priately illustrated, and well referenced. The only significant criticism I have of the book is that the reproduction of illustrations is not consistently good. The paper is not glossy and several figures lose clarity as a result. However, this is not a major detraction.

In summary, this volume would be a valuable addition to any laboratory concerned with plant molecular genetics. Postgraduate students, postdoctoral researchers and group leaders will find that it may help them to decide which strategy to employ in gene isolation and will provide an informative introduction to the chosen techniques.

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An Introduction to Recombinant DNA in Medicine (2nd edn). Alan E.H. Emery and Sue Malcolm. John Wiley and Sons, Chichester. 1995. Pp. 206. Price £14.99, paperback. ISBN 0 471 93984 6.

Being asked by a senior medical consultant to justify why it is important that one of their MD students has a working knowledge of genes, promoters, PCR, linkage, and homologous recombination is a recurring nightmare for me. The obvious implication is that although this molecular biology stuff is interesting, most still see it as having no relevance to how the majority of patients are assessed and treated. In their excellent book, *An Introduction to Recombinant DNA in Medicine*, Alan Emery and Sue Malcolm show not only that recombinant DNA technology *will* have an enormous impact on medicine, but that it already does. What their book serves to do, and does well, is explain the basic technology of molecular biology while remaining focused on the application of this to medicine. This book wins high praise from me on four counts: (i) the basic science, both the concepts and the technical detail are described very clearly, (ii) although the book covers a wide variety of subjects, the weighting given to each is remarkably even, (iii) historical background is often used to explain developments allowing the reader to see why there has been such a huge expansion in this field in such a short time, and (iv), the consistent emphasis on how and why this technology is relevant clinically.

The first half of the book focuses on the science and techniques of recombinant DNA manipulation, whilst the second half describes the molecular pathology of both genetic and acquired diseases, prevention and treatment of disease using recombinant DNA and finishes with some discussion of the wider issues associated with the application of molecular genetics to medicine. The text is very readable and assumes no prior knowledge of the field. Medical students and practising clinicians are likely to find the book most useful, but anyone with a general interest in the application of molecular biology to medicine would find it helpful. Some of the figures are not as sophisticated as we have become used to, but this might reflect the relatively low price compared to similar publications. There are perhaps a few areas I would have expanded. For instance, whilst the technology of transgenesis is described, a couple of examples of some of the disease models which have been created by this technology might have helped the reader to understand its importance more fully, and a little more on the human genome project would also have been useful.

The book is as up-to-date as publishing deadlines allow and should not date too quickly although some areas, for example, the chapter on treatment, may see more progress than others. What omissions I found were small, for example, I was surprised to see no mention of the cloning of antibodies as single chain molecules in the section on monoclonal antibodies and in the gene therapy section there was no mention of DNA vaccination which uses naked DNA alone. However, I am getting rather into the minutia of this field and away from the main thrust of the book which is an overview. I am about to lend my copy to the paediatric registrar who started in the laboratory today, because, and I have two witnesses, he said to me only this morning 'Is there a book about what I'm supposed to be doing for the next year or so?'. The answer now is yes.

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Visual Genetics CD Rom (demonstration disk). Alan Day and Robert Dean. Jones and Bartlett, Massachusetts. 1996. Price £24.95. ISBN 07637 0140 8.

How will we cope with teaching genetics to ever-increasing numbers of students with ever-decreasing resources? Can the use of computer-based teaching methods solve our problems? With these mundane questions in mind, I inserted the *Visual Genetics CD Rom* demonstration disk with real interest. The demonstration disk had two representative sections from the Virtual Genetics Study Guide (on complementation and on structural chromosome abnormalities), selected from the normal range of topics in the full version which would be included in most basic genetics courses. It also had material on nutritional mutant isolation and characterization and on complemen-

tation testing in the Virtual Genetics Lab. As the name implies, this provides interactive material to replace the use of real practicals in microbial genetics.

