

a mean distance the polar diameter was $15''\cdot381$; the equatorial diameter $17''\cdot053$, consequently a flattening of $\frac{1}{10}\cdot2$.* The body of the planet has also ribbon-like *stripes*, which are, however, less perceptible, though, at the same time, rather broader than those of Jupiter. The most constant of them is a gray *equatorial stripe*. Next to this follow several others, but with *variable* forms, indicating an atmospheric origin. William Herschel did not always find them parallel to the rings, neither do they extend as far as the poles. The region round the poles presents a very remarkable phenomenon, a change in the reflection of light which is dependent upon Saturn's seasons. This region is more brightly luminous in winter, a phenomenon which calls to mind the variable snow-region of Mars, and did not escape the penetration of William Herschel. Whether such an increase of luminous intensity is to be ascribed to the temporary formation of ice and snow, or to an extraordinary accumulation of clouds,† it is still indicative of the action of changes in temperature, and of the existence of an atmosphere.

We have already stated the mass of Saturn to be $\frac{1}{350}\cdot6$, it, together with the enormous volume of the planet (its diameter is $\frac{4}{5}$ of the diameter of Jupiter), leads us to infer a very small density decreasing toward the surface. If the density were quite homogeneous ($\frac{7\cdot6}{100}$ of that of water), the flattening would be still greater.

The planet is surrounded in the plane of its equator with at least two fully suspended and extremely thin rings, both situated in the same plane. Their luminous intensity is greater than that of Saturn itself, and the outer ring is still brighter than the inner.‡ The division of the ring seen by Huygens in 1655, as a single one,§ was indeed observed by Dominique

* Laplace (*Expos. du Syst. du Monde*, p. 43) estimates the flattening at $\frac{1}{11}$. The extraordinary deviation of Saturn from the spheroidal figure, according to which William Herschel, after a series of laborious observations, made with very different telescopes, found the major axis of the planet, not in the equator itself, but in a diameter which intersected the equatorial diameter at an angle of about 45° , was not confirmed by Bessel, but found to be incorrect.

† Arago, *Annuaire* for 1842, p. 555.

‡ This difference in the luminous intensity of the outer and inner rings was also stated by Dominique Cassini (*Mém. de l'Académie des Sciences*, année, 1715, p. 13).

§ *Cosmos*, vol. ii., p. 323. The *public announcement* of the discovery, or, rather, the complete explanation of all the phenomena which are presented by Saturn and his ring, did not take place until the year 1659, four years afterward, in the *Systema Saturnium*.