

a conjecture. Halley says⁴ that "Hooke, in 1683, told him he had demonstrated all the laws of the celestial motions by the reciprocally duplicate proportion of the force of gravity; but that, being offered forty shillings by Sir Christopher Wren to produce such a demonstration, his answer was, that he had it, but would conceal it for some time, that others, trying and failing, might know how to value it when he should make it public." Halley, however, truly observes, that after the publication of the demonstration in the *Principia*, this reason no longer held; and adds, "I have plainly told him, that unless he produce another differing demonstration, and let the world judge of it, neither I nor any one else can believe it."

Newton allows that Hooke's assertions in 1679 gave occasion to his investigation on this point of the theory. His demonstration is contained in the second and third Sections of the *Principia*. He first treats of the general law of central forces in any curve; and then, on account, as he states, of the application to the motion of the heavenly bodies, he treats of the case of force varying inversely as the square of the distance, in a more diffuse manner.

In this, as in the former portion of his discovery, the two steps were, the proposing the heavenly motions as a mechanical problem, and the solving this problem. Borelli and Hooke had certainly made the former step, with considerable distinctness; but the mathematical solution required no common inventive power.

Newton seems to have been much ruffled by Hooke's speaking slightly of the value of this second step; and is moved in return to deny Hooke's pretensions with some asperity, and to assert his own. He says, in a letter to Halley, "Borelli did something in it, and wrote modestly; he (Hooke) has done nothing; and yet written in such a way as if he knew, and had sufficiently hinted all but what remained to be determined by the drudgery of calculations and observations; excusing himself from that labor by reason of his other business; whereas he should rather have excused himself by reason of his inability; for it is very plain, by his words, he knew not how to go about it. Now is not this very fine? Mathematicians that find out, settle, and do all the business, must content themselves with being nothing but dry calculators and drudges; and another that does nothing but pretend and grasp at all things, must carry away all the inventions, as well of those that were to follow him as of those that

⁴ *Enc. Brit.* Hooke, p. 2660.