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Book reviews

Youvan, C.; Daldal, F. (eds.): Current Communications in Molecular Biology. Microbial Energy Transduction: Genetics, Structure and Function of Membrane Proteins. Cold Spring Harbor: Cold Spring Harbor Laboratory 1986. 181 pp., several figs. Soft bound $ 27.–.

The publication of results presented at conferences in the form of special editions is common place nowadays. In many cases these books are published a considerable time after the conference took place and in a rapidly progressing field the danger of such policy is manifest. The editors of this book, which summarizes the results of a conference on genetics, structure and function of membrane proteins mediating energy and signal transduction should be complimented with the rapid publication of extended abstracts.

Many topics are covered in this book: bacterial reaction centers, oxidoreductases of mitochondria and bacteria, proton-translocating ATP synthases of various organisms, transport of protons and sugars, and the flagellar motor and chemotaxis receptors are dealt with in a total of 30 contributions. These seemingly diverse topics are unified with respect to the involvement of transmembrane proteins in some aspect of energy transduction. The authors have tried to present a "state of the art" report in the various fields discussed. In my opinion they have succeeded very well.

The result is a comprehensible book, well suited for students entering the field of transmembrane proteins but also of value to scientists already involved in this field who want to be informed on the latest discoveries and views on their own and related areas of microbial energy transduction.

C. van der Drift, Nijmegen

Hogan, B.; Costantini, F.; Lacy, E.: Manipulating the Mouse Embryo. A Laboratory Manual. Cold Spring Harbor: Cold Spring Harbor Laboratory 1986. 350 pp., several figs. and tabs. Soft bound $ 60.00.

This laboratory manual is a boon for embryologists who specialize in mammals and in particular for the "mousers" among them. It is packed with information on the molecular-biological techniques of gene sequencing, hybridization, mapping, and transformation, to be applied in order to study the control of gene expression during embryonic morphogenesis and development. After a pithy introductory chapter and a summary of mouse development, there comes lucid descriptions of procedures and equipment required for the production of transgenic mice, the transfer of embryos, the introduction of new genetic information into the embryo, the isolation of stem cell lines, the visualization of genes and gene products, and the culturing of eggs, embryos, and teratocarcinoma cells. The illustrations in these sections of the book are very adequate. The authors are to be complimented with a job well done.

J. H. F. van Abeelen, Nijmegen

Becker, W. M.: The World of the Cell. Reading, Menlo Park, Don Mills, Wokingham, Amsterdam, Sydney, Tokyo: Benjamin Cummings 1986. xxvi + 882 pp., several figs. and tabs.

"The World of the Cell is a comprehensive introduction to cellular and molecular biology for students preparing for careers in biology, medicine or other health related fields." This is the first sentence in the preface of the book "The World of the Cell" by Wayne M. Becker. This book completely fulfills its task being one of the best textbooks in cell biology published lately.

It is divided into five parts. The first part deals with the biology of the cell, giving detailed descriptions of cellular organelles, the chemistry of the cell and cellular macromolecules. In the second part, energy and the cell are discussed while in part three membranes and the cell are covered. Part four is devoted to information and the cell, molecular and genetic aspects are especially emphasized. Part five focuses on specialization and the cell and gives an overview of embryonic development, cellular differentiation, the immune system and the cancer problem. Key terms and suggested reading lists, problem sets and box essays help the reader in using this book more effectively and prove that this book is based upon several years of classroom experience of the author.

I. Raskó, Szeged

Frank, R.: Zwiebel- und Knollengewächse. Stuttgart: Eugen Ulmer 1986. 461 pp., 121 color figs., 35 drawings. DM 128.–.

This is a factual book based on the technical, horticultural point of view. While plants with bulbs, stem- and root-tubers, bulb-tubers and rhizomes belong to different botanical families, they are all perennial plants, and have in common that they have storage organs, which in each new vegetation period produce anew shoots and, preferentially for the gardener, also flowers. The individual life of the plant remains maintained for a longer time so that this type of plant is very popular, under glass and in rock gardens, both indoors and outdoors.

