

Book Reviews

Bertinchamps, A.J., Hüttermann, J., Köhnlein, W., Téoule, R. (eds.): Effects of ionizing radiation on DNA.

Physical, Chemical and Biological Aspects. Vol. 27: Molecular Biology Biochemistry and Biophysics.

Berlin-Heidelberg-New York: Springer 1978. XXII, 383 pp., 74 figs., 48 tabs. Hard bound \$ 43.00

It is likely that the world is about to expand its nuclear industries many fold, so that the interaction between radiation and living matter becomes of the utmost importance. This book concerns itself with that interaction and is the result of the collaborative efforts of a group of specialists formed under the auspices of the Commission of European Communities. The group concentrates on the effects of ionizing radiation upon nucleic acids and attempts to identify the interdependence and the interaction of radiation products responsible for biological alteration and their free radical precursors.

The book is divided conveniently into three parts, concerned with the physical, chemical and biological aspects of the interaction. Under physical aspects, the structure of DNA is dealt with, as well as chapters dealing with the formation of free radicals. These include such topics as interaction of ionizing radiation with matter, structure of radicals from nucleic acid constituents, radical yields, radiomimetic radical production and transfer phenomena. The chemical aspects deal with the measuring and identification of the properties of the stable radiation products resulting from chemical transformation of these radicals. In keeping with the title of the book, the authors concentrate on DNA constituents.

Biological aspects include chapters on the biological function of DNA and methods of testing, radiation effects on DNA biological function and modification of damage, repair processes following radiation damage to DNA and the mutagenic effects of ionizing radiation. In a final chapter on conclusions and perspectives, G. Ahnström, A. Ehrenberg and A. Gräslund make the point that the effect of low doses of ionizing radiation on living matter should be investigated further, particularly in relation to cancer induction and other genetic effects. Great advances have been made in the field of DNA repair enzymology; the authors suggest that efforts must be made to extend the knowledge to the other, organised structures of the living cell, such as membrane-protein units.

The book has a subject index and a useful Appendix listing dose units, units of exposure and various conversion factors.

J.F. Jackson, Glen Osmond

Fraenkel-Conrat, H., Wagner, R.R. (eds.): Comprehensive Virology, Vol. 10: Regulation and Genetics. Viral Gene Expression and Integration.

New York-London: Plenum Press 1977 496 pp., 46 figs., 21 tabs. Hard bound \$ 47.40

The present volume of the series 'Comprehensive Virology' is concerned with problems of viral gene expression and the integration of viral genomes into host genomes. In the first chapter, Shatkin, Banerjee and Booth report on their studies of the translation of animal virus mRNAs in cell-free eukaryotic systems, on possible ways of gene expression of animal viruses as well as on the regulation of protein synthesis into virus infected cells. Special emphasis is on the importance of methylation for the translation of viral mRNAs. Huang and Baltimore present a review on defective interfering animal viruses and on their relationship to acute and persis-

tent viral diseases. The authors discuss the mechanisms of viral interference. They refer to the eventual practical application, e.g. the production of viral vaccines, but they also warn of premature conclusions since but little is known on the functions of the defective interfering particles. Bishop reviews the properties of virion-associated nucleic acid polymerases and discusses their possible functions in the process of infection. The following two chapters deal with the correlation between genomes of animal viruses and of host cells in general, and the cellular transformation by RNA viruses in particular, described by Doerfler and Hanafusa.

All the articles demonstrate that today every effort is being made to transfer the knowledge gained in the study of bacteriophages to the investigation of animal viruses. It is evident that only a profound knowledge of the biology of animal viruses allows an effective and systematic attack against them and thus consequently serves to benefit of man, respectively, e.g. gene engineering. The articles mentioned above are written by excellent experts who analyze the present knowledge of the subject in a critical manner. Voluminous references, including papers published by the end of 1975 and the beginning of 1976, added to each chapter enable the reader to get a profound insight into the related problems. This volume, which contains much information, is an important source of information for virological investigations. Readers interested in virology, as well as specialists, will benefit from this volume.

H. Stäber, Berlin

Bannister, J.V. (ed.): Structure and Function of Haemocyanin. Proceedings in Life Sciences.

