

later. To be effective, the professor is also requested to indicate to the student the card numbers that are pertinent to his presentation. An index which is provided to the cards becomes useless as soon as the cards are removed and reshuffled according to instructions.

The question is whether the gap exists that these two volumes are designed to fill and, if so, if the medium isn't far more cumbersome than the message. It is, however, an intriguing idea which some may find worthy of exploration.

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**INTRODUCTION TO CHROMATOGRAPHY**, Bobbitt, Schwarting, and Gritter, 160 pp., \$3.95, Reinhold Book Division, New York, 1968.

The title of this paperback book is correct. There are more compendious and also more weighty volumes on chromatography and there may be simpler ones. But this is a good introduction. It achieves its purpose by limiting its aims. After briefly outlining the field, the authors restrict themselves to three of its sectors: column chromatography, thin-layer chromatography, and gas-liquid chromatography. The presentation is direct and clear. The reader must have some acquaintance with general chemistry, but little that applies directly to chromatography itself is left unexplained. The emphasis is upon techniques and there is a minimum of theory. An abundance of data tables and of illustrations smooths the reader's path. The illustrations are nicely balanced between photographs and line drawings. A short bibliography and a list of suppliers precede the index.

In high school biology, paper chromatography has usually been employed and sometime, column chromatography. Except for an occasional sophisticated science fair project, thin-layer and gas chromatography are not in the high school repertoire. There is little to indicate any imminent change in this pattern. Nevertheless, this book may be of value to the high school biology teacher, not merely as a reference for aiding a rare explanatory student but, more importantly, as background for understanding some of the technology that lies behind so many reports of current research.

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### FIELD BIOLOGY AND ECOLOGY

**CONSERVATION YEARBOOKS**: No. 1 (1965), *Quest for Quality*, \$1.00; No. 2 (1966), *The Population Challenge*, \$1.25; No. 3 (1967), *The Third Wave*, \$2.00; No. 4 (1968), *Man . . . An Endangered Species?*, \$1.50; No. 5 (1969), *It's Your*

*World*, \$2.00. U. S. Government Printing Office, Washington, D.C. 20402.

Government documents have not, historically, been the most exciting publications in the world; and the first report of the Secretary of the Interior was no exception. Secretary Ewing covered "Public Buildings, Patent Office, Agricultural Bureau, Pension Office, Public Lands, Mineral Lands, Route to the Pacific, and Indian Affairs" in fifteen unillustrated pages of unglowing declaration, published with no fanfare on December 3, 1849. In his wildest dreams Thomas Ewing could not have imagined what the "Home Department's" special reports to the American public would look like only a little over a century later!

The Conservation Yearbooks, published annually since 1965 by the Department of the Interior, are spectacular portrayals in color and black-and-white photographs, picture essays, and well written text of, generally, conservation problems facing the nation, and, specifically, the yearly endeavors of the Department's various bureaus such as Outdoor Recreation, National Park Service, Geological Survey, Land Management, Reclamation, Sport Fisheries and Wildlife, Commercial Fisheries, Water Resources Research, Indian Affairs. . .

From the biology teacher's standpoint, these 9x12 paperbacks should prove most valuable as students browse in classroom, library, or office; and perhaps they should be obtained at least for this purpose. The initial response will be to their esthetic quality—a poor man's Sierra Club series. But there is a newsworthy essence to the various departmental operation reports—Willamette River Basic clean-up (1968), completion of eleven Bureau of Reclamation dams (1966), reintroduction of masked bobwhites in Arizona (1969); a provocation in some of the special features—a community conservation checklist (1969), "A Rationed Tomorrow" (1966), "Road to the Future" (1965); and a literary flavor in some of the picture essays—"The Grassroots Conservation Story" (1969), "Man Was Here. . ." (1966)—which needs to be shared with students and teachers in the English Department.

If you obtain these yearbooks, don't file them with Ewing's report to gather dust. After you and your students have dog-eared them, leave them in your family doctor's waiting room, to spread the gospel.

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**RACE AGAINST FAMINE**, Melvin A. Bernarde, 97 pp., \$4.75, Macrae Smith Company, Philadelphia, 1968.

This book presents a clear, direct statement concerning the problem of population increase in relation to food

production. The growth of population is graphically presented in simple, easy-to-read charts and graphs in the chapter, "The Curves Tell the Story."

The Food and Agriculture Organization (FAO) has estimated that food supplies in underdeveloped countries will need to be increased by 80% by 1975 and almost 300% by the year 2000 if improved levels of nutrition are to be achieved.

