

enormous amount of ground, reviewing much of molecular genetics in its path. The subject matter ranges from DNA structure to genome evolution, RNA splicing to prenatal diagnosis. Unfortunately, it falls short of the depth and detail one would expect of a general genetics text book, while lacking the elegance of more specialized volumes such as Mark Ptashne's *Genetic Switch* or David Latchman's book on gene regulation. It is reminiscent of well written revision notes, continually providing factual information but essentially failing to provide the colour that, for me at least, makes science interesting. More problematically, the brevity of the text almost requires prior knowledge in order that one can appreciate what is being expressed, potentially making the text difficult for a student to follow. Perhaps the book would serve well if a course was crafted around it but it does not have enough depth for the disparate interests of most lecturers who would almost certainly wish to expand well beyond the text or include areas not covered.

Inevitably with any text, particularly one which presents a continuous stream of factual information, there are minor errors or over simplifications. For example, GAL80 is presented as actively binding with or dissociating from GAL4 in response to the inducer, which is now thought to be erroneous, and in an earlier section on the DNA binding domains of what I presume to be GAL4 and related fungal proteins, the well characterised zinc binuclear cluster, which involves six cysteine residues, is described as zinc finger involving two cysteinyl and two histidyl residues. Although much is covered it is interesting that striking omissions still remain, for example, prokaryotic gene regulation does not include bacteriophage  $\lambda$ , the SOS or the heat shock response. However, I was pleased to see that the *lac* operon merited no greater emphasis than the *gal*, *ara*, *mal* or *trp* operons. For this new edition the information on techniques has been reduced, two chapters having been condensed into one. Consequently, as the text does not show how techniques have answered questions, the result is that the limited information is probably too isolated to be useful. With this section in particular, but perhaps also for the text throughout, a greater emphasis on the conceptual would assist the reader in appreciating what is being described (e.g. why clone a gene, what questions can that answer and how can different types of information, combined with the power of molecular genetics, be used to develop viable cloning strategies, etc.).

Looking back I feel I have been a bit harsh, the book is far from bad, and much of the text is clearly and precisely written. Perhaps the saddest omission is that its concise nature precludes the reporting of any of the experimental adventures that have provided the myriad of facts, and there is no sense of a complexity that remains untold.

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**Aspects of the Genesis and Maintenance of Biological Diversity.** Michael E. Hochberg, Jean Clobert and Robert Barbault (eds). Oxford University Press, Oxford. 1996. Pp. 316. Price £60.00, hardback. ISBN 0 19 854884 2.

Carefully conceived and edited multi-authored volumes of interest to a wide readership succeed by taking one of several approaches and sticking to it. They can take a process, idea, concept, or hypothesis and explore it from a wide variety of angles, making clear what has been included and excluded. They can take a pattern, observation, or result and explore hypotheses that explain and predict. Or they can take a collection of similar but non-identical objects, ideas, concepts, observations, or results and evaluate the combination of processes and patterns displayed in the diversity of those collected things (stars, eighteenth century musical works, vertebrates, genes).

This well-edited volume is of the third type. Its collection of objects is the diversity of extant and fossil species, the genes they contain, and, to a lesser extent here, the interactions among them — what we call biodiversity. The editors made no attempt to hold authors to a single theme on biodiversity, or even a group of themes. In fact, they say explicitly in the Preface that they are offering a transect through some of the major questions and themes. That kind of approach may put off some readers, as it often does me. But in this case that would be a mistake, because what we are given here are the combined views of a wide range of biologists on some of the most interesting questions concerning biodiversity and approaches to answering those questions. The final chapters are on what John Lawton and several co-authors in an overview section call 'the problems faced by biologists in their role as curators of biodiversity'.

The sixteen chapters sweep across many of the current major themes: the interpretation of diversity patterns in the fossil record, methods for (and pitfalls in) inferring process from pattern using species trees and gene trees, the structure of food webs and trophic interactions, the effects of non-uniform population distributions on the genetic structure and dynamics of populations and the ecological dynamics of interspecific interactions, local through global gradients in species numbers, and some implications for conservation. Most of the chapters are too short to develop arguments in depth, but most are long enough to explain why the questions are interesting, how those questions can be approached, and what kinds of progress are being made in getting some answers.

