

and complex terminology. Rarely is the student confronted with exciting details of how biologists formulate and test hypotheses. Precise behavioral objectives, not available to the reviewer, would add considerably to the thrust of the scripts.

In summary, these scripts are of above average to average quality and could serve a useful function in existing or developing audiotutorial biology programs.

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LIFE: ACTIVITIES AND EXPLORATIONS, by Eleanor R. Fabiano and Eunice S. Liberson. 1975. Houghton Mifflin Co., Boston. 495 p. \$4.98 (school price).

This biology textbook is not only very readable but stimulating and refreshing in its approach. The first unit captures the interest of the student by dealing with behavior—the whole individual, and then the authors build on this interest in the following units by looking within the individual and concentrating on the cell and mechanisms of life. The lab activities are integrated with the text and worksheets utilize the question-and-answer format. In most cases, the questions lead the student to broad concepts and are combined with such skills as making careful observations, recording data, and even designing experiments.

The open-ended ideas presented in "Research You Can Do" are especially good and in most cases introduce the student to current books, ongoing research, and some current social issues. The basic biological techniques—using the microscope, making wet mounts, the dissection of the frog—are skillfully presented and clearly illustrated. Also deserving of praise is the "Use Your Wits" section at the end of each chapter. These problem-solving activities are easily adaptable to many levels of difficulty and serve as a valuable resource for test questions. The appendix contains a useful "Careers in Health" table and a badly needed "Biology Hall of Fame."

Noticeably absent are the use of biological terms (almost to a fault) and in-depth explanations, which enhances the book's suitability for terminal science students and those not exposed to K-12 science programs.

The chapter on genetics lacks any mention of pedigree, Mendelian mechanisms of inheritance, and genetic technology and its implications; but the material on behavioral studies and on the brain—topics not usually scrutinized in books of this type—compensates. The last unit, on preventative medicine, lacks luster and substance. The issues of drugs, alcohol and tobacco are not included as teen-age health problems. Had these issues been included and ex-

amined objectively and in combination with values, a meaningful learning experience would have been provided. As it is, the unit belongs at the end of the book.

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### Periodicals

BIOLOGY DIGEST. Vol. 1, Issue 1, September 1974, and Issue 2, October 1974. 199 p. and 187 p., respectively. Data Courier, Inc., Louisville, Ky. 9-issue subscription \$75; \$10 per single issue.

*Biology Digest*, a new publication, has been designed to keep the educated layman and the biology teacher abreast of recently published materials in the biological sciences. It contains digests, or abstracts of articles, appearing in numerous publications ranging from the sophisticated scientific journal (*Scientific American*, *Science*) to the nonscientific publication (*Time*, *Prevention*, *New York Times*, *Washington Post*)—several hundred in all. Neither the scientific sophistication nor the brevity of *Biological Abstracts* is attempted by the editors.

Each abstract is placed under one of the following general headings: Plant Life, Living Systems, Micropopulations, Biosphere, Health Science, Biogenesis and Development, Animal Kingdom, and General Topics. An index based upon keywords identifying the main themes of an article assists in locating each abstract. This keyword index is not divided according to the eight major divisions of the publication, a feature which should prove helpful if included in future issues. An index listed according to publications represented would also be a valuable asset. An author index is included.

Each issue contains two special feature articles—one on a biological topic of interest, the other reviewing a life science career; a list of publications received for each issue (without addresses); and four or five unsigned book reviews. Whether these features actually contribute to the central purpose of *Biology Digest* or simply serve as a marketing device will have to be decided by the reader.

The brevity of each abstract (approximately 300 words) and the excellent writing style provide for interesting and easy reading. I found it difficult to put these issues down once I began reading and was surprised at how many of the over 550 reviews were of immediate value. My biggest disappointment was that several reviews which happened to be of particular interest were listed as having anonymous authors. Not only was it disappointing but, I believe, inconsistent with the standards of profes-

sional reporting to which a publication like *Biology Digest* should aspire.

