

are described simultaneously. It might have been useful in some sections to have described the dissection of each mammal individually.

My minor criticisms aside, I think this new edition of *Vertebrate Dissection* is a clear, authoritative manual that would be an excellent reference for high school teachers or an excellent text for a college comparative anatomy course.

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EVOLUTION

MICROCOSMOS: FOUR BILLION YEARS OF EVOLUTION FROM OUR MICROBIAL ANCESTORS

by Lynn Margulis and Dorion Sagan. 1986. Summit Books (Simon and Schuster Building, 1230 Avenue of the Americas, New York, NY 10020). 301 p. \$17.95 hardback.

The basic premise of this book is that microorganisms are the originators of all fundamental life processes and that evolution at every level has resulted from confluence and cooperation among them. This book brings together for a general readership a wide variety of hypotheses that have been gradually gaining acceptance among biological scientists—from the first membrane enclosed autopoietic bodies, through an endosymbiotic association between a eubacterium and an archaeobacterial host to give eukaryotic cells, to the creation and maintenance of the biosphere itself according to the Gaia hypothesis.

The sections that have a great deal of scientific evidence to support them are beautifully written and admirably supported with references to research publications.

Some more controversial concepts, such as the spirochete hypothesis for microtubules and therefore meiosis itself and a "symbiotic brain," are too overdrawn.

The second note in the back of the book even hopes "that the weight of evidence presented in this book will convince biologists—as well as everybody else—of the need to view life as a symbiotic phenomenon."

Sorry to disappoint the authors, but biologists are going to reserve the final acceptance or rejection of new hypotheses when scientific research presents enough evidence for a firm decision.

This book is not going to change scientists' minds, but it is a valuable compilation of current evolutionary theory for a popular audience. It could be particularly stimulating for a non-majors or interdisciplinary studies course where discussion should certainly be enlivened.

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MICROBES

THE WORLD OF MICROBES

by Howard Gest. 1987. Science Tech Publishers, Inc. (Madison, WI) 249 p. \$18.95 hardback.

This jargon-free book could have been written only by someone who is very familiar with the world of microbes. Gest takes readers by the hand and leads them through a multitude of different microbial topics. Although it is not stated, it appears this book is designed for those with little or no background in microbiology.

While reading through the various chapters one has the feeling of having a fireside chat with the author who explains simply why the microbial world is as it is. With anecdotes of historical perspective interwoven prolifically, the topics flow by and leave the reader with a feeling of awe and wonderment.

This presentation seems more a history and biography of microbiology than a text. Complex topics that can be completely understood only with a strong background in chemistry are presented conceptually for the non-scientist in a clear, concise, non-threatening manner.

The range of topics covered is enormous. From the first references to fermentation found in pre-history to modern biotechnology, from taxonomy to physiology, from the curious to the practical, virtually all aspects of microbiology are touched upon in a way that instills a desire to learn more.

This book would be an excellent choice for students in secondary school or college who are seeking an introduction to the various aspects of biology, or for anyone wanting to understand more about the effects of microbes on the world in which we live.

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ECOLOGY

LANDSCAPE ECOLOGY

by Richard T.T. Forman and Michel Godron. 1986. John Wiley & Sons (605 Third Ave., New York, NY 10158). 619 p. \$38.95, hardback.

Perceptions of our surroundings have long been segregated into two categories—ecological and environmental. The former has routinely emphasized interaction of plants and animals with the environment while the latter has focused on human impacts.

In their textbook, *Landscape Ecology*, Richard T.T. Forman and Michel Godron have forged a comprehensive link between the two perceptions. Landscape ecology is a composite area of study which relies on the ecosystem concept but readily incorporates notions about urban and rural settings as well as the wild. All this is accomplished without undue anthropocentric emphasis. The balance in the book is therefore, both new and praiseworthy.

Heterogeneity in the environment provides the impetus for recognizing three landscape forms: patches, corridors and matrices. A patch is an element within a landscape that is distinguishable from its surroundings; a field, wooded area, or farmhouse are examples. Corridors bound and transect patches and include roads, rivers and windbreaks. A matrix is akin to the emergent properties of the patch and corridor association. Recognition of the matrix for a particular landscape is largely a matter of scale with the matrix typically much larger than patches.

Landscape heterogeneity is highly variable, ranging from the relative uniformity of Great Plains grasslands to the very patchy farm or ranch one occasionally encounters in that region of the Western United States. Regardless, all landscapes can be characterized by examining three attributes: structure, function and change. Landscapes, therefore, are aggregates of interacting ecosystems.

This refreshing and groundbreaking textbook is divided into four sections: an overview including definitions and a summary of ecological principles, structure of landscapes, dynamics of landscapes and aspects of management and heterogeneity. The last section is an especially wide-ranging treatment of contemporary ideas in ecology, including the hierarchy in nature concept and model use for decision-making, and their application