to some trivial work and even some that appears preposterous, all manner of work merits some consideration.

As the various areas of research represented in the book fill in or are discarded, we will see no more books like this. Furthermore, standards for acceptable research will rise to the higher levels represented by some of the contributors. But nowadays, if we are really interested in mind, we must keep ours a little bit open.

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Enzymology

The Role of Nucleotides for the Function and Conformation of Enzymes. Proceedings of Alfred Benzon Symposium I, Copenhagen, Sept. 1968. HERMAN M. KALCKAR, HANS KLENOW, AGNETE MUNCH-PETERSEN, MARTIN OTTESEN, and JORN HESS THAYSEN, Eds. Munksgaard, Copenhagen, and Academic Press, New York, 1970. 336 pp. illus. $14.

The topics covered in this symposium range from the binding of nucleotides to enzymes, to the effects of nucleotides and other ligands on allosteric enzymes, and finally to some aspects of protein synthesis. Although all the papers mention nucleotides in some way (as, in fact, what biochemical papers do not?) details of their role are of importance for only a few. Notable for its absence in a book with this title is any formal consideration of the chemical properties of nucleotides. Nor is there any mention of studies on nucleotide binding to enzymes using the very powerful techniques of x-ray diffraction and nuclear magnetic resonance. In fact, the symposium can best be characterized as a collection of rather miscellaneous biochemical articles, weighted somewhat toward consideration of allosteric enzymes.

This is not to say that the book is without value. The overall quality of the individual papers is high and the format is attractive. The papers average about 25 pages each, and there is room for full development of ideas and detailed presentation of some interesting experimental approaches. These include Colowick's elegant method for rapid measurement of ligand binding to hexokinase by rates of dialysis, Theorell's use of gel electrophoresis to study liver alcohol dehydrogenase isozymes, and Frieden's stopped-flow light-scattering experiments to monitor ligand-induced dissociation of glutamate dehydrogenase. There are several review articles on well-characterized enzymes which remain up to date, particularly Cori's article on phosphorylase, which has an especially good description of ligand-ligand interactions; Stadtman's and Holzer's papers on glutamine synthetase, which discuss regulation of the enzyme both covalently, through adenylation of a tyrosine residue, and noncovalently, through cumulative negative feedback inhibition; and Kirschner's qualitative description of the use of rapid kinetic methods to resolve the steps involved in conformational change in glyceraldehyde 3-phosphate dehydrogenase. In addition, the transcripts of the question-and-answer periods following the presentation of each paper are included, and the sophistication of the audience was such that the comments are often insightful and amusing, as, for example, Cori's anthropomorphic observation on the T and R states of Monod, that "in order to be catalytically active one has to be relaxed."

Enzymologists with an interest in allostery will find much of value in this book, and for this limited audience it can be recommended. It is not, however, the place to get detailed knowledge of the role of nucleotides in enzyme function and conformation.

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Light and the Atmosphere

Introduction to Meteorological Optics. R. A. R. TRICKER. Mills and Boon, London, and Elsevier, New York, 1971. 286 pp., illus. $11.

Intended as an introduction, this book describes and presents the physics and elementary mathematics of most of the phenomena of atmospheric optics in an enjoyable, clear, and straightforward style. It also provides fresh perspectives, supported by convincing arguments and experiments, on many problems. The book begins with a short chapter on refraction, mentioning scintillation, lunar eclipses, and refraction in the atmospheres of planets, but omitting the green ray of the setting sun. The nature of the Heiligenschein, a back reflection from dew on grass around the shadow of the head of the observer, is explained through interesting microscopic and telescopic observations, as well as experiments. The theories of the ray optics and, in a later chapter, of the wave optics of the rainbow are carefully developed and made easily understandable. The horizontal rainbow is not mentioned.

The largest section of the book deals with ordinary and rare ice crystal halos. The author corrects an earlier explanation of Lowitz's tangent arc in connection with new insights into the orientation of falling crystals. The chapter on cloud droplet coronas extends to well-documented experiments with dusted and misted glass plates to show that interference pattern (with a dark center) will outweigh diffraction if particles are separated by less than two diameters. Then follows an attempt to extend the ray theory of the glory, which is the diffraction pattern seen on the surface of clouds around the shadow of an aircraft.

Now the author leaves the confines of the classical meteorological optics—the optics of hydrometeors—and turns to the fundamentals of atmospheric optics, of scattering by molecules and aerosol. He familiarizes the reader with boundary conditions and solutions of the Maxwell equation (which itself is derived in the short appendix, along with other, more complicated mathematical developments) and discusses the Mie theory. In the chapter on Rayleigh scattering, Lord Rayleigh's original reasoning is presented before the author turns, very briefly, to aerosol scattering. The last chapter, on visibility, brings together in unconventional ways the essence of theory and practice of scattering, attenuation, and contrast in the atmosphere.

Despite the high quality of this introduction, it does not provide any access to modern developments where such have taken place. The book appears to have been completed around 1950, with very little attempt at updating, even to the extent of adding important newer references. Thus the reader will not learn about the optics of the real rainbow as dictated by the flattening of falling raindrops or about the present-day applications of the Mie theory to all problems of scattering by aerosol and clouds. A good help to the mathematics of the book is the drawings, though captions are sparse. Most of the photographs are acceptable.

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