for accumulating information. The remaining chapters deal with special topics of fundamental or current interest. The book is up to date in the sense that it contains good accounts of a number of items which have been investigated in the recent past and prior to 1948. Topics of this type are as follows: Studies of thermoluminescence by the technique introduced by Wilkens and Randall which permits an approximate determination of the energy of trapped electrons; infrared sensitive materials; the work of Schulman on the coupled action of different additions in luminescent materials; the recent results of Leverenz, Fonda, and others on systems such as zinc oxide and the willemites; experiments in the changes in dielectric constant of luminescent materials during irradiation.

Garlick has decided to replace an author index with a tabulation of literature references and has provided only a very brief subject index. This policy detracts slightly from the value of the book since it is almost necessary to thumb through the text to find an account of the work of a given investigator. Fortunately the book is sufficiently small and sufficiently compartmentalized that this disadvantage is not as serious as it would be if the book covered a broader range.

The text was apparently written before the luminescent counter achieved its present prominence so that this aspect of the field is not touched upon at all. In fact, the chapter on organic materials does not even mention the properties of napthalene and related materials which are now so prominent. This is not a serious defect since, as stressed earlier, the book emphasizes fundamentals. On the other hand, much of the current information on the materials used in luminescent crystal counters could be fitted into the volume so easily as part of the fundamental lore that one might hope for a new edition which includes it in the very near future.

The reviewer believes that this book belongs on the shelves of any investigator who has a serious interest in luminescent crystals.

Frederick Seitz

University of Illinois

Sound Recording

ELEMENTS OF SOUND RECORDING. By John G. Frayne and Halley Wolfe. 686 pp. John Wiley and Sons, Inc., New York, 1949. $8.50.

This volume is a valuable contribution to the literature of a highly specialized subject, being the only book in the field that discusses all types of sound recording. It contains a wealth of information for the student and professional engineer alike.

Written in the authors' characteristically clear and lucid style and arranged in a logical and well integrated form, the book provides information which has hitherto been available only to those who have had access to an extensive reference library of professional journals. It is curious that, in a field as dependent upon technical knowledge as sound recording, one should find so very few books on the subject. This is probably because commercial and professional facilities for both disk and 35-mm motion picture film recording are concentrated in a few areas and are under the direction of highly skilled personnel. The appearance of this book is particularly opportune, coming as it does at a time when sound recording is expanding into other fields, as in the case of the 16-mm motion picture film producing industries.

The subject is introduced with a discussion of the nature of sound, followed by a description and discussion of electrical, mechanical, and acoustic circuits and electromechanical analogues.

Owing to the wide scope of the book, the space devoted to some subjects has necessarily been limited. This is true for example in the case of the chapters on audio amplifiers, which is shorter than the space alloted to network theory and circuit designs of attenuators, filters, and equalizers. These latter chapters contain much important reference material. The inclusion of numerical examples in these and other chapters to illustrate the use of design formulas is to be highly commended.

The basic problems of sound recording are treated fully in the chapters on photographic recording, which contain an abundance of information useful to the practical designer, operating engineer, or technician. Since the fundamental principles underlying all types of recording are the same, the treatment of disk recording and magnetic recording is limited to a description of methods and processes peculiar to them. The text throughout is supplemented by excellent diagrams and illustrations.

This reviewer unhesitatingly recommends the book to anyone who is seriously interested in sound recording processes.

O. Sandvik

Eastman Kodak Research Laboratories

Books Received

PROGRESS IN METAL PHYSICS, VOLUME I. Edited by Bruce Chalmers. 401 pp. Interscience Publishers, Inc., New York, 1949. $9.50.

NATURAL PHILOSOPHY OF CAUSE AND CHANCE. By Max Born. 216 pp. Oxford University Press, New York, 1949. $4.50.

REPORTS ON PROGRESS IN PHYSICS. 382 pp. The Physical Society, London, 1949. £2 2s. to non-fellows. 25s. to fellows.

PROCEEDINGS OF SYMPOSIA IN APPLIED MATHEMATICS. VOLUME I. NONLINEAR PROBLEMS IN MECHANICS OF CONTINUA. 219 pp. American Mathematical Society, New York, 1949. $5.25.

BASIC THEORIES OF PHYSICS. By Peter G. Bergmann. 280 pp. Prentice-Hall, Inc., New York, 1949. $5.00.

A TEXTBOOK ON HEAT. By J. H. Awbery. 302 pp. Longmans, Green and Company, Inc., New York, 1949. $3.00.

FUNDAMENTALS OF RADIO-VALVE TECHNIQUE. By J. Deketh. 535 pp. Philips Technical Library, Eindhoven, Netherlands, 1949. Elsevier Book Company, New York, 1949. $5.00.

ELECTRONICS IN ENGINEERING. By W. Ryland Hill. 274 pp. McGraw-Hill Book Company, New York, 1949. $3.50.

PHYSICAL METHODS OF ORGANIC CHEMISTRY. (Second Revised and Augmented Edition.) Edited by Arnold Weissberger. PART I. pp. 1–1072. PART II. pp. 1073–2059. Interscience Publishers, Inc., New York, 1949. PARTS I & II. $12.50 each.