

The apparent diameter of the Sun, at its mean distance from the Earth, is $32' 1''\cdot 8$, and therefore only $54''\cdot 8$ greater than the Moon's disk at its mean distance from us. In the perihelion, when in winter we are nearest to the Sun, the apparent diameter of the latter increases to $32' 34''\cdot 6$; in the aphelion, when in summer we are farthest from the Sun, its apparent diameter is diminished to $31' 30''\cdot 1$.

The Sun's true diameter is 770,800 geographical miles, or more than 112 times greater than that of the Earth.

The mass of the Sun is, according to Encke's calculation of Sabine's pendulum formula, 359,551 times that of the Earth, or 355,499 times that of the Earth and Moon together (*Vierte Abhandlung über den Cometen von Pons in den Schr. der Berl. Akad.*, 1842, p. 5); whence the density of the Sun is only about one fourth (or, more accurately, $0\cdot 252$) that of the Earth.

The volume of the Sun is 600 times greater, and its mass (according to Galle) 738 times greater than that of all the planets combined. It may assist the mind in conceiving a sensuous image of the magnitude of the Sun, if we remember that if the solar sphere were entirely hollowed out, and the Earth placed in its center, there would still be room enough for the Moon to describe its orbit, even if the radius of the latter were increased 160,000 geographical miles.

The Sun rotates on its axis in $25\frac{1}{2}$ days. The equator inclines about $7^\circ 30'$ toward the ecliptic. According to Laugier's very careful observations (*Comptes Rendus de l'Acad. des Sciences*, tom. xv., 1842, p. 941), the period of rotation is $25\frac{34}{100}$ days (or 25d. 8h. 9m.), and the inclination of the equator $7^\circ 9'$.

The conjectures gradually adopted in modern astronomy regarding the physical character of the Sun's surface are based on long and careful observations of the alterations which take place in the self-luminous disk. The order of succession, and the connection of these alterations (the formation of the Sun-spots, the relation of the deep black nuclei to the surrounding ash-gray penumbæ), have led to the assumption that the body of the Sun itself is almost entirely dark, but surrounded at a considerable distance by a luminous envelope; that funnel-shaped openings are formed in this envelope, in consequence of the passage of currents from below upward, and that the black nucleus of the spot is a portion of the dark body of the Sun which is visible through the opening. In order to render this explanation, of which we here only briefly