

BOOK REVIEWS

Biochromy, Natural Coloration of Living Things, D. L. Fox, Scripps Institute of Oceanography. University of California Press, 2223 Fulton Street, Berkeley, CA 94720. 1979. viii+248 pp. 16 x 23.5 cm. \$28.75.

Man's fascination with the beauty and variety of colored living organisms has been much enhanced by recent technological advances in color photography and reproduction and by access to remote and isolated areas at land and at sea. A new book, which embodies "a popularized treatment of the subject" (p. xi) and which is written by the author of scholarly works on "biochromy" should therefore be a welcome addition to the nontechnical scientific literature. Regrettably, Professor Fox's endeavor fails in its avowed objective.

Professor Fox's scholarly book on the subject, *Animal Biochromes and Structural Colours*, published in 1949, was a standard reference work for many years. Its emphasis reflected the author's principal research interest, the comparative biochemistry of carotenoids. A second edition, in 1976, was disappointing since the updating consisted of a small supplement, mostly on carotenoids [cf. J. T. Bagnara, *Ecology* 58, 218 (1977)]. Sections dealing with quinones, melanins, pterins, flavonoids etc. betrayed little acquaintance with developments between 1949 and 1976.

We now have a rewritten, condensed, better illustrated version of Professor Fox's 1949/76 book. It is based on the same outline as the previous book and is heavily slanted toward carotenoids. Technical black-and-white illustrations and most Tables have been omitted; structural formulas of representative compounds, complete with errors from the 1976 book, have been collected in an Appendix. A brief (26 entries) bibliography refers mostly to the secondary literature and only three items are post-1976. Even in the author's own field, Straub's 1976 updating of Isler's 1971 monograph on carotenoids has gone unnoticed.

It is a pity that so many new and exciting developments in biochromy, our knowledge of the role of flavonoids in plant-insect allelochemistry, the biogenesis of melanins, or the masculinizing hormone bonellin—to name a few—did not find their way into *Biochromy-Natural Coloration of Living Things*.

Worst of all, the book is poorly written—for scientist and nonscientist alike. Although in his Preface (p. xiii) Professor Fox forewarns us, "Finally, while in no sense a complete stranger to the demands inherent in writing for the general public, I have found elucidating my scientific notions to be quite demanding of any resources as to the printed word", I was unprepared for what I encountered. Two examples will suffice.

"The capacity of a compound for absorbing visible light fractions arises from loci or special intramolecular nexuses called chromophores, or color-evoking configurations, within." (p. 24).

"Given accordingly the rather cacophonous cognate name of leghemoglobin, this red biochrome does not serve as an oxygen carrier (hardly imaginably necessary in a green plant in any event), but is biochemically effective in catalyzing the reductive fixation . . ." (p. 126).

I was pleased to see that *Biochromy* in contrast to *Animal Biochromes* uses American rather than British spelling.

PAUL J. SCHEUER, *Department of Chemistry,*
University of Hawaii at Manoa, Honolulu, HI 96822

Natural Sulfur Compounds. Novel Biochemical and Structural Aspects, Edited by D. CAVALLINI, University of Rome, Italy, G. E. GAULL, Institute for Basic Research in Mental Retardation, New York, and V. ZAPPALÀ, University of Naples, Italy. Plenum Press, 227 West 17th St., New York, NY 10011. 1980. xv+552 pp. 17.5x25 cm. \$49.50.

This volume contains 47 contributions from the Third International Meeting on Low Molecular Weight Sulfur Containing Natural Products held in Rome, June 18-21, 1979. The subject matter from this meeting is highly varied and it provides a stimulating view of current trends in research on naturally occurring sulfur compounds. The book begins with a discussion of the stereo-chemical aspects of transmethylation reactions and then proceeds to a number of related topics such as the role of S-adenosylhomocysteine in the control of biological methylations and recent studies on the metabolism of 5'-methylthioadenosine. The middle section of the volume contains a number of contributions dealing with aspects of taurine biosynthesis and its roles in mammalian physiology. The remaining papers survey a wide variety of topics including the mechanism of C-S bond formation in biotin biosynthesis, the metabolism of sulfur containing heterocyclic cofactors, the clinical chemistry of mercaptopyruvate, and the biochemistry of thiocystine.

