which he may proceed to something more. Accordingly, to this he soon adds the idea, and hence the certain existence, of God and his perfections. He then asserts it to be also manifest, that a vacuum in any part of the universe is impossible; the whole must be filled with matter, and the matter must be divided into equal angular parts, this being the most simple, and therefore the most natural supposition.[3] This matter being in motion, the parts are necessarily ground into a spherical form; and the corners thus rubbed off (like filings or saw-dust) form a second and more subtle matter.[4] There is, besides, a third kind of matter, of parts more coarse and less fitted for motion. The first matter makes luminous bodies, as the sun, and the fixed stars; the second is the transparent substance of the skies; the third is the material of opake bodies, as the earth, planets, and comets. We may suppose, also,[5] that the motions of these parts take the form of revolving circular currents,[6] or *vortices*. By this means, the first matter will be collected to the centre of each vortex, while the second, or subtle matter, surrounds it, and, by its centrifugal effort, constitutes light. The planets are carried round the sun by the motion of his vortex,[7] each planet being at such a distance from the sun as to be in a part of the vortex suitable to its solidity and mobility. The motions are prevented from being exactly circular and regular by various causes; for instance, a vortex may be pressed into an oval shape by contiguous vortices. The satellites are, in like manner, carried round their primary planets by subordinate vortices; while the comets have sometimes the liberty of gliding out of one vortex into the one next contiguous, and thus travelling in a sinuous course, from system to system, through the universe.

It is not necessary for us to speak here of the entire deficiency of this system in mechanical consistency, and in a correspondency to observation in details and measures. Its general reception and temporary sway, in some instances even among intelligent men and good mathematicians, are the most remarkable facts connected with it. These may be ascribed, in part, to the circumstance that philosophers were now ready and eager for a physical astronomy commensurate with the existing state of knowledge; they may have been owing also, in some measure, to the character and position of Descartes. He was a man of high claims in every department of speculation, and, in pure mathematics, a genuine inventor of great eminence;—a man of family and a soldier;—an inoffensive philosopher, attacked and persecuted

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[3] *Prin.* p. 58. [4] Ib. p. 59. [5] Ib. p. 56.
[6] Ib. p. 61. [7] Ib. c. 140, p. 114.