

## Book Reviews

Klingmüller, W.: Genmanipulation und Genterapie.  
Berlin, Heidelberg, New York: Springer 1976.  
345 S., 184 Abb. Soft bound US \$ 15,60

The book, published in German, is probably not written for the limited number of German-speaking specialists working in this field. For a wider audience, it can be recommended with reluctance only.

The book contains a detailed description of many experiments involving the cloning of recombinant DNA molecules, which are now commonly referred to as "gene manipulation". A second group of experiments described in this book are the many claims of transformation of eukaryotic cells or organisms by prokaryotic DNA or whole bacteriophage. In addition to these two rather defined topics, the book contains a variety of reports on varying subjects ranging from the cross giving rise to the "beefalo" to the extra-uterine culture of mammalian zygotes. The non-expert reader will have difficulties in recognizing that very different scientific approaches are described and that only part of them is covered by the present debate on genetic manipulation.

The general remarks of the author in the concluding chapters are not very helpful for the non-expert reader either. In a chapter on possible misuse of this research, the author says that "... one must be afraid that influential individuals or groups could try to change genetic traits of whole parts of a population... with the goal to develop supermen on the one hand and slaves destined to labour on the other". In the same paragraph, "test tube babies" are mentioned which are described as human beings multiplied parthenogenetically and raised in culture flasks. This kind of discussion, enriched by a few cartoons from popular magazines or newspapers, ends in the statement (page 332) that "agriculturally important plants and animals will be improved in a controlled manner in the near future, that hereditary diseases will become curable and that the genes of man will be amenable to manipulation". In my opinion, these blunt statements are way out of the detailed and responsible discussion that is presently going on among the scientists involved in this research.

In summary, the book may be best suited for the academic teacher, who wants to use it for the preparation of lectures and who has enough independent knowledge to weigh the contents thoroughly. For a wider audience, the book will be only of limited value, as it is neither a pure scientific monograph written by a scientist actively engaged in this research, nor a book written by a generalist covering adequately the many problems beyond the realm of laboratory science posed by the new technology of gene cloning.

P. Starlinger, Köln

McLaren, A.: Mammalian Chimaeras (Developmental and Cell Biology 4).  
Cambridge: Cambridge University Press 1976.  
154 pp., 43 figs., 13 tabs. Bound £ 8,-

The introduction of experimental chimaeras as an analytical tool in developmental genetics and experimental embryology resulted in decisive progresses during the last few years and made developmental biology of mammals a rapidly advancing field of research.

Anne McLaren, well known for her significant contributions to this field, summarizes in her book all the essential experiments with mammalian chimaeras up to the end of 1974. By critically discussing the methods, results and interpretations the work provides a highly welcome review of developmental processes, into which experimental chimaeras provided insight: The 12 chapters offer a lot of information which are logically and clearly arranged and are of help to understand these complex processes. After defining the subject the author describes the techniques used to obtain chimaeras and the existent markers to distinguish their two components. The early development, especially the differentiation of the inner cell mass and the trophectoderm is the subject of the next chapter. In this context the preformationist theory and the epigenetic theory are discussed. The following chapters deal with sexual development and the germ cell differentiation in XX/XY chimaeras, the pigment patterns in the coat and the retina, and, briefly, with the development of other systems examined in chimaeras (skeletal system, musculature and neuronal system), as well as immunological questions (tolerance) and the incidence of tumours in chimaeras of high- and low-tumour strains of mice, resulting in the question of whether or not malignant transformation reflects the genotype of the cell or its environment. She also discusses differences and resemblances between chimaeras and mosaics and the distribution of cell populations, i.e. the process of cell mingling and clonal proliferation during ontogeny, the estimation of clone sizes and the phenotypic interaction of genetically distinct cell populations. One chapter deals with the incidence and causes of spontaneous chimaeras, especially in man.

But the author not only gives an excellent and comprehensive account of research done so far; in the last chapter she also confronts the reader with realistic ideas of what is still to be done. Unfortunately, the experiments by Mintz & Illmensee (Proc. Natl. Acad. Sci. USA, 72: 3585, 1975) and the role of the H-Y antigene in sex determination of XX/XY chimaeras could not be included. Although this book deals with a very specialized topic, the very interesting and fascinating results in this field of research are of far-reaching relevance. Indeed, this book communicates this fascination not only to a few people really interested in mammalian development, as it is the author's hope expressed in the preface.

Anne McLaren's book Mammalian Chimaeras is recommended to all interested in developmental genetics and experimental embryology. It will be read with a lot of profit.

