

## Book reviews

Edited by B. GILLIES

**The Puffin** by M.P. Harris, 1984. Calton, Waterhouses (Staffordshire, U.K.): Poyser. Pp 224, b. & w. p11 24, b. & w. figs (inc. maps) 47, tables 20. 160 × 240mm. £12.60.

When I first visited the northern hemisphere, my highest priority was to see puffins. My first encounter took place on Skokholm where I compared puffins and penguins with an Oxford University researcher for one idyllic day. With memories of their enchantment, I approached Harris's 'Puffins' with eager expectation and was in no way disappointed.

As I devoured the book, I was drawn to ask questions and it seemed as if the author had deliberately elicited this response: invariably they were answered before passing from my mind. The text is written in easy narrative style, uncluttered with hiccoughs of tedious statistics: the bibliography points to where to seek confirmation of data. Clear black-and-white photographs reinforce the text, taking the reader right into the puffin's world. Figures are comprehended almost at a glance and tables are relegated to appendices.

The charming black-and-white illustrations, both figures and other drawings liberally scattered throughout, capture the 'jizz' of puffins in their lonely windswept environment. Figures 25 to 28 (the title of Fig. 28 is omitted) are so endearing that one wonders how the birds could ever be regarded purely as a source of protein as still happens in some colonies; or how, at the end of the last century, the St Kildans in the Outer Hebrides could have annually harvested 2000 kg of feathers at 45 puffins per/kg.

Following an introduction into international studies of puffins on which the author has relied to complement his own work, there are 15 chapters — Auks; morphology of the puffin; distribution and monitoring numbers (3 chapters); breeding biology; behaviour; puffins at the colonies; food and feeding; growth of young; predators, pirates and competitors; man and puffins; pollution; migration, survival and winter at sea; and factors influencing numbers of puffins.

Each chapter, apart from those dealing with evolution and distribution, is followed by a summary, largely eliminating the need for recourse to the index. And for those who contemplate visiting a puffin colony, a glance at 'puffin watching' on p. 105 will ensure that visits are made at the appropriate time.

The 'guesstimates' of the world population of Common Puffins *Fratercula arctica* at five million pairs of 15 million birds does not suggest an immediate threat but this is no cause for complacency. The reasons for population decreases and increases throughout the range are not always evident but probably there are two dangers greater than pollution and introduced predators (including human-kind): climatic changes and over-fishing. About the first nothing can be done but constantly increased harvesting of small fish for fish meal could be controlled and decelerated before disaster overtakes fish stocks, seabirds or the fishing industry. Nevertheless, the author maintains optimism 'about the puffins' future' and claims that 'the general state of puffindom is far better than at any time this century'.

All seabird enthusiasts, specially those embarked on the study of individual species, need this book. It is a shining example of how

to present a monograph that is not only comprehensive and informative but also thoroughly enjoyable to any reader with the remotest interest in birds.

Pauline Reilly

**Bird Census and Atlas Studies**, edited by K. Taylor, R.J. Fuller and P.C. Lack, 1985. Tring: British Trust For Ornithology. Pp. 437, many tables, graphs and figures. 146 × 208. £10.

This is an account of the 'Proceedings of the VII International Conference on Bird Census and Atlas Work' held September 1983 in Buckinghamshire, England. There are 41 papers in five sections: Reviews (two papers), Design and Methods (13 papers including three introductory reviews), Monitoring (six papers), Habitat and Community Studies (ten papers), Atlas and Mapping Studies (ten papers). Apart from the first, each section includes abstracts of papers presented as posters at the conference.

Since the 1981 conference of censusing terrestrial birds held at Asilomar, California (Ralph & Scott 1981), there has been considerable interest in census and atlas procedures, their use in studies of bird populations and communities, and the application of census or atlas results for the conservation and management of avifaunas. The Buckinghamshire proceedings are a useful follow-up to the benchmark Asilomar conference. Just as Asilomar was biased towards North American studies, this meeting was primarily concerned with European studies. Taken together the two proceedings provide an exhaustive review of bird census and atlas work throughout the world. Both are mandatory reading for anyone attempting to count or map birds.

