

## EXPERIENCING NATURE

THE UNIVERSITY OF WESTERN ONTARIO SERIES  
IN PHILOSOPHY OF SCIENCE

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VOLUME 58

*"To a great experience one thing is essential,  
an experiencing nature."*

Walter Bagehot



**Allen G. Debus**  
(Courtesy of Allen G. Debus)

# EXPERIENCING NATURE

Proceedings of a Conference in  
Honor of Allen G. Debus

*Edited by*

PAUL H. THEERMAN

*Smithsonian Institution,  
Washington, D.C., U.S.A.*

and

KAREN HUNGER PARSHALL

*University of Virginia,  
Charlottesville, VA, U.S.A.*



SPRINGER-SCIENCE+BUSINESS MEDIA, B.V.

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

ISBN 978-94-010-6454-5      ISBN 978-94-011-5810-7 (eBook)  
DOI 10.1007/978-94-011-5810-7

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© 1997 Springer Science+Business Media Dordrecht  
Originally published by Kluwer Academic Publishers in 1997

Softcover reprint of the hardcover 1st edition 1997

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## INTRODUCTION

*Paul H. Theerman and Karen Hunger Parshall*

These papers, by Allen G. Debus, his students, and his adviser, I. Bernard Cohen, represent the proceedings of a conference held at the University of Chicago on 30 October 1991 to celebrate a triple anniversary—Allen Debus's sixty-fifth birthday, the thirtieth anniversary of his coming to the University of Chicago, and the twenty-fifth anniversary (plus one) of the publication of his celebrated work, *The English Paracelsians*. Coincidentally, it also marked the publication of his then most recent major study, *The French Paracelsians*. These books serve as benchmarks to an ongoing career, which this conference and these proceedings honor and acclaim.

In his scholarship, Allen Debus has consistently challenged traditional historiographical interpretations, a fact which shows through not only in his works on the Paracelsians in seventeenth-century England and in eighteenth-century France, respectively, but also in his numerous other publications. He has shown vividly and convincingly that the facile interpretation of an inevitable spread of the "Age of Reason," motivated and sustained by the empirical sciences, simply does not hold. He has enlarged this older interpretation through his demonstration of the persistent and important influence of Renaissance ideas—especially in the realm of religion and nature—well into the modern age. Two key historiographical lessons thus emerge from his work: simple typologies do not suffice for complex processes; and no substitute exists for the careful determination of the discrete and concrete ways in which ideas grow, change, and persist through time. Part of the intellectual delight that Allen Debus's work provides, lies in the rich historical analyses arising from his masterful application of these tenets.

Indeed, these two historiographical guides thematically unite the essays in the present volume. Far-removed from their original historical contexts, through agents who may not even be associated with science, ideas of science—"experiences of nature"—may exert profound and unexpected influences. Recent studies have tended to illuminate this process in two complementary ways: by focusing on changing intellectual contexts and by examining differing social milieus. To be sure, the more traditional, discipline-oriented approach to the history of science, in which theoretical ideas are traced and linked, sheds much light on the internal development of specific scientific fields. For example, viewed strictly as a work in the "new astronomy," Johannes Kepler's *Harmonices mundi* of 1619 yields a wealth of insights into its author's mathematical and astronomical thought when subjected to close textual and technical analysis.

Yet, viewed as a product of Kepler's larger intellectual milieu—one encompassing aspects of neo-Platonic and neo-Pythagorean thought—the text reveals underlying motivations and styles of argumentation that more purely mathematical and astronomical examinations may obscure or overlook. When ideas are borrowed from other disciplines or areas of thought and made to impinge on unaccustomed domains, potentially fruitful intellectual cross-fertilization can occur. Perspectives may be meaningfully narrowed or productively broadened with fresh insights as the result.

Bernard Cohen, Debus's major professor at Harvard, explores precisely this sort of cross-fertilization of ideas in his essay, given as the conference's keynote address. Broadly speaking, he examines the potency of concepts in the natural sciences—predominantly physics and physiology—as explanatory ideas in the social sciences. More specifically, Cohen investigates the body politic as modeled along physicalist lines by writers as diverse as William Harvey and Sigmund Freud. He focuses on the way in which different parts of theories cross disciplinary boundaries. In so doing, he tracks not only individual metaphors and structural analogies, but also the belief that the laws of society are, in fact, the very laws of physics and biology writ large. With great breadth of learning, Cohen illustrates the rule that ideas may have influence and consequence far beyond their initial points of departure.

Similarly, Michael and Phyllis Walton examine how ideas from one realm penetrate another and thereby acquire new and deeper meanings. They take, as their case in point, Kaballah, a method of close textual interpretation integral to the Jewish mystical tradition, which entered the intellectual mainstream during the Renaissance. The Waltons demonstrate how the notion of Kaballah—as a potent symbol of the mathematical unities of nature—motivated the ideas of two disparate thinkers: the Elizabethan mathematical magus, John Dee, and the idiosyncratic astronomer, Johannes Kepler. They underscore the interplay between purely mystical and more modern applications of mathematics.

Although different in time and topic, Robert Richards's study probes yet another aspect of the role of intellectual context in the development of scientific thought, namely, its effects on the first formulation of an individual scientist's theories. Standard accounts invoke Charles Darwin as the destroyer of natural theology, that is, the belief that the natural world demonstrates the wisdom and purposes of the creator. While Darwin's later thought posits an imperfect and contingent world antithetical to natural theology, Richards shows that Darwin hit upon natural selection using key assumptions of that older belief system. Indeed, natural selection took on certain attributes of God; Darwin made the

doctrine, in a naturalistic way of course, the author of human morality, an altruistic morality quite different from the simple utilitarianism that dogged his reputation.

