

ecosystems. For instance, wolves disappeared from the Scandinavian peninsula in the early 1970s. Thus, to prevent the failure of the recent re-introduction of the wolf, particularly in heavily populated areas, it is almost mandatory to have a good understanding of the complex interactions between humans and wolves. Only that kind of scientific knowledge will help modify the perception of people about wolves and to make proper decisions in terms of conservation policies, which will allow the maintenance of populations of wolves big and dynamic enough to prevent inbreeding depression. A good example of that is the data coming from the Scandinavian case study showing that the true impact of wolf depredation on livestock does not support people's strong negative perception of the species regarding this particular issue.

Also, the comparison between the approaches regarding wolf management and conservation shows that differences between countries have been and still are extreme, from strong population control to very active protection policies. In contrast with the fact that wolf numbers have increased over the past few decades, the book presents some disturbing evidence for decreasing growth rates in some areas, probably due to poaching and inbreeding depression. Long-term research on Isle Royale is a warning signal against generalisations. Also, it shows that major and more influential changes in a given ecological system are very difficult if not impossible to predict, a phenomenon that has also been described for other complex systems, like meteorology and economy. So, the so-called Precautionary Principle is absolutely necessary when making decisions regarding the management of a particular ecosystem, particularly when results from isolated studies may give us a false perception of our ignorance.

The grey wolf is perhaps one of the world's most intriguing and controversial species. In fact, the wolf is one of the species of mammal that has received more attention by the scientific community and it is deeply embedded in the cultural background of many human societies of the Northern Hemisphere, from the Palaeolithic to the present. Human beings have perceived wolves in a broad variety of ways throughout History, from curiosity and admiration to fear and contempt. These highly polarised attitudes are probably derived from the many similarities that exist between both species and the resulting ecological competition between them. The wolf is a gregarious predator with a very complex social behaviour and highly evolved cognitive abilities only comparable to those observed in primates. They live in family clans where co-operation for hunting, communal care of the youth, group defence and food sharing are prominent features of their social behaviour. All these characteristics are also found in most human societies of hunter-gatherers. Thus, wolves were probably seen by our ancestors as fellow predators as well as direct competitors. Nevertheless, the ecological conflict with wolves increased during the transition of human societies from hunter-gathering to an economy based on agriculture and livestock. This confrontation resulted in the

near extinction of the wolf both in Europe and North America. As an apex predator, the regained presence of the wolf deeply affects both natural ecosystems as well as the human environment. *The World of Wolves* is an outstanding review for scientists and students interested in wolf ecology and conservation, as well as on livestock management and welfare. The proper management of wolves has many implications in terms of animal welfare for both wild species and domestic animals, including livestock and companion animals. Also, the book constitutes a very valuable resource for anyone interested in understanding the highly complex ecological interactions that exist on a terrestrial ecosystem across both time and space.

Jaume Fatjó

Department of Psychiatry, Universitat Autònoma de Barcelona, Spain

The Encyclopaedia of Applied Animal Behaviour and Welfare

Edited by DS Mills (2010). Published by CABI, Wallingford, Oxon OX10 8DE, UK. 704 pp Hardback (ISBN 978-0-85199-724-7). Price £195.00, US\$370.00, €275.00.

When I agreed to review this book, I was not aware that it would so weighty: 4 kg, A4-format and 704 pages. But this book is not just useful for flower pressing, it is one of the most amazing encyclopaedic collections in behavioural biology, featuring more than 1,300 terms, which are not merely described briefly: most contributions are fully fledged essays, sometimes two pages or more in length and often accompanied by relevant quotes. Editor Daniel Mills mastered this enormous task with the help of seven co-editors and a total of 190 experts, mainly from the UK, who wrote the contributions. The topics covered range from 'Abandoned animal' to 'Zygote'. And, in between, one finds general topics, such as 'Reproductive behaviour' or 'Religious slaughter', 'Neuroethology' or 'Reintroduction', but also highly specialised ones, such as 'Dynorphin' (an opioid synthesised in the central nervous system), or 'Deceit behaviour' (I couldn't resist including this because Suzanne Held quoted a paper on deceit in ravens by T Bugnyar and myself; vanity is a component even in science, after all). According to my impression, this is a rather complete collection, including even some rather marginal topics, such as 'Wirkwelt', a term coined by J von Uexküll, hardly relevant in contemporary biology and animal welfare. On the other hand, there are topics which remain uncovered, for example, feather plucking/harvesting from live geese. But this is understandable since it is virtually impossible, in such a broad area, to cover all possible aspects.

It is, indeed, daring not only to include biological topics, but also important proponents and important animals. This is a strength, in principle, but also a weakness, as it makes the biases and omissions even more unavoidable with a book authored by so many different authors. For example, there is an informative account of Ruth Harrison, an important figure in farm animal welfare who, however, is not particularly well known outside the

UK. Her work is covered in 32 lines of text by David Morton. In contrast, Konrad Lorenz, one of the founding figures of the entire field is covered in 17 lines which are not terribly informative with regards to his scientific achievement. And the eminent Robert Hinde is not covered at all, which is a strange omission for a book from the UK. It is great that many contributions feature important references, but it is regrettable that this does not apply to all of them.

In my very personal view, this great encyclopaedia is not just a book for reference, it is indispensable for any writer — from the High School student to the emeritus

professor. This is definitely also a book for curious readers, such as myself, who like to browse through the many pages, exploring, hunting new facts and insights. This is clearly a book which every biologist should have at hand and it is a must for behavioural biologists and veterinarians in the field of human-animal interactions and animal-assisted activities and therapies. The authors and editors did a great service to a broad field. They deserve that the result of their work will be broadly distributed and frequently used.

Kurt Kotrschal
KLF, Gruenau, Austria