The five papers by Jacques Blondel (France), Chan Robbins (U.S.A.), Dave Dawson (N.Z.), Bruno Scherrer (Canada), and Almo Farina (Italy), which begin the proceedings, are excellent reviews of census theory, sampling design and application. Farina's review of quantitative habitat descriptions is unique and especially useful. A problem with census work in Australia, and especially of programs involving amateurs, has been a failure to quantitatively describe the habitats censused. In the absence of habitat descriptions it is not possible to explain changes in avian abundance or distribution. Surely the intent of monitoring bird populations is more than knowing that numbers have increased or decreased. The conservation and management of bird populations requires an understanding of the factors causing changes in numbers. Foremost among the factors affecting avian abundances are changes to the habitat. Farina's review demonstrates the wealth of procedures that can be used in quantifying habitat variables.

Papers in the section on study design and methods compare census procedures and investigate problems and biases inherent in each method. As are the habitat and community studies in Section IV, these are similar to a wide array of papers appearing in the European, North American and Australian literature. It is useful nonetheless to have them together for ease of reading and comparison. There is a particular value in the emphasis on European studies, many of which are not easily available to Australians.

Perhaps of greatest interest to Australians, in view of current

proposals for a national bird census and monitoring program (Smith 1986, 1987), are the papers in the sections on monitoring and atlas and mapping studies. These papers describe national programs that have been tested over a number of years in different countries covering a wide range of habitats and climatic conditions. Many of these could serve as models for Australia.

The volume is inexpensively produced, but the print is easy to read and the text has been edited carefully. I would like to emphasise that a concerted effort appears to have been made to keep the text readable and easily understood. This is especially true for the reviews and there is no excuse to be put off by the 'text bookish' appearance of the text. Good summaries at the start of each paper permit quick scanning of contents and the abstracts of poster papers provide important additional content.

There is probably little need for most people to own these proceedings. However, it does belong in institutional libraries and persons actively engaged in bird census work will probably want to have their own copy. I would strongly recommend that anyone wanting to census bird begin by becoming familiar with the contents of the Buckinghamshire and Asilomar proceedings.

## References

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H.F. Recher

**Conservation of Island Birds — Case studies for the management of threatened island species**, edited by P.J. Moors, 1985. Cambridge: International Council for Bird Preservation. Pp 271, b. & w., p11. 13, b. & w. drawings 19, maps 22. 138 × 216mm. £16.50.

Given the disproportionately high representation of island birds in lists of rare, endangered and extinct birds, it is surprising that, until this volume, no book has been devoted to the topic of their conservation. And, given this gap, it is clear that no single publication could fill it completely. This was recognised by the editor Phil Moors, who explicitly states in his Preface that he '... sought contributions that will reveal what is actually being achieved in the field, or will provide information for future work and decision-making' and is reflected in the volume's sub-title.

The book is divided into four parts. The first deals with processes affecting island birds and consists mainly of review papers. Much of the information summarised here will be familiar to island biologists, but the four papers will be of interest to anyone new to this subject. Warren King provides a general world perspective and historical background. Ian Atkinson contributes a comprehensive discussion of the spread of commensal rats to islands and the resulting effects on the birds. Atkinson's chapter combines an unequalled personal knowledge of the literature (nearly 300 references are quoted) but, despite this, it is worrying that even he could find very little direct evidence for rat predation on birds. It is not that I doubt that rats do prey on birds, it is just that I suspect some species, such as the largely vegetarian Pacific Rat *Rattus exulans*, may be innocent of some of the charges laid

against them. More importantly, a documented knowledge of the biology of rat predation is critical for its management.

Island biogeography theory is dealt with by Jared Diamond, who presents a succinct summary of classical equilibrium theory, and T.M. Reed, who presents a partial alternative. Neither mention the large and coherent body of criticism of equilibrium theory associated with Simberloff and his co-workers (see Simberloff 1983) and neither effectively counter the contention that, interesting though they are in theory, the dynamics of immigration and extinction on islands have so far proved to be of little or no relevance to conservation.

The second section, regional surveys of the status of island birds, begins with two excellent papers, one on the tropical Indian Ocean by A.W. Diamond, the other on the sub-Antarctic islands by Gavin Johnstone. Unfortunately, it ends there. An assessment of the status of Pacific island birds is a massive task (the Pacific has most of the world's islands and atolls) but a critical one, and is sorely missed. A summary of the situation in the Atlantic is a much simpler task and a more surprising lack. Other fertile areas for future review are the Arctic seas and the Caribbean.

