

cells and fibrinogen and cell surface proteins such as fibronectin. Hawiger and Niewiarowski discuss impressive data that have emerged from their laboratories concerning the exact amino-acid sequence in the fibrinogen molecule, that is, the carboxy-terminal portion of the γ chain responsible for the binding of fibrinogen to activated platelets, an event that appears essential in normal platelet aggregation. The detailed studies pioneered by Mosher also tell us of the exact domains in fibrinogen and fibronectin that allow these two molecules to attach noncovalently and covalently.

Several years of work in Henschen's laboratory had by 1982 provided information on the discrete amino acid switches in ten cases of dysfibrinogenemia. (At this time, the number of abnormally functioning fibrinogens that have been characterized has doubled.) This information is beginning to pay off in an understanding of the function of normal fibrinogen.

Although much information is needed in the form of high-resolution x-ray diffraction patterns before we can completely comprehend the three-dimensional structure of fibrinogen and fibrin, comprehension is clearly within our reach. Although work on the genes of the fibrinogen chains has just begun, the impressive progress made so far makes it reasonable to expect that the next few years will provide much clarification concerning the regulation of the fibrinogen genes as well as the genotypical features of the major inherited fibrinogen disorders, the afibrinogenemias and the dysfibrinogenemias. The book provides strong reassurance that we will soon understand the conversion of fibrinogen to fibrin.

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Invertebrate Lineages

Crustacean Phylogeny. FREDERICK R. SCHRAM, Ed. Balkema, Rotterdam, 1983 (U.S. distributors, MBS, Salem, N.H.). xii, 372 pp., illus. \$38. Crustacean Issues, 1. Based on a symposium, Dallas, Dec. 1981.

A revival of interest in the phylogeny of Crustacea has occurred in recent decades, stimulated by such developments as Manton's proposal that the Arthropoda are polyphyletic, the discovery of new classes of Crustacea apparently possessing ancestral characters (Cephalo-

carida and Remipedia), evidence from new fossils, and the availability of cladistic methods for constructing family trees. This revival has produced debate on a number of issues, some of which are considered in this volume. Three authors discuss the validity of Dahl's class Maxillopoda. Grygier argues that it is a natural taxon and enlarges it to include Hansen's Y-larvae and, on the basis of sperm morphology, the Pentostomida. Newman reconstructs the probable developmental stages of the ancestral malacostracan and suggests how the Maxillopoda evolved by pedomorphosis from the 11th of the proposed 14 stages. Boxshall rejects the Maxillopoda and finds within the group three independent lineages whose evolution has been guided by functional adaptations. The largest group of Maxillopoda, the Copepoda, and their diversity are the subject of a rather recondite essay by Marcotte, which includes an introduction to ancient Greek philosophy. The phylogeny of the Ostracoda, sometimes excluded from the Maxillopoda, is treated by McKenzie, Müller, and Gramm, with a good discussion and illustrations of the recently discovered Cambrian phosphatocopids with fully preserved appendages.

Other issues involve the caridoid facies and the carapace. Did the ancestral malacostracan conform to the caridoid facies, and did it have a carapace? Hessler answers yes to both questions in unequivocal terms. Dahl believes that eumalacostracan orders evolved from ancestors that lacked a carapace but had the caridoid escape reaction of suddenly flexing the abdomen and tail fan forward. In his view isopods and amphipods did not lose their carapaces during evolution but never had them.

The Peracarida and its components are considered by three authors. On the basis of the analysis of six characters, Watling abolishes the Peracarida, places the Spelaeogriffacea, Cumacea, Tanaidacea, and Thermosbaenacea in Schram's superorder Brachycarida, transfers the Mysidacea to the Eucarida, and raises the Amphipoda and Isopoda to superfamily rank. Useful papers on the Amphipoda and Tanaidacea are contributed by Bousfield and Sieg, respectively.

Kunze gives arguments for recognizing the Hoplocarida as a subclass of Malacostraca rather than a superorder within the subclass Eumalacostraca. In this she is supported by Dahl and Schram but opposed by Hessler.

Three papers deal with the Decapoda.

Felgenhauer and Abele find four independent evolutionary lines of shrimplike forms, Dendrobranchiata, Procarididea, Stenopodidea, and Caridea, but suggest that the last is heterogeneous. Rice reviews the evidence available from zoea larvae for the pathways of evolution in crabs but warns of pitfalls in basing phylogeny on larval characters. Burkenroad, long recognized for his pioneering work on peneid shrimp systematics, finally publishes his key to the taxa of peneids (Dendrobranchiata), a key that has been available in some circles for many years. It is good to finally have this key published, but unfortunately Burkenroad did not update it to include recent advances in peneid taxonomy, especially those of the distinguished peneid specialist Perez Farfante. Burkenroad's curt dismissal of Perez Farfante's important contributions in three footnotes is inexcusable, in my opinion.

This volume will not end debate on any issues of crustacean phylogeny, but Schram has done us a service by making available, conveniently, the pros and cons of many of the issues. I recommend this book to anyone interested in the evolution of Crustacea.

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Books Received

Chemical Skills. Edward I. Peters. 2nd ed. McGraw-Hill, New York, 1983. xvi, 472 pp. Paper, \$16.95.

Chemistry and World Food Supplies. The New Frontiers. CHEMRAWN II. L. W. Shemilt, Ed. Pergamon, New York, 1983. xvi, 664 pp., illus. \$135; paper, \$75. From a conference, Manila, Dec. 1982.

The Computerization of Newspaper Organizations. The Impact of Technology on Organizational Structuring. Nancy M. Carter and John B. Cullen. University Press of America, Lanham, Md., 1983. vi, 139 pp. \$21; paper, \$9.25.

Contemporary Nephrology. Vol. 2. Saulo Klahr and Shaul G. Massry, Eds. Plenum, New York, 1983. xxvi, 793 pp., illus. \$75.

Equilibria, Nonequilibria, and Natural Waters. Vol. 1. Ricardo M. Pytkowicz. Wiley-Interscience, New York, 1983. xvi, 351 pp., illus. \$49.95.

Equilibrium in the Balance. A Study of Psychological Explanation. Sophie Haroutunian. Springer-Verlag, New York, 1983. xviii, 157 pp., illus. \$23.50. Springer Series in Cognitive Development.

Ionization Potentials. Some Variations, Implications and Applications. L. H. Ahrens. Pergamon, New York, 1983. xii, 104 pp., illus. Paper, \$29.50.

Is God a Creationist? The Religious Case Against Creation-Science. Roland Mushat Frye, Ed. Scribner, New York, 1983. x, 205 pp. \$15.95.

Microclimate. The Biological Environment. Norman J. Rosenberg, Blaine L. Blad, and Shashi B. Verma. 2nd ed. Wiley-Interscience, New York, 1983. xxvi, 495 pp., illus. \$34.95.

Mindsteps to the Cosmos. Gerald S. Hawkins. Harper and Row, New York, 1983. x, 341 pp., illus. \$19.95.

Teratocarcinoma Stem Cells. Lee M. Silver, Gail R. Martin, and Sidney Strickland, Eds. Cold Spring Harbor Laboratory, Cold Spring Harbor, N.Y., 1983. xxii, 743 pp., illus. \$85. Cold Spring Harbor Conferences on Cell Proliferation, vol. 10. From a conference, Cold Spring Harbor, Sept. 1982.