Genes in Ecology.

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ENVIRONMENTAL LITERACY AND BEYOND. *Proceedings of a symposium held in Blacksburg, Virginia, 23 September 1993. President's Symposium, Volume V.*

Edited by Bruce Wallace, John Cairns, Jr., and Paul A. Distler. Virginia Polytechnic Institute and State University, Blacksburg (Virginia). $10.00 (paper). x + 65 p.; ill.; no index. ISBN: 0-929900-10-3. 1993.

To formulate solutions to problems of soil erosion, atmospheric pollution, loss of biodiversity, and the many other environmental threats is a demanding challenge. To formulate strategies for their sociopolitical implementation is much more so, and this is a primary topic of this thoughtful collection. Another and more basic matter discussed is the complex of related educational questions. How can we best increase the environmental literacy of the electorate, the individuals who have to be convinced ultimately of the necessity of the constraints required for a sustainable development of the human economy? How can we best educate scientists who understand not merely contributory concepts in biology or economics or climatology, but who understand how to use principles from several such fields to decide what must be done.

Each of the authors of the eight selections brings a unique perspective to the matters discussed. They all speak right to the crucial points with a minimum of jargon or jeremiad. All are distinguished academics well qualified to discuss campus programs and classroom experiences. Two also have diverse governmental and commercial expertise, and one is an environmentally well-informed novelist.

The book is uncommonly well written and edited, but I have a few reservations. There is little justification for T. F. Malone's many demographic and economic projections to the year 2050 or the implied conclusions. The main error in futurists' extreme projections in the 1940s and 1950s was their not being extreme enough. Cairns's advocacy of holism and interdisciplinary approaches and his condemnation of reductionism and specialization are not likely to be much help either. The institutionalized barriers that discourage the seekers of broad perspectives are a minor problem compared to individual limitations. Just learning the bare necessities for a narrow specialty can be challenge enough for most people. Also, I can imagine that some decades hence there may be another extremely narrow specialty put together from outmoded pieces of political science, ecology and macroeconomics and called *environmental policy science*. It could have its own journals, inbred faculties, and great masses of impenetrable jargon.

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GENES IN ECOLOGY. *Based on a symposium held at the University of East Anglia, 1991.*

Edited by R. J. Berry, T. J. Crawford, and G. M. Hewitt. Published for the British Ecological Society by Blackwell Scientific Publications, Oxford and Boston (Massachusetts). $52.95 (paper). ix + 534 p.; ill.; author and subject indexes. ISBN: 0-632-03504-8. 1992.

Since the birth of population biology in the 1960s there have been several symposium volumes that have brought together ecologists and geneticists in an effort to forge links between the two fields to solve problems in evolutionary biology. While ecology and genetics are complementary disciplines, particularly at the population level, at many universities workers in these two areas are often in separate departments with restricted opportunities for cross-fertilization. This situation has become more pronounced with the growth of the environmental sciences, on the one hand, and molecular biology, on the other.

This well-produced symposium volume sought to bring ecologists and geneticists together to confront the implications of each other's disciplines. Unlike other volumes that have attempted to do this, the editors arranged for the majority of chapters to be coauthored by workers from the two fields with no previous history of collaboration. Despite the difficulties presented by such a project, the symposium was a success and the resulting volume is a thought-provoking and up-to-date synthesis that is all the more valuable because it exposes many of the weaknesses that currently exist in population biology.

The volume is composed of 32 papers distributed among 4 sections: Genes in Ecology, Molecules in Ecology, Ecology in Genetics, and Techniques and Protocols. Topics covered in the first three sections include the history and possible demise of ecological genetics in the UK (see the chapters by Cain and Provine, and Harvey et al. for contrasting perspectives), stochastic processes, population dynamics, life-history evolution, phylogenetics, metapopulations, coevolution, the adaptive significance of molecular variation, parasitism, density and frequency dependence, the functional biology of adaptation, and conservation biology. The final section is composed of 14 shorter papers that outline some of the latest molecular techniques, including PCR, RAPDs, DNA fingerprinting, RFLPs, gene sequencing, and various electrophoretic techniques that can be used by ecologists in population-level studies. While one has the feeling that some of these approaches may become outdated within a relatively short time, they do at least provide a snapshot of research methods used in molecular ecology in the early 1990s.