'Island Conservation in Action', the third section, presents ten paper covering the promised case studies. There is no doubt in my mind that New Zealand wildlife managers and biologists lead the world in the management of island fauna. The two papers by New Zealanders are the highlight of this section. Chris Veitch tells us how to eradicate cats from islands, while Phil Moors details how to eradicate *Rattus norvegicus*, at least from small islands. Such clear and detailed 'how to' papers are remarkably scarce in the literature of conservation, but they are just what managers and planners need. They show what can be achieved by hard work and a willingness to experiment.

Several papers present new and interesting biological data of relevance to conservation. Bob Tompkins quantifies the effects of predation and other agents of mortality on the Dark-rumped Petrel *Pterodroma phaeopygia* in the Galapagos, and thus is able to clearly establish priorities and needs for the management of different sub-populations. Data presented on the variation in feeding strategies of Ospreys on the Red Sea island of Tiran by V. Safriel *et al.* show that the quality of the shoreline as habitat for this species varies considerably depending on its geomorphology and related changes in prey availability. Again, a knowledge of the biology of the species immediately provides clear-cut priorities for management action.

Lateral thinking is an important component of solving problems in conservation, and perhaps the most interesting example in this book is provided by James Wiley. The Puerto Rican Parrot *Amazona vittata* suffers from competition for nest sites in what little of its habitat still remains. The main competitor is the Pearly-winged Thrasher *Margarops fuscatus*. The simple provision of nest-boxes was not enough, but when pairs of nest-boxes — one optimised for the parrot, the other optimised for the thrasher — were placed closely adjacent, not only did competition from the thrasher cease, but the highly territorial thrashers also kept other species away from the area that might have otherwise ejected the parrots.

The final section is entitled 'A Programme for the Protection of Island Ecosystems' and consists of a single paper by Cameron Kepler and Michael Scott outlining the design of such a program. It is essentially a paper on the type of organisational structures and planning schemes needed to ensure that the right resources are available for island conservation and that they are directed to the

right ends. Their words are directed at politicians and bureaucrats, on whom the necessary funding and infrastructures critically depend. It is to be hoped that their program, with its emphasis on regional planning, the setting of priorities and, most importantly, taking action on those priorities, does not fall on deaf ears.

I can certainly recommend this book to anyone interested in island conservation and the management of island ecosystems. It is a good mix of the theoretical, the practical and the political, and, most unusually in these days of outlandish book prices, it is commendably cheap.

## Reference

- Simberloff, D. (1983). Biogeography: the unification and maturation of a science. In *Perspectives in Ornithology* (eds A.H. Brush & G.A. Clark, Jr.). Cambridge University Press, New York.

Charles Meredith

**Crows of the World (2nd edn)** by Derek Goodwin, 1986. London: British Museum (Natural History). Pp 299, col. pll 6, many b. & w. drawings and maps. 220 × 280 mm. £30.

The first edition of this book was reviewed in *Emu* 80, 93, and Ian Rowley's favourable comments on the book in general apply equally to the second edition. The purpose of this review is to comment on the section dealing with Australian *Corvus* in the new edition. I will say at the outset that I have some misgivings about the accounts of the Australian species, but I stress that my remarks apply only to this aspect of the book.

Goodwin used references up to 1984 (*RAOU Newsletter* 60, 5) in the compilation of the data on Australian species, but there are some glaring omissions. Nor is this entirely because some of the material appeared in obscure journals — *Aust. Bird Watcher* 7, 102 and 265-269 (1977-1978) were used but there is no mention of my behavioural and identification notes in *Aust. Bird Watcher* 8, 194-198 (1980) and 9, 147-153 (1982). There was no use made of new distributional data on the Forest Raven in *S. Aust. Ornithol.* 26, 251-253 (1977) and *Aust. Birds* 15, 7-12; 17, 79-80 (1980, 1983). Most surprising of all, Rowley's paper (1973) on behaviour and social organisation was used (for the Australian Raven only), but none of the other papers in this series (*Aust. CSIRO Wildl. Res.* 18, 67-169) was used. As a result, the accounts of the Australian species are minimally revised and omit important data on breeding seasons, breeding biology, feeding ecology and speciation (also behavioural data on the other four species, which could have been rectified in the Little Raven's case by reference to Rowley 1974, *Emu* 74, 47-52). It is simply not true that there is 'no information' on the Forest Raven's displays (*cf. Aust. Bird Watcher* 8, 194-198). As well as describing some displays of the various species, I showed that the Forest Raven's displays are like those of the Australian Raven, that the Little Crow is not the only species that soars (Little and Forest Ravens do it too), and that it is misleading to state that the Torresian (=Australian) Crow never utters an 'a' sound. With better research, the accounts of these species could have been extensively rewritten.

