

Reviews

Behavior

SOCIOBIOLOGY: THE NEW SYNTHESIS, by Edward O. Wilson. 1975. Harvard University Press (Cambridge, Mass. 02138). 697 p. \$20.00 hardback.

This is one of the most thought-provoking of the scientific books to be published this year. Wilson proposes to investigate the *possibility* that the evolution of human behavior in society is a direct result of the relation of genetic structures to environmental pressures. The synthesis referred to in the subtitle of the book is that of biology and sociology. Wilson examines three major aspects of biology: (i) population genetics, with emphasis on the identification of genetic characteristics that equip individual organisms and populations to function in a unit or social group, (ii) social behavior—communication, territoriality, sexual and parental behavior among species and populations, and (iii) evolutionary ecology—habitat adaptations which exert a selecting pressure causing the evolution of specific adaptive behavior patterns in a society and contributing to the survival of the population.

The book is meticulously researched. The three sections abound in compilations of experimental evidence. Wilson is an eminent entomologist and much of the experimental evidence cited in the book comes from research in entomology done by him and his associates at Harvard. To this he adds literally hundreds of references of studies in other specialities, ranging from microbiology to primatology. The bulk of the work cited was done in the last 15 years, much of it since 1970. The three major sections are beautifully organized, profusely illustrated, and can be read individually as reference studies of their subject areas.

However, the book is much more than just another scientific study of the evolution of behavior. The uniqueness

of Wilson's book is in the central thesis of synthesis—that the social behavior of organisms in a society is due to and can be studied as the modification of genetic endowment for population survival under evolutionary selective pressure. He suggests that habitat adaptation controls behavior and that social evolution, the progressive development of increasingly complex social units is governed by habitat adaptation.

No one would take exception to this thesis, had the author not included man. Wilson takes an intellectual quantum leap—he proposes to show that social behavior in man has a genetic basis. The evolution of society has traditionally *not* been a subject of quantitative scientific study. There is no eyewitness record of the history of man's social evolution over the last four million or, if you will, over the last ten million years. It is all inference. Wilson proposes to explore this history in the scientific synthesis of the three areas he examines—to quantify evolutionary anthropology. He is well aware of the difficulties this presents. In a discussion of the evolution of animal communication, he states:

“Social behavior comprises the set of phenotypes farthest removed from DNA” and later, in the concluding chapter, he calls for a new field of study: “a discipline of anthropological genetics.”

In this last chapter which relates biology to sociology, the author takes the step from scientific study to speculation: “Suppose, for example, there are two classes [in a society], each beginning with only a 1% frequency of the homozygote of the upwardly mobile gene.” An upwardly mobile gene! That is an interesting supposition, indeed, but we have no evidence to date, nor does Wilson provide us with any, that such a gene exists.

Most controversial and most disturbing, especially to teachers of biology who have begun to stress the scientists'

social responsibilities, is Wilson's call on page 562: “Scientists and humanists should consider together the possibility that the time has come for *ethics* to be *removed temporarily* from the hands of the philosophers and biologized.” It is dangerous to say that biologists should have a monopoly on truth and ethics. The study of the evolution of society ought to be the province of both biologists and humanists—working together.

Wilson concludes the book with a discussion of the future. He states explicitly that a thorough, scientific examination of behavior must wait until molecular biology has attained a full explanation of neuronal processes. He emphasizes that only when we can understand the biophysics of judgment and emotion can we begin to study the evolution of man's social behavior.

To summarize, this is an important book, beautifully researched and beautifully organized. Its language is complex and technical. It should be read—carefully—by all science teachers, indeed, by all scientists and sociologists. Wilson writes well; he provides an excellent glossary of terms used; the many references to current publications are immensely valuable. The reader is left richer in knowledge, whether he agrees with the author's central thesis or not.

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THE VAMPIRE BAT: A FIELD STUDY IN BEHAVIOR AND ECOLOGY, by Dennis C. Turner. 1975. Johns Hopkins Press (Baltimore, Md. 21218). 155 p. \$12.00.

This book is an account of an 18-month study of bats on a large ranch in Costa Rica. It is, in fact, a doctoral dissertation, but it is fascinating reading. The focus of the study is the predator-prey relationship between vampire bats and cattle, but many other related rami-

fications are explored. These related studies include reproductive biology, population estimates, transmission of diseases, other ecological relationships, and behavioral repertoires of both species. Inter- and intraspecies social behavior is emphasized. Over 100 references are cited and background information is given.

