the melancholy evidence that man habitually despoils his own nest. We understand this fault now: we have yet to eradicate it.

There are many other instances of using the insights of biology to illuminate the problems of history; but proportionately, these constitute only a small part of the book. Well over nine-tenths of Darlington's opus is just straight history, in the ordinary sense. To a biologist-reviewer it is somewhat disappointing that the biologist-author has not spent more time on the biological interpretation of history. Had he done so the resulting story would have been more biased—but in a desirable way, for it would have helped correct for most other books of history which have been written in almost complete ignorance of biological processes, which surely must have been important vectors in the story of mankind, however problematical their importance may have been.

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Worldly Problems

Biological Conservation. DAVID W. EHRENFELD. Holt, Rinehart and Winston, New York, 1970. xii + 228 pp., illus. Paper, $3.50. Modern Biology Series.

This book describes a branch of applied biology which has been treated patronizingly by academics for too long. It is written simply and directly, yet with sufficient imagination to appeal to college students and those older persons whose interest in the general subject has recently been aroused. Ehrenfeld, a biologist trained also as a physician, provides a certain fresh perspective, as follows:

> Ecology . . . is not yet a fully predictive science; community management, to be successful, must strive to base itself on the maximum amount of ecological data, be responsive to change, not be unduly influenced by rigid ecological theories and models, and must utilize the best historical information available.

The first chapter reviews the conservation movement in the United States and points out the differences between the philosophies of the early leaders: Murie's wilderness, Marsh's balance of nature, and Pinchot's sustained yield. In the 1920's the elder Leopold added the idea of the land ethic and management of population surplus for man. Thus, as Socrates said, the important ideas have been around a long time.

Ehrenfeld's primary targets are the mammoth forces of the U.S. Corps of Engineers and public works projects and their tragicomic apologists who still believe that progress is synonymous with civil engineering. Oddly, he almost ignores Rachel Carson and pesticides and in so doing neglects the part they have played in arousing contemporary public concern for the environment.

Conservation is still primarily a negative effort, as is shown by a sample of the author's chapter titles: "Endangered natural communities"; "Factors that threaten species"; "The preservation of natural communities." He dwells on pollution, major disasters, and industrial accidents, and he includes with these introductions of exotic species. Later on he deals with positive enterprises, such as zoos as genetic banks for endangered species, and analogues of natural communities such as the English hedgerows and gardens. In the last chapter he discusses the social traditions that have allowed the current process of environmental deterioration to thrive: the tragedy of the commons, the perpetually expanding economy, public acceptance of gradual deterioration, and the mystique of technology and progress.

His theoretical basis, stated in chapter 2, is that of the American ecological Establishment: complexity and diversity buffer the community against disturbance from the physical environment; the diverse, buffered community is the evolutionary purpose of ecological succession. The theme emerges repeatedly:

> . . . an ecosystem at less than optimum—merely a loose assortment of animals and plants.

> The water hyacinth is not new to Central America, and there it is under control by virtue of its integration in the natural community, where checks and balances exist to prevent one species from aggrandizing itself at the expense of the rest.

> Loss of a mature ecosystem . . . is as permanent, on the time scale of human civilizations, as the extinction of a species.

I think the author errs in ignoring the fact that these assumptions have been repeatedly challenged by other American ecologists, following Gleason's extreme opposite view. Ecologists in Europe, Australia, and elsewhere have avoided this polarization into extreme theoretical positions and have developed more objective means of describing ecosystems, which provide more rational bases for managing them. Because American ecologists do not resolve, or even recognize, these underlying theoretical problems, contemporary American conservation efforts face an unresolved conflict between two concepts, each apparently justified by successional theory: the wilderness-climax and limitless progress. In order to become acceptable to ordinary Americans (the city folk), the conservation movement must resolve this gratuitous dilemma. It must accommodate as part of its goals man-made systems such as the Tuileries gardens, the Vermont hillside meadows, the Japanese villages, and the Alpine pastures of Norway and Switzerland. The sympathetic interaction between man and his landscape which these represent is the basis of the rational movements in schools of design that Ehrenfeld mentions—the open space for leisure where urban residents need it, or the environmental corridors of McHarg and Lewis.

For the future, practical goals must be defined so that everyday small decisions can help work American society out of the mess into which everyday small decisions have brought it. At an early stage ecologists must present a rational body of community theory freed of the Procrustean concepts of succession and climax about which (as Egler said) ecologists have been mumbling in academese while hiding in their ivory towers.

As a capitalist society we should acknowledge that money attracts able people. My personal experience leads me to assert strongly that there is no shortage of students, of all ages and abilities, interested in field biology. Yet, as a recent article in *Science* pointed out, in the current cuts in jobs and research funds field biology has suffered least—because it was already at the bottom. Even this year many able people have been shunted off into other fields by the absence of jobs and money. If the environmental commitment is to be more than a NATO endeavor (No Action, Talk Only), the academic establishment must be forced to accept priority shifts from the glamor fields of molecular biology, neurophysiology, and cancer and heart research to a major effort in practical natural history.

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