Book Reviews

Heat conduction: with engineering and geological applications. Leonard R. Ingersoll, Otto J. Zobel, and Alfred C. Ingersoll. New York-London: McGraw-Hill, 1948. Pp. xii + 278. $4.00.

This text, one of the International Series in Pure and Applied Physics published by McGraw-Hill, is much more than a careful revision of the older text by the two senior authors. The first book appeared 35 years ago and is a familiar classic in this field.

Something of the difference between this text and the older one is indicated by the titles. The earlier title is *Mathematical theory of heat conduction.* The new text retains much of the format of the other text, and in this sense it is a revision. Symbols, however, have been revised, and a table on nomenclature in the Introduction will be very useful to anyone consulting the book. The applications are thoroughly illustrated in the text. General and particular solutions are worked out, and lists of problems and an excellent bibliography give the interested individual a fine opportunity to interpret and solve his own needs.

As the authors point out, the use of Fourier series to attack the problems arising when heat flows is not original with them. It should be noted, however, that there are few sources in the literature where the details of this problem of flow are so clearly introduced. Indeed, the methods described and illustrated so carefully in this book can be applied in many problems arising in connection with the study of anything which flows under the influence of the gradient of some potential function such as temperature.

Thus, the beginner in theoretical physics could be appropriately introduced to a method of attack to many problems through the use of *Heat conduction* as a text. The engineer who needs a means of interpreting some of the myriad curves that he draws will find constructive ideas here. And the person who wants a neat solution of specific problems in heat exchange will find here a surprisingly large number of practical instances for so modest a text. Bibliography and appropriate mathematical tables found at the back of the book will also prove explicitly useful.

Reading the text left the writer with a feeling of need for an understanding of what happens at boundaries in heat flow problems, for this depends so intimately and often obscurely on radiation and convection exchanges there. In fact, boundary problems and phenomena which develop due to grain size and nonhomogeneity of media often make it hard to define exactly what flows. Then, too, the concept of heat involves temperature, and temperature is defined only under equilibrium conditions which, strictly speaking, do not exist when heat is conducted. Heat exchanges across boundaries where sharp discontinuities in temperature exist are very important in most practical problems. No one should feel, however, that all heat flow problems can be solved in any one book. The authors make no such pretense, but are very careful to state the conditions they are treating.

Additions appearing in this book have definitely improved its range of usefulness. The accuracy of treatment is unquestioned, and the authors are to be congratulated in bringing so important a classical tool of physics up to date so neatly.

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Applied physics: electronics, optics, metallurgy. (Science in World War II, OSRD.) C. G. Suits, George R. Harrison, and Louis Jordan. (Eds.) Boston: Atlantic-Little, Brown, 1948. Pp. xiii + 456. (Illustrated.) $6.00.

This book relates the work of three divisions of the National Defense Research Committee—namely, electronics (mostly countermeasures for radar), optics, and metallurgy—these being embodied in what, in the final organization, were Divisions 13, 15, 16, 17, and 18 of the National Defense Research Organization.

The question which arises in one's mind when he sees a book covering as large a field of activity as is encompassed by several divisions of NDRC is: "Just why was the book written, anyway?" A brief perusal of this book shows the purpose was not for entertainment, nor can it be considered that the book was written just to honor individuals and enable them to see their names in print. Undoubtedly, such a book has valuable historical aspects not only in recording the accomplishments of such a group but also in recording the failures so that those who might have to go through this the next time will profit. Unfortunately, many of the incidents related for this purpose are not of general interest and cannot appeal to a wide variety or a large number of readers.

No writer could take so many characters and so many events and weave them into a continuous thread of a story. This book recounts the exploits of hundreds of people working on scores of unconnected projects. Therefore, it is expected that the book itself is a disconnected story. This is very apparent in the section on Optics, but no matter how unsatisfactory the result, it is difficult for the reviewer to see how it could have been done differently. This limitation is not as real in the section on Countermeasures, but here it is clearly evident that the section was written by a number of individuals whose final efforts were not properly coordinated. It is disconcerting for a reader to go through the life and development of the countermeasure "Window" so many times. One does this first on page 24, where he learns, in particular, the story of the British machines for making this device. Further on (p. 43) he is told almost the same story again in almost the same words. Actually, "Win-

dow'' is mentioned 33 times in the index of the book, and it seems that almost 33 stories of it are given.

Another fault of the book is that too often a device is mentioned by name, and it is assumed that the reader has some idea of the usefulness and method of operation of the device. This assumption is proper if the audience is limited to those familiar with the field. Applied physicists and electrical engineers engaged in the use of ultrahigh frequencies recognize the terms ''magnetron,'' ''lighthouse tube,'' and so on. But it is doubtful if a worker in the field of optics knows what these devices are, and certainly the layman or casual reader is immediately beyond his depth.

Another unfortunate, but perhaps necessary, fault of the book is that so many names are given. Such detail is lost on any casual or even studious reader who has no personal ties to those named.

In spite of all this, one finds the volume interesting reading if he has some knowledge of the field or if he has sat on the sidelines while the work was being done. To those who expect to continue in any one of these lines of work or to be engaged in it in another war, sections of the book will prove to be valuable. Few will read it from beginning to end.

