

science and of the achievement of Sadi. One could wish that the details of the argument had been brought out more clearly and in a less imposing and expensive format. It is, in fact, unfortunate that 1971 does not appear to mark any significant anniversary in the life or career of Lazare, to justify in this volume its characteristic marks of an anniversary memoir. Handsomely designed, more than half its pages consist of photographic reproductions—of the complete text of the manuscript of the Berlin essay and of copious extracts of the theoretical sections from the two Paris contest entries. The volume concludes with a useful bibliography.

* * *

Robert E. Schofield is a Professor of History of Science at Case Western Reserve University, Cleveland, Ohio.

Physics: The Behavior of Particles

By P. Stehle
434 pp. Harper and Row,
New York, 1971. \$10.95

Philip Stehle has written a text to be used in the standard noncalculus physics course. Such a course is attended in the main by lethargic life-science types, a few overeager medical and dental school aspirants, and an occasional stray soul from history or philosophy. To this group Stehle adds the future professional physicist and then sets himself the task of educating the lot without sacrificing their training.

His *idée fixe* is the particle, its varieties, existence and motion through the physical world. This perspective allows much of what has properly passed from the province of physics to the practice of engineering to be ignored. It also emphasizes modern physics, where the single-entity explanation of almost every phenomenon is favored because of its ease of mathematical formulation. This approach is thus both clever and promising.

The organization of the material is rather standard; a definition of physics, the compulsory superficial treatment of vectors, then a headlong plunge into Newtonian mechanics, which starts by stating the three laws and ends with energy and momentum conservation. The Lorentz force is discussed, and then the atom and its nucleus is explored. Relativistic mechanics is called forth, and a couple of denizens of the erstwhile elementary-particle zoo are exhibited. Light, relativity, and the electromagnetic wave

are merged, before chapters on kinetic theory and electrons in solids complete the exposition. The definition of physics is then revisited, and the book trails off with the inevitable tables of physical constants, answers to the odd-numbered problems, and so on.

The author's style is clear, informal and readable, but not exciting. The book itself is mediocre, the graphics unimaginative, the combination of type face and paper tiring to study, and the layout is uninteresting.

In my opinion the chief failure of the text lies with its choice of audience. A text that focuses on topics, examples and problems describing the physics encountered in biological and medical applications would better serve the typical noncalculus physics student. The audience of humanists, now almost a null set, could be expanded and stimulated by a course that dwells on concepts and principles, their philosophy and history, and deletes the details in which physicists delight. It is the student of engineering and natural science who could benefit most from Stehle's particle organization of physics. The gratitude accorded Halliday and Resnick for their fine book has begun to wain, while the over-stimulative efforts of the Feynman and the Berkeley series do not seem to work for the usual class. It is in this niche where the impact of Stehle's interesting organization could be most effective.

W. PETER TROWER
Virginia Polytechnic Institute and
State University
Blacksburg, Virginia

Introduction to the Theory of Solid State Physics

By J. D. Patterson
388 pp. Addison-Wesley, Reading,
Mass., 1971. \$14.50

This book is intended as a text suitable for second-year graduate students. The author, James D. Patterson, is associate professor of physics at the South Dakota School of Mines and Technology. His intention is to "present the fundamental aspects of solid state physics in a somewhat more than superficial way." The level of presentation is intermediate between elementary Kittel (*Introduction to Solid State Physics*) and advanced Kittel (*Quantum Theory of Solids*).

The book begins with a qualitative discussion of crystal structures and binding. A small amount of group theory is presented, and lattice vibrations, the Hartree-Fock approximation, and band theory follow. Many

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By V. de Alfaro, University of Torino, S. Fubini, M.I.T. and University of Torino, G. Furlan, University of Trieste, and C. Rossetti, University of Torino

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1972, approx. 850 pp., in prep.

Paul Ehrenfest

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By M.J. Klein, Yale University

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Physics Today

Second printing, 1972, 346 pp., \$9.50

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simple applications of band theory are included. Phenomenological theories of ferromagnetism are described with emphases on molecular field theory and on spin waves. The treatment of the Landau Theory of Second Order Phase Transitions is one of the strong points of the work. Crystal field theory and magnetic resonance are discussed; however, electron-phonon interactions and transport theory are treated in a fairly rudimentary manner. Finally there are brief presentations covering a variety of significant topics, including Fermi surfaces, optical properties, defects, dielectrics, semiconductors and superconductivity. Mks. units are used, and problems are given with each chapter.

The topics included are, in the main, fundamental ones. The most significant omission is a meaningful treatment of the electron-electron interaction, which is discussed only qualitatively. Not even the dielectric function of a free electron gas appears. The depth of coverage is occasionally quite superficial: one example is the discussion of lattice thermal conductivity, which is not based on the Boltzmann equation or other fundamental considerations and includes only a bit of hand waving about *umklapp* processes.

Perhaps this book would be useful for students at a lower level than the author intends. The degree of proficiency in quantum theory required is not high. I would not find it suitable for use with students who I wished to train to a research level: it is simply too simplified, even for experimentalists.

JOSEPH CALLAWAY
Louisiana State University

new books

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Electron Microscopy and Structure of Materials (Conf. proc. Fifty International Materials Symposium, Berkeley, Calif., 13-17 Sept. 1971). G. Thomas, ed. 1292 pp. Univ. of Calif. Press, Berkeley, Calif., 1972. \$28.50

Electronic and Atomic Collisions (Paper Abstracts, 7th International Conference on the Physics of Electronic and Atomic Collisions, 26-30 July 1972, Amsterdam, The Netherlands), Parts 1 and 2. L. M. Branscomb et al, eds. 1185 pp. North-Holland Publishing, The Netherlands, 1971. \$60.00

Physics of the Upper Atmosphere (Conf. proc. International School of Atmospheric Physics, Erice, Italy, 15-29 June 1970). F. Verniani, ed. 461 pp. Editrice Compositori, Bologna, Italy, 1971. \$20.00

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