

## Book reviews

**Lefèvre, W.: Die Entstehung der Biologischen Evolutions-theorie.** Frankfurt/M., Berlin, Wien: Ullstein Materialien 1984. 293 pp., 8 figs. Soft bound DM 19,80.

This German-written book forms part of the author's study on the introduction of the historical dimension in man's picture of the natural world. The book deals with the origin of evolutionary theory and is divided into two parts. In the first part, Lefèvre sketches Lamarck's and Darwin's theories; the second treats the history of four areas in biology which were of considerable importance to the origin of evolutionary theories, namely morphology, biogeography, paleontology and systematics. The second part finishes with 50 pages on Darwin's discovery of his evolutionary theory.

According to Lefèvre, the published studies on the history of evolutionary theory do not give a consistent picture. For this reason, he felt that he should study the original works and consult only minimally the secondary literature. However, it is near impossible for one person to study all the relevant literature. Accordingly, Lefèvre did not go through many of the important sources. For example, from Darwin he did not consult the M&N-notebooks, his book on the *Cirripidae* and his orchid book. Furthermore, Lefèvre refers to books which he appears to have read only superficially. In one such case (p. 94), he quotes Darwin saying that "it can hardly be supposed that a false theory would explain, in so satisfactory a manner as does the theory of natural selection, the several large classes of facts [discussed in the *Origin*]" and in the reference list, Whewell's *History of the inductive sciences*. However, Lefèvre seems to be completely unaware that the quoted statement, which he criticizes as being superficial, exactly corresponds with the core of Whewell's book. This Darwin had read and he also took great pains to follow the scientific method as dictated in the works of Lyell, Whewell and Herschel.

In conclusion, Lefèvre's book makes several good points although the picture that it yields hardly differs from that in many other books. The book would have been far more complete if Lefèvre had consulted more of the literature on the history of evolutionary theory.

G. J. de Klerk, Canberra

**Köhler, W.; Schachtel, G.; Voleske, P.: Heidelberger Taschenbücher, Band 234: Biometrie. Einführung in die Statistik für Biologen und Agrarwissenschaftler.** Berlin, Heidelberg, New York, Tokyo: Springer 1984. ix + 255 pp., 58 figs. Soft bound DM 29,-.

This textbook of biometrics for biologists and agronomists is a not fully satisfying attempt for making statistics accessible to research workers. While the book has its strong points: e.g. the useful distinction between a priori and a posteriori tests on p. 152 ff. and the introductory remarks on experimental design in Ch. VII, it also has its shortcomings:

1. No attention is paid to the aspects of data inspection and data processing.

2. The meaning of not significant results of statistical tests is not well explained. Maintaining ("Beibehalten") or even

accepting ("annehmen")  $H_0$  are dangerous expressions, not-rejecting  $H_0$  would be more careful.

3. The risk of accepting  $H_0$ , if not rejected is demonstrated on p 149 where applying ANOVA is justified by a test for homoscedasticity hardly missing significance, while Bartlett's test described on the following pages would turn out significant ( $p=0.016$ ).

4. The concept of p-values is not introduced and another possibility to indicate a degree of significance has not been introduced before p 168 (the "generally used" asterisks code).

5. Models and preliminary assumptions are not always carefully formulated: on p 125, p 130 and p 131, the restrictions on ANOVA model parameters ( $\Sigma a_i = 0$  etc.) are omitted. On p 101 (U-test) and p 178 (H-test) not strictly required continuity and "same shape" conditions are postulated for these tests. Besides: what are distributions "of the same shape" (von gleicher Form) – are they two normal distributions with unequal variances of the same shape?

6. Nowhere it is explained that two-sided tests are three decision procedures leading to three possible conclusions: e.g. for a two sample t-test:  $\bar{x}$  and  $\bar{y}$  do not significantly differ,  $\bar{x}$  is significantly larger or significantly smaller than  $\bar{y}$ .

7. Useful and easy simple tests like the sign test and the  $2 \times 2$ -table tests are not presented.

In summary: the book would gain much by an extensive and careful revision.

Ph. van Elteren, Nijmegen

**Cold Spring Harbor Symposia on Quantitative Biology, Vol. XLIX. Recombination at the DNA Level.** Cold Spring Harbor: Cold Spring Harbor Laboratory 1985. 854 pp., several figs. and tabs. Hard bound \$ 156,-.

