Hunter, C.N., Daldal, F., Thurnauer, M.C., Beatty, J.T.: **The Purple Phototrophic Bacteria.** Advances in Photosynthesis and Respiration. Vol. 28. Springer, Dordrecht 2009, ISBN: 978-1-4020-8814-8. 1014 pp. € 349.00; CHF 579.50; USD 499.00; GBP 276.00.

The 28th volume of *Advances in Photosynthesis and Respiration* Series brings a new comprehensive review of Purple Phototrophic Bacteria. With the new book the Series returned to the field of bacterial photosynthesis, which was already once covered by its second volume called *Anoxygenic Photosynthetic Bacteria* (Blankenship, R.E., Madigan, M.T. and Bauer, C.E. – Kluwer Academic Press, Dordrecht 1995). This monumental treatise contained 62 chapters covering all the various forms of anoxygenic photosynthesis, and with its 1331 pages it still represents the most voluminous part of the whole *Series*! Facing such a vast field the editors of the new volume wisely decided to restrict the focus of the new book only on the phototrophic microorganisms belonging to phylum *Proteobacteria*. The change of the word from *photosynthetic* to *phototrophic* in the title of the new volume was not just accidental. It signalizes one of the major advances in the field, which was the recognition of many phototrophic species, which cannot be considered as truly photosynthetic as they do not fix inorganic carbon, but frequently represent abundant and environmentally important organisms.

The effort of the authors and editors resulted in an exhaustive compilation consisting of 48 chapters (1014 pages, still the third largest volume of the Series!) organized into eight sections. The first part Physiology, Evolution and Ecology represents an introduction to the whole book. It brings a combined view of both classical microbiologists as well as the most recent information obtained from currently sequenced bacterial genomes. The second part Biosynthesis of Pigments, Cofactors and Lipids offers very nice reviews of biosynthesis of some basic components of phototrophic cells namely bacteriochlorophyll, carotenoids, cobalamin and lipids. The true photosynthesis starts in Part 3: Antenna Complexes: Structure, Function and Organization. This section is the largest one, containing eight chapters covering the most recent development both spectroscopy and structural biology of purple antenna systems. Part 4: Reaction Center Structure and Function describes the bacterial reaction center functioning and plasticity including the role of the redox cofactors. Part 5: Cyclic Electron Transfer Components and Energy Coupling Reactions deals with electron transport and proton translocation processes in the photosynthetic membranes. It also describes structure and function of cytochrome bc_1 and ATP synthase complexes. Part 6: Metabolic Processes reviews various biochemical and physiological processes in Purple bacteria such as respiration, carbon fixation and nitrate reduction. In addition it contains chapters about metals and metaloids interactions, aromatic compound degradation as well as swimming behavior in Purple bacteria. Part 7: Genomics, Regulation and Signaling deals with genomics and regulation of basic metabolic processes in Purple bacteria namely regulation of gene expression by light and oxygen, regulation of nitrogen fixation or tetrapyrrol biosynthesis pathway. The last part - New Applications and Techniques - describes various molecular, biochemical and biophysical techniques which are currently being introduced in the research of anoxygenic phototrophs.

The nice feature of the book is that it brings together chapters covering both the basic facts as well as chapters focusing on the last "cutting edge" research. The chapters review all the literature till the end of year 2007. However, the attempt to cover the most recent developments in the field probably led to one of very few drawbacks of the presented book. It contains several largely overlapping chapters describing different aspects of the structural biology of the purple light-harvesting complexes. In one case I even noticed the same AFM image of the photosynthetic membrane used in two different chapters. This duplication would not be a major problem if the authors in the same time would not neglect to mention some basic „old" results. For example I spent a long time to find information about the stoichiometry of carotenoids in the light harvesting complexes and still I did not find a definitive answer. Another part I found missing was a chapter dedicated to general bioenergetics and quantum efficiency of bacterial photosynthesis and growth, which I consider crucial for the real understanding of anoxygenic photosynthesis functioning. Similarly it is a pity that apart from the description of aerobic anoxygenic phototrotrophs (chapter 3, without any question the best review written on this topic) there was no space dedicated also to the other "exots", such as photosynthetic rhizobia or bacteriochlorophyll-containing methylotrophs. These phototrophic species play important roles in the environment and I strongly encourage all the coleagues to consider applying their biochemical and biophysical techniques on these organisms. There is still a lot of to explore!

In any case the new book has all the qualities to become a new great successor of all the previous reviews of this field such as the *Bacterial Photosynthesis* (Gest, H., San Pietro, A., Vernon, L.P. (ed.), Antioch Press 1963), *The Photosynthetic Bacteria* (Clayton, R.K., Sistrom, W. R. (ed.), Plenum Press, 1978) and *Anoxygenic Photosynthetic Bateria*. I am confident that it will represent a new basic text on anoxygenic phototrophs for many years to come, and it will become a basic source of reference and knowledge for experienced researchers as well as for students trying to get first glimpses of this exciting field.

M. KOBLÍŽEK (Třeboň)