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Book reviews

Schell, J. S.; Starlinger, P. (eds.): The Impact of Gene Transfer Techniques in Eukaryotic Cell Biology, 35th Colloquium-Mosbach 1984. Berlin, Heidelberg, New York, Tokyo: Springer 1984. IX + 209 pp., 76 figs. Had bound DM 96,–.

Techniques developed in molecular biology during the last decade have led to a cascade of progress in understanding gene structure and function in both pro- en eukaryotes. Recently, the development of methods to synthesize/modify DNA sequences as well as methods to transfer DNA to homologous and heterologous hosts have made it clear that a more refined understanding of the expression of eukaryotic genes will be obtained in the near future. "The Impact of Gene Transfer Techniques in Eukaryotic Cell Biology" gives a compact overview of the state of the art in different fields of eukaryotic molecular biology in which gene transfer has contributed to a significant progress. The book covers by no means all the different aspects of the field in great detail, but rather enables the reader to obtain insight in the potential and the pitfalls of the techniques developed. The papers, which are contributions for the 35th Mosbach Colloquium, are written as minireviews, mostly by German authors.

The book is divided into 5 chapters. The first chapter combines papers on chemical DNA synthesis, enhancers and Z-DNA. The paper on an alternative gene cloning method for the isolation of (human) genes by expression in mouse cell clones provides good insight in the potential of "gene rescue", also applicable for other organisms. The three following chapters deal with DNA rearrangements (e.g. transposable elements from *Antirrhinum majus* and *Drosophila*), genetic engineering of plants (Ti- and CaMV systems) and introduction of DNA into germ lines of animals. So far the expression of homologous and heterologous genes in transgenic mice generally appears to be non-specific. In contrast, however, the expression of homologous genes transferred to *Drosophila* (using p-element vectors) and plants (Ti-system) seems to be more specific. It is clear from these chapters that plant molecular biology, supported by the great potential of the Ti-system, and the totipotency of plant cells, is gaining momentum and is catching up rapidly with the more classical areas of eukaryotic molecular biology. In this respect also the last chapter on "applications of genetic engineering" provides a good insight in more novel applications in this field. The papers on genes involved in resistance reactions in higher plants as well as herbicide resistance provide very useful background information. Genome organization and expression of the Foot and Mouth Disease Virus and the related Poliovirus are discussed in relationship with the potential use of antigenic determinants to develop synthetic vaccins.

Taken together, the reader should not expect detailed reviews about all aspects of Gene Transfer and Eukaryotic Cell Biology, but rather a selection of clearly written, significant contributions. Reading the book requires a good background in molecular biology. The price of the book (DM 96,–; 210 pages) seems a little high, especially since the printing is not of a very high standard.

P. J. M. van den Elzen, Amsterdam

Wiseman, A. (ed.): Principles of Biotechnology. Glasgow/New York: Blackie and Son/Chapman and Hall 1983. ix + 217 pp., several figs. and tabs. Soft bound £ 11.95.

According to this editor the Spinks Report (1980) gave a fresh impetus to the development of biotechnology in the UK. In many universities biotechnology groups were set up to improve the extent of collaboration and cooperation between specialists in various departments. The present book has emerged from the cooperation between specialists in biotechnology at the University of Surrey and two experts from industry.

In the introductory chapter (3 p) A. Wiseman outlines his ideas on features of biotechnology. The application of the principles of industrial microbiology to biotechnology is discussed by M. E. Bushell (51 p). The author tries to cover many topics of industrial microbiology in varying degrees concerning the production of primary and secondary metabolites. This chapter is not well-balanced. Furthermore many definitions and statements are questionable. The sentence on "essential features of secondary metabolism" and the statement "ergot alkaloids are antibiotics" are confusing.

The principles of microbial genetics and its application in biotechnology is the topic of the 3 d chapter (36 p). The reader will get a fairly good introduction in at least some areas of microbial genetics: e.g. in vivo manipulations and some principles of DNA cloning given by J. W. Dale. The chapter (49 p) on fermentation engineering by M. A. Winkler is also informative. He describes some problems of fermenter design and the operation of the plant, e.g. heat transfer, mixing and oxygen supply, as well as the scale-up in biotechnology. More than 60 pages are devoted to the application of the principles of enzymology to biotechnology. Problems of enzyme isolation and purification are discussed by C. Bucke. The advantages and disadvantages of using immobilized enzymes or immobilized cells as biocatalysts is the topic of P. S. J. Cheetham's contribution.

Unfortunately, the editor does not say which part of the scientific community is supposed to read this book. In my opinion this book as a whole is not a perfect introduction to the principles of biotechnology as it is stated on the cover. Some of the chapters may be recommended to undergraduate and advanced students as a textbook supplement.

D. Gröger, Halle (Saale)

Hay, D. A.: Essentials of Behaviour Genetics. Melbourne, Oxford, London, Edinburgh, Boston, Palo Alto: Blackwell 1985. 359 pp., several figs. and tabs. Soft bound £ 15.80.