Most chapters are well written and include both

theory and empirical data drawn almost exclusively from animal populations. The almost complete absence of examples from plant population biology is somewhat surprising, given the widespread use of these organisms as experimental systems for testing evolutionary hypotheses and the large literature that exists on their population and ecological genetics. This deficiency probably reflects the current moribund state of plant evolutionary biology in the UK and the fact that most of the chapters in this volume are written by researchers from British universities. Indeed the volume has an overwhelmingly Anglo-American flavor with all but 3 of the 79 authors from either British or American research laboratories. Despite this bias, the book maintains the high standards that one has come to expect from published British Ecological Society symposia. I highly recommend this volume for students of evolutionary ecology.

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DESERTS: THE ENCROACHING WILDERNESS. *A World Conservation Atlas.*

Edited by Tony Allan and Andrew Warren; Introduction by Mostafa Tolba. Oxford University Press, New York. $35.00. 176 p.; ill.; index. ISBN: 0-19-520941-9. 1993.

This beautifully illustrated volume offers the general reader a global view of deserts. It includes brief but accurate information on why and where deserts develop; climatic, edaphic, geomorphologic, and other features of the desert landscape; an overly brief review of desert biota, including plants and animals, with comments on adaptive strategies of desert organisms; a more extensive review of peoples of the desert, including strategies for existing in such a physiologically taxing environment, and the development of cities in arid regions; a discussion of desert resources, from petroleum reserves and mineral riches to grazing lands and water resources; a visually striking section on geography that provides maps of the world's deserts and an accompanying color satellite photo of a portion of the same area; and a section on the threats posed to desert ecosystem stability by society, agricultural and other economic development plans, desertification, and overexploitation.

The color illustrations in this volume are outstanding—the reader is rewarded on almost every page with photos worthy of *National Geographic*. Attractive graphics are especially effective in conveying complex information in a simple manner. The editors adhere to the big picture and avoid getting bogged down in the details. Thus, for example, general oceanic currents and global wind patterns are shown simply and succinctly: The reader will not know the names of the currents, nor understand that complex countercurrents exist in tropical regions, but a glance at the graphic conveys the essential information concerning factors leading to desert formation.

As might be expected, the sweep of the book is so vast that no more than an overview of life in deserts can be provided. Indeed, the section on desert biota is really much too brief to show the unique and rich panoply of life forms that inhabit the world's drylands; of the hundreds of thousands of plant and animal species that occur in deserts, for example, only about 25 are shown. I wish that more attention could have been paid to this topic, because it is these unique organisms that cry out for protective measures to reduce habitat conversion, increased desertification, and extinction.

This attractive book will be of interest to specialists on deserts, as well as to any general reader who wishes to obtain an easy familiarity with one of the world's most fascinating, yet underappreciated habitats, the vast deserts of the world.

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APPLIED DEMOGRAPHY FOR BIOLOGISTS: WITH SPECIAL EMPHASIS ON INSECTS.

By James R. Carey. Oxford University Press, New York. $39.95. xvi + 206 p.; ill.; index. ISBN: 0-19-506687-1. 1993.

This textbook treats demography more completely than any general ecology or population biology volume. Six chapters and three appendixes cover basic population characteristics, life tables, reproductive rates, population growth and stable age distributions, variation in rates and structure, Leslie matrix models, applications, and a detailed study of mortality in the medfly, based on the author's work with a cohort of over 1,000,000 individuals.

Carey introduces a range of demographic literature not included in most intermediate and advanced textbooks on ecology or entomology. Many analytical techniques for life history data are presented and their usefulness is demonstrated with examples from the author's laboratory. He makes an excellent case for the value of these techniques in applications such as biological control, mortality analysis, and mass rearing. He also shows how complex problems, including social insect colonies, can be analysed to give novel insights into their dynamics.

Those with a general interest in population biology will find this book sprinkled with surprising results and incisive statements of fundamental principles. The author is particularly adept at showing the connections and parallels among different ana-