These conference proceedings give a wealth of information on recombination and should be a valuable reference for those working in this field. In the foreword the editors, A. J. S. Klar and J. N. Strathern, put recombination in a historical perspective. Thus, genetic linkage in Mendelian inheritance (T. H. Morgan, 1911) followed by genetic recombination through chromosomal crossing-over events (H. S. Creighton and B. McClintock, 1931; C. Stern, 1931) and an explanation of genetic recombination in molecular terms (R. Holliday, 1964) provide a historical frame work for the subject of this symposium.

In a series of 14 topics with over 90 speakers, the conference covered primarily biochemical aspects of recombination. Homologous recombination, transposition and enzymes involved in these recombinational mechanisms are described for different organisms like *E. coli*, yeast, mammalian cells and plants. From publications on a topic, consisting of contributions by various authors, it is often rather difficult to get a clear picture of the overall topic. Therefore, it might have been useful if subjects were covered by an overview article. On the other hand, the symposium has been preceded and concluded by chapters which unite the concepts of recombination at the DNA level.

From a historical point of view, recombination in plants is somewhat underrepresented. Actually, I missed contributions

on DNA transformation of plant cells and on *Agrobacterium tumefaciens* directed T-DNA integration into the plant genome.

Concluding this meeting A. Campbell addressed the question about the biological function of general recombination, since most contributions only dealt with the mechanisms of recombination. May be a next symposium could emphasize this matter in somewhat more detail. For private use the price of this book is quite high, but since the amount and quality of information are impressive and high, this volume can be strongly recommended.

J. Hille, Wageningen

**Losick, R.; Shapiro, L. (eds.): Microbial Development. Monograph 16.** Cold Spring Harbor: Cold Spring Harbor Laboratory 1984. 303 pp., several figs. Soft bound \$ 33.60.

According to the editors the intention of this monograph is to compare similar biological problems in different prokaryotic and eucaryotic microbes by different experimental approaches. The reader of the book is excited by the fact that in both main groups of microorganisms a common ground can be found not only in the questions which can be asked but also in the manner by which microbes have solved the problems inherent in developing systems. Examples of microbial development collected in this volume are the morphogenesis of *Escherichia coli* (Donachie et al.), endospore formation in *Bacillus* (Losick and Youngman), differentiation in *Streptomyces* (Chater), cell mobility and chemotaxis (Stock and Koshland), formation of streptococcal sex pheromones (Clewell), development in yeasts (Klar et al.), in myxobacteria (Kaiser) and *Dictyostelium* (Chisholm et al. MacWilliams and David). The informative book is finished by a contribution of Ausubel to *Rhizobium*/Legume symbiosis. Most of papers are of a high scientific level and are examples of the rapid growth of the bulk of knowledge in this field.

R. Borriss, Gatersleben

**Borisy, G.G.; Cleveland, D.W.; Murphy, D.B. (eds.): Molecular Biology of the Cytoskeleton.** Cold Spring Harbor: Cold Spring Harbor Laboratory 1985. 512 pp., several figs. and tabs. Hard bound \$ 69.00.

The Molecular Biology of the Cytoskeleton presents the contributions of a meeting having the same name in the Cold Spring Harbor Laboratory in August 1984. It consists of 40 papers grouped in three sections:

1) Cytoskeletal proteins: structures, dynamics and isoforms. This section comprises – not in sequence – four contributions on tubulin, two on kinetochores and one on the distribution of microtubule associated protein, one paper on iso-actins in muscle, one on the relation nuclear matrix-intermediate filaments, one on the dynamics of cytoskeletal proteins in focal contacts and one on the erythrocyte cytoskeleton.

2) Mutant analysis of the cytoskeleton. This unit commences with three papers on actin and tubulin in yeast followed by a paper on yeast chromomeric DNA, two papers on tubulin in *Physarum*, three on actin and associated proteins/structures in Nematodes, two on the function of microtubules, respectively in *Drosophila* and CHO cells, an interesting paper by Lai et al. on tubulin and actin in *Naegleria*, and explicitly on mutants, a paper on *Chlamydomonas* flagellae.

3) Cytoskeletal genes: structure expression and regulation. Four contributions are dedicated to tubulin genes, one to the  $\tau$  protein in neurite development, three to keratin genes, four on

various other intermediate filament genes, two papers on respectively actin and myosin genes and finally one paper on the use of antisense genes.

