Weiner, E.R.: **Applications of Environmental Chemistry. A Practical Guide for Environmental Professionals.** – Lewis Publishers, Boca Raton – London – New York – Washington 2000. ISBN 1-56670-354-9. 276 pp., GBP 53.99.

This book, designed as a practical guide for environmental professionals, presents highly exact and detailed descriptions of applications of environmental chemistry. The author uses his life-long experience in the study of water and soil pollution and pollutant behaviour in the environment. The book is divided into seven chapters and also contains three appendices.

Chapter 1—Water Quality—shortly defines the water quality and possible sources of water pollution. Chapter 2—Principles of Contaminant Behaviour in the Environment—deals mainly with pollutant behaviour in the aquatic and soil environments. Knowledge on contaminant behaviour, such as chemical reactions, mobility, partitioning between different components of the environment (air, water, soil), solubility of pollutants and their other characteristics is presented here. Chapter 3—Major Water Quality Parameters—presents important water parameters such as pH, redox potential, acidity, alkalinity, hardness, temperature, and content of total dissolved solids. These parameters strongly influence the behaviour of many substances, including pollutants in water. In this Chapter, the author also discusses several other important hydrochemical parameters, such as the contents of ammonia, sulphide, carbonates, dissolved metals, and dissolved oxygen. Chapter 4—Soil, Groundwater, and Subsurface Contamination—deals with surface and subsurface soil and groundwater contamination with pollutants. The author first describes the soil environment and soil formation. Afterwards are discussed the contaminants' behaviour and their possible interactions with the soil and groundwater environment. Chapter 5—Petroleum Releases to the Subsurface—discusses petroleum pollution occurring mainly below the soil surface. First, the types of petroleum products and behaviour of petroleum are explained in general. The several subsections of this Chapter present possible ways of solving the problem of surface or subsurface petroleum pollution. No exact methodology of pollutant removal is presented, but important information and references can be found here. Chapter 6—Selected Topics in Environmental Chemistry—deals with practical problems, such as agricultural water or drinking water pollution. One subsection of this Chapter also discusses ion exchange processes and indicators of faecal contamination (coliform and streptococci bacteria). Chapter 7—A Dictionary of Inorganic Water Parameters and Pollutants—promises a dictionary and in reality lists and discusses inorganic pollutants containing elements such as Fe, Pb, Cu, Hg, Ag, presented in alphabetical order. At the end of the book, there are two Appendices on Drinking Water Standards set by EPA, and National Recommended Water Quality Criteria, respectively. The third and last Appendix is most practical as it deals with sampling methods, preservation procedures and sample size.

The book has a wide focus on environmental pollutants and represents a highly practical guide to the environment, which is full of different pollutants. The book is well produced and provided with a simple index. It will be undoubtedly useful to everyone interested in environmental chemistry and ecotoxicology.

J. DUŠEK (*České Budějovice*)

Glaser, R.: **Biophysics.** – Springer-Verlag, Berlin – Heidelberg – New York 2001. ISBN 3-540-67088-2. 361 pp., € 45.95.

Biophysics—the science of physical principles of biological systems—is presented in this textbook from molecular structure of biological systems, through interfacial phenomena and membranes, then the energetics and dynamics of these systems are described, to come to the kinetics of biological systems.

The chapter "Molecular structure of biological systems" is introduced by the part dealing with intramolecular bonds. After that, the author explains shortly the basic aspects of molecular excitation and energy transfer. Three pages are also devoted to introduction in photosynthesis. The Boltzmann's thermodynamic probability and entropy is shown very simply in section "Thermal molecular movement, order and probability", where self-organisation and stability of biological structures is also discussed. Reader is here introduced into problems such as distribution of molecular energy, vibration, rotation, and translation of molecules, energy of enzyme activation, and so on. Section "Molecular and ionic interactions as the basis for the formation of biological structures" is fully devoted to properties of water molecules. And the last section of this chapter is devoted to interfacial phenomena and membranes.

"Energetics and dynamics of biological systems" is the largest chapter in the amount of pages (130 pp.). The key sections are firstly "The nonequilibrium distribution of ions in cells" and "Electric fields in cells and organism", where the ion pumps, transmembrane potential effects, and the action potentials of various nerve and muscle cells are illustrated. Secondly, in sections "Mechanical properties of biological materials" and "Biomechanics of fluid behavior" some basic properties of fluids are described (viscosity and viscoelasticity, the biomechanics of the human body; laminar and turbulent flows – blood circulation, swimming, flying).

The topics of next chapter are mainly mechanical oscillations [vibrations, (infra, ultra)sound, biophysics of hearing] electromagnetic fields (from static fields to satellite TV frequencies...), their effects on biological systems; from nature, properties, dosimetry of (ionising) radiation, to aspects of protection against radiation or noise, respectively.

