

HEMPFLING, W. P. (ed.): MICROBIAL RESPIRATION. — Dowden, Hutchinson and Ross, Stroudsburg, Pennsylvania 1979. 337 pp.

This is the 13th volume of the series of Benchmark Papers in Microbiology. The main theme is highly topical, the papers reproduced here count among their authors several Nobel Prize winners. The selection contains this time 31 papers, grouped into following sections: Historical background, The apparatus of terminal electron transport, Oxidative phosphorylation, Adaptive responses. The editor has provided comments on groups of two or three papers under a sub-heading. The papers are reproduced so as to fit the format of the book and they provide highly instructive and interesting reading.

A. KOTYK (*Praha*)

BUTLER, J. A. V., NOBLE, D. (ed.): PROGRESS IN BIOPHYSICS AND MOLECULAR BIOLOGY. Vol. 32. Pergamon Press, Oxford 1978. 321 pp.

The series Progress in Biophysics has won a common appreciation owing to high and steady quality of its contributions in the field of biophysics and molecular biology. This is confirmed even by the 32nd volume, which appeared in 1978.

The papers in the volume are devoted to two important topics — the theoretical analysis of multienzyme systems and the information transfer for protein synthesis on ribosomes.

The first topic is the subject of two articles. The opening paper by Heinrich *et al.* deals with mathematical modelling of metabolic regulation. The principal notions of mathematical modelling of dynamical systems such as stability, bifurcations, catastrophes and time hierarchy are reviewed here. The last chapter of this paper illustrates the preceding ones by presenting glycolysis models, namely those of the glycolysis of erythrocytes.

The article of R. Welsch discusses the role of organized multienzyme systems in cellular metabolism. Although rather general in nature, the ideas are presented with outstanding clarity. Based on the contemporary knowledge of self-organization of matter on biochemical level, it points out the importance of spatial organization of enzymes belonging to one biochemical pathway. A wealth of arguments is presented to support the concept of the cell as the spatial-functional structure. According to this concept the functions of enzymes *in vivo* are inseparably connected with the membrane matrix within the cell.

The remaining three papers — in contrast to the two mentioned above — are rather of experimental nature. That by Feldman (printed as the second in the succession of articles) analyses the structure-location-function relationship of minor components in tRNA. Special attention is paid to their role in the possible covalent fixation of tRNA on ribosome and some recent data supporting this hypothesis are reviewed. The paper of Goddard is thematically close, though printed as the last. It offers a survey of the present knowledge of the structures and functions of transfer RNA. Starting with the primary and tertiary structures of tRNA it continues through the biosynthesis of tRNA to the structure-function relationship of tRNA in ribosome-mediated protein synthesis. This section is logically completed by the paper of Cox devoted to the structure and function of prokaryotic and eukaryotic ribosomes. A great deal of attention is given here to the ribosomal structure and its connection with the genetic control of the protein synthesis on ribosomes.

All the papers, both theoretical and experimental, emphasize the importance of studying the relation between the functional and spatial structures of multienzyme systems. The only objection that may arise concerns the succession of the papers presented. According to referee's opinion, to place the Rieck Welsch's paper as the second and that by Goddard as the third one would be more logical from the point of view of their content. In spite of this the volume in question will undoubtedly prove very stimulating for both theoreticians and experimentalists. All facts, theoretical models and hypotheses in the articles are presented in a clear and plain manner. That is why the book may be recommended not only to the specialists in the field but to the beginners as well.

I. DVOŘÁK (*Praha*)

WILSON, J. R. (ed.): *PLANT RELATIONS IN PASTURES*. — CSIRO, East Melbourne, 1978. Pp. 425.

Symposium "Plant Relations in Pastures", held in Brisbane in May 1976, and voluminous book proceedings of the same title, deal with two basic processes in grazing ecosystems *i.e.* with the relations between different kinds of plants and with interactions between plants and grazing animals. Pastures usually comprise a mixture of species, each of which may respond differently to the aerial, soil and biotic environments. The species compete and interact with each other and produce a complex ecosystem. Pastures composed of a single genotype practically never exist a long time, pastures of a native species are always heterogeneous. Also sown pastures of single genotype are homogeneous only at the beginning being rapidly invaded by other species and weeds; their diversity increases with time. This biological instability may or may not be welcomed by agronomists. Replacement of desirable plants as are legumes, a source of nitrogen for the whole ecosystem and protein for animals, by others that are less nutritious, inedible or toxic is an undesirable trend from the practical point of view. Most of the papers presented at the symposium and incorporated in this book deal with detection and possibilities to control this undesirable trend. Papers are divided into five parts, the first one is J. L. Harper's "Introduction" to the problem.

Most interesting for the plant physiologists and ecologists is the second part "Comparative Ecophysiology", which deals with the response of the plants to temperature and genetic adaptation to thermal environment; light regimes in pasture canopies and light utilization by competing species; differences in the response of "spender" and "saver" species towards increasing water potential; the effect of frequency, intensity, uniformity and timing of defoliation on growth, persistence and botanical composition of pasture swards; physiological responses of roots and relationship between root and shoot growth; the effect of microorganisms on pasture plants; differences between species in requirement and response to the sources of nitrogen and phosphorus; and with responses of pasture plants to soil chemical factors other than nitrogen and phosphorus, with particular emphasis on the legume symbiosis.

Rapid advances made recently in basic knowledge of plant interactions and comparative physiology of crop plants are reflected in part three "Analysis of Plant Interactions". Its eight chapters contribute to the knowledge of dynamic, physiologically based model simulation and methods of analysing diallel experiments, competitive and non-competitive interference between species and competition for light in grass/leguminous communities. The next chapters discuss the relationships between uptake of mineral nitrogen, its symbiotic fixation and transfer; competition between strains of *Rhizobium* for nodulation by the host plants; methods for analysing multicomponent and perennial pasture ecosystems; the role of competitive ability; and effectiveness of the natural and artificial selection in adapting of pasture plant cultivars to the particular complex of conditions.

Part four "Pasture Ecology and Management" is devoted to the research of pasture communities on the agronomically significant scale. It involves chapters on ecology and on the management of alfalfa, white clover, subterranean clover, Townsville stylo — *Stylosanthes humilis* and Siratro — *Macroptilium atropurpureum*, based pastures, on the effect of grazing on pastures, replacement of native perennial grasses by natural invasion of annuals in grazing lands on regional and/or continental scale.

The concluding part five "Summative addresses" consists of the contributions of C. T. de Wit and C. M. Donald.

All instructive chapters are complemented by figures, graphs, schemes and lists of references. The book is well printed and supplemented with a satisfactory subject index, containing also plant species but, unfortunately, the author index is missing.

JARMILA SOLÁROVÁ (Praha)