Goodwin acknowledges that he was greatly assisted by ornithologists in various parts of the world who volunteered comment and extra information after the first edition. I therefore must accept some responsibility for my own work failing to reach his attention. Nevertheless it is a grave oversight for a professional attached to

a museum to omit reference to journals such as *Emu* and *CSIRO Wildlife Research*. It also seems a reasonable expectation that overseas ornithologists should be aware of the lesser Australian journals (e.g. through abstracting services such as the *Zoological Record*) and indeed many are, judging by the number of requests for reprints.

For a global review, the second edition has some serious shortcomings in the accounts of Australian species. There are also some errors and examples of sloppy printing and editing-in of new material. Bell, on urban corvids (*RAOU Newsletter* 60, 5), is listed as a reference under Australian Crow but no mention is made in the text; the Australian Raven is said to be an urban bird in Brisbane when in fact the Crow is town-adapted in Brisbane and the Raven in Sydney. The comparison of *Corvus orru*/C. *benneti* (sic) calls is printed twice, and the comment on the Australian Raven's 'presumed' display flight is somewhat anachronistic in view of Rowley's discussion of reduced-amplitude flight. In several places CSIRO is printed as 'CSLRO', and there are several cases of neglect to close quotation marks and parentheses (potentially confusing to readers). On the credit side, it is pleasing to read Goodwin's own observations on some Australian species.

Regrettably, I cannot recommend that Australian ornithologists buy the second edition of this book unless they are particularly interested in the corvids of the rest of the world, and in the behaviour, biology and systematics of the Corvidae in general. For a doubling in price (English that is, without taking into account our sliding dollar) one gets very little improvement in the Australian content of the first edition, and one is far better off going to the original sources for data on our birds. Nevertheless, the concept of a world monograph on the Corvidae is a commendable one and there is much of interest in the introductory chapters and the accounts of overseas species. It is well worth reading for the perspective it gives on Australian species, and the accounts of the better known overseas species are extensively revised. I would heartily recommend borrowing it from a library.

Stephen Debus

**Research on Penguins in New Zealand: Wildlife Research Liaison Group, 1986.** Wellington: WRLG Research Review No. 8, pp 38, 210 × 297 mm. No price given — available from WRLG, PO Box 2038, Wellington, NZ.

It came as a surprise to this reviewer to learn that New Zealand lays claim to nine species of penguin breeding within its domain, as well as four other irregular stragglers, until it was realised that offshore islands and that part of Antarctica under the control of New Zealand are included in this Research Review. Not only does New Zealand proper have four endemic penguin species, but it also has the world's rarest, the Yellow-eyed Penguin.

Following an introduction to New Zealand's penguins and a page dealing with general research on penguins, the next section gives information on eight of the nine New Zealand species: Emperor, Yellow-eyed, Adelie, Chinstrap, Blue, Rockhopper, Fiordland Crested, Snares Crested and Erect-Crested. Subjects covered are: distribution and abundance; reproduction, survival and mortality; embryology and development; physiology; behaviour; foods and feeding; and parasitology (Fiordland Crested only). There is a dearth of information about the Chinstrap, which is understandable as only about ten pairs breed on Balleny Island in the New Zealand Antarctic region.

The next section deals with current research on all nine species, followed by evaluation of past and present research and suggestions for future research. Here it is stressed that the greatest lack of knowledge of penguins at sea, a lack long-recognised by researchers in Australia and elsewhere.

The references take up sixteen pages. Though they may be useful to New Zealand workers, they omit those useful to those involved with penguins in Australia; e.g. *Biology of Penguins*, edited by B. Stonehouse is given only under individual authors, although fifteen other titles are listed against his name; and all the Blue (Little) Penguin papers are referred to only in the references to a paper by one New Zealand author.

Still, as the title implies, this is a review of major publications on penguin research carried out in the New Zealand region. Because publications relevant to all nine species would make for far too large a review of this nature, the reader is referred to a forthcoming world bibliography of penguins by Williams, Newton and Cooper.

Pauline Reilly.

