bold. When reading about ideas in astronautics, the practical applications of which are often exceedingly complex but which advance very rapidly, it is difficult to judge just how far ahead the author may be thinking. It certainly seems that some of the brains devoted to contemplating future developments have taken their thoughts well beyond the next few feasible technological steps: in the absence of a yardstick, it becomes difficult to distinguish between far-ranging speculation or suggestion and something very close to science fiction. One can only marvel at the opulence of an industry capable of supporting gentlemen who devote their thoughts to "Assembly of a Multi-Manned Satellite" particularly on reading sentences such as: "Imagine then a space-suited worker chasing tools and materials on different orbits". Of course, such papers are intensely interesting, particularly when written in concise English, as is this particular example. Papers using turgid prose are fortunately in the minority.

One is therefore caused to question the object of all this activity, and is gratified to find that Dryden's contribution to the introduction of Vol. 4 is entitled "Space Exploration and Human Welfare". It is probably unfair to expect a concisely stated objective: the paper lists a few minor benefits to television and meteorology, says quite bluntly that we do not know the ultimate role of space vehicles in transportation and makes reference to the desire for increasing our knowledge of the universe for peaceful purposes. It seems quite possible that something is left unsaid.

The binding and paper of these volumes are excellent: unfortunately the reproduction of the contents is very variable in quality. The first three volumes consist of reproductions of typescript and hand-written equations. The diagrams reproduce well, but most of the photographs are very unsatisfactory. Volume 4 reverses this situation. The print and photographs are generally good but the diagrams, while clear, are reproduced on far too small a scale.

These volumes contain much valuable information and would be useful additions to a generously endowed library.

F. G. Irving
J. L. Stollery

PLANT PHYSIOLOGY IN THE FIELD

Plants and Environment

A Textbook of Plant Autecology. By Prof. R. F. Daubenmire. Second edition. Pp. xi+422. (New York: John Wiley and Sons, Inc.; London: Chapman and Hall, Ltd., 1959.) 56*s*. net.

THIS is a revised edition of a book originally published in 1947. The format and the heavy glossy paper are typically North American. The text is enriched by many photographs and diagrams; some of the photographs appear to have suffered in reproduction.

As Prof. Daubenmire's introductory definition of autecology in his preface shows, the sub-title of this book is misleading to British ecologists, most of whom would define autecology as the study of the ecology of a single species. This book, on the contrary, deals with the environmental factors which affect plants. Seven factors—soil, water, temperature, light, atmospheric, biotic, and fire—are given a chapter each, and two further chapters deal with "The Environmental Complex" and with "Ecologic Adaptation and Evolution". Much useful information on recent work is included, particularly in the fields of plant physiology and genecology. Pursuing his interpretation of autecology, the author discusses the environmental factors as they affect particular plants, but the plant examples are chosen at random, and nowhere is there an integrated study of a single species such as a British ecologist would expect from "A Text-book of Plant Autecology". Nor is there any reference to the plant as part of a natural community, nor any analysis of different types of vegetation, nor any reference to the distribution of plants and historical ecology; presumably all these subjects fall within the author's definition of synecology and are deliberately excluded, but it is surely impossible to study the autecology of a species without at least considering these aspects. The approach to ecology presented in this book is therefore that of the experimentalist rather than that of the naturalist; indeed, "Plant Physiology in the Field" would be an apter title than "A Text-book of Plant Autecology".

Within these limits, the book will be of interest to plant geographers and should prove a useful reference book to students of botany. It provides data on many subjects which are relatively unfamiliar in Britain, such as frost action on soils, anatomical details of frost damage and sun scorch, anatomical effects on trees of the adverse habitats encountered at the upper timber-line of natural forest, and the ecological effects of widespread fires. Sections in the chapters on water factors and light factors provide a very useful bridge between plant physiology and ecology, and there is much miscellaneous but useful information in the chapters on atmospheric factors and biotic factors.

W. Tutin

NON-INDIGENOUS ANIMALS OF GREAT BRITAIN

The Ark in Our Midst

The Story of the Introduced Animals of Britain—Birds, Beasts, Reptiles, Amphibians, Fishes. By R. S. R. Fitter. Pp. 320+16 plates. (London: William Collins, Sons and Co., Ltd., 1959.) 18*s*. net.

THIS is an ambitious book for in it the author sets out to cover a wide field, to survey the non-indigenous animals of the British Isles, that is the mammals, birds, reptiles and amphibians, which owe their inclusion in our fauna to the agency of man, creatures so diverse as the edible frog, the pheasant and the grey squirrel; and he does not restrict himself to those that have been successfully naturalized but includes species that have failed to establish themselves, pointing out that they are not the less interesting because they lack the necessary adaptability. Mr. Fitter tells us that the failures have been many and in excess of the successes, though the latter have often been spectacular with far-reaching results, for example, the manner in which the rabbit, the rat and the grey squirrel have colonized Great Britain.

Although we may be sure that man was the agent concerned in the arrival here of a number of creatures, although we may be positive they did not get here 'under their own steam', it is by no means easy to ascertain in each case how the deed was done, still less when it was done, even when it must have been well within the historic period.