

of value to one unfamiliar with biochemistry. The 50 pages or so devoted to general biochemistry might have been better used to extend discussions of the biochemistry and physiology of the diseased plant.

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Two Natural Historians

A Naturalist in Russia. Letters from PETER SIMON PALLAS to Thomas Pennant. CAROL URNESS, Ed. University of Minnesota Press, Minneapolis, 1967. vi + 189 pp., illus. \$7.50.

Unpublished correspondence between fellow naturalists is not, in itself, particularly noteworthy. But when the protagonists are of international repute and concerned with all phases of natural history, interest is aroused. And when the region under consideration was, and continues to be, somewhat inaccessible, the editing of such manuscript material becomes mandatory.

Pennant (1726–1798) and Pallas (1741–1811) represent the best in 18th-century natural history: well-read and indefatigable field collectors, alert to all details yet possessing the ability to select the relevant data, candid and open-minded but critical and discerning in matters pertaining to science. Moreover, as the editor points out in the introduction, each was opposed to Linnaean taxonomy.

The present collection, then, records Pallas's (and, by implication, Pennant's) efforts to substantiate his criticism of Linnaeus' system of classification. Although he never addresses himself explicitly to the logical foundations of Linnaean taxonomy, it is clear that by his knowledge of Russian and subarctic fauna and flora Pallas was able to justify his dissatisfaction with the system. As a result of better information he obtained on geographical distribution and ecology, Pallas was able to add much new material to the zoological record. A knowledge of the seasonal changes of the behavior and coloration of animals in their native habitat enabled him to amplify many observations made by earlier naturalists.

Yet even this knowledge gained by some 40 years in the field did not satisfy Pallas. Over and again, he requests from Pennant information on some

matter of detail, news of new publications, and, above all, specimens. The exchange of specimens was a two-way affair, however, and many pages are taken up with Pallas's lists of desiderata and what he is willing to exchange. In addition to zoology, Pallas and Pennant shared an interest in mineralogy, botany, and geography. Information from Russia was particularly welcome to Pennant, and he owed much to Pallas's almost unique knowledge of northern taxa.

Following the 17 letters, there are a biographical sketch of Pennant and Pallas, a selected bibliography, a key to illustrations (derived from Pallas's writings), and a complete index.

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Chemical Reactions

Photochemistry and Reaction Kinetics. P. G. ASHMORE, F. S. DAINTON, and T. M. SUGDEN, Eds. Cambridge University Press, New York, 1967. xvi + 378 pp., illus. \$13.50.

This book commemorates the contributions of R. G. W. Norrish to photochemistry and reaction kinetics. It comprises a series of essays in which a number of Norrish's former students and scientific colleagues describe specific areas of research in which he has been active. While the immediate occasion of this volume was Norrish's retirement from the Chair of Physical Chemistry in the University of Cambridge in September 1965, its appearance is happily coincident with the accolade of the Nobel Prize in which he shared.

The first two contributions, by W. A. Noyes, Jr., and B. Lewis, respectively, specifically survey the contributions of Norrish to photochemistry and to the study of combustion. That by Noyes admirably summarizes both the historical context of the photochemical work and the sweep of its development.

Chapters 3 to 7 are concerned with photochemistry in several of its aspects. Chapter 3, "Photochemistry in the liquid phase" by C. H. Bamford and R. P. Wayne, presents a useful review of a number of photochemical systems, subdivided into inorganic and organic. The review does not uniformly carry each system to its latest state of development, but all of the material presented is helpful as survey and com-

mentary. Chapter 4, by F. S. Dainton and D. B. Ayscough, deals with gaseous photochlorination—principally of hydrogen, chlorocarbons, and hydrocarbons. Both mechanistic and rate considerations are discussed, and useful digests or relevant Arrhenius parameters are provided.

Chapters 5 and 6 describe some aspects of flash photolysis. The former is by George Porter, co-discoverer of the technique and Nobel co-laureate with Norrish. Porter presents a personal and brief account of the experimental characteristics of the method and surveys various subfields and applications of the technique to date. Chapter 6, by B. A. Thrush, reviews in considerable detail some of the intensely interesting work—much of it done at Cambridge—on the gas-phase kinetic spectroscopy of small radical and molecule intermediates in various states of electronic and internal excitation.

Chapter 7, "Energy transfer in molecular collisions" by A. B. Callear, is the highlight of the volume. In 65 pages Callear gives a succinct and effective account of various aspects of the study of transfer of energy between translational, rotational, vibrational, and electronic degrees of freedom of small molecules. The author's interest in the field obviously owes its origin to his location at the center of experimental work in kinetic spectroscopy.

In Chapter 8, J. C. Bevington summarizes Norrish's work in polymer chemistry. The remainder of the volume deals primarily with the kinetics of oxidation. Chapter 9, by N. N. Semenov, leads off with a somewhat general account of "Modern concepts." Chapters 10 and 11, by J. H. Knox and P. G. Ashmore, respectively, deal with low-temperature oxidation and the sensitization and inhibition of ignition. A chapter by J. H. Purnell and C. P. Quinn on pyrolysis of paraffins concludes the volume. These last four chapters provide a useful digest of the status of areas which, in some ways, rank among the most frustrating and recalcitrant in gas-phase chemical kinetics.

This tribute to Norrish is intended for use by students. It should be of value to all such who desire a very readable, introductory exposition of the areas treated, as well as to many scientists who wish to refurbish their backgrounds in these subjects.

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