

is dedicated to detailing and evaluating methods of restraint and pharmacological control. Additional topics covered include the stages of training, handling and protection against illness. One notable omission from this discussion is an evaluation of the use of the bit during equitation. However, Fraser acknowledges this by directing the reader towards other sources of comprehensive information that directly discuss horsemanship.

The penultimate chapter covers disordered behaviour and stress. The content has been revised to include the neurochemical basis of stress. Substantial attention is paid to the influence management practices can have on the development of abnormal behaviour and detailed descriptions of different types of oral and locomotor stereotypies are provided. The discussion then moves on to what Fraser terms abnormal reactions during handling and training, such as bolting, biting and kicking. The section concludes with a relevant insight into behavioural expressions indicative of pain, suffering and depression.

The final chapter, titled 'Equine culture and protection' summarises many of the main arguments raised in the previous chapters. Fraser lists 30 of the main arguments that relate to the horse's strategy for living or 'equine culture' and then periodically refers to them by number throughout the rest of the discussion which, in my opinion, does hinder navigation throughout the chapter.

One general criticism of this text is that many interesting points are raised without a clear indication of the relevant source of the information, leading one to conclude, possibly falsely, that this is purely author opinion. For a text aimed primarily at an academic audience, I would have expected more references to original work. Nevertheless, Fraser's writing style is fluid and interesting and will appeal to a range of audiences, including veterinarians, animal scientists and horse owners or carers alike that wish to broaden their knowledge of equine behaviour and inspire them to improve the lives of the equines within their care. As Fraser states in his final chapter: "No longer can the horse be viewed as a beast of burden in developed countries. No longer can the horse be regarded merely as a periodic plaything or recreational item. It is deserving of some natural time of its own, some quality of equine existence".

Reference

Mills DS, Eckley E and Cooper JJ 2000 Thoroughbred bedding preferences, associated behaviour differences and their implications for equine welfare. *Animal Science* 70: 95-106

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International Zoo Yearbook No 44

Edited by FA Fiskén (2010). Published by The Zoological Society of London, Regent's Park, London NW1 4RY, UK. 464 pp Softback. Price £127.00.

The *International Zoo Yearbook* (IZYB) was first published in 1960 by the Zoological Society of London to provide an authoritative channel for the international exchange of

information about zoos. The work carried out by zoos is increasingly dependent on co-ordinated effort and shared results, not only amongst themselves but also with laboratories, conservation centres and similar bodies engaged in the study and preservation of wildlife. The *International Zoo Yearbook* has been both the medium and the reflection of this changing outlook.

This volume is the 44th, and it continues the tradition, following the same general style and layout of previous editions. It is divided into three sections, the first of which is devoted to a special subject with articles usually commissioned by the Editor. In this volume, the subject is 'Bears and Canids'. The second section includes original articles on various aspects of captive husbandry and management, including reproduction, breeding and behaviour all under the general title of 'The developing zoo world'. The third section is a reference section listing data and survey results collated from information in the annual questionnaires returned from zoos and aquaria around the world.

The IZYB begins with a guest essay entitled 'African zoos: partnering a necessary renaissance' by Dave Morgan who is the Executive Director of the African Association of Zoos and Aquaria. This article reflects on the range of zoos in Africa and argues for the need for these to be encouraged and improved. It is particularly interesting because the author presents an honest review of the contradictions and controversies that these institutions face. For instance, he argues that although the continent boasts the world's largest densities of free-ranging wild animal populations, the increasing level of urbanisation currently taking place emphasises the need for zoos. However, he also points out some other less palatable truths about them — in particular their predilection for animal acquisition from the wild and poor operational practices. Both have significant welfare implications for the animals concerned but, as Morgan points out (p 3), "despite the best efforts of animal welfare and animal rights NGOs to have them closed down, they continue to exist". In addition, African zoos attract very high visitor numbers, they are legally mandated, they promote goodwill in their communities and infer the concept that animals and ecosystems have inherent value. Consequently, Morgan argues for an acceptance of both the existence of African zoos and the need for active involvement and engagement to assist them to overcome their capacity and resource challenges. In so doing, both animal welfare and conservation objectives of zoos are more likely to be realised.

