

One section deals with human attitudes and the tragedy of the commons, and addresses the question of *why* humans pollute.

The book is amply illustrated with useful graphs, charts, line drawings, and black-and-white photographs. Each illustration enhances the text to which it relates and aids in reader understanding.

I believe this book fills a serious void in curriculum materials for this level of study. Perhaps it should be in everyone's library.

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FIELD AND LABORATORY EXERCISES IN ECOLOGY

by Stephen D. Wratten and Gary L.A. Fry. 1980. University Park Press (233 East Redwood Street, Baltimore, MD 21202). 227 p. \$29.50.

The aim of this book is to show how modern numerical techniques in plant and animal ecology can be used practically at the undergraduate college level to demonstrate many of the fundamental principles of the subject.

The 227-page softback written by two British ecologists consists of 56 dual exercises organized into five sections: Sampling, Spatial Pattern, Population, Population Interactions, and Community Analysis.

The exercises begin with a one- or two-page discussion of the principle to be illustrated. The first study of the pair of exercises is to be done in the laboratory, often as a simulation. The second study is designed to be done in the field. As an example, the title of dual exercise 3-4 is "The Effects of Quadrat Size." Exercise 3 is a lab study of "the effects of quadrat size on plant associations." It is done as a simulation. Exercise 4 is a field study on "the effect of the diameter of point quadrats on cover estimation in herbaceous vegetation."

The exercises are designed to take three hours or less in most cases. Extensive use is made of the mathematics of statistics. Some of the studies are relatively simple, but others are rather involved and would require extensive preparation by the instructor and/or lab assistant. Organisms suggested in the exercises all occur in Britain, but related species in other temperate regions can be substituted without affecting the fundamentals of the methods.

The text is clear, well written, and nicely organized. Simple line drawings,

charts, and tables illustrate the text. There is no color. References and index are adequate.

Some of the exercises might be adapted for advanced biology courses on the secondary level, but most are suited for college plant or animal ecology courses.

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Evolution

DARWINIAN IMPACTS: AN INTRODUCTION TO THE DARWINIAN REVOLUTION

by David R. Oldroyd. 1980. Humanities Press (Atlantic Highlands, NJ 07716). 398 p. \$12.75.

Recent litigation in the state of California regarding evolution and creation, which was suggested in the press as "being a victory for both sides" illustrates the timeliness of materials pertaining to Charles Darwin. While Oldroyd suggests that the "majority of Christians have finally come to terms with the evolutionary doctrine," it is obvious that controversy exists. Where then does this book fit into the materials already written about Darwin?

Darwinian Impacts was developed from materials Oldroyd has taught for years in the School of History and Philosophy of Science at the University of New South Wales. Covering 24 chapters, his writing is much in the format of classroom lectures and presents a very tight, scholarly, documented argument for each specific area being covered. The text itself is divided into three major sections: 1) Antecedents of Darwinism, 2) Darwinism, and 3) Consequences of Darwinism.

In tracing the antecedents of Darwin, Oldroyd leads the reader through chronological events in the emergence of theories of the origin of life. He purports to show relations and perhaps ultimate effect on the thinking of Darwin and his predecessors. Certainly, it is true that one better understands history when a conceptual frame is gained for the intellectual/scientific/historical environment that was present at the time that the theory pertaining to the origin of life was first presented.

The second section highlights Neo Lamarckian ideas with Darwin and the

works of Wallace and Mendel. Oldroyd attempts an objective presentation as he continually utilizes negative replies to Darwin and how, in answering these comments, the theory of evolution continued to be clarified. Scientists often receive their information about evolution from classic studies but in a disjointed manner, thus this basic chronological approach permits the reader to amalgamate his/her own thinking with that of the giants of the era.

Part three is the longest section and presents the impact of Darwin. Interestingly, graphs and tables document the questions raised about evolution immediately after the publication and dissemination of Darwin's theory. Further, the consequences of Darwin and politics, theology, philosophy, psychology, anthropology, literature, and music are presented in separate chapters.

Darwinian Impacts can easily be read by both the evolutionist and the creationist; it will give each a better historical perspective on evolution. The evolutionist will be supported in his/her understanding and the creationist may find more questions to ask about evolution.

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EVOLUTION OF THE VERTEBRATES

by Edwin H. Colbert. 3rd ed., 1980. John Wiley & Sons, Inc. (One Wiley Drive, Somerset, NJ 08873). 510 p. \$25.00.

The first edition of this contemporary classic was first published some 25 years ago. Developed as a concise summary of the generally accepted evolutionary relationships of the vertebrates, the 479 pages were readable and interesting. A second edition was released in 1969 that included updated information, new interpretations of the fossil record, and other minor changes. Although increased to 535 pages, the book retained the qualities so useful to the neophyte interested in vertebrate evolution.

The third edition has been developed in the aftermath of discoveries of fossil reptiles and amphibians in Antarctica. In addition, the modern theory of plate tectonics has gained stature. Colbert has updated *Evolution of the Vertebrates* to take these and other paleontologic advances into account. With the addition of new information, old and perhaps irrelevant discussions were excised. I wish to emphasize this point. A casual comparison of the new edition with the

older versions is misleading. Since numerous diagrams, illustrations, and figures are identical and the material appears basically unchanged, the conclusion can be drawn that the new edition is merely a cosmetic revision. It is not.

