earlier edition by the same authors. They state that approximately a third of the articles in the second edition have been replaced by ones dealing with newer, innovative practices. However, only ten of the included articles have been published since 1970, and the three most current ones (1975) are all authored by one of the editors. The inevitable publishing lag is the major criticism of the book. Surely the editors could have surveyed their colleagues in order to have included more current articles.

The book is divided into eight sections, each dealing with a major facet of elementary science education. Prior to each section, and to each article, the editors provide a succinct, informative description of the major points of the articles, or article. These descriptive passages are particularly helpful for the preservice elementary teacher; they relate each topic to the whole concept of elementary science teaching.

In light of the concerns of most preservice elementary teachers, the more practical articles probably are the ones of greatest value. Among the outstanding practical articles are a detailed paper on the logistics of team teaching; a summary report of the National Assessment of Educational Progress in Science; two articles on the availability of ERIC and the variety of its services; an excellent checklist for assessing a science program; and a useful article, complete with many sample items, concerning evaluation procedures in elementary science.

The main concern about this book is that most of the included articles were written prior to or during the major national curricular projects for elementary science. Therefore, the readers are not exposed to detailed information about the theoretical bases for, or the practical problems of, the new elementary science curricula. Only one brief article compares ESS, SAPA, SCIS, COPES, and several smaller projects.

With the exception of the curricular area, the book is a fairly thorough compilation of articles concerning elementary science. It should be useful to both preservice and inservice elementary teachers as well as to their university and college instructors and supervisors.

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Evolution

COEVOLUTION OF ANIMALS AND PLANTS, ed. by Lawrence E. Gilbert and Peter H. Raven. 1975. University of Texas Press (Austin 78712). 246 p. $12.50 hardback.

This collection of papers, originally presented at the First International Congress of Systematic and Evolutionary Biology in 1973, addresses itself to a number of topics: terrestrial seed plants and their relationships with insects; leaf-feeding animals and their impact on plant evolution; ant-plant relationships; seed dispersal and ecological modeling; insect courtship and plant pollination, to name only a few. The flow of energy as the currency of plant-animal coevolutionary relationships is a common thread of many articles. The studies presented in this volume are concerned with the dynamics of evolutionary relationships that have led to a given situation and to the reciprocal modifications that have taken place in the participating organisms. Emphasis is placed on the processes rather than products of evolution.

The book will be extremely valuable as a reference because it is the only available presentation of the current research in this field. Complete bibliographies at the end of each article will provide the reader with avenues to more in-depth study. I recommend the book for the advanced high school or college student who has particular interest in plant-animal interrelationships.

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CONCEPTS OF EVOLUTION, by Everett C. Olson and Jane Robinson. 1975. Charles E. Merrill Publishing Co. (Columbus, Ohio 43216). 272 p. $4.50 softback.

Opinions, theories, and concepts animate this otherwise standard textbook for nonbiology majors. The introductory chapters give a view of organic evolution in its relationships to, and with, society and philosophy. This method helps the student place some kind of organization on that which is subjective and that which is objective. In other words, the text enables the student to understand that life is organization, and it is that organization which can extend and propagate itself by imposing the same self on other suitable matter. Thus, through growth and replication, organization creates organization.

In various other books, more attention is directed toward the history and meaning of the ideas behind evolution. These efforts, however, tend to fall short of the needs of students who desire an understanding of how evolutionary concepts, in biology and other fields, relate to human events and spheres of knowledge beyond the scope of science. This book is designed to meet such a need, but without sacrificing a sound understanding of the biological basis for evolutionary theory.