Most notably, the reader is taken "behind the scenes" to see how study techniques were developed, what difficulties were encountered, and how on-site observations led to new questions and hypotheses. A large number of these hypotheses were tested using appropriate methods and statistical designs. Often assumptions and speculations are given, but these are usually identified as such.

Turner is a creative, probing researcher and a lucid writer who allows the reader to vicariously experience a field study in the tropics. Teachers and graduate and undergraduate students could read the book for pleasure. Those interested in research would especially profit from it. Advanced high school students might enjoy the content, but some knowledge of classical ecology, advanced vocabulary, and statistics would be necessary for smooth easy reading.

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CROWDING AND BEHAVIOR, by Jonathan L. Freedman. 1975. Viking Press (625 Madison Ave., New York 10022). 177 p. \$7.95 hardback.

What is crowding? Chapter 1 answers this rhetorical question with a measurable definition: "[Crowding is] the amount of space available per person." Reducing this powerful word to such simplicity is, even for research purposes, troublesome enough; but in addition, the reader frequently must contend with whether "space" refers to a measurement of area or to one of volume.

The author's research supports two major conclusions: that there is no relationship between crowding and social pathology; and that high density intensifies the typical reaction towards other people whether that typical reaction is toward the positive or toward the negative. Chapters 7 and 8 describe the research in a manner that

is concise yet easily understandable. Along with the supporting appendixes, they make the book an important reference for college courses on overpopulation, crowding, and related issues.

Unfortunately, the rest of the book is best ignored. Chapter 4, "From Mice to Men?," is in very poor taste. It contains a succession of cheap shots at two supporters of rival theories: Robert Ardrey (*African Genesis; Territorial Imperative*) and Desmond Morris (*The Naked Ape*). The author's summary of their work, "Minor inaccuracies . . . — which a scientist tries to avoid—creep in unless a writer is an expert in the field in which he is writing" is a better commentary on himself. His statements with regard to natural selection are reminiscent of creationist thinking, and the concluding chapters on urban design clearly stretch the author's abilities. (He is a psychologist.)

The most frustrating aspect of this book is the author's tendency to comment with obvious truisms that have little direct relationship to the argument at hand; for example, "Although it is not guaranteed in the constitution [sic], the right to cheap transportation for everyone must be an important goal of society." This usage is pervasive throughout the initial chapters and only disappears when the author is on home ground with his own research.

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Ecology and Environmental Biology

ECOLOGY: THE LINK BETWEEN THE NATURAL AND SOCIAL SCIENCES, by Eugene P. Odum. 2nd ed., 1975. Holt, Rinehart & Winston (383 Madison Ave., New York 10017). 244 p. Price not given.

The second edition of *Ecology*, like the first, is a must for every biology, conservation, and environmental science teacher. This edition presents many new examples and results of Odum's recent investigations.

Once again, Odum's forte is his ability to present the principles of ecology in easily understandable terms. In treating human ecosystems, Odum discusses them in an energy-flow context showing

how dependent we are on our environment and how delicate the balance is. Odum warns time and again that ecological problems are complex and as such do not have simple answers. He gives many examples of the impossibility of solving one problem by implementing one solution alone as we have done so often in recent years. He emphasizes that regional planning and research are necessary before decisions can be made that will affect our lifestyles. Odum proposes, then, that economic and ecological values are so interconnected now that the world should shift its measure of the value of goods and services to energy units instead of dollars and cents. As a result, citizens would see the true cost in energy units of maintaining their lifestyles.

For someone who is not an ecologist, yet wants a good introduction to the subject, this publication covers the big ideas of the field and relates them to the individual's and society's survival. General readers, however, may find the cross-references in the text from one chapter to another annoying. Also, there are several misspellings and typographical errors that are at times distracting.

For those readers familiar with Eugene Odum's collaborative effort with his brother, Howard, on the classic *Principles of Ecology*, you will see much that is similar but in a more readable form employing examples that are meaningful to a wide audience.

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LIFE IN AND AROUND FRESHWATER WETLANDS, by Michael J. Ursin. 1975. Thomas Y. Crowell Company (666 Fifth Ave., New York 10019). 116 p. \$6.95 hardback, \$2.95 softback.

Intended as a handbook for biologists and students of natural history, this book covers organisms that could possibly be found in marshes, bogs, and swamps of temperate North America east of the Mississippi. Included are 98 pages of range maps, classifications, and line drawings of these organisms as well as 16 pages of excellent, full-color photographs.

The survey is meant only as a brief guide and does not include every species. The range maps tend to cover more territory than promised and the classifi-