finally, the question of how to recreate beauty in the city as a crucial factor in its hope for future greatness.

My one major criticism is that, this breadth notwithstanding, the book fails to face directly and adequately the world of the deep poor, the Negro, and the aged, who are as much Boston's people as the businessman and the middle-class potential suburbanite, to whose well-being most of the creative ideas in the book are directed. But readers in Boston and in America's other metropolises will find *Boston: The Job Ahead* a challenging effort at broad civic enlightenment.

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Faraday and Naturphilosophie

The Origins of Field Theory (Random House, New York, 1966. 160 pp., illus. Paper, $1.95) represents a condensation and an extension of L. Pearce Williams's important biography of Michael Faraday, published last year. On the one hand, although Faraday dominated the unfolding drama of field theory, his contributions cannot be given the previous detailed treatment. On the other hand, the roots of Faraday's ideas are here exposed with much greater assurance. It is Williams's contention—which now appears without the more tentative expressions of the biography—that Faraday was deeply indebted to the nature philosophy of Kant and Schelling and to the atomic theory (of points surrounded by force systems) of Roger Boscovich.

Such a viewpoint is provocative. It has stirred up debate among the specialists, and discussion can be expected to continue for some time. The general reader should therefore be aware that some of Williams's assumptions are interpretations which enjoy limited support. The extent to which Faraday was "touched by the currents of *Naturphilosophie*" (p. 67) cannot be measured by direct references to comments in his papers or letters. And where it is stated that Faraday's explanation of electrochemical decomposition "can be understood only in terms of Boscovichian molecules" (p. 83), or that the discovery of specific inductive capacity should not have been surprising "for it follows directly from the theory of Boscovichian molecules" (p. 86), the reader should realize there is no evidence that Faraday was acquainted with the detailed molecule described by Williams; his two published references to Boscovich were in very general terms, and apparently nothing appears in the surviving letters. Faraday's commitment to these influences, therefore, is a matter of speculative reconstruction, to be inferred from the facts that he had access to them and that his work can plausibly be explained in their terms.

It would seem unnecessary in any case to press these relationships beyond the evidence. Unity in nature and continuity in space are very old themes and in their simple form require little explanation. Whatever views Faraday began with were certain to adjust or give way to a lifetime of experimentation. A contrast can be made with Oersted, who is presented as the prime example of a nature philosopher who discovered something. Having been convinced for a number of years that there might be a connection between electricity and magnetism, Oersted was delighted to find it in 1820. But *Naturphilosophie* had given him no clues as to what form the effect would take or how to conduct his search; it now gave him no assistance in interpreting his results or in suggesting what else might be done. Faraday's discovery, after a two-decade search, that the plane of polarization of light could be rotated by a strong magnetic field, however, supported, extended, and modified his theoretical ideas. And this was typical of all his discoveries.

Although Faraday may have found comfort in his limited understanding of Boscovich and the German philosophers, they were clearly not leading him around by the intellectual nose.

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Gas Dynamics for Astronomers

Conditions in the interstellar medium are frequently rather different from those to which the standard methods and results of hydrodynamics and gas dynamics apply. Consequently, for the study of the dynamics of interstellar matter these methods must be adapted to interstellar conditions, either by gas-dynamicists who feel challenged by problems in this subject or by astronomers who have learned the methods. In **Interstellar Gas Dynamics** (F. D. Kahn, Ed. Pergamon, New York, ed. 2, 1966. 138 pp., illus. $6.50), S. A. Kaplan's main purpose is to give to astronomers an account of the ideas and methods of gas dynamics which are particularly applicable to the interstellar gas.

The book is divided into four chapters dealing with the (observed) distribution and motion, the physical state, discontinuities in the motion, and the equations of motion of the interstellar gas. The special character of the dynamics of interstellar gas is shown to result largely from the manner in which hydrogen in certain regions (H-II regions) is ionized and heated by the ultraviolet radiation of hot, luminous stars, the manner in which emission and absorption of radiation ultimately control the temperature of the gas, and the manner in which the gas, interstellar magnetic fields, and cosmic rays interact. Shocks, ionization fronts, and hydromagnetic discontinuities are discussed along conventional lines, and simple solutions of the equations of motion are described for steady flows and unsteady one-dimensional flows. Methods based on similarity solutions are given major emphasis. There is a brief discussion of turbulence.

The book presents a superficial and distorted account of the dynamics of interstellar gas, however. It is loosely organized and occasionally disconnected, and many topics are treated in so brief and casual a manner that they are barely understandable. Even some of the major topics become confusing in this presentation. For example, the whole character of the motion of an ionization front as an initial value problem is obscured by the discussion in sections 11 and 15. The bibliography is short and uneven in its coverage. Many statements in the text are made with neither a justification nor a reference to a source which would provide one. The omission of important references is disturbing. Although this edition is described on the copyright page as a revision of the Russian edition of 1958, only the briefest comments are made about developments which have occurred since that time. Thus the book tends to be out of date. It is a disappointing volume.

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