**The Sparrowhawk** by Ian Newton, 1986. Calton: T. & A. D. Poyser. Pp 396. b. & w. pll 24, b. & w. drawings many, figs 90, tables 63. 160 × 240 mm. Cloth \$65.00. Paper \$37.50.

In terms of his output, Ian Newton is the Barbara Cartland of raptor ecology; as one recent reviewer put it, 'when does he sleep?'. His books and papers are blockbusters. His romance is with the birds but perhaps, more particularly, with unravelling the way they regulate their populations and with their evolutionary fitness.

Newton's second book, *Population Ecology of Raptors*, has become 'the bible' of those studying raptors. *The Sparrowhawk* is his latest book and is just as important. It is the most thorough and significant account of the ecology of a raptor yet published. By piecing together many facets of Sparrowhawk ecology, Newton emerges with a picture that goes beyond ecology and provides insights into evolutionary theory.

*The Sparrowhawk* covers fourteen years of research on the European Sparrowhawk *Accipiter nisus*, much of it on marked individuals, some followed throughout their life. Important findings are made by comparing Sparrowhawks in good habitat with those in poor. Newton, assisted by various co-workers, has gathered more information on a raptor than anyone thought possible. Earlier in his career he, like many others, was discouraged from working on raptors because of the very real difficulty in obtaining a meaningful sample size. Hard work, dedication that at times amounts to obsession, and depth of vision have produced a remarkable achievement.

Collectors of Newton's papers will find the core of most chapters has already been published as papers, but some chapters are new. This is not a criticism, as Newton has woven them together — searching for patterns that flow through several aspects of sparrowhawk biology — and presented them as a coherent whole.

Each chapter is the product of a remarkably clear mind; set out logically, stating the problems to be tackled at the beginning and working through, shuffling and reshuffling the data, to extract every last piece of information in support of his argument, then finishing with a neat summary. Chapter titles are self explanatory:

background, study areas and methods; the Sparrowhawk; nesting habitat; nest spacing and breeding density; ranging behaviour; population trends; hunting and feeding behaviour; food; the Sparrowhawk as a predator; and breeding season. Then five on the breeding cycle; early stages; eggs and incubation; growth of young; parental care and post-fledging period. These followed by: seasonal trend in breeding success; nest failures; age and breeding; moult; dispersal; territory and mate fidelity; migration; mortality; effects of pesticides; and finally conclusions. This final chapter not only brings together the findings in the various chapters but seeks to explain the whole in terms of Darwinian fitness and evolutionary theory. Four instructive appendices on finding nests, persecution of Sparrowhawks, procedure for analysis of nest spacing and causes and diagnosis of nest failure precede a bibliography and a staggering 63 tables. These later are in addition to 90 figures scattered throughout the text. The whole is well indexed.

Food abundance (and availability) emerges as a factor of overriding importance to many aspects of Sparrowhawk ecology. It is one of the common threads that permeate the book. The different roles and behaviours of the two sexes, more disparate in size than in almost any other bird, are another recurring theme. Newton has found that females are large and competitive and that it is the larger females that live longest and produce more offspring. Males are small, hold the nesting territory and are the providers of food for the breeding effort. As females outnumber males in the adult population, and males hold territories of widely differing quality, and perhaps differ in hunting skill, 'good' males are a scarce resource. Several years ago we developed a theory to explain sexual dimorphism in raptors (Olsen & Olsen 1984, *Aust. Wildl. Res.* 11, 205-206), a subject that has fascinated many, including Newton, and spawned many theories. We believe that female raptors are usually larger than males because they compete for the scarce males; this is a Darwinian notion for which there was only piecemeal evidence until Newton brought together his Sparrowhawk research.

Those who wish to study sparrowhawks need not despair. Newton points out, for example, that the post-fledging period is still poorly known; his findings indicate that it is probably the most decisive period of a hawk's life and that mortality during this time has a great effect on regulation of the breeding population.

It is interesting to compare the European Sparrowhawk with our Collared Sparrowhawk *A. cirrhocephalus*. Both have rather long incubation times for small raptors (*nisus* about 33 days; *cirrhocephalus* about 35 days). Collared Sparrowhawks prefer to nest in introduced pines, even when native trees are nearby; pines are favoured nest sites in Newton's study areas. However, Newton rarely found sprays of green leaves lining his nests, while in Australia the sparrowhawk often adds greenery. Newton's ideas on the markings on sparrowhawk eggs providing camouflage are shaky, given his mistaken belief that the eggs of all small accipiters are marked while those of all large accipiters (more able to defend the eggs) are white. Our (Aussie) sparrowhawks most often have unmarked eggs.

