

Book reviews

Minvielle, Francis: Principes d'Amélioration Génétique des Animaux Domestiques. Paris/Quebec: INRA/University of Laval 1990. ffr 210.00.

This book deals in a very comprehensive manner with the breeding of domesticated animals. Each of the ten chapters is followed by a reference list of selected literature and, as in most American textbooks, by “problems” that allow the reader to test himself whether he or she has become familiar with the context of the chapter concerned. There is also one other method employed for increasing the understanding of the reader – namely in each chapter a number of framed paragraphs are present in which short summaries are given. A precise introduction to statistics is presented in two appendices. Albeit the author states in the introduction that he tries to present the subject matter with a minimum of mathematics, it still requires a solid knowledge of mathematics and calculus to follow the text. But everybody knows that population genetics requests mathematical calculations to be able to deliver solid data. Altogether the book can be recommended to both students and scholars. Naturally there are some misprintings or minor mistakes – but no more than would be found in the first edition of any book. One hopes that the author will be able to publish an English edition of the book in order to give it a broader distribution. K. Esser, Bochum

Valentine, F. A.: Forest and Crop Biotechnology. Progress and Prospects. Berlin Heidelberg New York: Springer 1988. 466 pp., 36 figs. Hard bound DM 120,-.

This book consists of the proceedings of a colloquium of the same title held at the New York State University (College of Environmental Science and Forestry) in Syracuse, April 1985. This last date is the major drawback of this book. I fully understand the editor's problem in collecting the papers after such a symposium, but progress is being made very quickly in biotechnology, especially in the biotechnology of trees. In this book the most recent information on this last subject originates from 1984 while the most relevant information on progress being made in somatic embryogenesis in conifers is given in articles published after 1984, and consequently not covered in the book. A more recent book on this subject, the proceedings of the *Genetic Manipulation of Trees* (1987) conference (East Lansing, USA), covers the subject better and was published within a year. Another main item of criticism is that the title does not cover the content: *Crop Biotechnology with some Emphasis on Trees* would have been a better title. Forest biotechnology is only dealt with in 2 of the 25 articles. One of the two, a review of molecular biology in forestry, is really outstanding. The other, which covers the in vitro propagation of conifers, suffers from the late publication date. The book consists of seven parts; the last article fits into the section “tissue, microporagule and protoplast culture”. It is rather surprising to find that apart from this one article there are only two reports exclusively on *Musa*. No overviews of the state of the art in broad-leaved trees and/or other crops in general are given. In conclusion, the titles of the

chapters are also too broad. In “Physiological Studies of Morphogenesis” an isolated study on the influence of tissue culture containers is presented next to fundamental aspects of protein immunochemistry. The chapters on industrial and commercial application, plant – microbial interactions and variability after regeneration, however, give very good overviews and are based on case studies. Implications for these subjects coming from the physiological process level are well documented and discussed. On the whole this book is a good entry for people new in the field. For more recent information, especially in forestry, better and more updated review articles are available. The strongest aspects of the book are its stress on the prospects of biotechnology and its discussions of progress while being aware of the constraints of physiological processes.

P. W. Evers, Wageningen

Borgoankar, D.S. (ed.): Chromosomal variation in man, 5th edition. New York: Alan R. Liss 1989. 852 pp. Hard bound \$ 96.00.

With respect to the publication of individual case reports on human chromosome aberrations most journals encourage authors to collate data on similarly affected patients. Access to a computer-sized human chromosome databank is a major step in solving the problem of the necessary literature search. This “Catalog” is a selected listing with comments and interpretations based on all published and communicated unpublished studies on chromosomal variation in man. An International Registry of Abnormal Karyotypes (“Repository”) contains all of the personally communicated findings, and it can be consulted by contributors by contacting the author of both of the above, Digamber S. Borgoankar. To cite the author (p. XIII): “I believe the Atma of the Catalog is in the methodology of organization, its simplicity of use, and the ease and economy with which it can be updated.” (Atma is a sanskrit word that means, roughly, the immortal soul or spirit of ... a thing.)

The collation of reports on a specific anomaly is useful in genetic counselling with respect to chromosomal problems. In liveborns the incidence of chromosomal variations and anomalies lies in the vicinity of 5%, and is certainly several times greater in zygotes. It appears that man as a biological species “tolerates” a great variety of anomalies. Nearly all of the 86 chromosome regions are involved in translocations; 6,078 entries for break points are enumerated, 37 polymorphic bands and 62 fragile sites are known, 40 partial trisomies and 35 monosomies are tabulated, complete trisomies for all 24 chromosomes are found, but only 8 complete monosomies and the known 4,871 different aberrations of 27 types are spread over all chromosomes. Doubtless, further studies in close collaboration with gene studies (listing of McKusick's catalog numbers with chromosome bands and vice versa are given) will generate an immense insight into man's biological nature. Those who work in the field will need a desk copy of the catalog to check their findings. Some people are reluctant to participate in such a scientific cooperation and believe that they can do better.

