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## BOOK REVIEWS

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*Current Communications in Molecular Biology – Translational Control.* Edited by M. B. MATHEWS. Cold Spring Harbor Laboratory. 1986. 194 pages. Paper, \$27. ISBN 0 87969 191 3.

The control of gene expression at the translational level is frequently forgotten or, at best, overshadowed by the far more familiar events which regulate transcription. The importance of this volume is that it goes a long way towards correcting the balance. In particular, it is made clear right from the introductory chapter that translational control is not simply a measure of the strength of ribosome binding sites but that there is a wide variety of effective, and often subtle mechanisms by which the translatability of mRNA can be regulated. Such mechanisms are not merely theoretical but can play an important role in determining the expression of specific genes.

'Translational Control' is a compilation of the proceedings of a meeting under the auspices of the Cold Spring Harbor Laboratory. As is stated in the organizer's preface, this is not a subject that 'regularly commands its own meeting', but that this seemed an 'opportune moment to gather together some of the leading practitioners in the field'. In the event he has been proved right. Unlike many such conference volumes, 'Translational Control' succeeds in being more than just a collection of specialized and unrelated papers and can be usefully read, either for selected articles or as a relatively coherent whole. The volume covers essentially every aspect of the subject, ranging from a discussion of the role of mRNA secondary structure, the factors which influence interactions between ribosomes and mRNA during initiation, the translational control of differentiation, to the exciting prospects of experimentally manipulating gene expression using complementary RNA to interfere with translation. My only reservation, which admittedly reflects a personal bias, is that prokaryotic systems are rather under-represented. This is particularly unfortunate as there have been a number of recent and exciting advances in this area which suggest that the factors which influence the interaction of ribosomes

with mRNA may best be resolved in bacterial or phage systems.

By its very nature, dealing with the 'state of the art', much of this volume will soon be out of date. However, because most aspects of the subject are brought together for, as far as I am aware, the first time, the book will certainly remain a key source of reference for many years to come. It is useful, both to the expert and to the interested 'layman'. In addition, I have even recommended certain chapters as additional reading and as a source of reference to our final year undergraduate students. Thus, this book should certainly be on the shelves of any library which caters for molecular biologists.

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*Essentials of Behaviour Genetics.* BY DAVID A. HAY. Blackwell Scientific Publications. 1985. 359 pages. £15.80. ISBN 0 86793 0640

This is an extremely good book and I give it a particularly warm welcome because it is the first text book of behaviour genetics that I can unreservedly recommend for students. The major source in the field remains Fuller & Thompson's *Foundations of Behavior Genetics* (an enlargement and update of their pioneer 1960 text) but this is too detailed for an undergraduate course. In fact there can be few courses in behaviour genetics in this country at present, but even for those of us who can afford only a few lectures, Hay's book has much to offer.

It is most clearly and attractively written. The whole book is well set out for use with students. There are main references and additional readings given at the end of each chapter. Each begins with a summary of the main points to be covered and ends with a few ideas for discussion. The book's layout makes the best use of a skewed set of data. For better, for worse, we must accept that behaviour genetics as she is identified concentrates very much on human behaviour and

in particular two aspects of it, firstly chromosome abnormalities and gross mutant genes which have severe effects on mental capacities and secondly the quantitative approach to the inheritance of intelligence.

Coping with this bias has led to some pretty boring texts in the past, but Hay avoids the main pitfalls. He began his research career with the Birmingham school of quantitative genetics. At the time they considered that animals only had behaviour while humans had psychology. Hence, uniquely so far as I know, they referred to the field as 'psychogenetics' in case they frightened off the psychologists. Hay seems to have no problems in keeping up his interest in all the different areas but he still sees himself as writing primarily for psychologists and at times, is faintly apologetic about why one needs to talk about *Drosophila* and rodents' as well as humans. I do not think he is very clear in his opening discussion of the way other fields relate to behaviour genetics and he fails to understand the scope of modern ethology, but this matters little for the framework of his book.

After a short chapter laying out the scope of the field and the plan of the book, it starts directly with the evidence on human chromosome abnormalities and single gene mutations, using this topic to illustrate the fundamentals of Mendelian genetics. He assumes no genetic knowledge and I agree that this is a good way to introduce psychologists with little science background to the basic phenomena. The next chapter moves on to the problems posed by quantitative variation – which is that manifested by most of the behavioural characters that have been studied – using a variety of good examples.

The introduction of the necessary formulae and algebraic manipulations is well done, and used to illustrate work with inbred lines and artificial selection, themes which are picked up later. The book moves on to two chapters organized around their experimental animals – invertebrates, pooled together for convenience, and rodents. *Drosophila* and mice have understandably been major subjects for behaviour genetics. Hay's review is up-to-date and he recognizes that what gets studied has often been dictated by what it is possible to measure and what genetic manipulations are feasible. The field offers a series of interesting glimpses but not a coherent picture. For the most part the examples are well described and well chosen.

The three final chapters return to humans. They deal primarily with the vast, tortuous and flawed literature on human cognitive abilities: the nature and validity of intelligence tests; the twin studies and the evidence from adoption; the debates on the efficacy of education programmes, on racial differences and, finally, a more general discussion on the social implications of genetical studies of behaviour. I know of no better account to give to students. Hay presents the studies as they stand, commenting neutrally, but

certainly not uncritically. He also makes a point of summarizing at intervals the different sides of an argument. In these chapters, as throughout the book, he makes extensive use of quotations from primary sources and the conflicting styles in this controversial area come out well – all the major contributors are there. Burt's refusal to allow inadequacies in the data to hamper a genetical theory of intelligence is compared with Margaret Mead's acceptance – at best naive – of fairy tales about Samoan culture to justify an environmental theory of behaviour. This is good, and the final chapter takes the reader through the old arguments on the biological sources of human nature and speculation on what behaviour genetics may have to contribute to the debate and to policy. Hay is not overly optimistic. Rotten arguments on both sides will not rapidly go away, but this book will certainly help to make them more easily recognized.

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*Foundations of Developmental Genetics.* By D. J. PRITCHARD. Taylor & Francis, London. 1986. 372 pages. Hard, £33.00. Paper, £14.50. ISBN 0 85066 2877.

It is generally acknowledged that the genetic control of development is an integral part of the subject of developmental biology, yet there are few textbooks which attempt to bridge the gap between genetics and development, and none, I think, does so more successfully than this one. It has been written primarily for undergraduates, but with the needs of postgraduates and research workers who are moving between the two fields in mind. The exposition of what are often rather complex topics is clear, and at the end of each chapter there is a bibliography containing references to a wide range of books, review articles and original papers, and there is a very useful and comprehensive glossary. The general plan of the book is to work down through the various levels of control, from external factors and gross phenotype, cell physiology and the properties of proteins, through RNA and translation to nuclear DNA and transcription. The balance between molecular genetic and embryological levels is well-judged, and the relation between the two is discussed in the penultimate chapter, in which such traditional embryological concepts as competence, induction and determination are interpreted in what currently appear to be the most likely molecular terms.

There are fifteen chapters. The first is on 'Prokaryotes and the origins of eukaryotes'; the author emphasizes the enormous gulf between the two groups, and the pitfalls in the way of deriving models of genetic control in the one from results obtained with the other. Chapter 2 is on 'The initiation of cytodifferentiation', an account of developmental strategies, illustrated in echinoderms insects and