

Book Reviews

Isozymes: current topics in biological and medical research Volume 15. Genetics, development and evolution. Mario C. Rattazzi, John C. Scandalios and Gregory S. Whitt (eds). Alan R. Liss, Inc., New York, 1987. Pp. xii + 290 Price: £42.00. ISBN 0 8451 0264 8.

The Isozymes series of volumes which began in 1977 is a useful and comprehensive source of review articles covering more or less the entire field of isozyme research. Ideally volumes in such a series should deal with one major theme of isozyme research enabling the editors to put together an integrated and balanced collection of papers. Volumes 14 to 16 represent the proceedings of The Fifth International Congress on Isozymes held on the island of Kos, Greece in May 1986. Volumes 14 and 16 are subtitled 'Molecular and cellular biology' and 'Agriculture, physiology and medicine' respectively. According to the forward there were 250 participants, 40 symposium presentations, as well as workshops and poster displays at the conference. As the number of papers in volumes 14-16 is also 40 involving about 100 authors, it would seem that the editors had the unenviable task of putting together all the symposium papers under just three headings. Thus we have great diversity assigned to three broad niches without the benefits of selection.

In volume 15 the diversity is manifest in two ways. First there is great variety of subject, for example, a theoretical paper on tree construction, papers on genetic mapping in barley, the mink and of DNA repair genes in man, and papers on evolution of specific isozyme systems in *E. coli*, yeast, and the tomato. Second there is unevenness in approach with some quite general reviews, for example, on heterosis, on the use of isozymes in systematic studies, on the metabolic significance of allozyme variation, mixed up with studies of specific isozyme systems in specific organisms. There is, however, no sloppiness in presentation, the volume is well and carefully produced with the same format for all papers.

I enjoyed reading those papers which coincided with my own research interests in evolutionary genetics, to study the rest was more painful. Although individual papers may be interesting and useful as works of reference I am not persuaded by this volume that there is any particular value in publishing conference proceedings.

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Single cell marking and cell lineage in animal development. R. L. Gardner & P. A. Lawrence (eds). The Royal Society, London. 1986. Pp. 187. Price: £41.00 (U.K. address) £44.00 (overseas address). ISBN 0 85403 261 4.

Over the past hundred years embryologists have endeavoured to understand how individual animals emerge from single cells and multicellular organisations. One of the important tasks in these studies is to follow cell lineages during development, helped in recent years by molecular genetics. Each species offers particular advantages and disadvantages for such studies. This is exemplified by work on *Caenorhabditis elegans* which has about 1000 cells and development follows a highly stereotyped pattern, compared with the mouse which has a more protracted and complex series of events involving cell mingling and interactions and where cell lineage is a less important developmental determinant. Many other species fit in between these two extremes. One view suggests that the differences in development strategies employed in different species are simply variations on developmental mechanisms already established in nematodes. This book is an account of comparative embryology and the diverse methods adopted in such investigations. I can assure readers that they will find this book highly rewarding but it needs hard work to extract maximum benefits. This is mainly because multi-author volumes like this do not provide any continuity between chapters or concepts.

In my view, Stent's overview on the role of cell lineage in development is perhaps the most readable and interesting. He discusses the broad concepts of development precisely and effectively, in a style worth emulating. This chapter serves as an introduction and sets the scene for the rest of the book. There are chapters covering studies on nematodes, the only organism for which the complete cell lineage is known with the sole help of Nomarski optics. Studies on the leech demonstrate that despite the overtly segmented form of this species, the segmental boundaries do not correspond to the borders of clonal restriction. Many aspects of *Drosophila* development are covered, this species being the major focus of attention over a number of years. Concepts defining segments, parasegments and compartments are discussed together with considerations of objective principles of pattern formation or 'internal representation' of the fly, as well as the role of homeotic genes. Work on amphibians describes the use of labelled cells introduced into blastocysts as a means of fate mapping, and the influence of different cell combinations on their abilities to mingle is particularly interesting. Development in birds is described using the familiar

quail-chick chimaeras which exploits species differences in the interphase nuclei as a marker. An analogous approach is employed in mammals using *in situ* hybridization with a satellite DNA probe on *M. musculus-M. caroli* chimaeras. Further studies describe the use of donor cells introduced into blastocysts for clonal analysis in the mouse. Some detailed work in mammals deals with the development of the extraembryonic tissues.

