

on urban wildlife, for as the author notes by the year 2020 it is estimated that 80 per cent of the world's human population will be living in towns and cities. The urban and suburban landscapes are of major significance and that significance is growing and should not be ignored.

As the author quoted Richard Fitter a number of times, I thought it a pity that in the further reading-list at the back, Fitter's seminal urban-wildlife classic *London's Natural History* was not listed. As it is just over 50 years ago that this book appeared, I hope that by mentioning it here some may take up the 'opportunity of comparing different eras of half a century apart'.

It was heartening to see the author state the point that magpies are increasing back to former numbers rather than the often stated belief that magpies are just increasing out of control at the expense of songbirds. He rightly points out that cockroaches have a 'PR problem' and having not changed much in 300 million years (predating the Coelacanth and the dinosaurs), this 'living fossil' deserves a little more respect.

Urban populations of what are viewed as 'less desirable' species are often made subjects for control whether it is needed or not and whether the control is effective or not. Cats, rats, pigeons, starlings and mice all come under this heading. These species have committed the cardinal sin of being successful and therefore too obvious. The author debates the pros and cons of pigeon control and points out that the huge starling-roosts crash as well as build up to become, for some, 'a nuisance'. For mice he assures us that at last the long awaited 'better mousetrap' has arrived and not only is it electronic and in use with pest control companies but the trap summons an operative to the trap at the capture of the mouse. Perhaps the author was right to leave out a chapter on the urban feral cat, for if these mousetraps catch one, the cat might be out of its traditional employment!

Roger Tabor

British Naturalists' Association

Northamptonshire, UK

Managing Vertebrate Pests: Feral Goats

John Parkes, Robert Henzell and Grey Pickles (1996). Bureau of Resource Sciences and Australian Nature Conservation Agency. Australia Government Publishing Service: Canberra. 129pp. Paperback. Obtainable from the publishers, GPO Box 84, Canberra, ACT 2601, Australia (ISBN 0644 358467). Price AUS\$24.95.

The Australian Vertebrate Pest Program of the Bureau of Resource Sciences is producing a series of guidelines on the management of mammalian pests. Feral horses, rabbits, foxes, feral pigs, rodents and feral goats (the subject of the booklet under review) are included. This series is being prepared under the umbrella of a booklet setting out the principles of the strategic management of vertebrate pests - *Managing Vertebrate Pests: Principles and Strategies* edited by M Braysher (in the same series).

Managing Vertebrate Pests: Feral Goats provides a well-structured, practical guide to management of a species whose dual reputations of an invaluable, domesticated ruminant in pastoral systems and an 'eco-wrecker' are legendary. There are 10 chapters ranging from introductory accounts (history, distribution and biology), economic and environmental impacts, through to management practice and deficiencies in knowledge and practice.

Particular attention is given to setting clear objectives for management and producing a plan based on achieving these objectives. Much of the guide could be applied with ease to the management of feral goats in other areas of the world and indeed, other large herbivores such as deer.

This booklet's title clearly identifies the feral goat as a pest. Reading it we begin to appreciate the difficulties of answering the question - what, exactly is a pest? There is no doubt that where the feral goat threatens indigenous biota (such as on Alcedo volcano, Isabella in the Galapagos Islands or on Aldabra in the Seychelles) it is a pest. In both examples the habitat and food availability of giant tortoises and other vertebrates are threatened. This has happened many times before in the Galapagos archipelago and other islands in the Indian and Atlantic Oceans. Control and preferably eradication of feral goats from all small tropical islands where native biota is threatened should be a global conservation priority.

In contrast, in mainland Australia it has proved difficult to attribute declines in native biota to the feral goat. Here the goats' status as a 'pest' relies mostly on its impact on the sheep industry. In economic terms the 2.6 million feral goats in Australia result in a loss (mainly in terms of sheep production) of \$25 million Australian dollars per year. This is a net loss because goats mustered as part of control programmes on sheep ranges are sold. Live capture, together with other commercial exploitation of (mainly feral) goats supports an industry worth \$29 million Australian dollars. However one looks at it, in the Australian semi-arid pastoral areas the feral goat is an economically important component providing a significant proportion of some farmers' incomes. In addition, goats are becoming well known as biological controllers of weeds such as blackberry, briar and thistles.