Berlin-Heidelberg-New York: Springer 1977 295 pp., 195 figs. 57 tabs. Hard bound DM 76,-

Haemocyanin represents a class of high molecular weight, oligomeric copper proteins, the occurrence of which is restricted to the Crustacea and Mollusca. It reversibly binds oxygen and transports it in the blood of the respective animals. Its analogous function to haemoglobin and the blue-colored oxidized state has led to the name 'haemocyanin'. The limited number of scientists who deal with the biochemistry and physiology of haemocyanin periodically come together to discuss the progress of investigations in their field. The present book represents the second publication of the proceedings of a 'haemocyanin meeting'. Forty meeting participants presented 36 contributions of heterogeneous characters that have been grouped into 5 chapters: 1. Haemocyanin a) the full protein, b) the subunits, c) physical properties; 2. Haemocyanin as a copper complex; 3. Reactions of haemocyanin a) thermodynamics, b) kinetics; 4. Evolutionary studies; and 5. Physiology. An introductory article written by P.J.P. Williams surveys the scientific progress communicated during the meeting, using the same divisions as the whole book. This seems to be a reasonable method to make proceedings of such highly specialized topics not only useful for specialists, of whom in the present case nearly all participated in the respective symposium, but for other scientists, too.

Quality and layout of the book correspond to others edited in offset printing in the series 'Proceedings in Life Science'. All contributions include references. At the end a 'subject index' facilitates the use of this book which foremost will be of interest for researchers in the field of haemocyanin, but should also be useful for protein biochemists and zoologists in general.

K. Müntz, Gatersleben

Hanan, J.J., Holley, W.D., Goldsberry, K.L. (Eds.): Greenhouse Management. Advanced Series in Agricultural Sciences, Vol. 5 Berlin-Heidelberg-New York: Springer 1978. XIV, 530 pp., 283 figs., 117 tabs. Hard bound DM 94,—

In this book the authors dwell upon the characteristics of a greenhouse. They compare the distribution of areas in greenhouses of different countries, which is of great interest, as well as the comparison of the costs for the construction and the proceeds per m² of area from different plants. There is also a good comparison of steel-glass-houses and steel-plastic-houses.

Chapter 2 deals with the growth factor of light. The new facts are compiled in tables and figures which are very informative.

The basis idea of chapter 3 is the development of greenhouse management along with the construction and material used. Construction costs complete this chapter.

Chapter 4 deals with temperature in greenhouses. Clearly arranged figures and photographs underline the scientific results. The same is true of chapter 5 dealing with water supply.

It is the first time that a book containing such chapters as named above deals with factors of growth in such a specific, clear and scientifically exact way. This book contains extremely useful information for all designers of greenhouses, but it is of even more importance to students interested in the problems of greenhouse management.

E. Kirmse, Quedlinburg

Needleman S.B. (ed.): Advanced Methods in Protein Sequence Determination. Molecular Biology Biochemistry and Biophysics. Vol. 25.

Berlin-Heidelberg-New York: Springer 1977 189 pp., 97 figs., 25 tabs. Hard bound DM 56,—

Within the series 'Molecular Biology, Biochemistry and Biophysics', Saul B. Needleman already has published two editions of Vol. 8, named 'Protein Sequence Determination: A Sourcebook of Methods and Techniques'. Now he has edited an additional volume (Vol. 25 in this series) entitled 'Advanced Methods in Protein Sequence Determination'. In his preface the editor refers to Volume 8 as 'the first volume' and he explains his intentions in editing the present 'second volume'. Whereas the 'first volume' should give 'practical information in sufficient detail to permit the researcher to undertake actual sequencing procedures', the 'Advanced Methods' are thought to provide 'an understanding of the principles of perhaps more esoteric procedures'. These procedures form the basis of 8 chapters written by well-known specialists in this field. Two chapters deal with solid-phase sequencing; chapter 2 gives information on 'Coupling Methods and Strategies in Solid-Phase Sequencing' (Laursen & Horn), whereas Chapter 1 reports on 'Stepwise Degradation of Peptides Attached to Solid Supports' (Mross & Doolittle). 'Sequencing Peptides and Proteins Lacking Free α -Amino Groups' (Doolittle) is the object of Chapter 3. Reichlin deals with the special cases of using 'Antibody in the Studies of Protein Structure' (Chapter 4). The remaining 4 chapters report on the application of special physical methods in protein sequencing: Polarized Light (Needleman), X-ray Crystallography (Kannan), Mass Spectrometry (Falter), and NMR-Spectroscopy (Nieboer & Falter). The technical quality of the present volume equals the high standard of all the books edited in offset in this series.

