Journal of Statistical Physics, Vol. 83, Nos. 3/4, 1996

Book Review: *A Survey of Thermodynamics*

A Survey of Thermodynamics. M. Bailyn, AIP Press, New York, 1994.

This is a fascinating book written by a knowledgeable author who is clearly in love with thermodynamics and its molecular underpinnings. The positive and negative aspects of the presentation are clearly delineated by this quote from the preface: "The plan was to write a book that might be useful as a textbook or a backup with enough detail to get into the nuts and bolts of contemporary exposition and with enough background to exhibit the ebb and flow of ideas—when they emerged and in what context—at least to some extent." The volume consists of three divisions called books: (I) *Origins*, which presents historical backgrounds and their consequences for modern developments; (II) *Equilibrium Thermodynamics*, which contains a nice exposition of the work of Gibbs on the general theory and the work of van der Waals and Landau on phase transitions; and (III) *Underpinnings*, which outlines the kinetic theory of Maxwell and Boltzmann, and the ensemble theory of Gibbs and its extension to quantum mechanics, and includes a chapter on the thermodynamics of special relativity.

The devotee of thermodynamics will enjoy reading the book from cover to cover, but will particularly savor the first division, with, among others, its sections on entropy and evolution and Maxwell's demon. The concept "turnaround" is introduced, in which early developments lead to generalizations or laws which in turn are used to recast and redefine the early results.

Unfortunately, it would be extremely difficult to use this volume as a textbook in a thermodynamics course. There is no clear division between books I and II and the student would have to switch back and forth between these books to obtain an adequate foundation. Although the general theoretical development is complete, there are very few applications and essentially no problems. This latter statement is true for book III as well.

0022-4715/96/0500-0791$09.50/0 © 1996 Plenum Publishing Corporation

I am sure the author enjoyed writing this book and can take satisfaction in the fact that his labors should be appreciated by the cognoscenti.

Irwin Oppenheim
Department of Chemistry
Massachusetts Institute of Technology
Cambridge, Massachusetts 02139