on radon and indoor air. Instead the book discusses a variety of topics related to radon in the environment, such as radon generated from mining and milling activities and from fossil fuel combustion, which are unrelated to the problem of radon and indoor air. Thus, although these are interesting matters, this book will be less useful than the other two books to anyone interested in the many scientific problems associated with indoor radon. It is this specific topic that is of considerable current research interest, because of its public health aspects. In the section on sources of radon in indoor air, this book, like *Indoor Radon*, does not include a significant discussion of the dominant source, pressure-driven flow from soil gas.

LYNN M. HUBBARD
Center for Energy and Environmental Studies
Princeton University

An Introduction to Liquid Helium

John Wilks and David S. Betts
Oxford U. P., New York, 1987. Second edition. 187 pp. $53.50 hc ISBN 0-19-851471-9

About 20 years ago, two major publications appeared that summarized to a large extent the then-current understanding of liquid helium. These works—*Helium-3 and Helium-4* by William Keller (Plenum, New York, 1969) and *The Properties of Liquid and Solid Helium* by John Wilks (Oxford U. P., New York, 1967)—provided the physics community with benchmark resources and, when taken together, covered the field with remarkable depth and clarity. The second edition of *An Introduction to Liquid Helium* by Wilks and David Betts represents a significant update of the 1970s abridged version of Wilks's major work. The book surveys many of the properties of He^3, He^4 and mixtures, and presents a number of the key theoretical concepts. As such, it provides a topical guide to many of the major subject areas in liquid helium physics. Students who wish to learn on their own might use the book as a guide to a number of the major works in the field, but it may be too concise and in places too sketchy to serve as a standalone text. It will be valuable as a companion volume for graduate students; it might also serve as recommended reading for a graduate course. Students interested in a more complete presentation might consider *Superfluidity and Superconductivity*

by David Tilley and John Tilley (Adam Hilger, Bristol, UK, 1986).

A reader familiar with the first edition will find many similarities in the second; several chapters are nearly identical to their originals in the first edition. The major strengths of the book continue to be excellent discussions of phonons, vorticity and dilute He^3 and He^4 solutions. The very good discussion of superfluid He^3 is entirely new and one of the best chapters in the book.

Superfluid He^3 is a complicated subject, but the authors provide a clear, if brief, picture of pairing and the quantum states. The discussion is most picturesque in its treatment of the vectors that are necessary to characterize the superfluid. In talking about the acoustical clapping and flapping modes, the authors actively engage the reader: "The reader may imagine his back to represent **l** [the orbital angular momentum] and his arms, held horizontally and mutually perpendicular, to represent the other two [components of the complex vector **d**] vectors. Then, 'clapping' corresponds to the arms oscillating in antiphase in the horizontal plane and 'flapping' to the arms oscillating in phase up and down." Delightful!

Chapters 12–14 constitute one of the best sections of the book: the discussion of rotation, vortices and critical velocities. Here the detail and motivation are at their best. The authors discuss the early experiments that insisted that flow in helium could not be everywhere irrotational and develop the notions of vortex lines and quantized circulation.

Wilks and Betts completed the manuscript in August of 1986—a bit too early to allow inclusion of the fascinating new quantum effect experiments of Eric Varoquaux and his colleagues at Université de Paris-Sud.

The book has considerable strengths. It also has several drawbacks. Missing almost entirely is any discussion of modern numerical calculations of the static properties of He^4, the emerging work in the area of polarized He^3, the substantial literature concerned with helium films or convective instability in He^3–He^4 mixtures. The last two topics in particular represent areas in which helium physics allows one to study more general phenomena. For example, helium films provided the laboratory setting in which many of the details of the Kosterlitz–Thouless theory of two-dimensional phase transitions were first documented and the theoretical ideas tested.

ROBERT B. HALLOCK
University of Massachusetts, Amherst

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