

280); not all eutherian 'oocytes remain suspended in dictyate' as stated (p. 88); Riggs, 1989 (p. 272 & 280) appears in the text but not in the references – but these largely editorial matters do not detract from the excellence of this publication.

The book will appeal to a wide readership and should find a place in every genetics and zoology library.

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Production of Biologicals from Animal Cells to Culture.

Edited by R. E. SPIER, J. B. GRIFFITHS and B. MEIGNIER. Butterworth Heinemann. 1991. 826 pages. Hardback, £90.00. ISBN 0 7506 1103 0.

This book gives an edited version of the papers presented at the 10th meeting of ESACT, the European Society for Animal Cell Biotechnology. ESACT has held meetings in nine countries over the last 15 years, with participants rising from 75 to over 350, while interest has moved from vaccines for foot-and-mouth disease and polio to monoclonal antibodies, recombinant proteins and recombinant vaccines. The general emphasis is, of course, on products of commercial value, and the 135 contributions to this volume make it clear that the whole area of animal cell biotechnology is very active.

The first paper is the Hyclone Award Lecture, by N. B. Finter of Wellcome Technology Ltd, Beckenham, Kent, entitled 'Animal cell culture: the problems and rewards'. After a brief summary of the successful development of their foot-and-mouth disease vaccine, now manufactured in many parts of the world, Finter describes their problems in making interferons. A British Medical Council committee set up in 1959 gave up after 12 years, but stubborn scientists at Wellcome took up the challenge and gradually solved the problem, producing 'Wellferon' in commercial quantities by 1980.

The remaining 134 papers, all much shorter and some followed by discussion or argument, are arranged in 11 sections with the following titles: (1) Cell Lines and their Characterization; (2) Nutrient Media with Special Supplements; (3) Serum-free and Protein-free Media; (4) Cell Physiology; (5) Gene Expression in Animal Cell Systems; (6.1) Bioreactors: Overview, (6.2) Bioreactors: Hardware, (6.3) Bioreactors: Particles, (6.4) Bioreactors: Membranes and Perfusion, (6.5) Bioreactors: Optimization via Metabolism, (6.6) Bioreactors: Comparative Studies; (7) Monitoring and Assay of Animal Cell Parameters; (8) Kinetics and Modelling; (9) Downstream Processing; (10) Products; (11) Regulatory Issues, which ends with paper 135 on The Media-Cult HybriTest—a new test for *in vitro* toxicology. Lists of exhibitors and participants, and subject and author indexes, bring the book to a close.

It is not possible here to discuss the immense amount of information in these papers, so I will simply paraphrase a few points made by the three editors in their introduction. Bioreactors still command intense attention (32 papers), but downstream processing and regulatory aspects, including quality control and assurance activities, need more study, since they will be the prime determinants of commercial success or failure. Use of the DNA fingerprint technique for identifying cell lines led to controversy since, for example, HeLa and BHK cell lines could be distinguished, but not HeLa and another human cell line (WI 38), and it would be impossible to distinguish an engineered cell line and its original host cell by this technique. Different investigators failed to agree about the value of two enzymes as indicators of cell lysis and therefore cell numbers in growing cultures. These were lactic dehydrogenase and the enzyme system involved in proteolysis: some reports claimed success and others failure (instability) with these systems.

Cell biotechnology is clearly a research area of growing interest, importance and commercial value, and I suggest everyone should be aware of this book and should keep an eye open for ESACT's 11th volume.

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Plant Population Genetics, Breeding and Genetic Resources. Edited by A. H. D. BROWN, M. T. CLEGG, A. L. KAHLER and B. S. WEIR. Sunderland, MA, USA: Sinauer. 1990. 449 pages. Hardback £47.95, paperback £27.95.

In this book the editors have assembled a wide-ranging collection of papers in the general area of applied plant genetics. The book arose from a symposium held in Davis, California, in 1988 to honour Professor R. Allard, and contains over 20 distinct and individualistic views of the present state of the subject. In order to impose some order on these varied topics they have been loosely grouped under the headings of Genetic Diversity, Evolutionary Processes and Breeding & Genetic Resources.

The Diversity section includes a theoretical study (Weir) of the distributional properties of the genetic diversity measure (1-SS of allele frequencies) in different types of population and illustrates the use of the methods. This is followed by a comprehensive survey of the current literature on allozyme variability in plant populations, which has enabled the authors (Hamrick & Godt) to produce some useful and reliable generalizations on the actual distribution of variability within and between populations and the relationship of this to the breeding system. Following this theme, Gepts emphasizes the potential value of storage proteins as measures of genetic variation, particularly in the context of relationships within and