The information contained in this book enables the researcher to assess protein sequencing results published on the basis of the above mentioned methods or to decide whether it will be useful to utilize these methods in his own work. For practical application he has to study the literature in more detail. At the end of the book, 477 references from all the chapters together can provide the respective basis.

K. Müntz, Gatersleben

Little, M., Paweletz, N., Petzelt, C., Ponstingl, H., Schroeter, D., Zimmerman, H.P. (eds.): Mitosis Facts and Questions. Proceedings in Life Sciences

Berlin-Heidelberg-New York: Springer 1977. VIII, 253 pp., 55 figs., 3 tabs. Hard bound DM 43,—

The Proceedings of a workshop on mitosis held last year at the German Cancer Research Center are published in this volume of 'Proceedings in Life Sciences'. The workshop was intended to point out the hard facts about mitosis and to define the questions still open to further investigation. The subject is treated in nine introductory lectures, each followed by a discussion. Poster abstracts are given at the end of the book.

Two lectures deal with regulation and timing of the cell cycle. Structure and function of the spindle and chromosome movement are treated at length from different points of view. There is a chapter on mitosis in differentiation and another one by Mazia on future research in the field. Most interesting are the lengthy discussions which reveal the weaknesses in many models and hypotheses and thus stimulate further research.

Although a complete coverage of all aspects of mitosis in nine lectures is obviously impossible, the reader misses a number of important topics he would have expected to be treated. Among them are the sophisticated dissection of the cell cycle in baker's yeast by means of cell division cycle mutants and the mechanism of chromosome contraction.

A.F. Croes, Nijmegen

Hahn, F.E.; Kersten, H.; Kersten, W.; Puck, T.T.; Springer, G.F.; Szybalski, W.; Wallenfels, K. (eds.): Progress in Molecular and Subcellular Biology.

Berlin-Heidelberg-New York: Springer 1978 XI, 354 pp., 65 figs., 59 tabs. Hard bound DM 86,—

This volume contains publications in research between the frontiers of molecular biology, biomedicine and genetics. In the first pages, F.E. Hahn points to the consequences for the classic gene structure concept recently arisen by the finding of 'genes within genes' in the genome of phage Φ X 174. The article of Timmis, Cohen and Cabello represents an extensive survey on how molecular cloning technology can be exploited in order to investigate plasmid DNA.

The following articles are related in that they consider biochemical or pharmacological problems of recent drug research. The peptide bond formation in mRNA-free systems is reviewed by Kleinkauf and Koischwitz with regard to their importance for the synthesis of a number of antibiotic peptides as well as of cell-wall components in microorganisms. According to the estimation of Goldstein and Cox, the endorphins very probably function as opiate receptors whilst their physiological role in animals and humans still remains obscure. From the paper of Hajduk we learn that the kinetoplasts of flagellates are organelles of mitochondrial nature and are the sites of action of several drugs used in the chemotherapy of trypanosomiasis. The events leading to immune functions of small lymphocytes after mutagenic activation are carefully reviewed in the paper of O'Brien, Parker and Dixon. The apparent similarity in the action of several antimicrobial, cancerogenic and mutagenic compounds on chloroplasts of *Euglena gracilis* leads Ebringer to support speculations that not only contemporary organelles of eukaryotic cells but also the extranuclear genetic elements of prokaryotes might be of endosymbiotic origin. From the therapeutic point of view, the latter article also raises the important question of whether an analogy also exists in the elimination by several drugs of plastids and bacterial plasmids.

J. Hofmeister, Gatersleben