Introduction to Advanced Inorganic Chemistry. By P. J. DURRANT and B. DURRANT. John Wiley and Sons, Inc., 440 Park Avenue South, New York, N. Y., 1962. xv + 1171 pp. Price, $15.50

The impression gained by the reviewer on first examination of this book was favorable since the book includes discussions of many topics of current interest to inorganic chemists as well as to chemists generally. It is, indeed, unfortunate that this favorable impression does not hold up in the light of careful examination of the book. This work is replete with errors, half-truths, ambiguities, and undesirable omissions. The reviewer became convinced of this upon reading the part of the book most closely allied to his field of interest, *viz.*, the section on the chemistry of the nitrogen family of elements. Not being willing, however, to base such an adverse review on his own reactions, the reviewer has consulted several other inorganic chemists at major research institutions in this country and abroad and found a uniformly adverse reaction and a unanimous agreement that this is not a dependable presentation of modern inorganic chemistry. It is customary to conclude an unfavorable review with the statement that "nevertheless, this book will be a valuable addition to the chemist's professional library." The reviewer cannot say this in this instance, for it is his belief that it would be undesirable for a chemistry student, teacher, or research worker to use this volume as a guide or as a basis for his work.

DEPARTMENT OF CHEMISTRY HARRY H. SISLER
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Inorganic Reactions and Structure. Revised Edition. By EDWIN S. GOULD. Holt, Rinehart and Winston, 383 Madison Avenue, New York 17, N. Y., 1962. xiv + 513 pp. 16.5 × 23.5 cm. Price, $8.50.

Reference is made to reviews of the First Edition (*Chem. Eng. News*, March 5, 1956, p. 1141, and *J. A. Chem. Soc.*, **77**, 5772 (1955)) without recommending the accompanying educational philosophies. With deserved praise the first listed review put the case fairly for the book and for the revision. The second was an accurate and detailed appraisal, though unnecessarily critical.

Most of the revision has been accomplished by inserting new information and viewpoint into the text at appropriate places. Examples of changes: carbon is used as the atomic weight standard; in Chapter 9 on bond properties a rewrite of the electronegativity abandoned the principle of electroneutrality and the discussion of the van der Waals radius was improved; material on carbonyls and other complex compounds has been modernized factually and expounded theoretically in terms of ligand field theory. Throughout, the examples of compounds and reactions have been chosen with skill to be representative. The questions have been rearranged to an order of increasing difficulty and there are a few new ones. The best part of the revision is Chapter 23, a section on inorganic reaction mechanisms, excellently done.

The book is not perfect. Some might select different examples and reactions, object to such items as neglect of the polymerization of water, or use of the Bohr atom, even though only as a straw dummy. Others may join the reviewer to deplore development of covalent bonding through use of watered-down quantum chemistry, which confuses rather than illumines and encourages in students a glib loquacity about matters they really do not understand.

There escaped the proof-reader a few imperfections of text, p. 154, and lapses from good usage, the latter mostly generated by need to summarize. On the whole, however, the text is rather free from errors of this or other kind. Notably, it is written in a lively style with an absence of pedantry and monotonous repetition.

The book is to be recommended as a text for students admitted to college with advanced standing in chemistry who need an introductory intellectual task prior to their blending into the normal course offerings. In the same vein it should be useful as text material for a late-freshman or sophomore honors course, or as an outline for an honors tutorial program. Finally, it should be of prime usefulness as instruction and refreshment for any one interested in a concise, well balanced factual account of what is inorganic chemistry. Included are most students, because proliferation of courses is unrealistic, and most knowledge should and must be privately gained.

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Paramagnetic Resonance. By GEORGE E. PAKE. W. A. Benjamin, 2465 Broadway, New York 25, N. Y., 1962. 205 pp. 15 × 23 cm. Price, $4.95, paperbound; $6.95, clothbound.

In view of the increasing interest being shown in the applications of paramagnetic resonance to problems in chemistry and physics, there has been a definite need for an introductory book on the subject. In his preface, the author states that his intention was to write an introductory book suitable for "students or scientists in any specialization who possess in their background the equivalent of the usual one-year course in quantum mechanics." He has done well in this respect. The book is indeed introductory in scope and content and requires no more than an elementary knowledge of quantum mechanics.

