



## Review: Current Problems in Sociobiology: An Adaptationist Review

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CURRENT PROBLEMS IN SOCIOBIOLOGY:  
AN ADAPTATIONIST REVIEW<sup>1</sup>

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This book is a potpourri of position papers on various controversial points relating to the evolution of animal sociality. Even though its treatment of the subject is in some ways unbalanced (toward mammals rather than invertebrates, concepts and methodology rather than data) it is one of the most consistently engaging multi-authored books I have read. Somehow the authors and editors have preserved the thoughtful and lively atmosphere that must have prevailed during the 1980 conference of the King's College (Cambridge) Sociobiology Group from which these 17 essays have emerged. They have done so in part by keeping the contributions short (only six exceed 20 printed pages), and by allowing a certain spontaneity in their presentation: N. Chagnon ("Sociodemographic attributes of nepotism in tribal populations: man the rule-breaker") continues a piquant exchange with J. Maynard Smith over the relevance of evolutionary theory to human behavior; and P. Bateson ("Behavioural development and evolutionary processes") pointedly locutes what R. Dawkins ("Replicators and vehicles") only circumlocutes—that he (Dawkins) has wisely changed his language to clarify the fact that the direct action of selection is on phenotypes, not genes.

Perhaps the most important contribution of this book is to bring together several discussions of a neglected topic—the significance of situation variability and phenotypic flexibility for the evolution of social behavior (chapters by D. I. Rubenstein, P. P. G. Bateson, A. Lomnicki, G. A. Parker, and N. B. Davies). Lomnicki in effect revises the ideas of Wynne-Edwards (1962) on social behavior and population regulation in the light of recent changes in thinking about how selection operates, evaluating the effects of phenotypic and environmental circumstances on migration. He thus forges an important (and surprisingly belated) connection between modern evolutionary and ecological theory. Bateson, as a developmental behaviorist and an especially good writer, best articulates the general significance of attempting what he calls (p. 133) “. . . a legal marriage

between ontogeny and phylogeny in studies of behaviour.” It is becoming increasingly evident that the critical genetic changes involved in social evolution often involve condition-sensitive regulatory genes (e.g., a gene switching on, in certain circumstances, parental behavior in an individual not yet a parent). The study of the nature and evolution of developmental plasticity and homeostasis thus promises to become increasingly important in forming, and altering, evolutionary theories of sociality.

A statement from the chapter by R. I. M. Dunbar (“Adaptation, fitness and the evolutionary tautology”) can serve to illustrate the kind of seminar-style expression of opinion I found thought-provoking. Although Dunbar eventually reaches the moderate-sounding conclusion (p. 26) that biology and population genetics are “. . . mutually dependent in that each provides the theoretical context or rationale for the other,” he sees *population genetics* as (p. 15) “. . . essentially a self-contained logico-deductive system” separate from *evolutionary biology* (or simply *biology*). Population genetics models “. . . are formal mathematical systems that happen (more or less) to describe real world phenomena . . . there is no necessary reason why there should have to be anything in the universe to which this particular system of equations applies.” If this were true, then the two endeavors (biology and population genetics) could relax into mutual neglect. Evolutionary biologists could stop struggling with theoretical mathematics. And population geneticists could stop feeling obliged to seek examples in the plodding and recalcitrant literature on the real lives of organisms. According to Dunbar (p. 16), “For theoretical population genetic analyses, we need to know *only* that there is differential reproduction, not *why* it occurs.” Is this whistling in the dark? The false sense of security implicit in such a statement is readily exposed, especially for models treating genes affecting social behavior. Given the widespread capacity for flexibility in the expression of social traits—a point nicely discussed in this volume—there may, for example, be no such thing as a gene for obligatory altruism (a special class of gene whose possession implies a certain inevitable cost, or fixed probability of cost, to the bearer's own reproduction). If this were to prove the case (facultative extreme altruism is virtually the rule in social insects), then how should we regard models of altruism depicting the spread of such an imaginary (obligatory cost-inducing) kind of gene? Can models with absolutely no basis in biology be regarded as impor-

<sup>1</sup> King's College Sociobiology Group, *Current Problems in Sociobiology*. Cambridge University Press, Cambridge and New York, 1982. xi + 394 pp. \$49.50 hardbound, \$16.95 paperback.

