tion of tribal homelands, topography, soil, or the suitability of regions for colonization and agriculture. No environmental appraisal was commissioned before the construction began, and none has been officially published since.

This book makes a valiant attempt to fill the void. The scope of the subject matter is enormous. There are chapters on deforestation and agriculture, epidemiology, Amerindians, fauna, vegetation, and industrial development. While reviewing nearly 400 references the authors are unavoidably drawn into some superficial, though nonetheless largely accurate, accounts of topics that are far removed from their own professional experience. I was especially aware of weaknesses in the chapter on fauna, the one I am best qualified to judge. No doubt experts on, say, tropical agriculture or public health would make similar remarks about the treatment afforded their fields.

Though the book is pervasively critical and negative, it does make an effort to point out viable long-range alternatives to the government's strong-arm development tactics; for example, selecting locations for colonization on the basis of soil quality, planting mixed gardens instead of monocultures, managing game and timber resources for sustained yield, "refining" forests instead of clear-cutting them, using trunks for timber, pulp, or methanol production instead of burning them, concentrating on pisciculture rather than cattle growing, avoiding regions of disease endemism, and honoring the constitutional rights of the Amerindians.

To live at equilibrium with nature and its cycles one has to think small, and that, regrettably, is anathema to most politicians. Although little time remains before we have done irreversible environmental damage to much of the planet, it is still a lamentable fact of life that the go-slow-and-be-careful advice of prudent scientists is more than likely to be scoffed at by ambitious and impatient public works administrators. The ultimate irony of the Transamazonian Highway is that even if it fulfills its planned purpose of providing for the accommodation of one million settlers, it will succeed in stalling the clock on Brazil's population bomb by just four months.

As with most environmental impact statements, the book is not to be recommended for light reading. For the environmentally conscious person with masochistic tendencies, it is guaranteed to provide a few nights of insomnia.

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Hutchinson's Botany Volume

A Treatise on Limnology. Vol. 3, Limnological Botany. G. EVELYN HUTCHINSON. Wiley-Interscience, New York, 1975. xii, 660 pp., illus. $30.

In this third volume of Hutchinson's masterly treatise, "botany" embraces all those plants which are not planktonic; the plankton were included in the previous volume ("Introduction to Lake Biology and the Limnoplankton," Wiley-Interscience, 1967). Primary production is also largely excluded since it is to form part of a volume on production by all freshwater organisms. (May one hope that that and the others of the "several volumes" referred to in the preface will not appear, like the first two, at ten-year intervals?) Obviously, production cannot be wholly excluded in an account that includes some 200 pages of the chemical factors affecting it. What is excluded is most of the comparative data about rates of production and sizes of crops.

Much of the book is concerned with classical, descriptive ecology or the natural history of flowering plants and other tracheophytes (ferns, fern allies, bryophytes), though there is much of interest on charophytes and algae. This is no bad thing in these days when interest is concentrated on other aspects, such as modeling, a powerful interpretative tool the enthusiasts for which occasionally seem to be somewhat unfamiliar with the natural world. The subject of limnological botany includes matters that some, like myself, may find boring. An example is phytosociology. One feels sympathy with the qualification appended to Hutchinson's statement, prefacing his treatment of the continental European approach, that "the following presentation is intended merely to show how the system works, or as some may say, is supposed to work." Nevertheless, it is right that phytosociology is included. One wonders whether even so broadminded an author as Hutchinson shares prejudices held by the reviewer, for the Saprobian system, so popular in some parts of Europe, is not mentioned.

There are valuable reviews and discussions on plant distribution with, as usual, the author throwing new light on the subject matter or offering informed speculation, notably in relation to chemical factors. Here too the information in some large works (Swedish ones, for example) is integrated into a clear account. The book is far from being devoted purely to descriptive matter. It deals, for example, with passive and active uptake of dissolved materials, the physical factors controlling the distribution of plants in depth, and the old and much-debated question concerning to what extent the roots of aquatic plants function purely as anchors and to what extent they are important for nutrient uptake and translocation. Frequently Hutchinson mentions unsolved problems, and the book should inspire younger workers to begin the large amount of experimental work that is crying out to be done, even in regard to microscopic plants, which can be relatively easy to handle. To take one example, anyone who has observed, even casually, the changes in an underwater aquatic weed bed over several years is likely to have seen marked changes unrelated to seral transformations from water to land. The information available, judging by this book, offers little explanation for such changes, and, in the main, experimental work is lacking.

Hutchinson takes certain important papers and discusses them in considerable detail to illustrate a given theme. This avoids the indigestible information mass found in many reviews. Any impression that the author is being too selective will be dispelled by a glance at the bibliography, over 700 titles, ranging in date from 1673 to 1973.

A word of praise should be given for the general, lake, and species and genera indexes, some 46 pages in all. I made no attempt to check them in detail, but often something on a page led me to look up an allied matter or name, and the indexes never failed me.

"Wooden boss in the roof of Selby Abbey, Yorkshire, England, presumably from the first half of the fourteenth century, depicting a heterophyllous aquatic species of *Ranunculus* with laminar floating leaves and very finely divided submersed leaves." [From a photograph by C. J. P. Cave, reproduced in *A Treatise on Limnology*, vol. 3, by permission of the Cambridge University Press and the National Monuments Record (England)]

It seems almost impertinent to criticize, if indeed criticism is necessary, someone who can write so well on every aspect of limnology. Doubtless every specialist will have his reservations. Probably it is a mistake to read the book straight through. At times this reviewer's interest flagged, notably as page after page was read about the elemental contents of the plants. One wonders whether we need more than a bibliographical reference to data on yttrium, scandium, neodymium, and the like. It is not obligatory to read everything, however. The information is there if needed.

