

would appear that this book would be an important addition to the reading list of any good introductory course.

Seasons. . . is printed in a format and style that complements the easy readability of the text. It is an excellent overview of the constantly changing cycle of life that occurs within the salt marsh ecosystem. The use of hard statistical data is well balanced with the concise statements of the characteristic behavioral patterns of many of the marsh plant and animal inhabitants. A particularly good portion of the text entitled "A Time For Understanding" describes our past, present, and potential uses of many of the marsh organisms such as the cat tail (*Typha* sp.).

The sketches in the illustrated appendix by Edward and Marcia Norman are a good collection of some of the plants, insects, shellfish, and fish that share the marsh habitat. One of the better characteristics of the plant portion of the appendix is a listing of the marsh plants by zones. However, the collection of sketches representing animals found within the marsh habitat has a noticeable omission of several animal groups including members of the chordate reptiles, amphibians, birds, and mammals. It appears that those animals that are depicted are categorized by zones, yet this is not stated nor in some cases would it be logical to do so. Thus the animal drawings seem to have been almost added as an afterthought.

The easy reading of this book compares quite favorably to the same kind of style found in Dudley Cammett Lunt's *Thousand Acre Marsh* and *Taylor's Gut*—both dealing with the cycle of life in a salt marsh. As many more individuals become aware of the tremendous importance of our salt marshes this book may well become a valuable first reader.

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ECOLOGICAL PRINCIPLES, by Michael A. Tribe, Michael E. Eraut, and Roger K. Snook. 1975. Basic Biology Course, Book 4. Cambridge University Press (32 E. 57th St., New York 10022). 168 p. \$19.95 hardback, \$6.95 softback.

It is refreshing to review a book that offers such a wide range of material designed to allow experimental pursuit by the reader. Although slanted mainly for the college level student, the book's

simplicity of format permits revision to the secondary school level without too much difficulty. In this feature lies the greatest strength of the publication. The many illustrated charts and graphs, unlike too many of the ecology materials that flood the current market, do *not* attempt to impress the reader with the vast knowledge of the authors. Instead the design is plainly that of involving the student in seeking solutions of his own.

There are drawings of, for example, leaf-litter invertebrates and many other organisms found in food chains. Sketches showing how to construct such basic equipment as a Tullgren funnel to collect litter and how to compile an understandable kind of ecological pyramid of this leaf-litter are representative of the features that make this work an excellent laboratory sourcebook.

In the foreword the authors state that "the main purpose of the book is to create an awareness in the reader of the complex structure of the ecosystems." This purpose is very well achieved throughout the entire book. The series of challenges at the end of each unit inspires the student investigator to continue his field and laboratory study. The section of a proposed closed ecological system for interplanetary travel is still another supplementary idea.

In conclusion, I recommend this fine work as a valuable sourcebook for college or secondary school use.

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WHAT MAKES EDUCATION ENVIRONMENTAL? ed. by Noel McInnis and Don Albrecht. 1975. Environmental Educators, Inc. (Washington, D.C.) and Data Courier, Inc. (620 S. Fifth St., Louisville, Ky. 40204). 472 p. \$9.95 softback.

This book provides a comprehensive view of environmental education. It was written primarily for teachers but probably would serve workshop directors, curriculum coordinators, and inservice program directors best. The 41 articles are organized into the following major areas: the basis for environmental education; instruction; environmental perception and communication; environmental education advocacy; and environmental education needs. The contributors provide a variety of views, and their own profes-

sions illustrate the comprehensive nature of environmental education. The reader sees the ideas and concepts developed through the eyes of professional writers, specialists in communications, classroom teachers, curriculum specialists, and governmental agency professionals.

Although there are over 25 tables and figures, not including several appropriate black-and-white photographs (without captions), this book is not a collection of articles by well known scientists presenting and documenting environmental data supportive to a particular problem. Such specialists can be found listed in the references and bibliographies that follow most of the articles. Not all articles have summaries, conclusions, or references. If this book were intended to be a handbook, then several articles need to have such sections incorporated. Also, some chapters are more or less personal views lacking documentation which should have been included to supplement the authors' ideas. Generally, the articles with extensive references are the best, but there is something for everybody. For the practical classroom teacher, colleagues have provided lists that include valuable sources of materials, films, plans, and games. For the director of a workshop in environmental education the book provides nearly all the information needed for an opening, body, discussion, and closing. For a governmental agency professional it provides the opportunity to see the needs of the classroom teacher.

Also included is a short glossary and a substantial index. These coupled with the list of figures and tables should make the book valuable to educators as a handbook and reference.

There is little doubt that the book presents well the methods and objectives of environmental education, but, by example, it goes on to broaden the scope and the importance of the subject. The authors fulfill nicely the comments presented in the brief overview indicating that environmental problems and resultant responsibilities for improvement not only belong to corporations, citizens, and governments but may be most effectively altered and developed by positive educational values, beliefs, and attitudes. The concepts presented show the value of communication, illustrating that journalists have something positive to contribute to environmental education.

