

And he has done all this well in this book. Its title, however, should perhaps have been 'Practical Pig Science' or 'Science and Pig Keeping'.

Whatever its title, this is a sound, well-informed, well-written book that I suspect could go through many editions. The ideas put forward so skillfully by the author have the potential to improve both pig production and pig welfare.

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***Farm Animals in Research: can we meet the demands of ethics, welfare, science and industry?***

*Proceedings of the ANZCCART conference, held at the University of Adelaide, Australia, from 30 November to 1 December 2000.* Published by ANZCCART, Department of Environmental Biology, Adelaide University, SA 5005, Australia. 128 pp. Paperback (ISBN 0 9586821 5 1). Price \$A40.

The collection of papers and reviews in these proceedings does not disappoint in terms of exploring the range of issues suggested by the title. The 'we' can, however, be taken to refer to 'we as scientists' rather than 'we as humans'. As such, and not surprisingly for the proceedings of a scientific conference, the book will appeal primarily to those using farm animals for research, whose professionalism and freedom is subject to ever-increasing pressures.

Right from the start it was acknowledged that there is a wide range of standpoints on these issues, yet the views of industrialists, philosophers, welfarists and others are here represented predominantly from the perspective of the scientist and academic. Nonetheless, the scientists themselves present diverse views. Somewhat controversially, John Barnett and Phil Glatz argue for the inclusion of housing systems that are no longer used by industry on ethical or animal welfare grounds as negative controls in experiments examining alternatives. In considering cloning, Simon Walker finds the science exciting and rewarding, yet recognises that ethics will almost certainly dictate the speed of progress. In this fast-moving area of science, yet more controversy — such as Dolly's arthritis — has arisen since he wrote the paper. Thus, his conclusion that it is unlikely that all needs can be satisfied, and that progress should therefore be slowed to consider all the implications, is even more pertinent. Several other papers recognise the pressure on scientific quality and integrity from industrial sponsors who not only demand a fast pace of progress but also may claim ownership of techniques and even of such things as genes and intellectual property. This may well impede future scientific progress.

There is full consideration of the ethics of animal experimentation and, particularly in the fields of biomedical research and surgery, the probability that models and computer simulation will dramatically reduce the need to use animals. Only one paper, by Carol Petherick and Bob Kilgour, mentions the 3Rs (replacement, reduction and refinement). These authors also consider the importance of knowledge transfer in research that is intended for uptake by (the farming) industry, which, if it does not occur, renders the results of the experiments worthless and the use of the animals unjustified.

Similarly, many authors address issues of animal welfare. An interesting angle on this, which is not considered sufficiently often, is the reduction in the quality of the scientific results if the social and other needs of the experimental animals are *not* met. Similarly, the effects of human contact on experimental animals are also thoughtfully addressed in papers

by Paul Hemsworth and others. Andrew Fisher notes that, whereas animals may need time to adapt to experimental housing and procedures that can affect the results of physiological experiments, the reverse could be true for experiments examining, for example, the effects of handling.

A particularly interesting contribution from Deborah Middleton describes the potential to reduce pain and suffering by applying the 'humane end points' that have been developed by CSIRO (the Commonwealth Scientific and Industrial Research Organisation). The example given considers the development of vaccines for classical swine fever. By carefully and systematically recording behaviour and other parameters, the clinical outcome was compared against these records. It was found that three clinical outcomes inevitably led to death some time later. In subsequent experiments, once animals reached any of those states they were euthanased and saved from prolonged pain and suffering without compromising the scientific objectives.

Neville Gregory points out that "understanding the breadth of attitudes towards animal welfare will assist us in deciding what society considers is right or wrong for animals". He also notes that there are some examples of paradoxes in attitudes towards animals amongst the public. One example of this is provided by a paper that describes how medics had moved on to farm animals such as sheep and pigs when public attitudes hardened against the use of primates and dogs as surgical models. In his excellent philosophical consideration of the topic as a whole, Andrew Brennan argues for consistency in the standards (particularly of health and welfare) applied to animal work.

The book is clearly set out with logical sections, and fulfils its aim of providing a balanced and wide-ranging analysis of the theme. It is a good read not only as an overview but also in that it provides a well-referenced entrée to any of the areas considered. With industries ranging from farming to pharmaceutical multinationals, animals ranging from crocodiles to fish, and topics ranging from animal rights to xenotransplantation, there is bound to be something new for everybody.

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### ***Introduction to Animal Technology, 2nd Edition***

Revised by S W Barnett (2001). Published for the Institute of Animal Technology by Blackwell Science Ltd, Osney Mead, Oxford OX2 0EL, UK. Distributed by Marston Book Services Ltd, P O Box 269, Abingdon, Oxon OX14 4YN, UK, or Iowa State University Press (A Blackwell Science Company), 2121 S. State Avenue, Ames, Iowa 50014-8300, USA. 128 pp. Paperback (ISBN 0 632 05594 4). Price £24.95, or £19.95 for IAT members.

This book has been written specifically as an introduction for animal technicians and closely follows the syllabus for the animal technology unit of the Institute of Animal Technology (IAT) Certificate examination. The subject matter of the book, however, will be of interest to all those working with the species covered. There are 15 chapters with a total of 142 photographs and nine line drawings. Fifty-seven of the photographs are in colour in a section illustrating handling and sexing. Some of the chapters are very brief, such as that entitled 'The animal house' which has only three pages, whereas the chapters on 'Safety' and on 'Feeding and watering' are each 13 pages long.