Transition Metal Chemistry, Volume 9; edited by G.A. Melson and B.N. Figgis, Marcel Dekker, Inc., New York and Basel, 1985, iv + 312 pages, $65.00 (U.S.A. and Canada), $78.00 (elsewhere). ISBN 0-8247-7188-5.

When Dick Carlin's excellent series, *Transition Metal Chemistry*, was resurrected with an eighth volume by its present editors in 1982, there was reason for some concern. Firstly, there are now many (too many?) series of reviews for topics, advances and progress in inorganic chemistry. Secondly, two of the three reviews in that volume were scarcely main-stream subject matter, dealing with complexes of tripodal phosphines and arsines, and the stereochemistry of α-hydroxycarboxylate complexes. Interesting? Yes. Worth reviving an old series for? Probably not. However, the latest volume in this series vindicates both the editors and the publishers. This book contains only two reviews: "Chemical information from the polarized crystal spectra of transition metal complexes" (M.A. Hitchman; 124 pp.; 237 refs.) and "UV photoelectron spectroscopy of transition metal complexes" (H. van Dam and A. Oskam; 184 pp.; 233 refs.). Both of these articles are central to modern coordination and organometallic chemistry, are concerned with the determination of electronic structure, and deal with important subjects which have not been reviewed for some years.

As the author himself states, the article describing polarized electronic absorption spectroscopy of single crystals is a "user's view". This makes his account both unique and invaluable. After an interesting preamble, a detailed discussion of the practical aspects of the technique (including crystal selection, mounting and cooling, baseline correction, derivation of molecular spectra from crystal spectra, and packing problems) is given. The major section of the article, concerned with obtaining information of chemical significance from the spectra, includes descriptions of mechanisms inducing intensity into *d—d* transitions, the effects of temperature on *d—d* spectra, geometries of complexes in excited electronic states, vibrational properties of complexes, metal—ligand bonding parameters, and deviations from the oriented gas model of crystal spectra. The author has wisely confined himself to a few carefully chosen illustrative examples, rather than attempting a catalogue of extant studies, and the resulting article is simultaneously readable, lucid, interesting and exciting.

The technique of polarized electronic absorption spectroscopy has almost exclusively been associated with classical coordination chemistry in the past, and it is quite remarkable how it has been essentially ignored by organometallic chemists (surely they are not all afraid of Hamiltonians and bra-ket notation). Indeed, it is rare for an organometallic chemist to even record a solution electronic absorption spectrum! Articles of this type should be compulsory reading, and their content taken to heart, if we are to gain an improved understanding of the electronic structure (particularly of the energy levels of the anti-bonding orbitals) of organometallic complexes. In contrast, photoelectron spectroscopists have not been slow to explore the wealth of volatile organometallic compounds for their studies (could this be because of the low volatility of many classical coordination complexes?), and the contents of Van Dam and Oskam's article reflect this phenomenon. Their review opens with the apparently obligatory brief description of the fundamentals of photoelectron spectroscopy and its applications to transition metal compounds. Studies upon metal carbonyls and substituted metal carbonyls are then described, followed by sections dealing with metallocenes, η^5-cyclopentadienylmetal carbonyl complexes, bent bis(η^5-cyclopentadienyl)ML_n complexes, metal β-diketonates and related complexes, alkene complexes, π-allyl complexes, transition metal complexes with alkyl, or with *O*-, *N*- or *S*-donor ligands, metal—metal bonded complexes and metalloporphyrins. The review concludes with a brief consideration of the future prospects for photoelectron spectroscopy. This review has many good features, not least of which is that it is copiously illustrated with both photoelectron spectra and molecular orbital diagrams, but it does suffer textually in several places from ambiguous or misleading wording (it is clear that the authors are not writing in their parent tongue). There are also occasional discrepancies between peak designations in the text and in the illustrations, and the authors have a particularly annoying habit of, for example, writing A^1 and A^{11} for A' and A''. To redress the balance, however, it must be said that this article summarizes a wealth of information in an enlightened and critical manner. Of especial importance, the authors clearly highlight invalid or questionable assignments, thus guaranteeing the usefulness of this review for many years.

In conclusion, this is an excellent book (if rather costly, considering that it is camera-ready copy). It should be of interest to all organometallic and coordination chemists, and should be in all libraries attached to academic and industrial laboratories. This volume is in the true spirit of the original series, and it is hoped that Volume 10, when it appears, will continue this tradition.

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Hydrogenation Methods, Paul N. Rylander, Academic Press, London, New York, 1985, xv + 193 pages, £40. ISBN 0126053650.

This is a further volume of the new series detailing "best synthetic methods" for various types of transformations in organic chemistry. The aim of the work is said to be "to give the reader ready access to what can be done with hydrogenation and how to do it". In this it succeeds only marginally.

The book opens with an introductory chapter on general aspects of catalysis and is thereafter organised according to substrate, with chapters on alkenes, aldehydes and ketones, acid derivatives, reductive alkylation, nitriles and oximes, nitro compounds, arenes, their derivatives, and heterocycles. Chapters on dehydrohalogenation and miscellaneous hydrogenolyses complete the book. This last chapter is possibly the most useful, since the material collected is not readily available elsewhere in an up to date form. The author's greater interest and expertise in the area of heterogeneous catalysis is self-evident; homogeneous catalysis of the processes he describes is treated extremely briefly or not at all. Readers should note that the structure of the chiral ligand BPPM on page 48 is incorrect.