This textbook is an introduction to behavior genetics for advanced students in psychology or genetics and as such it is a useful addition to the other introductory book by Plomin, DeFries and McClearn (1980). The present book under review seems to be directed slightly more towards psychology than towards genetics students. The emphasis is more on the understanding of behavior than on genetics. The problems associated with the relevant and reliable measurement of behavior in both invertebrates and vertebrates are discussed throughout the book and it is pointed out how genetic analysis might help

validate behavioral measures. In the first chapter Hay remarks that behavior genetics at the present time has ignored most of the developments in genetics since the early 1950's. Therefore, it is unfortunate that there is not a more extensive introduction to genetics. The basic genetic knowledge is explained in the second chapter in terms of the contribution of genetic factors to mental retardation and this approach does not allow a more comprehensive introduction. Apart from this, the book provides an excellent overview of the developments in animal (mainly mice and rats) and human behavior genetics research. Relatively much attention is paid to IQ research and the last chapter offers a rather lengthy discussion of racial differences in IQ. The book presents a useful introduction to model fitting approaches. An explanation of the different nomenclature systems currently used in behavior genetics is given as well as an explanation of the major differences between the different schools. Each chapter ends with interesting discussion topics and an annotated bibliography, which offers good suggestions for further reading. On the whole, the book can certainly be recommended to students of behavior genetics.

D. I. Boomsma, Amsterdam

Evans, C. W.; Dickinson, H. G.: Controlling Events in Meiosis, Symposia of the Society for Experimental Biology, 38th Symp. Cambridge: Company of Biologists 1984. VIII + 394 pp., several figs and tabs. Hard bound £ 32,–.

The Symposium "Controlling events in meiosis" must have been very interesting when it was held in 1983. Even now the book still contains a wealth of specific and general information. Naturally, not all details are as up-to-date as they were in 1983. This is apparently inevitable with a very well-produced report: it appears 1½ years after the symposium was held, primarily as a review of only relatively recent work. Then it takes another ½ year before the reviewer receives it, and again a similar period before the review appears.

Yet it is still a book full of valuable information. Most is on specialized subjects, but together the 19 chapters, carefully composed by experts, give a broad review of the field. However, it is somewhat surprising to find that meiosis apparently ends when first metaphase starts. In fact, the symposium was on meiotic resumption in oocytes (about 1/5 of the book) and on factors involved in pairing and recombinational exchange. There is practically nothing on centromere functioning, orientation, segregation. This should have been reflected in the title.

After an Introduction by Callan, there are four chapters which mainly deal with meiotic resumption in oocytes (McLaren; Tsafriri c.s.; Masui c.s.; Schorderet-Sklatkine c.s.). Although, of course, these chapters have an importance outside the subject proper, their number does not improve the balance of the book. The next chapter is on pre- or early meiotic events, mainly position in the nucleus (Bennett). One chapter is on recombinational exchange at the molecular level in yeast with extrapolation to a wider area (Esposito). Three chapters are on the biochemistry of meiotic prophase (Stern c.s.; Pukkila c.s.; Porter c.s.), which demonstrate that the narrow basis on which this important field has been based for many years (mainly Hotta and Stern) is widening. The synaptonemal complex was apparently still popular in 1983, mainly at the EM analytical level: there are six chapters (v. Wettstein; Carpenter; Moses c.s.; Rasmussen c.s.; Jones; Rees c.s.). These include parts or even chapters on recombination nodules, chiasma position, SC adjustment, DNA variation etc. and are not entirely restricted to EM studies. Lampbrush chromosomes are represented by one chapter (MacGregor), as is the relation between pairing and gametogenesis (Burgoyne). A finishing chapter on the significance of meiosis is by Holliday.

Reading this interesting 1983 report makes one look forward to a new Symposium on the same topic, to see what progress has been made, both in experimental results and in concepts. I hope it will include post-metaphase I phenomena.

J. Sybenga, Wageningen

Pirchner, F.: Population Genetics in Animal Breeding, 2nd edn. New York, London: Plenum Press 1983. 385 + 30 pp.

The first edition of Professor Pirchner's book "Populationsgenetik in der Tierzucht" was published in 1964. An English version appeared a few years later. The book has become widely used as a textbook in university courses and as a source of reference for scientists and others. The present volume is a revised and an expanded translation of the second German edition, which has been available for several years.

The book offers an extensive and thorough introduction to the theoretical base for modern animal breeding. It starts out in the conventional way with chapters on the genetic structure of populations, changes in gene frequencies, and inbreeding. However, most of the text is devoted to quantitative traits and how they can be improved by selection. The text is widely illustrated by numerical examples. Throughout the bock reference has been made to relevant literature, and the list of reference includes about five hundred entries.

The use of symbols is sometimes a bit inconsistent, as symbols derived from the German terms have been maintained in the graphs also in the English edition (e.g. V for sire, T for daughter). In some cases the explanation of the graphs is too sparse to permit easy interpretation of the graph without consulting the text.

The book has been announced as being "appropriate for the beginning student of animal husbandry, genetics, and agricultural economics". Many students of these categories might find the book slightly difficult, or even unnecessarily comprehensive for their needs. The book is probably more suitable for students at a more advanced stage, particularly for students who want to specialize in animal breeding. It treats in an excellent way not only the basic principles of animal breeding, but also most of the techniques applied in animal breeding research.

O. Syrotad, Oslo

International Board for Plant Genetics Resources: Annual Report 1984. Rome: Consultative Group on International Agricultural Research FAO 1985. 121 pp., 43 figs. in color, 22 tabs.

This is the usual yearly account on the activities of an autonomous international scientific organization to justify its existence. Its basic function is to promote and coordinate an international network of genetic resource centers. The political intention is to raise the standard of living and welfare of people throughout the world. The mobilization of financial support shows the USA, Japan, Canada, the UK and the World Bank to be the main contributors.

The report gives detailed information on crops which are promoted and on regional activities. Among the highlights of 1984 are 582 collecting missions in more than 90 countries, which delivered 121,000 samples of germplasm, providing funds for more than 300 seed storage facilities, as well as a broad information and training program. One must also not forget the 51 groups, numerous committees meetings and the production of 237 documents.

H. F. Linskens, Nijmegen