more closely related to sisters than to brothers, favouring a higher ratio of female to male brood. Herein lies the main source of conflict.

Recent theoretical developments have considered how Hymenopteran sex allocation should be affected by colonies containing multiple queens, as well as multiply mated queens. These parameters affect the relatedness structure of colonies and the authors give excellent explanations of the predicted responses of colony members using kin-selection based models. There follows a very in-depth and useful review of empirical tests which supports the generally accepted view that workers, and not queens, control sex allocation in these insects. Another recent development in the theory covered by this book is that of how resources should be allocated between new worker and new sexual production.

One short-coming of this volume is the omission of several recent empirical and theoretical studies. Although this is a rapidly developing field, there is a relative dearth of 1994 and 1995 papers referenced.

Overall, this book is an excellent review of both the theory and field data for sex allocation in social Hymenoptera. It is aimed at those interested in the mathematical or theoretical modelling of social insect evolutionary biology. People looking for a less mathematical treatment of social insect evolutionary biology should also consider Bourke and Franks' recent *Social Evolution in Ants* (Princeton University Press, 1995). These days, students of Hymenoptera have few excuses not to be well read. I believe Darwin would be delighted at the current understanding of worker 'altruism', and would place this book highly on his list of 'must reads'.

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Gene Therapy in Cancer (Basic and Clinical Oncology Series, 10). Malcolm K. Brenner and Robert C. Moen (eds). Marcel Dekker Inc., New York. 1996. Pp.264. Price $145.00, hardback. ISBN 0 8247 9481 8.

I was initially excited by the title of this short monograph when it appeared on my desk. It was an interesting read, but my major concern would be that in a burgeoning field such as gene therapy, a specialised book of this type is almost inevitably out-of-date by the time it goes to press. The book has been well edited, however, in that the articles are brief, to the point and easy to assimilate without the need to go to further text books.

Given that some of the contents are now past their sell-by date, I would have preferred to have seen more in the way of general introduction to the book, but the introductory chapter by Robert C. Moen was a useful and brief summary of the state of the art. The remainder of the chapters are detailed accounts written by acknowledged

experts in their area, but are heavily biased towards both immune therapy and immune-gene therapy of cancer. It is clear that this was the part of the field which had progressed most in 1994/5 and as such was most worthy of coverage. For a geneticist however, unless their speciality was the immune system (when the information is now outdated) there is less interest.

The title is therefore slightly misleading. Major omissions include more detailed information on 'suicide' genes as outlined in the chapter by Yawen L. Chang. I felt that the discussion of pro-drug metabolizing enzymes, for example, limited to two pages in this section, could have been expanded into a chapter of its own. There was however an interesting chapter by Sorrentino discussing the gene therapy of drug resistant cancers. Clearly, the development of drug resistant disease is a marker which can be targeted in tumour cells of all types, including the immune system, relative to normal cells and this approach may hold great potential for the prevention or elimination of relapsed cancers.

A discussion of cell-targeted gene therapy, for example by specific tailoring of promoters, as has been possible in a number of melanoma gene therapy trials, was also absent. The difficulties in achieving this type of targeting are occupying a large amount of international effort and a review of this would have been most valuable. Covered in the Introduction but not in the detail it deserves were the finer points of what has become known as 'vectorology', which is again vital if safe methods of gene transfer in humans are to be achieved.

I would therefore recommend the volume as a useful introduction to the state of the art at the time of its conception. This is particularly true for haematological malignancies. The introduction is sufficient to allow the non-specialist but interested clinical reader, at whom I believe the volume was targeted, to pick up sufficient information to lead them on to a critical reading of the current literature. However, I would caution that the field has moved at an explosive, exponential rate since this volume was both commissioned and published and that an update is already due if the book is to perform a useful function. I look forward to reading further volumes in this series as it develops.

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Statistical Methods for Plant Variety Evaluation. R.A. Kempton and P.N. Fox (eds). Chapman and Hall, London. 1997. Pp. 191. Price £39.00, hardback. ISBN 0 412 54750 3.

