

The *mass* of Mercury was determined by Lagrange upon very bold assumptions as to the reciprocity of the relations of distances and densities. A means of improving this element was first afforded by *Encke's Comet* of short period of revolution. The mass of this planet was fixed by Encke at $\frac{1}{4885751}$ of the Sun's mass, or about $\frac{1}{13.7}$ of the Earth's. Laplace* gave the mass of Mercury as $\frac{1}{2025310}$ according to Lagrange; but the true mass is only $\frac{1}{12}$ of that assigned by Lagrange. By this correction, also, the previous hypothesis of the rapid increase of density in the planets, in proportion as they were nearer to the Sun, was disproved. When, with Hansen, the material contents of Mercury are assumed to be $\frac{6}{100}$ those of the Earth, the resulting *density* of Mercury is 1.22. "These determinations," adds my friend, the author of them, "are to be considered only as first attempts, which, nevertheless, come much nearer the truth than the numbers assumed by Laplace." Ten years ago the density of Mercury was taken as nearly three times greater than the density of the Earth—as 2.56 or 2.94, when the Earth = 1.00.

VENUS.

The mean distance of this planet from the Sun, expressed in fractional parts of the Earth's distance from the Sun, *i. e.*, 60 million geographical miles, is 0.7233317. The period of its sidereal, or true revolution, is 224 days, 16h. 49m. 7s. No principal planet comes so near the Earth as Venus. She can approach the Earth to within a distance of 21,000,000 miles, but can also recede from it to a distance of 144,000,000 miles. This is the reason of the great variability of her ap-

but in the edition of the *Astronomie* of 1849, Mädler has given the preference to Bessel's result.

* Laplace, *Exposition du Syst. du Monde*, 1824, p. 209. The celebrated author admits, however, that in the determination of the mass of Mercury, he founded his opinion upon the "hypothèse très précaire qui suppose les densités de Mercure et de la Terre réciproques à leur moyenne distance du Soleil." "The very precarious hypothesis which supposes the densities of Mercury and the Earth reciprocal to their mean distance from the Sun." I have not considered it necessary to mention either the chain of mountains, 61,826 feet in height, which Schröter states that he saw upon the disk of Mercury and measured, and which Kaiser (*Sternenhimmel*, 1850, § 57) doubts the existence of, or the visibility of an atmosphere round Mercury during his transit over the Sun, asserted by Lemonnier and Messier (*Delambre, Hist. de l'Astronomie au dix-huitième siècle*, p. 222), or the temporary darkening of the surface of the planet. On the occasion of the transit which I observed in Peru on the 8th of November, 1802, I very closely examined the outline of the planet during the egress, but observed no indications of an envelope