In the last chapter of the text, the full circle of ideas begun in chapter 1 nears completion. First, dealing with what evolution is; then, the history of life and how it can be explained; and from there, the constant progression of the theory of organic evolution; like a tractor-tread, all these give movement to one of the great conceptual achievements of man. As with the links of the tractor-tread, systematically repeating its course of action, it is the same with ideas. They have a way of feeding back into the society that generated them and becoming the basic thought patterns by which its members live. The problems of all men become the problems of philosophers, and their writings, in turn, influence the society which generated them. Thus evolution has had an immense effect on everything we do, and even on the way we look at life. As we return to this point, now with a full background, we can see how evolutionary thinking has become entrenched in modern life and what some of its major consequences are and might be. In final analysis, a look at the past with an objective eye to the future is where any integrated study must come to rest.

The book is knowledgeably written, with artistic illustrations and important concepts summarized at the end of each chapter.

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BIOLOGY AND SOCIETY: THE EVOLUTION OF MAN AND HIS TECHNOLOGY, by Andrew McClary. 1975. Macmillan Publishing Co. (866 Third Ave., New York 10022). 320 p. $7.95.

Perhaps the greatest compliment a teacher-reviewer can render a book is to adopt it for a course. I have adopted McClary's excellent presentation for my course in "Social and Ethical Issues in Biology," offered to undergraduate biology majors as well as nonmajors. It is also ideally suited to a senior-level high school course.

The author evaluates our technological and social dilemmas from an evolutionary perspective. He divides the book into three parts: Past, Present, and Future. The "Past" begins with a comparison of the organismic level of life (hydra) and the ecosystem level (a pond). There follows a simplified, but adequate, survey of human biological and cultural evolution.

The "Present" begins with a history of domestication and its impact on the development of Western technology. Although McClary does not fully elucidate the thesis that "Domestication brought a series of social and technological changes of the greatest significance," this section is outstanding. It acquaints the reader, in a well-written and logically outlined sequence, with the rise of specialization and of scientific thought, the interaction between machine and nature, the price of the human "cultural ecosystem" ("... it takes 850 acres of Canadian timber to publish a single Sunday edition of *The New York Times*"), the impact of genetic se-

lection, the effects of population increase, pest control, and many other human endeavors. The section ends with a survey of our health problems, their causes and potential solutions. The reader is acquainted with the concepts of aging, the artificial heart, cancer therapy, biofeedback, and genetic disease, identification, and treatment.

The "Future" begins with an analysis of human behavior, as it is shaped by our technological environment and as it might shape our future. "Much of our behavior is obviously learned, rather than genetic .... But what of ... aggressiveness, ambition, the urge to form a family? Are these learned or genetic characteristics?" The science of ethology is also described. McClary proves to be a realist, by admitting that "all cultures serve their own interests first and nature's second ...." "We suggest that all peoples, Western or not, use nature on their own terms." Even, he says, the American Indian. He also admits what many of us forget: "... any step by Western culture back toward an earlier kind of nontechnological environment would ... be a step down the evolutionary process .... It would be a renunciation of the human potential." In a sense, the machine is not rendering man less human, but is instead an indication that man is becoming more human and more capable of utilizing nature to his benefit, as all species do. "To renounce technology is to renounce the human potential." We must not abandon technology, but we must integrate it more functionally with nature.

Being a realist, the author admits to the problems of vertical ecosystems called "high-rise" apartment buildings, the danger that "Machine made objects [may] have a dehumanizing effect" in some circumstances, and the decline of diversity and increase in specialization.

The book offers many tangential notes that are presented as sidelights to the main text. The best of these are "The Importance of a Front End," "Is Human Society a Superorganism?", "Reality as Seen by Art and by Science," and "Why Lawns?"

Some errors or debatable statements include the statement, "Most biologists oppose vitalism"; the assignment of purpose to the evolutionary process, especially in the first chapters; and an evolutionary tree showing all Chordate classes that lacks birds.

Any teacher who employs this book as a textbook is bound to disagree with some of McClary's beliefs. But this is one of the credits owed the author. He invites disagreement; but he offers sufficient background to enable the reader to be knowledgeable in reaching a conclusion.

This is a beautiful book—brief survey, detailed, not boring at all—the best in its class.