Statistical methodology in field trials is probably not many peoples' idea of 'sexy science'. Although receiving less

attention than advances in molecular genetics, or information technology, significant and (dare I say) exciting developments in experimental design, data management and analysis have been made. These are widely accessible to users through the general availability of high level computing power and there is really no need for plant breeders and others involved in field trial work to rely just on traditional methods — although these are better than having no proper experimental design at all. Often, statistical methods are not questioned until, for example, the costs of Statutory Variety Testing are raised or the challenges of getting varieties on to financially rewarding Recommended Lists are met. However, rising costs in generating experimental trial information demand that data concerning phenotypic performance and its underlying genotypic and environmental components should be produced as efficiently as possible throughout the process of crop improvement.

This aim of this book is to provide the necessary statistical background for efficient plant evaluation. It is based on a course presented in 1991 at the International Centre for Advanced Mediterranean Agronomic Studies (CIHEAM), Zaragoza, Spain, which brought together statisticians, computer specialists and plant breeders. The book is the third to emerge from CIHEAM's plant breeding courses as part of Chapman and Hall's useful *Plant Breeding Series*. Chapters are written by a wide range of well respected authors including the editors and contain detailed descriptions of field plot techniques and designs for plant breeding trials, statistical methods for spatial analysis and controlling inter-plot competition, methods for multi-environment testing and analysis of genotype by environment interaction, and partitioning of resources among different stages of selection.

My feeling is that the book can be read at two levels. I think it works best at a fairly superficial level by providing an introduction to current state-of-the-art designs and techniques. It provides useful background information on approaches such as FITCON, REML and AMMI. Readers can become acquainted with new methods of spatial analysis and discover what BLUEs and BLUPs are. Personally, I was interested in the discussion in Chapter 5 on FITCON and REML in relation to non-homogeneous year and location interactions which is very relevant to trials in a European context.

Apart from a brief mention, the special needs of forage grass trials in terms of multiple characters and repeated measurements are not considered, which is a pity. With regard to experimental design and analysis, outbreeding perennial crops fall between inbred annual plants at one extreme and animals at the other. As a result they are, unfortunately, often neglected in discussions on this subject — perhaps another book is needed.

In general I think the book works less well if read at a very detailed level. To a non-statistician some of the details may be rather daunting and confusing as the authors present a range of different ideas and solutions to similar problems. In this respect the book provides guidelines rather than answers which I suppose is part of the nature of statistics. However, if it prompts plant breeders to discuss their problems and needs further with specialist statisticians, then the book will have gone a long way to achieving its aims.

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The Gene Bomb. David E. Comings. Hope Press, Duarte, CA. 1996. Pp. 304. Price $25.00, paperback. ISBN 1 878267 39 6.

The cover of Dr Comings' book depicts the mushroom cloud of a nuclear explosion and features a promise that the theory within has important implications for the future of the human species. Indeed, with its apocalyptic eschatology, at times this book feels more like a religious or political tract than a work of science. In part, this may be because it is aimed at a very wide audience and in style attempts to be catchy and concise; but it is a scientific theory that is being proffered, and as a scientific theory it must be judged.

The hypothesis is essentially that many problem behaviours are increasing in western societies at an alarming rate, and this increase is due to the selection of genes for these behaviours. He argues that the selective advantage for these genes lies in the earlier age of pregnancy of individuals demonstrating these problem behaviours while individuals who do not carry these genes go on to higher education and delay starting a family. Finally, he suggests we need to act now to reverse the selection of genes for these behaviours by both genetic testing and other means.

The list of problem 'behaviours' lumped together by Dr Comings is extensive and includes depression, anxiety, suicide, alcohol and drug abuse, attention deficit and hyperactivity disorder, conduct disorder, autism, Tourette syndrome, learning disorders, decreased IQ, crime, smoking, delinquent behaviours, precocious sexual intercourse, teenage pregnancies, lower commitment to religion, truancy, and poor academic performance.

Genetic factors are undoubtedly important in many of the conditions in the above list; but because these behaviours cluster together, it does not mean we can generalise the evidence to suggest genetic involvement in them all. I cannot claim extensive knowledge of all the conditions listed, but as a researcher in the genetics of affective illness I find his consideration of the literature on depression unconvincing. For example, quoting the lifetime prevalence rates of depression from two epidemiological studies performed ten years apart, as evidence of a major increase in the condition, is tenuous to say the least. Differing methodologies seems a more likely explanation of the apparent increase. Even if, as may be true, there has been an increase over the past few decades, a change in the environment rather than gene frequencies would seem more plausible over this relatively short period of