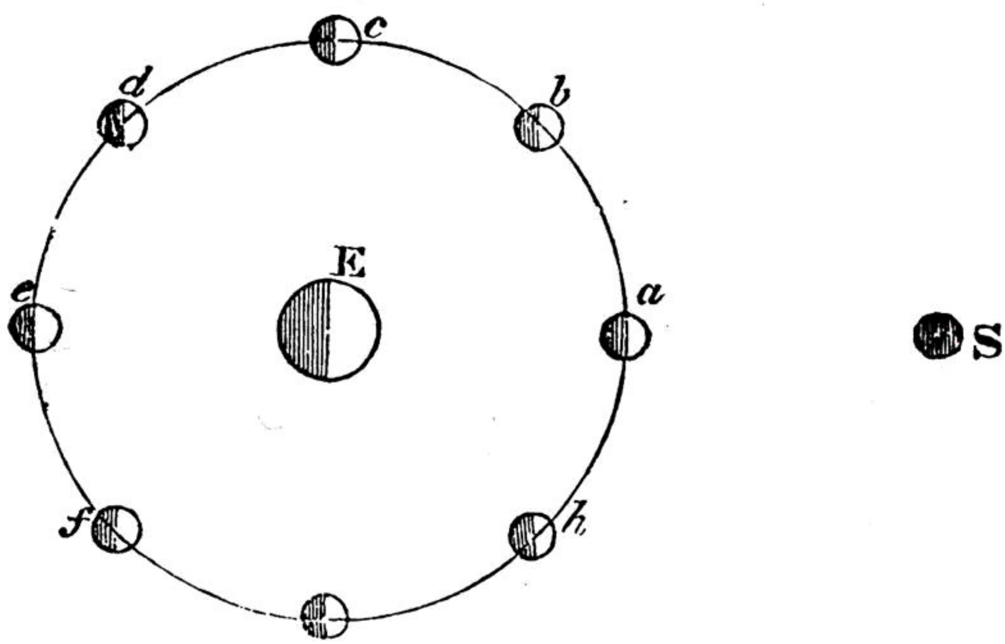
Let us take E as representing the earth, and *abcd*, &c., as the moon in different parts of her orbit, and S as the sun at its real distance, the sun's rays falling in parallel lines upon every part of the moon's orbit. Now, in whatever part of the orbit the moon may be situated, there is always one enlightened and one dark hemisphere. When in the position *a*, that is, when in conjunction with the sun, the dark part is turned towards the earth; when she comes to *g*, half the dark



and half the bright hemisphere are presented, and the same happens when she is situated at *c*; but when she is situated at *e*, the whole of the bright surface is presented to the earth, and there is a full moon. When the moon is situated at *b* and *h*, less than half the bright surface will be presented; when at *d* and *f*, more.

The orbit of the moon, like that of the planets, is an ellipse, but considerably more eccentric, and its plane does not coincide with that of the ecliptic, but is inclined to it at an angle of 5° 8′ 48″, which is called the inclination of the lunar orbit, and the two points where the moon's orbit intersects the ecliptic are called the moon's nodes; that in which the moon passes from the southern side of the ecliptic to the northern is called the ascending node; and the other, the descending. This fact will assist us in explaining the circumstances under which solar and lunar eclipses are produced.