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Scientific Book Register

COLE, ROBERT H. *Underwater explosions.* Princeton, N. J.: Princeton Univ. Press, 1948. Pp. ix + 437. (Illustrated.) $7.50.

HILLE, EINAR. *Functional analysis and semi-groups.* (American Mathematical Society Colloquium Publications, Vol. XXXI.) New York: American Mathematical Society, 1948. Pp. xi + 528. $7.50.

JOHNSON, B. CONNOR. *Methods of vitamin determination.* Minneapolis: Burgess, 1948. Pp. iv + 109. (Illustrated.) $3.00.

PIRENNE, M. H. *Vision and the eye.* London: Pilot Press, 1948. Pp. xx + 187. (Illustrated.) 12/6.

PUBLIC HEALTH INSTITUTE. *How laymen cut medical costs.* Chicago: Lakeside Press, 1948. Pp. 35. (Illustrated.)

SMITH, KENNETH M. *Plant viruses.* (2nd ed.) London: Methuen, 1948. Pp. ix + 78. (Illustrated.) 6/–.

SMITH, KENNETH M. *A textbook of agricultural entomology.* (2nd ed.) New York: Macmillan; Cambridge, Engl.: at the Univ. Press, 1948. Pp. xiii + 289. (Illustrated.) $4.50.

STEVELS, J. M. *Progress in the theory of the physical properties of glass.* (Monographs on the Progress of Research in Holland.) New York-Amsterdam-London: Elsevier, 1948. Pp. xi + 104. $2.00.

TRAQUAIR, H. M. *Clinical ophthalmology: for general practitioners and students.* St. Louis, Mo.: C. V. Mosby, 1948. Pp. xii + 264. (Illustrated.) $9.00.

WEINBERGER, BERNHARD WOLF. *An introduction to the history of dentistry* (Vol. I.); *An introduction to the history of dentistry in America* (Vol. II.). St. Louis, Mo.: C. V. Mosby, 1948. Vol. I: Pp. xv + 514; Vol. II: xii + 408. (Illustrated.) $20.00.

WIENER, NORBERT. *Cybernetics: or control and communication in the animal and the machine.* New York: John Wiley; Paris: Hermann et Cie, 1948. Pp. 194. $3.00.

Just Received—

ANDERSON, W. A. D. (Ed.) *Pathology.* St. Louis, Mo.: C. V. Mosby, 1948. Pp. xii + 1453. (Illustrated.) $15.00.

BARNETT, LINCOLN. *The universe and Dr. Einstein.* New York: William Sloane, 1948. Pp. 127. (Illustrated.) $2.50.

BELLAK, LEOPOLD. *Dementia praecox, the past decade's work and present status: a review and evaluation.* New York: Grune & Stratton, 1948. Pp. xv + 456. $10.00.

BUCHSBAUM, RALPH. *Animals without backbones: an introduction to the invertebrates.* Chicago: Univ. Chicago Press; London: Cambridge Univ. Press, 1948. Pp. ix + 371. (Illustrated.) $6.50.

DAMMERMAN, K. W. *The fauna of Krakatau: 1883–1933.* (Kon. Ned. Akad. Wet., Verhandelingen (Tweede Sectie), Dl. XLIV.) Amsterdam: N. V. Noord-Hollandsche Uitgevers Maatschappij, 1948. Pp. xii + 594 + xi. (Illustrated.)

FLYNN, JOSEPH E. (Ed.) *Blood clotting and allied problems: transactions of the First Conference, February 16–17, 1948, New York.* New York: Josiah Macy, Jr. Foundation, 1948. Pp. 179. (Illustrated.) $3.25.

GOLDSTEIN, KURT. *Language and language disturbances: aphasic symptom complexes and their significance for medicine and theory of language.* New York: Grune & Stratton, 1948. Pp. xii + 374. $8.75.

HARMON, R. W., and POLLARD, C. B. *Bibliography of animal venoms.* Gainesville, Fla.: Univ. Florida Press, 1948. Pp. xxx + 340. $8.00.

HORDER, RT. HON. LORD. (Ed.) *The British encyclopaedia of medical practice including medicine, surgery, obstetrics, gynaecology and other special subjects.* (Medical Progress, 1948.) London: Butterworth, 1948. Pp. v + 511 + 28.

LI, CH'IAO-P'ING. *The chemical arts of old China.* Easton, Pa.: Journal of Chemical Education, 1948. Pp. viii + 215. (Illustrated.) $5.00.

TAYLOR, DENIS, and WESTCOTT, C. H. *Principles of radar.* Cambridge, Engl.: at the Univ. Press; New York: Macmillan, 1948. Pp. x + 141. (Illustrated.) $3.50.

THORNER, MELVIN W. *Psychiatry in general practice.* Philadelphia-London: W. B. Saunders, 1948. Pp. xi + 659. $8.00.

———. *Findings and recommendations of the pharmaceutical survey 1948.* Washington, D. C.: American Council on Education, 1948. Pp. xi + 49. (Illustrated). $1.00.