*Biology Digest* does not pretend to appeal to the researcher, but will be of interest to the secondary school and college student and teacher, as stated by the publisher. Its high quality appearance, general interest reviews, attractive functional format, and non-technical terminology will also appeal to many persons outside of the formal classroom. The primary drawback to wide use beyond the school or departmental library will be cost. If such an amount is to be spent on the latest biological information, one must consider that a similar expenditure will also purchase annual subscriptions to several special-interest scientific journals of high quality.

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### Genetics

THE EXPERIMENTAL GENETICIST: AN INTRODUCTORY LABORATORY MANUAL, by P. Saint Lawrence, J. W. Fristrom, and W. H. Petri. 1974. W. H. Freeman and Co., San Francisco. 118 p. \$4.95.

This high-power collection of genetic experiments has been developed at the University of California, Berkeley. The authors gratefully acknowledge assistance from a number of friends who have also formulated packets of genetic experiments and from several teaching assistants who helped eliminate the "bugs."

The manual is geared to juniors and seniors with a minimum of two quarters of biology, a quarter of genetics, and two quarters of organic chemistry. Some will have taken courses in biochemistry and statistics as well. Strangely enough in view of the prerequisites, the authors state that the majority of the students have had very little previous laboratory experience in biology.

Their objectives for the course are laudable for, as they observe: "These experiments have been chosen because we believe that each presents a significant concept, experimental design, or technique that has contributed to the development of modern genetics." A ten-page section is devoted to the descriptions and life histories of the objects to be studied. Included are bacteriophages, *Bacillus subtilis*, *Escherichia coli*, *Salmonella typhimurium*, *Neurospora crassa*, *Saccharomyces*, *Drosophila*, and *Tribolium confusum* and *t. castaneum*.

At Berkeley each laboratory section is made up of 20 students who work in pairs. Several of the 23 experiments are required of everyone and the students may choose a certain number from the remainder. Some of the experiments are quite expensive, for they require costly

sophisticated apparatus and materials as well as a considerable amount of preparation by technicians and laboratory assistants.

The following incomplete list of experiments gives an inkling of the nature of the laboratory studies: conjugation in *E. coli*; genetic complementation; immunological methods in proteins; poky *Neurospora*; mapping genes in phage by deletion methods; transduction in *Salmonella*; use of radioactive isotopes. A four-page appendix deals with the use and detection of radioactive isotopes.

Separates and a 139-page "Instructions to the Instructor for the Experimental Geneticist" are available from the publisher.

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**THE ETHICS OF GENETIC CONTROL**, by Joseph Fletcher. 1974. Anchor Press/Doubleday, New York. 214 p. \$1.95 (softback).

The author has attempted to provide some answers regarding the new technology in genetic engineering and reproduction of humans by means other than the old, reliable (or perhaps unreliable) method. He suggests that this book goes beyond the usual book on these topics because, while other authors seem to be asking the same questions, they are not suggesting any answers. If you agree with Fletcher in this respect, you probably should read this book. You will then find that many answers have been proposed by Fletcher and others from the fields of biology, medicine, philosophy, and religion. The topics range from abortion to artificial insemination and from altering DNA molecules so that individuals can be improved to permitting death of other individuals who have heredity defects. But having read the book, you may still be confused as to which course is best for mankind to follow in these areas.

