

and physical chemists, possibly because it is difficult to go beyond the yes/no stages in interpretation of the results; greater detail is not easily won. Collins and Bowman's book does much to expose the richness and power of the method; successive labeling and temperature dependence studies are virtually untapped resources; perhaps recent improvements in mass spectrometry and simplifications in techniques for large-scale model calculations will encourage new workers to try their hands at this rewarding scientific game.

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## Toxic Metal

**Cadmium in the Environment.** LARS FRIBERG, MAGNUS PISCATOR, and GUNNAR NORDBERG. CRC Press, Cleveland, Ohio, 1971. 176 pp., illus. \$25.

Cadmium is one of the five most toxic of the environmental metals to which industrialized man has unwittingly exposed himself. Lacking a homeostatic mechanism, mammals can only sequester this metal and accumulate it in kidney, liver, and blood vessels, where it remains apparently for life.

This volume attempts to compile "information essential to the understanding of the toxic action of cadmium and the relationship between dose and effects on human beings and animals." It is based on the authors' long experience with a relatively small group of workers exposed industrially to cadmium fumes and dusts, and on the experimental literature. It is therefore misnamed, for factories do not represent the environment nor exposed workers the population.

The book, which contains many data, has several defects. There is no index; a complicated five-page table of contents has to serve—but does not. There is no way to track down an intriguing reference without reading the whole book. Through an error, pagination is off by 12 pages, a constant irritation. Of the 90 tables and figures, 25 are "unpublished observations" of the authors or, surprisingly, of other workers here and abroad, and there are many such references in the text. The text at times is wordy and repetitive. The relation of cadmium to zinc, probably the basis of its toxicity, is sparsely covered.

Animal experiments are well docu-

mented, although there is a tendency to apply effects from injected cadmium to disease in the population at large. For example, injected cadmium causes sarcomata, as do six other metals; ingested cadmium does not. This section ends with an uncritical discussion of the high rate of stomach cancer in Japanese. Some good work has been reported on cadmium teratogenesis which is not mentioned; this section is poor.

The treatment of the effects of cadmium on human health is largely confined to exposed and poisoned workers, and a great deal of attention is paid to proteinuria with little to renal function. Effects on blood, bone, liver, and other organs are discussed in respect to heavy air exposures. Respiratory effects are well considered, but the authors judge too adversely the hypothesis that cadmium from air and cigarettes could cause pulmonary emphysema in the general population. They are also too critical of the hypothesis that cadmium is a cause of hypertension, which has confirmation from the epidemiological, pathological, and experimental evidence although this disorder does not accompany overt poisoning. They imply that cadmium exposures of the general population come mainly from air, which is not the case in this country, nor was it in "itai-itai" osteoporosis in Japan.

This book contains much of what one wants to know about overt cadmium toxicity in animals and man—if one can find it. It should be useful to students and workers in this area of toxicology, if read with a critical eye. The overall situation is not nearly as bad as one is led to believe.

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## Element 81

**The Chemistry of Thallium.** A. G. LEE. Elsevier, New York, 1971. xii, 336 pp., illus. \$19.95. Topics in Inorganic and General Chemistry, Monograph 14.

It is stated in the preface that this book was written "to provide a comprehensive and critical review of the chemistry of thallium, paying special attention to the advances of the last decade." The author has, however, been successful in only one of his objectives. Within his terms of reference, Lee has certainly provided a compre-

hensive review of the field, and his book will serve as a useful source of references to the primary literature. Both inorganic and organometallic chemistry are described in detail and the organization of the content of the chapters is good. No attempt has been made to provide a "critical review of the chemistry of thallium," however; the facts are presented more or less correctly and critical appraisal by the author is carefully avoided.

There are three main features of this first monograph on the general chemistry of thallium which, singly or collectively, will infuriate most readers. First, the number of typographical errors is quite incredible. Second, and more serious, is the fact that in a significant number of instances large parts of the author's "discussion" are merely reproductions of discussions from the original literature, inserted without acknowledgment. And third, the index is inadequate. Because it is the only monograph on thallium available, this book will be a necessary purchase for specialists in this area—but only until a better volume is published.

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## Books Received

**Acoustique et Musique.** Données Physiques et Technologiques. Problèmes de l'Audition des Sons Musicaux. Principes de Fonctionnement et Signification Acoustique des Principaux Archetypes d'Instruments de Musique. Les Musiques Expérimentales. L'Acoustique des Salles. E. Leipp. Masson, Paris, 1971. iv, 340 pp., illus. Paper, 80 F.

**The Analysis of Subjective Culture.** Harry C. Triandis, in association with Vasso Vassiliou, George Vassiliou, Yasumasa Tanaka, and A. V. Shanmugam and with the assistance of Earl E. Davis, Keith M. Kilty, Howard McGuire, Tulsi Saral, and Kuo-shu Yang. Wiley-Interscience, New York, 1972. xiv, 384 pp., illus. \$16.95.

**Analytic Properties of Feynman Diagrams in Quantum Field Theory.** I. T. Todorov. Translated from the Russian by Clifford Risk. Pergamon, New York, 1971. xvi, 152 pp., illus. \$10.50. International Series of Monographs in Natural Philosophy, vol. 38.

**Annual Review of Psychology.** Vol. 23. Paul H. Mussen and Mark R. Rosenzweig, Eds. Annual Reviews, Palo Alto, Calif., 1972. x, 786 pp. \$10.

**The Ascent of Man.** An Introduction to

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