These parallaxes when applied with their proper signs to the right ascensions and declinations of the Moon for the assumed times, furnish the *apparent* right ascensions and declinations. The difference between the *apparent A. R.* of the Moon and the *true A. R.* of the Sun, must be reduced to seconds of *arc* of a *great circle*, by multiplying it by the cosine of the Moon's *apparent* declination. The apparent places of the Moon with respect to the Sun will give the Moon's apparent orbit, and the times of apparent contact of limbs are found in the same way as described in Art. 13. The only other correction necessary to take into account, is that for the augmentation of the Moon's semi-diameter, due to its altitude. The augmentation may be taken from a table prepared for that purpose, and which is to be found in all good works on Practical Astronomy, or it may, in the case of solar eclipses, be computed by the following formulæ :—

TO FIND THE AUGMENTATION OF THE MOON'S SEMI-DIAMETER.

Let C and M be the centres of the Earth and Moon, A a point on the Earth's surface, join $C\,M$, $A\,M$, and produce $C\,A$ to Z; then $M\,C\,Z$ is the Moon's true zenith distance $= Z =$ arc $Z\,S$ in *Fig.* 6; and $M\,A\,Z$ is the apparent zenith distance $= Z' =$ arc $Z\,S'$ in the same figure. Represent the Moon's semi-diameter as seen from C, by d; the semi-diameter as seen from A by d'; the apparent hour angle $Z\,Q\,S'$ by h', and the apparent declination by δ', then

$$\frac{d'}{d} = \frac{C\,M}{A\,M} = \frac{\sin Z'}{\sin Z}$$

$$= \frac{\sin Z\,S'}{\sin Z\,S} \quad (\textit{See Fig. 6.}) \qquad (40).$$

$$= \frac{\sin h' \cos \delta'}{\sin h \cos \delta}, \text{ by Art. 21.}$$

Therefore, $$d' = d.\ \frac{\sin h' \cos \delta'}{\sin h \cos \delta}, \qquad (41).$$

This formula furnishes the augmented semi-diameter at once. It can be easily modified so as to give the augmentation directly, but with logarithms to seven decimal places, it gives the apparent semi-diameter with great precision.