.7	.07	3.50	.209	77	13.4	.017	0.45	.027
						78	12.3	.017	0.41	.025
30		1 40.5	.07	3.36	.201	79	11.2	.017	0.38	.023
31		1 36.6	.06	3.23	.193					
32		1 33.0	.06	3.11	.186	80	10.2	.017	0.34	.021
33		1 29.5	.06	2.99	.179	81	9.2	.017	0.31	.019
34		1 26.1	.05	2.88	.173	82	8.2	.017	0.27	.016
35		1 23.0	.05	2.78	.167	83	7.1	.017	0.24	.014
36		1 20.0	.05	2.68	.161	84	6.1	.017	0.20	.012
37		1 17.1	.05	2.58	.155	85	5.1	.017	0.17	.010
38		1 14.4	.05	2.49	.149	86	4.1	.017	0.14	.010
39		1 11.8	.04	2.40	.144	87	3.1	.017	0.10	.006
						88	2.0	.017	0.07	.004
40		1 9.3	.04	2.32	.139	89	1.0	.017	0.03	.002

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TABLES.

TABLE

Dip of the Horizon.

Height.	Dip.	Height.	Dip.
Feet	"	Feet.	"
1	0	19	4
2	1	20	4
3	1	21	4
4	1	22	4
5	2	23	4
6	2	24	4
7	2	25	4
8	2	26	4
9	2	27	4
10	3	28	5
11	3	29	5
12	3	30	5
13	3	35	5
14	3	40	6
15	3	45	6
16	3	50	6
17	3	55	7
18	4	60	7

(Subtract from Altitude)

TABLE VII.

Sun's Parallax in Altitude.

Altitude.	Parallax.
°	'
0	9
10	9
20	8
30	8
40	7
50	6
55	5
60	4
65	4
70	3
75	2
80	2
85	1
90	0

(Add to Altitude)

TABLE VIII.

Diminution of the Vert. Semid. of Sun or Moon on account of Refraction.

Altitude.	Diminution of Semid.
"	"
5	25
6	19
7	14
8	11
9	9
10	8
11	7
12	6
13	5
14	4
15	4
16	3
18	3
20	2
30	1
45	1

(Subtrac from Semi-) diameter.

TABLES.

TABLE IX.

Reduction of the Moon's equated Parallax for the Spheroid figure of the Earth.

TABLE X.

Augmentation of Moon's Semidiameter.

Altitude.	Augment.	Latitude.	Horizontal Parallax.			
			54'	56'	58'	60'
0	0	0	0.0	0.0	0.0	0.0
5	1	8	0.2	0.2	0.2	0.2
10	3	16	0.8	0.8	0.9	0.9
15	4	20	1.3	1.3	1.4	1.5
20	6	24	1.8	1.9	2.0	2.0
25	7	28	2.4	2.5	2.6	2.7
30	8	33	3.0	3.1	3.3	3.5
35	9	36	3.7	3.9	4.0	4.3
40	10	40	4.5	4.6	4.8	5.1
45	11	44	5.2	5.4	5.6	6.0
50	12	48	6.0	6.2	6.3	6.8
55	13	52	6.7	7.0	7.2	7.6
60	14	56	7.4	7.7	8.0	8.5
70	15	60	8.1	8.4	8.7	9.3
80	15	64	8.7	9.1	9.4	10.0
90	16	68	9.3	9.6	10.0	10.6
		72	9.9	10.1	10.4	11.2
		76	10.3	10.6	10.9	11.7
		84	10.7	11.1	11.5	12.0
		90	10.8	11.2	11.6	12.4

(Add)

(Subtract.)

**Table XI** Showing the distance of the **Mṛga Mesha Sampatha** from the **First Point of Aries** for the year **1917**. (**Ayānaśam.**)

