

finite carrying capacity of Planet Earth. The commons is no longer tenable as a system for utilizing the environment because it relies on individual consciences—an altruism. Altruism, he believes, is possible only “on a small scale, over the short term, in certain circumstances, and within small, intimate groups.” In large groups enlightened egoism is the most powerful motive we can expect. Hence his Cardinal Rule of Policy: “Never ask a person to act against his own self-interest.”

Hardin contends that “there is no way that free, egoistically centered individuals, guided by the germ line survival principle, can avoid overwhelming the carrying capacity of their environment.” In natural communities, predators prevent such calamities. Humankind has eliminated most of its predators and is deprived of this control. So predation must be replaced by social control.

Because the commons cannot reward virtue, continues Hardin, we must always have a measure of provincialism. Humankind has developed a social structure composed of many antagonistic but coexisting tribes, each individual identifying himself/herself with several tribes of different degrees of inclusiveness. He believes it would be unwise to alter this system drastically. But any claim to national sovereignty must be accompanied by responsibility for adjusting population to the carrying capacity of the land. We must “make carrying capacity the primary ethical consideration, putting human lives in a subservient position.” This conclusion reflects concern beyond the fleeting present to the rest of this generation and posterity.

This provocative book requires reappraisal of the ideal of world community and how it can best be expressed. The reader may resist some of its pronouncements but will either concede its validity or be forced to develop some difficult alternatives.

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## Educational and Professional Concerns

### LEARNING DISABILITIES AND HANDICAPS

by Gilda Berger. 1978. Franklin Watts, Inc. (730 Fifth Avenue, New York 10019). 86 p. \$4.90.

*Learning Disabilities and Handicaps* assumes greater importance to all teachers as a result of the recent change in public attitudes about the mainstreaming of the handicapped students in the public schools. All teachers have a much greater

likelihood of having handicapped students in their classes. It is important that science teachers be able to recognize learning disabilities and physical handicaps not only to promote effective learning, but also to provide the necessary safety precautions in laboratory science courses.

Learning disabilities are separated by Berger into the educable retarded, and the emotionally disturbed. Physical disabilities are speech and language impairment, hearing impairment, visual impairment, and physical handicaps. Each disability is illustrated by a short case study of a student who has successfully coped with the disability. In addition, characteristics of the disability and how professionals have treated it are described well.

The book apparently is designed to provide teachers with a cursory overview of the world of the student with disabilities. Diagrams of the anatomy of the eye and ear would have improved the author's description of the maladies of these sense organs. The book can be easily read in an evening and should be on the professional reading list of all teachers.

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## Evolution

### UNDERSTANDING EVOLUTION

by E. Peter Volpe. 1977. William C. Brown, Publishers (2460 Kerper Avenue, Dubuque, Iowa 52001). 220 p. Price not given.

Eleven years of use attest to the value of this volume. In these lucid few pages the author concentrates on the causal rather than the historical aspects of evolution. Darwin is dealt with in about ten pages and Lamarck in one, with the rest of the volume concerned with modern observations and experiments dealing with evolutionary theory. This book is “must reading” for those whose knowledge of evolution is still basically concerned with evidences and who regard evolution as essentially Darwin-centered. The text is comprehensible by an intelligent layman and its emphasis proper in the latter quarter of the 20th Century. Volpe is not concerned with debating the existence of evolution but, rather, the reader is led through evidence for a variety of explanations of evolution.

One also observes the destruction of a number of myths concerning the process. To those who still believe mutation is a rare event, evidence is presented to substantiate that at least 75 percent of all human offspring contain at least one newly mutated gene. To those con-

cerned with the great reaches of time required for new species formation, Volpe introduces them to cataclysmic evolution as exemplified by the origin of wheat species. Those who feel competition to be nature's rule are introduced to coexistence.

In terms of 20th Century knowledge, evolution is defined as changes in the genetic composition of a population with the passage of each generation. This definition allows focusing upon modern evidence for mechanisms rather than on the laborious piling up of data to demonstrate the validity of evolutionary theory. This book should be available in every classroom to serve as a clear and simple reference concerning the views of the modern biological community concerned with explicating the “how” of evolution.

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## General Biology

### PATTERNS OF LIFE

by Bradley T. Scheer. 1977. Harper and Row, Publishers (10 East 53rd Street, New York 10022). 526 p. \$14.95.

The author has designed this book for college biology majors as a general introduction to the study of biology and also for nonmajor students as an overall view of biology. Scheer's aim has been to stress understanding rather than detail and to present facts in such a way that they are not isolated but rather fall into definite and understandable patterns. The author also feels that the book can be used to fit quarter-, semester-, or year-long courses.

The 21 chapters of the book are divided into five parts, the first of which is unique because it begins with nutrition, digestion, cells, transport, metabolism, and regulation. Basic chemistry and feedback and control mechanisms are dealt with in appendices. The author feels that students are more receptive to beginning a course with something familiar like nutrition and digestion rather than basic chemistry. I don't feel that he gains much, if anything, with this approach because he starts out by dealing with classes of organic molecules as nutritive requirements without including any basic chemistry. The second part considers patterns of movement, information, and behavior. Part three on reproduction and heredity, part four on five kingdoms, origin of life, and evolution, and part five on ecology and environment, follow in order. Consideration of plants is not slighted.

