The Evolution of Adaptation by Natural Selection

Edited by J. Maynard Smith and R. Holliday
The Royal Society; London, 1979
iv + 170 pages. £9.00 (UK); £9.50 (overseas)

This book offers a fascinating introduction to many facets of modern evolutionary thinking. Its origin is in a meeting organised by J. Maynard Smith and R. Holliday at the Royal Society (December 1978). The conference contributions were collected and published as papers in the Proceedings of the Royal Society, series B (vol. 205 (1979) pp. 435–604) then reprinted in book form.

Following the example of Darwin who took inspiration in the work of Malthus, modern evolutionists keep drawing their arguments from the economic and political scene. Van Valen viewed, in his Red Queen Hypothesis, the inflation spiral by which wages and prices increase without change in relative value as a good model for the co-evolution of many species. In this book, a finer analysis of the prey–predator system is now offered by Dawkins and Krebs, based not on economics but on military policies. Thus the arms escalation concept is used to discuss many traits of animal developmental behaviour, from ants to cuckoos. Hawks and doves: this metaphor of the war in Viet-Nâm is now reinjected back into the animal kingdom. Maynard Smith shows that a stable animal society needs both hawks and doves. His analysis of intraspecific competition has been extended to include the Bourgeois (but not the Marxist) – again, a necessary component of 'evolutionary stable strategies'. Planified obsolescence is the last word in comtemporary Capitalism. The concept has now led to the Holliday and Kirkwood 'disposable soma' theory of ageing by which they explain the selective advantage of dying.

But is there a need to find a selective advantage, an adaptive value for every individual trait that is observed in a species? Inventing an adaptive story for each particular trait has been a major pastime for 'British upper middle class evolutionists' and A. J. Cain in the concluding chapter of the book pleads for the pursuit of this activity. He rejects as being emotionally-guided and non-objective those who question the all-power of natural selection. The offender, at the meeting, was S. J. Gould whose critique of the adaptionist programme found much support in the audience and led to heated discussions at the end. Gould and Lewontin's written contribution gives as the main alternative to adaptive stories, the search for developmental constraints in the organisms.

Some classical issues in Population Genetics are discussed in 4 chapters: Genetic diversity (B. C. Clarke); Sexuality in plants (D. and B. Charlesworth); Allometry (T. H. Clutton-Brock and P. H. Harvey); and Sex-ratios in vertebrates (C. G. Williams). The molecular biologist will find himself on more familiar grounds with the chapters on extra-cellular selection of nucleic acids (L. E. Orgel) or on the evolution of enzymes (B. S. Hartley). 'I find it surprising that so little has been done along these lines; perhaps it is because experiments in the field are difficult to fund.' (Orgel).

Most authors have managed to write exciting chapters that are readable by non-specialists and yet give an excellent guidance to the specialized literature. The book is highly recommended to all molecular biologists who are prepared to admit that there is something to learn on evolution outside the journals that usually fall into their hands.

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