retical Mechanics, as, a little previously, Dynamics had eclipsed and superseded Statics.

The laws of variable force and of curvilinear motion were not much pursued, till the invention of Fluxions and of the Differential Calculus again turned men's minds to these subjects, as easy and interesting exercises of the powers of these new methods. Newton's *Principia*, of which the first two Books are purely dynamical, is the great exception to this assertion; inasmuch as it contains correct solutions of a great variety of the most general problems of the science; and indeed is, even yet, one of the most complete treatises which we possess upon the subject.

We have seen that Kepler, in his attempts to explain the curvilinear motions of the planets by means of a central force, failed, in consequence of his belief that a continued transverse action of the central body was requisite to keep up a continual motion. Galileo had founded his theory of projectiles on the principle that such an action was not necessary; yet Borelli, a pupil of Galileo, when, in 1666, he published his theory of the Medicean Stars (the satellites of Jupiter), did not keep quite clear of the same errors which had vitiated Kepler's reasonings. In the same way, though Descartes is sometimes spoken of as the first promulgator of the First Law of Motion, yet his theory of Vortices must have been mainly suggested by a want of an entire confidence in that law. When he represented the planets and satellites as owing their motions to oceans of fluid diffused through the celestial spaces, and constantly whirling round the central bodies, he must have felt afraid of trusting the planets to the operation of the laws of motion in free space. Sounder physical philosophers, however, began to perceive the real nature of the question. As early as 1666, we read, in the Journals of the Royal Society, that "there was read a paper of Mr. Hooke's explicating the inflexion of a direct motion into a curve by a supervening attractive principle;" and before the publication of the *Principia* in 1687, Huyghens, as we have seen, in Holland, and, in our own country, Wren, Halley, and Hooke, had made some progress in the true mechanics of circular motion,[2] and had distinctly contemplated the problem of the motion of a body in an ellipse by a central force, though they could not solve it. Halley went to Cambridge in 1684,[3] for the express purpose of consulting Newton upon the subject of the production of the elliptical motion of the planets by means of a central

[2] Newt. *Princip.* Schol. to Prop. iv. [3] Sir D. Brewster's *Life of Newton*, p. 154.