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## Review of: Lectures on Natural Philosophy by Richard Helsham, D. A. Attis, P. Kelly, and D. Weire

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Lectures on Natural Philosophy by Richard Helsham; D. A. Attis; P. Kelly; D. Weire  
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rected saltpeter and gunpowder production in France turned to chemical theory and metrology in an attempt to augment production, discipline labor, reform bureaucratic procedure, and fortify the military power of the state.

But as Bret rightly notes, in spite of the presence of no less a scientist than Lavoisier, few productive gains resulted from scientific research. Bret adopts the explanation offered by Lavoisier and his cohorts: institutional blockages, uneducated artisans, and stubborn adherence to tradition everywhere stymied innovation. He thereby exemplifies the manner in which such texts advanced claims of scientific authority in the domain of manufacture, articulating the superiority of chemical knowledge over craft practice and established custom. Bret identifies the complex of changes that were entailed in the promotion of scientific investigation over the atelier: the recourse made to explanatory theories, instrumental measurements, and experimental demonstrations. The articles on assaying and the densimeter by Clouet, the ballistic pendulum by Le Tors, and charcoal by Lavoisier all exhibit a relentless effort to subject the workshop to instrumental rule linked to theoretical precepts and experimental determinations, revealing as well the legion of practical difficulties that often thwarted endeavors to calculate productive operations.

The attractions of this volume go well beyond the compass indicated by the title, which unfortunately gives undue prominence to Lavoisier. Scholars will indeed find compelling new evidence here for how the chemistry of Lavoisier intertwined with pressing geopolitical, economic, and social issues of Old Regime France. But the manuscript material will be useful for specialists studying a much wider range of historical subjects: the transit of scientific and technical literature into print, the connections between scientific theory and manufacturing practice, the rise of quantification, and the development of new relations among science, labor, industry, and the state.

JOHN DETTLOFF

**Richard Helsham.** *Lectures on Natural Philosophy*. Edited by D. A. Attis, P. Kelly, and D. Weire. 18 + x + 404 pp., illus., figs., tables, bibl. Reprint of 4th edition, 1767. Bristol: Institute of Physics; Bremen: Verlag MIT, 1999. \$59, £35.

Richard Helsham (ca. 1682–1738) was a successful Irish physician and a member of a Dublin

circle of Tory intellectuals that included Jonathan Swift and Patrick Delaney. Beginning in 1711, without either salary or official position, Helsham lectured on natural philosophy to medical students at the newly established school of medicine in Trinity College, Dublin. After thirteen years of service, he was appointed the first professor of natural and experimental philosophy at the college.

Helsham published a treatise on the use and misuse of tea and (anonymously) a political satire. But, like most of his colleagues at Dublin, the “silent sister” of Oxford and Cambridge, he devoted himself more to teaching than to writing. Helsham’s *Course of Lectures in Natural Philosophy*, the result of many years of teaching his subject, was published posthumously in 1739 by his pupil Bryan Robinson. Seven further editions appeared up to 1802 at Dublin, London, and even Philadelphia. An abridged version was printed three times at Dublin between 1818 and 1834, and Helsham remained required reading for students at Trinity College as late as 1849.

Helsham’s book has affinities with two separate genres. It was a part of the first wave of simplified accounts of Newton’s natural philosophy. Earlier and better-known works in this genre include Willem Jacob’s Gravesande’s *Mathematical Elements of Natural Philosophy Confirm’d by Experiments; or, An Introduction to Sir Isaac Newton’s Philosophy* (1720), Henry Pemberton’s *A View of Sir Isaac Newton’s Philosophy* (1728), and Voltaire’s *Elements of the Philosophy of Newton* (1738). Helsham’s graceful introductory chapters on attraction and central forces, as well as his concluding chapters on light, vision, and colors, imbue his book with its Newtonian spirit.

But Helsham’s book had this difference, that it was not addressed to the general enlightened reader but was written as an introduction for university students. So Helsham included detailed treatments of the lever, pulley, wheel, and wedge, as well as projectile motion and the collisions of elastic and inelastic bodies. These subjects give his book a substantial overlap with earlier textbooks, such as J. T. Desaguliers’s *A Course of Experimental Philosophy* (1734) and even Jacques Rohault’s much earlier *Treatise of Mechanics*. Moreover, each edition of Helsham’s book beyond the first included an appendix with worked problems. When you add it all up—and throw in Helsham’s chapters on hydrostatics, pneumatics, and sound—the physics required of premeds has changed very little in the last two hundred years.