The book is indeed a mine of information, and one that sparkles with gems of insight and interpretation. Though similar remarks have been made before and may seem trite, one can only say that every limnologist who can afford the book should buy it.

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Pest Control in the People's Republic of China

Nung tso wu pin chung ti ch'ün chung hsing ts'e pao (Monitoring and Forecasting of Crop Diseases and Insects). "Monitoring and Forecasting of Crop Diseases and Insects" Writing Committee. Shanghai People's Press, Shanghai, China, 1973. 317 pp. + plates. Paper, 85¢.

Chih pao yuan shou ts'e (Plant Protection Workers' Handbook). "Plant Protection Workers' Handbook" Writing Committee. Shanghai People's Press, Shanghai, China, 1974. 251 pp. + plates. Paper, $2.05.

Li yung p'ing fu hsiao feng fong chih li chih ch'un hsiang (Use of *Anastatus* to Control Lichee Stinkbug). Kwangtung Institute of Entomology and Biology Department, Chungshan University. Kwangtung People's Press, Kwangchow, China, 1973. 40 pp. Paper, 10¢.

During a trip to the People's Republic of China as a member of the Insect Control Study Group of the Committee on Scholarly Communication with the People's Republic of China (*1*) in August 1975, I acquired over 40 books on economic entomology published since 1971 and some 20 earlier works (*2*). The majority of the books deal with injurious species and are in the form of pictorial guides and handbooks, with information on life history, host relations, and control for each species and in some cases lists of scientific names of insects.

In China books in this field, with a few exceptions, are published by the Scientific Press, the Agricultural Press, or the People's Presses. The first two publishers are national and are located in Peking, whereas the People's Presses are provincial and municipal and the materials they publish are of more localized importance. All these books are available, perhaps only, at the Hsin-hua (New China) Bookstore, which has branch stores in various cities.

Most of the books are paperbound, 18 to 19 centimeters in size. The printing is of good quality, the color plates are excellent, and the prices are very reasonable.

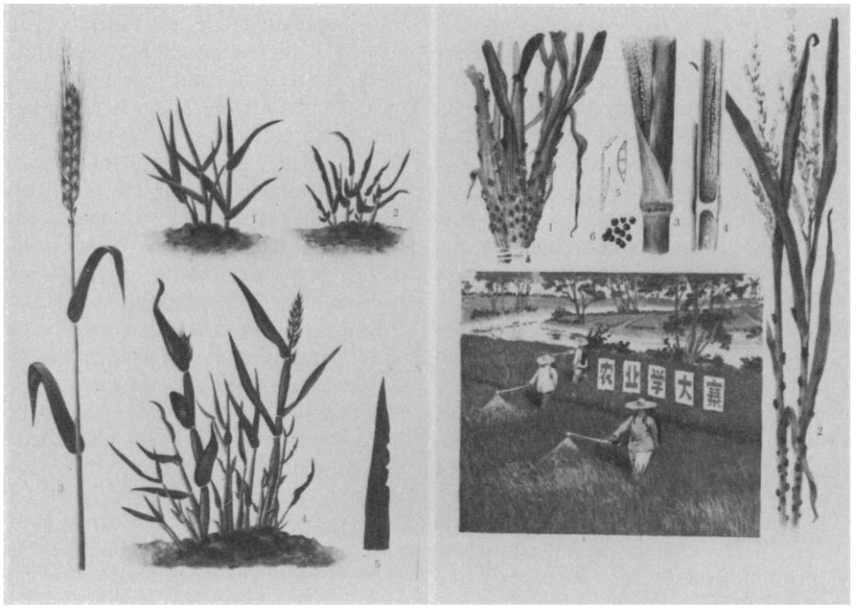
In the last two or three years, more and more of the practical books have been prepared by and are credited to editorial committees rather than individuals. The process of preparation described for "Monitoring and Forecasting of Crop Diseases and Insects" may serve as an illustration.

The editorial committee included producers, scientists, and administrators, representing peasant farmers, plant protection technicians from communes and brigades (the commune is a production unit of thousands of hectares and the brigade a subunit about one-tenth the size of a commune), the staffs of the County Agriculture and Water Bureau and the County Crop Seed Stock Station (the county is a political administrative unit below the province, containing numerous communes), the Provincial Agricultural Research Institute, and the publishing press. Such collaboration ensures that the information in the book meets practical needs and is technically sound and that the measures recommended are administratively feasible. During the preparation of the book field data were solicited from neighboring counties and references and specimens from neighboring provinces were checked. The material was integrated, and before publication drafts were reviewed by all concerned. The entire task had the support of the County Revolutionary Committee (the top political administration of the county).

To illustrate the type of coverage I shall describe this book and two others I acquired.

"Monitoring and Forecasting of Crop Diseases and Insects" deals with methods of identifying fields in which insect control is needed and the time at which control measures should be taken. For rice it covers ten insect pests and two diseases, for cotton eight insects and one disease, for wheat five insects and one disease, for rapeseed one insect and two diseases, for corn two insects, and for green manure crops five insects and one disease. The book contains numerous figures, color plates, and sketches. In many cases forms for recording data are included.

To illustrate the nature of the coverage I shall summarize the treatment of the cotton bollworm, *Heliothis armigera*, which is an important pest of cotton in the United States also. The material oc-



Facing pages from "Monitoring and Forecasting of Crop Diseases and Insects," showing planthopper damage and control measures.