the appropriate Gmelin volumes in which individual compound properties are detailed); the index of compound types in each volume. All of these features combine to make the information presented in these volumes accessible and assimilable.

Like all their companions in the Houben-Weyl series, these books are well and attractively produced. We look forward to Volume 13, Part 3c, that will complete the organoboron series and that will bring details of the reactions of organoboron compounds and of their analysis.

**Dietmar Seyferth,** *Massachusetts Institute of Technology*

**Modern Synthetic Methods. Volume 3. Transition Metals in Organic Synthesis.** Edited by R. Scheffold. Otto Salle Verlag, Frankfurt, Verlag Sauerländer, Aarau, and Wiley, New York. 1983. 440 pages. $33.95 (paperback).

This book brings five reviews based on lectures presented by the authors at the International Seminar on Modern Synthetic Methods held in May 1983 in Interlaken. The subject, transition metals in organic synthesis, is one of great current interest, one in which chemists throughout the world are very active, one which has had a major impact on synthetic organic chemistry.

The book opens with a 60-page survey of the principles of transition-metal chemistry by John K. Stille. This is standard material and is aimed at the uninitiated: structure and bonding and then the processes that are involved when transition-metal chemistry is applied to organic synthesis: oxidative addition, reductive elimination, insertion reactions, nucleophilic addition to coordinated ligands, transmetalation, and homogeneous catalysis. After this quick course in transition-metal chemistry, the remaining four chapters focus on selected important aspects of the subject under discussion.

L. S. Hegedus summarizes the use of group 8 metal complexes (principally those of nickel, iron, and palladium) in organic synthesis in the first of these chapters. Hegedus is an old pro at such summaries; he has coauthored the leading textbook on organotransition-metal chemistry and has written a number of reviews on various aspects of the use of transition-metal complexes in organic synthesis. The present 78-page review covers, briefly with many equations, six topics: reactions of group 8 metal carbonyls, of group 8 metal alkyl complexes, of group 8 metal olefin complexes, of group 8 metal compounds with alkynes, of group 8 ($\pi$-allyl)metal complexes. The literature coverage in this discussion is broad, and within his limitations of space, Hegedus gives a good overview of his subject.

J.-F. Normant's two-part chapter, on the other hand, is quite narrow in scope. In the first section (31 pages) the preparation of conjugated dienes and enynes by use of organocopper reagents is discussed, while the second section (42 pages) brings an account of the use of organomanganese reagents in synthesis. The latter is a relatively new area of investigation, largely by Normant and his co-workers. The "organomanganese reagents" are solutions formed by mixing manganese(II) halides and main-group organometallic reagents (RLi or RMgX) in 1:1, 1:2, and 1:3 stoichiometry in ethereal solvents. Little is known about what actually is swimming around in these solutions, but whatever it is, has some advantageous application in the synthesis of organic compounds, especially of ketones from acid chlorides or anhydrides.

In the next chapter D. Seebach, B. Weidmann, and L. Widler bring a 137-page review of the noncatalytic applications of $\sigma$-bonded organotitanium and -zirconium derivatives in organic synthesis. This is a relatively new and fast-moving area, mainly due to the research groups of Seebach, Reetz (who also reviewed this area recently in Volume 106 of "Topics of Current Chemistry"), Tebbe, Grubbs, and, a bit earlier, Schwartz. This is an excellent, well-organized chapter that discusses in detail the special utility of these Ti and Zr reagents. As the authors point out, it is a matter of the selectivity of known transformations (C–C bond formation and functional group transformations) rather than of novel reactivity.

In the last chapter of 85 pages, R. Scheffold, G. Rytz, and L. Walder provide a review of the use of vitamin $B_{12}$ and related cobalt complexes as catalysts in organic synthesis: in oxidation, in hydrogenation and hydrogenolysis, and in reductive processes. In the initial sections the types of such cobalt complexes and their synthesis and their properties and general reactivity are reviewed. This general area is one that has been covered in many reviews and monographs, but it is useful to have the present brief, well-organized review whose focus is on organic synthesis applications.

All in all, this is a book that the organic (and organometallic) chemist will find interesting and useful. The book is a direct reproduction of the typescripts, but the result is attractive. A feature that will enhance its utility to the synthetic chemist is the inclusion of quite a few representative experimental procedures in all chapters (except the introductory one). Futhermore, this is a book that the ordinary mortal can afford to buy.

**Dietmar Seyferth,** *Massachusetts Institute of Technology*