

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