with the planned appearance of a companion volume by the same author which will treat nucleic acid function and related topics. There is every reason to assume that the second volume will be of the same high caliber as the first. The combination of the two volumes should serve admirably in any general course on the biochemistry of the nucleic acids.

Many a lecturer, however, will find this first volume to be sufficient for his purposes, providing a foundation upon which to build structures of his own choice. The book is an excellent, ready source of up-to-date basic information of nucleic acid chemistry and metabolism. As befits the title of the book, the material is given in semi-outline form. The presentation is concise and surprisingly complete, yet it is unusually lucid. The discussion of experimental methods is brief or lacking, but references to the original literature are numerous. Factual material is emphasized, but present areas of uncertainty are clearly indicated and the opinions and the philosophy of the author are refreshingly apparent.

The major defect of the book, considering it as an attempt to provide a broad, minimal background of the chemistry and metabolism of the nucleic acids, is the absence of information on the chemical synthesis of mono and oligonucleotides and on the physical properties of the polynucleotides, natural and synthetic. This deficiency is recognized by the author, and, it is to be hoped, may be removed in a future edition.

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Substitution at Elements Other Than Carbon

C. K. Ingold, University College, London. The Weizmann Science Press of Israel, Jerusalem, 1959. 52 pp. 6 figs. 5 tables. 15 × 22 cm. $1.75. (Distributed by the Weizmann Institute of Science, Rehovot)

This book contains two chapters which summarize 4 lectures delivered by C. K. Ingold on the occasion of the 5th Weizmann Memorial Lecture Series, May, 1958. The first is entitled "Nucleophilic Substitution at Octahedral Metal Atoms, in Particular Cobalt" and the second "Electrophilic Substitution at Nitrogen and Oxygen."

The discussion in Chapter I is based on the premise that the more complicated mechanisms of substitution of ligands of complex ions are best understood when compared with the simpler nucleophilic substitutions at carbon. The lecturer developed an interpretation based on available rate and stereo chemical data which he characterizes thus: "I do not dare to hope that the interpretations I have suggested are correct in their entirety. But I do believe them sufficiently to think they are more likely to be modified than scrapped."

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In Chapter II the lecturer dealt with nitration and nitrosation in his usual thorough manner. First he indicated the possible species that could be the reagent and showed the kinetic form that the rate equation should have for each. Comparison of the experimental results with the kinetic forms expected gave strong indications as to the nature of the reactive species under different conditions. This chapter gives a convenient summary of the mechanism of nitration and nitrosation.

This short book is worthy of inclusion in a chemists' personal library.

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Radioisotope Techniques

Ralph T. Overman, Oak Ridge Institute of Nuclear Studies, and *Herbert M. Clark,* Rensselaer Polytechnic Institute, Troy, New York. McGraw-Hill Book Company, Inc., 1960. xiv + 476 pp. Figs. and tables. 16 × 23.5 cm. $10.

This book is the outgrowth of courses given over the past years at ORINS and Rensselaer Polytechnic Institute, places where instruction in the use of radioisotopes is more varied and where facilities are somewhat more extensive than at most colleges and universities.

The first chapter treats in 24 pages "Nuclear Radiations and Their Interactions with Matter," topics which occupy at least a third of a one-semester course given by the reviewer. The second chapter encompasses discussion, with illustrations, of the common detectors of individual events as well as the associated instrumentation such as discriminators and differential pulse height analyzers. No discussion of electronic circuitry is included. The same chapter very briefly mentions chemical and photographic dosimeters. At the end of this and of each subsequent chapter, several experiments are described incorporating and supplementing the textual material of that chapter.

Chapter 3, on errors in radioactivity measurements, is a mature general errors treatment from which the authors lead to the application of radioactive disintegration. Chapter 4 deals with practice of radiological safety. The next three chapters deal, respectively, with techniques of preparation of radioactive sources, laboratory characterization of radiation, and standardization of radioactive sources and calibration of detectors. Rather late in the reviewer's opinion comes the treatment of radioactive decay and growth kinetics in Chapter 8. This is the first text to present the counting procedure for determination of relatively short half lives of about one minute.

Chapter 9, on radiochemical separation methods, seems to be in exile, quite removed from the earlier chapters on techniques of handling of radioisotopes.

(*Continued on page A438*)