The author explores the problems of protein deficiency as seen in so many places in the world, indicating its relationship to general malnutrition. Through the work of INCAP, a protein-rich food supplement of cottonseed flour and whole-cooked corn, with yeast, CaCO<sub>3</sub>, and Vitamin A, and called Incaparina, is gaining acceptance in Central America. Other protein-rich food supplements, such as Laubina, FPC (fish protein concentrate), and soy products are discussed in terms of their use in meeting the needs of protein-starved populations.

Bernarde also discusses the possibility of greater use of the oceans as a food source and the attendant problems of refrigeration, transportation, and marketing in underdeveloped countries. Fish farming is acclaimed as a quick and effective method of increasing protein production. Improved agricultural methods, increased use of fertilizer, and use of improved seed show great promise and have already greatly increased yields in areas where they have received adequate testing. Getting people to try new foods, although better nutritionally, runs into difficulty because of customs, taboos, and just plain dislike for anything unfamiliar.

The book, although short (87 pages plus a good index), is well written, easily understood and well documented. It would be excellent for biology students and teachers concerned with problems of population explosion and insufficient food supply.

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**NATIVE SHRUBS OF THE SAN FRANCISCO BAY REGION**, Roxana S. Ferris, 82 pp., \$1.75, University of California Press, Berkeley, 1968.

**DEEP-WATER FISHES OF CALIFORNIA**, John E. Fitch and Robert J. Lavenberg, 155 pp., \$2.25, University of California Press, Berkeley, 1968.

These guides (No. 24 and No. 25 of the California Natural History Guides) like the others in the series, give the names of the organisms, with some information about each and line drawings and colored prints of many of them. Intended for field observations these small paperback books can be carried in a coat pocket.

High school and college teachers new to the area will find the guides an ex-

cellent means of getting acquainted with the local flora and fauna. For the serious student of systematic biology, these books include very good references to the more technical studies. The books will perhaps find their best use as field guides for students who wish to extend their classroom experiences in the biological sciences.

This reviewer has found all 25 guides in the series helpful and enjoyable.

Betty Wislinsky  
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San Francisco College for Women

UNDERSTANDING ECOLOGY, Elizabeth T. Billington, 87 pp., \$3.95, Frederick Warne and Co., New York, 1968.

This volume, a useful supplement to a junior or senior high school biology course, considers ecosystems, balance of nature, biosphere, the biomes of the world, communities, habitat and niche, energy, and food cycles, and biogeochemical cycles. Suggestions for a few observation activities are included, along with instructions for record keeping of observations. Rather than a glossary, the index refers readers back to the text page where the term is defined in context, certainly a sounder educational method than the usual separate glossary. Diagrams are clear, and the photographs—many of them from the American Museum of Natural History—are of good quality.

H. G.

AMERICA THE BEAUTIFUL, Gary McFarland, (Recording), \$4.95, Skye Recording Co., Ltd., 40 W. 55th St., New York 10019, 1969.

A recording of a symphonic piece composed by McFarland in the jazz idiom. The composer has taken the theme of man's destruction of his environment and composed 6 sections of music. The music is listenable, and would be interesting without a program. There are occasional hints of theme-music connections, however. An interesting aspect of teaching conservation and available at a reduced rate (above) to members of NABT.

FROM SEA TO SHINING SEA. The President's Council on Recreation and Natural Beauty, 304 pp. \$2.50. The Superintendent of Documents, U.S. Government Printing Office, Washington, D.C., 1968.

An abundance of well-selected black-and-white photographs makes this book a better mirror of the present face of America than one can obtain elsewhere at several times the price. Further, if one can tolerate an aseptic official prose style, the letterpress provides much information concerning still small—but rather numerous—efforts to cope with the impact on the American landscape of a large mass of perhaps natively untidy primates furnished with impressive energy resources.

What has something created by a "Council on Recreation and Natural Beauty" to do with biology? Very little—at least directly—with most of the biology now being taught in classrooms. There are no crayfish exopodites, though the litter of exurbanites receives attention; there is no DNA, though the TVA is present; there are no mitochondria, though perhaps some occasion for hypochondria. Even the teacher with a "whole organism" background may at first be puzzled. Nevertheless, the book is essentially an essay in ecology. Twelve different variants of that term occur in the index, together with thirteen forms of the term "environment." For the report of the Council is really not concerned directly with recreation and beauty. Rather it is concerned with the conditions in which a true recreation of human beings can occur and from which beauty can develop. One of the numerous quotations (this one from R. F. Dasmann) makes the point: "Beauty is order, it is health, it is diversity, it is function. The opposite of beauty is disorder, disease, monotony and malfunction."

Yes, this is a biology book. If it seems a link with your social studies department, so much the better for both of you.

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