Karen Parshall also considers the fruitful conceptual cross-fertilization between scientific disciplines—specifically between invariant theory in mathematics and the theory of molecular structure in chemistry—in the research of the nineteenth-century mathematician, James Joseph Sylvester. Although chemists did not find useful the mathematical structures he developed, the perceived interrelations reflected, to Sylvester's mind at least, the fundamental unity of the mathematical and the natural sciences. Parshall isolates in Sylvester's positivistic philosophy the motivating force behind this novel and unexpected reciprocal application of mathematics and chemistry. She further explores the ideological uses Sylvester made of and envisioned for his unification of these two disparate areas.

As the papers of Cohen, the Waltons, Richards, and Parshall demonstrate, examination of the broader intellectual context in which scientific ideas emerge, mature, and interact reveals the richness and complexity of our attempts fully to experience and understand nature. The interaction of ideas, however, implies the interaction of people within their various social milieus. Just as an idea from one discipline may unexpectedly spark a discovery in a seemingly unrelated area, so the perspective of members of a particular social class or group may shed new light on our understanding of the pervasiveness of science and scientific thought. And the popular perception and comprehension of science represents but one aspect of the complex interrelations between science and society. Social mores, prevalent social, political, and cultural ideologies, these and other features of society may impact and be impacted by science.

In his essay, Terence Murphy gains insight into the world of French middle-class professionals of the sixteenth and seventeenth centuries by adopting just this sort of social perspective. He concentrates on the political and judicial instability occasioned by the religious civil wars in France as well as on some of its concomitant intellectual consequences: the metaphysical status of the Eucharistic host, the rising belief in sectarian uses of witchcraft, and the wavering opinion on the efficacy of the "royal touch" in curing scrofula. Murphy investigates the way in which political and legal problems acquired a medical dimension. He then shows how the restoration of political authority in France paralleled both the restabilization of the medical and physical basis of these practices and the ascendancy of medical authority in the corporate institutions of the physicians.

Other aspects of the impact of the social setting on medicine—the interplay between varied constituencies in an attempt to understand

disease—define the contours of Martha Baldwin's contribution to the present volume. Tarantism, a malady resulting from the tarantula's bite, received much attention throughout Europe during the early modern period, despite the fact that it only manifested itself in a very limited geographical region and that only a handful of physicians had or would ever see an actual case of it. Baldwin documents numerous accounts of the disease reported by peasants, Catholic clergymen, learned physicians, and natural philosophers, in order to appreciate contemporary understanding of the affliction and its cure. These accounts then mark the point of departure for an analysis of the role of social class in the establishment of an "expert witness" as well as of experimental verification in seventeenth-century medicine. She concludes by showing how physicians used tarantism, a disease in the abstract for virtually all the commentators, as a platform for the espousal of their own particular natural philosophical views.

The Bureau d'Adresse, a highly eclectic intellectual clearinghouse sponsored in the mid-1600s by the growing bureaucracy of the Ancien Régime, reported on tarantism as well as many other widely ranging topics. In her essay, Kathleen Wellman examines this institution as a mirror reflective of the extent and depth of the diffusion of ideas of nature associated with the Scientific Revolution. The constituency of the Bureau d'Adresse, middle-class professionals who would increasingly come to exert power in the modern state, readily embraced an eclectic mix of Aristotelian, animistic, and mechanical notions. While not rigidly systematic, these ideas were easily adapted to support the authority of the emergent absolutist state. Wellman thus suggests rethinking the supposed connections between Cartesianism and absolutism.

Paul Theerman investigates the curious life of scientific ideas in still another venue by focusing on the phenomenal American career of the British popularizer and physics lecturer, Dionysius Lardner. Lardner's success in the 1840s belies the notion that Americans were indifferent or antagonistic to science. Instead, when presented with sufficient theatricality, when tied to public morality and progress, when backed by influential, reform-minded supporters such as Horace Greeley, scientific ideas reached a substantial proportion of the American population through lectures and their publication. Theerman's study points to the importance of such cultural concepts as "the sublime" in explaining the engagement of the popular imagination with scientific ideas.

This book closes with a perspective on the history of science different from those of the papers just described. In his essay "From the Sciences to History: A Personal and Intellectual Journey," Allen Debus provides an overview of his career in the field. He describes not only his develop-

ment from a practicing chemist to a scholar of Renaissance science but also the concurrent development of the program in the history of science and medicine at the University of Chicago. Through his teaching and example, Debus has inspired a generation of students. Like him, these scholars have seen little inevitable in the way that modern science and its concepts have developed. They have taken up the challenge to follow the ideas wherever they lead. The corpus of Debus's work may thus be found not only in the bibliography which concludes the present volume but also in the historical research of his students, past, present, and future.

### Acknowledgments

For assistance in the production of the conference and its proceedings, the authors and editors acknowledge the gracious aid provided by Michael and Phyllis Walton; the Morris Fishbein Center for the History of Science and Medicine at The University of Chicago and its director (from 1980 to 1992), George Stocking; the Joseph Henry Papers Project and the Smithsonian Institution Archives; the University of Virginia; and, especially, Elizabeth Bitoy of the Department of History and the Fishbein Center at the University of Chicago.

Three other former students also made presentations at the conference: Regis Cabral, "The Brazilian Way of Perceiving Nature: The 1925 Relativity Debate"; Ronald Calinger, "Leonard Euler: The First St. Petersburg Years"; and Sherrie Lyons, "Sea Monsters, Charles Lyell, and the History of Life on Earth." Their papers, however, were unavailable for publication here.