

Avian affairs

Mark Kirkpatrick

Sperm Competition in Birds: Evolutionary Causes and Consequences. By Tim R. Birkhead and Anders P. Møller. Academic: 1992. £39, \$75 (hbk); £19.50, \$39.95 (pbk).

THE so-called 'monogamous' birds are not the paragons of Victorian sexual sensibility for which they were once taken. This realization, growing over the past decade, has been confirmed by recent molecular studies showing that a substantial fraction (sometimes an outright majority) of chicks in many species are the offspring of males other than those tending their nests. With these and other seedy aspects of avian family life now exposed, there is a lot of interest in understanding their evolutionary implications.

In *Sperm Competition in Birds* Tim Birkhead and Anders Møller review the data and hypotheses on male-male reproductive competition in birds. The title might suggest something narrower, and in fact there is little evidence that the sperm themselves have elaborate adaptations for competitive chicanery. But competition for fertilizations has far-reaching effects, and the authors argue that it has shaped many aspects of behaviour and morphology. One dramatic example is the suggestion that male-male reproductive competition is the driving force behind the evolution of territoriality in birds. The book should be read by all who are interested

New Journals issue

This year, *Nature's* annual New Journals review supplement will appear in the issue of 1 October. Publishers and learned societies are invited to submit journals for review, taking note of the following criteria:

■ Journals that first appeared during or after June 1990 and issued at least four separate numbers by the end of April 1992 will be considered.

■ Journals covering any aspect of science are eligible, although those dealing with clinical medicine, engineering and pure mathematics are excluded, as are publications of abstracts.

■ Frequency of publication must be at least three times a year. The main language used must be English. Translation journals in English are, of course, eligible.

■ Deadline for submission is the end of May.

When submitting journals for review, please send at least four different issues (the first, the most recent and any two others) of each title, together with full details of subscription rates (personal and institutional) and frequency of publication, to: Peter Tallack, *Nature*, 4 Little Essex Street, London WC2R 3LF, UK. For further information please telephone Peter Tallack on 071-836-6633 (011-44-71-836-6633 from the United States), extension 2414.



Greylags before the storm. This painting is taken from *The Art of Peter Scott: Images from a Lifetime*, which contains more than 150 superb colour reproductions of the work of this leading wildlife painter and conservationist, who died in 1989. Published by Sinclair-Stevenson, price £25.

in bird behavioural ecology.

Birkhead and Møller have produced a field guide to the hypotheses and gold mine of data. As yet, there are few convincing resolutions to the harder questions, but the subject is still young. At present, it is possible to test many of the arguments only by seeing if they are consistent with the data, rather than by showing that all reasonable alternatives can be ruled out, and the available comparative analyses do not always include rigorous controls for phylogenetic effects. Interesting patterns do emerge where it has been possible for the authors to overcome these limitations. Take, for example, two of the ways in which males decrease the odds that their mate will be fertilized by another male. One is mate guarding, in which males follow their mates closely during the fertile period, and another is frequent copulation, in which males displace the sperm of interlopers with their own sperm. The authors show convincingly that an evolutionary increase in either of these behaviours is correlated with a decrease in the other, indicating that the behaviours represent evolutionary alternatives.

A widely discussed question that is addressed by Birkhead and Møller is why some females solicit matings with many different males. (The corresponding question for males is not as controversial: more fertilizations presumably translates to greater fitness.) The authors consider in detail several possible costs and benefits of this behaviour. A clear difficulty is that none of the explanations seem to account well for the variation within species. My favourite explanation, for example, had

been that females benefit by insuring against an infertile mate. The authors point out, however, that not all females mate with more than one male, even in polygynous lekking species, where females have more social freedom than they do in many 'monogamous' species. If insurance against male infertility was an important consideration, one would expect almost all females to mate with several males, but only a minority seem to. Various costs to the behaviour (for example, the female's mate may withhold parental care from the offspring if he finds out that she has mated with others) likewise fail to explain the variation between females.

This situation is common in behavioural ecology, where many issues involve understanding the causes of individual variation. There are two genera of obvious explanations. The first is that each female is acting optimally, and that different circumstances make different behaviours ideal for different individuals. Probably most behavioural ecologists begin work with this view. A second possibility is that the variation is noise, maybe a side effect of hormone levels that reflect background environmental and genetic variation. This would be the favoured sort of explanation if one were discussing, say, a morphological trait such as tarsus length rather than a behaviour. Sorting out the relative merits of these two kinds of explanation will be a large part of the agenda for the behavioural ecologists who take on the many questions raised in the book. □

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