The book is a well written introduction to the principles and theories of paramagnetic resonance but is sketchy concerning applications and techniques of measurement. There is one chapter concerning applications of paramagnetic resonance but these deal mainly with problems in the area of physics. There is very little discussion about the paramagnetic resonance of free radicals and none about the observation of excited triplet states in aromatic molecules. Further in the chapter on crystal fields and the effective spin Hamiltonian there is no mention of how the nature of the bonding between the metal ion and its ligands alters the parameters of the spin Hamiltonian. This is not to be taken as a criticism of the work but rather as a warning not to expect too much from the book, which is definitely introductory in scope. For the chemist interested in learning about paramagnetic resonance it should serve as an excellent introduction to the principles and will furnish the background necessary to understand the original literature on applications of paramagnetic resonance to chemical problems.

DEPARTMENT OF CHEMISTRY BRUCE R. MCGARVEY
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Inorganic Isotopic Syntheses. Edited by ROLFE H. HERBER, Rutgers, The State University, New Brunswick, New Jersey. W. A. Benjamin, Inc., 2465 Broadway, New York 25, N. Y. 1962. vii + 249 pp. 15.5 × 23.5 cm. Price, $7.50.

For those interested in synthesizing compounds containing H^2, H^3, N^{15}, O^{18}, P^{32}, Cl^{36}, or I^{131}, this collection of papers by different authors is intended to do two things. One is to discuss certain common syntheses in such detail as to make further recourse to the literature unnecessary, and the book is successful in this. The other aim is to provide a bibliography for the less common syntheses involving these nuclides and to evaluate the relative merits of the different methods. The bibliography appears to be excellent and makes the book a valuable addition to the literature. Unfortunately, the lack of critical evaluation in most cases does lessen the utility.

The book is reproduced directly from typewritten copy and, as a result, both the clarity and ease of reading suffer considerably. Subscripts and superscripts are in the same size type as the body of the text, resulting in a cluttered, crowded appearance. Furthermore, the references are given as superscripts in the identical manner as are the isotopic masses. The quality of paper and binding appear adequate.

As is usual in a collection of this kind, there is considerable variation in style among the different authors. The differences are unnecessarily intensified by use of differing formats and conventions by each author. Some use letters, some numbers, some both, and some no numbers at all to identify a particular synthesis. Different systems of denoting the isotopic labeling also are used. The book certainly would have been improved by more vigorous editorial direction.

The initial chapter entitled General Procedures is so brief and simplified that it is almost useless and could well have been replaced by a list of well chosen references. The chapter on deuterium labeling is very specific with complete directions for a great number of syntheses. However, a number of the descriptions are rather long and over-complicated (*i.e.*, p. 20, the synthesis of LiD, where $1^1/_2$ pages describe the preparation of D_2 from D_2O and $^1/_4$ page the actual synthesis of LiD), and frequently no evaluation of competing methods is made. The preparation of compounds containing tritium is more succinctly yet adequately described in Chapter 3 but suffers from failure to recommend the more desirable methods. Chapter 4 on the use of N^{15} is extremely verbose, far beyond the needs of any reasonably well trained chemist. This chapter also contains a large number of typographical errors. The introduction of O^{18} into compounds is lucidly described in Chapter 5 with a recommended method described for each synthesis and literature references to other methods. The longest chapter is the one entitled Radiophosphorus. It would have been much better if only one-half as long. On pages 161–165, for example, six methods for preparing PCl_3 are given in detail and then only two are recommended for use. Each synthesis is assigned a number and then a different number in brackets is assigned to the particular equation pertinent to the synthesis. Then reference to that synthesis in the text is made by a bracketed number following a formula, the bracketed number referring to the equation number and not to the bold face synthesis number. This needlessly complicated system took the reviewer some time to unravel.

The final three chapters on sulfur, chlorine, and iodine present the syntheses in an orderly and efficient way without going into excessive detail and seem to be at least as useful as the very long chapters.

The index is by subject only and appears to be adequate in its coverage.

