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Book review

KORB, J. & HEINZE, J. (Eds.) 2008: *The ecology of social evolution*

Springer-Verlag, Berlin, 266 pp., ISBN 978-3-540-75956-0, Price: € 139.95

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The theory of kin selection explains the occurrence of altruism as a function of relatedness and the numbers of offspring gained and lost through altruistic acts (benefit and cost). It follows that genetic factors (affecting relatedness) and ecological ones (affecting benefit and cost) must simultaneously be considered to understand social evolution fully. For this reason there is no real disagreement between those pursuing genetic studies of social evolution and those pursuing ecological ones; none has a monopoly of scientific righteousness, though the ecologists probably get muddier.

Since Hamilton first proposed it forty-five years ago, however, the intellectual history of kin selection theory has been tortuous in the extreme. One feature of this history has been the repeated appearance of former controversies long thought defunct, as the arguments and counter-arguments of one decade vanish from the field's evidently leaky collective memory, only to reappear in another. A current manifestation is seen in some eminent figures in the field having recently resurrected several old misunderstandings of kin selection, of a sort effectively countered three decades ago (DAWKINS 1979), while adding some new ones of their own. Less bizarre, but keeping similar time, has been the swing of the intellectual pendulum from the side of genetic explanations for social evolution, to that of ecological ones, then back again, and so on. It is no disparagement to place *The ecology of social evolution* in this tradition and state that it is the latest, but not the first, attempt to redress a perceived bias for genetic interpretations in the study of social evolution by focussing on the ecological side. I must immediately add that few of the contributors make the mistake of couching their arguments in terms of an unsustainable either / or; on the contrary, nearly all, where appropriate, place what they have to say in the Hamiltonian framework, and the editors in their preface clearly state that they seek a synthesis of genetic and ecological explanations. Nonetheless, it is striking that even the title of this book echoes those of two edited volumes on similar topics of twenty years ago (RUBENSTEIN & WRANGHAM 1986, SLOBODCHIKOFF 1988) – neither of which is cited.

Despite these forerunners, there are new and valuable insights in this book. Readers will find authoritative and up-to-date reviews on a wide range of taxa, from social insects both familiar and unfamiliar, to social vertebrates

including cooperatively breeding birds, mole-rats and primates. Many chapters deal explicitly with the question of whether variation in relatedness or variation in ecological factors explains more strongly variation in social traits. The conclusion is often in favour of a greater contribution from ecological variation. Frequently, however, the evidence is, as the authors admit, qualitative and comparative (though in aphids, thrips and mole-rats, well-developed phylogenies add rigour to the comparative conclusions). The reason for this stems from a couple of factors that have repeatedly dogged ecological studies of social evolution; namely, that it is hard, under natural conditions, to perform effective experiments or to quantify the ecological variables likely to determine the benefit and cost terms in Hamilton's rule. An example overcoming the first of these difficulties appears in the chapter on stenogastrine wasps by J. FIELD, who describes one of the few experimental tests of the ecological constraints hypothesis in social insects. Other highlights include the chapter by J. KOMDEUR, D. RICHARDSON and B. HATCHWELL, who argue persuasively that, to understand how variation in relatedness influences variation in social traits, we need to consider how different kin discrimination mechanisms affect the degree to which social behaviour is kin-directed; and the book's final chapter, a synthesis by the editors that proposes a refined functional classification of eusocial societies, then explores why different types of ecological factor might affect different types of society.

A conventional conclusion that more data are needed is entirely apt; specifically, if an ecological understanding of sociality is to progress faster, both experimental studies and those quantifying benefit and cost are essential. Perhaps it is also worth considering whether the sorts of social traits most affected by variation in relatedness, for example those linked to within-group conflict in established social groups (e.g., WENSELEERS & RATNIEKS 2006), are different from the sorts of social traits most affected by variation in ecological factors, which conceivably have more to do with the formation of social groups.

References

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