useful if answers were included. These, however, are almost negligible defects in an exceedingly well written and well printed book. All its readers will join with the reviewer in looking forward to the appearance of the second volume.

In Awbery's *Textbook of Heat* we likewise have a book written by an acknowledged authority. The author's standing as a physicist and his long connection with the National Physical Laboratory and other English scientific research organizations give this assurance. The book is also very readable and while it does not have the bulk of many similar treatises it is reasonably complete and few subjects which one would expect in a book of this character are untouched. However the balance of the different parts may not be what one usually finds, because, as the author remarks in the preface, he has not hesitated to "jettison traditional material" if he does not consider it of real importance.

The usual subjects of thermometry, calorimetry, heat transfer, change of state, and similar topics are treated with some emphasis, as might be expected, on the experimental side. The chapters on properties of gases, liquids, and solids seem particularly well done and the two on statistical mechanics and on the applications of thermodynamics to chemistry form a welcome and up to date, if all too brief, addition, by no means always present in even the most recent books of this character.

The reviewer has few criticisms. One might perhaps ask for a little fuller discussion of the laws of thermodynamics and also more kinetic theory. While much of the treatment is almost nonmathematical, the mathematics in a few cases slow down the reading more than would seem necessary. The treatment of conduction is a case in point. While the use of Fourier Series is all to be praised, one or two of the illustrative problems are unnecessarily complicated.

The book is well printed on light nonglossy paper and is adequately but by no means over illustrated with fifty line drawings. Its small bulk and weight are points in its favor in the eyes of one who, like the reviewer, likes to carry a book around with him.

In the introduction the author regrets that he has never been a teacher. This lack of pedagogical experience is by no means evident in the book, which commends itself to all who are looking for a text on heat to follow the general college physics course—assuming, of course, that the student has some knowledge of calculus, as would almost always be the case.

L. R. Ingersoll
*University of Wisconsin*

## Good Reference

THERMODYNAMICS. **By E. A. Guggenheim. 394 pp. Interscience Publishers, Inc., New York, 1949. $6.50.**

This is a very authoritative book, and although the emphasis is on applications, Guggenheim does not lose sight of the necessity for mathematical rigor. One may well use the book as a reference whenever at a loss to understand the thermodynamical principles. It is too advanced and sophisticated for use in an undergraduate course, but it would be excellent for instruction on a graduate level. Guggenheim covers in great detail all of the general aspects of thermodynamics, including systems of one and two components with and without chemical reactions, extremely dilute solutions, electrolytes, electrochemical systems, gravitational fields, magnetic and electrostatic systems, and radiation.

Guggenheim presupposes the knowledge of statistical mechanics. This is very refreshing as most thermodynamics books infer that statistical mechanics is a thing apart or does not exist. He states the third law as the ability to calculate absolute entropy by the use of statistical mechanical methods. His treatment of the absolute entropy of a substance containing a mixture of isotopes is somewhat involved but so is the phenomenon which he is trying to describe. His treatment of two component systems is detailed and excellent. The sections on solutions and electrolytes are particularly good, which is understandable since Guggenheim is recognized as the grand master in this field.

Unfortunately, there are very few references to modern literature, so that this treatise cannot be represented as complete or up to date. As a matter of fact, in many respects it is the same as his 1933 text, *Modern Thermodynamics by the Method of Williard Gibbs*. There are still many research aspects in thermodynamics, such as the development of an adequate equation of state for liquids and solutions, and no book in thermodynamics can treat these subjects in an altogether satisfactory fashion until the fundamental problems are clarified. Nevertheless, this reviewer is glad to have a copy of Guggenheim's new book and believes a great many physicists and chemists would feel the same.

Joseph O. Hirschfelder
*University of Wisconsin*

## Books Received

THE MATHEMATICAL THEORY OF COMMUNICATION. By Claude E. Shannon and Warren Weaver. 117 pp. University of Illinois Press, Urbana, Illinois, 1949. $2.50.

AN INTRODUCTION TO LUMINESCENCE OF SOLIDS. By H. W. Leverenz. 569 pp. John Wiley and Sons, Inc., New York, 1950. $12.00.

SOUND ABSORBING MATERIALS. By C. Zwikker and C. W. Kosten. 174 pp. Elsevier Publishing Company, Inc., New York, 1949. $3.00.

TRILINEAR CHART OF NUCLEAR SPECIES. By William H. Sullivan. John Wiley and Sons, Inc., New York, 1949. $2.50.

PROCEEDINGS OF THE AMERICAN PHILOSOPHICAL SOCIETY. Pages 521–548. American Philosophical Society, Philadelphia, Pennsylvania, 1949. $0.50.

L&N BIBLIOGRAPHY OF POLAROGRAPHIC LITERATURE. 103 pp. Leeds and Northrup Company, Philadelphia, Pennsylvania, 1949. Free copies on request.

SPECTROPHOTOMETRY. 48 pp. National Bureau of Standards Circular 484. Government Printing Office, Washington 25, D. C., 1949. $0.25.