

## Ocular Chemistry

**Biochemistry of the Eye.** ELAINE R. BERMAN. Plenum, New York, 1991. xvi, 476 pp., illus. \$85. Perspectives in Vision Research.

The 1980s saw a large influx of scientists into the field of eye research and a concomitant surge in information about the biochemistry of this organ. Elaine Berman, who pioneered the study of ocular macromolecules 30 years ago, has undertaken the task of integrating this new knowledge (including that obtained by molecular-biological techniques) with enduring older studies. The result is a much-needed, thoughtful snapshot of this rapidly expanding field as it existed in mid-1989.

The tissues that compose the vertebrate eye have a unique function: they must maintain their transparency while focusing light on the retina. The retina has the additional job of converting incident light into electrical signals that the brain can interpret as visual patterns. In many ways these functions are reflected in specialized biochemical pathways, such as the visual cycle, in which vitamin A is processed into an isomeric form found nowhere else in the body and required for interaction of the retina with light. On the other hand, much of the activity in the eye is a set of variations on standard biochemical themes. And to make matters even more interesting, the eye sometimes subverts ordinary cellular components and mechanisms for its own use, as in the recruitment of some common enzymes like lactate dehydrogenase into service as structural proteins (the crystallins of the lens). This book succeeds in differentiating among these cases by including several introductory chapters on selected aspects of general biochemistry, such as G proteins, extracellular matrix components, and defenses against oxidative damage. Then, when these topics are later discussed in connection with the various ocular tissues, it is clear how each process is modified to meet the requirements of the eye.

Berman's text is remarkably compact and yet relays in-depth information about the components, metabolism, and specialized reactions of the various tissues of the eye, from the tear film to the retinal pigment epithelium. This concision is achieved, in part, by the skillful utilization of schematic diagrams. The sections of the book that link clinical disorders (such as cataracts and retinal degenerations) to biochemical mechanisms gone awry make particularly interesting reading. Perhaps the most important achievement of this book is its exhaustive lists of references to the original literature, making it a valuable resource for researchers in the field.

The two other most recent books on the subject, both also entitled *Biochemistry of the Eye* (C. N. Graymore, Ed., 1970 and R. E. Anderson, Ed., 1983), were multi-authored. The single authorship of the present volume reduces redundancy and ensures a consistent style and viewpoint. The book is not without some weaknesses: A more detailed index with cross-referencing would facilitate the location of individual components and processes in the text. The labels on figures sometimes do not coincide with terms in the text, as is the case with the introductory diagram of the eyeball. Finally, some topics are discussed without appropriate mention of active controversies among investigators; an example is the collagen composition of the corneal basement membrane. This is not too serious a defect, however, since the reader is always told where to find details in the primary sources.

The 1990s have inevitably brought exciting discoveries, such as the correlation between retinitis pigmentosa and rhodopsin mutations, that could not have been included in this book. A sequel will be necessary in a few years. Until then, Berman's book makes accessible a wealth of well-organized information and references and should be a very useful resource for researchers, students, and ophthalmologists who need a manageable summary of the biochemical functioning of the eye in health and disease.

ALICE J. ADLER  
*Eye Research Institute,  
Boston, MA 02114*

## Books Received

**Biomedical and Social Developments in AIDS and Associated Tumors.** G. Giraldo *et al.*, Eds. Karger, New York, 1991. viii, 283 pp., illus. \$198.50. Antibiotics and Chemotherapy, vol. 43. From an advanced course, Naples, Italy, March 1990.

**The Birds of Japan.** Mark A. Brazil. Illustrations by Masayuki Yabuuchi. Smithsonian Institution Press, Washington, DC, 1991. xiv, 466 pp., + plates. \$49.95.

**Chemometrics.** Experimental Design. Ed Morgan. Wiley, New York, 1991. xviii, 275 pp., illus. \$54.95. Analytical Chemistry by Open Learning.

**Cirrhosis, Hepatic Encephalopathy, and Ammonium Toxicity.** Santiago Grisolia, Vicente Felipo, and María-Dolores Miñana, Eds. Plenum, New York, 1991. viii, 276 pp., illus. \$69.50. Advances in Experimental Medicine and Biology, vol. 272. From a symposium, Valencia, Spain, Nov. 1989.

**The Dentition of Arctic Peoples.** Christy G. Turner, II. Garland, New York, 1991. xiv, 281 pp., illus. \$59. Evolution of North American Indians.

**Designer's Handbook of Instrumentation and Control Circuits.** Joseph J. Carr. Academic Press, San Diego, CA, 1991. xiv, 626 pp., illus. \$99.50.

**Education and Training in the Care and Use of Laboratory Animals.** A Guide for Developing Institutional Programs. Committee on Educational Programs in Laboratory Animal Science, National Research Council. National Academy Press, Washington, DC, 1991. xii, 139 pp. Paper, \$7.95.

**Finite-element Plasticity and Metalforming Analysis.** G. W. Rowe *et al.* Cambridge University Press, New York, 1991. xxvi, 297 pp., illus. \$100.

**Fits and Faints.** John B. Stephenson. Keith Press, London, 1990 (distributor, Cambridge University Press, New York). x, 202 pp., illus. \$40.50. Clinics in Devel-

opmental Medicine, no. 109.

