SCIENTIFIC BOOKS

ELECTRIC WAVES

Fundamentals of Electric Waves. By HUGH HILDRETH SKILLING. 186 pages, 65 illustrations. John Wiley and Sons, Inc. $2.75.

THE ever-increasing importance of ultra-high frequency in modern communication practice acutely emphasizes the need for an approach to the electromagnetic problems involved other than that of the conventional circuit theory, so familiar to engineers. Instead, for most problems it is essential to adopt the point of view of the electromagnetic field. Since the latter approach is not so familiar to engineering students, Professor Skilling's book performs a very useful function and fills a long-felt need. The particular advantage of this book is the fact that it has been designed with the practical applications in view. Thus while the material is reasonably complete the discussion in general is as brief as is consistent with clarity. The book is, however, to be regarded only as an introduction, providing the reader with a sufficient knowledge of the subject to cope with the more involved treatises in which special problems are treated in greater detail.

The scope of this book can best be appreciated from a brief discussion of the contents. The first half of the book is concerned with the general nature of electric and magnetic fields, the study of the static fields being basic to this development. The experimental basis of the laws of electricity and magnetism are put in evidence so that the reader at once recognizes the fundamental definitions and relations on which the theory rests. At the same time an attempt is made to render familiar, by means of schematic models, the essential mathematical constructs (vector operators). The latter half of the book is devoted to a discussion of the Maxwell equations and the propagation of electromagnetic waves. The applications (antennas and wave guides) are confined to the last two chapters.

The author is to be commended for the illustrations, which are well chosen. The collection of tables on the inside covers of the book (conversion factors for the various systems of units, formulas and the fundamental field equations) should be very useful. In addition the illustrative problems given at the end of each chapter and the examples interspersed in the text serve to provide practice in the application of the principles discussed.

While an admirable attempt is made to stress the physical meaning of the various concepts introduced it seems regrettable that this is often done at the expense of rigor. For example, the integral solution of the Poisson equation in electrostatics is presented as a self-evident generalization of the field of discrete point charges. This lack of rigor in itself would not constitute a serious objection, in so far as it does not directly interfere with what may be considered the primary purpose of the book; *viz.*, to provide the reader with a working knowledge of the field theory of electromagnetic waves. However, it seems worthy of note inasmuch as a claim of rigor is made.

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ORGANIC CHEMISTRY

Modern Theories of Organic Chemistry. By H. B. WATSON. Second edition. Pp. vii + 267. Oxford: Clarendon Press. April, 1941. $5.00.

THE first edition of this excellent treatise appeared in November, 1937, and was reprinted in 1940. That edition has now been thoroughly revised, various alterations and rearrangements have been made in the interest of clarity and serviceability, and the treatment of some topics has been considerably expanded, while the general purpose, plan and scope of the book remain much the same, the main theme being the application of the electronic theory to the reactions of organic compounds.

The subject-matter is presented under the following chapter headings: I. Theories of Chemical Combination; II. Applications of the Electronic Theory in Organic Chemistry. Strengths of Acids and Bases. The Inductive Effect; III. Applications of the Electronic Theory in Organic Chemistry. Substitution in Aromatic Compounds; IV. The New Physical Methods of Investigation; V. Kinetic Methods; VI. Applications of the Electronic Theory in Organic Chemistry. General Discussion; VII. Free Radicals; VIII. Compounds of Divalent Carbon and Allied Problems; IX. Esterification and Hydrolysis; X. Aliphatic Substitution; XI. Addition to Unsaturated Compounds; XII. Tautomeric Change; XIII. Migrations from Side-chain to Nucleus and Other Rearrangements; XIV. A Review of Some Stereochemical Problems; XV. Applications of Kinetic Methods to Stereochemical Problems; XVI. Stereochemistry of Elements Other Than Carbon.

As explained by the author in the first edition, his object has been to give a bird's-eye view over the field rather than minute details of more limited areas. Hence it is not, nor pretends to be, encyclopedic in character, but is a clear and compact presentation of those topics with which it deals, and as such is cordially recommended to all interested in organic chemistry. Paper, binding and press work are excellent.

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