

now know that many soil organisms secrete antibiotics and growth inhibitors to other organisms and in other cases complete or modify pathogens. Examples of some specific biological control practices mentioned in detail in the book are: 1. Nematode control—These tiny worms cause many root diseases or damage the roots of many plants. It is possible to encourage the growth of particular soil fungi that control specific nematodes; 2. Mycoviruses—It is possible to activate specific viruses that attack fungi that are pathogens; 3. Bacterial control—Crown Gall tumors can be prevented by inoculation of the root stock or seeds of susceptible plants with a bacterium that blocks the crown gall bacterium; 4. Soil amoebas—It is possible to activate some soil amoeba that attack pathogenic fungi. Some of the fungi (rust, mildew, blight) are economically very important pathogens; & 5. Genetic manipulation—It is now possible to create new antagonists in the laboratory that will attack serious pathogens.

The book also discusses possible control of many diseases that have been disastrous in some locales: Chestnut blight, Dutch Elm disease

and avocado root rot. This is an expensive book but is considered a basic book for the most recent information on biological control of pathogens. There are more than 1,100 references on the state of the knowledge in this field. The book would be an excellent reference book for farmers, organic gardeners, and biology teachers desiring recent information on this important subject.

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CLASS EXPERIMENTS IN PLANT PHYSIOLOGY

by Hans Meidner. 1984. Allen & Unwin, Inc. (9 Winchester Terrace, Winchester, MA 01890). 167 p. \$35.00 hardback, \$15.00 softback.

Class Experiments in Plant Physiology has been written as a *source book* of technical information for teachers aiming to carry out class experiments. The experimental topics range from physicochemical processes to enzyme and hormone mediated biochemical changes at the cellular and whole plant levels, covering most subdivisions of plant physiology.

The book has been well written

with the aim of providing instructors with tested experimental procedures from which they can select appropriate experiments fitting their teaching programs. The book has three major divisions:

Part A contains basic topics, namely the system of units used in this book, descriptions of common laboratory reports and diagrams of apparatus, as well as procedures for collecting, growing, and preparing plant materials for physiological experiments.

Part B contains accounts of experiments, grouped under 11 headings. The style of presentation is somewhat concentrated to fit the subject matter into the available space, but also leaves teachers to prepare their instructions or experimental schedules for their classes in their own style. Where appropriate, relevant anatomical studies have been included so that the unity of structures and function can be emphasized.

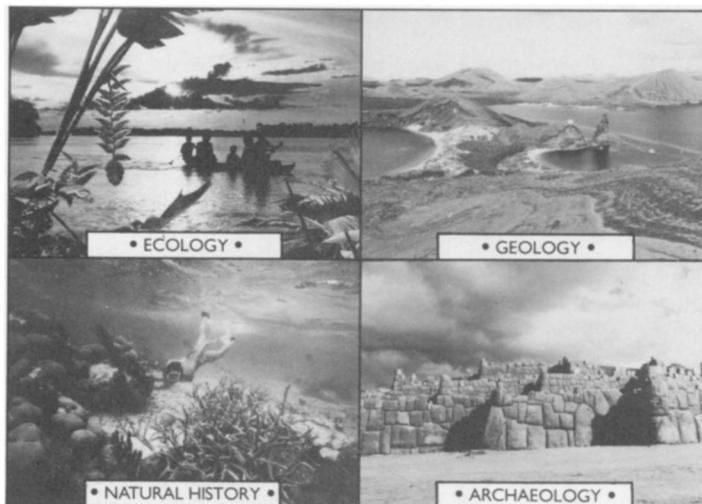
Part C is in the nature of a technical directory. It contains formulae of those reagents and other preparations which are common to many experiments, addresses of suppliers of specialist materials referred to in the experimental accounts, and addresses

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of those colleagues who have contributed to this book.

The way instructors take the information from this source book and use it in their classes would vary with the nature of their course.

I would recommend this book for college plant physiology instructors.

Henry J. Bindel, Jr.
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PLANT REPRODUCTIVE ECOLOGY
by Mary F. Willson. 1st ed., 1983.
John Wiley & Sons (605 Third Ave.,
New York, NY 10016). 241 p.
\$35.00.

This small volume consisting of an introduction, 4 chapters, epilogue and summary, and index, is useful chiefly for botany (biology) teachers, graduate students, and an occasional alert and advanced undergraduate, but it is not recommended for high schools. The four chapter headings are: (1) life histories, (2) sexual systems, (3) mating, and (4) offspring. The various genetic, physiological, and ecological factors involved in plant reproduction are discussed in a way which indicates their mutual impact on the cost and success of the reproductive effort.

