Simplifying sociobiology

Sociobiology and Behaviour. By D. P. Barash. (Elsevier Scientific: New York, 1977.) Hardback, $9.95; paperback, $4.95.

Sociobiology and Behaviour is essentially a much abbreviated version of parts of E. O. Wilson's *Sociobiology: The New Synthesis* (Harvard University Press). After introducing the basic ideas of natural selection, Barash proceeds through the by now familiar topics: altruism, living in groups, mate selection, parental investment, and aggression. Although Barash covers the 'right' topics, is usually clear in what he says, and provides plenty of good examples, this is not a book I would recommend to first-year undergraduates, the intended audience.

Although I am all in favour of making scientific texts clear and informal in style, I find Barash's racy prose annoying. Phrases such as "tunnel of love" (sticklebacks nest), "shennanigans of a love-crazed prairie chicken" (lek behaviour), "slice of the sociobiological cake" (meaning uncertain) lack both elegance and precision. This, however, is a purely aesthetic reaction, and my real objections to the book arise from three aspects of its scientific content. First, Barash claims more for sociobiology than it deserves. He proudly proposes (for the first time, he says) the Central Theorem of Sociobiology—"animals should behave so as to maximise their inclusive fitness". It sounds to me rather like what Darwin said more than a hundred years ago. Second, the book sets a bad example to students by giving the wrong impression of what scientific prediction is all about. On p259 we are told of the prediction of "sociobiologic theory" that "territories will be defended when it is adaptive for individuals to do so, i.e. when their personal inclusive fitness (*sic*) is maximised"! Almost as bad is one of the quoted 'tests' of this theory: wildebeest do not defend territories because it would not be adaptive for them to do so. It is a great pity that Barash gives readers the impression that "sociobiologic theory" (which I call natural selection) makes only tautologous or trivial and uninteresting predictions, because evolutionary theory can be used to make highly quantitative and often counter-intuitive predictions just like any proper hypothesis.

My third criticism is that Barash, in his effort to make the book simple, often stops short of the point where he could convey some real understanding of the issues involved. Let me give a few examples. The discussion of costs and benefits of ritualised fighting (p233) simply misses the point because it does not make clear the fact that the benefit to an individual derived from any particular strategy depends on what everyone else does: the payoffs are frequency dependent, so the problem is to find an evolutionary stable strategy. The same line of reasoning should have been applied to the review of mating systems (p168 *et seq.*). In summarising the idea of sexual selection, Barash presents one hypothesis (the "handicap principle") without pointing out any of its known pitfalls, and fails to make a clear statement of the most widely accepted idea (Fisher's theory). The important work of Trivers and Hare on eusocial insects is incorrectly reported in a single sentence on p84; the cost of sex is incorrectly explained on p139; and although Barash asserts on p119 that "gregariousness in shorebirds represents a unique and optimal compromise between conflicting demands of predation . . . and . . . foraging interference", the reference he cites has no information on whether or not spacing is optimal.

These points, and many other similar ones, are not too difficult to explain to first-year undergraduates (see *The Selfish Gene* by Richard Dawkins, Oxford University, 1976), and I feel that it is absolutely essential to get things exactly right if one is to convince students that evolutionary biology is more than a hand-waving exercise.

A final point about presentation. The text is well illustrated with good graphs, but inexplicably the photographs often have little to do with the text. A description of distraction displays in the Killdeer is accompanied by a photograph of two Cranes, a pair of male Topis serves to illustrate territorial behaviour in the Wildebeest, and plate 3.3, a bizarre study of grey blobs, defies analysis.

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● The UK edition of *Neuronal Recognition*, by S. H. Barondes, has been published by Chapman and Hall (London), price £20. For review, see *Nature*, **267**, 85, 1977.