that do not meet the usual criteria, such as acid phosphatase deficiency, where there is no evidence for storage of any material, and cystinosis, where lysosomal storage occurs but an enzyme deficiency has not yet been demonstrated. An interesting chapter on neuronal ceroid lipofuscinosis is included even though the authors state that "current available data does not permit extension of the concept of lysosomal diseases to the neuronal ceroid lipofuscinosis." Aspartylglycosaminuria, lactosyl ceramidosis, Farber's disease, β-xylosidase deficiency, chronic granulomatous disease of childhood, myeloperoxidase deficiency, Chediak-Higashi syndrome, and the relationship of lysosomes and gout, silicosis, and drugs are all included in a single chapter. Heterozygote and prenatal detection using a variety of biological materials for enzyme determinations, as well as the use of suction biopsy of intestinal mucosa for cytopathological investigation, are discussed in separate sections.

Several chapters are included which document the functional role of lysosomes in the digestion of intra- and extracellular macromolecules. These are based both upon cytochemical observations in situ and investigations employing isolated intact organelles. A brief catalog of the enzymes detected and their observed hydrolytic role is provided.

The book is heterogeneous, containing 26 chapters, varying from 9 to 35 pages, by 35 authors. Certain of these chapters provide only superficial treatment of their subject matter. The editors have included essays describing the biochemistry of the sphingolipids as well as the mucopolysaccharides in order to provide the basic information required for a thorough understanding of the biochemical aspects of the diseases. These are offered presumably for the clinician or nonspecialist. A similar treatment of basic clinical pathology might have been useful for the biochemist who is not a physician.

As an attempt to relate the functional and physiological role of lysosomes to these diseases the book is not completely successful, since approximately 80 percent of it is devoted to the diseases and only 20 percent to lysosomes and their function.

The book is too expensive to be used as a primary source for any formal course. It could be useful as a general survey of the field for investigators who are not actively working in it, however. There are books available which treat these diseases in greater detail but are not restricted to lysosomal disorders. Also available are books about lysosomes that do not extensively discuss the lysosomal storage diseases. This book could bridge the gap.

J. KANFER
Eunice Kennedy Shriver Center for Mental Retardation, Waltham, Massachusetts

Radicals in Organic Reactions

Free Radicals. JAY K. KOCHI, Ed. Wiley-Interscience, New York, 1973. Two volumes. Vol. 1, xxii, 714 pp., illus. $37.50. Vol. 2, xxii, 906 pp., illus. $42.50. Reactive Intermediates in Organic Chemistry.

The brilliant contributions of M. Kharasch and F. R. Mayo in America and D. H. Hey and W. A. Waters in England in the 1930's proved, contrary to the then-current thought, that radicals are involved in many types of organic reactions in solution. (The pioneering work of L. Michaelis did the same in the biological field at about the same time.) Waters's monograph, the first to discuss the chemistry of organic radicals in mechanistic terms, was published in 1946; in 1957, Walling published his widely quoted monograph. Both these books offered far-reaching insights and a conceptual framework for understanding what was a novel, burgeoning field.

The 1960's saw the publication of the first textbook on radicals and an impressive series of monographs covering virtually every topic in the field. My own shelves contain over 50 books on specialized themes in radical chemistry, electron spin resonance, photochemistry and photobiology, and radiation chemistry and biology. Clearly, radical chemistry now is a mature field, and novel mechanistic insights cannot be expected in the same degree as when Waters and Walling wrote. Nevertheless, there have been many important theoretical as well as practical developments in the past decade, and a detailed rationalization and review of the wealth of new data was sorely needed. Now, however, this task is beyond the talents or time of a single author: the field is just too vast. Clearly, a series of chapters by specialists writing under tight editorial direction was called for; Kochi's volumes elegantly supply this need.

These two volumes provide an up-to-date review of virtually all of organic free radical chemistry. A series of 26 chapters, most by recognized experts, are divided into four main classes: dynamics of elementary processes; radical chain reactions; structure and energetics; and reactions with heteroatoms. Gas-phase reactions are covered only in a short, introductory chapter, as is appropriate for a work centered on the chemistry of organic radicals. More surprisingly, there is no chapter on polymerization, although some discussion of polymer data is included in other chapters. This work is, of course, aimed at organic chemists, and virtually no free radical biology or examples of the role of radicals in biological systems are included.

Most of the chapters are excellent. Some are more perceptive, better written, or of more general interest than others. Some, as would be expected, duplicate material already available in recent monographs; some provide reviews and insights into recently developing areas that are not available elsewhere.

In sum, the book is a most satisfactory effort which will be widely used: well organized and, with very few exceptions, expertly and lucidly written. Every organic radical chemist should own a personal copy of these two volumes, expensive though they are. These books will be one of the first places to look for a survey of data and theory on organic radicals and their reactions for the decade to come.

WILLIAM A. PRYOR
Department of Chemistry, Louisiana State University, Baton Rouge

The Arctic Region

Arctic Geology. Proceedings of a symposium, San Francisco, Feb. 1971. MAX G. PITCHER, Ed. American Association of Petroleum Geologists, Tulsa, Okla., 1973. xviii, 746 pp., illus. $30; to members, $24. AAPG Memoir 19.

Arctic Geology is by far the most up-to-date, comprehensive, and authoritative volume on the geology of the Arctic Ocean basin and its margins. The book, consisting of 70 papers selected from the symposium program, goes a long way toward achieving its goal: "integration of regional geology of the Arctic provinces." This is done