

Book Review: *Statistical Mechanics*

Statistical Mechanics. B. K. Agarwal and Melvin Eisner, John Wiley and Sons, 1988.

There are two reasons for writing a new book on an old subject: to make a fresh exposition of the material, or to include new developments and new applications. I do not see that this book does either.

The approach taken in presenting statistical mechanics is that of Gibbs. It is carefully reasoned and readable. It is still beautiful. It is not new. The topics chosen are the conventional ones. The most detailed and original parts of the book are the sections devoted to liquid helium and to semiconductor statistics. In a book of 251 pages, 20 are devoted to liquid helium and 22 to the equilibrium and nonequilibrium properties of semiconductors. These sections are rife with figures, experimental results, and references to the original literature. By contrast, the chapter on critical phenomena, claimed in the Preface to be a special effort, is not well done: there no figures, there are no experimental results, and there are no references whatsoever. The $2\frac{1}{2}$ pages devoted to the renormalization group theory will not serve to bring the reader into the fold. There is no discussion of the important modern developments in the general theory of liquids.

The scarcity of references in this book reduces its value greatly. There are very few references anywhere but in the sections on liquid helium and on semiconductors. There is a list at the end of the book of 23 books, 21 of which are general textbooks and 2 of which are on liquid helium. This list omits many valuable general texts (Pathria, McQuarrie, Reichl, Balescu) and gives no help for the reader wishing to pursue special topics other than helium. Even an introductory text should give the reader a source of important historical references and a route to modern developments. A strength of the book is the long set of problems at the end of almost every chapter.

The book, priced at \$29.95, is printed on poor-quality paper, through which the print shows from the back side, and is cheaply bound. It

contains a number of typos and grammatical errors. The index is not comprehensive.

This book will be of value to readers wishing a brief exposition of the statistical mechanics of liquid helium or of semiconductors.

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