Most of the bulb and tuber plants in our gardens come from distant, even tropical areas, like Anatolia, Africa, China, Japan, the Mediterranean. The exotic ones need more care, most of these perennials need protection during the winter if they are transferred into temperate climatic zones. A special knowledge is therefore necessary for their culture and maintenance. All this information is provided by the German bulb plant expert Reinhilde Frank. Some species do not need special care, such as *Scilla, Puschkinia, Muscari,* some *Cyclamen* varieties, and the highly appreciated wild *Narcissus* and wild tulips; others prosper only under indigenous soil and habitat conditions.

Detailed knowledge is a prerequisite for successful cultivation. This is all given in short descriptions according to an alphabetical list of Latin species' names which comprises 85% of the contents of the book.

The general introduction gives some coaching in botany, as well as on phythopathology and plant protection instructions (*Botrytis, Fusarium,* virus and bacterial diseases, nematodes, thrips, snails, mice and rabbits are the most important enemies), planting (depth is of crucial importance), propagation, forcing and fertilizing. The author gives some romantic aspects by a description of the history of some species (lily, *Fritillaria, Colchicum,* Hyacinth, Crocus, Iris, Narcissus and tulip) with special emphasis on their sometimes adventurous introduction into European horticulture, their symbolic values, use as food and decoration and their curative powers.

This excellently illustrated and printed book has a pronounced disadvantage: it gives no information on the intensive breeding activity done with many of the species, which have already a huge, nearly not-to-survey, spectrum of hybrids, varieties and cultivars. Also, some information on the most famous breeders and supply addresses would have made the book an even more valuable handbook for professionals and amateurs.

H. F. Linskens, Nijmegen

Olssen, G. (ed): Svalöff 1886–1986. Research and Results in Plant Breeding. Södertälje, Stockholm: LTs förläg, Almqvist & Wisell International 1986. 290 pp., 8 plates, 22 color figs., 118 figs., 69 tabs. SEK 190.–.

In the world of plant breeding Svalöf is a byword for high quality cultivars adapted to local growing conditions with an improved yield and quality. During the 100 years of its existence a total of 420 cultivars of agricultural crops have been released from Svalöf. A considerable number of which, including spring wheat, barleys, oat cvs., red clover, timothy, lupine, alfalfa, and winter and spring rape, are growing in many parts of the world. In addition, considerable theoretical studies on genetics, plant breeding methods and even plant physiology and pathology in close relation to practical breeding works have been carried out.

The report of its activities and results on the occasion of its 50-year jubilee was published in "Der Züchter", the predecessor of TAG, in 1936. The centenary is celebrated with a book illustrating the wide scope of activities at present being undertaken by the staff of an institute which started a century ago as a private enterprise of Scanian farmers. The driving force behind the organization was Birger Wilinger, the owner of the estate of Heleneborg at Svalöf. Together with Baron F. G. Gyllenkrook they started the South Swedish Association, transformed to what is now an organisation funded and supplied by the State.

In 1913 the State obtained complete control of what is now the Swedish Seed Association and its numerous branches and field stations. Famous names as Hjalmar Nilssoj, H. Nilsson-Ehle, Åke Åkerman, Erik Akerberg, Arne Müntzing, Albert Levan and the former co-editor of TAG, Åke Gustafsson, have been employed at Svalöf. Our journal has, therefore, a strong historical link with Svalöf, which continues to-day with J. MacKey who is in the present editorial board.

Svalöf, however, is more than a breeding institute: space and time have been used for polyploidy research, physiological and resistance studies, biochemical research, and gene ecological studies. The book gives an impressive survey of these fields of investigations, with emphasis on the effects of recurrent selection in cross-pollinated crops, mutation and gene recombination as principal tools in plant breeding (by Åke Gustafsson), diversity and genetics of barley mutants (by Udda Lundquist), the use of interspecific hybridization in plant breeding, on triticale, potato breeding and many other topics. Very impressive to read are the prospects of modern plant breeding in the year 2000, as described by Arne Lundquist, Arne Hagberg, James MacKey, Vilhelms Umaerus and Göran Kuylenstjerna. Surely the book is inspiring and will help to create positive contacts between the staff at Svalöf and plant breeders abroad.

H. F. Linskens, Nijmegen

Ouellette, R. P.; Cheremisinoff, P. N.: Essentials of Biotechnology. Lancaster, Basel: Technomic Publ. 1985. ix + 226 pp., several figs. and tabs.

