starting up in the field. The book is user friendly and good value for money.

MARK J. I. PAINE
Wolfson Unit of Molecular Genetics
Liverpool School of Tropical Medicine
Liverpool L3 5QA,
U.K.

Interspecific and Intergeneric Crosses in Cultivated Plants. A. Belea. Akadémiai Kiadó, Budapest, 1992. Pp. 255. Hardback, price £18.00. ISBN 963 05 6053 4.

The subject of this book is one where a comprehensive review of the techniques and achievements, both contemporary and historical, should provide a valuable and needed source of information and references.

In the Preface the author states that the book is aimed at researchers and specialists and assumes that the reader is already acquainted with the subject at university level. This is the level at which it would have the most value but the level actually achieved is more that of the university student, and for most of the subject matter, it does not achieve sufficient depth to be of real value to the research scientist.

The book is divided into five chapters, which cover most aspects of intergeneric and interspecific hybridization. The first chapter, the Introduction, includes a historical review and also covers the taxonomic concept of the genus and the species. In this an attempt is made to define a species although it leaves the reader with the impression that a species is indefinable.

The second chapter, entitled 'Circumstances Required for Interspecific and Intergeneric Crossing', covers items such as flowering time, climatic conditions and crossability. Chapter 3, 'Morphology of Interspecific and Intergeneric Hybrids', contains a large section on the detailed morphology of F_1 and F_2 progenies. Chapter 4, 'Sterility, Fertility and Cytology of Interspecific and Intergeneric Hybrids', again has sections on progenies but also covers a range of cytogenetic techniques and discusses aneuploidy and polyploids. The final chapter, 'Practical Results and Future Prospects', is fairly brief and outlines the origins of some crop varieties.

Overall, the book very much reflects the author's area of research and, as such, is very heavily biased towards interspecific and intergeneric hybrids between wheat and its relatives; so much so in places that it appears that other cultivated plants are only added as an after thought.

A large number of detailed tables appear throughout the book, many from the author's own research, but often with inadequate captions. For example, there is a large list of hybrids within the Triticeae but it is not clear whether this is a comprehensive list or just a list of those hybrids obtained by the author. There are numerous tables of quantitative characters for interspecific wheat crosses of questionable value which could easily have been omitted, especially as many of the combinations would be better classified as intraspecific rather than interspecific. Much of the textual detail of the wheat crosses, particularly that relating to morphology, has insufficient explanation for readers who are not closely familiar with the genus *Triticum*. A genetic explanation for much of the variation described in the hybrid progenies has been almost entirely ignored. Similarly, data on different levels of chromosome pairing in hybrids is given but the causes of these differences are not explained.

The most serious fault with the book is the fact that it contains quite a number of factual errors. These include discrepancies between the text and the tables, the placing of genera into the wrong tribe, incorrect references, wrong symbols assigned to genomes and chromosomes, and even discoveries attributed to the wrong person. It would appear that the author often cannot have actually read the publications referred to. Most, but not all, of the errors detected were in connection with wheat, which, like that of the author, is also my area of research and consequently the subject with which I am most familiar. Because of the errors discovered I have serious misgivings regarding this book and can in no way recommend it. This is a pity, as in concept it is good and it is very reasonably priced.

TERRY MILLER
Cambridge Laboratory
IPSR, Colney,
Norwich, U.K.

Non-isotopic DNA Probe Techniques. L. J. Kricka. Academic Press (Harcourt Brace Jovanovich), New York. 1992. Pp. 358. Price £40.00, hardback ISBN 012 426295 3.

Traditionally DNA probe hybridizations have been carried out with radioactively labelled probes, ^{32}P being the most commonly used radionucleotide. Recent advances in nucleic acid technology, however, now offer alternatives to radioactivity with several advantages. There is none of the hazard associated with the use of radioisotopes, probes are stable and their use is not restricted by a short half-life, protocols are more rapid and reagents are generally less expensive. For someone wishing to adopt a non-radioactive technique, the choice can often appear extremely daunting. Although most methods have been developed within the last 5 years, the range of non-isotopic methods available is now very extensive and information is dispersed. This book is intended to give research workers and assay developers a single source of information on non-isotopic procedures for DNA hybridization. This has not, to my knowledge, been attempted previously. It was therefore with great interest that I approached the book.

The books consists of 13 chapters in total with 11 devoted to an impressive range of detection methods such as time-resolved fluorescence, bioluminescence, chemiluminescence and colourimetry of labels, such as alkaline phosphatase, horseradish peroxidase, glucose-6-phosphate dehydrogenase, lanthanide chelates and acridinium esters. Each chapter is prepared by an inventor or developer of the particular method thereby providing an expert account.