The subject matter of this volume is sufficiently diverse that anyone interested in naturally occurring sulfur compounds is certain to find something of value. However, since the majority of the contributions deal with the biochemical and medical aspects of sulfur compounds, the book will no doubt be of greater interest to workers in those areas than to natural products chemists.

RONALD J. PARRY, *Department of Chemistry,*
Rice University, Houston, TX 77001

Isotopes: Essential Chemistry and Applications, Edited by J. A. ELVIDGE and J. R. JONES, University of Surrey. Special Publication No. 35, The Chemical Society, Burlington House, London W1V 0BN, England. 1980. vii+400 pp. 15x21cm. \$32.00.

This publication contains the proceedings of a symposium organized by the Education Division of the Chemical Society held at the University of Surrey in 1979.

Whilst there are a number of excellent publications in which the biosynthetic mechanisms leading to natural products are discussed, single volumes containing up-to-date information concerning the preparation, analysis and use of radio- and stable-isotope labelled material for biosynthetic studies are scarce. "Isotopes: Essential Chemistry and Applications" fills that gap, and in addition, it covers a lot of material outside the biosynthesis field.

In ten chapters the whole spectrum of isotope chemistry is covered. Chapter titles are: Stable Isotopes—Separation and Application (I. M. Lockhart), Isotopic Labelling with Carbon-14 and Tritium (E. A. Evans), Purity and Stability of Radiochemicals (E. A. Evans), ^{13}C N.M.R. Spectroscopy in Medicinal Chemistry (D. M. Rackham), Deuterium and Tritium Nuclear Magnetic Resonance Spectroscopy (J. A. Elvidge), Mass Spectrometric Methods of Isotope Analysis (D. S. Millington and W. D. Unsworth), Applications of Isotopes in Drug Metabolism (D. R. Hawkins), Applications of Isotopes in Biosynthesis (D. W. Young), Isotopes and Organic Reaction Mechanisms (F. Hubbert), and Hydrogen Isotope Exchange Reactions (J. R. Jones).

From the titles it can be assumed (correctly) that some of the topics covered are only of peripheral interest to someone engaged in natural product biosynthesis. However, the majority of the publication is pertinent. The section, "Application of Isotopes in Biosynthesis," which covers the use of isotopes of carbon, hydrogen, oxygen, and nitrogen in biosynthesis and uses studies on penicillin and cephalosporins as well as other compounds as examples, is of direct interest. The discussion covers the use of different isotopes to investigate biosynthetic precursors as well as individual reaction mechanisms, and discusses the relative merits of the various methods for analysis of labelled compounds.

Synthetic approaches to ^{14}C and ^3H -labelled compounds are covered in the chapter by Evans, and similar topics are discussed in less depth in the chapters by Lockhart and Hawkins. Dr. Evans' chapter is especially useful and is an excellent account of the merits and drawbacks associated with the various reaction types and approaches to labelling. Dr. Evans also wrote a fine chapter on the analysis of the purity of labelled compounds and the hazards of self-decomposition of radiochemicals, which is especially important to those contemplating the use of high specific activity ^3H -labelled material.

Up-to-date methodology for the analysis of labelled compounds is covered in chapters by Rackman, Elvidge, and Millington and Unsworth, which includes ^{13}C , ^2H , and ^3H N.M.R. and mass spectrometry. The authors provide a thorough understanding of these methods, and relevant examples from the biosynthetic literature are discussed with limitations of the technique being mentioned.

Because of the wide coverage of material in 400 pages, sometimes topics are discussed only briefly; however this is easily circumvented by looking at the references, of which there are a considerable number. Somewhat surprisingly, liquid scintillation counting is not mentioned to any useful extent; for workers wanting to use radio-isotopes in biosynthesis, familiarization with this technique is essential.

In summary, anyone who is interested in employing isotopes for biosynthesis research would find this book excellent as an introduction to the important methods for labelling, analyzing, and using radio- or stable-isotopically labelled compounds. In addition, there is a lot of background material. The price is reasonable for such a useful and enlightening book.

CEDRIC PEARCE, *Department of Chemistry,
University of Illinois, Urbana, Illinois*