What is missing from the book are two things. The first is continuity of argument among chapters. To some extent, that is inevitable in any edited volume. Some continuity, however, is established through Robert May's introduction, which nicely sutures at least some of the chapters, and three other useful overviews of sections of the book, written by teams of authors. The second missing aspect is some indication of, well, what is missing. It is difficult to know from this collection of chapters whether the editors and authors think that these are major issues and questions in biodiversity and we should therefore

focus all our attention on these problems, or whether these are just some issues and there are others that are equally important. For example, no chapters confront in detail the evolution of interspecific interactions or the process of coevolution. The interaction biodiversity of the earth is as much a product of evolution as is species biodiversity and genetic diversity. Processes such as gene-for-gene coevolution and coevolutionary alternation mold the genetic diversity of interacting taxa.

There are so many issues to address in biodiversity that the problem is in getting our priorities straight. One of the points that emerges from these chapters, and is highlighted in one of the section overviews by Sean Nee and a group of co-authors, is the continuing real need for better integration of evolutionary perspectives with many ecological and conservation issues in biodiversity. These chapters help to show some of the places where the integration is best and worst. That, in itself, is a useful contribution, because it points to aspects of biodiversity where some of most important work needs still to be done.

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**Genetic Data Analysis II.** Bruce S. Weir. Sinauer Associates, Inc. Publishers, Sunderland, Massachusetts. 1996. Pp. 445. Price £24.95, paperback. ISBN 0 87893 902 4.

Do not be misled by the title of this book: it is not the second volume of Weir's *Genetic Data Analysis* (1990), but a second edition. Indeed, the publishers should take note that the Library of Congress catalogue entry refuses to record the 'II' and just lists it as the second edition. Other librarians should do likewise.

The first edition was an immediate success, filling a large gap in the literature. In the new edition the original Chapter 6 'Analyses between generations' has been expanded into three chapters, 'Individual identification', 'Linkage', and 'Outcrossing and selection'. Computer programs are no longer included, but an insert advises that they may be obtained from the author's Web site. All the typographical and other errors which I noticed in the first edition seem to have been corrected.

The field which the book covers is now so large, and growing so fast, that in many parts the treatment is necessarily introductory, especially in the cases of 'Linkage' (Chapter 7) and 'Phylogeny reconstruction' (Chapter 10), but up-to-date references to the specialist literature are given. The author has, however, missed an important book on the latter topic, perhaps because it is not in English. *Reconstruction phylogénétique* by P. Darlu and P. Tassy (Masson, Paris, 1993).

It cannot be often that a reviewer finds that a table from one of his own papers has become the cover illustra-

tion for the book under review, but my rendering of Mendel's original data is used as a kind of backdrop to the cover of the new *Genetic Data Analysis* (from *Biological Reviews*, **61**, 295, 1986, source acknowledged). In Weir's typesetting, however, the Greek  $\chi$  of the  $\chi^2$  test has been replaced by a Roman  $X$  and  $X^2$  for Pearson's chi-squared criterion is used throughout the book as it was in the first edition. This is presumably an attempt to apply the convention that random variables are lower-case while their realized values are upper-case. Introduced for  $\chi^2$  by W. G. Cochran (*Biometrics*, **10**, 417) in 1954 it is doubly to be regretted, first because although Greek  $\chi$  and Roman  $x$  differ in lower case, they are both  $X$  in upper case and  $x$  is an overworked letter in statistics, and secondly because Pearson's criterion is not exactly distributed as  $\chi^2$  anyway, even when the null hypothesis is true (which it never is). It is reminiscent of the attempt to call the *ABO* blood-group genes  $I^A$ ,  $I^B$  and  $I^O$ , which died a natural death. In notation, too much logic is not a good thing.

This new edition of a well-established text is greatly to be welcomed, and selects itself automatically as the preferred text for a course on the subject. There are many worked examples as well as exercises in abundances. The printing and the paper have both been improved. I hope the author will be able to keep up with the field and present us with a third edition in due course.

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**Genomes of Plants and Animals (21st Stadler Genetics Symposium).** J. Perry Gustafson and R. B. Flavell (eds). Plenum Press, New York. 1996. Pp. 319. Price \$85.00 (USA), hardback. ISBN 0 306 45372 X.

There has been considerable controversy over the value of big budget genome projects. What of value will come from them? If most DNA is non-coding, how will the coding DNA be distinguished from the non-coding DNA and what is the point of spending any time on the non-coding sequences? *Genomes of Plants and Animals* provides some convincing answers to these questions. The book is the result of the 21st Stadler Genetics Symposium and consists of a collection of papers ranging across the field of genome biology.

Unlike many books of this nature, the papers are well presented and the figures are reproduced clearly. Papers describe advances in genome analysis technology, progress on the major genome projects, the application of current technology to breeding and conservation programmes, and the use of the technology and data generated thus far to answer a range of biologically interesting questions.