In Australia, a majority of land managers, conservation groups and animal welfare groups support management of the feral goat. The latter would favour eradication. However, they recognize that in practise, the economic value of the goat together with the difficulties of achieving total removal mean that support for control methods which minimize stress and suffering is the best option. What are the animal welfare concerns of feral goat control? A key issue here is mustering, where a large number of feral goats are gathered. The costs of capture are offset by sales and welfare issues mainly relate to capture, transport and slaughter. *Managing Vertebrate Pests: Feral Goats* outlines the welfare recommendations of the (Australian Government) Sub-Committee for Animal Welfare as they pertain to musters. These include statements claiming that the procedures for slaughtering at abattoirs and for live transport are being revised. Approximately 50,000 goats per year are transported by sea or air from Australia to be slaughtered elsewhere. Instances of high mortality have been reported in both forms of transport.

In the booklet's appraisal of control techniques those that have negative welfare aspects have been highlighted. However, we noted some inconsistencies in the recommendations. For example, 'goats should not be shot from moving vehicles' is followed by a section on shooting from helicopters which 'can be humane if done by trained shooters with suitable weapons'. Sedation (valium in bait food) followed by shooting or removal 'could avert many of the animal welfare concerns associated with poisoning or trapping at water'. Do we know enough about the stress, suffering and recovery of sedated goats or non-target species?

Managing Vertebrate Pests: Feral Goats is, of course, written for Australian land managers and the like. However, we have been impressed by the clarity and openness of the

recommendations and deficiencies in knowledge. It is an explicit, straight-talking, useful and practical guide to managing one of Australia's feral, mammal species. Whether or not the feral goat is a pest depends on who you are, where you are, where they are, how many of them there are, their economic value and their impact on environmental interests. Animal welfare concerns should not vary with situation, in practise they will probably do so. *Managing Vertebrate Pests: Feral Goats* gives clear guidelines for minimizing stress and suffering when managing the so-called 'arch despoiler of the earth'. We recommend this booklet as the best available summary of this field.

David J Bullock
The National Trust
Cirencester, UK
Pauline Oliver
University of Luton, UK

Kinds of Minds: Towards an Understanding of Consciousness

Daniel C Dennett (1996). Weidenfeld & Nicolson: London. 184pp. Hardback. Obtainable from the publishers, Weidenfeld and Nicolson, The Orian Publishing Group, Orian House, 5 Upper Saint Martin's Lane, London WC2H 9EA, UK (ISBN 0 297 81546 6). Price £11.99.

When does mere sensitivity turn into sentience? This is the central question of *Kinds of Minds*. It is also the central question of animal welfare, for sensitivity (such as that shown by a thermostat) does not call upon our morals, whereas sentience does. This, the mind-body problem has occupied philosophers and lay-person alike for centuries. What does Dennett add?

For a start he adds a readable style and a familiarity with the reader lacking in most texts. No philosopher writes as accessibly as Dennett and this not because he is popularising but rather because his quirkiness, wordplay and familiarity with the reader lay bare the inherent popularity of the subject matter. Dennett's approach to philosophy is unique in so far as it resembles science rather than mathematics. Rather than pounding away at the philosophical rockface by strict deduction from initial axioms (to produce conclusions valid only with the sphere that those axioms permit) he starts with 'hypotheses' which are checked against reality, experiments (often of the thought variety) and commonsense. Thus whilst the path he follows has gaps, it makes good progress. He is also not too bothered about what other people have said unless it is definitely part of the flow; what is happening now is important and so the book is more like a documentary than a history of ideas.

Dennett starts his reasoning with his own creation, the 'intentional stance', the practice of describing an entity and predicting its behaviour as though it had beliefs and desires. Though our being able to adopt the intentional stance towards an animal is probably a necessary condition for it to be conscious, it is clearly not sufficient since many certainly non-conscious entities may appear intentional at times (shopping trolleys, for example). Indeed, Dennett proposes that networks of simple 'on/off' functions can produce complex behaviour that looks highly intentional, despite nothing going on inside that looks like specific thoughts. He contends that most animals exist at this level only. The road to sentience lies in labelling these networks so that the concepts that they embed become objects of representation - then the inner eye opens. This draws on ideas going back at least to