

BOOK REVIEW

CRONIN, HELENA. 1991. *The Ant and the Peacock*. Cambridge University Press, Cambridge, xiv + 490 p. ISBN 0-521-45765-3. Paperback. \$19.95.

The book is arranged into three parts with 16 chapters and has an extensive bibliography, a list of cited correspondence between Charles Darwin and Alfred Wallace, and an index. The foreword was written by John Maynard Smith. The first part provides a background for the remaining two, each of which tackles an evolutionary paradox exemplified by the ant (altruism) and the peacock (sexual selection). How can self-sacrifice, especially reproductive self-sacrifice that places others at an advantage, possibly be passed on to subsequent generations? And how can flamboyant, burdensome structures be selected that seem disadvantageous to the bearer?

Part One, 'Darwinism, its Rivals and its Renegades', explores the views and controversies surrounding the theory of evolution through natural selection during and since the time Darwin and Wallace published their respective versions in 1859. Divine design, directed evolution, and Lamarckism are contrasted with classical Darwinism and its tenet that evolution results from gradual change through a culling of "bad" traits, and that such natural selection acts on individuals rather than groups or species. As elsewhere in the book, the author explores historical changes in views that have shaped modern Darwinism. The unit of natural selection has shifted from the group or individual to the gene and extended phenotype; the interpretation of phenotype was broadened from the merely physical to the physical and behavioral; and the view that traits are purely adaptive or maladaptive gave way to recognition of strategic tradeoffs in costs and benefits. Although classical Darwinism overlooked the concepts of evolutionarily stable strategies and optimality, Cronin contends that overall it was still a good approximation of modern Darwinism.

In the six chapters of Part Two, 'The Peacock', Cronin applies the theory of sexual selection to explain the conundrum of why some traits seem counteradaptive, especially in males. She discusses the virtues and failures of the handicap principle, which argues that faults or hindrances should be exaggerated or simulated by an individual to demonstrate to potential mates that the individual thrives despite them and is therefore a good mate. Cronin also addresses the historical controversies over whether sexual selection rather than natural selection can account for seemingly counteradaptive traits, why mate choice is the mechanism behind sexual selection, and how, or if, Darwinian forces allowed it to evolve. Included, among others, are Wallace's view that flamboyant male color is a physiological manifestation of higher energy and vigor of males rather than a mate-selected phenomenon, Julian Huxley's argument that male flamboyance is used in displays of threat rather than mate attraction, and entomologist O.W. Richards' insistence that male traits associated with mating are developed to stimulate a "passive", but not choosy, female into mating. Throughout Part Two, Cronin outlines the many arguments, particularly those between Darwin and Wallace, over whether the force driving the evolution of the peacock's tail is sexual selection or natural selection. She ultimately contends that trade-offs and compromises are forms of adaptation, and that the trade-off between, for instance, reproductive success and predation in a flamboyant male is no different in principle from trade-offs between foraging and predation. Sexual selection, she concludes, is just one case of natural selection, and is not different after all.

Part Three, 'The Ant', is arranged into six chapters and deals with altruism. Here Cronin describes the development of the idea of kin selection and explores the evolution of theories on altruism, self-restraint, cooperation, and the evolution of sociality, including ethics and morality in humans. She continues to expound on the pitfalls of

This article is from *Florida Entomologist Online*, Vol. 77, No. 4 (1994).
FEO is available from the Florida Center for Library Automation gopher (sally.fcla.ufl.edu)
and is identical to *Florida Entomologist (An International Journal for the Americas)*.
FEO is prepared by E. O. Painter Printing Co., P.O. Box 877, DeLeon Springs, FL. 32130.

group selection, and argues that altruism is explainable only on the level of the gene. The last chapter is devoted to the disagreements surrounding the mechanism of speciation, including the earlier notions ascribing an altruistic basis for hybrid sterility and the separation of lineages, followed by a discussion of emphasis on geographic isolation versus natural selection as the most important force behind speciation.

This book does not generally bring to light profound new evolutionary thought. Its value lies, rather, in its detailed interpretation of the reasons behind the transformation of thought on two of the most fascinating topics in evolutionary theory, sexual selection and altruism. It presents a fine dissection of the prevailing views and personalities of a legion of evolutionary scientists and philosophers over the past 150 years, as well as a clear summary of many aspects of evolutionary theory. Although the topics may not be easy to grasp by the uninitiated, and the teasing apart of minutiae in some areas seems a bit excessive, Cronin's witty and conversational tone nonetheless coaxes the reader to new heights of understanding and avails the information to biologists and non-biologists alike. For the entomologist, a satisfying peppering of discussions on insects spices up a fare otherwise heavy on birds and mammals.

The book has a few minor shortcomings. It is occasionally redundant and in some places the reader is left puzzling about the relevance of a new paragraph until he or she is well into it. The writing style, although entertaining and witty, is so idiomatic it may be nearly unintelligible to readers whose first language is not English. There are some minor omissions, such as no explanation for why Lamarckism was intuitively acceptable to many people (page 44). An eagle is misidentified as an osprey in one of the illustrations (page 184), whereas in another illustration showing a seemingly normal male pelican, the caption leads the reader to expect that the bird is sporting a huge bump on its bill (page 196).

Overall, however, the book is informative, provocative and well worth reading by anyone interested in evolution, the history of science, philosophy, or all of the above.

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