

after the moving power had ceased to act; and that he had ascribed it to the effect of the air or other medium in which the stone moves. Tartalea, whose *Nuova Scienza* is dated 1550, though a good *pure* mathematician, is still quite in the dark on mechanical matters. One of his propositions, in the work just mentioned, is (B. i. Prop. 3), "The more a heavy body recedes from the beginning, or approaches the end of violent motion, the slower and more inertly it goes;" which he applies to the horizontal motion of projectiles. In like manner most other writers about this period conceived that a cannon-ball goes forwards till it loses all its projectile motion, and then falls downwards. Benedetti, who has already been mentioned, must be considered as one of the first enlightened opponents of this and other Aristotelian errors or puzzles. In his *Speculationum Liber* (Venice, 1585), he opposes Aristotle's mechanical opinions, with great expressions of respect, but in a very sweeping manner. His chapter xxiv. is headed, "Whether this eminent man was right in his opinion concerning violent and natural motion." And after stating the Aristotelian opinion just mentioned, that the body is impelled by the air, he says that the air must impede rather than impel the body, and that "the motion of the body, separated from the mover, arises by a certain natural impression from the impetuosity (*ex impetuositate*) received from the mover." He adds, that in natural motions this *impetuosity* continually increases by the continued action of the cause,—namely, the propension of going to the place assigned it by nature; and that thus the velocity increases as the body moves from the beginning of its path. This statement shows a clearness of conception with regard to the cause of accelerated motion, which Galileo himself was long in acquiring.

Though Benedetti was thus on the way to the First Law of Motion,—that all motion is uniform and rectilinear, except so far as it is affected by extraneous forces;—this Law was not likely to be either generally conceived, or satisfactorily proved, till the other Laws of Motion, by which the action of Forces is regulated, had come into view. Hence, though a partial apprehension of this principle had preceded the discovery of the Laws of Motion, we must place the establishment of the principle in the period when those Laws were detected and established, the period of Galileo and his followers.