

Galileo's work 1612 published 1613

contact, and to the spots by the ambient, or else conferred by contact directly to the spots, could carry them around.

And if anyone should wish to have the rotation of the spots around the sun proceed from motion that resides in the ambient and not in the sun, I think it would be necessary in any case for the ambient to communicate this movement to the solar globe as well. For I seem to have observed that physical bodies have physical inclination to some motion (as heavy bodies downward), which motion is exercised by them through an intrinsic property and without need of a particular external mover, whenever they are not impeded by some obstacle. And to some other motion they have a repugnance (as the same heavy bodies to motion upward), and therefore they never move in that manner unless thrown violently by an external mover. Finally, to some movements they are indifferent, as are these same heavy bodies to horizontal motion, to which they have neither inclination (since it is not toward the center of the earth) nor repugnance (since it does not carry them away from that center). And therefore, all external impediments removed, a heavy body on a spherical surface concentric with the earth will be indifferent to rest and to movements toward any part of the horizon. And it will maintain itself in that state in which it has once been placed; that is, if placed in a state of rest, it will conserve that; and if placed in movement toward the west (for example), it will maintain itself in that movement.⁸ Thus a ship, for instance,

⁸ The importance of this paragraph to the history of modern physics cannot be exaggerated. What it contains is the first announcement of the principle of inertia, according to which a body will preserve a state of uniform motion or of rest unless acted upon by some force. Galileo's explicit statement of this principle is confined to the cases of (1) rotating bodies and (2) heavy bodies moving freely upon smooth spheres concentric with the earth. In applying the principle to physical problems, however, he included the more important case of bodies moving uniformly along straight lines, neglecting the force of gravitation. But even in such cases Galileo restricted his inertial principle to terrestrial objects. He did not, as is sometimes stated, attribute the orbital motions of the planets