

while the volume of the Sun is to that of the Earth = 1407124. Small alterations in the measurements of the diameters increase the data of volumes in the ratio of their cubes.

The moving planets which agreeably enliven the aspect of the heavens, influence us simultaneously by the magnitudes of their disks and their proximity, by the color of their light, by scintillation—which is not entirely wanting to some planets, in certain positions—and by the peculiarity with which their different surfaces reflect the Sun's light. Whether a feeble evolution of light from the planets themselves modifies the intensity and properties of their light, is a problem which still remains to be solved.

4. *Arrangement of the Planets and their Distances from the Sun.*—In order to form a general conception of the planetary system as a whole, so far as it is yet known, and to represent it in its mean distances from the central body, the Sun, the following table is given, in which, as has always been the custom in astronomy, the mean distance of the Earth from the Sun (20,682,000 geographical miles) is taken as unity. The greatest and smallest distances of the individual planets from the Sun in aphelion and perihelion—according as the planet is situated in the ellipse whose focus is occupied by the Sun, at that point of the major axis (line of apsides) which is the farthest from or nearest to the focus—will be added afterward, when treating of the planets individually. By the mean distance from the Sun, of which alone mention will be made in this place, is to be understood the mean of the greatest and smallest distance, or the *half major axis* of the planet's orbit. It must also be observed, that the numerical data employed, both previously and hereafter, are for the most part taken from Hausen's careful classification of the planetary elements in Schumacher's *Jahrbuch* for 1837. Where the data refer to time, they are, in the case of the older and larger planets, for the year 1800; but in the case of Neptune, for the year 1851, by the aid of the Berlin *astronomischen Jahrbuch* of 1853. The comparison of the small planets occurring afterward, and for which I am indebted to Dr. Galle, refers exclusively to more recent epochs.

Distances of the Planets from the Sun.

Mercury	0·38709		Earth	1·00000
Venus	0·72333		Mars	1·52369