discussed in detail; 9 pages are devoted to dielectrics and ferrites, 15 pages to basic refractories, and 16 to carbides, nitrides, and nonclay oxide refractories.

Following a brief introduction to crystal and glass structure, almost half the book is devoted to clay and silicate raw materials; the remainder is concerned with the manufacture and properties of products—brick, glazes, refractories, earthenware, stoneware, porcelain, and electrical insulators. The treatment is at an intermediate level; detailed elementary explanations of phenomena are not given, nor are quantitative analytical treatments presented. Extensive references to original literature, up to 1954 and 1955, are included. For the 13 pages on porcelains, 83 references are given; for the 120 pages on clays, 612 are cited.

One of the valuable features of prior editions was Salmang's tables of property data. These are extended and improved in the present book. Large foldout tables—"Properties of refractory materials," "Properties of high-duty refractory oxides," and "Properties of ceramic insulators"—updated and reorganized by G. Van Gijn, are the best available, and they will be considered the book's most valuable feature by many readers.

The quality of the book and of its half-tone reproductions is excellent.

W. D. KINGERY
Department of Metallurgy,
Massachusetts Institute of Technology

Circuit Design

Understanding Digital Computers. Paul Siegel. Wiley, New York, 1961. x + 403 pp. Illus. $8.50.

Siegel's book is for the reader who is interested in learning how a digital computer operates and how the logical circuitry of such a machine is designed. It is concerned with the internal operation of a computer. Except for a brief incidental description of an example of a program involving a loop, no attempt is made to describe methods of programing digital computers or the methods of solving scientific problems by means of such equipment. Thus, this book is not aimed at the person who wants to use digital computers in solving his computational problems. Rather, as stated by the author in the preface, it is written primarily for the technician who is thinking of entering the digital computer field. It can be read by anyone who has a basic understanding of electronics—a ham radio operator, for instance.

Emphasis is on principles, and the principles are illustrated by examples. The book is divided into three sections: Logic and arithmetic; Building blocks; and Functional units of a digital computer. These sections are preceded by an introduction that describes the general characteristics of a computer. The section on logic and arithmetic begins with a description of various number representations, including binary and decimal, describes in considerable detail the arithmetic processes involved, and concludes with a discussion of machine logic, including AND, OR, and NOT elements. In the section on building blocks, there is a description of the various types of components used to build up the logical blocks developed in the first section. Included are mechanical, electromechanical, vacuum-tube, electromagnetic, diode, and transistor components. Emphasis is on the logical functions performed, rather than on circuit principles. In the final section the logical and functional building blocks developed in the second section are combined into the five functional units of a digital computer: memory, input, output, arithmetic, and control. This section culminates in the description of a specimen digital computer which combines the functional units already described.

A unique feature of the book is the summary, provided at the end of each chapter, which includes the basic ideas and definitions of the chapter.

JOHN G. HERRIOT
Computation Center,
Stanford University

Pesticide Handbook

Pesticide Index. Compiled and edited by Donald E. H. Frear. College Science Publishers, State College, Pa., 1961. 193 pp.

Frear has prepared a list, cross-indexed and arranged in alphabetical order, of 3000 names (common, coined, and chemical names are included) which have been applied to chemical pesticides. Approximately 700 of the entries are considered main entries; these summarize properties, chemical structure, and uses of the compounds.

Air Force Research

Air Force Scientific Research Bibliography, 1950–1956. G. Vernon Hooker, Mabel H. Duffner, Aaron S. Dann, and Doris C. Yates. Science and Technology Division, Library of Congress, Washington, D.C. (order from Superintendent of Documents, GPO, Washington, D.C.). xx + 1147 pp. $6.75.

This one-volume index contains more than 4000 summaries of publications that resulted from research supported by the Air Force during the period from 1950 to 1956. Technical notes and reports, books, papers published in symposium proceedings, and articles published in journals are summarized. In addition to the alphabetical subject index, the entries are indexed by contractor, by author, and by AFORS control number. Current and original sources are indicated for the reports. Volume 2, scheduled for publication in 1962, will cover 1957 and 1958. When volumes covering research up to 1960 have been published, future bibliographies of research sponsored by the Air Force will be published by the Armed Services Technical Information Agency.

New Books

Biological and Medical Sciences

Advances in Ophthalmology. vol. 2. E. B. Streiff, Ed. Karger, Basel, Switzerland, 1961. 272 pp. Illus. $16.

Anatomy of the Monocotyledons. vol. 2, *Palmae.* P. B. Tomlinson. Oxford Univ. Press, New York, 1961. 466 pp. Illus. $10.10.

British Flies. pt. 3, *Empidinae and Hemerodrominae.* J. E. Collins. Cambridge Univ. Press, New York, 1961. pp. 556–782. Illus. $6.

The Cell. Biochemistry, physiology, morphology. vol. 3, *Meiosis and Mitosis.* Jean Brachet and Alfred E. Mirsky, Eds. Academic Press, New York, 1961. 453 pp. Illus. $12.

European Society of Haematology, Proceedings of the Seventh Congress. vol. 1, 172 pp., $8; vol. 2, pts. 1 and 2, 1332 pp., $58. E. Neumark, Ed. Karger, Basel, Switzerland, 1960.

Insect Sounds. P. T. Haskell. Quadrangle Books, Chicago, 1961. 197 pp. Illus. $5.75.

Instrumental Methods for the Analysis of Food Additives. William H. Butz and Henry J. Noebels, Eds. Interscience, New York, 1961. 296 pp. Illus. $11.

An Introduction to the Study of Protozoa. Doris L. Mackinnon and R. S. J. Hawes. Oxford Univ. Press, New York, 1961. 523 pp. Illus. $12.75.

The Origin of Medical Terms. Henry