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tant in population genetics? Or would population genetics without biology wither and die, like (in some universities) entomology without agriculture? The relationship of population genetics and "adaptationist" approaches to evolutionary explanation is further explored by Maynard Smith ("The evolution of social behaviour—a classification of models"), P. O'Donald ("The concept of fitness in population genetics and sociobiology"), and D. I. Rubenstein ("Risk, uncertainty and evolutionary strategies"). O'Donald's admirably concise article is particularly useful. It helps explain why genetic models of sociality have become so complex, while the concept of inclusive fitness, as formulated by Hamilton, is relatively simple, and satisfactory for workaday organismic biologists.

Mutualism, in which selfish (individual fitness-raising) behavior benefits associates, is given the attention it deserves. Wrangham's idea (in "Mutualism, kinship and social evolution") that mutualism may sometimes lead to high relatedness (kinship) among group members probably could have been made more general. If proximity benefits a neighbor, genes promoting it should spread more rapidly if the benefitted neighbor is a relative likely to bear replicates of the same gene(s). So the expected association between mutualism and kinship should characterize groups showing all kinds of reciprocity (mutualism, and reciprocal altruism)—not just those showing Wrangham's "interference mutualism" (cooperation for success in social competition, limiting access of conspecifics to contested resources). If such an association is stronger in the case of interference mutualism, as Wrangham predicts, it may be due to the great strength of selection (large variance in fitness) often characterizing the evolution of social (vs. non-social) traits.

While it is clear from this book that the participants in the King's College conference debated with each other, it is not always clear that they listened to each other with the same acuity. For example, the generality of Wrangham's idea might have been appreciated by someone attending to one of Maynard Smith's main points, namely, that "Kin selection is bound to operate whenever relatives interact" (p. 30). And Chagnon's data on human kinship and alliances for social competition—a classic example of "interference mutualism"—might have been profitably discussed by Wrangham (or by Chagnon) as such, putting the "nepotism" of the Yanomamö Indians in a new light.

Two chapters on methodology and many comments on methods throughout the book deal with important criticism and philosophically interesting issues, but tend toward self-righteous knuckle-rapping. Symptomatic of this was the pejorative use of "adaptationist" and "selectionist" to describe evolutionary interpretations. Except in the professions (geologist, biologist, psychiatrist, anaesthetist), people ending in "-ist" are often other guys and bad guys (papists, rapists, communists, capitalists, etc.). Even "naturalists" were originally bad, as in "those blasphemous truth-opposing Heretiks and Atheistikall naturalists" (R. Carpenter, 1612, Oxford Unabridged Dictionary, p. 1899). E. Thompson (p. 113) complains that the concept of genic evolution is "submerged" and "encumbered" by (adaptationist) concepts like inclusive fitness and intraspecific selection. And some chapters gave the disappointing impression that the most exciting generalizations coming out of biological analyses of sociality have to do with ecology and body size. One thus sometimes loses sight of the fact that the spectacular recent progress in this field has been primarily due to conceptual advances in biology (especially, in "adaptationist" thinking), not improvements in the precision of measurements. The feeling that the sections on methodology have somehow missed the essence of successful cross-phyletic approach may be due partly to the placement of these chapters at the end of a book so full of ideas and so largely empty of new data. A reader cannot help but be a little suspicious of methodological criticisms from so luxurious an armchair.

This is not primarily a collection of major research papers and definitive reviews (although some are included, e.g., Clutton-Brock and Albon on "Parental investment in male and female offspring in mammals"). Rather, it is a group of thoughtful essays, quite well interconnected (as shown by the editors' summaries preceding each of the five sections), and in places inspired. As such it can be recommended to biologists interested in social behavior and natural selection. It would be an excellent catalyst for a graduate seminar.

#### LITERATURE CITED

- Wynne-Edwards, V. C. 1962. *Animal Dispersion in Relation to Social Behaviour*. Oliver and Boyd, Edinburgh. 653 p.