

drawing largely on work funded by the BBSRC or undertaken at BBSRC-sponsored research institutes.

The booklet is introduced by a short section on the difficulties associated with evaluating animal welfare; this leads into a chapter on the different scientific approaches that can be used to understand welfare issues. The information provided is basic but well written and accessible to those with little scientific background. This section also maps out the BBSRC's priorities for animal welfare research, which include cognition, motivation, and pain and discomfort.

The next chapter is entitled 'What animals can tell us about how they perceive the world'. First, it touches on research into recognition; it then moves on to the subject of whether animals can retain mental pictures independent of their surroundings. This whole section reports findings of experiments, but for an enquiring mind it fails to provide sufficient experimental detail to allow the reader to fully understand how these conclusions have been drawn. However, as an introduction to the topic it draws the reader in and would hopefully encourage readers to find out more. The chapter continues with a section about research into social behaviour and understanding and concludes with a short piece on memory.

'What animals can tell us about their needs and preferences' is the title of the next chapter. It provides a clear explanation of approaches to assessment of animals' preferences; it draws on various experiments carried out to determine what animals will work for, what they will choose to avoid, and what they will endure in order to receive a reward. The following two chapters address specific welfare issues and practical ways of improving livestock welfare. Areas of research that are highlighted include space requirements, environmental enrichment, lighting, handling and transport. The final chapter addresses health-related welfare problems including respiratory disease in pigs, lameness in cattle and osteoporosis in laying hens.

A useful addition to the booklet would be discussion of the ethical considerations when designing experiments and an explanation of the Ethical Review Process and the strict controls put in place to ensure the welfare of experimental animals. However, all in all, it maps out interesting areas of animal welfare science and gives a good overview of areas that are currently of interest to welfare scientists. It is written in an easily digestible way and it could be an excellent tool for sparking an interest in the subject.

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*Science and Animal Welfare* (2002) Published by the Biotechnology and Biological Sciences Research Council, Polaris House, North Star Avenue, Swindon SN2 1UH, UK. 48 pp. A4 paperback (ISBN 0 7084 0648 3).

### **The welfare of zoo elephants in Europe**

Being concerned about the welfare of zoo elephants in Europe, the RSPCA recently commissioned Ros Clubb and Georgia Mason of the Animal Behaviour Research Group at Oxford University to undertake a review of the subject. The aims of this review, the results of which were published in October 2002, were to identify welfare problems and their relationships to husbandry, and to make sound, ethically based recommendations for improving the welfare of captive elephants.

The report includes chapters on elephants in the wild and in captivity, general husbandry, social aspects in captivity, handling and training, diseases and mortality rate, captive reproduction and behaviour problems. In the conclusions and recommendations, whilst noting that "some zoos are not doing too badly in certain areas", the authors comment: "Overall, our conclusion is that zoo elephants generally experience poor welfare, stemming from stress and/or poor physical health". Among the potential causes of poor welfare that they list are restricted

exercise, climatic factors (cold and wet), inappropriate substrates (hard and wet), diets and social structures, early weaning, and exposure to aversive stimuli during training. However, the authors are cautious in inferring links between signs of poor welfare and husbandry: "In rare instances, scientific data allowed us to make a link between specific aspects of husbandry and welfare — but for the most part these issues remain unresolved due to a lack of research". In view of this, they propose a project to explore the causes of welfare problems. This would involve investigating across a wide sample of captive elephant facilities the impact of various environmental parameters (eg enclosure design and husbandry) on indices of welfare status including mortality, reproduction, disease incidence and behaviour problems.

The report includes a brief discussion of cost–benefit considerations, addressing the question of whether the keeping of elephants in zoos can be justified on the grounds that, although there may be associated welfare problems, these are outweighed by the benefits (eg for education, research, or public interest). The authors do not believe that the benefits do outweigh the costs.

Incidentally, as it is stated in the report that the pros and cons of keeping farm, pet or zoo animals are never formally weighed up in this way, it is relevant to point out here that this is no longer the case in the UK. The new edition of the Secretary of State's Standards for Modern Zoo Practice (DEFRA 2000) requires that "Zoos should establish ethical review processes or seek appropriate help in planning and implementing their conservation, education and research strategies". This ethical review process was introduced particularly to address "situations where the use of animals (eg acquisition, management or disposal for conservation, education or research) may be in conflict with the best welfare interests of the animal or animals involved" (DEFRA 2000).

Clubb and Mason conclude with four recommendations: first, that the factors responsible for poor welfare require urgent investigation; second, that, meanwhile, importation and breeding should cease; third, that various measures should be undertaken to improve social and physical environments; and fourth, that, in future, elephants should be kept only by zoos that can solve their welfare problems.

This report will no doubt stimulate further debate about the care of elephants. It is well written and presented and contains a great deal of valuable information and analysis. It should be read by everyone involved in captive elephant management in Europe and elsewhere.

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*A Review of the Welfare of Zoo Elephants in Europe* (October 2002) Clubb R and Mason G. Animal Behaviour Research Group, University of Oxford, Department of Zoology, South Parks Road, Oxford OX1 3PS, UK. 280 pp. A4 paperback. The Report, which was commissioned by the RSPCA, can be viewed at the RSPCA website: <http://www.rspca.org.uk>.

DEFRA (2000) *Secretary of State's Standards of Modern Zoo Practice*. Available at <http://www.defra.gov.uk/wildlife-countryside/gwd/zooprac/index.htm>

### **Management of Ethiopian donkeys**

The aim of the work described in this report was to characterise the use and management of donkeys for transport. Welfare of the working donkey is a cause for concern in many areas of the world, and the specific objective here was to identify ways in which the welfare of donkeys used for transport in peri-urban areas of Ethiopia might be improved.

The health status and management practices associated with working donkeys were monitored by carrying out informal interviews with owners. The results confirm that most donkey owners recognise the financial and timesaving benefits of owning a donkey; however, despite placing considerable value on their donkeys as an economic resource, people were reluctant to spend