

Jean Buridan

The concept of inertia was alien to the physics of Aristotle. Aristotle, and his peripatetic followers held that a body was only maintained in motion by the action of a continuous external force. Thus, in the Aristotelian view, a projectile moving through the air would owe its continuing motion to eddies or vibrations in the surrounding medium, a phenomenon known as antiperistasis. In the absence of a proximate force, the body would come to rest almost immediately.

The theory of impetus proposed that motion was maintained by some property of the body, imparted when it was set in motion. Buridan was the first to name this motion-maintaining property impetus but the theory itself probably did not originate with him. A less sophisticated notion of impressed force can be found in the Avicenna's doctrine of *mayl* (inclination).[8] In this he was possibly influenced by John Philoponus who was developing the Stoic notion of *hormé* (impulse).[8][19] The major difference between Buridan's theory and that of his predecessor is that he rejected the view that the impetus dissipated spontaneously, instead asserting that a body would be arrested by the forces of air resistance and gravity which might be opposing its impetus. Buridan further held that the impetus of a body increased with the speed with which it was set in motion, and with its quantity of matter. This is closely related to the modern concept of momentum. Buridan saw impetus as causing the motion of the object:

...after leaving the arm of the thrower, the projectile would be moved by an impetus given to it by the thrower and would continue to be moved as long as the impetus remained stronger than the resistance, and would be of infinite duration were it not diminished and corrupted by a contrary force resisting it or by something inclining it to a contrary motion (Questions on Aristotle's *Metaphysics* XII.9: 73ra).[20]

Buridan also contended that impetus is a variable quality whose force is determined by the speed and quantity of the matter in the subject. In this way, the acceleration of a falling body could be understood in terms of its gradual accumulation of units of impetus.[8]

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