

ness of this relation extends to  $\frac{1}{800}$  of the longer periods. This unnoticed result was communicated to me by Sir John Herschel in a letter as long back as 1845. The four satellites of Jupiter present a certain regularity in their distances, forming very nearly the series 3, 6, 12. The distance of the second from the first, expressed in diameters of Jupiter, is 3.6; the distance of the third from the second, 5.7; that of the fourth from the third, 11.6. Moreover, Fries and Challis have endeavored to prove the so-called law of Titius in all satellite systems, even in that of Uranus.\*

## URANUS.

The acknowledged existence of this planet, the great discovery of William Herschel, has not only increased the number of the principal planets known for thousands of years, and more than doubled the diameter of the solar regions—it has also, after the lapse of sixty-five years, led to the discovery of Neptune, through the disturbances which it underwent from the influence of the latter. Uranus was discovered accidentally (13th March, 1781), during the examination of a small group of stars in Gemini, by its small disk, which, with magnifying powers of 460 and 932, increased far more considerably than was the case with other adjacent stars. The sagacious discoverer, so thoroughly acquainted with all *optical* phenomena, also observed that the luminous intensity *decreased* considerably in proportion as stronger magnifying powers were employed, while in the fixed stars (6th and 7th magnitude) it remained nearer the same.

When Herschel first announced the existence of Uranus, he called it a *comet*,† and it was only by the united labors of Saron, Lexell, Laplace, and Méchain, which were considerably facilitated by the discovery made by the meritorious Bode, in 1784, of the previous observations of the planet by Tobias Mayer (1756) and Flamsteed (1690), that the elliptical orbit of Uranus and the whole of its planetary elements were determined with admirable celerity. According to Hansen, the mean *distance* of Uranus from the Sun is 1,918,239, or 1585 million geographical miles; his *period of sidereal revolution* 84y. 5d. 19h. 41m. 36s.; the inclination of his orbit to the ecliptic,  $0^{\circ} 46' 28''$ ; his apparent *diameter* at

\* Fries, *Vorlesungen über die Sternkunde*, 1833, p. 325; Challis, in the *Transact. of the Cambridge Philos. Society*, vol. iii., p. 171.

† William Herschel, *Account of a Comet in the Philos. Transact.* for 1781, vol. lxxi., p. 492.