Would the material arouse a student's interest in genetics and deepen his or her understanding of the subject? The Virtual Genetics Lab starts off as fun, and this must encourage interest. Quite soon however, one gets down to very repetitive mouse movements in order to generate some data. For example, the complementation test involves using a syringe icon to produce all pairwise combinations of 10 mutants. This is all very sensible, but one's mind does wander away from genetics to thoughts of how can one speed up the mouse movements. I suppose this does make the point to students (possibly subliminally) that research involves perspiration as well as inspiration, but less committed students' minds may stray. However, when one gets down to analysing data, things improve markedly. Only the first 17 out of 1000 segregants have to be classified in the three point cross and only 8 out of 160 tetrads in the tetrad analysis before the rest of the data is provided, and then the student is into thinking about the results. Direct monitoring of each step by computer must be a better learning method than using pencil and paper, with checking by the lecturer at the end of the class.

The teaching section on complementation was disappointing. The basic material on the theory and practice of complementation was clearly set out just as in any standard textbook, but now the computer seemed a distraction which would not be found if the same material was on the written page. The programme advances automatically every few seconds. The student can, and should, pause as required, but the pausing distracts in a more intrusive way than moving ones eye down a printed textbook page would. Also, the graphics are inevitably not as good as the very high standard of illustrations routinely achieved by publishers of textbooks. However, the use of movement definitely is a great advantage in the description of chromosome behaviour and must help students' understanding in ways that are not achievable in textbooks.

The self-assessment multiple-choice questions are the simplest part of the program, but in some ways, the most useful. Their interactive nature must be of value in the student's learning process. They were well prepared and covered a good range of standards.

Overall, this is not going to be a panacea for the problems of too many students and too few resources, but then it is naive to hope for a panacea anyhow. This package is a brave attempt to solve a very difficult problem and contains some useful material which could, with judicious planning and adaptation, fit into many undergraduate courses.

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Narrow Roads of Gene Land, Vol. 1, Evolution of Social Behaviour. W.D. Hamilton. W.H. Freeman Spektrum, New York. 1995. Pp 552. Price £20.00, paperback. ISBN 0 7167 4530 5.

W.D. Hamilton has made enormous contributions to modern evolutionary biology and the publication of his collected papers is long overdue. This is volume one, beginning with his first paper in the *American Naturalist* (1963) sketching his ideas of kin selection that were fleshed out the following year in *Journal of Theoretical Biology* and ending in 1980 with a paper on evolutionary dispersal strategies. Inbetween we get senescence, biased sex ratios, the selfish herd and insect altruism, along with a large dose of evolutionary entomology. It is sometimes forgotten that Hamilton is an exceptional entomologist with an encyclopaedic knowledge of the class, and extensive experience in the field, from the North Downs to Amazonia. The break in 1980 is natural because since then Hamilton has been occupied chiefly, although not exclusively, with the evolution of sex and in particular the role that parasites and pathogens may play. Hamilton's work lends itself well to collection in a single volume because unlike most contemporary scientists he has worked largely alone, developing a series of intertwining themes, rather then heading a laboratory of students and collaborators. Indeed only three of the fifteen papers reprinted here are co-authored (with Bob May and Hugh Comins on evolutionary dispersal strategies, and with Nancy Moran on the evolution of plant defences to herbivores).

But the current volume is more than a collection of papers as each of the fifteen publications is preceded by an essay describing its genesis and incorporating a large chunk of autobiography. Hamilton read genetics at Cambridge but moved to London in 1960 to begin a PhD at University College (UCL) and the London School of Economics (LSE). Already, he had had the critical insight into the evolution of social behaviour and he spent his PhD collecting relevant data and formulating a quantitative theory. Neither UCL nor LSE took him to its bosom, both frightened of the spectre of genetic determinism he appeared to represent, and Hamilton movingly describes a rather lonely life spent in library and digs, plagued by self doubt and worried that he may be wrong, or just stating the obvious. But he persevered and the acceptance of the preliminary note in the *American Naturalist* spurred him to write the definitive account in *JTB* (though I have to say that on re-reading these papers I still find the mathematical formalism completely counterintuitive). Having completed his PhD, in 1964 he became a lecturer in the Biology Department at Imperial College, an appointment I had always considered a masterpiece of my Department's prescience and judgement, although Hamilton's more prosaic explanation is that there were two candidates and the other one declined the job. Based at Imperial's Silwood campus, he developed theories of the selfish herd, the evolution of ageing, and the effect of local mate competition on the