pounds produced by the host tree, and others are host tree compounds that have been metabolically altered by the beetle with the probable assistance of specific microorganisms harbored by the beetles. Males, attracted to these pheromones and stridulatory clicking of the female, emit chirps that cause the female to produce an "antiaggregation" pheromone. The male, then, also produces antiaggregation pheromones. Other females in the area, attracted to the aggregation pheromones but repelled at close distance by the antiaggregation pheromones, begin boring into the tree trunk at a suitable distance from other females. This continues until the suitable areas of the trunk are occupied. The beetle attack often induces a defense response in the host tree that involves production of higher quantities of resin. The larger the beetle density on a tree, the greater the individual beetle's chances are of overcoming this defense. In turn, some parasites and predators of the beetles described by Dahlsten use the aggregation and antiaggregation pheromones as kairomones for locating their own hosts. This naturally evolved host-seeking mechanism of the bark beetle enemies frustrates efforts of forest pest managers, who find that the synthetic aggregation pheromones they use to trap beetles sometimes capture almost as many beetle parasites and predators. Recent investigations by Sturgeon indicate genetic substructuring in beetle populations on the basis of host tree species, perhaps due to genotype-specific host selection. Since beetles do mate on their host trees, the opportunity for host race formation is certainly enhanced.

Mitton and Sturgeon conclude, in the last chapter, that we are still lacking many pieces of information that will be needed to effectively manage these beetles and test hypotheses regarding their evolution and coevolution with their hosts, enemies, and mutualists. This could probably be said about any system. The important question is whether there is any hope that this information will ever be obtained. If basic population biologists were alone in investigating this system, the answer would probably be no, and they would be wise to seek other, more tractable systems. Given the economic significance of bark beetles and the accompanying research resources, however, Mitton and Sturgeon are probably correct in offering this system to population biologists as one with unique biological properties that promises to offer some answers to questions about speciation, coevolution, and population dynamics.

This volume presents the bark beetle system as one example of the many economically important ecological systems that offer opportunities for answering basic ecological and evolutionary questions. Regardless of their interest in the social relevance of their work, population biologists must face the fact that the basic biological information and the resources necessary for answering such questions may often be associated with economically significant organisms.

FRED GOULD
Department of Entomology, North Carolina State University, Raleigh 27650

Cetaceans

The Ecology of Whales and Dolphins. D. E. GASKIN. Heinemann, Exeter, N.H., 1982. xii, 460 pp., illus. $45.

A proliferation of popular books and articles has inspired and sustained a wishful, often uncritical belief in the sentience, sociability, and gentleness of whales and dolphins. David Gaskin, perhaps in response to a long line of students who have enrolled in his classes already believing, or at least predisposed to believe, in the exceptional qualities ascribed to this group of animals by the media, has gone out of his way in this book to give such beliefs a drubbing. Fair enough; they deserve it. At times, however, I wonder if he hasn't overreacted to some of the anthropomorphisms and sentimentalisms, in the process becoming not only provocative but defeatist. After all, breaching (jumping) behavior may well be something more than "just another method of generating a recognizable sound," and serious questions about cetacean intelligence and social structure do not deserve to be dropped entirely just because a few investigators have approached them irresponsibly.

Gaskin and his graduate students at the University of Guelph have, since 1969, focused most of their efforts on studies of the productive inshore marine ecosystem in the lower Bay of Fundy. The small, locally abundant harbor porpoise *Phocoena phocoena* is a prominent part of that ecosystem, and Gaskin's familiarity with this species informs much of the book. For example, in the chapter on metabolic rates and energy budgets, the harbor porpoise provides a fascinating case study. Gaskin suspects that female harbor porpoises rarely produce more than four offspring in a lifetime and that the average could be as low as two or three. Energy budget calculations suggest that harbor porpoises are not adequately insulated for living in waters colder than 5°C, yet they appear regularly in waters with a temperature as low as 1.9°C. The existence of these animals seems precarious indeed, especially considering the heavy mortality imposed by fishing activities and the degree to which much of their nearshore habitat has been exposed to industrial contaminants.