Discussions are imaginative, succinct, and often include suggestions for following up provocative ideas and unsolved problems. It could be a very useful source of ideas for research on various facets of plant reproduction.

The extensive bibliographies cited at the end of each chapter are excellent, and one of the most valuable attributes of the book.

The price seems high for the size of the volume, but in view of its limited market and inflation, it is justifiable to publish a discussion of this quality at a somewhat greater cost.

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ECOLOGY

OUR NATURAL RESOURCES

by Harry B. Kircher and Donald L. Wallace. 5th ed. 1982. Interstate Printers and Publishers, Inc. (Danville, IL 61832). 412 p. \$12.50 hardback.

This fifth edition starts with the premise that natural resources have been the foundation of America's greatness. Recent resource shortages and ecological disasters have

awakened us to the continuing dependence of our entire economy upon the natural resource base. The schools, therefore, are committed to train our nation's youth as custodians of their natural resource heritage.

Addressed to the high school or undergraduate student level, the book also appeals to any individual with an interest in this topic. It analyzes the basic resource position of the United States, suggesting future alternatives. It appraises with authority the past, present, and future of the entire spectrum of natural resources—the variety of kinds of energy sources, the nonfuel minerals ("muscles of the iron age"), forests, soils, and human resources. This edition retains the emphasis on agriculture since two-thirds of all businesses hinge upon agribusiness. The book enhances the technical presentation with interesting historical perspectives on origins, early uses, and the evolution of more efficient production and exploration techniques.

Constructive and realistic, the book delineates principles and practices of resource management through restoration, conservation, and improved or expanded exploration and resource recovery. It conveys none of the hopeless desperation which characterized typical books on resources in recent decades. It acknowledges signs of recent progress in relation to man's requirements.

Inviting and attractive, the concise organization of a comprehensive coverage enhances its potential as a textbook. More than 120 photographs capture the appeal of the natural world. Study questions and problems follow each chapter. It offers an effective vehicle for teaching long-range resource use and management.

The book is easily readable with quotable persuasions supported by interesting, convincing statistics. It also recognizes the technological, economic, and social problems that ensnare industrial development in specific areas, such as the use of nuclear energy. In this book, the authors improve upon the prior edition, which had become a classic in schools and libraries across the nation.

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THE FATE OF THE EARTH

by Jonathan Schell. 1982. Avon Books, a division of the Hearst Corporation (959 Eighth Avenue, New York, NY 10019). Avon paperback \$2.50. Knopf hardback \$11.95.

The threat of nuclear weapons to the security of mankind has been present since the first test of an atomic bomb on July 16, 1945. It is a menace which most prefer not to discuss or even think about, but which Jonathan Schell addresses directly in his book, *The Fate of the Earth*.

Schell's book is divided into three sections, each of which covers a different aspect of the nuclear peril. The first, "A Republic of Insects and Grass", is a well written, factual, and detailed explanation of the history, physical principles, and past effects of nuclear weapons. It begins with the simple concepts of the energy of the atom. Subsequently, the history of atomic weapons is discussed, and the two known uses of nuclear bombs against human populations, Hiroshima and Nagasaki, are presented in gruesome detail. Finally, the possible effects of a full scale attack are examined. Schell offers data of the fatal doses of radiation for various organisms, and shows that those with the highest radiation tolerance level are the insects and grasses. This leads to his conclusion that after a major attack, these would be the only surviving forms of life.

In the second section, entitled "The Second Death", Schell moves into the purely philosophical realm, discussing extinction and the "modest hopes of human beings which would be nullified by a nuclear holocaust." This section is verbose, considerably slowing the rapid pace set by the preceding chapter. Often it seems as if Schell is simply redefining extinction on each page. In fact, I found that when I read a paragraph in this section and turned 40 pages ahead, I found essentially the same statements. The book insists on our present "obligation to unborn generations," yet gives little reasoning for this except that since our generation was brought forth on the earth, we should in turn assure future generations a similar opportunity.

The final section, "The Choice," discusses primarily the political and social problems manifested by nuclear weapons. Deterrence, a major factor in preventing nuclear holocaust in the present world, is analyzed in detail. Schell speculates on the future with and without arms limitations, and the possible effects on escalating arms production on a worldwide scale. The most important concept in this section is the altered complexion of war in modern society. This may be the most valid argument in the entire book, stating that formerly war was a