Since the pace of research in this field has increased there are already noticeable gaps in the book. Discussions relating to homeotic genes and on the importance of parental origin of genomes and chromosomal determinants in development of the mouse are missing. There is also no mention of the use of transgenes with markers such as β -galactosidase which are now available for studies in a number of species, especially in mammals. The editors describe the meeting as 'noisy and friendly', and I imagine lively discussions on concepts such as compartments, polyclones and parasegments. It is a pity that the discussions were not recorded since this would have given a deeper insight into some of the chapters. I also feel that a concluding chapter by the editors summarizing major ideas, controversies and predictions for the future would have been very useful.

Unfortunately, this worthwhile book comes at a price which is probably too high for individuals as well as for many libraries. However, this work has previously appeared in *Philosophical Transactions of the Royal Society*. This book will prove to be an invaluable source of reference for years to come and I am very pleased to own a copy in exchange for this review.

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The gene: its structure, function and evolution.
Lawrence S. Dillon. Plenum Press, New York.
1987. Pp. ix + 896. Price: \$95.00 U.S. ISBN
0 306 42319 7.

This review is late, but for that I make no apology. Rather I feel a quiet sense of pride that I managed it at all. This could have been—indeed should have been—an interesting and stimulating book. The question "What is a gene?" must be amongst those most frequently asked of undergraduates at exam time and the huge explosion in sequence data available over the last few years provides a rich source of reference. So rich indeed that the author of this volume appears to have succumbed to gluttony and in consequence be suffering from indigestion.

It is the author's claim that this book represents the "first unified analysis of the gene on a broadly comparative basis" and that it is therefore inevitable that "new characteristics and interrelationships among genes as

entities in their own right should be disclosed". As a consequence of this, a whole new nomenclature develops, including split genes, mature genes, compound genes, assembled genes, diplomorphic genes and cryptomorphic genes, to mention but a very few. Now clearly new approaches do need to be adopted to rationalize these enormous globbets of new information. However, already molecular geneticists are castigated even by other biologists for their over-fondness for obscure terminology—and these new terms are obscure, even to those of us in the business.

These attempts by the author to deal with an admittedly difficult problem might be met with a great deal more sympathy, were it not for his habit of changing the names of well known genes for what are often less than convincing reasons—the rat sarcoma v-ras gene becomes v-don for example.

To this plethora of new and confusing terminology, the author adds frequent strictures as to the short sightedness of his fellow workers. It was rather a surprise to find that the nature of the transposase encoded by Tn3 had been neglected in the literature—I'm sure the substantial groups working in this area will be similarly surprised. Likewise, apparently, the extent of complexity of the transposition process has not been realised. I can only say that I, for one, certainly never considered it to be a simple process.

Finally, I would mention that there must be some limit to the amount of raw sequence data that can be crammed into any one book. This is a volume of approximately 900 pages. Remove the sequence data and it would be about half the size. It really becomes very difficult to read normal text when a sea of A and T's, G's and C's are imprinted on ones retinas. The exponential increase in the amount of sequence data in the literature means that comparative studies are not only possible, but essential. However, I suspect that to try and approach the subject on such a grand, global scale is to attempt the impossible. Not only can one not see the wood for the trees, but one ends up simply standing back in awe at the size of the forest.

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The Solomon Islands Project. A longitudinal study of the health, human biology, and culture change.
Jonathon Scott Friedlander (ed.). Oxford University Press, Oxford. 1987. Pp. xii + 409. Price £45.00
ISBN 019 857595 5.

This is the fourth book in a research monograph series on Human Population Biology. Earlier volumes dealt with aboriginal man, genetics of the Jews and the peoples of Southern Africa. Consequently this volume is much narrower in scope than the previous books in the series.