Review
Reviewed Work(s): Commentationes astronomicae: Mechanicae et astronomicae ad physicam cosmicam pertinentes by Leonhard Euler and Eric J. Aiton
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he charts the revisions made as late as the nineteenth century to philosophy, philosophy of language, and literature as a result of the extension of epigenesis.

In the first chapter, Mueller-Sievers reviews the preformationist-epigenetic debate in biology beginning with Georges-Louis Buffon's objection to preformation. Next he introduces Albrecht von Haller's defense of preformation, then Christian Wolff's critique of Haller's defense. The chapter concludes with a discussion of Johann Friedrich Blumenbach's epigenetic notion of the "formative drive" and its influence on Immanuel Kant. Mueller-Sievers's goal in this chapter is not to analyze the biological evidence that provoked the debate but to provide a context for the thesis of his book. To that end, he addresses the social implications of these two ideologies. When discussing Wolff's ideas on epigenesis, for example, he introduces the notion of romantic love to account for self-generation.

In the second chapter, Mueller-Sievers continues his discussion of the influence of Blumenbach's epigenetic thought on Kant's philosophy, particularly on the first and third *Critiques,* in terms of the generative force of reason. In the next chapter, he examines the impact of Kant and epigenesis on the philosophy of Johann Gottlieb Fichte, as symbolized by the "I." Epigenesis, Mueller-Sievers argues, is the basis of idealism around the 1800s, especially as the source of "idealist originality." The subject of the fourth chapter is the effect of epigenesis on theories of the origin of language as developed by Johann Gottfried Herder and Wilhelm von Humboldt in order to relate thought and language as the "linguisticity of reason." In these chapters on philosophy and language, as in the first chapter, Mueller-Sievers's aim is to explore the social and cultural implications of epigenesis. Here, for example, he considers the influence of epigenesis on Fichte's notion of love with respect to procreation and the relationship of the sexes.

In the final chapter, which builds on the preceding chapters yet remains separate from them, Mueller-Sievers discusses the effect of preformation and epigenesis on literature, examining the notions of marriage and self-generation in Pierre Caron de Beaumarchais's *Marriage of Figaro* and Goethe's *Elective Affinities.* Mueller-Sievers contrasts the influence of preformation on Beaumarchais and the influence of epigenesis on Goethe, as well as the social implications of those influences. For example, he describes the preformationist mode of arranged marriages and the challenge of epigenesis to preformation: the freedom to choose one's spouse.

Mueller-Sievers's book is an ambitious attempt to trace the consequences of epigenesis for philosophy, language, and literature. As a literary critic, he is effective in clarifying the social and cultural implications of epigenesis, as well as the relationship between science and literature. His book is required reading for those interested in such implications and should be helpful to those interested in the integration of the history of developmental biology during the 1800s within its cultural context. Mueller-Sievers has laid the groundwork for future studies on the significance of culturally integrated epigenesis, in such disciplines as philosophy and literature, for the closure of the preformation-epigenesis debate in the late nineteenth and early twentieth centuries.

JAMES A. MARCUM

Leonhard Euler. *Commentationes astronomicae: Mechanicae et astronomicae ad physicam cosmicam pertinentes.* Edited by **Eric J. Aiton.** (*Leonhardi Euleri Opera omnia*, Series 2, Volume 31.) cii + 378 pp., diags., tables. Basel: Birkhäuser Verlag, 1996. DM 270, SFr 225, ÖS 1,971.

The writings of Leonhard Euler collected in this volume deal with topics in "cosmic physics," a term that in the eighteenth century denoted phenomena involving in some way the physical interaction of the bodies of the solar system. The main subjects in these works are the theory of tides, the character of the lunar atmosphere allegedly revealed by solar eclipses, the nature of comets, and the resistance of the planetary bodies as they move through the putative aether of space. Included is an essay by Euler's son, Johann Albrecht Euler, on the last of these topics, entered into the Paris prize competition of 1761. The late Eric Aiton's detailed introduction provides an excellent exposition of the contents of the writings, although questions of historical evaluation and interpretation are left largely to the reader. Andreas Kleinert discusses a memoir on the causes of gravity that Euler published anonymously in 1743.

