are incorporated, and the results seem well supported. He proposes four orders of marsupials arranged in two cohorts: the Ameridelphia, which includes all Western Hemisphere forms with the exception of the small opossum *Dromiciops*, and the Australidelphia. This arrangement of *Dromiciops* is also supported by karyotypic evidence (Sharman) and has obvious zoogeographic significance.

Naturally, there are things to criticize in such a large and complex undertaking. There are too many typographical errors and too many of the figures were poorly designed for the required reductions in size. I find it unacceptable to include, as some authors have, the distinctive dasyurid *Antechinomys* within the genus *Sminthopsis*. Except for dental morphology, all other aspects of anatomy and the isozyme data support separate generic status for *Antechinomys*. Rather than list deficiencies and disagreements, however, I prefer to emphasize the major contributions made in these two volumes, their welcome synthesis of various viewpoints and approaches, and the genuine effort that was apparently made to keep the authors in communication with each other. This seems to have been a symposium true to the literal sense of the word, and the volumes are ones any biologist would be pleased to own. They are clearly essential for any mammalogical library and are to be recommended for any scientist or research group concerned with the comparative approach to ecology, physiology, behavior, paleontology, or evolution.

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Biochemistry

Structure and Function Relationships in Biochemical Systems. Proceedings of a symposium, Rome, Sept. 1981. FRANCESCO BOSSA, EMILIA CHIANCONE, ALESSANDRO FINAZZI-AGRÒ, and ROBERTO STROM, Eds. Plenum, New York, 1982, x., 386 pp., illus. $49.50. Advances in Experimental Medicine and Biology, vol. 148.

The work of Alessandro Rossi Fanelli provides the focus in this proceedings of a symposium organized to celebrate his 75th birthday. A concise and vivid profile of Rossi Fanelli from both a personal and a scientific perspective is provided by N. Siliprandi in the opening paper. This is followed by a unique statistical analysis by W. E. Blumberg of the honoree's publications and collaborations.

The rest of the volume consists of 26 scientific papers that are divided into five sections. The first is titled Hemoglobin, Myoglobin, and Other Respiratory Proteins and is composed of a theoretical paper by Wyman, discussions of mammalian, fish, and invertebrate hemoglobins by Perutz, Gibson and Carey, and Antonini *et al.*, and a paper on the effects of heavy metals on respiratory proteins of marine organisms by Bonaventura *et al.* Perutz's paper incorporates the extensive literature on this subject in a concise, up-to-date view of hemoglobin structure and function. The papers by Gibson and Carey and Antonini *et al.* serve to emphasize the utility of studies of hemoglobins from fish and invertebrates and their contribution to our understanding of mammalian hemoglobin structure and function.

The second section, Mechanism of Action of Metal-Containing Enzymes, deals extensively with present knowledge of the structure and function of cytochrome *c* oxidase. Papers by Malmström, Chance *et al.*, and Brunori *et al.* discuss current views regarding the participation of the Cu and heme centers in the reduction of O_2 to H_2O as well as structural alterations involved that may be relevant to the role of this redox protein in energy coupling. An excellent paper by Beinert discusses the influence of conformational alterations on function for a number of enzymes containing iron-sulfur centers in addition to cytochrome *c* oxidase. The role of Cu in enzyme-catalyzed reactions is also treated in papers on the well-studied Cu-Zn superoxide dismutase and the less understood amine oxidases.

The third section, Bioenergetics, Membrane Structure, and Multienzyme Complexes, serves to remind us of the role of supramolecular organization in the functional control of biological processes. Topics addressed range from protein-membrane interactions to enzyme-enzyme interactions, with excellent papers by Lehninger on mitochondrial energy transduction and by Reed and Oliver on the pyruvate and α-ketoglutarate dehydrogenase complexes.

Modulation of the chemical function of the bound coenzyme by the environment provided by the host apoenzyme is discussed in the fourth section, Cofactor-Dependent Enzymes. Excellent papers by Snell and by Massey deal respectively with the comparative aspects of pyridoxal phosphate and pyruvoyl-dependent amino acid decarboxylases and with the correlation of flavin environment with function in a number of flavoenzymes.

The final section, Sulfur Metabolism, consists of a review of the chemistry and biological occurrence of persulfide groups by Wood and one of the biological utilization of selenium- and sulfur-containing amino acids by De Marco and Di Girolamo and a paper on some interesting observations of chemical reactions of selected sulfur-containing amino acids subsequent to enzyme-catalyzed oxidative deamination by Cavallini *et al.*

The volume is readable and informative. The papers are, in general, well written and provide concise, current treatments of their respective topics.

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An Era in Classical Physics

Energy, Force, and Matter. The Conceptual Development of Nineteenth-Century Physics. P. M. HARMAN. Cambridge University Press, New York, 1982. x, 182 pp., illus. Cloth, $27.50; paper, $8.95. Cambridge History of Science.

To laypersons classical physics has long been epitomized by Newtonian mechanics, in contraposition to the relativistic mechanics and quantum mechanics of our century. Peter Harman seeks to reform that consciousness by displaying for a non-mathematical audience the great subtlety and variety in the mechanical worldview of 19th-century physicists. The reader will see that energy physics, thermodynamics, electromagnetic field theory, and statistical mechanics were a long way from Newton. They were also a long way from Einstein and Bohr, but not so far as we imagine when we think of mechanics only in terms of forces acting between atoms in conformity with the laws of motion. During the second half of the 19th century "classical" physics posed for itself puzzles that still haunt those who wish to understand nature. What is an electromagnetic field? What is the meaning of the second law of thermodynamics? How are we to conceive that randomness in nature which seems to require a probabilistic description at the most fundamental level? Such are the questions to which Maxwell, Wilhelm Weber, Helmholtz, Boltzmann, William Thomson, Hertz, and others equally renowned sought answers. Their subjects did not exist in 1840, but by 1900 these men had upset the foundations of mechanical philosophy in their attempts to elaborate it.