

least nearly true, before he visited Newton. Hooke was reported to Newton at Cambridge, as having applied to the Royal Society to do him justice with regard to his claims; but when Halley wrote and informed Newton (in a letter dated June 29, 1686), that Hooke's conduct "had been represented in worse colors than it ought," Newton inserted in his book a notice of these his predecessors, in order, as he said, "to compose the dispute."¹ This notice appears in a Scholium to the fourth Proposition of the *Principia*, which states the general law of revolutions in circles. "The case of the sixth corollary," Newton there says, "obtains in the celestial bodies, as has been separately inferred by our countrymen, Wren, Hooke, and Halley;" he soon after names Huyghens, "who, in his excellent treatise *De Horologio Oscillatorio*, compares the force of gravity with the centrifugal forces of revolving bodies."

The two steps requisite for this discovery were, to propose the motions of the planets as simply a mechanical problem, and to apply mathematical reasoning so as to solve this problem, with reference to Kepler's third law considered as a fact. The former step was a consequence of the mechanical discoveries of Galileo and his school; the result of the firm and clear place which these gradually obtained in men's mind, and of the utter abolition of all the notions of solid spheres by Kepler. The mathematical step required no small mathematical powers; as appears, when we consider that this was the first example of such a problem, and that the method of limits, under all its forms, was at this time in its infancy, or rather, at its birth. Accordingly, even in this step, though much the easiest in the path of deduction, no one before Newton completely executed.

2. *Force in different Points of an Orbit.*—The inference of the law of the force from Kepler's two laws concerning the elliptical motion, was a problem quite different from the preceding, and much more difficult; but the dispute with respect to priority in the two propositions was intermingled. Borelli, in 1666, had, as we have seen, endeavored to reconcile the general form of the orbit with the notion of a central attractive force, by taking centrifugal force into the account; and Hooke, in 1679, had asserted that the result of the law of the inverse square in the force of the earth would be an ellipse,² or a curve like an ellipse.³ But it does not appear that this was any thing more than

¹ *Biog. Brit.* folio, art. *Hooke*. ² Newton's Letter, *Biog. Brit.*, Hooke, p. 2660.

³ Birch's *Hist. R. S.*, Wallis's Life.