Reviews

Behavior

ANIMAL BEHAVIOR: AN EVOLUTIONARY APPROACH, by John Alcock. 1975. Sinauer Associates (Sunderland, Mass. 01375). 558 p. $14.00 hardback.

In the last 10 years we have seen an upsurge of interest in the study of animal behavior as exemplified by the work of such scientists as Jane van Lawick-Goodall and George Schaller. Alcock has written a textbook that integrates our present understanding of animal behavior with an examination of the evolution of this behavior.

The book is divided into several basic sections. A brief introductory chapter provides the rationale for a book on the evolution of behavior and outlines the reasons for both the orientation and the organization of the book. The author devotes two chapters to phylogenetics and the bulk of the first part of the book to a thorough discussion of the effect of the information systems (hormonal and nervous) on an organism. The second half consists of an in-depth examination of the interrelationship of organisms and their ecology; the two concluding chapters deal exclusively with the evolution of human behavior, that is, the interaction of physical and cultural anthropology.

Each chapter is prefaced with an introductory essay describing the content of the chapter and telling why we should or should not read it. For example, in the introductory essay to chapter 2, "Animal Species and their Evolution," Alcook indicates that he realizes most of his readers are familiar with phylogenetic evolution and advises us that we may "safely ignore" it. He concludes each chapter with an excellent summary of the major subject areas explored and a short suggested reading list for further study. Finally at the end of each chapter there is a godsend for all teachers—a list of pertinent films along with addresses of distributors.

Animal Behavior reads well: Alcock has a nice sense of humor along with an excellent understanding of, and an obvious love for, his subject area. He is possessed of a clear, no-nonsense style, which eliminates unnecessary technical language while retaining all applicable scientific terminology. Because he cross-references voluminously, there is a tendency toward repetition. For example, herring gull nesting behavior is examined—from different viewpoints to be sure—in three different sections of the book. Given the organization of the book, this seems difficult to avoid.

There are many black-and-white photographs of good quality and numerous graphs and diagrams that are well executed and helpful for teaching purposes. The reading level appears to be designed for college undergraduates and bright twelfth grade high school students. This is an excellent textbook, and I would recommend it to teachers as well as to readers interested in the evolution of animal behavior.

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MY SISTER LOOKS LIKE A PEAR, by Douglas Anderson. 1974. Hart Publishing Co. (15 W. 4th St., New York 10012). 268 p. $7.50 hardback, $2.95 softback.

The author believes that everyone has the potential for creative expression of ideas, thoughts, feelings, and emotions through poetry. It is his argument that this ability lies dormant within the minds of many young students due to the restrictive influence exerted by many classroom teachers. Thus, several problems associated with the clarification of teacher values must be solved. For the most part, these problems seem to be associated with the ability of the teacher to accept student use of words and language forms that are in conflict with the teacher's value system. Through the use of student examples, the author suggests ways for teachers to modify their behavior in order to provide an environment conducive to reactive expression.

Many biology teachers have been reluctant to include affective experiences within their curricula, whereas at least one elementary science curriculum and several environmental education guides focus upon the inclusion of such activities. Thus, this book would be especially beneficial to the biology teacher who has wished to include activities devoted to the expression of feelings, attitudes, and emotions within this domain, but has previously lacked resources for doing so. For many environmental educators, such activities are a must.

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Botany

BOTANY: AN INTRODUCTORY SURVEY OF THE PLANT KINGDOM, by James D. Haynes. 1975. Halsted Press (605 Third Ave., New York 10016). 562 p. Price not given.

Intended design as stated in the preface is achieved in this book: "The student who has had a principles course in general biology will find the book useful as an introduction to botany and the more advanced areas of plant morphology and anatomy ..." Further, "This book does not discuss ... interpretations of taxonomy and classification."

The topical sequence is uniform for each group, which should make study easier for students. A definition of the group begins each topic, followed by an outline of morphological characteristics and one or more life histories. A final portion of the discussion of each group is entitled "Human Relevance." Groups of interest to plant pathologists and mycologists are discussed first, but the phylogenetic connection between bacteria and blue-green algae is acknowledged.

Algal groups are covered in the second series of chapters. The author recognizes the difficulty of separating algae and protozoa taxonomically and indicates that the difficulty of separating algae and higher plants is even more difficult. Life cycles are well described and clear reference is made to haploidy in all cells except the zygote in *Chlamydomonas* and *Volvox*. The chapter on lichens is between the chapters on algae and on bryophytes, a convenient choice since lichens and bryophytes are sometimes studied together in other courses. Lichens are referred to as a designation of symbiotic relationship. *Marchantia, Porella, Anthoceros, Sphagnum,* and *Polytrichum* are used as examples of bryophyte morphology.

The last half of the book is devoted to vascular plants. Terminology in this section, as elsewhere in the book, is held to a desirable minimum. The 34 pages on human relevance of angiosperms is an excellent review of economic botany.

Writing style is reasonably concise and objective. On page 450, one of the few style lapses makes it difficult to determine what the author wished to indicate about the persistence of endiosperm and photosynthesis in cotyledons. Printing errors are rare; on page

37 "prosporus" occurs for "prosorus." Color photographs throughout the book are too small, and opposite page 302 a caption for a lichen illustration directs the reader to "note the black apothecia" which are not visible.