The promise on the dust jacket that this book contains "much original research" is misleading. It is in fact a survey of the literature, organized as a series of extended lectures for graduate students and advanced undergraduates. The author plunges into "some difficult, and often controversial topics," from academic questions about the origins and systematic relationships of cetaceans to the political or moral question of whether whales should be "harvested" at all. He challenges or reinterprets the conventional wisdom on many fronts, revealing how weak the evidence is in support of some of the most basic truisms in cetology. His synthesis is creative; it should be fertile ground for students seeking fresh ideas and approaches. Informed by a broad range of first-hand experience with the animals in nature and by an acquaintance with much of the disparate, unwieldy literature on cetaceans (available as of January 1980), the book is a useful reference for those with a serious interest in cetacean ecology.

RANDALL R. REEVES
Arctic Biological Station, Ste. Anne de Bellevue, Quebec H9X 3R4, Canada

Neurophysiology

Axoplasmic Transport. D. G. WEISS, Ed. Springer-Verlag, New York, 1982. xiv, 480 pp., illus. $62. Proceedings in Life Sciences.

Axoplasmic Transport in Physiology and Pathology. D. G. WEISS and A. GORIO, Eds. Springer-Verlag, New York, 1982. xii, 196 pp., illus. $32. Proceedings in Life Sciences.

The phenomenon of axoplasmic transport attracts investigators with a variety of interests. For those studying mechanisms of cell motility, axoplasmic transport offers a dozen theories, considerable data, and no hard conclusions. For those interested in cytoskeletons, studies of slow axonal transport offer insights into structure and function of intracellular frameworks. For those who prefer

membranes, fast axoplasmic transport offers the opportunity to learn about movement of membranes to a variety of destinations. For those interested in growth and development, axonal transport is the traffic system for intercellular signals and cellular building blocks.

These two volumes arise from a single meeting held in Bavaria in 1981. One volume would have been equally appropriate. *Axoplasmic Transport* is claimed to be "the first volume in which all basic aspects of axoplasmic transport and its mechanisms are comprehensively discussed" and "a complete treatise on the properties of axoplasmic transport in a variety of neuronal systems"—an embarrassingly tall order. The two books contain 78 papers averaging less than nine pages. The number of papers allows for a variety of topics to be covered; the length of the papers means that they are far from comprehensive. Much of the presented material is available elsewhere in the literature, but the compilation is useful nevertheless.

One of the subjects covered in *Axoplasmic Transport* is the mechanism of fast transport. Recent data reviewed in the book contribute to confusion rather than enlightenment concerning that mechanism. Alternatively, the mechanism may be more complex than most realize. The spotlight has shifted from earlier data and models emphasizing microtubules as the major structural component to data suggesting a role for actin (Isenberg *et al.*; Schwartz and Goldberg). Interestingly, models of the mechanism of chromosome movement have undergone similar changes (Brinkley and Brenner). The suggestions concerning a mechanism of fast axonal transport are more varied than are those concerning a mechanism of chromosome movement. Axoplasmic smooth endoplasmic reticulum (SER) was postulated years ago to be involved in transport (Droz and others), and detailed models now postulate roles for the SER ranging from being a mere depositor during the saltatory movement of other vectors to being itself motile (Hammerschlag and Stone, Droz and Rambourg, Morré, and others). The bias of the editor is shown in the greater space allotted to chromatographic or microstream models. Of the major structural constituents of axoplasm, only neurofilaments (10-nanometer intermediate filaments in axons) have been largely ruled out as playing a major role (but see Levine *et al.*) in the mechanism of fast transport (Papasozomenos *et al.*, this volume, and Griffin *et al.*, other volume).

Axoplasmic Transport in Physiology and Pathology emphasizes more clinically related topics. Pfenninger nicely summarizes his work, which demonstrates that new plasma membrane is inserted at the tips of growing neurons. Some insights into the long-recognized and intriguing relationship between the rate of slow transport (SCb or group IV) and the rate of nerve regeneration are given by Cancalon *et al.* and complement well the ongoing studies from Lasek's lab.

Hints that the disruption of axoplasmic transport plays a role in the etiology of Alzheimer's disease (Dustin and Flament-Durand) are worth strong follow-up because of the increasing incidence of the disorder in an aging U.S. population.

Overall, the pair of books are a good collection of research papers and brief reviews in a dynamic field of biological research.

DAVID L. WILSON
Department of Physiology and Biophysics, University of Miami, School of Medicine, Miami, Florida 33101

Books Received

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