



the two faces of the cation.¹⁶ Judged on the basis of what is known concerning the nature of the transition

(16) It should be emphasized that the stereoselectivities reported here are probably *minimum* values. It seems quite likely that under the experimental conditions, especially in the latter stages of reaction, newly formed hydrocarbon might compete with silane for hydride donation—with attendant racemization. See C. D. Nenitzescu in "Carbonium Ions," Vol. II, G. A. Olah and P. v. R. Schleyer, Ed., Wiley-Interscience, New York, N. Y., 1970, pp 463–520.

states for such hydride transfers,^{6,10,11,17} it is difficult to rationalize why the stereoselectivity is in the direction observed if only differences in steric bulk are important. We are continuing our investigations in this area in an effort to determine the factors responsible for the magnitude and direction of this stereoselectivity.

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(17) J. D. Austin and C. Eaborn, *J. Chem. Soc.*, 2279 (1964).

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Book Reviews

Jac. Berzelius: His Life and Work. By J. ERIK JORPES (Royal Carolinian Medico-Chirurgical Institute). Translated by BARBARA STEELE. University of California Press, Berkeley, Calif. 1971. 156 pp. \$8.00.

This short, delightful book fills a long-standing gap in the chemical biographical literature. The first edition of this book, which is based on H. G. Söderbaum's 1929–1931 three-volume Berzelius biography, was printed in Sweden in 1966. The present book is the first American edition. American chemists should be grateful that the University of California Press and the translator have made this work available to them.

The book tells the story of that amazing man, Baron Jöns Jacob Berzelius (1779–1848), who discovered cerium, selenium, and thorium in an era when new elements could still be "scraped off the walls." Berzelius' magnificent contributions to chemistry are presented along with much interesting biographical and historical information. The book is impressively illustrated.

This book will provide enjoyable reading for many chemists and chemistry students.

David H. Kenny, *Michigan Technological University*

Quantum Chemistry. Volumes I and II. By I. N. LEVINE. Allyn and Bacon, Inc., Boston, Mass. 1970. Volume I: x + 591 pp. \$14.50. Volume II: xvi + 477 pp. \$11.50.

One might well have doubts about the need for yet another quantum chemistry text when the field already boasts half a dozen good ones in print: Eyring, Walter, and Kimball (1944), Kauzmann (1957), and Pilar (1968) to name just three. As implied by the dates of these last three books, the basic subject matter has not changed drastically in the last three decades. However, the unity and freshness of approach of Levine's book do combine to present a good case for it.

Volume I is subtitled "Quantum Mechanics and Molecular Structure." The chapter headings are typical of a quantum chemistry text. This volume covers the postulates and theorems of quantum mechanics, the exactly soluble eigenvalue problems, the essential theories and approximations, molecular symmetry, the virial and electrostatic theorems, and the electronic structure of diatomic and polyatomic molecules.

Volume II, subtitled "Molecular Spectroscopy," is concerned with the application of the material in the first volume. It treats vibration and rotation of diatomic/polyatomic molecules, and

nuclear magnetic resonance, with short sections on electronic transitions of diatomics, on nqr, and on esr. The last chapter is a self-contained exposition on group theory and matrices.

This is a carefully written textbook, and is up-to-date in style, contents, and notation. The author integrates brief mathematical interludes into the body of the text as needed, and gives the student direction by considering the goals of the various interludes before embarking upon them. Physical intuition is fully exploited, and different theories and approximations are often applied to one and the same model (*e.g.*, the harmonic oscillator). The mathematical sophistication is approximately equal to that of the other three texts mentioned above. Closing each chapter are some two dozen problems which adequately reflect the material covered; many relate to current interest as well.

A number of figures, particularly in the second volume (*e.g.*, p 168), seem hastily drawn, and some three-dimensional figures are confusingly rendered into two dimensions. It is perhaps more unfortunate that the book had to be divided into two volumes. The last chapter in the first volume, which covers the electronic structure of polyatomic molecules, is also the first chapter in the second volume, ostensibly to strengthen the claim that the second volume is independent of the first. Volume I does indeed stand well alone, but the second volume relies rather more heavily on the first than the author is willing to admit. In this respect, Pilar's book, although somewhat large, was managed in but one volume and costs but \$15.50 contrasted with the \$26.00 of Levine's volumes.

As to the material he has chosen to cover, Levine is thorough enough, but one would have hoped for greater coverage of the more recent and more promising applications of quantum mechanics. For example, double resonance is restricted to a short paragraph in the chapter on magnetic resonance, and no mention at all is made of photoelectron spectroscopy, although most of the relevant theory is already present in the book.

Taken as a whole, this work complements the other books in its field, and the crucial introductory chapters are better than many.

Kent Lanini, *University of Michigan*

Advances in Macromolecular Chemistry. Volume II. Edited by W. M. PASIKA. Academic Press Inc., London and New York. 1970. vii + 267 pp. £ 5.

In his preface to the first volume, the editor emphasized that reviews were essential for the specialist and nonspecialist because

the number of publications was increasing exponentially. The scope of this review series was to be all aspects of macromolecular research. Certainly, even those outside the polymer field recognize that the advances in macromolecular chemistry in the 60's and 70's are greater than advances in the entire field of chemistry in the 40's. The 432-page first volume appeared to meet many of the editor's ambitious objectives.

Seven authors from Austria, England, Ireland, Japan, and the USA contributed to Volume I. Three of the reviews were on polymerization, two were on new polymers, and one was on rheology. One objection to the comprehensive reviews in the pioneer volume was the absence of up-to-date references which resulted inadvertently from the time lag in printing, etc. This objection was overcome in Volume II by the addition of a timely "Post Proof Review." However, it is disappointing to note that the second volume is much smaller than the first and lacks the international aspect of the pioneer volume.