UNIVERSITY OF CALIFORNIA LARNED B. ASPREY
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Advanced Inorganic Chemistry. By F. A. COTTON and G. WILKINSON. Interscience Publishers, John Wiley and Sons, Inc., 440 Park Avenue South, New York 16, N. Y., 1962. xv + 959 pp. 23.5 × 16 cm. Price, $14.50.

This is an excellent and modern text, suitable for a senior or beginning graduate course in inorganic chemistry. The organization is, briefly, as follows. An 85-page introduction reviews general electronic theory of atoms and chemical bonding. The approach, while mathematically restrained, does make fluent use of simple wave mechanical formulations in a way calculated to convince a student that the subject is perhaps not so difficult after all. Then follows some 400 pages of fairly standard coverage of the chemistry of non-transition elements. The emphasis is more on structural and bonding considerations than on either preparative chemistry or chemical kinetics, but in general a fair balance is maintained. From time to time simple molecular orbital diagrams are given along with the older line-bond representations.

The final section of the book falls into two parts. The first comprises a survey of transition metal chemistry, mainly that of Werner type complexes, and mainly from a constitutional point of view, followed by a somewhat sketchy, although authoritative, presentation of crystal and ligand field theory. The remaining, and longer part consists of about 300 pages of detailed description of first row transition elements and of the lathanide and actinide series. There is a short appendix and a shorter index.

It is no disparagement to say that the book by no means exhausts inorganic chemistry; no one volume could. It follows that while the book should be fairly useful to the practicing chemist, inorganic or otherwise, it should function best as a textbook for presenting the subject in a modern light to students. While there are no detailed literature references, suggestions for collateral reading are provided. While these are somewhat erratic in ranging from broad reference collections to highly specific articles, they do reflect the intimate acquaintance of the authors with an amazing breadth of inorganic chemistry. From a textbook point of view, however, it is to be regretted that no problems or study questions are provided.

There are a fair number of errors, omissions, and other nondesiderata. While on p. 56, resonance structures are carefully described as having no real existence, elsewhere, as on pp. 58–61 and p. 69, the authors fall into the practice of talking about resonance structures as though they were separately existing ingredients of a chemical bonding situation. It has been noticed that the figures on p. 17 of balloon representations of p-orbitals are confusing. They are signed plus and minus, corresponding to angular wave function plots, yet are oval rather than round, so must actually be the squares of the function; they reach to the origin, yet in the text are described as 90% contours. Also, the figure depicting atomic orbital energies (p. 496) seems unnecessarily confusing. Representative errors or misprints noticed include a sign omission in eq. (2–5), an upside down figure on p. 48, ΔF instead of ΔF° on p. 138, a formula error on p. 531, an inversion of the ^4D and ^4P levels in the diagram on p. 702, and a fair scattering of misprint-type spelling errors. There is noticeable variation in style, indicating the writing to be truly coöperative. Finally, it is unfortunate the publication date allowed the statement on p. 145 that rare gases form no compounds.

The above and other items will presumably be corrected in the further printings this book undoubtedly will enjoy. Over-all, it is indeed a pleasure to welcome it with much appreciation to the authors for their excellent job.

DEPARTMENT OF CHEMISTRY ARTHUR W. ADAMSON
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Argon, Helium, and the Rare Gases. Volumes I and II. Edited by GERHARD A. COOK, Research Laboratory, Linde Co., Tonawanda, N. Y. John Wiley and Sons, Inc., Interscience Division, 440 Park Avenue South, New York 16, N. Y., 1961. xxvii + 818 pp. 15.5 × 23.5 cm. Price, $17.50 per volume.

Theoreticians have long suffered the frustration of finding scanty and scattered data on the inert gases, which are ideal substances for verifying theories of the structure of matter. A monograph on the group 0 elements should indeed be welcomed. Cook and his collaborators set themselves the task of critically reviewing the state of knowledge of the inert gases, assessing the validity of various conflicting measurements and experiments, and finally reporting the "best" values of properties and behavior. The end result is extremely useful and should stand for a number of years as the basic reference on the subject. Fifteen authors have collaborated to produce 20 chapters distributed through two volumes of approximately 800 pages. The