S. J. Geerts, Nijmegen

Grain Crops Research Institute Potchefstroom: Report on research and other activities of the oil and protein seed centre. 1988/89. Directorate of Agriculture RSA. Pretoria, 1990.

The production of protein material for animal feed has remained static in South Africa for the past 13 years. Due to the steadily increasing demand for protein and oil-containing crops, the emphasis of this well-staffed and well-equipped centre concentrates on groundnut, sunflower, dry beans, lupins, and cowpea. From the budget allocation it is quite evident that the main emphasis is on breeding, with plant protection, weed control and cultivar evaluation also receiving attention. Interesting projects include the breeding of groundnuts for dryland and irrigation conditions, sunflower restorer lines, and the identification of soybeans on the biochemical level. *Lupinus albus* and *L. mutabilis* are now considered to be poised to take off; most interesting research is reported on the development of high-yielding, adapted, alkaloid-free cultivars and on the evaluation of cultivars in various localities in the summer rainfall area.

H. F. Linskens, Nijmegen

Kidd, K. K. et al. (eds.): Human gene mapping 10. Cytogenetics and cell genetics. Vol. 51, No.1-4. Basel: Karger 1989. VIII+1148 pp., 57 figs., 81 tabs. Soft bound \$ 195.00.

In the past several years the general conclusion come to by researchers is that the complete mapping and sequencing of the human genome within a reasonable time is both feasible and desirable. In the time between the appearance of *Human Gene Mapping 1* (1973) and *Human Gene Mapping 10* (1989) an enormous amount of data has been gathered. This volume represents the end-result of a 1-week workshop in which 750 scientists had on-line access to a computer system by which to study critically all available mapping data. Several databases (why not the "Repository on human chromosome anomalies?") were at the disposal of the 29 committees in DATA 10 and in the user's interface program EDIT 10. These committees produced 947 pages of digestions and tabulations from 1,200 literature citations, 8,000 entries of DNA probes, 2,000 Restriction Fragment Length Polymorphisms, and nearly 2,000 known mapped genes. This resulted in 1,631 marker genes, 113 fragile chromosome sites, 3,300 polymorphic DNA segments, and 54 mitochondrial loci – in total, over 5,100 genes (what is a gene?). Lodscores, comparisons with primate and non-primate (mouse) loci, 149 chromosome changes in 43 neoplasias, a list of localizations of clinical disorders, and many other compilations are published in this volume. The question now is will this volume be the last of the series. "We are rapidly outgrowing the capacity of a printed format to convey efficiently the information contained in the map, and undoubtedly, future conferences will necessitate the 'publication' of information in some type of electronic format" (p. 1). Besides that "Our experience with the Human Gene Mapping Workshops over the past several years has taught us that the task of monitoring and reporting construction of the human gene map has become a full-time job and requires a permanent full-time office to carry out the task properly In this sense, *Human Gene Mapping 10* must be the last of the series of discontinuous meetings, and the first of a breed of workshops which function on a continuous basis" (p. 2).

This is your last chance to have a complete publication of the human genome. Get your copy now. S. J. Geerts, Nijmegen

Crawford, R. D. (ed.): Poultry Breeding and Genetics. Amsterdam: Elsevier Science Publ. 1990. 1123 pp. Hard bound \$ 130.75.

This is a comprehensive up-to-date review of poultry breeding and genetics. It deals mainly with chickens, but includes material also on another seven economically important poultry species. There has been no general text on poultry breeding and

genetics since Hutt's (1949) *Genetics of the Fowl*, which was out of print in the 1960's. The book is a vast compendium of information with 1,123 pages, an index of 1,200 subject items and some 4,000 references to published material. There are 37 authors (27 North American), most authoritative figures in their field. The first 4 chapters are on the basic biology of the fowl. There are 17 chapters in qualitative genetics, dealing with mutant types and major variants, and 15 chapters on quantitative genetics and genetic improvement. There are 3 chapters on industrial applications (one by a poultry fancier), and 3 chapters on new directions; immunogenetics, molecular genetics and genetic engineering.

The book is well presented and edited, and reads well for a multi-authored book, with little overlap. It should become the standard reference text in poultry breeding and genetics for the next decade. In the quantitative genetic section, the chapters by Chambers on growth, Fairfull and Gowe on egg production and Pym on nutritional genetics are particularly comprehensive and useful. The text has little basic science or theory, but is an excellent catalogue and summary of most of the important research results in poultry breeding over the last three decades. It reviews past results well but may be criticized for lacking an integration of the material in an overall synthesis or philosophy and for failure to look ahead.