Date.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Date.
1	2231 18	22 31 22	22 31 26	22 31 30	22 31 34	22 31 38	22 31 43	22 31 47	22 31 51	22 31 55	22 31 59	22 32 4	1
2	18	22	26	30	34	39	43	47	51	55	59	4	2
3	18	22	26	30	34	39	43	47	51	55	59	4	3
4	18	22	26	30	35	39	43	47	51	56	0	4	4
5	18	22	26	31	35	39	43	47	52	56	0	4	5
6	18	23	26	31	35	39	43	48	52	56	0	4	6
7	18	23	27	31	35	39	43	48	52	56	0	4	7
8	19	23	27	31	35	39	44	48	52	56	0	5	8
9	19	23	27	31	35	40	44	48	52	56	1	5	9
10	22 31 19	22 31 23	22 31 27	22 31 31	22 31 35	22 31 40	22 31 44	22 31 48	22 31 52	22 31 56	22 32 1	22 32 5	10
11	19	23	27	31	36	40	44	48	52	57	1	5	11
12	19	23	27	32	36	40	44	48	53	57	1	5	12
13	19	24	27	32	36	40	44	48	53	57	1	5	13
14	19	24	28	32	36	40	44	49	53	57	1	5	14
15	20	24	28	32	36	40	44	49	53	57	1	6	15
16	20	24	28	32	36	40	45	49	53	57	2	6	16
17	20	24	28	32	36	41	45	49	53	57	2	6	17
18	20	24	28	32	36	41	45	49	53	58	2	6	18
19	20	24	28	33	37	41	45	49	54	58	2	6	19
20	22 31 20	22 31 25	22 31 28	22 31 32	22 31 37	22 31 41	22 31 45	22 31 49	22 31 54	22 31 58	22 32 2	22 32 6	20
21	20	25	29	33	37	41	45	50	54	58	2	6	21
22	21	25	29	33	37	41	45	50	54	58	2	6	22
23	21	25	29	33	37	41	46	50	54	58	3	6	23
24	21	25	29	33	37	42	46	50	54	58	3	7	24
25	21	25	29	33	37	42	46	50	54	59	3	7	25
26	21	25	29	33	38	42	46	50	55	59	3	7	26
27	21	25	29	34	38	42	46	50	55	59	3	7	27
28	21	22 31 26	29	34	38	42	46	51	55	59	3	7	28
29	21	21	30	34	38	42	46	51	55	59	3	7	29
30	22	...	30	22 31 34	38	22 31 42	47	51	22 31 55	59	22 32 3	8	30
31	22 31 22	...	22 31 30	...	22 31 38	...	22 31 47	22 31 51	...	22 31 59	...	22 32 8	31

**NOTE:—**Do not the number given opposite to each date of the above table from the Geocentric longitude (Sāyāna Sputam) given for the corresponding dates in the Ephemeris to get Nirāyāna Sputam.

**Table XII.** - For the Latitude of Trivandrum. Duration of the Zodiac (in Mean time and Sidereal Time).  
The duration of each sign of the Zodiac for the Latitudes of Lanka and Trivandrum in Mean Time and Sidereal Time. (Sayana and Nirayana Rasamanam).

	Lankodaya.			To Trivandrum.			Lankodaya Sidereal.			To Trivandrum Sidereal.															
	Sayana.		Nirayana.	Sayana.		Nirayana.	Sayana.		Nirayana.	Sayana.		Nirayana.													
	h	m	s	h	m	s	h	m	s	h	m	s													
lam	1	51	21	1	56	52	1	44	35	1	50	46	1	51	40	1	12	1	44	52	1	51	4		
vam	1	59	16	2	6	35	1	53	29	2	3	15	1	59	36	2	6	56	1	53	48	2	3	36	
unam	2	8	23	2	9	30	2	6	3	2	10	38	2	8	44	2	9	52	2	6	24	2	11	0	
itakam	2	8	23	2	1	52	2	10	42	2	6	55	2	8	44	2	12	1	2	11	4	2	7	16	
am	1	59	16	1	52	41	2	3	1	59	24	1	59	36	1	53	0	5	24	1	58	28	1	59	44
	1	51	21	1	50	30	1	58	8	1	57	32	1	51	40	1	50	48	1	58	28	1	57	52	
	1	51	21	1	50	30	1	58	8	2	3	0	1	51	40	1	50	48	1	58	28	1	57	52	
	1	59	16	1	52	41	2	3	3	9	54	1	59	36	1	53	0	24	2	10	16	2	10	16	
ram	2	8	23	2	1	52	2	10	42	8	23	2	8	44	2	2	12	11	4	8	44	8	44		
	2	8	23	2	9	30	2	6	3	1	56	48	8	44	2	9	52	2	6	21	1	57	8		
	1	59	16	6	35	1	53	29	1	45	58	1	59	36	2	6	56	1	53	48	1	46	16		
m	1	51	21	1	56	52	1	44	35	1	43	27	1	51	40	1	57	12	1	44	52	1	43	44	

