

be more near to the truth if the multipliers, (which according to the following rule would be 4 and 5) be replaced respectively by  $4\frac{1}{2}$  and 5 $\frac{1}{2}$ .

The corrections for latitude to be applied to the times of rising are the same as those used for setting, but with the signs changed. In strictness two corrections for longitude are required: one due to the motion of the moon in Right Ascension during the interval that elapses between her rising (or setting) at stations in different longitudes and the other due to the change in the moon's declination during the same interval.

The average value of the first of these corrections is about 2m., to be added for each hour, or for each fifteen degrees of longitude west of the meridian (4h. 46m.); the correction being subtracted, when the place is east of the central meridian.

The correction due to the change in the moon's declination may be disregarded.

The last column in each month on pp. 6, 7, 8, shews the time to which a watch should be set, when the sun is due South, or when the shadow falls on the noon mark of a sun dial.

The times of rising and setting of the sun and moon on pp. 6, 7, 8, without modification, will serve with sufficient exactness for Halifax, Montreal, and Ottawa; and by the rules already given they may be adapted to all other stations. On pp. 9, 10, 11, 12, 13, 14 special tables are also given, shewing the local civil times at which the sun and moon rise and set at Toronto and Fort Garry—two extreme stations as regards latitude.

### THE PLANETS.

**VENUS.**—Venus is an evening star from January 1 till she reaches inferior conjunction with the sun on May 5; after which she passes to the west of the sun and becomes a morning star.

The following are the dates at which she reaches certain remarkable points in her course:

February 22, greatest elongation  $46^{\circ} 30'$  E.; March 7, in perihelion; March 30 greatest brilliancy; April 13, stationary; May 5, inferior conjunction with the Sun; May 18, conjunction with Mercury, Venus  $3^{\circ} 55'$  N. of Mercury; June 10, at greatest brilliancy; June 27, in aphelion; July 14 greatest elongation,  $45^{\circ} 38'$  W.; September 9 conj. with Uranus, Venus  $0^{\circ} 54'$  S.; Oct. 14 conj. with Jupiter, Venus  $0^{\circ} 21'$  N.; Oct. 17 perihelion.

**MARS.**—January 17, quadrature; March 21 stationary; April 27 opposition to Sun; June 7, stationary; Aug. 11, quadrature; Nov. 16, perihelion; Nov. 19, conj. with Saturn, Mars  $1^{\circ} 8'$  S.

**JUPITER.**—Feb. 14, opposition to Sun; April 17, stationary; May 12, quadrature; Sept. 4, conj. with Sun; Sept. 14, conj. with Mercury, Jupiter  $0^{\circ} 54'$  S.; Oct. 14, conj. with Venus, Jupiter  $0^{\circ} 21'$  S.

**SATURN.**—Jan. 13, conj. with Sun; Jan. 29, conj. with Mercury; Saturn  $1^{\circ} 21'$  N.; April 22, quadrature; May 12, stationary; July 21, opposition to Sun; Sept. 29, stationary; Oct. 19, quadrature.

**URANUS.**—Jan. 23, opposition to Sun; April 18, stationary; April 21, quadrature; July 2, conj. with Mercury, Uranus  $1^{\circ} 32'$  S.; July 25, conj. with Sun; Nov. 2, quadrature; Nov. 15, stationary.

The following table gives the local civil times at which the five principal Planets pass the Meridian of 4h. 46m. west longitude, on the first day of each month, together with the days on which their conjunctions with the moon occur. These times will serve very nearly for any other meridian. For brevity A. M. is denoted by (a) and P. M. by (p.)

MONTHS.	VENUS.		MARS.		JUPITER.		SATURN.		URANUS.	
	Culminates. Conj. (H. M.)		Culminates. Conj. (H. M.)		Culminates. Conj. (H. M.)		Culminates. Conj. (H. M.)		Culminates. Conj. (H. M.)	
January .....	2 55 p.	{ 1 31	6 32 a.	21	3 30 a.	16	0 50 p.	27	1 45 a.	13
February .....	3 6 p.	*	5 24 a.	18	1 17 a.	12	11 4 a.	23	11 34 p.	10
March .....	3 0 p.	{ 1 30	4 8 a.	17	11 9 p.	11	9 26 a.	23	9 39 p.	9
April .....	2 25 p.	27	2 12 a.	13	8 56 p.	7	7 35 a.	19	7 35 p.	5
May .....	0 16 p.	23	11 34 p.	10	6 58 p.	4	5 42 a.	17	5 38 p.	{ 2 30
June .....	9 42 a.	20	9 1 p.	6	5 6 p.	{ 1 28	3 39 a.	13	3 37 p.	26
July .....	8 55 a.	20	7 15 p.	4	3 26 p.	26	1 35 a.	10	1 49 p.	24
August .....	8 56 a.	18	6 2 p.	{ 1 30	1 46 p.	23	11 20 p.	6	11 55 a.	20
September .....	9 20 a.	17	5 13 p.	27	0 7 p.	19	9 7 p.	{ 3 30	9 57 a.	16
October .....	9 44 a.	18	4 40 p.	26	10 33 a.	17	7 7 p.	27	8 5 a.	14
November .....	10 3 a.	17	4 17 p.	24	8 52 a.	14	5 8 p.	24	6 16 a.	10
December .....	10 27 a.	18	3 55 p.	23	7 13 a.	12	3 20 p.	21	4 8 a.	8

### ECLIPSES.

In the year 1873 there will be two Eclipses of the Sun, and two of the Moon.

I. Total Eclipse of the Moon, May 11, partly visible in Canada.

The following table shews the local astro-

nomical times at which such phases as are visible occur at different stations; the blank spaces indicating that the Moon at the corresponding stations will set at or before the time when the phase occurs.