To a quantitative geneticist it marks the end of an era. It documents the significant and continuing success of selection in improvement, but shows little development of new ideas or technologies, compared with other livestock species. There is no discussion of different reproductive technologies, or of the relationship matrix or multi-trait REML. Quantitative poultry geneticists are becoming a rare breed, and the new molecular biologies have yet to fill their promise in poultry genetics and improvement. So the book should be the authoritative source on pre-molecular qualitative and quantitative poultry genetics for many years, and is recommended (despite its price) as a valuable resource documenting the 1990 poultry genetics information base.

C. Smith, Guelph

Lamb, C. J.; Beachy, R. N. (eds.): Plant Gene Transfer. UCLA Symposia on Molecular and Cellular Biology, New Series, Vol. 129. New York: Wiley-Liss 1990. 345 pp. Hard bound \$ 99.-.

This book contains the Proceedings of a UCLA Symposium held at Park City, Utah, April 1-7, 1989. This meeting focussed on emerging strategies and opportunities for crop improvement by gene transfer and the use of gene transfer technologies to elucidate the molecular mechanisms governing plant growth and development, environmental adaptation, and stress protection. A major focus was the successful engineering of crops resistant to diseases and pests, herbicides, and prospects for engineering resistance to microbes and physical stresses. Field tests indicate that certain of these resistances are very effective outside laboratories. Three groups report the successful down-regulation of genes by antisense techniques. Commercial applications will certainly emerge in the near future, especially in the field of post-harvest biotechnology and flower-color engineering. The breakdown of signal transduction pathways is now coming into reach. A number of transcription factors have been cloned by conventional technology or transposon tagging. The biochemical characterization of receptors for hormones and elicitors has just begun. One section of the book is devoted to protein engineering and targeting with special emphasis on vacuolar and mitochondrial import. An understanding of the trafficking of proteins will lead to new insights in the molecular mechanisms of protein storage versus excretion, mitochondrial forms of cytoplasmic male sterility, and photosynthesis. Future research will focus on the further isolation and characterization of genes governing

plant growth and development. Their manipulation and transfer to crop species will deepen our understanding of their mechanism of action and will ultimately lead to improved plant varieties.

In summary, the book gives an excellent state of the art of the "plant gene transfer" field as it has developed in 1988. This precisely points to the problem I have with such publications. Most, if not all of the data presented has in the mean time appeared in the regular literature in more detailed form. As a result, the book in its present form is obsolete especially since recently a vast number of interesting regulatory genes have been isolated. In my opinion, books of this kind should be published before or at the scientific meeting itself in order to be useful to the scientific community. J. N. M. Mol, Amsterdam

Melton, Douglas A. (ed.): Current Communications in Molecular Biology. Antisense RNA and DNA. New York: Cold Spring Harbor Laboratory 1988. 149 pp. Soft bound.

Antisense RNA is known to exist naturally in some biological systems, where it acts to regulate gene expression through hybridization for example to a mRNA and thereby prevent its translation. This book *Antisense RNA and DNA* is a result of a Cold Spring Harbor Discussion Meeting at the Banbury Center, on this subject and the possible uses of antisense nucleic acids to regulate gene expression in a wide range of cells.

The natural examples dealt with in this book include control of transposition and phage gene expression in the bacterial systems. Research in this area has revealed a detailed understand-

ing of which RNA transcripts bring about antisense regulation, and the relative amounts needed for gene blocking. Approaches have been made as to the type and mechanism of hybridization involved; it has been revealed that at least some antisense RNA molecules are capable of intramolecular base pairing and form hairpin-like structures with at least one loop. The hairpin may be necessary to protect against single-stranded RNases, while host factors may be required for pairing etc.

Eukaryotic systems have been tried in attempts to block harmful, e.g. viral, expression, using antisense techniques. Chapters in this book deal in this way with such eukaryotic systems as tissue culture cells, trypanosomes, slime molds, fruit flies, frogs and mice. So far, few general conclusions can be drawn. However, it is clear that we need to consider closely how the antisense RNA is to be delivered, amongst many other problems. And given the lack of information on mechanisms of gene expression blockage and the differences in cell type and genes involved, it is difficult to pinpoint reasons as to why the technique does not always work. There are also several reports of the use of antisense DNA (actually short oligodeoxynucleotides) some apparently successful. In vitro studies suggest that when translation is blocked by a DNA oligonucleotide, this is achieved by an RNase-H-mediated cleavage of the M-RNA. This book draws attention to the new technique which could become a standard method for studying gene formation. With it could come a better understanding of gene function and the development and prevention of harmful and/or undesirable gene activities in disease states. J.F. Jackson, Glen Osmond

Announcements

International Symposium on Angiosperm Pollen and Ovules; Basic and Applied Aspects. Villa Olmo, Como (Italy), 23–27 June, 1991

Topics include:

- Genetics of Male and Female Gametophyte
- Molecular Biology of the gametophyte
- Biotechnical methods
- Developmental selection in natural populations
- Gametophytic selection as a breeding tool

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