# EXPLANATION AND USE OF THE DIFFERENT

## ARTICLES IN THE ASTRONOMICAL

### EPHEMERIS FOR 1917.

Time is distinguished into three kinds: *Apparent* or *True* time, *Mean* time and *Sidereal* time; each of which is expressed in days, hours, minutes and seconds. An *Apparent* or *true* day is the interval of time between two consecutive passages of the Sun over the meridian; a *mean* day is the time between two consecutive passages of an imaginary Sun called the *mean* Sun, and is equal to the mean or average of all the apparent solar days in the year; lastly, the time between two successive passages of the same star over the same meridian is a *sidereal* day.

A day is either astronomical or civil; the astronomical day commences at *apparent* noon, or at *mean* noon, according as *apparent* or *mean* time is employed. In this, the civil day and Trivandrum mean time have been used throughout, unless otherwise stated for the convenience of the public. The civil day commences at the midnight preceding the commencement of the astronomical day. This is separated into two periods of twelve hours each, those situated between midnight and noon being called morning hours (written A. M.) and those between noon and midnight, afternoon hours (written P. M.).

The Sidereal day commences at the instant of the passage over the meridian of the Vernal Equinox or, first point of Aries. It is divided into 24 Sidereal hours, counted from 0 to 23, both figures inclusive.

Generally clocks are adjusted in two ways, either mean Solar Time or Sidereal Time. Clocks generally indicate 24 hours, *i. e.*, from 0 to 23 both figures inclusive. If such a clock is adjusted and rated to indicate *mean* time, then the *mean* Sun could be observed on the meridian, when this clock indicates 0 h. 0 m. 0 s.

Clocks and chronometers are generally regulated to mean solar time; so that a complete revolution (24 hours) of the hour hand of one of these machines should be performed in exactly the same interval as the rotation of the Earth on its axis with respect to the mean Sun. If the mean or the fictitious Sun could be observed on the meridian at the instant that the clock indicated 0 h. 0 m. 0 s. it would again be observed there when the hour hand returns to the same position next day. As the time deduced from observation of the *true* Sun is called *true* or *apparent* time, so the time deduced from the *mean* Sun, or indicated by the machines which represent its motion, is denominated *mean* time.

Mean time cannot be obtained immediately from observation; but it may readily be deduced from the Sidereal time according to the Table II... .., or from an observation of the true Sun, with the aid of equation of time, which is the angular distance in time between the mean and the true Sun.

Sidereal time at a moment, at a particular place, is the hour angle measured along the Equator, otherwise called the Right Ascension of the visible heaven, or heavenly body, from the first point of Aries or Vernal Equinox passing the meridian of that particular place at that moment. Consequently a clock adjusted to the Sidereal time must indicate 0h. 0m. 0s. when the first point of Aries passes the meridian and that sidereal clock indicates the Right Ascension of a heavenly body passing the meridian, at that moment.

To calculate the exact mean time of any place in Travancore, convert the longitude given in degrees and minutes into hours, minutes and seconds according to Table III....., find the difference between this and the Trivandrum longitude and add this quantity to, or subtract it from the Trivandrum mean time, as the place is east or west of Trivandrum.

*The Golden Number* is that which any given year holds in the Lunar Cycle, which is a period of 19 years, at the lapse of which the phases of the Moon take place on the same days of the months respectively as at the commencement of the Cycle.

*The Epact* is the number of days of the Lunar Cycle, over and above all the complete courses of the Moon for any number of years; hence the number indicates the age of the Moon at the beginning of the year.

*The Solar Cycle* is a period of 28 years, which owing to leap year, must necessarily elapse before the days of the month can return respectively to the same days of the week as at the commencement of the Cycle. The first year of the Christian Era was the tenth year of this Cycle.

*The Dominical Letter* is that letter of the (first 7 letters of the English) alphabet which points out in the Calendar the Sundays throughout the year; hence also called Sunday letter.

*Roman Indiction* is a period of 15 years, instituted in A. D. 312, by which the Popes have dated their Acts by the year of the Indiction which was fixed on the first of January.