The first section of the IZYB then focuses on 'Bears and Canids', and comprises 15 articles which reflect current research and progress within the captive management of these animals. The first article is particularly useful in that it provides an overview of the history of bears and canids in zoos and then introduces the important issues relating to their captive management. As such, it helps to provide a framework for the articles to follow and to put into perspective much of what we have taken for granted regarding these species. For instance, despite being amongst the most

common and popular animals to be displayed in zoos, bears and canids have until recently been much neglected compared with other charismatic mammals. This has been reflected in their inadequate housing and display, and the relatively high incidence of infectious and degenerative diseases reported in captive carnivores. However, as the authors explain, there has been a huge resurgence of interest in them in recent years which has brought with it considerable improvements in their standards of husbandry and welfare. Two important changes are emphasised: the inclusion of environmental enrichment practices and the development of larger enclosures. Both have allowed the animals to exhibit a greater range of normal behaviours with a consequent reduction in the levels of stereotypies previously observed in many zoo exhibits. Nevertheless, the authors also point out the need for further research, innovation and co-operation amongst zoos to transform the lot of zoo bears “to being the centre of stunning, dynamic, educational exhibits” (p 14).

The advances in our knowledge and understanding of the captive management requirements of bears and canids are then reflected in the rest of this section. There are 14 articles here, with eight reviewing particular topics while six refer to individual species. The topics reviewed include veterinary and taxonomic issues, rehabilitation and reintroduction, environmental enrichment, mixed-species exhibits and reproductive management (including contraception). The subsequent ‘individual species’ articles then provide examples of how such information can be incorporated in better and more appropriate captive management and display systems. They should be invaluable to curators and keepers responsible for these animals in their collections. They also reflect the continued development and gradually changing emphasis of zoos towards a greater appreciation of the quality of life (and hence welfare) of the animals in their collections.

Section two of the IZYG is entitled ‘The developing zoo world’, and as the name suggests, it consists of a number of articles which describe recent advances and innovations in captive animal husbandry and management. These include articles on the hand-rearing of Spix’s macaw, population trends for captive woolly monkeys, infant development in two species of guenon, the breeding results for hand-reared gorillas, and the behaviour of captive binturongs. In addition, there are two papers which review the contribution of zoos to the rest of society. The first evaluates their work with *in situ* conservation, and through an analysis of 113 projects concludes that there has been “an appreciable contribution to global biodiversity conservation” (p 183). However, the authors temper this remark by arguing that a greater allocation and pooling of resources would significantly increase the zoos’ conservation impact. The second review article examines the economic and social contribution of the zoological industry in Australia and, as such, provides an interesting and useful insight into an aspect of the zoo industry which is commonly assumed but rarely quantified. Through an analysis of their economic, social and conservation contributions, the authors conclude that zoos play a significant and undervalued role in their

communities by providing a venue which facilitates social and family bonding, and that this role is critical to the future of zoos as effective and sustainable conservation activists.

The IZYG continues to be an interesting, useful and accurate mirror on the international zoo world. This one volume manages to pack in a variety of factual information about the world’s zoos and aquaria, zoo associations and international studbooks for rare species of wild animals in captivity, its articles reflect current research and advances in aspects of captive wildlife husbandry, while the guest essay provides an insight into the development and objectives of an aspect of the zoo industry that is usually overlooked. Consequently, it is a book that I would recommend to anyone interested in zoos — their history, development, aims and objectives, and their role and relevance into the future. It continues to make a valuable addition to our knowledge and understanding of just what we should expect from today’s zoos.

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Principles of Cattle Production, Second Edition

CJC Phillips (2010). Published by CAB International, Wallingford, Oxon OX10 8DE, UK. 256 pp Paperback (ISBN 978-1-84593-397-5). Price £35.00.

This revised new edition of Phillips’s widely used *Principles of Cattle Production* book covers the same general themes as the original 2001 version, in that there are still the same number of chapters but in a somewhat different order and with a few slight alterations to chapter titles.

There is, however, some change in overall emphasis. Phillips’s move to Australia has made him able to comment more widely on non-European cattle production systems, and the increasing interest shown by environmentalists and food/energy economists in important general subjects, such as the use of cattle to utilise marginal land and the problems of overall food and water shortages, pollution, carbon footprints etc have lead him to pay greater attention to these matters.

The first 2 chapters entitled ‘The development of the world’s cattle production systems’ and ‘Cattle production and the environment’ and the last (number 10) chapter ‘The future role and practice of cattle farming’ together form a near self-contained account of these important general subjects — although in following-up ideas suggested in the “near self-contained account” — some of the remaining 7 ‘core’ chapters may have to be consulted via the good 14-page index.

The 7 ‘core’ chapters cover production systems, breeding, welfare and disease, housing/handling and the environment, nutritional requirements, feeding methods, and grazing management systems. Each is an informative, well-written, well-argued and up-to-date account of a particular aspect of cattle production.

All the chapters end with a short Further reading list. This is a very positive concept but it’s a pity, perhaps, that the list is not annotated. One of the current problems for students in the agricultural/animal welfare/veterinary field is the