Although Helsham’s textbook is available in

microform in "Landmarks of Science," it is useful to have it as a volume for the hand. This reprint of the 1767 edition is accompanied by an introduction that treats Helsham and his circle and the teaching of natural and experimental philosophy in eighteenth-century Dublin.

JAMES EVANS

**David N. Livingstone; Charles W. J. Withers** (Editors). *Geography and Enlightenment*. viii + 455 pp., illus., tables, app., bibls., index. Chicago/London: University of Chicago Press, 2000. \$52, £36.50 (cloth); \$25, £17.50 (paper).

The Enlightenment plays a critical role in most established histories of geography. Skepticism toward traditional authorities, growing openness to empirical data, and the progress of astronomical theory and instrumentation in the sixteenth and seventeenth centuries bore fruit in the eighteenth century in accurate, positive geography, free of myth and superstition. Conversely, geography has long occupied an important place in histories of the Enlightenment. Sages of progress from Francis Bacon to Alexander von Humboldt considered the growth of geographical knowledge both motor and model of enlightenment. D'Alembert and Diderot compared the writing and reading of an encyclopedia to the composition and navigation of a map and the human subject to the geographer, confronted with fragments but no whole; Kant compared the process of transcendental criticism to the determination of an island coastline. Nineteenth-century historians placed Columbus next to Luther and Gutenberg, the discovery of the New World next to the Protestant Reformation and the advent of movable type, to mark the beginnings of the modern age. Paul Hazard was in part continuing a very long tradition of Enlightenment and enlightenment historiography when he began his account of "la crise de la conscience européenne" (1935) by describing the "leavening" effect of geographical knowledge on "the European mind."

A collection of studies on geographical knowledge in the Enlightenment therefore has the potential to revise substantially the received narratives about both geography's emergence into scientific positivity and the Enlightenment's defeat of blinkered dogmatism with expansive experience. The thirteen essays collected in *Geography and Enlightenment*, first presented at a 1996 conference hosted by the Department of Geography at Edinburgh, at least complicate received ideas about the relationship between ge-

ography and the Enlightenment. At their best, they indicate the paths such revision might take.

Several of the essays are content to demonstrate the diversity of uses to which Enlightenment thinkers put geographical knowledge. David Livingstone shows how a mid-seventeenth-century French Calvinist used reports about Greenland and Iceland to undermine the orthodox, monogenist reading of Genesis and hasten the fulfillment of sacred history and how two late eighteenth-century American educators used geographical textbooks and gazetteers to defend the traditional Mosaic and a Christian-republican moral order. Comparing such historically disparate examples can tell us little about the history of geography or of the Enlightenment, except that "different kinds of geographical inquiry were suited to different Enlightenment emphases and mobilized in the service of different moral projects" (p. 133). Charles Withers shows how the search for Paradise implicated geographical knowledge in various ways in the central debates of seventeenth- and eighteenth-century sacred, civil, and natural history. Geography supplied Turgot, Volney, and St. Simon with the framework and the data to debate the problem of environmental determinism and free will in human history, according to Michael Hefernan.

Other essays, by dealing directly with geography as a discipline and with the historically specific practices of Enlightenment geography, and revealing their political, ideological, and rhetorical functions, suggest a more fundamental challenge to the story of geography and the Enlightenment. A good example is Denis Cosgrove's essay, which begins the volume. Cosgrove juxtaposes the Venetian cosmographer Vincenzo Coronelli with the contemporary Jesuit polymath Athanasius Kircher to demonstrate that, far from wilting under the empirical weight of geographical discovery, the cosmographic and iconographic functions of geography flourished on it. Kircher elaborated a Jesuit Enlightenment, centered on Rome, and Coronelli a Bourbon Enlightenment, centered on Versailles, as geographical projects, defined by erudition, mathematics, and networks of correspondence (mercantile and missionary). "Cosmography's project of accurately representing terrestrial space while seeking to illuminate metaphysical space served the rhetorical purposes of Baroque rulers bent on promoting global enlightenment by means of Catholic faith" (p. 63).

Essays by Matthew Edney and Anne Godlewska directly challenge the myth of geography's growing sobriety by exposing epistemol-