The first chapter, written by the editor L. J. Kricka, consists of a general introduction to the applications of non-radioactive hybridization techniques with general information on labelling and detection. The chapter provides

a useful and comprehensive source of information, being well supplied with tables and concise directions on the various systems available, labelling and detection methods and patents. I particularly liked the list of properties of an ideal label. One of the most useful parts of this and chapter two is the enormous set of references provided.

The second chapter provides a very good account of both enzymatic and chemical labelling methods. The descriptions of the enzymatic techniques are also extremely useful for die-hard users of radioactivity. I appreciated the presence of a table comparing the sensitivity and availability of different techniques. The chapter concludes with overviews of factors affecting hybridization and detection systems. I anticipate that these two chapters will provide most of the information needed by the reader.

After such a promising start I was slightly disappointed with the chapters on detection. Whereas each chapter was well written and full of information on various hybridization strategies as well as the detection, the book overall was disjointed and inconsistent and would have benefitted from more stringent editing. There was a great deal of repetition of information, most of which was adequately covered in the first two chapters. Very often, although the information given was of a high quality and potentially useful, it was not readily accessible. For example, a good account of *in situ* hybridization was found in a chapter entitled 'Colourimetric detection of alkaline phosphatase'. Another disappointment was the heavy bias towards indirect enzymatic detection of probe labels rather than use of the enzymes as labels themselves. The ubiquitous nature of biotin was demonstrated as it 'popped up' in several chapters.

I would personally have preferred to have seen a chapter devoted to hybridization techniques, covering subjects such as sandwich, filter and *in situ* hybridizations that were scattered throughout the book, and giving general protocols for different probes. The detection chapters could have concentrated more upon practical and most suitable applications. The availability of instrumentation and reagents for each technique was generally well presented although I did not approve of the extreme bias demonstrated by the writer of one chapter, employed by Tropix Inc., towards the products of that company, with no suggestion of alternatives.

My review of the book may appear unjustly critical but I must emphasize that I am putting forward my personal preferences. On the whole the book contains a very comprehensive account of non-radioactive hybridization techniques not found elsewhere and is well supplied with tables and illustrations. For those well initiated into non-radioactive hybridization and with the time to 'wade through', the book provides a wealth of information although I fear the scientist, baffled by the choice of methods available, could leave the book equally confused. As a final gripe, I had two copies sent to me, the first had pages falling out, the second had some pages that had been double printed making them almost illegible. For £40 I would expect better quality.

SUSANNAH M. HILL
Wolfson Unit of Molecular Genetics
Liverpool School of Tropical Medicine
Liverpool L3 5QA
U.K.

Biotechnological Innovations in Animal Productivity. Biotol (Biotechnology by Open Learning). Butterworth-Heinemann, Oxford. 1991. Pp. 217. Price £19.95, paperback. ISBN 0 7506 15117.

This book is a considerable achievement by the authors and publishers. They have succeeded in providing a broad review of the principal areas of biotechnology in animal production and have created a text which is readily comprehensible to readers not expert in these areas. There are chapters on endocrine regulation of the oestrus cycle, manipulation of reproduction, *in vitro* embryo production and manipulation, the production of transgenic animals, somatotrophins in animal production, and vaccines and diagnostics. In addition, there is a useful introductory chapter on 'animals in biotechnology-state of the art,' and there are several helpful appendices.

Most of each chapter is concerned with scientific and technical principles. In addition, a brief mention is made of the economic, ethical and regulatory aspects. Some of these would have been worthy of greater consideration. Inevitably in a book of this type there are over-simplifications, for example the claimed benefits of anti-PMSG antibodies in superovulation. In some cases the perspective of future developments in animal production may be considered optimistic. For example, whilst cloning of cattle embryos has been achieved very few normal calves have been produced, and many are abnormal.

This book assumes an undergraduate level of knowledge in biochemistry, physiology and cell biology. As an open learning text it has many useful features including an index, margin notes and self-assessment questions, however, the almost complete lack of references (other than to other Biotol books!) is a serious omission which neither facilitates nor encourages further enquiry and reading.

Overall, this book will be valuable to readers requiring a technical overview of the principles and applications of biotechnology in animal production. It is not only a student text but a useful reference book for libraries.

TIM G. ROWAN
Central Research Division
Pfizer
Sandwich,
Kent
U.K.

Variance Components. S. R. Searle, G. Casella and C. H. McCulloch. John Wiley, Chichester, 1992. Pp 501 + xxiii. Price £56.00, hardback. ISBN 0 471 62162 5.

This appropriately titled book is devoted exclusively to the theory of ANOVA and the estimation of variance components. Its 12 chapters and three appendices offer a comprehensive treatment of the subject. Chapter 1 introduces the subject through definitions of the most commonly used terms in the book and chapter 2 provides a brief but up to date history