ers, Zener diodes, silicon-controlled rectifiers and four-layer diodes, unijunction and field-effect transistors are discussed in a short and well established manner.

Chapter 6 is reserved for equivalent circuits, the interrelationship of transistor parameters and for the basic parameters occurring in actual circuit evaluations. The next chapter deals with dc operating conditions and transistor biasing. At this point actual circuits can be treated. He then analyzes low-level, low-frequency amplifiers, discusses gain control and feedback in the usual manner and states some facts on low-noise circuits. In the second part of this chapter some detailed circuits are given. Following the same lines the author discusses in chapter 9 problems of high-power audio amplifiers. The equivalent circuits of transistors are modified in chapter 10 for the high-frequency amplifier case. The author then deals with the single- and double-tuned high-frequency amplifier and briefly also with very-high-frequency and pulse amplifiers.

In chapter 11 standard sinewave and relaxation oscillators are considered. A very short chapter 12 describes some receiver circuits. Transistors as switches are the subject of the next section covering simple on-off switches, trigger circuits, counters and the basic logic elements. Problems of dc amplifiers, of power supplies and inverters are treated in the next two sections. Due to the clear descriptions and drawings a very good introduction into the field of integrated circuits follows. Most recent developments in the field of solid-state electronics, such as the MOS transistor, thin-film transistor, laser diode and semiconductor microphone are dealt with in the last chapter.

As a whole Hibberd's book will be a good introduction for technicians, explaining transistor techniques in a language a reader with almost no mathematical and physical background can understand. The chapters dealing with the general topics and the basic material are very well composed and written, thus suitable for the purpose intended. The chapters on some applications, such as oscillators, high-frequency and dc amplifiers and transistor switching are too short to serve as more than a review on how these problems are solved in principle. The technician working in an electronics laboratory will better understand what's behind transistors and transistor circuitry after having read Hibberd's book.

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More physics for engineers

MODERN PHYSICS FOR ENGINEERS. By Otto Oldenberg, Norman C. Rasmussen. 477 pp. McGraw-Hill, New York, 1966. $9.95

by Peter L. Balise

Because tomorrow's engineering utilizes today's physics and mathematics, engineering curricula place increasing emphasis on these disciplines. Engineering courses contain more physics and mathematics than they did just a few years ago, and there is more engineering interest in modern physics courses. The authors are well qualified to write an appropriate text; Otto Oldenberg is associated with the Air Force Cambridge Research Laboratories and is an emeritus professor of physics at Harvard, while Norman Rasmussen is a professor of nuclear engineering at MIT.

The book can be succinctly described as an adaptation of *Introduction to Atomic and Nuclear Physics,* by the senior author. The first chapter is a brief and lucid introduction to the Lorentz transformation. Otherwise, the first half of the text consists of the first five parts of the older book without substantial change except for the omission of physical-chemistry material and the addition of modern topics such as three pages on the maser and laser (too brief for this engineer's taste).

The chapter on the solid state has been rewritten to give much more related to semiconductors, as well as notes on other topics of potential engineering importance, such as superconductivity. The last part, on nuclear physics, has been greatly expanded and rewritten. The treatment of radioactive decay and nuclear reactions seems a good summary, but there is less attention than might be desired to topics that are presently more esoteric than practical, such as antimatter. Interaction of radiation with matter is well covered. There are also reviews of nuclear power and radioisotope applications.

As in the earlier book, the writing is marked by descriptive clarity, with mathematical arguments generally relegated to carefully composed problems (with answers). Where applicable, the problems are those of the earlier text. The book very well fulfills its title.

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The reviewer is a professor of mechanical engineering at the University of Washington, in Seattle.

Not too advanced

INTRODUCTION TO MATRICES AND LINEAR TRANSFORMATIONS. (Second ed.) By Daniel T. Finkbeiner II. 297 pp. Freeman, San Francisco, 1966. $7.75

by Dagmar Henney

The second edition of Daniel Finkbeiner's book presents a lucid introduction to matrix theory, linear transformations and the theory of linear algebra. The author presents ideas in linear algebra effectively with the help of matrices. The first half of the book discusses abstract algebraic systems, vector spaces, linear operators, matrices and determinants. An early introduction of the dual space provides an effective means for investigating the transpose and adjoint of a linear operator and for describing primal and dual problems of linear programing. The second part contains a treatment of metric concepts, which includes Hermitian functions and normal transformations. Another chapter covers combinatorial equivalence to a deeper extent than in the first edition.

Though this particular book is not written on the same advanced level as, for example, Greub's *Linear Algebra* or Nering's *Linear Algebra and Matrix Theory,* the reviewer recommends it as a text for the undergraduate or beginning graduate student.

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The reviewer is associate professor of mathematics at George Washington University.