Most of the reviews in the pioneer volume included conclusions, but conclusions are omitted in all except A. Blumstein's review on "Polymerizations in Preoriented Media" in Volume II. There is one other 87-page polymerization review by U. C. Arthur on "Graft Polymerization onto Polysaccharides." Koton, who is the only non-American reviewer in this volume, discussed "High Temperature Polymers Containing Cyclic Functions" in a 60-page article. The other two reviews are on "Critical Opalescence" by B. Chu and "Topological Isomerism" by H. L. Frisch and D. Klemper. The latter is of interest to both the synthetic and biopolymer scientist.

The authors have supplied comprehensive bibliographies and have included significant photographs and tables. No pattern for selection of subjects is apparent in the first two volumes. The decrease in size of the second volume is not in accord with the exponential increase in volume and diversity of polymer publications and is probably related to economics rather than polymer science. The five reviews are well written and of considerable value to the specialist and nonspecialist. Critical reviews are essential in all phases of modern science, and it is hoped that Dr. Pasika will continue to edit and expand his reviews in macromolecular chemistry.

R. B. Seymour, *University of Houston*

Negro Employment in Basic Industry. By N. R. NORTHRUP and RICHARD L. ROWAN (University of Pennsylvania). University of Pennsylvania Press, Philadelphia, Pa. 1970. xvii + 769 pp. \$10.00.

The authors have produced a massive text that clearly catalogs the history of systematic racial discrimination in the employment and promotion practices of American industry. Data cover the years from late 19th century to 1968. The text is divided into eight sections, of which six cover the basic industries in the United States. They are the automobile industry, the steel industry, the rubber tire industry, the aerospace industry, the petroleum industry, and the chemical industry. With this format there is a tendency for the reader to detect a redundancy as he progresses through the book. This is not the fault of the authors, but arises from the constancy of factors which have led to the unequal employment opportunities for Blacks in all industries.

This text is one that is definitely needed. Hopefully it will not be confined to corporation employment offices or the libraries of academia, but will find its way to all members of industry, particularly those with managerial responsibilities. As pointed out in the text, in many cases the vigorous equal opportunity programs formulated by corporation executives are scuttled by the inaction and prejudices of middle-line administrators. If industrial employment and promotional practices are to change significantly without a plethora of court cases, job actions, and agitation for additional

legislation, those at all levels of responsibility in industry must be made aware of and learn to deal with their own prejudices and those of their colleagues. A required reading of this text is one small step in that direction.

The authors have plans to produce eight additional volumes on related subjects. Three are now being prepared for release. This reviewer anxiously awaits their publication.

A. H. Miller, *Esso Research and Engineering Company*

Annual Reports of NMR Spectroscopy. Volume 3. Edited by E. F. MOONEY (University of Birmingham). Academic Press Inc., London. 1970. xi + 505 pp. £7.00.

The present volume in this series, formerly titled "Annual Review of NMR Spectroscopy," contains updated reviews in three areas of general interest covering primarily the 1967-1968 literature: "General Review of Proton Magnetic Resonance," by T. N. Huckerby; "Nuclear Magnetic Resonance Spectroscopy as an Aid in Conformational Analysis," by W. A. Thomas; and "Fluorine-19 Nuclear Magnetic Resonance Spectroscopy," by K. Jones and E. F. Mooney.

Two new areas covered in this volume should be a particularly welcome addition: "Nuclear Magnetic Resonance of Steroids," by J. E. Page; and "Nuclear Magnetic Resonance Spectroscopy of Paramagnetic Species," by G. A. Webb. The chapter on steroids is largely devoted to a general survey of developments in the field during the 1964-1968 period. In the chapter on paramagnetic species a brief but adequate theoretical discussion precedes a more detailed examination of recent applications to metal complexes, ion pairs, and free radicals.

As in the previous volumes of the series, the authors have opted for completeness of coverage rather than critical discussion. Each chapter summarizes in a clear and concise manner a massive body of information. This review is certain to become part of the essential literature for the practicing nmr spectroscopist.

Dean L. Griffith, *Case Western Reserve University*

Photochemistry of Coordination Compounds. By V. BALZANI and V. CARASSITI (Universita di Bologna and Universita di Ferrara). Academic Press Inc., London and New York. 1970. xvii + 432 pp. £7.50.

This book provides a comprehensive and critical review of theoretical and experimental photochemistry of coordination compounds. The scope includes all aspects of the subject except photographic and biochemical processes. Following an introductory chapter, the text is divided into two parts. The first part (Chapters 2-6) provides a thorough and basic review of photochemical principles and of the classical inorganic theories accounting for the structure, substitution reactions, spectral properties, and excited states of coordination compounds. In the second part, the authors deal with experimental work on coordination compounds of specific elements or groups of elements in Chapters 7-16. In Chapter 17 the photochemistry of carbonyl and organic π -bonded complexes is reviewed. Chapter 18 contains work on solid-state photochemistry, and in Chapter 19 the authors summarize the experimental work in the form of several general remarks. Valuable features of the second section are extensive tables of experimental data and a discussion of the emission properties of coordination compounds. The authors offer in many places pertinent criticism of the experimental work.

The text is well written and contains few typographical errors. Literature coverage is exhaustive and includes primary and secondary sources through 1969. Many articles are cited from the lesser known journals, and historically interesting material from as early as 1970 is included. The rich content of this book will make it very useful as an introduction to the field, as a reference for specific information, and as a source of ideas for future work.

G. David Mendenhall, *National Research Council of Canada*