The last chapter is devoted to the kinetics of biological systems. Reader can find here some foundations of systems theory, introduction to compartmental analysis, model approaches to some complex biological processes, such as models of neural processes.

The textbook is not so rangy as the well-known "Biophysics" edited by W. Hoppe, W. Lohmann, H. Markl, and H. Ziegler (Springer-Verlag 1983), where students can find, *e.g.* structure determination of biomolecules by physical methods (spectroscopy). Glaser's Biophysics is a modern textbook, comparable with Russian biophysics monograph written by M.V. Vol'kenshteĭn (Biofizika, Nauka Press, Moscow 1988). This first English edition is not just a translation of the fourth German edition, but is rather a fully revised fifth edition. Many imaginative drawings and 162 figures can encourage students to attend biophysical courses. Rather elusive are numerous corrigenda.

M. DURCHAN (*České Budějovice*)

Leegood, R.C., Sharkey, T.D., Caemmerer, S. von (ed.): **Photosynthesis: Physiology and Metabolism.** – Kluwer Academic Publishers, Dordrecht – Boston – London 2000. ISBN 0-7923-6143-1. 624 pp., USD 334.00, EUR 286.00, GBP 208.00.

This 9th volume of the series "Advances in Photosynthesis" (Series Editor is Govindjee) contains 24 chapters written by authors from all over the word. The reader will certainly know most of their names from the literature of from lectures at photosynthesis meetings. The chapters deal with all details of photosynthetic carbon metabolism, from molecular to eco-physiological aspects, from photosynthetic bacteria to higher plants. A very important aspect in most chapters is genetic basis, mutation, genetic manipulation, modifications in transgenic plants, *etc.* All chapters are based on a broad analysis of existing, mainly recent, literature, the lists of which comprise from 26 to 490 items (very oft over 200 references).

The chapters may be divided into three subsections. The first subsection deals with pathways and regulation of CO_2 fixation, with focus on both carboxylase and oxygenase functions of the enzyme ribulose-1,5-bisphosphate carboxylase (RuBPCO), and with the role of photorespiration. The longest of these chapters deals with the Calvin cycle, its enzymes, gene organisation, expression, and biochemical regulation. Other two chapters on this enzyme explain its assembly, mechanisms of action, and physiology *in vivo.* A special chapter is devoted to photorespiration, its pathway, transfer of reductants from mitochondria, with peroxisomes, *etc.*

Eight chapters of the second subsection are devoted to photosynthates, their main types, cellular partitioning, interactions with respiration and nitrogen metabolism, transport within (across the chloroplast envelope and cell wall, fluxes in the cytosol) and out of the leaf, and so on. They deal with individual saccharides, starch, sugar alcohols, fructans, amino acids, *etc.* Functions of various transporters are also described as well as allocation and partitioning by sugar regulated gene expression.

The remaining eleven chapters in the third subsection explain how plants acquire CO_2 from their environment and how they developed the necessary structures and mechanisms. They deal with conductances to CO_2 transfer in leaf boundary layer, through stomata, and within the leaf, the role of carbonic anhydrase (types, structure, and kinetics), with CO_2 acquisition and concentration in cyanobacteria and algae, and with photosynthetic fractionation of carbon isotopes (among others with water use efficiency, plant production, and ecological aspects). In four chapters devoted to C_4 photosynthesis, its pathway, function, enzyme regulation, metabolite transport, developmental aspects (bundle sheath and mesophyll cells, compartmentation of photosynthesis, gene regulation), and physiological ecology (control by temperature, irradiation, water supply, salinity, nitrogen, and human factor) are discussed. Special chapters deal with C_3-C_4 intermediate plants (advantages of this metabolic type, modification of photorespiratory mechanism, evolutionary importance, *etc.*) and with plants of the Crassulacean Acid Metabolism (two chapters: on molecular aspects and on ecophysiology).

As common in this book series, in most chapters various models are presented in numerous figures and their validity is evaluated. Four colour plates show the active site of RuBPCO, structure of this enzyme, structure of forms of the H-protein from the leaf glycine decarboxylase complex, and the metabolism and transport of primary soluble photosynthates. In tables in individual chapters the presence, properties, and functions of substances, translocators, enzymes, assimilates, important metabolic values, *etc.* in various plant species and various papers are listed. A detailed subject index is supplemented. I usually regret that this book series does not contain also author indexes – I often recall the author's name but not the exact citation of the paper I am looking for. Let us hope that such comprehensive author index will be later produced for those who own the complete "Advances in Photosynthesis". Its proper form may be a CD-disc.

This book is again a perfect source of information for advanced students and researchers. In this field no other up-to-date book exists.

Z. ŠESTÁK (*Praha*)