Multidisciplinary Essays

Mind, Matter, and Method: Essays in Philosophy and Science in Honor of Herbert Feigl (University of Minnesota Press, Minneapolis, 1966. 531 pp., illus. $9.75), edited by Paul Feyerabend and Grover Maxwell, contains articles by 26 contributors, many of them distinguished philosophers, psychologists, or physicists. The more scientific pieces are often rather technical, but all of them deal with matters sufficiently fundamental and controversial so that a philosophical flavor is maintained throughout. The book is divided into three parts: Philosophy of Mind and Related Issues; Induction, Confirmation, and Philosophical Method; and Philosophy of the Physical Sciences. This division aptly reflects Feigl's wide-ranging interests, but does not succeed entirely in binding together this exceedingly diverse and multidisciplinary collection. This disunity is compounded by the circumstance that almost all of the articles presuppose distinct literatures; except in a few cases, there is little overlap among their bibliographies.

Though several of the contributions appear to be occasional pieces, most of them represent substantial research within their respective fields; a few are valuable as summaries of previous work. I shall discuss some of the articles which struck me as most interesting.

Paul Meehl's "The compleat autocerebroscopist: A thought-experiment on Professor Feigl's mind-body identity thesis" is far more wide-ranging than its title indicates, being a comprehensive and penetrating examination of "pragmatic" difficulties facing the identity theory of mind and body. Though frankly inconclusive as to the mind-body problem itself, this article succeeds in illuminating and ordering many of the concepts which in recent years have been developed in the study of this question.

Both Wilfrid Sellars's and Adolph Grünbaum's contributions are important and thought-provoking critiques, of phenomenalism and of the thesis that any scientific hypothesis can be "saved" by suitable adjustment of background theoretical assumptions. But versions of these articles have previously appeared in print.

In his "Verifiability and logic," Wesley Salmon proposes that the notion of empirical verifiability be explicated by means of concepts from inductive as well as from deductive logic. His tentative formulation of such an explication encounters difficulties which, I suspect, cannot be overcome so long as the criterion of deductive validity is truth-functional.

Henryk Mehlberg's "Relativity and the atom" contains some valuable general remarks concerning special relativity, as well as an axiomatic "world geometry," proposed as an abstract relativity theory applicable to both micro- and macro-phenomena. This system is rather sketchily presented, and it is to be hoped that the author will soon publish a fuller account of it.

Wolfgang Yourgrau combines in his "Language, spatial concepts, and physics" the suggestion that topological concepts might be fruitfully applied in the physical sciences, with a polemic against Euclidean (and, apparently, metric) geometries. While the former point may have some merit, the latter is much overstated; it seems highly unlikely that metric or even Euclidean spaces will lose their mathematical or physical importance. Also, it is difficult to see the relevance to these matters of the psychological points made by the author.

A few generalizations can be made about the articles in this collection, in spite of their diversity. Almost all of them make use of concepts from symbolic logic; even where their topic is far removed from logical matters, many of the contributors will occasionally make points by means of logical notation. Quite striking also, throughout the book, is the rigor of thought and clarity of expression which men like Feigl have done so much to promote in philosophy.

The volume contains a lively biographical sketch of Feigl (by Feyerabend) and a bibliography of his writings to 1965.

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Issues of Urban Life

One of the great problems of urban man in the 20th century is an information gap. This is the gap between the vastly increasing knowledge about the problems and issues of urban life available among our leading scholars and the very limited knowledge on which the public and its political leaders generally base community action. The past decade has witnessed an extraordinary amount of penetrating research focused on the metropolis by civic organizations like New York's Regional Plan Association; university researchers in the fields of economics, sociology, political science, and public planning; governmental agencies concerned with urban policy in the areas of transportation, land development, and social welfare programs; and other research groups.

Two university scholars of outstanding ability, Martin Meyerson and Edward C. Banfield, were given an opportunity in Boston during the past four years to attempt a bridging of the urban information gap. They were invited by Boston business leaders to publish a series of 12 essays on key public-policy topics. These reached a mass audience by being printed as full-page, uncensored advertisements in the daily newspapers of the area. In **Boston: The Job Ahead** (Harvard University Press, Cambridge, 1966. 127 pp., illus. $3.95), the essays are made available in hard-cover form. Attractive in style not only to the thoughtful book-reading general public but to high-school and college students as well, the book will have an impact on the voting citizens of Boston's next generation.

It is fascinating to see how the authors analyze a wide variety of the city's public issues and the specific strategies they propose for coping with Boston's future. In the hands of authors not so well qualified, this sort of two-man braintrust might be a risky enterprise, susceptible to the twin dangers of superficiality and idiosyncratic outlook. That these dangers have been largely avoided is a tribute to the writers—Meyerson, an educational administrator of immense intellectual scope, and Banfield, a political scientist with great vigor of mind and a capacity to see events clearly through many sets of eyes in addition to his own.

The chapters run the gamut of what currently worries metropolitan man: how to split governmental power and taxes among the city, the suburbs, and the state; the high costs, confusions, and unfavorable trends in public transport and freight-handling; the creation of adequate incentives for private investment to revitalize central areas; the unique disabilities of the crucial commodity, housing; the dangerous impasse in Boston's public education program that blocks action in this fundamental urban function; the special problems of today's youth in big cities and of maintaining public safety; and

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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