we have already mentioned. Its reasonings are professedly on Aristotelian principles, and exhibit the common Aristotelian absence of all distinct mechanical ideas. But in Varro, whose *Tractatus de Motu* appeared in 1584, we find the principle, in a general form, not satisfactorily proved, indeed, but much more distinctly conceived. This is his first theorem: "Duarum virium connexarum quarum (si moveantur) motus erunt ipsis ἀντιπέπονθῶς proportionales, neutra alteram movebit, sed equilibrium facient." The proof offered of this is, that the resistance to a force is as the motion produced; and, as we have seen, the theorem is rightly applied in the example of the wedge. From this time it appears to have been usual to prove the properties of machines by means of this principle. This is done, for instance, in *Les Raisons des Forces Mouvantes*, the production of Solomon de Caus, engineer to the Elector Palatine, published at Antwerp in 1616; in which the effect of Toothed-Wheels and of the Screw is determined in this manner, but the Inclined Plane is not treated of. The same is the case in Bishop Wilkins's *Mathematical Magic*, in 1648.

When the true doctrine of the Inclined Plane had been established, the laws of equilibrium for all the simple machines or Mechanical Powers, as they had usually been enumerated in books on Mechanics, were brought into view; for it was easy to see that the *Wedge* and the *Screw* involved the same principle as the *Inclined Plane*, and the *Pulley* could obviously be reduced to the *Lever*. It was, also, not difficult for a person with clear mechanical ideas to perceive how any other combination of bodies, on which pressure and traction are exerted, may be reduced to these simple machines, so as to disclose the relation of the forces. Hence by the discovery of Stevinus, all problems of equilibrium were essentially solved.

The conjectural generalization of the property of the lever, which we have just mentioned, enabled mathematicians to express the solution of all these problems by means of one proposition. This was done by saying, that in raising a weight by any machine, we *lose* in Time what we *gain* in Force; the weight raised moves as much *slower* than the power, as it is *larger* than the power. This was explained with great clearness by Galileo, in the preface to his *Treatise on Mechanical Science*, published in 1592.

The motions, however, which we here suppose the parts of the machine to have, are not motions which the forces produce; for at present we are dealing with the case in which the forces balance each other, and therefore produce no motion. But we ascribe to the