

tions into English have been made. The volume, which is designed for college-level students, is both an excellent historical reference work and a valuable teaching tool, containing as it does a case study of scientific progress, with its false turnings, leading to a major discovery and its remarkable application. Its coverage in good part may be summarized by the verse Otto Hahn was fond of quoting:

*To split the mighty atom
All mankind was intent.
Now any day the atom may
Return the compliment.*

LAWRENCE BADASH
University of California,
Santa Barbara

Helium 4

By Z. M. Galasiewicz
338 pp. Pergamon, New
York, 1971. \$9.50

The modern science of low-temperature physics dates from the liquefaction of helium in 1908. Since that time, the behavior of liquid helium has been widely studied owing both to its inherent fascination and to its nearly universal role as a cryogenic substance. This intensive effort has yielded successful phenomenological descriptions that fit the various experimental data. The theoretical picture remains incomplete, however, for it is still impossible to perform quantitative calculations from first principles. Consequently, the study of liquid helium continues to flourish.

It is therefore appropriate that Pergamon Press's Selected Readings in Physics series has issued a new volume *Helium 4*, edited by Zygmunt Galasiewicz. It contains an introductory essay of about 50 pages, followed by 19 basic papers (12 experimental and 7 theoretical) that have been wholly reset in a uniform format. As stated on the back cover, this series is planned for an undergraduate or beginning graduate student. In general, *Helium 4* keeps to this level, but it also contains some quite technical material on the derivation of the two-fluid model and the kinetic coefficients. Part of this last material summarizes Galasiewicz's earlier book *Superconductivity and Quantum Fluids* (Pergamon Press, 1970).

The introduction reports the present status of superfluid helium, with emphasis on the theoretical developments of Lev Landau, Nikolai Bogoliubov, and Richard Feynman. Regrettably, the text is marred by numerous misprints, including a confusion between h and $\hbar$. Thus the quoted expressions

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1972, 320 pp., \$16.00

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by JOHN F. READY, Honeywell Corporate Research Center, Hopkins, Minnesota

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production engineer to evaluate laser materials processing for specific applications. The author includes background information on lasers themselves—their properties, measurement techniques, and safety aspects. He also treats a tested method, here presented for the first time in print, for determining laser-induced temperature increases in cases of practical interest.

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OPTICAL PHYSICS

by MAX GARBUNY, Consultant, Westinghouse Research Laboratories, Pittsburgh, Pennsylvania and Lecturer, Summer Courses, University of California Extension, Los Angeles, California

After introducing atomistic models of varying refinement, this classic work discusses the processes by which radiation between the infrared and ultraviolet region is emitted. Based on these fundamentals, the principles and applications of modern optics are

treated with particular reference to such subjects as monochromatic and continuum light sources, broadening of spectral lines, optics of the materials, lasers, nonlinear optics, and processes of detection.

1965, 466 pp., \$16.00

ACADEMIC PRESS  NEW YORK AND LONDON
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Academician Lev Landau in 1962. Landau's work with superfluid helium won him the Nobel Prize for Physics in that year.

cannot be used with confidence. Furthermore, many of the arguments merely reproduce the steps of the original authors, with little attempt to provide additional guidance for the student.

The reprints are largely confined to the period before 1947, and only the last three date from the 1950's. Most of the experimental papers are acknowledged prewar classics, describing the specific heat and other properties of liquid helium near the lambda point, and the discovery of superfluidity. Especially welcome are the two final experimental reprints reporting the celebrated experiments of Eleuter Andronikashvili with the oscillating disks and V. Peshkov on second sound. The theoretical reprints include Landau's well known work on the semiphenomenological description of liquid helium, Bogoliubov's treatment of a weakly interacting Bose gas, and Feynman's seminal essay in volume I of *Progress in Low Temperature Physics*.

The choice of papers evidently reflects a personal view of the subject, but the restriction to work before 1960 necessarily omits several of the most interesting new developments, such as the neutron-scattering experiment that verified Landau's quasiparticle spectrum, the demonstration of the ac Josephson effect in helium, and the detection of quantized circulation, persistent currents and vortex rings. For this reason, the book presents an incomplete and dated account of the current situation.

Helium 4 is definitely not a textbook, but rather appears designed for auxiliary reading. Unfortunately, it is apparently available only in a hard-covered edition that sells for \$9.50 (or £ 3.00 = \$7.50 if ordered from Britain!).

