

political strategists). Von Neumann saw the world in terms of power games, a vision that author Heims, a historian of science, traces to the European "survivor" mentality. He served as a consultant to the Manhattan Project and stayed in the field of weapons development. Wiener, meanwhile, applied his training to the development of prosthetic devices. He also wrote three books advocating the humane uses of technology. Wiener emerges as Heims's ideal ethical scientist; von Neumann, as the ambitious technocrat more concerned with the progress of his career than with the moral implications of his work.

**PLURALITY OF WORLDS:**  
**The Origins of the**  
**Extraterrestrial Life Debate**  
**from Democritus to Kant**  
 by Steven J. Dick  
 Cambridge, 1982  
 246 pp. \$34



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In addition to providing popular culture with one of its more enduring and profitable themes, the possibility of extraterrestrial life has long been the subject of heated scientific debate. This, despite the unlikelihood of life elsewhere in our solar system or of planets, populated or barren, existing outside our solar system. Dick, an astronomer/historian at the U.S. Naval Observatory, considers the "interplay of theory, metaphysics, observation and imagination" in the evolution of the "plurality of worlds" debate through the 18th century. Classical Greek atomists, including Democritus, posited an infinity of worlds (*kosmoi*), while Aristotle and his followers insisted on the existence of only one world (*kosmos*), with the Earth at its center. Through the Middle Ages, the issue hinged on interpretation of the Scriptures. With Copernicus's revolutionary heliocentric model of the solar system, the moon and the planets became Earthlike, hence possibly habitable. And telescopic observations, from Galileo's time onward, fueled rather than resolved the controversy. Presenting Cartesian and Newtonian contributions to the argument, Dick shows that speculations about life on other planets, considered by many as mere scientific fantasy, are in fact qualitatively no "different from other scientific endeavours."