

Hooke and others showed that, by diminishing the obvious resistances, the retardation also became less; and men were gradually led to a distinct appreciation of the Resistance, Friction, &c., which, in all terrestrial motions, prevent the Law from being evident; and thus they at last established by experiment a Law which cannot be experimentally exemplified. The natural uniformity of motion was proved by examining all kinds of cases in which motion was not uniform. Men culled the abstract Rule out of the concrete Experiment; although the Rule was, in every case, mixed with other Rules, and each Rule could be collected from the Experiment only by supposing the others known. The perfect simplicity which we necessarily seek for in a law of nature, enables us to disentangle the complexity which this combination appears at first sight to occasion.

The First Law of Motion asserts that the motion of a body, when left to itself, will not only be uniform, but rectilinear also. This latter part of the law is indeed obvious of itself, as soon as we conceive a body detached from all special reference to external points and objects. Yet, as we have seen, Galileo asserted that the naturally uniform motion of bodies was that which takes place in a circle. Benedetti, however, in 1585, had entertained sound notions on this subject. In commenting on Aristotle's question, why we obtain an advantage in throwing by using a sling, he says,⁴ that the body, when whirled round, tends to go on in a straight line. In Galileo's second Dialogue, he makes one of his interlocutors (Simplicio), when appealed to on this subject, after thinking intently for a little while, give the same opinion; and the principle is, from this time, taken for granted by the authors who treat of the motion of projectiles. Descartes, as might be supposed, gives the same reason for this as for the other part of the law, namely, the immutability of the Deity.

Sect. 2.—Formation and Application of the Notion of Accelerating Force.—Laws of Falling Bodies.

WE have seen how rude and vague were the attempts of Aristotle and his followers to obtain a philosophy of bodies falling downwards or thrown in any direction. If the First Law of Motion had been clearly known, it would then, perhaps, have been seen that the way to understand and analyze the motion of any body, is to consider the

⁴ "Corpus vellet recta iter peragere." *Speculationum Liber*, p. 160.