

words, the fraction of the book devoted to ideas developed since 1959 is very small.

The style of writing is clear, concise and very readable. It would make an excellent text-book. The printing and paper are of high quality, and it is essentially free from errors. There is a definite, but justifiable, lean to the British work and apparatus, which does not make it any less useful to the American reader. It is highly recommended to the beginning chromatographer or the technician who needs more background.

DEPARTMENT OF CHEMISTRY
UNIVERSITY OF CALIFORNIA
LOS ANGELES 24, CALIFORNIA

ROBERT L. PECSOK

Separation of Heavy Metals. By ANIL K. DE, D. Phil., Reader in Chemistry, Jadavpur University, Calcutta, India. Pergamon Press Ltd., Headington Hill Hall, Oxford, England. 1961. 308 pp. 16 × 23.5 cm. Price \$9.00.

The opening sentence on the inside of the dust jacket is: "This book, the first of its kind, is devoted to liquid-liquid extraction and deals with the theory and practice of this valuable tool for separation of heavy metals." However, it is by no means devoted exclusively to this separations technique, the 91-page section on liquid-liquid extraction being followed by 78-page, 37-page and 27-page sections, respectively, on ion-exchange, analytical procedures (classical) and radiochemical separations procedures.

Of course this diversity of treatment is not, in itself, bad; but the lack of a unifying philosophy of presentation renders the book difficult to read. The resultant disjointed effect is heightened by the presence of an irritatingly large number of "typographical" errors: O_x for Ox (p. 30), making the theoretical treatment difficult indeed; HQEHP for HDEHP (p. 66); Szilard-Chalmer's for Szilard-Chalmers (consistently); misspelling of the names of prominent workers in the field such as Hindman (pp. 106, 189), Maddock (p. 95, 96), Dyrssen (pp. 105, 176), etc.

The theoretical sections on liquid-liquid extraction and ion-exchange are so sketchy as to be of doubtful value; and the "applied" discussions are, in many instances, deficient in detail. For example, pp. 243-249, if the TBP, (*n*-C₄H₉O)₂PO, has not been freed from acidic phosphates (almost certain to be present in the sample as received), the stripping procedure will be totally ineffectual.

Nevertheless, the major criticisms may be summarized by saying that too much has been attempted in too few pages. With the exception that exceedingly sparse attention has been given to amine "liquid ion exchange" systems, the book constitutes a good survey of both liquid-liquid extraction and ion-exchange in the field of metals separations. Whereas it will be of limited value to the separations specialist, it should prove of very real worth to the research worker wishing to use these techniques as tools and to the analytical chemist faced with unusual separations problems.

CHEMISTRY DIVISION
ARGONNE NATIONAL LABORATORY DONALD F. PEPPARD
ARGONNE, ILLINOIS

Progress in Organic Chemistry. 5. Joint Editors, J. W. COOK, D. Sc., F.R.S. Vice-Chancellor, University of Exeter, Fellow of University College, London, and W. CARRUTHERS, Ph.D., M.R.C. Carcinogenic Substance Research Unit, Washington Singer Laboratories, Exeter. Butterworth Inc., 7235 Wisconsin Avenue, Washington 14, D.C. 1961. viii + 172 pp. 15 × 24.5 cm. Price, \$9.00.

Most books which gather together an extensive literature on one or more topics in the field of organic chemistry are useful and valuable even if they leave something to be desired. However, at a time when chemists depend so heavily on the review as an indispensable instrument for broadening their grasp of the ever-changing and proliferating fields of chemical science, one hopes for an emphasis on quality, for a logical selection of topics to be reviewed and for expert and well-reasoned presentation. The latest in the series of volumes on "Progress in Organic Chemistry," in my opinion, is at best of average quality relative to the various reviews which are currently available in organic

chemistry. Its coverage includes chapters on homolytic oxidation processes, hydroxylation of phenols, dextran, diterpenoids and finally tropylium and related compounds. The last of these chapters, written by Professor Nozoe, appeared to me to be of outstanding merit. However, some of the others hardly seemed suitable for inclusion in a series dedicated to "the policy of presenting critical reviews of some of the major topics of organic chemistry which are of present interest." If the chapters do not blend to one man's punch, it is as much due to the unevenness and lack of care in the treatment as to the variety of topics. The book is not inexpensive.

DEPARTMENT OF CHEMISTRY
HARVARD UNIVERSITY
CAMBRIDGE 38, MASSACHUSETTS

E. J. COREY

Molecular Sieves. By CHARLES K. HERSH, Senior Engineering, Armour Research Foundation of Illinois Institute of Technology, Chicago, Illinois. Reinhold Publishing Corporation, 430 Park Avenue, New York 22, N. Y. 1961. vii + 129 pp. 16 × 23 cm. Price, \$6.50.

This well-printed but brief volume on the so-called "molecular sieves" will serve a useful purpose, because of the growing importance of the synthetic zeolites in industrial and technical processes such as the drying of gases at both low and high temperatures, gas separations, ion-exchange and gas chromatography. It is the only book on the subject wherein a coherent picture of the applications of molecular sieves can be found in a single source. The principal difficulty with this book is its brevity. However, the reviewer strongly recommends this volume to libraries and to individuals interested in the subject, especially those desiring an introductory approach.

The brief historical introduction is well-presented and accurate. However, the second and fourth chapters on the physical chemistry of adsorption will be of little interest to those familiar with the theory of adsorption or informative to others. Chapters five to seven represent the heart of the book, and justify its publication.

The lack of specific references to the original literature will limit its usefulness to the initiated, but may be justified on the grounds that the book is primarily directed to the novice. The price is high, considering the number of pages.

Despite some of the obvious short-comings of this book, the reviewer believes that it will serve a useful purpose in stimulating interest in the application of molecular sieves to technical problems, and it is recommended on that basis.

DEPARTMENT OF CHEMISTRY
WILLIAM MARSH RICE UNIVERSITY W. O. MILLIGAN
HOUSTON, TEXAS

The Chemical and Biological Action of Radiations. Volume 5. Edited by M. HAISSINSKY. I. Mechanism of the Radiolysis of Water by Gamma Rays or Electrons. By A. O. ALLEN. II. Action des Rayons Alpha sur les Solutions Aqueuses. By J. PUCHEAULT. III. Diffusion Kinetics in Radiation Chemistry. By A. KUPPERMANN. IV. Mass Spectrometry and Radiation Chemistry. By D. P. STEVENSON and D. O. SCHISSLER. Academic Press, Inc., (London) Ltd., 17 Old Queen Street, London, S. W. 1, England. 1961. xi + 278 pp. 16.5 × 24.5 cm. Price, \$8.00.

The book is prefaced by a seven page introduction by the editor which itself provides an excellent review of the book. He discusses unresolved problems and differences of opinion in a manner not feasible for the individual authors.

No one is better qualified than A. O. Allen to discuss the development of the theories used to explain the action of gamma rays or electrons on aqueous systems and to point out the areas where research work remains to be done. This he does in an interesting and concise manner in the 20 pages of Part I.

In Part II, 53 pages, Pucheault reviews experimental information on the effects in aqueous systems of heavy particles ranging in L.E.T. from high energy protons to low energy alpha particles. He also introduces some new ideas to explain and correlate the yields observed in various