quantities and in varying combinations. That a smaller quantity of matter in motion could produce the same action as a larger which was moving slowly, or even apparently at rest, and acted only by what is termed its dead-weight, was a well-known phenomenon; but it was only within the half-century which preceded the publication of the 'Principia' that, through the labours of Galileo and of Huygens, mathematical definitions and simple formulæ were laid down, and generally accepted, which gave the means of accurately measuring and calculating the phenomena of moving bodies and the combination of forces. These labours resulted in a definition of matter which, translated into the language of our day, says that matter is that which moves and is capable of resisting any change of motion. Motion is a measurable quantity. For its measurement we require the measurement of space and time, and the well-known relation of both —*viz.*, velocity.

The above formula therefore says that matter is measured by the resistance it offers to change of motion or of velocity. And correspondingly force is that which is capable of producing change of motion, or velocity in matter, and it is measured by the amount of change it produces. Given a definite, though unknown, force, portions of matter—*i.e.*, masses—can be compared by the resistance they offer to the change of their motion; the smaller the change the larger the mass or quantity of matter. Given a definite, though unknown, quantity of matter, forces can be measured by the different changes they produce in the motion—*i.e.*, the velocity—of this quantity; they are greater or smaller in the proportion