

looked so obvious a fact.—F. Piccolomini, in his *Liber Scientiæ de Natura*, published at Padua, in 1597, says, “On the subject of the motion of heavy and light bodies, Aristotle has put forth various opinions, which are contrary to sense and experience, and has delivered rules concerning the proportion of quickness and slowness, which are palpably false. For a stone twice as great does *not* move twice as fast.” And Stevinus, in the Appendix to his Statics, describes his having made the experiment, and speaks with great correctness of the apparent deviations from the rule, arising from the resistance of the air. Indeed, the result followed by very obvious reasoning; for ten bricks, in contact with each other, side by side, would obviously fall in the same time as one; and these might be conceived to form a body ten times as large as one of them. Accordingly, Benedetti, in 1585, reasons in this manner with regard to bodies of different size, though he retains Aristotle’s error as to the different velocity of bodies of different density.

The next step in this subject is more clearly due to Galileo; he discovered the true proportion which the Accelerating Force of a body falling down an inclined plane bears to the Accelerating Force of the same body falling freely. This was at first a happy conjecture; it was then confirmed by experiments, and, finally, after some hesitation, it was referred to its true principle, the Third Law of Motion, with proper elementary simplicity. The Principle here spoken of is this:—that for the same body, the Dynamical effect of force is as the Statical effect; that is, the Velocity which any force generates in a given time when it puts the body in motion, is proportional to the Pressure which the same force produces in a body at rest. The Principle, so stated, appears very simple and obvious; yet this was not the form in which it suggested itself either to Galileo or to other persons who sought to prove it. Galileo, in his *Dialogues on Motion*, assumes, as his fundamental proposition on this subject, one much less evident than that we have quoted, but one in which that is involved. His Postulate is,<sup>15</sup> that when the same body falls down different planes of the same height, the velocities acquired are equal. He confirms and illustrates this by a very ingenious experiment on a pendulum, showing that the weight swings to the same height whatever path it be compelled to follow. Torricelli, in his treatise published 1644, says that he had heard that Galileo had, towards the end of his life, proved his assump-

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<sup>15</sup> *Opere*, iii. 96.