

Book reviews

Transgenic Animals in Agriculture. J. D. Murray, G. B. Anderson, A. M. Oberbauer and M. M. McGloghlin (eds). CAB International, Wallingford. 1999. Pp. 290. Price £55.00, hardback. ISBN 0 85199 293 5.

As a general rule, compendium volumes tend to be unsatisfactory. The quality of the articles is frequently uneven, coverage of the field may be incomplete or biased, and often some areas receive duplicate treatment. This is particularly true when the compilation consists of (or purports to be) the proceedings of a conference or symposium. The present volume is no exception. It deals with transgenic fish, birds and mammals, which is appropriate, but the articles vary from general reviews through recapitulation of the work of single laboratories to original papers. One or two of the original papers are of journal quality (and probably to be found already published in journals), while others are more cursory and yet others, for one reason or another, would be hard pushed to achieve journal publication. The book is not helped by a long 2-year time lapse since the conference was held. In a field that is moving quite rapidly, this unfortunately makes much of the content obsolete.

Attempts to generate commercially useful transgenic livestock have aimed at numerous different goals, which may be classified as follows: (i) the use of livestock as ‘bioreactors’, to produce large quantities of completely foreign proteins such as human pharmaceutical proteins; (ii) modification of a secreted animal product, such as milk or wool, to supply an existing or anticipated commercial market; (iii) more profound modification of metabolism to increase feed conversion efficiency, or to improve the quality of a product such as meat or to confer resistance to disease without excessive loss of feed efficiency.

Sadly, the results obtained so far have fallen very far short of expectation and have not been commensurate with the effort expended and costs incurred. What success there has been is in inverse proportion to the disturbance of the basic metabolism of the animal. Thus, the bioreactor field is at least promising, while transgenic livestock with improved carcass quality are as remote as ever. This might well have been foreseen. Unlike plants, which have a systemic plasticity that allows them to tolerate enormous insults so as to make the best of hostile environments, the physiology of animals, and particularly warm-blooded ones, is highly susceptible to perturbations. In transgenic livestock consequently, benefits are generally more than offset by concurrent deficits. This is part of the reason for the high rates of success obtained with transgenic plants, in contrast to the more or less zero success rate obtained with livestock.

This symposium volume presented an opportunity to air this and other fundamental problems, and to discuss answers to them. However, not until we reach Chapter 12 (by Kevin Ward and colleagues), following a litany of hopeful failures, is

there even a hint that something might be amiss. The final summing up (Chapter 18, by G. E. Seidel Jr) points unequivocally at the high failure rate, but seems to slide off into an optimism which is not explained. Chapter 17 briefly addresses a number of issues which have come to be lumped together as ‘ethical’: practical (environmental damage), humanitarian (will small farmers suffer?), sociological (consumerism), religious (thwarting God’s will) and superstitious (transgenic animals are unnatural). Issues of animal welfare are dealt with at greater length.

Considering that much of the material that it contains is obsolete or irrelevant, and that most of what is useful can already be found in libraries, the value of the book is at odds with its price.

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The Genetical Theory of Natural Selection — A Complete Variorum Edition. R. A. Fisher (edited by Henry Bennett). Oxford University Press, Oxford. 1999. Pp. 318. Price £25.00, hardback. ISBN 0 19 850440 3.

This is perhaps the most important book on evolutionary genetics ever written. Nearly every topic currently discussed is to be found in it, often dealt with in brief passages of condensed prose (it is gratifying to read that Fisher himself described Chapter 2 as ‘heavy’). The treatment is anchored in ecology, so that absolute rather than relative fitness is discussed, and the central theory is developed in spectacular and challenging directions. A new edition needs no justification.

At different times I have struggled with passages in the 1930 Oxford edition and the Dover edition of 1958, without taking note of the differences between them. In his foreword J. H. Bennett outlines the background to production of the first edition and the steps leading to the later one, which incorporated a variety of alterations. The variorum component identifies these for us. At first sight, at least, they reveal little of the author, given the developments in genetics and human affairs between the two editions. Many are grammatical improvements or replacement of archaic phraseology. Some of the larger ones are designed to make a passage clearer; for example, the discussion of genetic variance is extended as ‘Many readers may prefer a more explicit analytic treatment of the problem,...’. A new section on self-sterility alleles is included, ending with a swipe at Sewall Wright. Other changes which reflect contemporary issues are one minimizing the importance of drift in small populations, and another challenging the