The still rising interest in the cytoskeleton with its many functions certainly justifies a further contribution to the subject. According to the editors the purpose of the book is to serve as a reference and guide in the molecular biology of the cytoskeleton. Much qualitatively valuable information is presented in an accessible way, impressively showing the diversity and versatility of the cytoskeleton. However, it suffers from the same disadvantages as any other meeting proceedings: a somewhat unbalanced choice of topics with a lack of coherence, emphasized by a rather haphazard grouping of the contributions, which in part essentially hardly differ from recent publications. The attractiveness of this book is the accessibility of, at least a part of the present, up-to-date research on the molecular biology of the cytoskeleton.

J. Derksen, Nijmegen

**Sikora, K.; Smedley, H.M.: Monoclonal Antibodies.** Oxford: Blackwell Scientific Publications 1984. xi+132 pp., several figs. and tabs. Soft bound £ 8.50.

The hybridoma technique has undergone a stormy and much discussed development. Nowadays, however, it is being applied to various fields of biology and medicine. In this book by Karol Sikora and Howard M. Smedley causes of this revolution are somewhat unveiled through descriptions of the breakthrough in histology, microbiology, tissue culture and oncology, for which diagnostic and identification is of crucial importance. The authors also see an important role for monoclonals in the therapy of various diseases (e.g. tumors) and they think in terms of coupling monoclonals with cytostatics, toxins and radio-nucleids. The application in therapy will increase in the near future as soon as the problems concerning the production of human monoclonals have been solved. Higher fusion frequencies are to be reached and higher production has to be guaranteed, as well as the anti-tumor-binding activity improved. The preference for monoclonals in comparison to classic antisera is linked to the higher specificity, the cheaper and less-time-consuming applications, and the better standardization.

This book is considered to be an introduction into a new technology and describes why monoclonals became so used so soon after discovery. It is therefore suitable for anyone who has heard the bell ring and wants to get more information. A certain elementary knowledge of immunology makes access easier.

This book is not the only book, nor is it the first, which describes the hybridoma technique in more detail. It can be considered by experts as a promotion spot for further development of monoclonal antibodies.

The chapters on cancer localization and treatments are so preliminary that they would be better placed in a sensation orientated newspaper. It is decorated with only a few color plates and these would stand better in a museum of modern art.

F. Hogervorst, Amsterdam

**Ganesan, A.T.; Hoch, J.A. (eds.): Genetics and Biotechnology of Bacilli. Proc. 2nd Int Conf Genet Biotechnol Bacilli.** Held at Stanford University, Stanford, Calif. July 6–8, 1983. Orlando, San Diego, New York, London, Toronto, Montreal, Sydney, Tokyo: Academic Press 1984. xix+421 pp., several figs and tabs.

The Syntro Corporation and the Stanford Medical School sponsored the "Second International Conference on the Genetics and Biotechnology of Bacilli" which was attended by nearly 300 scientists from 17 countries. This meeting gave an outstanding overview on current research activities in the field of Bacilli which are the most useful of procaryotes for biotechnological applications.

The material presented is divided into five sections: the first one, on chromosomal organization, contains eight contributions solely dealing with the *Bacillus subtilis* chromosome. Problems of genetic mapping of cloned ribosomal RNA genes, transfer RNA gene organization, mapping and cloning DNA from the replication terminus region, gene amplification and new genetic methods, as well as molecular cloning strategies which take advantage of TN 917 insertional mutagenesis, are discussed. In the next section, on secretion, the reader is informed on  $\beta$ -lactamases of Bacilli, levansucrase secretion in *B. subtilis* and secretion of foreign gene products by the aid of a *Bacillus* secretion vector. The subsequent papers deal with cloning and expression of proteases including subtilisin as well as  $\alpha$ -amylase. Section 3 is devoted to transcription. Inter alia structure regulation and genetic locus of a temporally expressed promoter of *Bacillus subtilis*, and the mechanism of the inhibition of *B. subtilis* RNA polymerase by lipiarmycin are described. In a further paper the application of bacteriophage SPP1v as a cloning vector is discussed. In a number of other contributions the results of cloning comprise the 4<sup>th</sup> section. Absorbing communications deal with the development of an inducible promoter for controlled gene expression in *B. subtilis*, cloning and partial characterization of the cereolysin gene, the stability of recombinant bifunctional plasmid transfer from *E. coli* to *B. subtilis* and general problems of cloning of genetic material in Bacilli. Section 5, on the synthesis of sporulation associated products, consists of 6 papers. Genetic and biochemical aspects of endotoxin production by *B. thuringiensis* are discussed in several papers. During sporulation cells of this particular species synthesize a crystal protein which is lethal to many lepidopteran larvae and is used commercially as a pesticide. Very impressive is the contribution written by Japanese authors on amplification of sporulation genes and its effect on differentiation in *B. subtilis*.

