

manifestation of political decisions upon the cultural landscape. The much-debated issue of air pollution is discussed by Peter Cox in Chapter 8, while the contributions (actual and potential) of geographers to global and regional studies of ill-health, disease, and death, are noted by Neil D. McGlashan in Chapter 9.

The fast-growing field of recreational geography—the evolution, demand, and supply, of leisure facilities—is authoritatively described in Chapter 10 by J. A. Patmore. The concluding chapter by I. G. Simmons, on conservation, is perhaps misplaced, deserving greater prominence although it provides the *pièce de résistance* for the entire collection. It is an elegant and thought-provoking essay in which the author reviews the fundamental concern of geographers for Man's environment, and supports the move towards conservation studies based upon human values: 'what a cultural group desires from its environment and what it will accept by way of change in order to get it.'

In sum, this book is a timely and welcome addition to the literature, being particularly useful in the educational task of exposing students to contemporary issues in the science of human environment. It should appear on the recommended supplemental reading lists of many courses in physical and human geography.

BARRY N. FLOYD
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Edge of Life: The World of the Estuary, by PEGGY WAYBURN. A Sierra Club Landform Book, with photographs by Dennis Stock, and Introduction by Paul Brooks. Sierra Club, San Francisco, California: 144 pp., 36 colour plates, 31.5 × 26.5 cm, \$14.95, 1972.

Because the marsh is neither liquid enough for swimming nor solid enough for walking, casual nature-lovers tend to neglect it. How often does it fall victim to the 'developer' who would 'reclaim' and fill it in! Yet, as Peggy Wayburn shows, here in this area that is neither land nor sea is the most productive of all habitats and a vital link in the food-chain both for marine life and for animals (including Man) that live inland.

To demonstrate the role of the estuary, Bolinas Lagoon near San Francisco is chosen as a sample, although the author ranges widely afield in her account of the mechanisms involved.

In Part I of the book the cycles of energy exchange are traced—of water, nutrients, and the food-chain. Important links within the estuary are the bottom organisms, plant and animal, and the birds. In Part II, earth history is sketched, using a dramatic device of a year for all the elapsed time since the Earth was formed. The shortness of the time-span since land vertebrates appeared (two weeks), and, even more, the shortness of human presence, comes as a shock—a matter not of days or hours but of minutes and seconds on the last day of 'earth's year.' How much change Man's heedless exploitation has wrought on this one estuarine sample is documented in Part III, where Bolinas Lagoon, beautiful and productive though it may still be, is shown to have diminished from a deep-water harbour to a shallowing remnant, because of mistreatment of surrounding land areas and pollution from human wastes.

That the author has studied cognate fields long and carefully is evident. The section on the role of birds as important agents in the estuarine economy is especially to be commended. Some of the discussions of bottom-dwelling invertebrates come off less well—perhaps because this is one of the aspects of the subject that, as the author admits,

had to be condensed in the interests of presenting the broader picture.

The colour pictures are reproduced with the usual fine quality of Sierra Club books. Anyone who has attempted to capture birds on film must admire Dennis Stock's success. Some of the pictures need more captioning than a mere sentence culled from the text, especially for those (such as the one of the Atlantic Coast Roseate Spoonbill) for which the *locale* is not California. The picture of snails among beach-drift (unfortunately reversed in printing) also may not be of a Californian form, and its caption is misleading.

Typographical errors are few and minor and do not mar what is, on the whole, a book deserving praise—one that should go far to waken those who read it to the wonder and the fragility, as well as the basic importance, of any estuary. Not least to be commended is the author's insight into the interrelationships of all living things to the terrain in which they live. The message of conservation comes through the more forcefully because it is so skilfully woven into the fabric of the whole account. The 'Notes on Ecology' at the end are a particularly valuable encapsulation of the fundamentals of this subject. The author and the Sierra Club are to be congratulated on producing a book that will open, for many people, new vistas, that is pleasing to the eye, and that is, as well, eminently readable.

A. MYRA KEEN
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Conserving Life on Earth, by DAVID W. EHRENFELD. Oxford University Press, New York & London: xx + 360 pp., illustr., 23.4 × 16 × 2.6 cm., £4.50, 1972.

This publication, based on the author's college textbook: *Biological Conservation*, outlines the purpose and practice of conservation of wildlife and natural communities for the general reader. The sound structure and content of the original teaching material has been carried over into this new version, but it is coupled with an uneasy commentary on elements that are apparently judged necessary for selling ecologically-orientated books on the U.S. market.

Ehrenfeld is at his best in the sections dealing with wild things and wild places, and his sensitive appreciation of their values illuminates his writing. He is less at home with polemics that flow easily when handled by such masters as Barry Commoner, Paul Ehrlich, and Garrett Hardin.

Ehrenfeld discusses how natural communities are threatened by man-made change in two scene-setting chapters, one of which is largely concerned with pollution and other with effects of industrial activity. The activities of the U.S. Army Corps of Engineers, which endangered the Oklawaha River valley in Florida, and the complex problems involved in conserving the Pacific Coast redwood communities, are taken as case-studies to illustrate the conservation issues involved.

Attention is then turned to factors linked with the extinction of species: habitat destruction, trade, collecting, hunting, and predator control measures. A curious chapter on the Blue Whale is interpolated by way of illustration of such factors, and this includes an account of a cloak-and-dagger operation circumventing the controls of the International Whaling Commission.

The threats to natural communities are examined in relation to potential conservation action. Management techniques are explored and their areas of usefulness delimited. Space is also given to the conservation of semi-natural or cultural landscapes.

