NEW NARRATIVES IN EIGHTEENTH-CENTURY CHEMISTRY

Archimedes

NEW STUDIES IN THE HISTORY AND PHILOSOPHY OF SCIENCE AND TECHNOLOGY

VOLUME 18

Archimedes has three fundamental goals; to further the integration of the histories of science and technology with one another: to investigate the technical, social and practical histories of specific developments in science and technology; and finally, where possible and desirable, to bring the histories of science and technology into closer contact with the philosophy of science. To these ends, each volume will have its own theme and title and will be planned by one or more members of the Advisory Board in consultation with the editor. Although the volumes have specific themes, the series itself will not be limited to one or even to a few particular areas. Its subjects include any of the sciences, ranging from biology through physics, all aspects of technology, broadly construed, as well as historically-engaged philosophy of science or technology. Taken as a whole, *Archimedes* will be of interest to historians, philosophers, and scientists, as well as to those in business and industry who seek to understand how science and industry have come to be so strongly linked

New Narratives in Eighteenth-Century Chemistry

Contributions from the First Francis Bacon Workshop, 21–23 April 2005, California Institute of Technology, Pasadena, California

Edited by

LAWRENCE M. PRINCIPE

Springer

A C.I.P. Catalogue record for this book is available from the Library of Congress.

ISBN 978-1-4020-6273-5 (HB)
ISBN 978-1-4020-6278-0 (e-book)

Published by Springer,
P.O. Box 17, 3300 AA Dordrecht, The Netherlands.

www.springer.com

Printed on acid-free paper

CONTENTS

The Francis Bacon Award vii

Notes on Contributors ix

1. A Revolution Nobody Noticed? Changes in Early Eighteenth-Century Chymistry 1
   Lawrence M. Principe

2. Georg Ernst Stahl's Alchemical Publications: Anachronism, Reading Market, and A Scientific Lineage Redefined 23
   Kevin Chang

3. Chemistry without Principles: Herman Boerhaave on Instruments and Elements 45
   John C. Powers

4. Practicing Chemistry "After the Hippocratical Manner": Hippocrates and the Importance of Chemistry for Boerhaave's Medicine 63
   Rina Knoeff

5. Public Lectures of Chemistry in Mid-Eighteenth-Century France 77
   Bernadette Bensaude-Vincent and Christine Lehman

6. Apothecary-Chemists in Eighteenth-Century Germany 97
   Ursula Klein

7. The Aberdeen Agricola: Chemical Principles and Practice in James Anderson's Georgics and Geology 139
Matthew D. Eddy

8. Dr. Thomas Beddoes (1760–1808): Chemistry, Medicine, and Books in the French and Chemical Revolutions 157
Trevor H. Levere

9. Reflections: "A Likely Story" 177
Seymour Mauskopf

Index 195

THE FRANCIS BACON AWARD

On April 22, 2005 the first Francis Bacon Prize in The History and Philosophy of Science and Technology was awarded to Lawrence M. Principe, Professor of History of Science and Technology and of Chemistry at Johns Hopkins University. Offered biennially by the California Institute of Technology on behalf of the Bacon Foundation in the amount of $20,000, the Prize is awarded to an outstanding scholar whose work has had a substantial impact on the history of science, the history of technology or historically-engaged philosophy of science. As part of the award, Principe was invited to organize a meeting on the history of chemistry with a view to the eventual publication of an edited volume. *New Narratives in Eighteenth Century Chemistry* is the final result of that meeting. It is the first in what we hope will become a series of volumes in *Archimedes* to be edited by the award winners.

Jed Z. Buchwald

NOTES ON CONTRIBUTORS

Bernadette Bensaude-Vincent is professor of the history and philosophy of science at the Université de Paris X. She has authored a number of books about the history and philosophy of chemistry including *A History of Chemistry* (with Isabelle Stengers, 1996) and *Lavoisier: Mémoires d'une revolution* (1993). In 1997, she received the Dexter Award for Outstanding Contributions to the History of Chemistry from the American Chemical Society.

Ku-ming (Kevin) Chang received his Ph.D. at the University of Chicago, and is now assistant professor at the Institute of History and Philology, Academia Sinica, Taiwan. He has published several articles on Georg Ernst Stahl's matter theory, medicine, and alchemy and is revising his dissertation on Stahl's theory of life and matter for publication. He has also published an article that sketches the transformation of the dissertation as a genre of academic publication in early modern Europe, and is embarking on a project that will expand this sketch into a book.

