heterocyclic compounds (pyrroles, porphyrins, pyridines, imidazoles, triazoles, tetrazoles, and so on) and polyfunctional and multifunctional compounds (amino acids, nitro alcohols, various natural products, nitrogenous dyes, and many physiologically important nitrogen compounds) are excluded. Virtually all synthetic procedures have been omitted, as have important methods for the detection and quantitative estimation of organic nitrogen compounds. No reference is made to the applications of compounds containing nitrogenous functional groups in the field of analytical chemistry, nor is there any discussion of the relationship between physical properties (as ultraviolet, visible, infrared, and nuclear-magnetic spectra) and the structure of the nitrogen-containing compounds. Relationships between structure and physiological properties, so important in many fields (as antibiotics, hormones, and enzymes), are excluded. Franklin's American Chemical Society monograph, devoted to the ammonia or nitrogen system of compounds and recognized as one of the most refreshing contributions in this field, is cited only cursorily, as in connection with the structure of hydrazoic acid.

Many of the formal correlations appear to be remotely related to laboratory procedures. This is illustrated by the statement that ammonia will "burn readily to form nitrogen and water." The implication is that ammonia will burn in air, but this is not the case unless it is dissociated (as by heat and catalysts).

Who will find these volumes useful? The better students in the first-year course in organic chemistry would gain a clear concept of functional groups as well as additional information about the properties of nitrogen compounds by perusal of this material. More advanced students of organic chemistry and those seeking an introduction to the chemistry of organic compounds with open-chain, nitrogenous groups would also profit from a study of these volumes. In view of the omissions cited above, however, students of organic nitrogen compounds may not rely on these volumes as a sole source of information or as a key to the literature.

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EPR: A Nonmathematical Approach

The purpose of **An Introduction to Electron Paramagnetic Resonance** (Benjamin, New York, 1966. 286 pp., illus. $13.75) is, in the words of the authors, Malcolm Bersohn and James C. Baird, to "present the fundamentals of electron paramagnetic resonance (EPR) in a form suitable for chemists and biochemists who have no previous knowledge of the subject." To this end, most of the important concepts are explained in simple, nonmathematical language, with extensive use of analogies. Most of the book should be readily comprehensible to anyone who has had an undergraduate course in physical chemistry. Indeed, many with a more extensive background will find some illuminating insights.

There is, however, much to object to in the content of the book. Perhaps most important is that the nonmathematical approach simply does not permit sufficient development to give an understanding of much of the current research in the field. Many serious omissions are readily apparent. No mention whatever is made of the very useful Bloch equations; only four pages of very general discussion are devoted to EPR of metal complexes, and no examples are discussed.

Five appendices of variable usefulness are included. Appendix A, entitled "Why EPR instruments give derivatives of absorption lines," apparently takes the place of the chapter on instrumentation which might have been expected in a book such as this. Appendix E, which gives hyperfine splittings of some organic radicals in solution, is a generally useful addition to the book, although many of the examples are somewhat redundant, a number of interesting radicals are notable by their absence, and there are some cases in which credit is not given to the first investigator.

The literature references are generally incomplete or poorly chosen. For example, at the end of the chapter on relaxation phenomena, Abragam's excellent, but mathematically very sophisticated book is cited, while the more useful book by Pople, Schneider, and Bernstein is ignored.

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Rhenium and Technetium

A book on rhenium and technetium was published (in French) 9 years ago. From 1958 to 1964 there was an eightfold increase in the number of citations of these two elements in *Chemical Abstracts*. This rate of growth suggests that future books on these elements will of necessity be limited to certain fields of study or the texts considerably enlarged. In **The Chemistry of Rhenium and Technetium** [Interscience (Wiley), New York, 1965. 195 pp., illus. $8.50], R. Colton has pretty well covered the literature through 1963, but the coverage of 1964 is incomplete and only a few references for 1965, to work done by the author, are included.

Two chapters deal with the isolation of the elements and analytical procedures. The next four cover the oxides and sulfides, halides and oxyhalides, complex halides, and other complex compounds. Interest in these compounds has been stimulated recently by the discovery and theoretical investigation of the polymeric nature of some of the complexes which exhibit strong metal-metal bonding. New preparative techniques and more careful study of older preparations have yielded many new compounds. The author points out that no fewer than ten simple binary halides of rhenium have been prepared for the first time in the last 5 years.

The material presented on organometallic compounds and cyanide complexes demonstrates the use of the modern inorganic chemistry techniques of x-ray diffraction, infrared spectral analysis, magnetic susceptibility, and nuclear magnetic resonance measurements in order to characterize and determine the structure of compounds. The chapter on polarographic reduction and the rhenide state gives a good review of the experimental data on the "rhenide ion."

A reader familiar with a particular field in the chemistry of these elements may sometimes find the author's coverage a cursory one. This is not surprising in a book of this size and merely emphasizes the need to consult the original literature when more than a brief review is desired. The value of the book to the more-than-casual reader is that it aids in the literature search.

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