Drosophila genetics

The Genetics and Biology of Drosophila. Volumes 1a, b, c. Edited by M. Ashburner and E. Novitski. Pp. xv+486, xv+487–954, xii+955–1,427. (Academic: New York, San Francisco and London, 1976.) £16.80 per volume.

THE present three volumes represent a substantial part of an ambitious treatise dealing with the genetics, biology, development, evolution and ecology of *Drosophila* in the form of a series of articles contributed by specialists in the various subdivisions of this extensive field. They deal with the more strictly genetic aspects and display the great variety of analytical techniques which can be applied, especially in *D. melanogaster*. Ever since the early days of *Drosophila* genetics, presided over by the now legendary associates of T. H. Morgan, there has been a progressive development of ingenious ways of exploiting structurally altered chromosomes to investigate the properties of genes and chromosomes, often combined with supporting evidence from the ordered banding of the polytene chromosomes of the salivary gland. This methodology is dealt with in the articles according to their relevance to particular topics, but it is a pity there is no classified account of the principles of analysis and how they may be applied to different kinds of problem. This would have been valuable for newcomers to *Drosophila* and would have reduced the sense of discontinuity created by the rather arbitrary ordering of topics. Is it too much to hope that such an article could be included in a later volume of this series? Might the editors be persuaded to round off their labours with what could well be a *tour de force*?

In the total of some 1,400 pages the articles deal with such topics as chromosome aberration, conditionally expressed mutations, mosaic systems, gene conversion, meiotic mutants, distributive pairing, compound and ring chromosomes, altered segregations including segregation distortion, genetics of the Y chromosome, analysis of simple and complex loci, analysis of the proximal region of the X chromosome and of the fourth chromosome, position effect variation, mitotic recombination, the bobbed locus, radiation genetics, chemical mutagenesis, polytene chromosomes, together with reviews of *D. virilis* and *D. hydei*.

Merely to list these topics, which are generally covered in depth, is sufficient to indicate the wealth of information and conceptual diversity packed into these volumes. Naturally, almost all the theoretical framework has been strictly genetic in origin; ultimately it will have to be reconciled with molecular evidence and interpretation, and a promising start has been made in that direction. Studies of the kinetics of extracted DNA, its appearance under the electronmicroscope, DNA–DNA and DNA–RNA hybridisation, the sequencing of satellites, *in situ* hybridisation to the polytene chromosomes and the characterisation of transfer RNA have already made a notable contribution. The elegant analysis of the bobbed locus described here is an excellent example of how the classic *Drosophila* methodology can be integrated with the analytical methods of nucleic acid biochemistry. Current developments in DNA sequencing will surely guarantee that the *Drosophila* genome will continue to be better known than that of any other eukaryote.

This interest in the use of the analytical tools provided by *Drosophila* is not confined to molecular biologists. In the past decade students of embryonic development and differentiation, cell lineage in organ formation, behaviour, and the biochemistry of gene action have discovered in *Drosophila* strategically significant situations worth investigating.

One of the pleasing features of this work is that the historical aspect is not neglected. There is an introductory chapter by C. P. Oliver, one of the *Drosophila* veterans, which outlines the chronology of the major discoveries. In many of the articles there is comment on the origin of new interpretations or techniques and the reader is often thus reminded of the friendly exchange of stocks and ideas which has been, and remains, a traditional attitude among *Drosophila* workers.

It is obvious from the list of 44 contributors to the first three volumes of this series, that the centre of gravity of *Drosophila* research lies within the confines of North America, not overlooking some important European laboratories. It is a pity there are so few British laboratories in which the *Drosophila* lore flourishes. Perhaps these historic volumes will encourage some of our younger biologists to invade the field, provided they have a chance of reading them, none too certain in these days of dwindling library grants in view of the regrettably formidable price per volume.

It must have required immense effort, patience and tact on the part of the editors to marshall so many authors and ensure that the contributions were sufficiently similar in style and standard. They are to be congratulated on their altruistic devotion which will be gratefully acknowledged for many years to come.

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Marine pollution

Effects of Pollutants on Aquatic Organisms. (Society for Experimental Biology, Seminar Series 2). Edited by A. P. N. Lockwood. Pp. x+193. (Cambridge University: Cambridge, London and New York, September 1976). Hardcover £8.50; paperback £3.80.

THE overall trend towards physiological effects and turnover is apparent from most of the papers collected in this volume. Heavy metal storage, excretion and tolerance is covered comprehensively by Bryan with considerable experimental data on *Nereis*. The effects of cadmium on fish biochemistry is described by Larsson *et al.* Cautious comparisons are made with published work in the mammalian field.

Fish physiology is taken up further by Lloyd and Swift. Gas exchange and water balance are discussed with some emphasis on the care required in explaining observed abnormalities in fish kept in captivity. A quantitative approach towards histological studies in gills is presented by Hughes along with interesting information on fish respiratory and circulatory mechanisms. Support is expressed for the tentative hypothesis of Lloyd, that increased ventilation rate by the gills increases the toxicity of poisons.

Organochlorine compounds are dealt with in a detailed review by Addison, in which the author makes several helpful suggestions for future work. The effects of hydrocarbons are covered in two papers. Corner *et al.* comprehensively cover zooplankton and fish. Vandermeulen and Ahern appropriately deal with the primary producers, being concerned with algal physiology. Both papers include experimental data on the effects of naphthalene on these organisms. Zooplankton and phytoplankton are discussed again by Reeve *et al.* who describe the first year's results obtained in the ambitious 'Controlled Environment Pollution Experiment'. Interesting comparisons with laboratory-acquired data are presented with particular reference to copper.

The wide coverage of this book, its readability and excellent index, will make it valuable for project hunters and established researchers alike.

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