BOOK REVIEWS

FARMING THE SEA

Farming the Edge of the Sea

By E. S. Iverson. Pp. 301. (Fishing News (Books): London, 1968.) 85*s*.

THE importance of the sea as a source of high-quality protein in a world desperately short of protein is increasingly being realized. Some 95 per cent of the food won from the sea, however, is still obtained by hunting, albeit with advanced electronics aids, but with little attempt at husbandry, let alone farming. Many of the advances in fisheries biology of recent years have been in the field of population dynamics, but with few exceptions the application of the results for the benefit of man has been rendered only partially effective by the difficulties of controlling fishing effort in the major international fisheries.

In the light of these problems, and in view of the eminent sensibleness of trying to cultivate marine animals as well as hunting them, increasing attention is being given to artificial rearing and marine cultivation. As soon as the possibilities of marine culture are examined, however, the fundamental differences between the requirements of most marine food animals and those of land food animals become apparent. In the sea most of the important food animals, whether mammal, fish or invertebrate, are carnivores and many are high in the food web, as well as being highly mobile in a three-dimensional environment. As a consequence the culture of marine animals has in the past been most successful with the filter feeding sedentary invertebrates such as mussels, oysters and clams, which stay where they are put and obtain their food from the phytoplankton.

In recent years there has been a considerable increase in the scientific effort to improve traditional methods of cultivation and to develop the artificial rearing of promising species, but the scientific literature on the subject is very limited and scattered and there are few adequate descriptions of current commercial practices. In this situation a comprehensive review of the present state of marine farming would be very welcome.

Farming the Edge of the Sea, by Dr Iverson, a marine biologist at the Institute of Marine Sciences, Miami, only partly fills this gap. The author makes it clear in his preface that he has not set out to give a complete review of the subject or to provide a handbook, but that he is writing for the person who is interested in general books on the sea, and also for that ever-increasing number of people who write in to marine laboratories because they have money to invest and think that rearing some marine fish or shellfish would be lucrative and interesting and want to know what their prospects are and how to go about it.

The book is attractively produced with 158 illustrations, largely of good quality photographs, and is very easy to read in spite of a very considerable amount of detail in some fields.

The early chapters discuss many general aspects of cultivating marine animals, from the broad issues of the demand for sea food and the productivity of estuaries to the details of artificial foods and the role of artificial reefs made from discarded car bodies. The possibilities of improving the strains of fish and shellfish by breeding and selection are also outlined.

About one third of the book is devoted to descriptions of current procedures in cultivating seaweeds, oysters, clams, mussels, shrimps, milkfish and mullet, and includes descriptions of some fisheries in which there is little husbandry, such as the shrimp fisheries of the gulf of Mexico. These descriptions are very variable in their completeness. The Japanese seaweed and prawn culture, the American cultivation of oysters, harvesting of clams and fisheries for shrimps, and the cultivation of milkfish and prawns in the Philippines are fairly fully described. Under mussels, however, only four lines are given to the very successful raft culture which has been operating in Spain for a number of years and which has increased output so greatly that Spain is now the leading producer of mussels in Europe. Similarly, the very successful methods of oyster cultivation in Japan, Australia and France are each covered in one or two short paragraphs, in spite of their advanced nature. There is no mention of the cultivation of yellow tail fish which is now practised on a substantial scale in Japan.

Two chapters discuss the possibilities for the cultivation of a range of invertebrates and vertebrates at present farmed only on a limited scale or not at all, such as sponges, conchs, abalone, bait worms, lobsters, crabs, tilapia, plaice, salmon and trout. Lobsters, crabs and crawfish are dealt with at some length, because the lay person is often hopeful of farming these animals, because of their high retail price, until the particular problems are pointed out.

The concluding chapters give a very general outline of diseases, predation and pollution, and add some hints to the would-be sea-farmer. He is wisely warned against expecting to solve quickly such problems as the mass culture of juveniles in cases where no methods exist at present, and is told that cash reserves are very necessary because quick returns can rarely be expected.

The American reader who has a general interest in the sea and fisheries, or who is considering entering into some aspect of marine cultivation, will find this book of real interest and value. The non-American with similar interests will enjoy reading the book and will get a general view of the subject, but is likely to be disappointed in the lack of more detailed information on what is going on or is possible in his own country. The student of fisheries will find it informative and worth reading, but, with the exception of American experience, will find many of his more penetrating questions unanswered. One annoying feature of the book is that the illustrations often match up with the text in only the loosest way, and in some cases do not illustrate at all the point being made.

A. C. SIMPSON

FOREST ECOLOGY

Fundamentals of Forest Biogeocoenology

By V. Sukachev and N. Dylis. Translated by J. M. Maclennan. Pp. viii + 672. (Oliver and Boyd: Edinburgh and London, 1968.) 252*s*.

ALTHOUGH only the names of Sukachev and Dylis appear on the title page of this book, they are the authors of only a small part; for the rest, they have supplied inspiration and editorship for their twelve collaborators. The ten chapters deal with the atmosphere, the "phytocoenose", animal life, micro-organisms, and the soil, all as components of a forest biogeocoenose, basic concepts, forest succession, classification, and the application of cybernetics to biogeocoenology.

In plain language, the title could be simply "Forest Ecology". The "biogeocoenose" is Sukachev's own invention, made in 1944; for all practical purposes it is the

©1968 Nature Publishing Group