In addition to the main sessions some topics were included in three focus sessions: Phages, spores and problems of general genetics. The highlights of these events are summarized in short chapters at the end of this publication.

This book achieves an up-to-date survey of a group of bacteria which is of a particular academic and economic importance. In summary, a very useful book which rapid publishing should be especially acknowledged.

D. Gröger, Halle (Saale)

**Nossal, G.J.V.: Reshaping Life. Key Issues in Genetic Engineering.** Cambridge, London, New Rochelle, Melbourne, Sydney: Cambridge University Press 1985. xiii+158 pp., 10 figs. Soft bound £ 6.95.

Genetic engineering and related technologies represent the biggest single advance in the life sciences this century. Its influence on medical therapy, agriculture, mining industry and waste disposal is already or will become, substantial in many ways. However, the main sources of information about this new technology are mainly specialized technical articles and books on the one hand or shallow press releases on the other, with a gap in between. G. J. V. Nossal felt this gap. He succeeded in presenting the essential elements of genetic engineering and its technological and social implications

within a slim volume in a manner requiring no or little background in biology. The book is readable for the target audience: all interested people working in non-biological fields especially decision-makers at many levels.

The book contains twelve chapters of about ten to fifteen pages long. Each chapter is subdivided. The content of the book is built up in a rational way. The text is informative and clear, and masks the shortage of illustrations. The book contains a useful extensive glossary, and is not expensive.

The author, director of a large medical research institute, does not deny his scientific origin: the book contains many medical examples. After the introductory chapter, an explanation of the organization of cellular life and the basic mechanisms of gene transplantation are given. Next, the role of genetic engineering in the mass production of hormones and other human proteins in the treatment of serious diseases is described. The following chapters deal with the help of purified genes in solving hereditary problems, speculate about future substitution of good genes for bad ones and examine some disease problems of tropical, developing countries with special attention to the production of new vaccines. Further, technological and agricultural aspects of genetic engineering are treated. In the last three chapters attention is paid to broader social aspects of genetic engineering: the relationship between science, industry and politics, the ethical and legal aspects, and the problems of communication about genetic engineering. These chapters make the book particularly interesting by showing how the reshaping of life due to genetic engineering is reshaping life inevitably.

L. J. W. Gilissen, Wageningen

**Heisenberg, M.; Wolf, R.: Studies of Brain Function, Vision in Drosophila, Genetics of Microbehavior, Vol. 12.** Berlin, Heidelberg, New York, Tokyo: Springer 1984. IX, 250 pp., 112 figs. Hard bound DM 149,-.

This book reviews behavioural analyses on vision of *Drosophila*, albeit excursions into the visual system of other dipterous insects are frequent. The book is indeed an excellent introduction in the kind of system analysis initiated by Hassenstein and Reichardt's work on the optomotor reaction of the beetle *Chlorophanus* during the fifties, and continued by many other investigators, among them chiefly the staff of the Max-Planck Institut für biologische Kybernetik in Tübingen, of which for several years one of the authors (Martin Heisenberg) was a member. Most aspects of the approach of the group in Tübingen are thoroughly discussed in this monograph and, in fact, while going through its pages one clearly realizes just what considerable progress in the field of research on vision of flies has been during the last fifteen years, both in terms of factual knowledge and conceptual understanding. Part of this progress is due to the work of the authors, reviewed in this monograph. Since the emphasis of the present description is on *Drosophila*, the experimental approach to the problem of vision, as utilized by the present authors, is supplemented here and there with genetic variants. This is probably the reason for the subtitle "Genetics of Microbehaviour" which is given to this book, the real meaning of which, I must confess, escapes my understanding (is microbehaviour a particular aspect of the entire behavioural repertoire of the fly or, rather, the behaviour of a small animal?). Whatever meaning this subtitle has, the use of genetics in this book is actually rather mild, merely restricted to the instrumental application of particular mutants to unravel particular problems, and even the authors seem to recognize in the Introduction that the application of the genetic approach to

behaviour is premature since the basic structure of the system to be dissected with mutants has to be previously known to a certain extent.

