Kühlanlagen. H. DREES, VEB Fachbuchverlag, Leipzig, 1959, 6th Ed. 350 pp.; 225 figs., 31 tables, including thermodynamic properties of ammonia and the Freons and a Mollier i–x diagram.

THIS book is concerned with the design and operation of industrial cooling plant. The first two chapters provide an elementary treatment of the relevant parts of thermodynamics and heat-transfer theory. Chapter III describes the industrially important working fluids and the main elements of practical plant—compressors, condensers, evaporators, control valves, etc. Six further chapters describe plant suitable for air-conditioning, domestic refrigeration and food preservation, together with other aspects of the practical use of cooling equipment. There are numerous line diagrams and photographs.

The book is intended chiefly for engineers concerned with the operation and the detailed design of plant. Its theoretical content is too small to permit the quantitative prediction of refrigeration-plant performance, or the optimum selection of component types and sizes, but academically trained readers may find that the qualitative descriptions of actual plant and its practical problems provide a valuable supplement and corrective to their theoretical knowledge of heat transfer. The book has been carefully produced and is well printed.

D. B. SPALDING

Thermodynamik. H. D. BAEHR, Springer-Verlag, Berlin/Göttingen/Heidelberg, 1962, 431 pp.+xvi, DM 38.

IN ENGINEERING schools throughout the world an answer is sought to the question: How does one educate an engineer to be effective in a technical society that changes so rapidly the engineer soon finds himself dealing with theory and equipment developed after his graduation? In the foreword to his book *Thermodynamik*, Professor H. D. Baehr refers to this question. His answer for the field of thermodynamics is to stress the logical development o the science of thermodynamics largely divorced from application in the first three chapters, and then in subsequent chapters to apply these basic principles to engineering problems of today. This uncoupling of the logical development and the application represents in Professor Baehr's mind a departure from European practices and yields an approach similar to that now practised in English speaking lands.

The material presented and level of presentation are those employed in a two-semester undergraduate engineering thermodynamics course. The ten chapters are entitled: General Fundamentals; The First Law; The Second Law; Thermodynamic Properties of a Pure System; Processes of Open Systems; Cyclical Processes for Heat Power Machines; Thermodynamics of Refrigeration; Gas and Gas Vapor Mixtures; The Combustion Process; and Thermodynamic Magnitudes and Units.

The departures of this book from current German and American texts are perhaps better recognized if we mention some of the things which are not included in Professor Baehr's book. He does not make use of statistical mechanics in discussing the second law of thermodynamics, nor does he have other than a very brief discussion of viscosity, and almost no discussion of heat and mass transfer. The 320 odd figures in the text are used more for illustrating principles than for supplying the student with calculation procedures. There are ninety-two examples worked out in the text. These examples are not selected because of topical interest; there are few rocket and no re-entry examples. The chief purpose of the examples is to demonstrate the logical applications of thermodynamic principles to classical engineering problems.

A characteristic feature in the book is the skilful and thorough way in which the concept of availability has been introduced and applied in numerous examples, under the name of exergie. Professor Baehr, whose publications demonstrate his interest in this area, makes extensive use of his familiarity with the concept of availability throughout the latter three-fourths of the text.

The figures are beautifully executed. Those topics which are treated are covered thoroughly. There seems to be no question but that Professor Baehr accomplishes magnificently what he set out to do. In treating the topics that he does with patience and clarity, he necessarily must leave out a number of applications which frequently find themselves in European and American thermodynamic texts.

For example, the treatment of combustion processes in Professor Baehr's book consists of the following topics: (1) General conservation of mass (a) First law, (b) Second law (he does not consider the equilibrium constant); (2) Stoichiometry and gas analysis; (3) Heats of reaction and theoretical flame temperature (without dissociation); (4) Loss of availability in combustion; (5) Absolute entropy—the third law.

The chemical thermodynamics presented is far less comprehensive than in the usual American and German texts at the same level. The magnificent aids to combustion calculations found in books by E. Schmidt and F. Bošnjaković are not presented. It should be emphasized that where omissions occur, these are not oversights but carefully weighed omissions predicated by a desire to keep the material within the bounds of the two semesters.

In debating what to teach engineers in a rapidly changing technology we are aware that no magic formula guarantees the students will be forever able to cope with new developments as they emerge. If the subject is well taught and the interest of the student is awakened, there would seem a good possibility that the student has both the background and the motivation to keep abreast of these new developments. In teaching the carefully selected fundamental aspects of thermodynamics, their logical development and application, and in striving for clarity, Professor Baehr, in this reviewer's opinion, has given his students a good chance of remaining viable. It is not certain that this is the ideal answer to the thermodynamic education of an engineer in a changing world, but it is a clear answer and one deserving serious attention.

P. L. BLACKSHEAR