

this entire section and the following one on thermocouples could compose a good part of an experimental-thermodynamics book. The section on the calibration and use of liquid-in-glass thermometers is invaluable to anyone who is engaged in standardization work.

The final two sections on optical pyrometry and spectroscopic thermometry cover each area very well. Both of these methods involve temperature considerably higher than those usually encountered in most laboratory work. However, with the increase of work in plasma physics, the spectroscopic methods are increasing in interest and value.

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James B. Kelley has recently become vice-president for academic affairs at Adelphi University, New York. He has done research in thermometry, particularly resistance techniques.

Pocket encyclopedia

THEORIE DU MAGNETISME. By André Herpin. 882 pp. Presses Universitaires de France, Paris, 1968.

by DANIEL C. MATTIS

André Herpin has written the most complete textbook in magnetism, one that recommends itself to all physicists who are familiar with the French language. Some of the topics covered in rather substantial detail are local-field theory, domain theory and ferro-, ferri- and antiferromagnetism.

There is a chapter on the experimental methods of magnetism, that is, Mössbauer effects, nuclear-magnetic resonance and neutron diffraction. The author is particularly clear in correlating experimental parameters with theoretical analysis. He discusses atomic properties in some detail, including the rules of Hund, and then introduces the crystalline field and discusses its effects on ions of the transition series.

Also covered are thermodynamics, the exchange forces, anisotropy, dynamic phenomena and molecular-field theory. This last is perhaps the weakest feature of the book. The most recent theoretical developments define thermodynamic functions of magnetism, which often differ considerably from the molecular-field results.

It is, however, difficult to fault this book, which manages in addition to tell all about hysteresis, rare earths and many other miscellaneous aspects of the field. Perhaps it should not have been titled *Theory of Magnetism* but rather *Pocket Encyclopedia of Magnetism*. It is recommended for all students in this field.

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The reviewer, professor of solid-state physics at Belfer Graduate School of Science, Yeshiva University, is the author of *Theory of Magnetism*, which is more theoretical and much less encyclopedic than Herpin's book.

Hot and fast

PHYSICS OF SHOCK WAVES AND HIGH-TEMPERATURE HYDRODYNAMIC PHENOMENA, VOL. 2. By Ya. B. Zel'dovich and Yu. P. Raizer. Wallace D. Hayes, Ronald F. Probstein, eds. (Trans. from Russian) 916 pp. Academic Press, New York, 1967. \$18.00

by ROLF LANDSHOFF

The existence of shock waves was predicted theoretically by Bernhard Riemann and proven experimentally by Ernst Mach, but for many years research in this field proceeded at a very slow speed. This situation changed quite drastically when the development of nuclear bombs and of missiles led to technical problems. The implosion of fissionable material, the expansion of and radiation from the nuclear fireball and the reentry of missiles could not be solved without a thorough understanding of these phenomena. Obvious interest also arose through astrophysical applications, such as the explosion of a supernova and the observed optical phenomena on the surface of certain stars.

Both authors have been active contributors in this field. They are members of the USSR Academy of Sciences, Ya B. Zel'dovich in the section designated as Astronomical Soviet and Yu P. Raizer in the Institute of Mechanical Problems. Among their numerous publications, one by Raizer once gave me a bit of a chuckle because of a not quite successful attempt to "declassify" the title of the English summary of the article. It was given as "The Formation of Nitrogen Oxides in the Shock Wave of a Strong Explosion in Air," and somehow the editor in charge of the clean up had overlooked the original Russian title just

above the English one, with the word "atomic" in place of the word "strong."

This book is the second of two volumes; the first is devoted to fundamental hydrodynamic, physical and chemical processes and the second one to details of the shock-wave structure and to numerous important applications. Discussion of the shock-wave structure deals with the role of various nonequilibrium type processes. In very strong explosions the most important of these is the radiative transfer of energy. Radiative transfer is also a major factor in determining the luminosity of a fireball. One of the phenomena observed is the so called "cooling wave" that moves toward the center of the fireball and whose theory was developed by the two authors together with A. S. Kompaneets.

Other applications include spark discharges and shock waves in solids at the surface of stars and in an inhomogeneous atmosphere with an exponential density distribution. Many of these problems can be successfully attacked by similarity transformations.

Altogether, these two volumes are required reading for anyone working in this field. The presentation is comprehensive, authoritative, and clear, and the translation reads very smoothly. Much of the credit for the latter must go to the US editors, who are themselves reputable scientists and authors. The books are also intended for graduate courses, and they will be useful for engineers who want to apply the results to specific problems.

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A senior member of the Lockheed Palo Alto Research Laboratory, the reviewer is the editor of a recent book on excitation and nonequilibrium phenomena in air.

The cultivated reader

ANOTHER LOOK AT ATLANTIS AND FIFTEEN OTHER ESSAYS. By Willy Ley. 229 pp. Doubleday, New York, 1969. \$5.95

by JACQUES E. ROMAIN

Most of this book is not concerned with physics. However, any scientist will read with pleasure this refreshing series of essays on topics ranging from history through zoology and technology to cosmology and, of course, space science.

The first two subjects are unexpected