Each of the five parts of the book is preceded by several pages of text that provide a "bridge" between sections and introduce the next section. Each chapter begins with a chapter outline and several "goal questions." The latter constitute questions related to chapter content. Chapters end with a summary and a reference list. A glossary is included.

The author covers most of what you would expect in a general biology course, but there are a number of items that it seems to me deserve mention in a modern biology book that are omitted in *Patterns of Life*. These omissions include nondisjunction, amniocentesis, genetic counseling, genetic engineering, recombinant DNA, genetic load, and cloning. Protein synthesis is described very sketchily and without any illustrative material. The information on the origin of life is also minimal and unaccompanied by any illustrations. I found no mention of electrovalence or polarity in the text.

There are very few photographs in the text and some of them are not of good quality and were not well chosen. In general, this book is not attractive when compared to most general biology books. On the other hand the author makes liberal use of drawings and diagrams, many of which are excellent. The author also makes frequent use of historical background information and in so doing creates interest in topics and makes them more meaningful to the reader.

The study guide that accompanies the text includes a study module for each chapter. Each module consists of a statement of aims, a list of prerequisites, a pretest, instructional or behavioral objectives, a programmed learning section which is very well done, and a post-test with answers. Among some 50 or 60 study guides I have examined this one stands out, in my estimation, as clearly the best.

The instructor's manual includes a 14 page introduction to teaching biology, which draws on the author's extensive experience. For each chapter in the text there is a corresponding section in the manual that includes aims, organization, teaching approach, experiences or visual aids, and evaluation. The latter includes short answer, matching, and multiple choice questions. This is one of the best instructor's manuals I have seen.

Although some of the sequences and emphases presented in the text are not those I would personally prefer, the combination of text, study guide, and instructor's manual constitute an excellent teaching-learning package that many instructors should find appropriate.

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## EXPLORATIONS IN BASIC BIOLOGY

by Stanley E. Gunstream and John S. Babel. 2nd ed., 1978. Burgess Publishing Company (7108 Ohms Lane, Minneapolis, Minnesota 55435). 260 p. \$8.95

Laboratory manuals tend either to emphasize the process or the content of a given science. *Explorations in Basic Biology* fits firmly in the latter category. Though Gunstream and Babel occasionally direct the student to hypothesize, they are convinced that the laboratory work in an introductory biology course should confirm the concepts biologists generally accept. The authors tell students what to do, prepare them for what they will observe, and provide blanks where these observations can be recorded.

If users can accept the "do-it-this-way approach," Gunstream and Babel, teachers at Pasadena City College, have prepared an uncluttered, streamlined guide to laboratory activities. Every major idea of biology is touched on. Though plant and animal physiologists, anatomists and histologists, geneticists, and ecologists may criticize the brief treatment these areas of the field receive, *Explorations* lives up to its title and purpose. Each exploration has clear directions for the major activity and refers to several related demonstrations, many of which feature live material. On the whole, the activities strike a balance between the simple, traditional exercises (detecting starch in leaves, dissecting the crayfish) and more elaborate investigations (extracting and fertilizing sea urchin eggs, measuring the oxygen consumption of a mouse).

Background reading introduces each exploration. By providing this supplementary information, Gunstream and Babel give their manual maximum flexibility. Investigations are complete in themselves allowing teachers to arrange the sequence to suit their courses. *Explorations* can be used with any general biology textbook since the context for each activity is provided. The authors show themselves to be well acquainted with the biological ideas and processes these procedures illustrate.

Inevitably there are things that irk and things that please. There is no glossary, for instance, and some terms—mid-sagittal or ctenoid, for examples—are not defined. References to the frog's rib cage are disconcerting. But the drawings are superb, labels carefully placed, objectives clearly stated, and directions simple and clear. Many procedures are illustrated with flowcharts.

A class set of this college-level survey

of laboratory investigations will find frequent use in the high school biology classroom.

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## THE BIOLOGY OF PEOPLE

by Sam Singer and Henry Hilgard. 1978. W.H. Freeman and Company (660 Market Street, San Francisco, California 94104). 549 p. \$15.

This is a textbook designed for the college general biology student but most definitely can be understood and appreciated by any interested layperson.

It is divided into three main parts—the Human Species, the Human Machine, and Human Genetics—all of which have an underlying theme of evolution. It is this theme and its development that makes the book unique and interesting.

Also, many of the illustrations are not typical of most biology textbooks and are as diversified as a modern photomicrograph of a human lung and an illustration from a 1707 textbook on the human body. Each chapter has a summary and selected readings making the book a most useful reference tool.

The transition from humanity's earliest traces (i.e. Richard Leakey's discovery of Homo 1470) to the genetic manipulation research of today is done smoothly and lucidly. The authors continually interject the most recent research and events with past knowledge producing an unbelievably interesting textbook. This is perhaps best illustrated in the chapter on Human Ecology and the side effects of controlling infectious diseases or even more compelling, the chapter on immunity and allergies in connection with the IgE antibodies.

In any area, however, it is a book I highly recommend for high school biology students and college students as a reference.

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## BIOLOGY: ITS PRINCIPLES AND IMPLICATIONS

by Garret Hardin and Carl Bajema. 3rd ed., 1978. W. H. Freeman and Company (660 Market Street, San Francisco, California 94104). 790 p. \$16.

This is another introductory biology textbook and although similar to most it has some refreshing differences. The book is oriented more for the nonmajor and yet contains sufficient material for a major's course.