

cribed to the altered form of the small nebulous star in the vicinity of the Sun, and to the action of the unequal density of the strata of cosmical ether.\* These facts, and the investigations to which they have led, belong to the most interesting results of modern astronomy. Encke's comet has been the means of leading astronomers to a more exact investigation of Jupiter's mass (a most important point with reference to the calculation of perturbations); and, more recently, the course of this comet has obtained for us the first determination, although only an approximative one, of a smaller mass for Mercury.

The discovery of Encke's comet, which had a period of only  $3\frac{1}{3}$  years, was speedily followed, in 1826, by that of another, Biela's comet, whose period of revolution is  $6\frac{3}{4}$  years, and which is likewise planetary, having its aphelion beyond the orbit of Jupiter, but within that of Saturn. It has a fainter light than Encke's comet, and, like the latter, its motion is direct, while Halley's comet moves in a course opposite to that pursued by the planets. Biela's comet presents the first certain example of the orbit of a comet intersecting that of the Earth. This position, with reference to our planet, may therefore be productive of danger, if we can associate an idea of danger with so extraordinary a natural phenomenon, whose history presents no parallel, and the results of which we are consequently unable correctly to estimate. Small masses endowed with enormous velocity may certainly exercise a considerable power; but Laplace has shown that the mass of the comet of 1770 is probably not equal to  $\frac{1}{5000}$ th of that of the Earth, estimating further with apparent correctness the *mean* mass of comets as much below  $\frac{1}{10000}$ th that of the Earth, or about  $\frac{1}{12000}$ th that of the Moon.† We must not confound the passage of Biela's comet through the Earth's orbit with its proximity to, or collision with, our globe. When this passage took place, on the 29th of October, 1832, it required a full month before the Earth would reach the point of intersection of the two orbits. These two comets of short periods of revolution also intersect each other, and it has been justly observed,‡ that amid the many perturbations experienced by

\* Encke, in the *Astronomische Nachrichten*, 1843, No. 489, s. 130-132.

† Laplace, *Expos. du Syst. du Monde*, p. 216, 237.

‡ Littrow, *Beschreibende Astron.*, 1835, s. 274. On the inner comet recently discovered by M. Faye, at the Observatory of Paris, and whose eccentricity is 0.551, its distance at its perihelion 1.690, and its distance at its aphelion 5.832, see Schumacher, *Astron. Nachr.*, 1844, No. 495. Regarding the supposed identity of the comet of 1766 with the third