was below the horizon. Once the observers understood that this was the cause of the gap, they could fill it by adding an invisible eclipse at the right moment; thus a regular and continuous series of five or six visible or invisible eclipses was formed. Then the series finished; but after a year or two a new series began, at a time one month earlier than what would have been a continuation of the former series. So if they observed an eclipse not preceded by another 6, 12, or 18 months earlier, they could infer that a new series had started, and could thus foretell new eclipses 6 or 12 months later.

From modern knowledge it is easy to see the basis for this regularity. After six lunar periods (177.18 days) the sun, and hence also the position of the full moon, has progressed on the average 174.64° in longitude. Because of the variable velocity of sun and moon the real progress can be some few degrees more or less. Simultaneously the nodes of the lunar orbit have receded 9.38°; hence the opposite node is situated at a longitude 170.62° longer. Relative to the node, the full moon has then progressed 4.023°. Had it been near a node, then six months later it would again be near a node. The full moon can pass through the earth's shadow when its distance from the node is not more than 10° to 12°; for a total eclipse the distance should be not larger than 5° or 6°, otherwise the eclipse is only partial. We can make these conditions clear by computing the distances for a number of consecutive full moons at intervals of 6 months, starting from an arbitrary first value and increasing it each time by 4.02° or 4.03°:

\[-14.50° | -10.48° | -6.45° | -2.43° | +1.59° | +5.62° | +9.65° | +13.67°\]

for which the aspects will be:

no eclipse | partial? | partial | total | total | total? | partial | no eclipse

The accompanying figure (2), in which the large circles represent the shadow and the small circles represent the moon, shows these aspects.