It may seem churlish to criticise such a fine work but at times Newton seems so convinced of the quantitative importance of food for breeding that his usually precise logic fails him. For example, on p. 144 he suggests that extra weight put on before laying tides females over food shortages during incubation. Yet on p. 148 he notes that females given supplementary food did not weather the incubation period any better than unfed females — not necessarily contradictory but certainly not supporting his argument. It is difficult to reconcile his findings on p. 39, where he graphs adult weights, which start to increase in March-April, most markedly in

females, with a later comment (p. 89) that these two months were hard and sparrowhawks could be expected to suffer the 'greatest' food shortage. We cannot help but think that hormones, perhaps obtained from their prey, may sometimes override food abundance in importance. Hormones in courting prey, for example, may act as precise timers for Sparrowhawk breeding. Sparrowhawks begin laying before any increase in fledgling abundance so that by the time they have nestlings and fledglings there is ample, inexperienced prey available. Could hormones in their prey help them predict this abundance? It is also hard to accept that food shortage led to a smaller number of eggs in clutches laid late in the season, and to increased desertions of late clutches, when most of his figures (p. 118-119) of easily caught fledgling prey in the diet show that fledglings have yet to peak. Could hormones (as intrinsic factors) again be involved? Perhaps late in the season the birds are winding down and losing the urge to breed.

The tables are informative and well set out and the figures provide clear visual representations of the relevant points. At the beginning of each chapter, and every now and then, the reader comes across delightful illustrations by Keith Brockie. — scenes and behaviours appropriate to the chapter.

Do not let our criticisms deter you. There are so many things of interest and substance in the book that it was easier to pick the few points that seemed questionable. It is a book not to be missed — packed with information, insight and sheer hard work. It will stand as a model and motivator for raptor study, indeed the study of any species, for years to come, and further secures Newton's place amongst the greatest ecologists of our time.

Penny & Jerry Olsen

**Helpers at Birds' Nests: A worldwide survey of cooperative breeding and related behaviour** by Alexander F. Skutch, 1987. Iowa City: University of Iowa Press. Pp 298, b. & w. drawings 61, 175 × 250mm. N.P.G.

The author's aim appears to be twofold: first to present a comprehensive world-wide survey of cases in which co-operation, and in particular co-operative breeding, have been recorded amongst birds; and second 'to make helpful birds more generally known, as a possible antidote to all the publicity that nature's uglier side receives'. Unfortunately, he is only partially successful in achieving the first aim and unconvincing in regards to the second.

The book begins with an introduction outlining the author's long association with the study of co-operative breeding that began with his pioneering paper (Skutch 1935) where he first gave the name 'helpers' to birds that aid mated pairs. The following 49 chapters attempt to document known case of both intra- and interspecific helping by birds from taxonomic families or, where co-operative breeding is rare, from groups of families such as oceanic birds. The inclusion of examples of interspecific helping (the most extreme being the celebrated case of a Northern Cardinal *Cardinalis cardinalis* that fed seven goldfish in a pond) throughout the book is confusing. Such information would have been more effectively presented as a table or list of cases in Chapter 51, where the significance of interspecific helping is discussed.

Each chapter dealing with a family includes a brief account of the geographic distribution of the family and its members' general appearance and nesting habits. This is followed by a description

of each species in which helping has been observed. The accounts are written in a somewhat chatty style: paraphrasing work in the scientific literature or recording the author's own observations. This style assists in making the literature more accessible to a wider audience but introduces weaknesses that will be outlined later.

Citation of the authors of work referred to in the text occurs at the end of each chapter in an alphabetical listing. This is a frustrating arrangement in which it is frequently difficult to establish the research Skutch is referring to in the text. This is despite the inclusion of an accurate and very useful bibliography and index at the end of the book. This fault could have been avoided by using reference numbers beside each piece of research discussed that corresponded to a numerical listing of the authors at the end of each chapter. In addition, the value of this book as a 'worldwide survey of co-operative breeding' would have been greatly enhanced by the inclusion in each chapter (or in a summary chapter or appendix) of a table listing the species exhibiting particular types of helping behaviour and the relevant references. The absence of such a list, or of even a figure of the total number of co-operatively-breeding species, is a major weakness and hard to comprehend.

