Drosophila developmental biology upon my return. Would the book make good airport reading, and how would undergraduates like it as a text?

In his preface, Peter Lawrence describes the book as a narrative that should be read from beginning to end. To achieve this he has inserted descriptions of the methodology that underpins modern research in developmental biology into boxes set apart from the body of the text. Indeed this is helpful, especially having set the book down, and when trying to pick up the story line again in a different time zone. He has created a highly readable text that is by and large free from jargon, and which presents the salient features of Drosophila development using carefully chosen examples from the vast literature to illustrate his points. The primary literature is not cited, and this helps in maintaining the flow of the text. The result is a book that will give a highly readable overview of Drosophila development to those non-specialists who have been intimidated by the sheer quantity of scientific reports and the strange language of the Drosophilist.

The examples chosen by the author to illustrate his points are by and large the most appropriate. There are obvious idiosyncrasies, but these bring the book to life and serve to remind us who is telling the story. The theme of the first chapter, the intimate inter-relationship between mother and egg, is elaborated in chapter two, which describes how maternally active genes establish the body axes of the embryo. The natural course of events is followed by a description in chapter three of the zygotically expressed genes active in the embryo in response to these maternal cues. These chapters are very successful, and comprise broad overviews of developmental pathways with carefully selected examples of specific gene interactions that illustrate basic principles without getting bogged down by the increasing complexity of the system as development proceeds. Chapter four is about cell lineage, an area in which it is difficult to separate the technical approach from the message. This chapter, which allows the author to address subjects dear to his heart, defines the **parasegment** and leads in to the topic of the next chapter, the homeotic genes. To my mind the story line of the book seemed to break up somewhat from this point, although it could be that jet-lag was now at its worst. The emphasis of the next chapter seems an over-indulgence. It describes a large number of cuticle-grafting experiments from a variety of insects that indicate the importance of positional gradients in generating polarity. These are important considerations, but they seem to be given too much weight. The penultimate chapter describes the role of cell–cell interactions in establishing spacing patterns, and the final chapter describes eye development. My feeling is that it will be difficult for the non-specialist to put these final chapters into the context of 'making a fly'. Many of the future problems that face those studying Drosophila development relate to what happens downstream of the homeotic genes; what controls the development of the nervous system; and how imaginal tissues develop into adult structures. Whilst the final chapters touch with insight on these questions, it would have been helpful to put later development into a broader context, perhaps by first having a chapter simply describing what goes on, and what are the unsolved problems. Having said this, the book is a good read and I can highly recommend it.

How does it serve as a teaching aid? In this context, it could be a disadvantage to split the technical approaches from the story line. This depends upon the background of the students. I was teaching a class of biochemists who had never before come across any of the techniques involved. Thus the experimental approaches had to be taught in parallel. This meant that the students had to dip into sections of the text, not an approach that Peter Lawrence recommends. Nevertheless, I think they liked it. All, that is, but one unshaven youth, who spent the first minutes of every lecture still plugged into his Walkman. He later confessed that he didn't understand what I was talking about, and I had several private attempts to try and instil the basics of the gap, pair-rule, segment polarity, gene hierarchy... to no avail. Peter Lawrence's book? Well he didn't understand that either. Ah well.

DAVID GLOVER
CRC Cell Cycle Group
Department of Biochemistry
Dundee University

DNA Science: A First Course in Recombinant DNA Technology. By DAVID A. MICKLOS and GREG A. FREYER. Cold Spring Harbor Laboratory/ Carolina Biological Supply Company. 1990. Pp. 477. Paperback, £19.95. ISBN 0 89278 411 3.

Having been involved for several years in introducing students to recombinant DNA technology, I have become only too aware of the lack of an introductory laboratory text: a text which is written not for advanced undergraduate or research students, but rather one that is specifically designed for those at an early stage in their careers in the biological sciences, both for those intending to pursue molecular biology as a specialism and those who are taking such a course as a subsidiary. *DNA Science: A First Course in Recombinant DNA Technology* is a very readable amalgam of the history, theory, application, development and practice of modern molecular genetics. Although straightforward language has been used, this has not resulted in any loss of scientific rigour, and the authors should be warmly congratulated for this achievement.