In addition to an Introduction and a Synopsis the contents of the book are subdivided in two main parts. The first deals with the functional organization of the compound eye and visual ganglia, as well as with what the authors call "simple behaviour" (motion sensitivity in "open loop" conditions); furthermore it includes an attempt to correlate structure of the compound eye and visual ganglia with several different aspects of vision, e.g. spectral sensitivity, polarization sensitivity, dark adaptation, motion detection. In the second part, the authors deal with a higher level of behavioural performance, or "endogenous behaviour", as worked out in experiments with "closed loop" conditions, e.g. fixation of flying and walking flies, menotaxis, foreground-background experiments, plasticity and so on. The authors deal scholarly with these two parts and, despite being principally concerned with their own work, also succeed in giving a fair picture of the current state of the art by extensively referring to the work of others. Therefore, here we find a source of abundant references concerning many aspects of sensory physiology. Nevertheless, these two parts make also obvious that this is a book for specialists, with a text naturally obscured by the difficulties inherent to most of the problems treated. Readers who are not familiar with the background of behavioural analysis of insect vision might perhaps encounter difficulties while following some of the arguments. The Introduction only briefly presents the conceptual background on which the approach relies, and the Synopsis summarizes the same background concepts on the light of the experimental results. Introduction and Synopsis also clearly show that this book is not simply a compilation of facts but actually, using the words of the authors, a "personal exercise". Rather personal aspects are found, for example, in the invention and use throughout the text of several terms, like "orientedness" and the fly's "value system", and above all in a continuous attempt to put the fly, rather

than the experimenter, in the foreground of attention, as I understand the discussion on reorganization of visuo-motor coordination at the torque meter and its relationships to voluntary behaviour. This is certainly a very legitimate attempt, though doing so is in my opinion a matter of taste as well.

In spite of the price of 149 DM this book should be able to find a large audience. I personally found the "personal exercise" a very useful and enjoyable tool.

J. Campos-Ortega, Köln

**Falconer, D.S. (German translation by Glodek, P.): Einführung in die Quantitative Genetik.** Stuttgart: Eugen Ulmer 1984. 472 pp., 67 figs., 44 tabs. Soft bound DM 34,80.

As a consequence of the rapid advance in molecular biology, many volumes in this field are published and, as a consequence, even in textbooks the amount of quantitative genetics is decreased. Therefore a textbook to close this gap is well desired.

The present textbook is much more than an introduction. It is intended to communicate to those readers having already a basic knowledge of general genetics comprehensive information on quantitative genetics needed for breeding and understanding the process of evolution.

In addition to a short and precise description of the main topics – populations and their changes, variance, heritability, selection, inbreeding and crossbreeding, it presents some examples, especially in the field of animal breeding, as well as some typical methods of plant breeding. This concise book includes many references to special papers. Appendices with tables and a list of abbreviations effectively simplify the understanding of the text.

Reading this book will be profitable for all those who want to learn more about quantitative genetics. Libraries catering to animal breeders should have it.

E. Günther, Greifswald

## Erratum

Theor Appl Genet (1985) 70:377–382. P. Wehling, G. Schmidt-Stohn and G. Wricke: Chromosomal location of esterase, peroxidase and phosphoglucomutase isozyme structural genes in cultivated rye (*Secale cereale* L.)

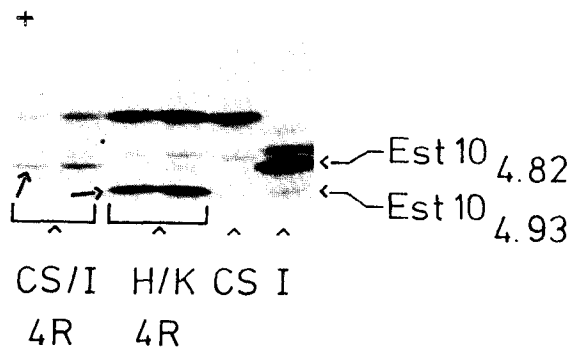


Fig. 4

In Figs. 4 and 5 the wrong isozyme bands were marked. The corrected figures are given here:

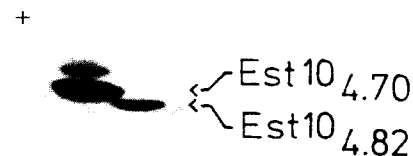


Fig. 5