of the role of inhaled coal dust in the etiology of chronic bronchitis and emphysema. In this context I liked Keith Morgan and Earle Shoub's apothegm (page 210) that the epidemiologist tends to study large numbers of subjects inadequately while the physiologist studies a few—usually the wrong ones—in great detail. Dare we hope that the insight thus revealed will allow workers in the United States to avoid the mistakes made so frequently in the past by their European colleagues who have attempted to draw conclusions of general validity using data derived from nonrepresentative populations? This book must be considered essential reading for all those who would investigate or learn about the health hazards produced by the inhalation of coal dust.

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The Chemistry of an Element

Sulfur Research Trends. A symposium, New Orleans, La., Feb. 1971. David J. Miller and T. K. Wiewiorowski, symposium chairmen. American Chemical Society, Washington, D.C., 1972. viii, 232 pp., illus. $11. Advances in Chemistry Series, 110.

Theoretically oriented readers will be interested in two complementary chapters in this book, one by Cusachs and Miller on semiempirical molecular-orbital calculations on sulfur-containing molecules, and the other by Van Wazer and Absar on ab initio linear-combination-of-atomic-orbitals, molecular-orbital, self-consistent-field calculations on H_2S, H_2SO, and H_2SO_2 with and without *d* orbitals' being allowed to the sulfur. Apparently, binding-energy data demonstrate the great influence of adding *d* character to the sulfur when oxygen atoms are present. The S–H bond seems to be surprisingly independent of the oxygen atoms. A chapter by Musher provides stimulating reading almost exclusively of a speculative nature on sulfur (IV) and (VI) (sulfuranes and persulfuranes).

I found the chapter by Schrauzer on the neutral metal complexes of 1,2-dithioketones, R·CS·CS·R, and enedithiols (the so-called metal dithienes) quite interesting. For the organic chemist, there are up-to-date discussions of the photolysis of thiols by Stanley, Henderson, and Pryor, of the addition of sulfur to olefins by Strausz, and of fluorinated polymers by Krespan, Brasen, and Cripps. The reactions of mercaptans with liquid sulfur, which can serve as model for other mechanisms in sulfur chemistry, are treated mainly from a kinetic standpoint by Langer and Hyne.

I learned a great deal from the chapter by Jolly on the structure of sulfur-nitrogen compounds and from the chapter by Wayne on sulfur and selenium chlorides and organochlorides. The behavior of the sulfur molecule is discussed in two chapters, one on the spectrum of sulfur and its allotropes, by Meyer, Gouterman, Jensen, Oommen, and Stroyer-Hansen, and the other on the influence of pressure and temperature on the structure of the sulfur molecule, by Vezzoli and Zeto. Several chapters deal with more specialized topics: amorphous chalcogenide alloys (Ward), electrical conductivity of liquid sulfur and sulfur-phosphorus mixtures (Steunenberg, Trapp, Yonco, and Cairns), and chemical-mechanical applications of elemental sulfur (Dale). Finally, a chapter on potential applications of sulfur by Fike rounds out this eclectic symposium on sulfur research trends. This material is well suited to the Advances in Chemistry Series, and the book is, in fact, one of the best in the series.

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Vitamin B_{12}

Inorganic Chemistry of Vitamin B_{12}. J. M. PRATT. Academic Press, New York, 1972. x, 348 pp., illus. $18.75.

Vitamin B_{12}, perhaps the most interesting of all vitamins, is a cobalt complex of the porphyrin-related corrin system. Capable of forming stable organocobalt derivatives, and existing as such in one of its coenzyme forms, vitamin B_{12} continues to attract the attention of biological, inorganic, and organometallic chemists. Pratt's aim in this book is to summarize the chemistry of the vitamin from the "inorganic" side; accordingly, the book contains only relatively scant accounts of its biochemistry and biomedical applications. The book is directed to specialists in the field, biochemists, and coordination and organometallic chemists. The literature (about 450 references) is covered through 1969, but some more-recent references are given in an appendix.

The author, a student and former collaborator of R. J. P. Williams (Oxford), understandably emphasizes the contributions from his laboratory. For the specialist the book indeed provides a convenient summary of past work, some of it unpublished, from this group. It also is valuable as a collection of spectroscopic and structural data. For a more general readership its coverage and interpretational value are insufficient for unreserved recommendation. For example, the electronic structure of vitamin B_{12} derivatives is discussed often in terms of a crude ionic formalism which will be taken with the necessary grain (or more) of salt by those knowledgeable in the field but is likely to be misunderstood by others. On page 4, figure 1.3, the structure of coenzyme B_{12} is shown as if a 5′-deoxyadenosylcarbanion is coordinated to the Co(III) ion of the corrin. This formalism is recurrent in the book, but its pitfalls are not clearly indicated (the chemical properties of organocorrins are dominated by the ability of the cobalt atom to stabilize bonds to carbon with a high degree of covalency; ionic limiting structures contribute only to a minor extent). Considerable space is dedicated to effects associated with the attachment of other substituents to the corrin cobalt atom; these effects are discussed in terms of "cis- or trans-effects," although an explanation in less empirical terms would have been advantageous. Too much space is given to description and critique of earlier work. For example, half a page is consumed for a description of the Co–C bond cleavage of cyanoethylcobalamin, first reported in 1966. Pratt's critique of some aspects of this work is no longer justified in 1972. Perhaps the most serious shortcoming of the book is the almost systematic omission of the results of work on vitamin B_{12} model compounds and of the comparative information resulting from this work. This introduces a clear impression of some of the "personal preference and prejudice" (p. 8) which the author evidently has and needlessly narrows the scope of this book. Finally, the book was written at a time when much of the inorganic chemistry of vitamin B_{12} was in a state of flux; considerable portions of it are for this reason already obsolete.

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