Chapter 9 ("Steroids and Related Substances") is perhaps the least satisfactory and least complete chapter in the book, probably reflecting the author's own interest in other areas. A number of the recent pertinent papers from the literature were not or could not be cited and several fragmentation mechanisms are based on very tenuous grounds. Indeed some of them (*e.g.*, discussion of 11-keto steroids on p. 347) have been disproved in the reviewer's laboratory by recent studies with deuterium-labeled steroids.

The last two chapers, entitled "Miscellaneous Classes" (7 pages) and "Applications to Synthetic Problems" (4 pages) represent only very sketchy outlines, with the exception of a useful discussion of recent work on nucleosides performed in the author's own laboratory.

The production and printing of the book follow the usual high standard established by the McGraw-Hill Book Company. The proofreading, on the other hand, has been carried out in a somewhat sloppy manner and the book contains a substantial number of trivial errors. Some of them are consistent misspellings throughout the book, which could have been caught by the editorial staff (furan, pyran, chlorohydrin, etc., spelled with a terminal *e*, deuterio spelled without the *i*—all of them insignificant but annoying because they appear so often) and so could the printer's own notation on p. 118. There are minor errors in the figures on pp. 47 (C_6H_5N), 272 (N-formylisoleucine) and 332 (M-43 misplaced), methyl groups missing in squalene (p. 247), extra carbomethoxy groups in structure (22) on p. 324, equations (3-36) and (3-37) reversed on p. 108 and bond *a* (mentioned in text) not marked in formula, as well as trivial spelling errors on pp. 108, 218, 235, 241, 275, etc. The peaks at *m/e* 176 and 178 mentioned on the top of p. 101 actually refer to *m/e* 146 and 148 in Fig. 3-16. These are only beauty marks, but they are unnecessary.

In conclusion, where does this leave the potential reader for whom this book is largely intended—the organic chemist with a minimum or no knowledge of the role of mass spectrometry in organic chemistry? I would recommend that such an individual start out with McLafferty's chapter (*loc. cit.*), which covers the organic chemist's field clearly and succinctly. Following this introduction, he should delve into Biemann's book, possibly in conjunction with the more extensive text of Beynon (*loc. cit.*), which can be employed for supplementary reading on those sections (*e.g.*, instrumentation, ionization potentials, etc.), where no detailed coverage was intended in the present book.

Actually, my view is that the ideal book on mass spectrometric applications in organic chemistry cannot be written for at least another two to three years, because there still exist too many gaps in too many areas, which however are being clarified at an ever accelerating pace. In another three years, the chapter on synthetic applications, instead of its present 4 pages, will be substantial; the mechanistic sections will be replete with well-documented cases based on labeled substrates; and, finally, many additional organic structures will have been subjected to the type of semiempirical approach that has created the presently existing body of knowledge. It is questionable whether at that time a single author will have the stamina and background to prepare such a book for the organic chemist. However, if single authorship is possible, Biemann may well be the author *par excellence* for that future and necessary monograph.

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Theories of Electrons in Molecules. By WILLIAM T. SIMPSON, Professor of Chemistry, University of Washington. Prentice-Hall, Inc., Englewood Cliffs, New Jersey. 1962. vii + 183 pp. 16 × 23.5 cm. Price, $9.00.

Advanced students of quantum chemistry will welcome Professor Simpson's book and will benefit from it. The expressed purpose of the book is to "fill in the gap between what is found in quantum chemistry books and what is found in the journals"; however its importance probably lies more in the fresh ideas and insights that it will bring to those who are already cognizant of the literature. Indeed, one cannot expect a book of this length to fill more than a few selected gaps. Also, it should be pointed out that the level of presentation is not noticeably below that of most chemical papers, and the reader is expected to be familiar with transformation theory and group theory.

The book is an integrated collection of special topics related to the author's research interest rather than an introduction to or survey of molecular quantum mechanics. Emphasis is placed on mathematical rigor; however the physical problems are always kept close at hand. Professor Simpson proceeds immediately into the calculation of matrix elements in the first pages, and a rapid pace consisting of concise statements, equations, and little wasted space is maintained throughout. Chapter 1 is mostly concerned with the quantum theory of atoms while Chapters 2 and 3, which are somewhat longer, are devoted to the molecular orbital method and the valence bond method, respectively. The treatment of the valence bond method is especially good. The independent systems approach is briefly discussed in Chapter 4 where, unfortunately, the novel molecules in molecules method is confined to one short section. In addition, a large amount of information is compressed into the twelve sections which make up the appendices and the treatment again is concise. The topics covered in these sections range from the Born–Oppenheimer approximation to time dependent polarizability.

