

different kinds of model. There are deterministic and stochastic models, descriptive and predictive models, dynamic models, compartment models, matrix models, multivariate models, optimisation models, game theory and catastrophe theory models, all illustrated with particular examples. For a brief flavour of these, I can think of no better text. My main criticisms are aimed at the ten tables with computer listings. These convey little useful information and the space could have been more profitably used.

The final book in this selection, *Statistics*, by D. Freedman, R. Pisani and R. Purves (W. W. Norton: New York; \$13.95, including an *Instructor's Manual*), is a general statistics text, and not aimed especially at biologists. It fits into this quartet only in that a good grounding in statistics is important for any ecologist. The book is intended for "nonstatisticians who want to learn some statistics in order to go about their affairs", and relies on the plentiful use of exercises and a smooth narrative. The authors' have made no

concessions at all to what they call "pluginski", the rather mindless application of a statistical technique to a problem, and have whenever possible banished equations from the text. The result approaches 600 pages of text and notes with an almost complete absence of the different computational recipes needed in the application of everyday statistics. This over-reaction, together with the neglect of any treatment of the Poisson and negative binomial distributions that are so important in ecology, leaves a book ill-suited to the ecologically minded student.

For a concluding remark, I return to Hutchinson's *An Introduction to Population Ecology*. It stands apart from the rest as a work of distinction, that should be studied for its scientific content and savoured for its recondite footnotes.

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## Sociobiological literature reviewed

THE three books reviewed here all reflect the recent growth in sociobiology. They are, nevertheless, very different in character. *Readings in Sociobiology* and *The Sociobiology Debate: Readings on Ethical and Scientific Issues* are collections of reprinted papers (there also are some new articles in the latter volume), while *Sex, Evolution and Behavior* is a new textbook written at a level suitable for first- and second-year undergraduates.

The contrast between the two sets of readings is graphically demonstrated by the fact that only two out of 60 articles in the two are identical: Wynne-Edwards on group selection and Trivers on reciprocal altruism. *Readings in Sociobiology* (Freeman: San Francisco and London; hardback \$18, £9.50; paperback \$9, £4.50), edited by T. H. Clutton-Brock and P. H. Harvey, is aimed at undergraduate or graduate student audiences, and it covers the subject of sociobiology as understood by most academics working in the field. Concepts such as inclusive fitness, evolutionarily stable strategy, parental investment, and cost-benefit ratio crop up on every other page. *The Sociobiology Debate* (Harper and Row: New York and London; \$12.95, £7.95), edited by A. L. Caplan, is largely about the subject as

seen through the eyes of the popular press, politically motivated scientists, and some philosophers of science. Biological determinism, sociobiological theory, pluralism, and Science for the People are phrases which give an idea of its contents.

Both books have their place. The collection edited by Clutton-Brock and Harvey is well chosen and a fair representation of the current state of the field. Important subjects such as altruism, sexual selection, game theory and comparative socioecology are included; and Trivers, Hamilton and Maynard Smith between them wrote half the reprinted papers. There are brief and pithy introductions by the editors to each of the four sections. The collection reflects the bias in the sociobiological literature as a whole towards theory at the expense of data. Only three out of 18 papers are specifically concerned with testing ideas (Bertram on lions, Packer on reciprocal altruism, Clutton-Brock and Harvey on primate socioecology); and no experimental work is included. The book should be useful as an adjunct student text in places where the original journals are not available.

Caplan's book is, I assume, aimed at a different audience, the nature of which is not clear. The papers are in five groups: older writings of T. H. Huxley, Kropotkin and others; 1960s 'human ethology' (for example, Lorenz); philosophers comments; the biology of sociobiology (Hamilton, and others); and two long sections on the polemics arising out of E. O. Wilson's book. These last two

sections are the core of the collection. There is probably some value in a number of book reviews, short comments, and the Wilson versus Science for the People exchanges collected together; however, the overall result has little coherence. Editorial summaries might have helped, but Caplan's own contributions are sometimes confusing in themselves. This is illustrated by an amusing juxtaposition at the start of the book. E. O. Wilson writes in his Preface "Sociobiology is a discipline, not a particular theory". Two pages later, Caplan starts his introduction by saying of sociobiology "The very boldness of the theory . . .".

M. Daly and M. Wilson's clearly written book (*Sex Evolution and Behavior*; Duxbury Press; North Scituate, Massachusetts) does more to disperse the clouds of confusion, both deliberate and unintentional, about what sociobiologists have said, in particular the little they have said about human behaviour. After a brief introduction to modern ideas about natural selection, the book races through the cost of sex, sexual selection, parental investment, mating systems, life-history strategies, the physiology and ontogeny of sex differences and finally human sexual behaviour. The style of writing is direct and easy to follow; the contents accurate within the constraints of an elementary treatment. A wide range of literature including evolutionary ecology, anthropology, physiology, psychology and sociology is discussed.

Daly and Wilson are strong advocates of the view that sociobiology has a lot to say about human behaviour. Those who think that this is an overenthusiastic standpoint will at least find that Daly and Wilson summarise their ideas with clarity. I quote from their last chapter. In discussing a statement of the Science for the People Sociobiology Study Group they say "Consider the following excerpt from a statement recently signed by thirty-five authors, some of them well-known scientists:

. . . determinists assert that the possibility of change in social institutions is limited by biological constraints on individuals. But we know of no relevant constraints placed on social processes by human biology. There is no evidence from ethnography, archaeology or history that would enable us to circumscribe the limits of possible human social organisation."

What can this mean? If human gestation, infantile helplessness, language capacity, sensory systems, cognitive abilities, maturational rates, senescence, and so on, are not "relevant constraints placed on social processes by human biology" whatever could be?"

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