The order in which the chapters dealing with families are arranged is puzzling as it departs from conventional taxonomic order in several places e.g. the corvids and cracticids are placed in the middle of the book, well before the melaphagids and the malurids. Some of the taxonomic divisions used appear to be outdated, e.g. the thornbills are included in the Maluridae rather than the Acanthizidae. The author's attitude within the book to taxonomy is reflected in a statement in a chapter where he admits that 'Since this is not a taxonomic work, in this chapter I shall disregard recent changes in taxonomy ...' Such an attitude towards taxonomy reduces the book's value as a useful reference or guide to the occurrence of avian helping and will not be well received by many readers.

The 61 black and white line drawings by Dana Gardner of important species referred to in the text are dispersed throughout the chapters dealing with individual families. These illustrations are generally helpful but are of mixed quality. Drawings of several Australian species appear to reflect the artist's lack of familiarity with them and resemble modified northern hemisphere counterparts rather than those in question e.g. the Apostlebird *Struthidea cinerea*, Australian Magpie *Gymnorhina tibicen* and Superb Fairywren *Malurus cyaneus*. The misplacement of the Brown Tree-creeper *Climacteris picumnus* drawing in a chapter dealing with aegithalids, rather than climacterids, is an unfortunate one.

The aim and potential of this book to act as a benchmark of co-operative breeding, at the time of publication, through a world-wide survey of the field is severely hampered by many serious omissions throughout the text. The author's failure to refer to past major reviews (e.g. Dow 1980) has led to an incomplete account; amongst Australian species alone at least 29 co-operatively breeding species are omitted. Even amongst the Central and South American species, with which one would assume the author would be more familiar, there are omissions e.g. the Stripe-backed Wren *Campylorhynchus nuchalis* (Rabenold 1985).

The accounts of several families include no reference to major recent works on these groups e.g. the bee-eaters (Fry 1984) and the jays (Woollenden & Fitzpatrick 1984) respectively. Coupled with these omissions is the author's selective presentation of particular research aspects into certain species; the original researcher's interpretation of their data is often ignored in favour of

Skutch's own, more group-selectionist, interpretation. For example, in the discussion of egg-tossing by the Groove-billed Ani *Crotophaga sulcirostris* little mention is made of Vehrencamp's (1977) own interpretation of the phenomenon. Such an approach results in an unbalanced and incomplete presentation of the current thinking on co-operative breeding.

The final chapter of the book is a discussion of the evolution of co-operative breeding. It is pervaded with the author's tendencies towards group-selectionist explanations of co-operation. This is evident from the way he begins the chapter by defining the problem, in part, as being one of determining how co-operative breeding affects the reproduction and stability of the species. The statement later in the chapter that 'Co-operative breeding is rightly viewed as a flexible method of population regulation' is a reasonable summary of the author's favoured explanation of the behaviour.

The type of alternative explanations raised and the manner in which they are discussed are out-dated, incomplete and shallow. Two past debates, one from the 1960s regarding the regulation of reproduction and the other from the 1970s regarding whether true altruism exists in nature, are presented in a very unbalanced and simplistic fashion, ignoring major relevant work (e.g. Lack 1966). Important contributions to current theoretical understanding of co-operative breeding have also been omitted from the discussion (e.g. Emlen 1982a,b). It is therefore not surprising that such trite conclusions as 'It is obvious that individual selection, kin selection and group selection are simultaneously involved in co-operative breeding' result. Coupled with the author's hesitancy to deal seriously with the theoretical literature is a dangerous use of anthropomorphisms that permeate the entire text e.g. 'Birds are occasionally free to behave in ways they find satisfying, regardless of any effects upon reproduction. They remain in their natal territory ... because they enjoy companionship and feel more secure in the home of their childhood.' Such an approach, while being emotionally appealing, is littered with pitfalls and can be scientifically misleading.

In conclusion, the enormity of the task the author has attempted to tackle in this book should not be under-estimated. His success in producing a worldwide survey of co-operative breeding has only been partial. Nevertheless, many amateur ornithologists and naturalists will be fascinated by the varied and intriguing instances of co-operation recounted by the author. Those interested in serious study of co-operative breeding in birds are more likely to be frustrated by this book, which appears to have suffered from having been written in isolation. The consequences of that isolation are most evident in the series of omissions and result in a book which falls short of its potential.

## References

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