

and indisputable; such, for instance, as that "in fluids the upper parts do not gravitate on the lower;" that "a lighter fluid will not gravitate on a heavier;" that "levity is a positive quality of bodies as well as gravity." So long as these assertions were left uncontested and untried, men heard and repeated them, without perceiving the incongruities which they involved: and thus they long evaded refutation, amid the vague notions and undoubting habits of the stationary period. But when the controversies of Galileo's time had made men think with more acuteness and steadiness, it was discovered that many of these doctrines were inconsistent with themselves, as well as with experiment. We have an example of the confusion of thought to which the Aristotelians were liable, in their doctrine concerning falling bodies. "Heavy bodies," said they, "must fall quicker than light ones; for weight is the cause of their fall, and the weight of the greater bodies is greater." They did not perceive that, if they considered the weight of the body as a power acting to produce motion, they must consider the body itself as offering a resistance to motion; and that the effect must depend on the proportion of the power to the resistance; in short, they had no clear idea of *accelerating force*. This defect runs through all their mechanical speculations, and renders them entirely valueless.

We may exemplify the same confusion of thought on mechanical subjects in writers of a less technical character. Thus, if men had any distinct idea of mechanical action, they could not have accepted for a moment the fable of the *Echineis* or *Remora*, a little fish which was said to be able to stop a large ship merely by sticking to it.¹ Lucan refers to this legend in a poetical manner, and notices this creature only in bringing together a collection of monstrosities; but Pliny relates the tale gravely, and moralizes upon it after his manner. "What," he cries,² "is more violent than the sea and the winds? what a greater work of art than a ship? Yet one little fish (the *Echineis*) can hold back all these when they all strain the same way. The winds may

¹ Lucan is describing one of the poetical compounds produced in incantations.

Huc quicquid fœtu genuit Natura sinistro
 Miscetur: non spuma canum quibus unda timori est,
 Viscera non lyncis, non duræ nodus hyænæ
 Defuit, et cervi pasti serpente medullæ;
 Non puppes retinens, Euro tendente rudentes
 In mediis *Echineis* aquis, oculique draconum.
 Etc. *Pharsalia*, iv. 670.

² Plin. *Hist. N.* xxxii. 5.