Usually the presentation is clear, though at times overly abbreviated, and the derivations and illustrations are often original. The examples, which are worked out in many sections, are exceedingly useful. Although a few typographical errors are present, they do not detract from the usefulness of the book.

I strongly recommend this book to advanced students of quantum chemistry and to spectroscopists with sufficient background. The non-experts will find that it is not easy reading and that step-by-step verification with pencil and paper will often be required; however their labors will be well rewarded.

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Inorganic Polymers. Edited by F. G. A. STONE, Department of Chemistry, Queen Mary College, University of London, London, England, and W. A. G. GRAHAM, Arthur D. Little, Inc., Cambridge, Massachusetts. Academic Press Inc., 111 Fifth Avenue, New York 3, N. Y. 1962. xi + 631 pp. 16 × 23.5 cm. Price, $19.50.

This book was written to provide chemists with a reliable review of current research in several areas of inorganic polymer chemistry. It consists of nine chapters contributed by leading industrial and academic scientists. As pointed out in the Preface the state of knowledge of inorganic polymers is not as well developed as it is for organic polymers. Much of the effort in this field at the present time is devoted to the study of the basic chemistry of model systems and the book reflects this by frequently discussing simple, even non-polymeric, inorganic systems.

In Chapter 1 (A. V. Tobolsky) pertinent polymer properties are defined and briefly reviewed. Obviously the objective of this chapter was to acquaint workers in the inorganic polymer field with some of the fundamentals on which the organic polymer chemist bases polymer evaluation. Many readers will be prompted to dig deeper.

The second chapter (J. R. Van Wazer and C. F. Callis) on "Phosphorus-Based Macromolecules" draws very heavily on the book "Phosphorus and Its Compounds, Vol. I" by Van Wazer. Thus, of the thirty-four figures in this chapter twenty-four are credited to this source. The discussion of the polymeric phosphonitrilic chlorides—essentially word for word the discussion in the above treatise (published in May, 1958)—does not take into account the well over one hundred papers published since 1958. As a consequence, the views presented on this unique, completely inorganic system exhibiting typical polymer properties are not up to date. The discussion on the polymerization of the lower phosphonitrilic chlorides, for example, is based entirely on the work by Patat, *et al.*, and ignores the results of later investigators such as Konecny and Douglas, Gimblett, etc. Becke-Goehring's work on linear phosphonitrilic chloride polymers endcapped by HCl—cited as a personal communication (ref. 6)—was published in 1959 (*Chem. Ber.*, **92**, 1188 (1959)). This reviewer—who may be biased—would have preferred coverage of the phosphonitrilic polymers similar to Schmulbach's review in "Progress in Inorganic Chemistry" (Vol. 4).

Chapter 3 ("Sulfur Polymers," by M. Schmidt) is limited to compounds containing sulfur–sulfur bonds with the additional arbitrary restriction that at least one of the sulfur atoms must be bivalent. After a rather detailed up-to-date discussion of the various forms of elementary sulfur—which incidentally is also briefly covered in Chapter 2—the chapter mainly reviews the basic chemistry of polysulfides, polythionates and related systems.

Boron polymers are reviewed in Chapter 4 by A. L. McCloskey. The reader may stumble over an apparent contradiction: on p. 161 borazole is said to be thermally stable at 500° whereas on page 163 the statement is made that "borazole deposits solids on standing or on being heated, and gives off hydrogen under the same conditions." It should also be pointed out that references 54 and 63 report not only on the volatile products from the pyrolysis of borazole, but also on non-volatile residues of compositions $BNH_{0.8}$ and $BNH_{0.3}$, contrary to the statement on p. 163 "These residues have not since been investigated."

Silicones are the only inorganic polymers that have so far reached commercialization. There is, of course, much more information available on these polymers than on any other inorganic polymer system. They are admirably reviewed by A. J. Barry and H. N. Beck in Chapter 5 which almost could have