K. Becker, Gatersleben

Goodwin, T.W.: Chemistry and Biochemistry of Plant Pigments Second edition, Vol. 1 and 2.  
London, New York, San Francisco: Academic Press 1976. Vol. 1: 870 pp., 184 figs, 73 tabs. Bound £ 26.50; Vol. 2: 373 pp., 59 figs., 53 tabs. Bound £ 12.00

The great advances in the chemistry and biochemistry of plant pigments during the last 10 years warranted a second edition of the "GOODWIN". This new edition is divided into four parts also. The first part deals

with nature, distribution and biosynthesis of plant pigments (12 chapters, 623 pp). In the chapter 1 A.H. Jackson describes structure, properties and distribution of chlorophylls (a, b, c, d, bacteriochlorophyll, *Chlorobium* chlorophyll and protochlorophyll. L. Bogorad discusses in chapter 2 the biosynthesis of porphyrines including the chlorophylls. The discussion of chlorophyll biosynthesis is prebared by a brief outline of pyrrole porphyrin chemistry, as a supplement to chapter 1, and is followed by considerations of demonstrated as well as imagined mechanisms by which biogenesis is controlled. The chemistry of carotenoids (isolations and general properties, structural studies of carotenoids by electronic spectroscopy, mass spectrometry, nuclear magnetic resonance spectroscopy, infrared spectroscopy, optical rotatory dispersion, circular dichroism, X-ray crystallography and by chemical reactions and their stereochemistry) are presented by G.P. Moss and B.C.L. Weedon. In chapter 4 T.W. Goodwin gives an overall picture of carotenoid distribution in photosynthetic tissues (higher plants, bryophytes, pteridophytes, lichens, algae), non-photosynthetic tissues (reproductive tissues, flowers, seeds, fruits, roots, parasitic plants, plant tissue cultures) of higher plants and fungi. G. Britton describes the carotenoid biosynthesis and their regulation in fungi, algae and higher plants (chapter 5). In chapter 6 P. O'Carra and Oheocha give a review of structure, function, biogenesis and metabolism of algal biliproteins and phycobilins. H. Smith and R.E. Kendrick describe the structure and properties of the native phytochrome. The nature and properties of flavonoids (T. Swain) and the biosynthesis of flavonoid compounds (E. Wong) are reviewed in chapters 8 and 9. Chapter 10 describes the nature, distribution and biosynthesis of quinones (R.H. Thomson). M. Piatelli reports on the chemistry, biosynthesis and physiology of the miscellaneous pigments in chapter 12.

Part II (155 pp) deals with the function of pigments. Their function in photosynthesis is described by C.P. Whittingham. He analyses the chemistry of pigments *in vivo*, "enhancement" effects, the electron transport of photosynthesis and photophosphorylation. The functional role of carotenoids in plastids and chromatophores in photosynthesis is discussed in this chapter also. Other possible functions of carotenoids (photoprotection, phototropism and phototaxis) are reviewed by L.H. Burnett (chapter 14). The physiological function of phytochrome *in vivo* are described by R.L. Sattler and A.W. Galston. I.B. Harborne reviews our present knowledge of the chemical factors controlling plant colour and the function of flavonoids in leaves (chapter 16).

The last chapter of Volume 1 (part III, 62 pp) deals with the metabolism of chlorophyll, carotenoids, anthocyanins and betalains in senescent and stored tissues (K.L. Simpson, T.-C. Lee, D.B. Rodriguez, C.O. Chichester).

Part IV (366 pp) incorporated in the second volume deals with analytical methods of isolation, separation, identification and quantitative determination of chlorophylls, chlorophyllase (M. Holden), carotenoids (B.H. Davis), flavonoids (T. Swain), quinones (R.H. Thomson) and phytochrome (R.E. Kendrick and H. Smith).

In chapter 22 W. Junge gives an introduction to flash spectroscopy as applied to photosynthesis. This chapter is divided into three major sections, including a digression on molecular spectroscopy, a section on instrumentations and specific difficulties and pitfalls inherent in the method, and a section on the primary processes of photosynthesis exemplifying the application of flash spectroscopy.

In comparison with the first edition the second is a new book. All chapters have been completely rewritten and in addition new topics have been included (betalain, flash kinetic spectrometry, quinones and phytochrome).

This book is an excellent collection of reviews (23) concerning the chemistry and biochemistry of plant pigments. As a standard work of this subject it is intended for undergraduate and postgraduate students as well as for professional researchers both academic and industrial. The book deserves a wide circulation among all botanists interested in the biochemical aspects of plant physiology. F. Herrmann, Halle (S.)

Deverall, B.J.: Defence Mechanism of Plants.  
Cambridge: Cambridge University Press 1977.  
110 pp., 7 figs., 8 tabs. Bound £ 5.50

The book is concerned with the defence mechanisms of plant cells against attack by parasitic microorganisms. Professor Deverall reviewed the data obtained in the last 15 years to consider the main questions: how host cells stop the disease development; why they remain healthy despite their constant exposure to potential parasites. The fate of parasitism is dependent upon the matching of specific information, determined by complementary genes in hosts and parasites. The central interest of the book is the intramolecular means by which the single genes of host and parasite express themselves.

The book is arranged in seven chapters: the introduction characterises infection type, cellular compatibility and genetic determination of host-parasite interaction; the second and the third chapters examine discriminatory events before and after infection; examples of induced resistance are analysed in chapter four; there is an extensive description of phytoalexins in chapters five and six; and the book closes with problems of host-parasite specificity.

Professor Deverall had not reviewed variety unnecessarily but has emphasized significant recent works. The result is that the book is more valuable than the recent massive specialised treatises. The book is useful for a wider range of readers than plant pathologists: plant physiologists and plant biochemists, geneticists, microbiologists, botanists and mycologists, who are concerned with plant diseases, will find interesting information in it.

Professor Deverall showed that plant pathologists still have a rich field to explore. It is a great merit of the book that it reveals new ways for further investigations and provides the background for studies on the central problems of plant pathology.

Yulia M. Plotnikova, Moscow