Book Reviews

Theory and applications of electricity and magnetism. Charles A. Culver. New York-London: McGraw-Hill, 1947. Pp. xii + 594. (Illustrated.) $5.00.

Prof. Culver's book, *Theory and applications of electricity and magnetism,* is a fine book for those who have just completed a first-year course in physics and are yet unprepared to plunge into a course in electricity and magnetism which would prepare them to cope with advanced electricity and magnetism courses such as those based on the material covered in Jean's *Electricity and magnetism,* Smythe's *Static and dynamic electricity,* or similar highly specialized courses in this field. Prof. Culver's book, in its attempt to be comprehensible to the undergraduate, who has had only the first year of physics, avoids the discussion of such basic topics as the solution of the Laplace Equation, the use of images, conformal transformations, and similar topics which must be presented to the senior student if he is to cope with the more advanced courses given in our first-rate universities.

The topics that are presented in this text are treated lucidly. Great care is taken to teach the student the use of proper units, and many examples are solved to illustrate methods of solution. The discussions of various measuring instruments are very effectively supplemented by diagrams and photographs, thus making the study of such instruments relatively easy. It is only in the case where a correct explanation of a concept, as, for example, polarization, leads to material for which the student is unprepared that Prof. Culver has to compromise and leave the reader aware that the explanation is neither rigorous nor convincing.

Few instructors who take their lectures seriously find the available textbooks to their liking. Almost everyone feels that he can write a better book or at least organize the material in a sequence that appears to him to be more logical, easier to present, or more convincing to the student. This is particularly so in the case of intermediate courses such as are usually offered in our larger universities to the senior physicists and engineers or to the first-year graduate students.

The difficulty of writing an intermediate textbook on electricity and magnetism, or mechanics, or heat, or atomic physics that would be universally acceptable is rooted in the fact that learning, itself, is a successive approximation process wherein each step is dissatisfying because it is only one of several steps that have to be taken before a satisfying understanding of the subject can be obtained. For this reason it becomes a matter of personal taste to a large extent as to how far one should carry a given topic before other topics are introduced. A clear example of this difficulty arises when one has to decide how much mathematics one should assume to be known. Electricity and magnetism, mechanics, vector analysis, and differential equations are all so closely tied in together that to single one out to be taught ahead of the others is almost entirely an arbitrary procedure. A physics student does not really obtain a satisfactory comprehension of vector analysis and differential equations unless illustrative problems in physics are used. The illustrative problems will make little sense unless he already knows the subject matter from which these are drawn. On the other hand, a good course in mechanics or electricity and magnetism cannot be given without vector analysis and differential equations.

Prof. Culver avoids this difficulty by limiting his subject matter to the level of advanced sophomore or junior year. It falls short as a text for advanced undergraduates.

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Organic analytical reagents. (Vol. III.) Frank J. Welcher. New York: D. Van Nostrand, 1947. Pp. xi + 593. $8.00.

This third volume, like its predecessors, contains pertinent data on a large number of organic analytical reagents. The treatment is the same as in Volumes I and II (reviewed in this journal, July 18, 1947, p. 72; January 16, p. 74).

There are three parts in Volume III. The first deals with Heterocyclic Nitrogen Compounds, which includes chapters on, "Pyridine and Its Derivatives" (48 pp.), "Quinoline and Quinoline Derivatives" (15 pp.), "Dipyridyl and Related Compounds" (41 pp.), "Pyrazolone Derivatives" (12 pp.), and "Miscellaneous Heterocyclic Compounds" (37 pp.). Part II deals with the Oximes and presents chapters on "The Dioximes" (80 pp.), "Acyloin Oximes" (15 pp.), "Hydroxyoximes" (20 pp.), "Monoximes of Diketones" (5 pp.), "Isonitroso Compounds" (13 pp.), "Nitrosophenols" (49 pp.), "Miscellaneous Oximes" (16 pp.), "Cupferron and Neocupferron" (49 pp.), and "Nitroso Amines" (8 pp.). Part III, on Acidic Imino Compounds, contains chapters on "Rhodanine and Its Derivatives" (15 pp.), "Carbazides, Thiocarbazides, and Semicarbazides" (24 pp.), "Carbazones" (9 pp.), "Thiocarbazones" (90 pp.), and "Miscellaneous Imino Compounds" (25 pp.). The volume concludes with an index of names and synonyms of the organic reagents treated in the text, and one on their uses, listed in alphabetical order under the element or radical for which they are employed in analytical procedures.

Volume III, together with the others in the series, will make a ready reference set for all who have occasion to make chemical analyses.

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