*The Julian period* embraces 7980 years and is used as a fixed era for dating astronomical calculations. The first year of the Christian era is 4713 of the Julian period.

*Nutation in R. A.* The *true* place of the equinox at any time, differs from its *mean* place by a quantity termed the

**Nutation.** The Nutation in Right Ascension is to be applied with the proper sign to a R. A. reckoned from the *mean* equinox to obtain the value with respect to the *true* equinox, and thus serves to find the *apparent* point of intersection of the Ecliptic on the Equator.

*Sun's Horizontal Parallax* is the *greatest* angle, under which the equatorial semidiameter of the Earth would appear at the Sun's centre. It varies inversely as the distance.

*The Parallax* serves for reducing a Solar observation made at the surface of the Earth to what it would be if made at the centre.

*Sun's Aberration.* The progressive motion of light, combined with the motion of the Earth in its orbit, causes the Sun to appear in a different position from that which he really occupies, the *true* position being always in advance of the *apparent*. The numbers in this column indicate the amount of Aberration, or the quantity to be applied to the *true* longitude of the Sun to obtain the *apparent* longitude. The longitudes derived from the Solar Tables include Aberration, and are therefore *apparent* longitudes, such as are contained in this Ephemeris. If the *true* longitude of the Sun be wanted, as is the case in finding the longitude of the Earth for the calculation of the Geocentric place of a body, the Aberration must be applied with a contrary sign.

*Mean Longitude of Moon's Ascending Node.* This column contains the *mean* longitude of the Moon's ascending node, reckoned from the *mean* equinox. The longitude of the node is necessary in the calculation of nutation; it is also sometimes used to determine roughly the stars, which are likely to undergo occultation by the Moon.

*Obliquity of the Ecliptic.* The apparent inclination of the plane of the Ecliptic to that of the Equator is ever varying, as well from the effect of its mean diminution, as of the nutation of the Earth's axis. It is an important element in deducing the positions of the heavenly bodies, with reference to either of the planes, when their positions are known with respect to the other; as, for instance, in computing Right Ascensions and Declinations from Longitudes and Latitudes, and vice versa

To each month of the Ephemeris, there are devoted 4 pages, distinguished by the Roman numerals I to IV.

#### PAGE I OF EACH MONTH.

The first column contains the *Day of the Week*; the second the *Day of the Month*; and the third the corresponding *Malabar Date*.

The *Sun's Right Ascension* given, is *affected with aberration*, and reckoned from the true equinox; it is therefore the sidereal time of the apparent Sun at mean noon, or the time which ought to be shewn by a sidereal clock at that instant. The *Sun's Declination* at mean noon is the *apparent* angular distance of the Sun's centre from the Equator of the date, measured on the meridian.

The Sun's *Declination* is necessary to find the *latitude*, from the meridian altitude observed; it is also requisite for computing the Sun's *azimuth* in order to find the variation of the compass; to calculate the *apparent time* from an observed altitude at a distance from the meridian; to compute the time of the Sun's *rising* or *setting*; and for many other problems in astronomy.

The *Semidiameter of the Sun*. The numbers in this column express the angle at the centre of the Earth subtended by the Sun's semidiameter, and are required for reducing observations of the limb to the centre, as in measuring the altitude of the Sun's upper or lower limb, or the distance of the Moon from the Sun.

The *Sidereal Time of the Sun's Semidiameter passing the Meridian* is useful for reducing a transit observation of either limb of the Sun, when one only has been observed, to the transit of the centre.

The *Equation of Time* is the difference between apparent and mean time, and therefore serves for the conversion of either kind of time into the other. The numbers here given shew, for Trivandrum mean noon, the distance of the mean Sun from the meridian, or the portion of time to be *added to*, or *subtracted from* (according to the precept at the head of the column) Trivandrum apparent noon to obtain the corresponding mean time at the same meridian, or the time which ought to be shewn by the mean time clock. Where time is deduced from observations of the Sun, the *immediate* result is *apparent* time; to convert it into mean time the equation of time is necessary, and is to be applied to apparent time, according to the precept at the head of the column.

The *Sidereal Time at mean Noon* is the angular distance of the first point of Aries, or the true vernal equinox, from the meridian, at the instant of mean noon; it is therefore the Right Ascension of the mean Sun, or the time shown by a sidereal clock at Trivandrum, when the mean time clock indicates 0 h. 0 m. 0 s.