Possibly another title would have been better, but *What Makes Education Environmental?* has something to say of value to nearly every aspect of our education system. It awakens the science teacher and scientist to the scope of environmental education and to the fact that other professions are available and can contribute positively to making education environmental.

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Evolution

SURTSEY: EVOLUTION OF LIFE ON A VOLCANIC ISLAND, by Sturla Fridriksson. 1975. John Wiley & Sons (605 Third Ave., New York 10016). 198 p. \$14.95 hardback.

This is a first-hand account of the formation of an island in the mid-1960s through volcanic action in the Atlantic Ridge. The island, located off the coast of Iceland, is called Surtsey. The biologist author, who resides in Iceland, was a founding member of the Surtsey Research Society which is directing observations on natural colonization of Surtsey by plants and animals. The book describes the evolution of Surtsey's abiotic environment for the first fifty pages. The bulk of the book deals with the dispersal mechanisms and colonization patterns for organisms from all five kingdoms. Most especially, the vascular plants are treated. These events are described in a detailed, interesting manner. The author did much of this research himself.

The last section of the book deals with the vegetation of nearby areas including the island of Heimaey which underwent a massive volcanic eruption in 1973. Chapter 18 is an inadequate attempt to put Surtsey into perspective with what is known generally about island colonization.

This book is interesting and informative for mature general audiences. Most of the literature cited is unavailable except in larger university libraries. This collection of fascinating information furnishes much needed data for the plethora of speculations about insular biotas which are currently fashionable in ecology.

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HOW LIFE BEGAN: CREATION VERSUS EVOLUTION, by Roy A. Gallant. 1975. Four Winds Press (50 W. 44th St., New York 10036). 224 p. \$7.95 hardback.

Astronomers have historically played an equal role with geologists and biologists in the debate between creation and evolution. Thus, it seems perfectly natural that an experienced astronomer and award winning writer, Roy A. Gallant, should attempt to clarify this frequently revived controversy. However, Gallant obviously sacrificed quality to speed in producing this, his fortieth-plus, book. The product is much like what we would expect of a sophomore term paper. In typical sophomoric fashion, Gallant grossly paraphrases just a few major sources and overuses direct quotes; in fact, one quote was a full three pages long!

The overall organization of the book is a semi-historical counterplay of thesis-reply-rejoinder-surrejoinder. Folklore is traced from the Babylonians through the Sumerians to Egyptian and Genesis versions of creation. Greek and Roman atomistic logic and rational materialism are presented as the first nonteleological alternatives to traditional myth-derived beliefs. Astronomy is traced from geocentric to heliocentric to more contemporary models of our universe. Concomitantly, catastrophic and

nebular hypotheses for the origin of the solar system and steady state and big bang cosmogonic theories for the origin of the universe are historically traced. Spontaneous generation, fossils (very much out of sequence), and contemporary scientific hypotheses for the origin of life follow. In another chronological and logical shift, evolution and some of the nineteenth-century evidence for it are finally proffered. After three-quarters of the text is consumed, then we are "quoted" the contemporary creationist and evolutionist positions in adjacent chapters. Gallant concludes with an analysis of exobiology, which tenders the possibility that the knowledge of extraterrestrial life will settle the debate.

Besides the disorganized presentation, Gallant's logic is frequently specious and his eclectic choice of evidence displays a lack of scholarship. The creation myths, in a wide historical and anthropological perspective, have been presented to the layperson in a much better fashion by Phillip Freund's *Myths of Creation* and Sylvia Fahs and Dorothy Spoerl's *Beginnings: Earth, Sky, Life, Death*. Gallant commits grievous errors in terms of a historians' perspective; he repeatably commits the error of judging earlier scientists and beliefs on the basis of contemporary knowledge which leads him down such *cul de sacs* as saying Aristotle set science back 2000 years (p. 56). Despite Gallant's insistence that his goal in writing the book is not "to [sic] say that one group is 'right' and the other 'wrong,'" he continually uses judgmental adjectives throughout the book which reflect his own prejudices or his perceived view of consensus lay opinion. For example, materialism is called "cold and impersonal" (p. 57) and "cheerless" (p. 54); creationists are considered irrational by obvious inference (p. 64), are constricted by the "straightjacket of purpose" (p. 57), "carefully structure their argument" in contextually implicit deceit (p. 54), are "quite right" (p. 144) about mutations; or, we are offered a "remarkably clear example" of the evolutionary importance of incipient polymorphism (p. 145).

Readers of *American Biology Teacher* have been treated to a much finer analysis of this debate (so much so that Gallant has quoted extensively from these pages). The chapter on astronomy is the single exception. Otherwise Gallant's dismal lack of current awareness of contemporary molecular evolu-