The various papers assembled here present a full picture of Euler's research pursuits, particularly in the 1740s, and provide a window onto the world of eighteenth-century cosmic physics. To me the most interesting are the writings on the space aether and the causes of gravity. Euler was convinced that the Newtonian concept of action at distance was unacceptable, that the phenomenological laws must be supplemented by a

physical mechanism involving the interaction of matter in contact. The transmission of light, which Euler regarded as propagated in waves, indicated the existence in space of an optical aether whose elastic properties and density could be deduced in analogy from established acoustic laws. Euler believed that a comparison of ancient and modern solar observations indicated a shortening in the length of the year and concluded that the resistance experienced by the earth as it passed through the aether was causing the progressive contraction of its orbit about the sun. This finding implied that the world both had a beginning and will have an end, a scientific finding consonant with contemporary theological doctrines. (Although Euler was aware that the fixed stars constituted other suns, he equated the world or cosmos with our solar system.) The world must have had a beginning, because otherwise there would be no limit on the size of the earth's orbit in past time, and the world will have an end, when the earth finally falls into the sun.

Euler believed that gravity could also be explained as an aether phenomenon. The preeminent eighteenth-century advocate of a mechanical theory of gravity was the Swiss physicist George-Louis Lesage, who posited the existence in space of a pervasive and multidirectional wind composed of otherworldly or "ultamondaine" particles. Two bodies in space shield each other from the wind and as a result experience a gravitational force tending to bring them together. Although Euler never accepted Lesage's theory, he corresponded with the Swiss thinker on scientific subjects, including the causes of gravity. On the basis of an exchange of letters between the two men in 1765, Andreas Kleinert infers that an anti-Newtonian memoir on the nature of gravity published anonymously in Berlin in 1743 was in fact written by Euler. Kleinert suggests that Euler submitted the paper anonymously because of a concern for its reception in the Paris scientific community, where Newtonianism was enjoying growing popularity.

In the paper, gravitational force is attributed to a restorative pressure or elastic tension arising from the separation of bodies in the all-pervasive aether. Lesage pointed out in his letter to Euler that the resulting theory entailed a very large value for the density of the aether, a value inconsistent with the observed laws of planetary motion. In effect it would be necessary to posit the existence of at least two aethers, one optical and one gravitational. Euler acknowledged his error but declined to accept Lesage's alternative impact theory. After 1765 he seems to have become less interested in mechanical explanations of gravity, writing in his *Letters to a German Princess* of 1768 that the subject belonged more to metaphysics than to mathematics.

CRAIG FRASER

Dennis Todd. *Imagining Monsters: Miscreations of the Self in Eighteenth-Century England.* xviii + 339 pp., frontis., illus., index. Chicago/London: University of Chicago Press, 1995. $52, £41.50 (cloth); $17.95, £14.25 (paper).

The freak show is back. Monsters are all the rage in recent scholarship, where they appear in a range of historical and theoretical arguments. Inspired by Leslie Fiedler's *Freaks* (Simon & Schuster, 1978), studies such as Marie-Helene Huet's *Monstrous Imagination* (Harvard, 1993), Robert Bogdan's *Freak Show* (Chicago, 1988), Rosemarie Garland Thomson's *Extraordinary Bodies* (Columbia, 1997), and the anthologies *Freakery* (ed. Thomson [New York, 1996]) and *Monster Theory* (ed. Jeffrey Jerome Cohen [Minnesota, 1996]) link monsters to issues as varied as reproduction, imperialism, artistic creation, carnival, spectacle, and the rise of mass culture. Reading the monster as the ultimate Other, something whose shocking flaws stage an uncanny commentary on what is "normal," this body of work makes a significant contribution to cultural studies' ongoing dissection of the power dynamics of modern societies, the politics of representation, and the social construction of the self. Dennis Todd's *Imagining Monsters* provides an astute and entertaining addition to "monster studies." Building on the celebrated case of Mary Toft, a poor Englishwoman who claimed to have given birth to seventeen rabbits in the fall of 1726, Todd presents a textured, nuanced account of how Enlightenment ideas about monstrosity intersected with contemporary ideas about the mind, the body, and the peculiarly uncertain relationship between the two.

Centering on eighteenth-century concepts of the imagination, Todd's study ranges from the Toft case, to medical and psychological debates about birth defects, to the fiction, poetry, and letters of Swift and Pope. *Imagining Monsters* begins with a detailed account of Mary Toft's alleged monstrous births, a remarkable set piece that enables Todd to lay out the central concerns of his book: Why was the Toft case so fascinating to doctors and laymen alike? What was it about her hoax—stuffing pieces of dead rabbits deep in her vagina and then birthing them while doctors watched—that was so compelling and controversial? Why, in particular, did *anyone* be-