

## BOOK REVIEWS

**Carrion and dung: the decomposition of animal wastes.** R. J. Putman, 1983, The Institute of Biology's Studies in Biology No. 156, Edward Arnold, London. 61pp. ISSN 0537-9024;156, ISBN 0-7131-28690 Price (in UK) £2.50.

I bring Dr Putman's book on carrion and dung to the attention of New Zealand ecologists with pleasure, hope and perhaps admonition: pleasure because its a good little book; hope because I might be able to encourage some ecologists to read it; and admonition because the study of decomposer systems figures so little in the biological research of this country despite the fact that the economy of these islands is based on the products of death and decay. How many kapnunis would be required if all those sheep, cows, goats and deer, as well as the rabbits, hares, hedgehogs, horses and grassgrubs suddenly digested all they ate with complete efficiency?

The grasslands and savannas of the world are, or were, stocked with mammalian herbivores and their trophic dependents i.e. predators, coprophiles and necrophiles. New Zealand has had the grasslands but not the mammals. Not so now - grass and mammals abound, but where is the rest of the chain as so well discussed in Putman's book? In fact, man's efforts at redeeming -the balance are limited to the introduction of one species of dung beetle of restricted range and some earthworms. As Putman points out, the latter do not deal with dung in dry areas such as those encountered on the well stocked east coasts of both main islands.

Putman is mainly concerned with terrestrial systems and starts off the book by outlining the place of carrion and dung in the terrestrial ecosystem. Did you know that decomposers are responsible for 95% of the biological activity of many communities? He then introduces the organisms, with an understandable bias to western Europe and Africa (that is where most of the research has been undertaken), before the dynamics of decomposition are discussed. Human waste, i.e. sewage, gets a brief mention here. Perhaps this section could have been extended.

Then come two major sections - one each on communities specialising in the decomposition of carrion and dung. Here, Putman is able to draw on his own fundamental research on the decomposition of mouse corpses within a deciduous woodland system.

The book ends with a very short chapter on

decomposition in aquatic systems. He had no chance of covering this subject adequately in the space allotted so perhaps the space would have been better used for extending the information on sewage.

A key feature of this book is that it deals with biological processes in absolute terms - energy units. New Zealand ecologists are good at counting things - birds, possums, seals, snails etc - but how many are prepared to convert their numbers to absolute data and discuss them in the context of ecosystem dynamics? This book should be compulsory reading for every ecology student in the country, so buy it and read it.

J. A. Wightman

**Proceedings of the 3rd Australasian conference on grassland invertebrate ecology.** Edited by K. E. Lee. 1981. Government Printer, Adelaide.

This conference would have been a great disappointment to the cynic hovering at the back of the hall waiting to pick off the easily recognisable 'conference paper'. In fact, as is evident from the Proceedings, each participant had something new to say and wanted to say it. And what a range of papers were presented! However a non-grassland oriented person need not feel excluded from the contents of this publication. The principles expounded have wide application.

The subjects ranged from grassland degradation by man, beasts and pests to pasture enhancement. Barbara Barratt's paper on the ravages caused by weevils to white clover growing in Otago's hill country was an example of the negative side of invertebrates. Pauline McColl's demonstration of the importance of earthworms for converting subsoil to a plant growth medium is an excellent example of the benefits of earthworms - and their buffering effect on the ravages caused by the eternal quest for wealth by some people. It was good news, however, to hear from Reg Roberts that the depredations caused by crickets, grasshoppers and scarabs to the grasslands of the northern Tablelands of New South Wales although great do not reduce the amount of food available to sheep and cattle. Would it were the same on this side of the Tasman Sea. Or - if it were this side of the Tasman perhaps there would be more sheep and cattle to compete with the insects for the food.

- However, I do not wish to give the impression that these Proceedings are all gumboots and stock units. The paper by Hutchinson and King on

phosphorus cycling, that quotes real data, was particularly edifying. Peter Greggs evaluation of temperature effects on the rate of development of crickets demonstrated that all responses are not linear and goes a long way to explaining why. This paper is good reading for those involved with day degree determinations.

I could continue and give details of more of the 52 papers in this volume of 400 pages but I think it better that members interested in the ecology of terrestrial invertebrates should get hold of a copy because they are sure to find something of interest. Dr K. E. Lee, CSIRO - Division of Soils, PO Box 2, Glen Osmond, South Australia 5064, Australia will send you one in exchange for a cheque to the value of \$A20.