Ouellette, R. P.; Cheremisinoff, P. N.: Applications of Biotechnology. Lancaster, Basel: Technomic Publ. 1985. ix + 247 pp., several figs. and tabs.

These two books cover a wide spectrum of fundamental and applied aspects of biotechnology. The book "Essentials of Biotechnology" deals with the following subjects: drug delivery and therapy, synthesis and modification of neurotransmitters and brain hormones, chemicals from plants, water as the basic substance in biotechnology, the pre- and post-transcriptional modifications of DNA and proteins (like methylation, phosphorylation, glycosylation), and the role of proteins and enzymes in biotechnological processes (artificial and synthetic enzymes, the catalytic action of enzymes, the functioning of enzymes under extreme conditions). The last two chapters of the book describe a range of methods and systems for operating fermentation processes or tissue and cell cultures, with special attention for the "chemical field effect transistors" (ChemFETs), these being the offspring of the marriage between chemistry and micro-electronics. In the first, introductory chapter on "What is Biotechnology" the use of both terms "biotechnology" and 'genetic engineering" is annoying.

The book "Applications of Biotechnology" indicates the different niches of human society in which biotechnology is or will become involved, i.e. the market for biotechnological products, the role of biotechnology in defense, food and agriculture, chemistry, pharmaceutics, the energy system, environmental protection, and microbial leaching of metals. The penultimate chapter goes into details about separation, concentration, purification and product recovery techniques, whereas the final chapter describes the role of the computer in the present biotechnological "boom". This book is strongly based on the American experience and a certain degree of chauvinism is apparent at several points in the next.

The set-up of the books is compendium-like. The text is interwoven with short lightly philosophical or contemplative sentences, which add considerably to the readability of the books. Each chapter begins with a brief introductory paragraph, ends in a paragraph of conclusions or future prospects, and includes an extensive list of references up to 1983.

The quality of the illustrations is in obvious contrast to the quality of the text: the few figures of the books are very carelessly drawn, some of them show errors (e.g. Figs. 1–15 in "Essentials of Biotechnology"), and all suffer from insufficient explanation. The books contain several extensive tables, one of which (Table 8–8 in "Essentials of Biotechnology") is printed upside down. As the cover design of both books is identical, the words "Essentials ...." and "Applications ...." are not sufficiently accentuated on the cover, thus the cover colours (grey-green and grey-brown) are the only difference between the exteriors of both books. These considerations in combination with the remarks mentioned above, have a negative influence on first reading the books. The price of 70 US dollars for each book (as obtained from a local bookseller) is extremely high, at least for students who can choose nowadays from an increasing number of good textbooks on "Biotechnology".

L. J. W. Gilissen, Wageningen

Linskens, H. F.; Jackson, J. F. (eds.): Modern Methods of Plant Analysis. New Series, Vol. 1. Cell Components. Berlin, Heidelberg, New York, Tokyo: Springer 1985. xx + 399 pp., 96 figs. Hard bound DM 238,–.

The series "Modern Methods of Plant Analysis" was successfully published between 1956 and 1964. It is now being

continued with the appearance of the first volume in the New Series and the announcement of the publication in 1986 of two other volumes (Vol. 2: Nuclear Magnetic Resonance, Vol. 3: Gas Chromatography and Mass Spectroscopy). The main considerations for this continuation are the same as for the "Old Series". Scientific progress in the different fields of applied biology, ranging from agriculture to pharmaceutical institutes and biotechnology depend on the availability of well documented, complete and modern plant analytical methodology. The Series aims to collate and adapt (where necessary) newly developed methods from biochemistry, biophysics and medicine for use with plant material.

The editors of the New Series have standardized the aims and the layouts of the contributions of the nineteen authors to produce an attractive piece of work. The chapters pay thorough attention, after an introductory paragraph, to the methodology of the subject to be analysed and they also provide extensive lists of references to original articles. The references in this volume (more than 1,600 in all) include some of 1985! The contents table indicates chapter titles and all section and sub-section headings, and complements the brief subject index.

Two cell components received special attention in the book: the cell wall (two chapters: isolation and growth aspects; chemistry, structure and components) and the plastids (five chapters: chloroplasts as a whole; the envelopes; the main stroma protein; the thylakoid membrane; isolation and characterization of non-green plastids). Separate chapters are dedicated to the other cell components (the plasma membrane, the vacuole, protein bodies, lipid bodies, mitochondria, the endoplasmatic reticulum, polyribosomes, the nucleus, microtubules). The fact that plant cell technologies became very dependent on the protoplast system necessitated that one chapter dealt with the use of protoplasts for compartmentation studies. Another relevant subject, on which attention is focussed in a separate chapter, is the marker concept in cell fractionation.

