(who might have some difficulty recognizing his child) of the nondirective therapy which is the accent of the moment in a good many of our university departments of clinical psychology.

KEITH SWARD

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***The physical principles of wave guide transmission and antenna systems.*** W. H. Watson. Oxford, Engl.: Clarendon Press, 1947. Pp. xiii + 208. (Illustrated.) $7.00.

This book is an advanced text intended for the research engineer or physicist who is specializing in the subject of microwaves. A very good background in mathematics is necessary in order to understand the book fully. However, the author has included much information which is the result of practical experience in the field.

In the early chapters the author reviews the basic equations of plane wave, slab line, and rectangular wave guide transmission. Matrices are used extensively throughout the book in an effort to simplify the mathematics.

In Chapter III there is a practical discussion of microwave measurements.

Babinet's principle is used as a basis for computing the effect of obstructed propagation in wave guides. Gratings, irises, slots, and other discontinuities which are found in wave guide work are all treated in considerable detail. The author has devoted much space to an excellent treatment, both theoretical and practical, of various types of slots in wave guides, guide coupling by slots, and wave guide arrays. Wave guide slot arrays were a wartime development of McGill University, where the author was working. Cavities, phase changers, magic-tees, and some more of the later developments in microwave work are touched upon.

The book makes a real contribution to the microwave field in that it will do much to bring the research worker up to date in several phases of microwave techniques.

LA VERGNE E. WILLIAMS

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***Basic botany.*** Fred W. Emerson. Philadelphia-Toronto: Blakiston, 1947. Pp. xi + 372. (Illustrated.) $4.00.

This is a refreshing new textbook of elementary botany which continues the recent trend away from the ponderous and sometimes pedestrian tomes characteristic of so many books for students. The departure from the conventional starts with the cover, which is a landscape scene in color from New Mexico or vicinity. The arrangement and treatment of the subject matter, while not so startling, is sufficiently different to be challenging to those familiar with the more orthodox texts. The author's style is fresh and unstilted, the illustrations adequate and often admirable, and the scope the usual one of morphology, physiology with chapters devoted to genetics and evolution, plus excellent sections on plant classification, ecology, and conservation.

Criticism of the text can be made on two minor points. The author plainly considers evolution to be a law, as it is, but persists in calling it a theory. The other criticism is directed at the drawings of mitosis, in which there appears a spindle figure in prophase, an error perpetuated in most botany texts, diagrams, and charts. In the excellent text description of the process, however, no mention is made of the appearance of a spindle before the disappearance of the nuclear membrane. In the preface, the author states as his conviction that both students and teachers learn, study, and investigate under the drive of significance, and that freshness and spontaneity should characterize the atmosphere of classroom and laboratory. It is good to hear of a botanist who believes in his subject, and one finds in this book none of those desperate attempts to justify the business usually entitled 'why study botany.' Those who confuse measured monotony with scholarship will probably not like this book.

EARL H. NEWCOMER

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***Physical chemistry.*** E. D. Eastman and G. K. Rollefson. New York-London: McGraw-Hill, 1947. Pp. viii + 504. $4.50.

This text is "designed to meet the requirements of the year course in physical chemistry usually presented to third- or fourth-year college students and to serve as a reference book in later work." The authors have written for mature students and have, I think, achieved their purpose admirably.

Three introductory chapters explain the objectives and methods of physical chemistry and define such terms as *system*, *conditions*, *potentials*, *components*, *changes in state*, etc. This should give the student a perspective that often comes only after the course is nearly over; as a preview, these chapters evince a keen pedagogical insight. The range of topics in the remaining 23 chapters is fairly conventional, but the rigorous treatment and fine writing give them an unusual vitality. For example, Chapter IX, "Energy and Heat Capacity of Gases and Crystals," is a well-integrated account of classical and modern views ranging from the work of Clément and Desormes in 1819 to Raman's contributions in 1941. In Chapters VIII, X, and XII are presented the current ideas on the structure of solids and liquids; although these 68 pages are mostly descriptive, they have a high intellectual specific heat. The important chapters on thermodynamics, equilibrium, and kinetics are remarkably free of that most common fault of elementary texts—the failure to distinguish between exact and approximate relationships. An example of this kind of error occurs in applying the First Law to processes taking place under constant pressure or constant volume. The authors distinguish the energy changes by the use of subscripts in the terms $\Delta E_p$ and $\Delta E_v$, but this distinction is subsequently ignored in the statement (p. 45) that the difference between the heats of reaction at constant pressure and at constant volume is always calculable from the equation: $\Delta H_p = \Delta E_p + P\Delta V$. Although $\left(\frac{\partial E}{\partial P}\right)_T$ is relatively small, thermochemists do measure it, and it is unfortunate that nearly every popular text treats this fundamental subject incorrectly. A similar oversimplification occurs in Chapter XXI, where the equilibrium constant for the reduction of ferric iron by iodide is calculated from electromotive force data. It should be emphasized that, in actual systems encountered by the student, the presence of phosphates or fluorides can result in the quantitative reversal of the equilibrium predicted. Later in the same chapter, a beautiful graphical picture of the effect of ionic strength on a similar equilibrium of ferric-ferrous iron should make the alert student ask questions about the former.