

treme ends of the visible spectrum are designated red and *purple*, respectively.

There are few mathematical symbols in the text, but mathematical concepts of some stature are discussed—divergence and curl, boundary conditions, invariance, etc. This material is plainly beyond the capabilities of the average intelligent layman for whom the book is intended. It would, perhaps, be more effective and rewarding in the hands of the senior physics major, for whom it might provide a refreshing and thought-stimulating restatement of some of the material he has been over.

Théorie Générale de l'Equation Mathieu. By Robert Campbell. 272 pp. Masson et Cie, Paris, France, 1955. Clothbound 2.900 fr.; paperbound 2.400 fr. *Reviewed by Philip M. Morse, Massachusetts Institute of Technology.*

The connection between the world's practical needs and the progress of mathematics, adumbrated by Bernal and by Hogben, seems to be born out by the recent increase of interest in Mathieu functions and the related spheroidal functions. Elliptic and spheroidal waves are now of practical interest in radar and sonar, as well as in quantum mechanics; this seems to have induced new interest in the mathematical properties of the corresponding functions on the part of mathematical analysts. Since analysts of stature are almost nonexistent in this country (and let's not here go into the reasons for it!) the results of the renaissance have had to come to us from abroad. The first was MacLachlan's *Theory and Application of Mathieu Functions*, second was Meixner and Schäfke's *Mathieusche Funktionen und Sphäroidfunktionen* and now we see the volume under present review.

The ground covered is more or less the same. Readers in this country will probably find MacLachlan's volume more readable; Meixner's is more thorough. Campbell's goes into somewhat more detail in listing the forms in which the solutions may be expressed. But I would list it the least desirable of the three.

L'Interprétation Physique de la Mécanique Ondulatoire et des Théories Quantiques. By Paulette Février. 211 pp. Gauthier-Villars, Paris, France, 1956. Paperbound \$9.28. *Reviewed by L. Marton, National Bureau of Standards.*

The average person, seeing the title of a book, makes for himself a preconceived image of its contents and is disappointed if the author's interpretation of the words used in the title differ from his own. I must confess to this kind of disappointment. For me the words "physical interpretation" bear a close relationship to measurement and experiment; for the author they mean an examination of the logical basis of the theory and a re-evaluation of its contents in terms of what David Bohm called "hidden variables". No doubt this is a

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By GAYLORD P. HARNWELL, University of Pennsylvania; and WILLIAM E. STEPHENS, University of Pennsylvania. *International Series in Pure and Applied Physics.* 412 pages, \$8.00

Presenting the essential physical ideas upon which the current atomic theory of matter rests, this book departs from the strictly historical approach, discussing only briefly the early work on quantum theory, x-rays, etc. Emphasis is on the extension of the basic classical concepts of physics into the realm of atomic phenomena, and on the evolution of those particularly central and elemental quantum concepts, having no classical counterpart, which uniquely characterize the physics of atomic particles. A statistical description of atomic particles and their aggregates is given and applied to properties of gases, liquids and solids.

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valid point of view, but there may be others misinterpreting the author's intent in a manner similar to mine—they had better be warned.

Within the above mentioned framework the presentation is essentially mathematico-philosophical. The chapter headings give a vague indication of the contents: (1) Adequation of a Physical Theory, (2) General Theory of Previsions, (3) The Spectral Decomposition, (4) Open Character of a Wave Mechanics, (5) Objectivistic Measurements and Schemes, (6) Previsional Interpretation and Realistic Interpretation, (7) Microphysics and Cosmology, (8) The Functional Representation, (9) Considerations of Logical Structure, (10) The Method of Associated Fluid by Destouches.

One of the aims of the book is to revive an early interpretation of de Broglie relative to the pilot-wave with double solution. As related in the introduction, this interpretation was put forward by de Broglie as early as 1926, but abandoned in consequence of discussions at the 1927 Solvay Congress in favor of more statistical considerations. The revival of these early ideas was probably started by Rosen in 1945 and more actively pursued by Bohm in 1952. Recent work of de Broglie, of Destouches and now of Mme. F  vrier indicates a definite tendency away from "indeterminism" and toward what Mme. F  vrier calls: "a change in the epistemological climate". How permanent that tendency will be is hard to predict; 25 years or more of wave mechanics were spent in an atmosphere of indeterministic considerations and no one will deny the eminently successful treatment of many physical phenomena by the existing quantum theories. On the other hand, to quote David Bohm: "a choice" between "a single precisely defined conceptual model" or a renouncement of any possibility of such a model "is conceivable in domains, such as those associated with dimensions of the order of 10^{-13} cm, where the extrapolation of the present theory seems to break down". In that sense it is good to see efforts toward a return of "realism and determinism" as expressed by Mme. F  vrier.

Many passages of this book are quite thought provoking. It is therefore a pleasure to recommend this book to the attention of those who are interested in the interpretations of modern physical theories as well as the attention of those who like to follow the development of the ideas of de Broglie's school.

The Meaning of Relativity (Fifth Edition). By Albert Einstein. 169 pp. Princeton U. Press, Princeton, N. J., 1955. \$3.75. Reviewed by E. R. Cohen, *Atomics International*.

In May 1921 Albert Einstein delivered a series of lectures at Princeton University on the broad topic of relativity. The lectures form a unified survey of the basic concepts of relativity. Beginning with the pre-relativity physics of Newton (or perhaps more correctly, the "three dimensional" relativity of Newton) Einstein lays the foundation for "four dimensional"