J. A. Wightman

**The Deer Wars. The Story of Deer in New Zealand.** G. Caughley, 1983, Heinemann. 187pp, 2 figs, 15 photographs. Price \$17.95.

Graeme Caughley is a wildlife ecologist of wide experience with an ability to write in a clear and entertaining manner. He has applied his talents in this interesting and provocative account of deer in New Zealand, from the time of their liberation to the present-day controversy about their place in our mountain lands.

Chapters 1 to 3 describe the build-up of deer numbers and accompanying changes in attitude to deer that culminated in the destruction campaign of the 1930s. Led by Captain Yerex of the Internal Affairs Department, the campaign paralleled a military operation though its objective was not attained. Chapters 4 and 5 highlight the problems of Government deer culler and private shooter and, using his own experience, Caughley captures some of the tribulations and elations that accompany deerstalking.

In Chapter 6 (Research) Caughley examines the assumptions that led Cockayne to argue that New Zealand vegetation is particularly vulnerable to grazing and browsing animals and that there is a direct connection between deer numbers, accelerated erosion and flooding. Caughley seems to imply that the influence of deer may be no more than a substitute for that of the extinct moas. However nobody has demonstrated equivalence in effects on vegetation of these two groups of browsing animals. Caughley also discusses the work of Thane Riney and suggests that his greatest contribution to the deer problem was the idea of an equilibrium between vegetation and deer. The essence of this idea had, however,

already been developed by J. T. Holloway (N.Z. *Journal of Forestry* 6: 123-37) before Riney reached New Zealand.

Chapter 6 is primarily concerned with encapsulating the growing evidence that much so-called 'accelerated' erosion is actually rapid natural erosion stemming from the country's boundary position astride the edges of two crustal plates. Vegetation cover, and hence the effect of deer, thar and chamois on it, is thus "essentially irrelevant to the rate at which sediment is washed into rivers and accumulates in the lowlands". I believe the argument is a strong one although, as so often with sweeping generalisations, the truth is likely to be more complicated than the generalisation. For example, the soil compaction that results from long periods of deer trampling, and its possible effect in increasing run-off and flood peaks from specific parts of catchments, has still to be evaluated. Nor does the argument take proper account of the past effects of fires.

The difficulties and dangers of ungulate research in the high mountains are graphically described in the remainder of Chapter 6, again from Caughley's personal experience. Meat hunting, deer farming, politics and legislation relating to deer in New Zealand, are the subjects of Chapters 7 to 11. Here we find amusing and penetrating insights into the workings of government departments.

Chapter 12 (What is to be done?) is contentious. The crux of his argument is that if there is no direct connection between deer numbers and erosion, then "deer are no longer a menace but a valuable resource" and deer control will only be needed in a few special places such as Secretary Island, the takahe reserve and market gardens (p.171). The primary objective for managing deer should now be that of optimum sustained yield (p.174) whether this yield is used for recreational hunting, live capture, venison recovery, aesthetic herds or unharvested herds as experimental controls (p.177).

In other words, Caughley suggests that our mountain lands should be used as a giant deer farm, though presumably a rather less efficient one than those of the lowlands. In advocating sustained yield of deer on this scale he may be exaggerating in order to make a case, or perhaps his sympathies with deer hunters and hunting have clouded his objectivity. Such a proposal may be reasonable for carefully selected areas but as a general guideline it ignores our international responsibility to prevent substantial parts of New

Zealand's indigenous ecosystems from becoming more and more similar to those of other countries. It ignores the botanical interest of a dense forest understorey containing palatable shrubs and ferns or a tussockland filled with palatable alpine plants. It ignores the competitive overlap between deer and herbivorous birds such as kokako and kakapo. It ignores the desiccation of invertebrates such as native landsnails that occurs following browsing of the understorey and drying out of the litter. It ignores the effects of deer in facilitating the spread of other browsing animals such as possums, or even goats. And it

ignores the destruction of whole communities such as alpine bogs that cannot withstand concentrated trampling from deer. An open park-like forest modified by deer may be attractive to some, but we do not want all our forests looking like those of a continental country, least of all those of our Wilderness Areas, National Parks, Nature Reserves and Ecological Areas. To advocate the sustained yield of deer in all our mountain lands is as misguided as advocating that deer should be eliminated from all these lands in order to restore them to their "pristine state".

I. A. E. Atkinson