PAGE II OF EACH MONTH.

The *Sun's rising and setting*, though affording a less accurate means of regulating clocks and watches, than direct observations

of the Sun's Altitude, may yet be useful for common purposes. The times are given to the nearest minute, in mean time, of the Sun's centre being in the horizon, and they include the effect of refraction.

The *Sun's Longitude*, here given, is affected with aberration, and reckoned from the *true* equinox: it is therefore the apparent longitude of the Sun at the instant specified.

To obtain the Sun's true longitude referred to the Mean Equinox of the beginning of the year, it is necessary to add the aberration, to subtract the precession, and to apply with proper sign the nutation, corresponding to the date, to the longitude here given.

The *Sun's Latitude* is the angular distance of the Sun's centre from the plane of the Ecliptic, measured on a great circle perpendicular to that plane.

The *Mean Time of Transit of the First Point of Aries* is the distance or the *mean* Sun from the meridian, at the instant when the *true* point of intersection of the Ecliptic and Equator (called the first point of Aries) is on the meridian of Trivandrum; and as the distance of the first point of Aries from the meridian at the instant, the mean Sun is on the meridian, is denominated sidereal time at mean noon, this may, by analogy, be termed the *mean time at sidereal noon*. It is the time by a mean time clock adjusted to the Trivandrum meridian at the moment that the sidereal clock indicates exactly 0 h. 0 m. 0 s.

If the place of observation be not on the meridian of Trivandrum, the mean time must be corrected by the *subtraction* of 9s. 8296 for each hour (and proportional parts for the minutes and seconds) of longitude, if the place be to the west of Trivandrum; but by its *addition*, if to the East.

As the sidereal day is shorter than the solar day, there will always be an occasion (near the time of the autumnal equinox) on which two consecutive transits of the first point of Aries occur on the same mean civil solar day; the first shortly after midnight of one day, and the second shortly before midnight of the following day.

#### PAGE III OF EACH MONTH.

The *Moon's Right Ascension and Declination* are useful to compute her Altitude at any time, or to deduce the time from an observed Altitude. The Declination with the Semidiameter and Parallax serve for finding the Latitude by the meridian Altitude of her upper or lower limb, her Azimuth, time of rising and setting &c. By reason of the Moon's irregular motion, her Right Ascension and Declination, at any time intermediate to those here given, will not be obtained sufficiently exact for very

nice purposes by simple proportion. The numbers represent the position of the Moon, as it would appear from the centre of the Earth, with respect to the equator and the true equinox; and they are given for midnight and noon only.

The *Moon's Semidiameter* is the angle under which her semidiameter would appear if viewed from the centre of the Earth; and the *Horizontal Parallax* is the *greatest* angle under which the Earth's equatorial semidiameter would appear if seen from the centre of the Moon. The former is requisite to obtain the position of the centre from an observation of the Moon's *limb*, as in all cases of altitudes or lunar distances; the latter for computing the horizontal parallax of the Moon at any given Latitude on the Earth, *considered as a spheroid*; also for finding the parallax in altitude, right ascension &c., for the purpose of reducing an observation of the Moon made on the surface of the Earth, to what it would be if made at the centre.

The *Moon's Age* (Thithi) at mean noon is the mean time elapsed since the Moon's ecliptic conjunction with the Sun, or since the Sun and Moon had the same Longitude. The numbers in this column represent her age at Trivandrum, and are expressed in days and decimal parts of a day.

The *Changes of the Moon*. The numbers denote mean time, at which the difference of Longitude between the Sun and the Moon is  $0^\circ$ ,  $90^\circ$ ,  $180^\circ$ , or  $270^\circ$ , being

$0^\circ$  at the New Moon,  
 $90^\circ$  at the First Quarter,  
 $180^\circ$  at the Full Moon,  
 $270^\circ$  at the Last Quarter.

The *Moon's Apogee and Perigee*. The numbers here given indicate, to the nearest hour, the Trivandrum mean time at which the Moon is respectively at her greatest and least distance from the Earth.

#### PAGE IV. OF EACH MONTH.

The mean time of the *Moon's Rising and Setting* is given to the nearest minute: this will be found useful to persons travelling and in many other ways.