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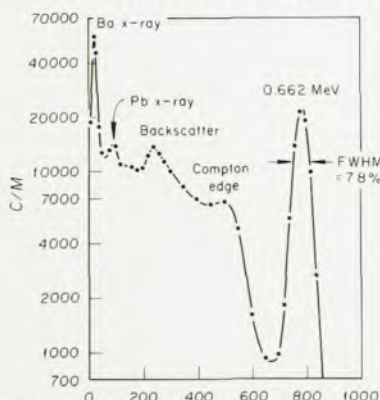
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March 1972

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Science Books: A Quarterly Review
568 pp, 582 illus (1972) \$11.75

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by D. H. Perkins, *University of Oxford, England*

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INTRODUCTION TO ATOMIC PHYSICS

by Harald A. Enge, *Massachusetts Institute of Technology*, M. Russell Wehr, *Drexel University*, and James A. Richards, *State University of New York at Delhi*

Also in the modern physics series, this one-semester, junior-level text develops a solid foundation in understanding modern physics, following the historical-chronological development of atomic physics to the more difficult areas of wave mechanics and atomic nuclear theory. A chapter on solid state physics and an extensive appendix on relativity are also included.

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1972, 2 volumes, approx 1800 pp., in prep.

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This high price presumably reflects the costs involved in setting and printing the journal articles instead of reproducing them. If the book is truly planned for students, why did Pergamon not issue a simultaneous soft-covered edition, as they did for the reprint volume *Men of Physics: L. D. Landau, Vol. I*, which sells for \$2.95?

It is interesting to compare *Helium 4* with the AIP Selected Reprints series, where the papers are reproduced photographically from the original journals. This procedure is much cheaper, and the AIP volume *Liquid Helium* (edited by Cecil Lane) costs only \$2.50. Furthermore, the two books contain many identical papers. Although the AIP book lacks much of the theoretical work, it does include the original notes by Fritz London and Laszlo Tisza along with four experimental papers from the 1960's. In view of the high price of *Helium 4*, a thrifty student would be better advised to order the Selected Reprint volume *Liquid Helium* (Department BN, American Institute of Physics) and supplement it with the above mentioned soft-covered edition of Landau's selected works, thereby saving \$4.05 and gaining six more of Landau's papers.

ALEXANDER L. FETTER
Stanford University

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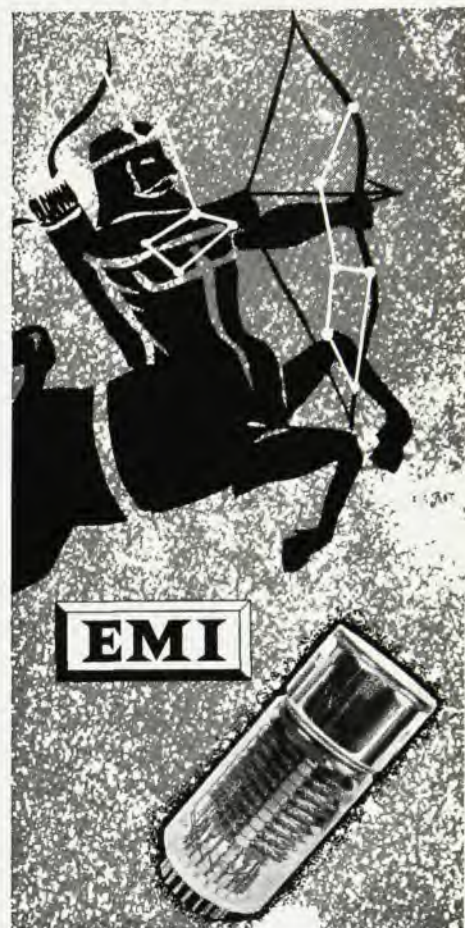
L. D. Rozenberg, ed.
429 pp. Plenum, New York, 1971. \$30.00

This book consists of six parts written by experts in different areas of high-intensity sound, nonlinear absorption of sound, acoustic radiation pressure, acoustic streaming and ultrasonic cavitation. This last topic accounts for a little more than one-half of the book.

The editor, the late Lazar Davidovich Rozenberg, an outstanding leader of Soviet ultrasonic research, worked for 15 years in the broad field of physical ultrasonics at the Acoustics Institute of the Academy of Sciences in Moscow. The material in the book is based, to a large extent, on the work by him and his many students and research associates at the Institute. He was Chairman of the Scientific Council on Ultrasonic Physics and Engineering of the Academy and was intimately involved in the coordination of research and industrial development projects in many organizations and institutes in the Soviet Union.

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