Although the chapters are complete in themselves, the book as a whole has some omissions, which should be mentioned. 1. No attention has been given to the cytosol: only a few authors mention it indirectly. 2. The plasmodesmata, being the structures which integrate adjacent cells to the plant symplast, deserve a separate chapter. The only information given in this volume is that ".... the strand of cytoplasm connecting cells through plasmodesmata are stretched and broken during plasmolysis" (p. 56). 3. The superficial treatment of the plastid genome in only a small subjection of one chapter is in contrast to the amount of attention given to the mitochondrial and nuclear genome. 4. Since biotechnologists and genetic engineers will form part of the target readership, as well as plant (cell) physiologists, cytologists, plant pathologists etc., information on the isolation of chromosomes (to be used in genetic manipulation research) would have been useful.

Nevertheless, the present book will become indispensable to all inquisitive research workers after a first reading. This volume will also undoubtedly serve as a useful basis for the future volumes in the series. A successful continuation of the "Old Series" is to be wished to the editors and all present and future contributors to the New Series of Modern Methods of Plant Analysis.

L. J. W. Gilissen, Wageningen

Crow, J.F.: Basic Concepts in Population, Quantitative, and Evolutionary Genetics. New York: Freeman 1986. xii+273 pp., several figs. and tabs. Soft bound £ 15,95.

That James Crow dedicates his book to Sewall Wright, R. A. Fisher, J. B. S. Haldane and H. J. Muller indicates the enlightenment with which it is written. It is the work of an author with an admirably practical outlook who knows the difficulties of measurement, analysis and interpretation at the bench or in the field. He addresses an audience at the level of the advanced undergraduate or beginning graduate student but the book will be read with benefit and pleasure by all biologists and molecular biologists needing to pick up on population genetics and evolutionary analysis. As might be expected, particular attention is paid to breeding systems, mutation, selection and drift while the treatments of migration, population structures and evolution are especially useful. The author has been cautious about attempting the quantitative treatment of the effects of transposable elements, multigenic families and highly reiterated sequences, believing that more evidence is required. However, he builds knowledge of nucleotide and amino acid sequences into the context of traditional studies of mutation, selection and evolution. The book reads with the spontaneity of a delivered lecture series in the personal asides and appreciation of coworkers that are included. It is to be commended to all concerned with quantitative approaches to genetics, evolution and population studies.

Ralph Riley, Cambridge

Rigby, P.W.J. (ed.): Genetic Engineering, Vol. 5. London: Academic Press 1986. 158 pp., 34 figs., 5 tabs. Soft bound £ 10,–.

With this booklet a well accepted series of review papers on genetic engineering is continued.

The first paper, by C.F. Higgins, provides an overview of our current understanding of the regulation of gene expression in *Eschericha coli* and its bacteriophage. Step by step the different levels, such as regulation of transcription and of RNA processing and degradation, are dealt with. This is followed by a compilation of data on translation regulation and, finally, by gene and operon fusions. The rather complicated matter is elucidated by drawings which, unfortunately, are reproduced on a very small scale (certainly not the fault of the author) and therefore are not easy to read. Evidently, this paper was already completed in 1984, because later literature is not covered.

The second paper, by Alan Hall, is an excellent compilation of our current knowledge on oncogenes. In different chapters the following subjects are covered: the transformed cell; RNA tumor viruses and viral oncogenes; cellular oncogenes; the biochemistry of oncogene proteins. The text is very well illustrated and again (not the fault of the author) the reproduction of some photographs (Fig. 1, p. 66) is just awful.

The last paper, by Michael Steinmetz, deals with genes of the immune system. Specific topics are: major histocompatibility complex, immunoglobulin genes, T-cell receptor genes, the immunoglobulin superfamily, generation of diversity, and species comparison. The provided information is well illustrated, with good but overreduced figures.

Albeit all three papers are written by different authors, they have three things in common: they are well written, provide detailed knowledge and are worthwhile to be read.

K. Esser, Bochum