In reference to modern advances in medicine and biology, Fletcher states, "Just because something is a fact or could become a fact does not mean necessarily that it is good or right." For example, until recently, children born afflicted with Down's syndrome (mongolism) often died young due to anatomical defects such as perforated anuses or stomach blockages. Today, however, surgical techniques can often prevent such deaths, and thus the number of adults afflicted with this genetic disease is increasing. When such adults reproduce, the disease is very prevalent among their children. Down's syndrome is only one example of many genetic defects which can not at present be "cured," but which can be treated to permit survival of the individual through the reproductive stage

of adulthood. As our gene pool becomes more and more polluted by deleterious genes and chromosomal abnormalities, it will become more and more difficult for our species to survive. The statement by other authors that man is on the list of endangered species may be more factual than most of us would care to admit. Fletcher puts it quite aptly when he says, "Heredity plays a part in more than fifteen hundred diseases, and many of us are carrying time bombs—just waiting to explode with the right sexual combination, and as time goes along the chances are greater and greater." (Some sources put the number of known genetic diseases in humans at more than two thousand.)

There are some instances of over-simplification and a few errors which most readers who have studied introductory genetics should be able to recognize. For example, on page 50, in a discussion of transmission of a fatal condition which is caused by a dominant allele, Fletcher quotes a physician who said, "You could wipe out this disease within a generation, even without a cure, if the affected persons simply stop having babies." Of course, even if all of the affected persons abstained from having children, one would expect the allele to arise spontaneously in other individuals through mutation. The above quotation should not have gone unchallenged by the author for the sake of those readers who do not understand elementary genetics. Also, on page 71, we find "A fertilized ovum or zygote is extracted from the oviduct and the fertilizing done in vitro."

In general, I would recommend this book because it contains many thought-provoking ideas. It should provide stimuli to motivate even the most reluctant high school or college student, and it could be considered for use in health, social studies, and family life courses as well as for courses in biology. But you should read the book and consider possible negative reactions in your community before assigning it to your students.

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**FOUNDATIONS OF GENETICS**, by Anna C. Pai. 1974. McGraw-Hill Book Company, New York. 386 p. \$10.50.

During the last 5-10 years scientists have become increasingly aware of a need to interpret to the layman the results and implications of their research. This is particularly true for the biological sciences, of which perhaps the present and contemplated research in genetics bears the greatest social responsibilities. In answer to the problem of better communication between the geneticist and the general citizen, Anna C. Pai has produced a timely and use-

ful book. Although intended primarily for nonscience students and adults in continuing education, the book should be equally useful in any course concerned with social implications of genetics and the responsibilities of scientists and other citizens.

The author has intentionally used an informal and nontechnical style which, nevertheless, adequately encompasses the basic principles of genetics. As a result, many teachers may wish to use the book as a basic text or as a supplementary reader in an introductory genetics course for science majors. Problems relevant to man receive a primary emphasis in the textual discussions and in the illustrations.

The first 8 chapters contain discussions of the basic principles of genetics. Chapters 9-15 are concerned with matters relevant to both the scientist and the nonscientist, including such topics as the genetics of immune reactions, viruses and cancer, chromosomal mutations, genetic basis of evolution, and radiation and chemical mutagenesis. In a last chapter, "Now and to Come," the author asks questions which at present have no answers, but which must be asked now. Here the discussion is forthright and technically correct; and it is without the emotional, exaggerated pessimism which often accompanies such discussions.

Best of all, the book is good reading! Students and teachers will enjoy it.

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## Microbiology

**BIOLOGY OF MICROORGANISMS**, by Thomas D. Brock. 2nd ed., 1974. Prentice-Hall, Inc., Englewood Cliffs, N.J. 852 p. \$15.95 hardback.

For years biology teachers have referred euphemistically to the purchase of expensive textbooks by students as "the beginning of your library." In this case, the euphemism is justified. This improved and expanded edition would serve as an excellent reference book for persons loosely associated with microbiology as well as a good foundation for persons having this major interest. The promises of the author in the preface are kept: pages have been updated and improved and many new illustrations and diagrams have been included. The expanded areas reflect the results of microbial research in the last several years as well as the new taxonomic treatment from the eighth edition of Burgey's *Manual*. The reading lists have also been updated and a glossary has been included to refresh the reader's definition of terms.

As might be expected, the book is extremely well written and complete. It is this completeness which may not be advantageous in all situations. The