

Molecular Microbiology. A new journal. Edited by CHRIS HIGGINS and GARY SCHOOLNIK. Published bimonthly by Blackwell Scientific Publications Ltd, Oxford. Vol. 1: three issues in 1987, subsequent volumes six issues. Price 1987 £40.00 in UK, £48.00 Overseas; 1988 £88.00 and £105.00. ISSN 0950-382X.

This is a handsome new journal, in the now popular large format ($10\frac{3}{4} \times 8\frac{1}{4}$ inches), which will catch the eye of the reader scanning the library display shelves, by its colourful front cover. The paper inside is of good enough quality to give clear half-tone prints and the choice of size of print and type face makes for easy reading. Tables of DNA and amino-acid sequences vary from large and easily read (e.g. vol. 1, page 205) to very small print (page 175 in the same issue) which would give a selective advantage to the short-sighted and those young enough to be able to see *Drosophila* easily, but the rest of us can easily buy a magnifying glass. In general, however, the figures are given plenty of space for easy interpretation. The editors and/or publishers must also be congratulated on finding a name for their journal which is both short and informative – quite an achievement in view of the multitude of journal titles which play variations on the small number of appropriate words that one can choose from.

The editors ask for original research papers addressing any microbiological question at a molecular level. The molecular biology, genetics and biochemistry of any microorganism, prokaryotic or eukaryotic, and articles on molecular pathogenicity are acceptable, but biotechnology papers have a limited appeal for the editors. These terms of reference appear to exclude evolutionary studies of microorganisms, which are beginning to get much more attention as DNA sequences are accumulated, and the same applies to ecological studies. It is worth noting that the evolutionary relationships and the ecology of microbes are the two aspects of their biology about which we know least, but the editors may draw their net more loosely if these aspects become of obviously greater interest and importance. Further points are that the editors like papers of 2–10 printed pages (1400–7000 words); and that they consider and invite short reviews. In fact, the first issue starts with a 'MicroReview' (clearly not so-named because of its length, since it takes up 4 pages) entitled 'Bending the rules: the 2 μ plasmid of yeast'.

It would be difficult to give an adequate summary of the 31 research papers in the first two numbers of *Molecular Microbiology*, so I will simply whet the potential reader's appetite by listing the variety of organisms which are the subject of the 47 papers included in the three issues of 1987. These include 15 papers on *E. coli* and its plasmids, 5 on *Klebsiella*, 2 each on pathogenic neisserias, *Bacillus subtilis*, *Bordetella* and *Pseudomonas aeruginosa*, and 1 each on *Agrobacterium tumefaciens*, *Mycobacterium avium*,

Erwinia carotovora carotovora, *Clostridium perfringens*, *Acinetobacter calcoaceticus*, *Streptococcus mutans*, *S. pneumoniae*, *Bacillus circulans*, *B. sphaericus*, *B. thuringiensis*, *Histoplasma capsulatum*, a halophilic *Archaeobacterium*, *Aspergillus nidulans*, *Dictyostelium discoideum* and a cyanobacterium (*Calothrix*). There are a number of papers from major research groups, and it is obvious that the new journal has got off to a very good start. All those interested in this wide range of microbiological topics will have to keep a close eye on its current and future numbers.

It is a remarkable fact that we now have the main editorial offices of three journals publishing essentially genetic research located in Scotland – *Genetical Research* from Edinburgh, *Genes and Development* from the AFRC Institute at Roslin, near Edinburgh, and now *Molecular Microbiology* edited from the University of Dundee, only 57 miles from Edinburgh. All three journals also have an American editorial office, and two of them are published from, respectively Cambridge and Oxford. I hope the ties of the three journals with Scotland, and the health of the Departments/Institutes from which they are edited, will long survive!

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The Production of New Potato Varieties: Technological Advances. Edited by G. J. JELLIS and D. E. RICHARDSON. Cambridge University Press, 1987. 358 pages. £27.50 (\$49.50). ISBN 0 521 324580.

This book emerged from a meeting held in Cambridge in 1985. The meeting was a joint gathering of the European Association for Research in Plant Breeding (EUCARPIA) and the European Association for Potato Research (EAPR). Of the 63 chapters (by a total of 79 authors), 59 were presented at the meeting and four were additional. Most of the contents are loosely organized under such headings as: genetic resources, breeding strategies, selection and screening methods, variety assessment, semi-conventional breeding methods, true potato seed, unconventional breeding methods. The chapters vary greatly in length and quality, from longish reviews to two-page trivia with contents barely sufficient to justify posters. Many chapters would not, in my opinion, have got past a thoughtful referee but that, I suppose, is in the nature of symposium volumes, with their deplorable tendencies both to republish what has been said before and to publish that which should not be published at all.

