

Volume 15 of the series resembles previous ones in being occupied mainly by essentially theoretical articles in which the properties of well-defined models are worked out and compared, more or less thoroughly, with experiment. The longest article, that by R. W. James on the "Dynamical Theory of X-Ray Diffraction", falls very clearly into this category. It will prove of great importance to workers in electron diffraction as well as to those concerned with X-rays. In treating the "Elementary Theory of the Optical Properties of Solids", F. Stern combines a discussion of phenomenological electromagnetic properties, including the wave-length dependent dielectric constant, with treatments of the free electron gas, electrons and holes in semiconductors and optical modes in ionic crystals: the application of dispersion relations is considered. L. J. Sham and J. M. Ziman discuss carefully the basic concepts of "Electron-Phonon Interaction" and the resulting electron scattering in solids. The considerations which they present resolve a number of questions and doubts on some fundamental points, and lead to clear definitions of the matrix elements which appear in the theory: topics treated include deformation potential, pseudopotential and screening effects. In discussing "Spin Temperature and Nuclear Relaxation in Solids", L. C. Hebel impresses one further with the rich interplay of theoretical and experimental activity (theorist and experimenter often being the same person), which has characterized work in nuclear magnetic resonance.

The first article in the volume, that by G. Borelius on "Changes in Energy Content, Volume, and Resistivity with Temperature in Simple Solids and Liquids", is in a different category. Here the experimental results dominate, and such theoretical discussion as there is frequently emphasizes the apparent inadequacies of present-day theory. It is good to see this approach represented.

C. W. McCOMBIE

SCHRÖDINGER'S LOGIC

My View of the World

By Erwin Schrödinger. Translated from the German by Cecily Hastings. Pp. viii+110. (Cambridge: At the University Press, 1964.) 18s. net; 3.50 dollars.

THIS book consists of two long essays, hitherto unpublished. Although separated by a long period—the first was published in 1925, and the second in 1960—there are close links between them in respect of subject-matter and treatment. There are also affinities with the reflexions with which Schrödinger concluded his book *What is Life?* (1944), although this book is not mentioned in the present work.

In these pages Schrödinger puts forward a philosophical and indeed metaphysical view of the world, of human experience and of human nature. He rightly does not attempt to derive these conclusions from theories in the natural sciences but adopts a starting point which is philosophical—that is to say, one in which the sciences themselves are located in the wider context of human experience of the world and of moral relationships. Schrödinger accepts the validity of Kant's criticism of speculative metaphysics but argues, in my view correctly, that to some degree metaphysics, in the sense of pre-suppositions of enquiry, is indispensable. The particular problem which concerns him is the basic one of the relation between experience and reality. He points out that the commonsense view that independent observers, or 'selves', have similar experiences of the same external world is not self-authenticating; here Schrödinger is clearly under the influence of his mentors, Mach and Avenarius. There is no doubt that Schrödinger is right in saying that this is a metaphysical point of view in the sense explained. It is with less plausibility that he seeks to supplant it with an alternative and indeed inverted metaphysical doctrine which he derives from the Vedanta.

Instead of thinking of different selves experiencing a common world, he invites us to think of a multiplicity of selves sharing a common consciousness. According to this idea there is no ultimate distinction between different minds or indeed between consciousness and its object. To a Westerner, at any event, this is a paradoxical view which lacks inherent plausibility; unfortunately Schrödinger does not offer convincing arguments in its support.

Another difficulty is that Schrödinger appears to think that it goes some way to solving a problem the genuineness of which is very much open to doubt. "If she who is now your mother had cohabited with someone else and had a son by him, and your father had done likewise, would you have come to be? Or were you living in them, and in your father's father . . . thousands of years ago? And even if this is so, why are you not your brother, why is your brother not you, why are you not one of your distant cousins?" To ponder why I am not my brother, or where or what I would be if my parents had not met, is to induce a kind of intellectual vertigo for which the cure is not the Vedanta, but rather a closer attention to the logic of our language. The reason why I am I and not someone else, or that this pencil is this pencil and not another pencil, is to be found in the logical principle of identity—that is, a tautology. Schrödinger is not the first, and will not be the last, to find in logic a source of wonderment, and in metaphysics an apparent resolution of it—but what precisely is the 'problem', as distinct from the wondering?

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SPECTROSCOPIST'S VADE-MECUM

Flame Spectroscopy

By Radu Mavrodineanu and Henri Boiteux. (Wiley Series in Pure and Applied Spectroscopy.) Pp. xiv+721. (New York and London: John Wiley and Sons, Inc., 1965.) 315s.

FLAME Spectroscopy, by Drs. R. Mavrodineanu and H. Boiteux, is probably one of the most detailed and comprehensive works on flame emission spectroscopy and atomic absorption spectrophotometry which has ever been written. It may be regarded as a modernized edition of the original *L'Analyse Spectrale Quantitative par la Flamme*, published in France in 1954.

The authors deliberately avoid the discussion of practical laboratory methods for the analysis of specific elements or compounds, although most extensive references are given to published papers of this type.

The present publication has a far more generic approach to the theoretical and instrumental aspects of flame spectroscopy, the descriptive text being embellished with photographic illustrations and diagrammatic representations of the highest quality and most commendable clarity. The coverage given to spectrographic instrumentation is truly international, the products of the world's most well-known instrument makers being given detailed attention. The construction, performance and general physical parameters of these spectrometers, etc., are concisely listed for rapid comparative reference.

The present work is presented in three parts comprising twenty-two chapters. The first part deals in a most exhaustive fashion with the fundamental principles of flame production; inflammability, burning velocity, temperature contours, etc., are but a few of the topics lucidly described. In addition to the less common flames of cyanogen-oxygen or hydrogen-perchloryl fluoride, much attention is directed to plasma jet, atomic hydrogen and high-frequency flame systems.

Numerous types of burners and atomizers are clearly described, the range covered extending from the apparatus of Beckman (1899) and Lundegårdh (1936) to the ultrasonic device of Peskin and Raco (1963). Much valuable detail is also given regarding the properties of materials