**General Relativity and Relativistic Astrophysics.** Norbert Straumann. Springer-Verlag, New York, 1991. xiv, 459 pp., illus. Paper, \$39. Texts and Monographs in Physics. Translated from the German edition (Berlin, 1988) with revisions by E. Borie.

**Genetic and Ecological Diversity.** The Sport of Nature. L. M. Cook. Chapman and Hall, New York, 1991. x, 192 pp., illus. Paper, \$29.95.

**High Temperature Superconductivity.** J. Evetts, Ed. Hilger, Philadelphia, PA, 1991 (distributor, American Institute of Physics, New York). xvi, 453 pp., illus. \$130. From a conference, Cambridge, U.K., Aug. 1990.

**History, Philosophy, and Science Teaching.** Selected Readings. Michael R. Matthews. Ontario Institute for Studies in Education, Toronto, Canada, and Teachers College Press, New York, 1991. xii, 244 pp. Paper, \$22.95. Readings in Educational Controversy.

**Infants in Crisis.** How Parents Cope with Newborn Intensive Care and Its Aftermath. Glen Affleck, Howard Tennen, and Jonelle Rowe. Springer-Verlag, New York, 1991. x, 156 pp., illus. \$49. Disorders of Human Learning, Behavior, and Communication.

**Komodo.** The Living Dragon. Dick Lutz and J. Marie Lutz. Dimi Press, Salem, OR, 1991. xvi, 174 pp., illus. Paper, \$10.95.

**Land Planner's Environmental Handbook.** William B. Honachefsky. Noyes, Park Ridge, NJ, 1991. xviii, 722 pp., illus. \$96.

**Laser Light Scattering.** Basic Principles and Practice. Benjamin Chu. Academic Press, San Diego, CA, 1991. x, 343 pp., illus. \$74.50.

**Il Linguaggio delle Variabili.** Strumenti per la Ricerca Sociale. Mario Cardano and Renato Miceli. Rosenberg and Sellier, Torino, Italy, 1991. 346 pp., illus. Paper, Lit. 38.

**Mathematical Physics.** P. K. Chattopadhyay. Wiley, New York, 1991. xii, 352 pp., illus. \$34.95.

**Mathematical Sciences, Technology, and Economic Competitiveness.** James G. Glimm, Ed. National Academy Press, Washington, DC, 1991. xii, 114 pp., illus. Paper, \$22.

**New Perspectives on Evolution.** Leonard Warren and Hilary Koprowski, Eds. Liss (Wiley), New York, 1991. xii, 258 pp., illus. \$49.95. Wistar Symposium Series, vol. 4. From a symposium, Philadelphia, PA, April 1990.

**Nuclear Structure and Heavy-ion Reaction Dynamics 1990.** R. R. Betts and J. J. Kolata, Eds. Institute of Physics, Philadelphia, PA, 1991. x, 308 pp., illus. \$80. Institute of Physics Conference Series, no. 109. From a workshop, Notre Dame, IN, May 1990.

**Our Universes.** Sir Denis Wilkinson. Columbia University Press, New York, 1991. xiv, 213 pp. \$45. George B. Pegram Lecture Series. From lectures, Brookhaven, NY, Feb. 1989.

**Patty's Industrial Hygiene and Toxicology.** Vol. 1, Part A, General Principles. George D. Clayton and Florence E. Clayton, Eds. 4th ed. Wiley, New York, 1991. xx, 1079 pp., illus. \$198. A Wiley-Interscience Publication.

**Pay for Performance.** Evaluating Performance Appraisal and Merit Pay. George W. Milkovich and Alexandra K. Wigdor, Eds. with Renae F. Broderick and Anne S. Mavor. National Academy Press, Washington, DC, 1991. x, 210 pp., illus. Paper, \$24.95.

**Quantum Mechanics 2.** A. Galindo and P. Pascual. Springer-Verlag, New York, 1991. xvi, 374 pp., illus. \$59.50. Translated from the Spanish edition (Madrid, 1988) by L. Alvarez-Gaume. Texts and Monographs in Physics.

**Resonance Ionization Spectroscopy 1990.** J. E. Parks and N. Omenetto, Eds. Institute of Physics, Philadelphia, PA, 1991. xvi, 474 pp., illus. \$130. Institute of Physics Conference series, no. 114. From a symposium, Varese, Italy, Sept. 1990.

**Scanning Force Microscopy.** With Applications to Electric, Magnetic, and Atomic Forces. Dror Sarid. Oxford University Press, New York, 1991. xviii, 253 pp., illus. \$45. Oxford Series on Optical Sciences, 2.

**Science, Medicine, and Animals.** Committee on the Use of Animals in Research, National Academy of Science and the Institute of Medicine, National Academy Press, Washington, DC, 1991. viii, 30 pp., illus. Paper, \$5.00.

**Trees.** Why Do You Wait? America's Changing Rural Culture. Richard Crutchfield. Island Press, Washington DC, 1991. xvi, 270 pp. \$19.95; paper, \$14.95.

**A World List of Mammalian Species.** G. B. Corbet and J. E. Hill. Illustrations by Ray Burrows. 3rd ed. Natural History Museum Publications, London, and Oxford University Press, New York, 1991. viii, 243 pp. \$72.