

(September 11th to December 20th, 1847), and Bond,\* the director of the observatory at Cambridge (U. S.), (September 16th, 1847). The Pulkowa observations gave: the *period of rotation* of Neptune's satellite, 5d. 21h. 7m.; the *inclination* of its orbit to the plane of the ecliptic,  $34^{\circ} 7'$ ; the *distance* from the center of the primary, 216,000 geographical miles; the *mass*,  $\frac{1}{14} \frac{1}{500}$ . Three years afterward (August 14th, 1850), Lassell discovered a second satellite, for the examination of which he employed a magnifying power of 628.† This last discovery has not, I believe, been confirmed by other observers.

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### III.

#### THE COMETS.

THE comets, which Xenocrates and Theon of Alexandria call *light-clouds*, and which, according to an old Chaldean belief, Apollonius Myndius considered to "ascend periodically from great distances in long-regulated orbits," though subject to the attractive force of the central body, form a peculiar and separate group in the solar regions. They are distinguished from the planets, properly so called, not merely by the eccentricity of their orbits, and, what is still more important, their *intersection* of the planetary orbits; they also present a variability of figure, a change of outline, which in some instances has been observable during the space of a few hours, as, for example, in the Comet of 1744, so accurately described by Hensius, and at the last appearance of Halley's Comet in 1835. Before Encke had discovered the existence of *interior comets of short periods of revolution*, whose orbits were inclosed within those of the planets, dogmatic speculations, founded upon false analogies as to the increasing eccentricity, magnitude, and decreasing density in proportion to the distance from the Sun, led to the opinion that planetary bodies of enormous volume would be discovered beyond Saturn, revolving in eccentric orbits, and "forming an intermediate group between planets and comets, and, indeed, that the last exterior planet ought to be called a comet, since perhaps its orbit intersected that of Saturn, the planet next to it."‡ Such

\* W. C. Bond, in the *Proceedings of the American Academy of Arts and Sciences*, vol. ii., p. 137 and 140.

† Schum., *Astr. Nachr.*, No. 729, p. 143.

‡ "By means of a series of intermediate members," says Immanuel