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Gravity in the Century of Light: The Gravitation Theory of Georges-Louis Le Sage

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Each generation of physicists, or natural philosophers, has sought to place universal gravitation in the context of its own worldview. Often this has entailed an effort to reduce gravitation to something more fundamental. But what is deemed fundamental has, of course, changed with time. Each generation attacked the problem of universal gravitation with the tools of its day and brought to bear the concepts of its own standard model. The most successful eighteenth-century attempt to provide a mechanical explanation of gravity was that of Georges-Louis Le Sage (1724-1803) of Geneva. Le Sage postulated a sea of ultramundane corpuscles, streaming in all directions and characterized by minute mass, great velocity, and complete inelasticity. Mostly these corpuscles just pass through gross bodies such as apples or planets, but a few are absorbed, leading to all the phenomena of attraction. In a voluminous correspondence with nearly all the savants of the day, Le Sage constantly reshaped his arguments for his system in order to appeal to metaphysicians, mechanicians and Newtonians of several varieties. Le Sage's theory is an especially interesting one, for several reasons. First, it serves as the prototype of a dynamical explanation of Newtonian gravity. Second, the theory came quite close to accomplishing its aim. Third, the theory had a long life and attracted comment by the leading physical thinkers of several successive generations, including Laplace, Kelvin, Maxwell and Feynman. Le Sage's theory therefore provides an excellent opportunity for the study of the evolution of attitudes toward physical explanation. The effects of national style in science and generational change take on a new clarity.