The book is divided into two main sections: text, and laboratory schedules. Chapters 1 and 2 adopt an historical approach: they introduce the underlying

concepts of DNA science and chart the development of our knowledge of the mechanisms of heredity from the early classification of species through to the elucidation of the genetic code and the amendments to Crick's 'central dogma'. The text is made especially attractive to read by the inclusion of contemporary photographs of some of the major protagonists. The theory behind the techniques of cutting, joining and propagation of DNA molecules is clearly and concisely described in chapters 3 and 4, with chapter 4 concentrating on more advanced technologies for the analysis of complex genomes. One minor criticism would be that I could find no mention of insertional inactivation of an antibiotic-resistance gene as a method for distinguishing between recombinant and non-recombinant plasmid molecules. The remaining four chapters describe in a lucid and practical way how recombinant DNA technology has revolutionized both basic and applied research in the fields of development, cancer, human genetics, agriculture, medicine and industry. Rather than describing technological developments in isolation, experimental theory is combined with succinct summaries of the advances in our understanding that these developments have afforded. This is one of the book's great strengths. Diagrams throughout are attractive and easy to interpret, and each chapter is concluded by useful suggestions for further reading. I think it would have been a useful addition if chapter summaries had also been provided.

The laboratory schedules assume no previous experience, and guide the novice from the basics of micropipetting and sterile technique through to the construction and identification of recombinant plasmid molecules. Extensive prelab notes include useful tips and hints for teachers, technicians and students on the preparation, handling and storage of materials, and clear flow-charts and diagrams ensure that the protocols are easy to follow. Potentially hazardous operations are well flagged throughout. At the end of each experiment the student is presented with a series of questions and suggestions for future research, and likely 'non-ideal' experimental outcomes (such as incomplete restriction enzyme digestion or overloading of electrophoresis gels) are discussed. The laboratory section is followed by appendices detailing reagents and restriction site data, and the book is concluded by a comprehensive glossary/index. If necessary, the relevant materials may be purchased from the Carolina Biological Supply Company. From a purely practical point of view I would question whether it is appropriate for the laboratory schedules to be bound together with the eight theory chapters: perhaps thought could be given to publishing the schedules separately.

In conclusion, I believe that readers of this book will find it engaging and enjoyable to read. The authors (one a science educator, the other a practising molecular biologist) have broken new ground here and have produced a very valuable resource for students and teachers alike.

ARTHUR C. ROBINSON
Department of Biological Sciences
Napier University
Edinburgh

Genes and Phenotypes: Genome Analysis Volume 3. Edited by KAY E. DAVIES and SHIRLEY M. TILGHMAN. Cold Spring Harbor Laboratory Press. 1991. Pp. 174. Hardback $40. ISBN 0 87969 402 5.

This is the third of a series of short single-theme review books, designed to keep us up to date with fast-moving areas of molecular genetics. Its title, *Genes and Phenotypes*, is a little uninformative, but the contents, whether or not they can be bracketed under a single theme, are well worth inspecting. Of the six chapters, three (nos. 1, 4 and 6) are concerned with the genetic analysis of human diseases genes, chapter 2 brings us well up to date on the mouse *t*-complex responder locus, chapter 3 describes cloning the mammalian sex-determining gene, TDF, and chapter 5 the molecular biology of the *W* and *Steel* loci of the mouse. A main theme in the book is 'reverse genetics', later called 'forward genetics' and still more recently renamed 'positional cloning', a relatively new approach which has been of particular value in running down genes responsible for major single-gene disorders in man.

Taking first the studies on human genes, Tsui and Estivill give an overview of identifying the genes responsible for single-gene disorders, starting with their chromosomal localizations. They discuss the successful cases of chronic granulomatous disease (CGD), Duchenne/Becher muscular dystrophy (DMD/BMD), retinoblastoma (RB), cystic fibrosis (CF), choroideraemia (TCD), neurofibromatosis type 1 (NF1) and Wilms' tumour (WT). Progress with CGD and DMD was made much easier by the discovery of a patient affected by both these conditions and also retinitis pigmentosa, whose X chromosome had a cytogenetically detectable deletion responsible for these defects. The molecular genetic techniques applied in these studies, described in some detail with adequate references, are complex, varied, highly ingenious and, I imagine, difficult to grasp fully by anyone not working in one of the large teams involved with them, but this chapter should certainly help the enthusiast. Tsui and Estivill remark:

> There has been tremendous competition in the field of disease gene cloning... It is difficult to describe the feelings of performing repeated searches for clone after clone without an open reading frame, constructing and screening genomic and cDNA libraries one after another, watching the come and go of a candidate gene, and working under the fear that the gene has perhaps been identified by another group.