This book is well written and retains the good qualities of earlier editions. It, like its predecessors, will well serve the junior high school to college student of biology. A ten-page reference section will provide the more serious individual valuable leads to more detailed writings. I encourage individuals and libraries to discard the older editions and replace them with this updated interpretation of vertebrate evolution.

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General Biology

AQUATIC SCIENCE: MARINE FISHERIES BIOLOGY

by James T. Davis and Deborah Lightfoot. Sea Grant College Program, Texas A & M University (College Station, TX 77843). 18 p. (Single copies available at no charge, 2 to 10 copies available for \$.50 each. When ordering, request publication TAMU-SG 79-405.)

One of the initial problems encountered while reading this booklet is to discern whether it was written for the novice or budding expert in the field of marine aquatics. The authors focus on the Texas Gulf Coast with four intentions: (1) identification of organisms that inhabit that area; (2) developing an understanding for the area's physical and biological features; (3) initiating an understanding for proper management of species commercially valued; and (4) providing suggested activities for exploration and specific-interest projects designation.

The major shortcoming of this booklet is that the presentation of each of the aforementioned topics is shallow, limited, and vague. More specifically: (1) Both the dichotomous and descriptive identification keys used are too brief in description and species identification (molluscs, oysters, crabs); however, one dichotomous key (shrimp) and pictorial/descriptive key (Food and Game Fish) are quite adequate. (2) The handling of physical (waves, tides, estuaries, etc.) and biological (shoreline organisms, food chain/webs) features are inadequately covered

to provide any meaningful use. (3) The topic of "proper management" is restricted to a few paragraphs of any valuable resource content. The remainder of that section provides proposed activities intended to guide the reader through a self study of the topic. (4) Many of the activities are too brief in description, guidance, or procedures to follow. Only the well-informed student could provide an in-depth compliance of the activity's suggestions. The novice would require significant, additional guidance. However, the activities in the Level III section of "Life History and Management" are detailed enough to be considered above average suggested activities.

In summary, the authors must either expand the text of the booklet for content improvement and detail, or submit a more extensive reading list for the student. A teachers' guide would prove very useful, also.

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EXPERIENCES IN BIOLOGY

by Penelope Hauchey Bauer, Michael A. Magnoli, Armand Alvarez, Dorothy Chang-Van Horn, and Delilah Taylor Gomes. 1981. Laidlaw Brothers, Division of Doubleday and Company, Inc. (River Forest, IL 60305). 831 p. Price not given.

This is a modern and up-to-date high school textbook. It follows the current trend toward easy reading, although no reading level indicator is given. When scientific words are used, a phonetic pronunciation is given in parentheses. The glossary also shows pronunciation as well as definition.

The book is divided into eight units. The first two units are the customary introductory material covering five chapters. The next two chapters seem out of place: chapter six is a brief overview of plants, nonvascular and vascular; chapter seven previews the animal kingdom. In a later unit the "World of Animals" is covered in five chapters; however, an entire unit of microbes and fungi separates the first introduction to animals and the continuation of the animal kingdom. If I were using this book, I would cover chapter seven and then jump to chapter thirteen to keep the sequence of the material on the animals intact.

Chapter eight, "Neither Plant or Animal," which is also introductory, precedes the unit on "Microbes and Fungi." The authors suggest the possibility of

dividing living organisms into six kingdoms but actually use five: Animalia, Plantae, Protista, Monera, and Fungi. The higher algae have been returned to the plant kingdom. There is merit in the authors' classification, although it differs from most of the current textbooks used in secondary schools.

Beyond the survey chapter in unit two only three chapters are devoted to plants. One of these is concerned with plant physiology.

"Reproduction and Heredity" follows the plant unit with five chapters, thus giving fairly good coverage of elementary genetics. A small section on recombinant DNA is included at the end of the unit under the heading "Pros and Cons." (Each unit has this "pros and cons" segment as well as a page on careers in the area covered by the unit.)

The seventh unit covers "The Human Organism" in five chapters. One glaring error is present in an illustration in the teacher's edition, in a full-page diagram of the circulatory system. A question is asked, "Which ventricle pumps blood to the lungs?" and in this edition the answer, printed in blue, reads "The left ventricle."

A final unit entitled "Interactions in the Living World" completes the book. Much of the material in this unit is included in earlier chapters in other textbooks.

Throughout the book, each chapter begins with a paragraph or two of introduction and four or five behavioral objectives. Within the chapters, questions are asked to help reinforce the material covered. A review of important ideas is given at the end of each chapter. About twenty questions that cover vocabulary, facts and concepts, and application and critical thinking are included. Throughout the teacher's edition, there are marginal notes. However, it became irritating to read constant repetitions of "you may wish to tell the student" or "you may wish to mention," and so on. One of the marginal notes states "the amount of ATP produced by complete cellular respiration . . . is only 36 ATP according to current evidence." Because this information is contrary to what is contained in over a half dozen textbooks I have read and does not agree with the views of several scientists with Ph.D. degrees whom I have consulted, the statement should be supported by some evidence.

Although there is a chapter focusing on taxonomy and how the various groupings are determined, there is no classification presented below the phylum level, except for the use of the complete classification of *Homo sapiens* as an illustration of how "lumpers and splitters" (taxonomists) work. Classification could at least be explained in the appendix for those who are interested.