Matthew D. Eddy is lecturer in the history and philosophy of science and an associate of the Centre for the History of Medicine and Disease at the University of Durham. He has most recently held fellowships at the Dibner Institute (MIT), Harvard University, the Max Planck Institute for the History of Science (Berlin), and with the University of Notre Dame's Erasmus Institute. He has written numerous articles on eighteenth- and nineteenth-century intellectual history. Most recently he has edited (with David M. Knight) *Science and Belief: From Natural Philosophy to Natural Science, 1700–1900* (2005) and *William Paley's Natural Theology* (2006). He is currently writing a book on the interactions between medicine, philosophy, and science in Enlightenment Edinburgh.

Ursula Klein is senior research scholar at the Max Planck Institute for the History of Science in Berlin. She is author of *Experiments, Models, Paper Tools: Cultures of Organic Chemistry in the Nineteenth-Century* (Stanford: Stanford University Press, 2003), and (together with Wolfgang Lefèvre) of *Materials in Eighteenth-Century Science: A Historical Ontology* (Cambridge, MA: MIT Press, 2007), as well as editor of *Tools and Modes of Representation in the Laboratory Sciences* (Dordrecht: Kluwer, 2001).

Rina Knoeff is postdoctoral research fellow in the Faculty of Arts at the University of Leiden. She is the author of *Herman Boerhaave (1668–1738). Calvinist Chemist and Physician* (Amsterdam: Edita, 2002). She has worked on the history of medicine and chemistry in relation to (natural) philosophy, theology, and the arts. Currently, she is also involved in research on the Leiden anatomical collections.

Christine Lehman teaches physics and is the author of a Ph.D. dissertation entitled "Gabriel François Venel (1723–1775): Sa place dans la chimie française du XVIIIe siècle" and defended at the Université de Paris X – Nanterre in 2006. Her main research interest is eighteenth-century chemistry.

Trevor H. Levere is University Professor in the Institute for the History and Philosophy of Science in the University of Toronto. His current research is on Dr. Thomas Beddoes (1760–1808) and his circle, and on the interplay between the design of apparatus and the development of concepts in eighteenth- and early nineteenth-century chemistry. He is the author of eight books, including *Discussing Chemistry and Steam: The Minutes of a Coffee House Philosophical Society 1780–1787* (2002), *Transforming Matter: A History of Chemistry from Alchemy to the Buckyball* (2001), *Chemists and Chemistry in Nature and Society 1770–1878* (1994), *Poetry Realized in Nature: Samuel Taylor Coleridge and Early Nineteenth-century Science* (1981), and *Affinity and Matter: Elements of Chemical Philosophy 1800–1865* (1971). Among his five edited books is *Instruments and Experimentation in the History of Chemistry* (2000), with Frederic L. Holmes.

Seymour Mauskopf did his B.A. at Cornell University, and his Ph.D. at Princeton University in the history of science. His fields of research interest are the history of chemistry (*Crystals and Compounds*, 1976; *Chemical Sciences in the Modern World*, 1993) and the history of marginal science (parapsychology) – *The Elusive Science*, with Michael R. McVaugh, 1980. Currently, he is investigating the role of scientists in the development of munitions. In 1998, he received the Dexter Award for Outstanding Contributions to the History of Chemistry from the American Chemical Society. He has taught history of science at Duke University since 1964. He has recently published on Richard Kirwan and the phlogiston theory: "Richard Kirwan's Phlogiston Theory: Its Success and Fate," *Ambix* 49, 2002, 185–205.

John C. Powers is a collateral assistant professor in the Department of History and Assistant Director of the STS Initiative at Virginia Commonwealth University. His current book project, entitled *Inventing Chemistry: Herman Boerhaave and the Reform of the Chemical Arts*, focusses on the shaping of chemistry into a university subject in the early eighteenth century.

Lawrence M. Principe splits his time between the Department of the History of Science and Technology and the Department of Chemistry at Johns Hopkins University, and holds the Drew Professorship of the Humanities. His research interests focus on early modern chymistry, particularly chrysopoeia, and he is currently completing a

book provisionally entitled *Wilhelm Homberg and the Transmutations of Chymistry at the Académie Royale des Sciences*. In 2004, he was the inaugural winner of the Francis Bacon Award. His publications include *The Aspiring Adept: Robert Boyle and His Alchemical Quest* (Princeton, 1998) and (with William R. Newman) *Alchemy Tried in the Fire: Starkey, Boyle, and the Fate of Helmontian Chymistry* (Chicago, 2004), the winner of the 2005 Pfizer Prize.