governing the behavior of fluids, with proper emphasis on the more recent advances in the domain of so-called fluid mechanics. Scarcely any of these novel concepts are used or referred to in the book under review. In fact, after an introductory chapter which sets forth in a very clear, although somewhat elementary, manner the basis of old-fashioned hydraulic theory, the volume concentrates on a detailed treatment of certain engineering applications. There again the title *Applied hydraulics* appears to be broader than the actual contents of the volume. In fact, the selection of the subject matter is substantially limited to the requirements of the mechanical engineer specializing in water power. Open channel flow, weirs, and hydraulic structures are omitted. The emphasis is laid on pipe hydraulics, water hammer, and surge tanks, with a closing chapter on hydrometry. In his treatment of these subjects Prof. Dubs avoids general principles and follows mostly what may be termed a semiempirical course, gradually building up his presentation from the most elementary concepts. The author has succeeded well in his limited task. Also, the usefulness of the book is enhanced by the disclosure of valuable experimental data obtained in the Institute for Hydraulics and Hydraulic Machinery of the Zurich Polytechnicum, of which Prof. Dubs is director.

The eventual difference between the modes of apprenticing the engineer for professional work in different countries offers useful material for thought and comparison. Switzerland, with the preponderant role of water power, naturally requires much of its engineering talent to be specially trained for that field. The country, with its highly competitive position, may naturally prefer early and narrow specialization. By concentrating instruction on certain selected fields, a substantial level of professional competence may be reached at the school level, making the graduating engineer ready to perform responsible technical work of a kind which, in other countries, may require years of practical apprenticeship in industry or in the field.

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Heat. Archie G. Worthing and David Halliday. New York: John Wiley; London: Chapman & Hall, 1948. Pp. xii + 522. (Illustrated.) $6.00.

This book, as stated in the preface, is intended as a text for second-year work in physics and for an advance course for college seniors and early graduate students. Unless this reviewer has entirely forgotten his experience in a second-year course in physics, present-day juniors are much better prepared than they were a generation or more ago!

In the 522 pages of this book the authors have covered the field generally considered under "Heat." The subjects treated, with a chapter devoted to each are: Temperature, Thermal Expansion, Theory of Heat, Calorimetry, Specific Heats, Thermal Conduction, Thermal Properties of Gases, Elementary Thermodynamics, Change of Phase, Heat Engines and Refrigerators, Convection, and Radiant Energy. The first chapter is concerned with Laboratory Procedure and might well be a first chapter in any (or all) advanced books on physics. This chapter seems to show some of the experiences of the senior author with younger men in his earlier work in an industrial laboratory.

Each chapter is followed by a number of problems—over 200 in all—that well illustrate some of the principles discussed.

As a help to the student there are four appendices. The first gives a derivation of the Maxwell velocity distribution law for gases, the second consists of a number of tables of data, the third is made up of tables of both natural and common logarithms, and the fourth is a discussion of the properties of determinants.

The authors make their statements exact and precise in order to avoid, as far as possible, the loose usage sometimes found. Following this idea, they have employed, as far as possible, the standard nomenclature that has been adopted by the American Standards Association. In this they are careful to use terms and endings that distinguish between the properties of a body and of a material. However, when they think the gain in ease of understanding and freedom from confusion warrants, they do not hesitate to introduce new terms. An example of this is their use of the word "massing" for weighing for a determination of the mass of a body. Also, since the word pound is used in two senses, *i.e.* as a unit of mass and as a unit of force, they use the abbreviation pd for the mass and lb for the force.

A valuable feature of the book is the combination of theory, practical examples, and methods of measuring the various characteristics. There are many illustrations—about 250 in all—in this well-printed book which is remarkably free from errors.

This book promises to fill a need in the field of second-year physics.

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Chemical process principles. Pt. II: ***Thermodynamics***; Pt. III: ***Kinetics and catalysis.*** Olaf A. Hougen and Kenneth M. Watson. New York: John Wiley; London: Chapman & Hall, 1947. Pt. II: Pp. xv + 437–804 + xlviii. $5.00. Pt. III: Pp. xv + 805–1107 + xlviii. $4.50.

The problems of the chemical engineer fall broadly into three classes: first, developing the process; second, planning the equipment for carrying it out; and third, designing a coordinated plant. The two latter problems are essentially physical and mechanical, but the first involves a thorough understanding of chemical and, in particular, physicochemical principles. The purpose of the work under review is to give "an intensive quantitative training in the practical applications of the principles of physical chemistry to the solution of complicated industrial problems" and, through recent developments in thermodynamics and kinetics, to integrate these principles "into procedures for process design and analysis."

The first part of *Chemical process principles,* published in 1943, deals with material and energy balances; the second and third parts, recently issued, cover various