Nevertheless, the knowledgeable reader, the person who already has a good knowledge of the crop, will get many points of interest and a fair general picture of current trends in potato breeding research. That person would recall that breeding everywhere proceeds quite successfully, as it has long done, by selection

among large populations of tetraploid clones produced by crossing superior parental clones. Neat cytogenetic tricks with diploids have yet to have any significant effects though they have been favoured objects of research for nearly 30 years and figure frequently in this volume. True Potato Seed (TPS), a popular topic in the past ten years, is still a popular topic rather than a matter of practical exploitation and I have yet to see a critical review of it. Biotechnology and genetic engineering are still about to revolutionize potato breeding, though seemingly mostly applied to blight and virus resistance, characters for which breeders have long suffered from *un embarras de richesses*; there is no shortage of disease-resistance genes – the difficulty lies in assembling them into excellent varieties.

The experienced reader, then, will read with the appropriate scepticism and, skipping chunks of trendy irrelevance, will learn things of interest. The non-potato person, however, is advised to read with care. There are some nice new tricks around (even ‘technological advances’) but the solid core of potato improvement, though represented in this book, is not being revolutionized; and it still presents many and difficult problems of efficiency of selection and testing which deserve more attention than they get here.

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Exploiting New Technologies in Animal Breeding: Genetic Developments. Edited by C. SMITH, J. W. B. KING, and J. C. MACKAY. Oxford University Press, 1986. 216 pages. £30. ISBN 0 19 854 209 7.

This rather pricy book is made up of 20 papers, plus discussion summaries, presented at a symposium held in Edinburgh in 1985. Drawn from nine European countries, the participants surveyed the application of new methods of livestock production and speculated on the future. At one end of the spectrum we have advice on how to get more mileage out of the established methods of biometrical genetics, with better indices of selection and better understanding of genetic causes of variation, as a consequence of new ways of manipulating reproduction. At the other end we are propelled into the uncharted realms of bioengineering. It is convenient to consider the contents in that order.

Within the context of animal breeding there has often been a degree of mutual suspicion between the biometrical geneticists and the physiologists. The former deal with the statistical analysis of phenotypic variation and are content to consign antecedent causes to the black box. The other approach, natural to biologists, encourages a search for causes in the hopes of rational intervention. This is very often frustrated by the complexity of living systems. But times are changing, due partly to new methods of

handling embryos and partly to the impact of molecular genetics, which drives a new and independent path to what it sees as ultimate causes. This book reflects the transition which is taking place.

One feature of the contemporary scene is the growth of interest in single genes of major effect and several papers are devoted to this theme. Ovulation rate in sheep is influenced by polygenic variation within and between breeds. But there is also a gene in the Booroola Merino which causes a substantial increase in the rate, while in the Cambridge and also Javanese breeds there is segregation of genes with equally noticeable effects. There is the prospect of enhancing the prolificacy and twinning rates of improved breeds by incorporating these genes. In addition, analysis of how they produce their effects should extend our understanding of the control of ovulation.

The Belgian Blue Cattle breed is distinguished by some 25% hypertrophy, especially of superficial muscles, drastic reduction of adipose tissue in males and sundry other effects, associated with homozygosity of a partially recessive gene. Increase in muscle size has been traced to accelerated mitosis during the early stages of primary fibre formation and hence an increase in fibre number. The process of myogenesis, upon which the beef industry is founded, might well be clarified by an understanding of how these primary changes are caused, while molecular characterization of the gene could pave the way for transfer to other breeds.

Another contribution deals with the exceptional prolificacy of several native Chinese breeds of pigs, which manage to surpass European crossbreds by some 30%. In this instance the increase in yield is due to higher embryo survival. The results of crossbreeding trials are presented, as first steps to make use of this unexpected cache of genes, which may also promote a better general understanding of embryo survival.

Two of the papers consider biological rather than the usual statistical indices of selection. One deals with back-fat thickness in pigs, the other with milk production in cows. In the former the index is based on the sum of the activity of four NADPH-generating enzymes, which are involved in fatty acid synthesis. The index proved effective but was no better than simple selection for back-fat differences. In the other account, the physiological criteria for identifying genetic merit in milk production are considered. But it seems we are still at an early stage of identification although there may be some immediate advantage in identifying in bulls variables, such as perhaps the blood level of growth hormone, which may be genetically correlated with mammary development in cows.

About half the papers deal with practical developments made possible by multiple ovulation, transfer of sexed embryos, embryo splitting and long-term storage as well as nuclear transfer or cloning. These