

From ... *in mediis regulariter cedentibus*

Def. 11. The quantity of motion is that which arises from the velocity and the quantity of a body in translation [*corporis translati*] jointly. Moreover, the quantity of a body is to be reckoned [*aestimatur*] from the amount [*copia*] of the corporeal matter, which is usually proportional to its gravity [*gravitati*]. The oscillations of two equal pendulums with bodies of equal heaviness [*ponderis*] are counted, and the amount [*copia*] of matter in each will be reciprocally as the number of oscillations made in the same time.

Def. 12. [~~*Vis corporis seu*~~ [^]*Corporis vis insita, innata, et essentialis* [^]] The internal, innate, and essential force of a body is the power by which it ~~*conatur*~~ perseveres in its state of rest or of moving uniformly in a straight line. It is proportional to the quantity of the body, and is truly [*vero*] exercised [*exercetur*] proportionally to the change brought about [^]of state [^], [^]and insofar as it is exercised it can be said to be the exercised force of the body, of which one kind is the centrifugal force of rotating [*gyrantium*] bodies [^].

{Canceled: Def. 13. The force of a motion or of a body [*Vis motus seu corpori*] from motion at its approach [*ex motu sua adventitia*] is that by which a body endeavors to preserve the [^]total [^] quantity of its motion. It is commonly called impetus and is proportional to its motion, and according to its kind is absolute or relative. ~~The centrifugal force of rotating bodies is of the absolute kind.}~~

Def. 14. The force brought against and impressed on a body [*Vis corpori illata et impressa*] is that by which a body is urged to change its state of moving or rest [^]and is of diverse kinds such as impulse or pressure of percussion, continuous pressure, centripetal force, resistance of a medium, etc. [^]

Def. 16. I call centripetal force that by which a body is impelled or attracted [*atrahitur*] towards a certain point regarded as its center. Of this kind is gravity [*gravitas*] tending toward the center of the earth, magnetic force tending toward the center of a loadstone, and the celestial force restraining [*cohibens*] the Planets from going off [*abeant*] along the tangents of their orbits.

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Law 3. As much as any body acts on another so much does it experience in reaction. Whatever presses or pulls another thing by this equally is pressed or pulled. If a bladder full of air presses or carries another equal to itself both yield equally inwards. If a body impinging on another changes by its force the motion of the other then its own motion (by reason of the equality of the mutual pressure) will be changed by the same amount by the force of the other. If a magnet attracts iron it is itself equally attracted, and likewise in other cases. In fact this law follows from Definitions 12 and 14 in so far as the force exerted by a body to conserve its state is the same as the impressed force in the other body to change the state of the first, and the change in the state of the first is proportional to the first force and the second to the second force.

Law 4. The relative motion of bodies enclosed in a given space is the same whether that space rests absolutely or moves perpetually and uniformly in a straight line without circular motion. For example, the motions of objects in a ship are the same whether the ship is at rest or moves uniformly in a straight line.

Law 5. The common center of gravity of bodies does not change its state of rest or motion by reason of the mutual actions of the bodies. This law and the two above mutually confirm each other.

**A Page Inserted in ...*in mediis regulariter cedentibus*,
all in Newton's hand**

6. The density of a body is the quantity or amount [*copia*] of matter compared with the quantity of space occupied.
7. By the heaviness [*pondus*] of a body I understand the quantity [^]or amount [*copiam*] [^]of matter [^]moved [^]apart [*abstracta*] from considerations of gravitation [*gravitationis*] as often as it is not said [*non agitur*] of gravitating bodies [*de gravitantibus*]. To be sure, the heaviness [*pondus*] of a gravitating body [*gravitantium*] is proportional to its quantity of matter, [^]and the agreement [*analogia*] legitimates [*licet*] setting forth [*exponere*] and designating each by the other. The agreement is actually to be gathered [*colligitur*] as follows. [^]The oscillations of two equal pendulums of the same heaviness [*ponderis*] are counted and the amount [*copia*] of matter in each will be reciprocally as the number of oscillations made in the same time. Moreover, experiments carefully [*diligenter*] made on gold, silver, lead, glass, sand, common salt, water, wood, and wheat always led to the same number of oscillations. On account of this agreement [^]and lacking a more convenient word [^]I set forth and designate quantity of matter by heaviness [*pondus*] even when gravitation [*gravitatio*] is not being considered.
8. Place
9. Rest
10. Motion
11. Velocity
12. Quantity of motion is that which arises from the velocity and quantity of matter of the body in translation [*corporis translati*] jointly. The motion by addition of another body of the same motion is double and with doubled velocity quadruple.