

or negligence. It is a curious fact resulting from the westward and eastward progress of the exploration of European nations that as they went eastwards they found the expressed time always moving onwards, those moving westwards found it falling backwards. Where the two explorations met, there, of course the nominal times of the two parties, would come to a decided discrepancy. The meeting is betwixt Asia and America. The extreme west of this continent was settled by Russians who have come from the west, while the rest was colonized by Europeans from the Eastward. While the Russians at Sitka are finishing their latest *vespers*, the Christians in British Columbia are commencing their earliest *matins*.

### Law of Eclipses.

Owing to a remarkable adjustment of the times in which the Moon's synodical revolution, and that of her nodes are performed, eclipses return after a certain period, very nearly in the same order and of the same magnitude. For 223 of the Moon's mean synodical revolutions or lunations, as they are called, will be found to occupy 6,585·32 days, and nineteen complete synodical revolutions of the nodes to occupy 6,585·78. The difference in the mean position of the node then, at the beginning and end of 223 lunations is nearly insensible; so that a recurrence of all eclipses within that interval must take place. Accordingly, this period of 223 lunations, or eighteen years and ten days, is a very important one in the calculation of eclipses. It is supposed to have been known to the earliest astronomers, the regular return of eclipses having been known as a physical fact for ages before their exact theory was understood. In eighteen years there are usually about seventy eclipses: twenty-nine of the moon, forty-one of the sun; or nearly as two to three. Seven is the greatest number that can occur in a year and two the least. If there are seven, five must be of the sun, two of the moon. If there are only two both must be of the sun; for in every year there are at least two solar eclipses. There can never be more than three lunar eclipses in a year, and in some years none at all.

Though the number of solar eclipses is greater *absolutely* than of lunar; yet there are more *lunar* than *solar* eclipses visible in any particular place, because while a lunar eclipse is visible to an entire hemisphere, a solar eclipse is only visible to a particular part, and sometimes to a very small part. A lunar eclipse is visible to an entire hemisphere by reason of the larger shadow and greater proximity of the earth, and the consequent larger immersion of the moon in its shadow, which is far broader than the lunar diameter. A solar eclipse is only visible to a particular part, on account of the moon's shadow immersing only a very small portion of the earth's surface by reason of the comparative smallness of the moon. The lunar shadow traverses the earth at the rate of about 1830 miles per hour.

Total solar eclipses are phenomena rarely observed; for although there are about twenty-eight such eclipses in every period of eighteen years, yet the space over which any one of them appears to be central, is but a narrow belt of the earth's enlightened hemisphere. At Paris there was only one total eclipse of the sun in the 18th century—that of 1742, and there will not be another till near the close of the 19th century. In London not one total eclipse was witnessed during the 575 years—1140 to 1715.