The concluding chapter recapitulates the dangers inherent in the current trends in environmental disturbances. It identifies destructive factors and points out remedies that are open to those concerned with citizen action to halt deterioration.

Ehrenfeld's constant theme is the need to prevent the loss of irreplaceable diversity, and this message is well presented. His book is, however, somewhat sketchy in its treatment of certain important matters—such as those involving the planning, establishment, protection, and management, of national park and reserve systems.

He treats conservationists as divided into two camps: 'resources' and 'holistic,' the latter being given the role of saving life on Earth. This may account for some strange gaps in his bibliography and suggested reading list. These, as was appropriate in the original textbook for United States college students, are largely confined to materials published in U.S.A.

FRANK G. NICHOLLS
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Human Ecology: Problems and Solutions, by PAUL R. EHRLICH, ANNE H. EHRLICH, & JOHN P. HOLDREN. W. H. Freeman, San Francisco, California, & 58 Kings Road, Reading, England: xi + 304 pp., 77 illustr., 23.5 × 16.5 × 1.3 cm, US \$4.95 or £1.95, 1973.

This is a concise and most instructive book that is commended to any person interested in the environment and the future of mankind on this globe. As stated by the authors, it was prepared as a result of a survey of potential users, which indicated the need for a comprehensive introduction to human ecology 'focusing on the biological and physical aspects of Man's present problems, and on the ways that they can be solved.' As such, the authors have fully realized their objective in presenting this book.

The first chapter prepares the reader for what follows in the book, and clearly explains the problems facing mankind through the exponential growth of human population, the delays between cause and effect in many environmental systems, and the frequent irreversibility of damage by the time it becomes visible.

Chapters 2 through 7 provide the reader with well-documented analyses of seemingly every facet within each problem. Here one finds a mine of scientific and up-to-date information on the human population problem as seen by an accomplished demographer, and on the world's carrying capacity of land, energy, and mineral resources, as well as of food and renewable resources. As if gifted with prophesy, emanating from their scientific insight into the problems of mankind the authors gave a full account of the energy crisis before it recently loomed so large, and admirably reflected the world's current attitude by stating: 'people in the developed countries are using the richest and most accessible energy resources at a rate not justified by legitimate needs, and energy consumption is doubling every 14 to 17 years in developed countries and underdeveloped countries alike. The difficulties and consequences of maintaining this rapid growth-rate raise many questions besides that of potential supplies of fuels. Can the technology to extract, transport, and process the fuels keep pace with rising demand? Will environmental mistakes become more frequent and serious as we attempt to deploy such technology rapidly? Will sufficient investment capital be available to pay for expanding the energy supplies?'

One can also read in these chapters a full account of the types of pollution and their direct effect on society, as well as of the various ecological systems and how these can be

disrupted by the different pollutants. The authors' didactic approach is well exemplified in Chapter 7, where they synthesize in the reader's mind all the pressures related to human population, physical resources, and biological environment, on society's ability to dispense the basic services of education, medical care, and administration of justice. This indicates the complexity of the whole problem, how the various factors are inextricably linked by an array of cause-and-effect connections, and how 'the web of blame must... be attacked if we are to weather the environmental crisis.'

In the last three chapters—8 through 10—the authors give an objective, critical assessment of the solutions so far attempted regarding population control, and consider the change in human behaviour toward the environment and toward our fellow men before concluding by giving recommendations for a positive programme.

Throughout the book, the reader cannot but admire the scientific depth and sincerity of the authors, their convincing and well-documented arguments, and their pedagogic talents enabling them to make, of such a complex subject, a very tasty, colourful, and digestible, food for thought. And though their conclusions as they state 'are necessarily rather pessimistic,' and their recommendations 'will seem unrealistic,' yet, one would readily agree with their views that 'the world has been allowed to run downhill for so long that only idealistic and very far-reaching programmes offer any hope for the future.'

M. A. F.

World National Parks: Progress and Opportunities, Ed. RICHARD VAN OSTEN. Hayez, Rue Fin 4, Brussels, Belgium: 394 pp., 23.6 × 15.8 × 1.5 cm, paper covers, US \$10, 1972.

This book was especially compiled as a token, in 1972, of the conservation world's esteem for the United States of America, which had created the first national park of our planet a hundred years earlier, and which has since unceasingly shown the way in the field of rational management of these precious protected areas. Professor Jean-Paul Harroy, of Belgium, who had been Chairman of the International Commission on National Parks of IUCN since 1966, was charged by the Executive Board of IUCN with the considerable task of planning the volume and collecting the 54 articles involved. It was his privilege, on behalf of IUCN, to present Mrs Richard Nixon with a luxury copy of this jubilee work on the evening when she 'rededicated' Yellowstone National Park at Madison, Wyoming.

In all some fifty authors, representing twenty-one countries of the six continents and several international organizations (including FAO, UNESCO, and WWF), contributed to this book which attempted to deal with all aspects of the constitution, defence, upkeep, management, and use (particularly scientific and tourist), of the world's national parks. The titles of the sections of the work, published solely in English, are as follows: 'General Principles and Historical Records,' 'Around the World,' 'National Parks and Conservation,' 'National Parks and Scientific Research,' 'National Parks and Tourism,' 'Organization and Management of National Parks,' 'National Parks and Economics,' and 'The Future: A.D. 2000.'

Although inevitably somewhat uneven, the quality of the articles is generally high, and as a whole they present a valuable perspective of a large and complex subject. Even the specialist will be rewarded by reading valuable distillations of their wisdom and *bons mots* from leaders in a wide range of the topics surveyed.

N. P.