The *Moon's Meridian Passage* is the Trivandrum mean time at which the Moon's centre is on the *upper* meridian of Trivandrum, and is useful in finding out the time of high water. When an asterisk is marked across the column, it is to be understood that the Moon does not pass the *upper* meridian on that day at Trivandrum. This is the case one day in each Lunation, and arises from the circumstance of the lunar day being longer than the mean solar day, and including it within its limits. For the

same reason, there are some days on which the Moon *does not rise*, and others on which it *does not set*.

The mean astronomical time of upper transit under any other meridian may be obtained by subtracting or adding the proportional part, due to the longitude, of its *preceding* or *following* difference, according as the longitude is *East* or *West* of Trivandrum.

The *Moon's Longitude and Latitude* indicate the position of the Moon at the respective times, referred to the true Equinox and the Ecliptic of the date, as it would be seen from the centre of the Earth. From these longitudes, the Rasis and Nakshatras and parts thereof, can be easily calculated, by dividing these Longitudes by  $30^\circ$  and  $13^\circ 20'$  respectively.

#### PLANETARY EPHEMERIDES.

These pages contain the Right Ascensions, Declinations, Geocentric Longitudes, and Latitudes, at mean Noon of Trivandrum and Risings, Meridian Passages, Settings, Horizontal Parallaxes and Semidiameters of all the important Planets for every day of the year; and for any time intermediate, they may be found by interpolation.

The Geocentric Right Ascensions are reckoned from the true equinox and are *affected with aberration*, and are therefore *apparent* positions.

The phenomenon that takes place in the case of the planets is that of two transits on the same day, which arises from the planetary day being sometimes *shorter* than the solar day, beginning *after* and terminating *before* the solar day. When two risings, transits, or settings occur, the times of both are given.

#### PHENOMENA.

In these pages are given the approximate times of the conjunctions in Right Ascension of the Planets with the Moon, with each other, and with certain Stars, and the times when the Planets appear to be stationary in Right Ascension; also the times of the conjunctions etc., in longitude of the Planet with the Sun; and other notices, of use to the astronomer.

The conjunction of Planet with Planet is given only when the difference of declination does not exceed  $3^\circ$ ; that of Planet with star, when the difference does not exceed  $10'$ .

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TO FIND LAGNA, USE THE FORMULA,

$$\sin \Theta \cos \omega + \cos \Theta \cot \lambda + \sin \omega \tan \phi = 0$$

Where  $\Theta$  = Sidereal Time

$\omega$  = Obliquity of the Ecliptic

$\phi$  = Latitude of the place

$\lambda$  = Longitude of Lagna

E. g. To find the Lagna of a child born at 5-25 A. M. on 17th September 1916 at Trivandrum, first find the Sidereal time corresponding to 5-25 A. M. Trivandrum Mean Time of the particular date. This can be found out from the preceding Tables, and the Explanations.

$$\begin{aligned} \text{Thus 5 hrs. 25 mts. A. M.} &= 5 \text{ hrs. 7 mts. 26 s.} \\ &= 76^\circ - 51' - 25'' \text{ vide table.} \end{aligned}$$

From tables we have

$$\sin \Theta = \cdot 9738$$

$$\sin \omega = \cdot 3980$$

$$\cos \Theta = \cdot 2274$$

$$\cos \omega = \cdot 9174$$

$$\tan \phi = \cdot 1496$$

$$\sin \Theta \cos \omega = \cdot 89336412$$

$$\sin \omega \tan \phi = \cdot 05954080$$

$$\sin \Theta \cos \omega + \sin \omega \tan \phi = \cdot 95290492$$

Substituting this in the given formula

$$\cos \Theta \cot \lambda = - \cdot 9529$$

$$\cot \lambda = \left. \begin{array}{l} - \cdot 9529 \\ \hline \cdot 2274 \end{array} \right\}$$

$$= - 4 \cdot 1904$$

$$\lambda \text{ (from tables)} = 180^\circ - (13^\circ 25' 19'')$$

$$\text{or Longitude} = 166^\circ 34' 41''$$

To find Longitude from Mesha subtract distance of Mina-Mesha-Sampada of the particular date which is  $22^\circ 31' 3''$

$$\text{The Lagna} = 166^\circ 34' 41''$$

$$\quad - 22^\circ 31' 3''$$

$$\hline 144^\circ 3' 38''$$

This gives Simha Lagna