The content satisfies the objectives described in the preface. This textbook would support a course between an introductory principles course and the advanced morphology courses ordinarily offered at the graduate level. The laboratory aspect of any such course would, of course, need to be strongly emphasized. For curricula designed as Haynes envisions, the subjects in this book would be useful content for secondary teachers and botanists.

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Cell and Molecular Biology

THE LIVES OF A CELL: NOTES OF A BIOLOGY WATCHER, by Lewis Thomas. 1974. Viking Press (625 Madison Ave., New York 10022). 148 p. $6.95.

Thomas Jefferson may be alive and well and frequenting the New Haven-New York area. Only a DNA-print would reveal whether Lewis Thomas is an alias or an intellectual look-alike. The "brainpower" tribute of JFK to our third president could well be made for the author of this work. Thomas' book reflects the genius of one man, who, like Jefferson is as broad as he is deep.

The book, a collection of short essays which first appeared in the *New England Journal of Medicine,* can be read in several hours, but the reader will want to return again and again to savor the subtle imagery of Thomas' thought. It is destined to become a classic for the biological generalist, the evolutionist, the ecologist. Thomas has organized and synthesized much of the contemporary material from several disciplines including anthropology, microbiology, cytology, ethology, and genetics. The result is a story of freshness and simplicity that is as unique as one of its leading characters, the termite symbiote, *Myxotricha paradoxa.*

Thomas' writing style projects an image of a warm, compassionate, optimistic human being—one awed by the complexity that is man and the countless thousands of other species that make up the "membrane" of life which covers this planet. Thomas is humbled by the realization that his identity may not be what he supposes it to be, for his cells are "occupied" by possible endosymbionts, the mitochondria, centrioles and perhaps others. "I had never bargained on descent from single cells without nuclei .... There is additional humiliation that I have not, in a real sense, descended at all. I have brought them all along with me, or perhaps they have brought me."

Thomas feels that basic biomedical research will provide the foundation for advances in those areas where "effective" and efficient medical technology is not present. He very cleverly distinguishes between applied and basic science and points out that the former is only possible after a thorough understanding of the latter. Thus, basic biological research appears to be the first step in the elimination of incurable diseases and "halfway technology."

Biofeedback, the recent "breakthrough" in experimental psychology, is met with much reservation by Thomas. He feels it is not in keeping with a "return to nature," and implies that such control may lead to serious problems of the fumbling type associated with practiced skills. Jokingly, he suggests the exact opposite—a complete let go. This, he contends, would be in accord with becoming part of our ecosphere rather than manager of it.

Thomas' etymology is superb. He sees syntax as an innate elaboration of our linguistic genome—something which separates us from other animal species. Ambiguity is seen as desirable, even necessary, since it provides us with the straying power to drift away—up, up, and away. Thomas views language as endowed with a life of its own and as any life form, always changing.

It has been about 200 years since Jefferson penned our Declaration of Independence. Lewis Thomas' essays may represent an equally eloquent Declaration of Interdependence for our ecosphere. The pieces of Nature's jigsaw puzzle, past and present, have been increasingly joined so that a picture is emerging—that of a ecological-evolutionary unity among all life on earth.

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Ecology and Environmental Biology

ON DEFUSING THE POPULATION BOMB, by Michael Endres. 1975. Halsted Press (605 Third Ave., New York 10016). 191 p. $10.00 hardback, $5.00 softback.

The author of this volume has attacked a problem of heroic proportions. While the presentation is adequate, it fails to come up to the expectations generated by the title. It lacks, for example, the flair and grace of Paul Ehrlich's *The Population Bomb*—its logical antecedent. For this reason, it seems unlikely to produce an enthusiastic readership despite the several important insights brought to bear.

The book seems most appropriate as supplementary reading for college level social science courses. The first three chapters outline various aspects of the problem of population growth and continue with an historical review of population theory. The piece on Malthus is excellent, probing his writings in depth and going far beyond the popularized notion of this man as doomsayer prophet. In addition, the organization into natural theories of population vs. socio-cultural approaches and the accompanying discussion is illuminating in that it opens the field to a much wider array of social commentary. The section "Karl Marx on Population" is a good example.

Chapters 4-10 lay the groundwork and present the author's main thesis: that massive increments in life expectancy will make an emphasis on fertility control less than adequate in dealing with population-related problems. The author is not a biologist and draws primarily from known authorities in medical research for support. Unfortunately, the Buckminster Fuller-like musings frequently cited are poor substitutes for documented research results.

The basic fault with this book lies in the author's style. Redundancies are abundant—notably where arguments from previous chapters are cited and rephrased without adding to the discussion. The reader is forced into a pattern of skimming and then rereading for significant ideas. Along with heavy and convoluted wording and frequent digressions, this tends to disrupt the smooth flow of ideas throughout the book.

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Educational and Professional Concerns

SCIENCE FOR THE ELEMENTARY SCHOOL, by Edward Victor. 3rd ed., 1975. Macmillan Co. (866 Third Ave., New York 10022). 744 p. $12.95 hardback.

This is a book of methods and materials designed especially for the elementary school science teacher. It strikes a nice balance between the biological, chemical, and physical sciences, at times separating them but also interrelating where appropriate. The initial chapters seem more suited for the beginner or less experienced teacher who is concerned with planning, sample teaching units, and objectives relating to teaching science in the elementary school. Some areas, such as the topics relating to various psychological theories including Piaget's, are applicable for more experienced teachers. The overall strength of the text relates to the basic science information section, which provides a mixture of ac-