to describe the statistical behavior of the resulting highly intermittent solutions. It is interesting to see how much can be learned about a complicated nonlinear problem by straightforward arguments and without numerical simulation. It would have been even better to treat the reader to some discussion of relevant experiments or observations, to make the discussion less abstract.

One of the pleasant features of the book, and an indicator of Zel'dovich's intellectual breadth and curiosity, is a section of speculations on the application of statistical methods to social problems, such as the intermittent spatial distribution of populations and the occurrence of rare and apparently unpredictable events or catastrophes. More substantively, the chapter on magnetohydrodynamics is a welcome introduction to the fascinating and challenging problem of the spontaneous origin of sustained magnetic fields in conducting fluids.

The Almighty Chance seems at first glance to be more easily penetrated than it really is. However, pleasing insights await the reader who is prepared to follow the sometimes demanding arguments and relate them to physical phenomena. Previous familiarity with statistical methods and the phenomena of nonlinear continuum mechanics would be helpful, despite the presence of some introductory material. Ruzmaikin and Sokoloff have done a service to physics by bringing this project to completion.

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Benjamin Franklin's Science

I. Bernard Cohen
Harvard U. P., Cambridge, Mass., 1990. 273 pp. $35.00 hc
ISBN 0-674-06658-8

Benjamin Franklin's Science is a retrospective of the foremost scholar of the subject, I. Bernard Cohen. The book includes nine previously published articles—revised and updated for this volume—on particular aspects of Franklin's scientific work; three additional chapters written for the volume offer a broader view of Franklin's electrical theory. An essay by Samuel J. Edgerton, Jr on the Franklin stove closes the book.

Cohen's scholarship on Franklin dates from the 1940s and early 1950s. Prior to this time Franklin's scientific work was little known. Historians cast Franklin in the role of practical inventor and failed to appreciate the theoretical importance of his work—in part because before World War II Americans held basic or theoretical research in low regard. The history of science, which might have provided a better perspective, did not yet exist as a discipline. Cohen himself was one of its founding fathers.

Cohen's work completely revised our view of Franklin, exhibiting the range and depth of Franklin's theoretical research and its importance for electrical theory. Franklin's contributions to electricity include the analysis of the Leyden jar, the design of the parallel-plate capacitor, a clear statement of the law of conservation of charge and a theory of static electricity that with some modifications remains valid today. Nor could Franklin have conceived his most successful invention, the lightning rod, without extensive theoretical research conducted before any practical application of electricity seemed possible. In fact, electricity had no practical significance at all before that invention—if one excepts the doubtful benefits of medical benefits of electrical shocks.

Cohen also set Franklin's work firmly in the 18th-century tradition of natural philosophy. Most of the articles in *Franklin's Science* trace with impeccable scholarship the sources of Franklin's work in that tradition. One of the earliest and most entertaining, "The Mysterious Dr. Spence" (1943), examines the role of an itinerant scientific lecturer in stimulating Franklin's interest in electricity. Other articles work out complex issues of dating and priority for the sentry box experiments, kite experiments and lightning rods of Franklin and other American and European natural philosophers.

The most interesting of three articles on non-electrical subjects takes up Franklin's well-known experiments on the differential heating of light and dark colored objects and traces them to discussions by Hermann Boerhaave, Isaac Newton and Robert Boyle—whose works, as Cohen points out, were basic intellectual equipment for 18th century natural philosophers. Franklin's and much contemporary experimental physics owed a great deal to Newton's *Opticks* in particular. Cohen's *Franklin and Newton* (1956), summarized here in a chapter on Franklin's scientific style, showed that the *Opticks* was as highly regarded as a model of experimental physics as the *Principia* was of mathematical physics.

Age has not diminished the interest of Cohen's scholarship, and the present collection will be enjoyed by anyone interested in Franklin's science. If anything dates the collection, it is that historians of science now understand that the 18th-century did not distinguish basic from applied research; that is a later prejudice. Nor do we today undervalue basic science. The lack of appreciation of Franklin against which Cohen wrote no longer troubles us—but for this we owe much to the work represented in *Franklin's Science.*

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More Heat Than Light: Economics as Social Physics, Physics as Nature's Economy

Philip Mirowski
Cambridge U. P., New York, 1990. 450 pp. $59.50 hc
ISBN 0-521-35042-5

The title of this book may reveal more than the author intended. Philip Mirowski is an economist who has a grudge against what he perceives as the establishment in economic theory, the group that has promulgated neoclassical economics. In the course of his somewhat heated argument, he takes an unjustified swipe at physics, shedding less light than he may have wished.

Mirowski's argument is more or less as follows. He leans heavily on modern trends in philosophy such as deconstructionism, a doctrine that sees ideas as tied to the prejudices and limitations of those who originated them. (In other words, it is an intellectual form of guilt by association.) He traces the history of the conservation of energy in physics to the 19th-century thermodynamicists, who often used metaphors such as fixed monetary exchange rates, values and prices to describe exchanges of energy. He then sees physics as tied to a concept of energy as substance, and of dull conservation laws and variational principles from which we are only now freeing ourselves. A physicist found it hard to read further—see below.

When Mirowski gets to economics, his own subject, he seems to be on firmer ground. He accuses the neoclassicists of "physics envy" and what is more, of envying and borrowing ideas from the older physics, based on the old concepts of conservation and of variational principles, which have in his mind the taint of association with 19th-century economics. Through a lengthy and often turgid