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General Biology

BIOLOGY OF THE FUTURE, by Eckehard Munck. 1974. Franklin Watts, Inc. (730 Fifth Ave., New York 10019). 128 p. $5.90 hardback.

This book, even though small, encompasses most of the concepts of modern biology without going into much history. It focuses on many of the new areas of biology, such as bionomics, molecular biology, ethology, and so on, which have come to be an important part of modern biology because of the work of philosophers, psychologists, and others. The author states that our only hope in survival lies in the understanding of the life around us and ourselves.

"Zero Hour," "And Slew Him," and "Whereto, Adam?" are examples of some of the intriguing chapter headings found in this book. Accompanying these interesting chapters are some unusually good and interesting illustrations, some in color, others in black-and-white. My only criticism of this book is on the sequence of the material. Chapters 1 and 2 discuss the cell, DNA, and the genetic code, which should have been placed in the last half of the book in exchange for some of the exciting and more interesting material that could provide a stimulus to the average reader. This book is intended for grades seven and up; however, it might be a little difficult for younger readers.

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MAN AND THE NATURAL WORLD, by Coleman J. Goin and Olive B. Goin. 2nd ed., 1975. Macmillan Publishing Co. (866 Third Ave., New York 10022). 654 p. Price not given.

Educators and students who utilized and enjoyed the first edition of this textbook will surely welcome the second edition, as the body of the book has remained intact. One of the author's original convictions in writing the first edition was that "... such biological phenomena as respiration, osmosis, and energy exchange are more interesting, more understandable, and more thought-provoking for the general student when examined in the context of his own body and life." This premise has not been altered. The second edition once again presents biology to the prospective nonscience major using the human body as the principal experimental system.

Changes from the first edition are minimal and consist primarily of updating. Most of the modifications are simply incorporated at the conclusion of existing information.

The book is clearly and concisely written, relying heavily on diagrams for illustrative material. Many of the selected drawings are quite "diagrammatic" and, in some instances, forsake absolute scientific representation for the sake of emphasis. Photographs receive only limited use, being most evident in the taxonomy, ecology, and behavior sections.

Very little chemistry is included in the book, other than the elementary material found in an appendix. In addition, detailed experimental evidence is lacking. These omissions probably reflect the book's intended use, which, in my opinion, would be best served in high school and community college courses for students not preparing for a career in the sciences.

One of the most educationally enjoyable and satisfying aspects of the book is the author's use of material from disciplines other than science to convey scientific information. For example, the "tears" of the Mock Turtle are employed to illustrate the phenomenon of salt elimination, and quotes from Shakespeare attest to an early medical understanding of the value of urinalysis.

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BIOLOGY: A HUMAN APPROACH, by Irwin W. Sherman and Vilia G. Sherman. 1975. Oxford University Press (200 Madison Ave., New York 10016). 553 p. $13.95 hardback.

This introductory textbook is divided into three sections, the first reviewing such topics as the origin of life, the nature of the cell, and the chemical aspects of respiration, photosynthesis, and the genetic code. The second section focuses upon the human as a "type" organism, with chapters on reproduction, development, digestion, circulation, and coordination, while the concluding part contains chapters on human genetics, evolution, and environment.

The book is well designed, with many excellent illustrations. An index and two appendixes (general chemistry and metric measurement) are included. Frequent "asides" from the text appear in boxes and add interesting vignettes into biological inquiry. An admirable teacher's guide ("Teacher's Companion To ...") is also available and provides, for each chapter, an outline and summary, objectives, reference and film lists, and sample questions.

The emphasis on the human organism is both a strength and a weakness. Because the book is written for the nonmajor, many familiar topics have, of necessity, been excluded. Most notable, of course, is the absence of botanical references. With the exception of photosynthesis, very little discussion of plants is found, and such commonly encountered botanical words as *algae* or *flower* are not indexed. (But then,