

one expects of them—clear, readable type nicely arranged on good paper, the whole being tastefully bound in a handy-sized volume, though more care in proof reading might have avoided the many small errors that occur in both text and index.

Reprinting of this nature, however, raises problems, some of which have not been very happily solved in this case. Two courses of action seem legitimate: either the separate parts reprinted in one volume should preserve the original matter intact, or if revision is permitted it should be thorough. While the first course is the simplest, the latter course has obvious advantages for the reader, and the scale of the present reprinting would have made such revision an easy matter. Mr. Bush has, however, adopted an intermediate course, making enough changes to lull the reader into a false feeling of up-to-dateness while leaving unaltered many other equally simple alterations. Thus, while "Lebensraum" becomes in a de-Nazified world "Elbowroom" (p. 337), and "Sir William Beveridge's" plans become "Socialist" ones (p. 222) with the change of Government, no reference is made of the valuable supplement to T. Wallace's "Diagnosis of Mineral Deficiencies" in the footnote on p. 94, where the original publication is mentioned. Reference is still made to a grafting booklet (p. 42), by R. J. Garner, that has been out of print for eighteen months or more, and the price is some three years out of date. The spraying chart remains untouched by recent knowledge, and stirrup pumps would seem to be still occasionally used for incendiary bombs (p. 183). The opening paragraph of Chapter 3 refers to the small space at the disposal of Mr. Bush in contrast to that in Mr. Bagenal's "Fruit-growing"; while this was true of one volume of the Penguin series, Mr. Bush's omnibus volume contains 496 pages in contrast to Mr. Bagenal's 416 pages!

The original illustrations have all been carefully re-drawn for this edition. The artist has made good use of the better facilities for reproduction afforded by this book, and the general effect is cleaner and neater. The result might have been better still if the artist had drawn direct from Nature instead of faithfully copying Mr. Bush, as he was not always quite correct in the original. For example, in Fig. 4 the bud looks quite unlike an apple bud, and the slit to accommodate it is inconveniently short. More care is needed in checking with the text those figures that have been altered; typical discrepancies occur with Figs. 64 and 65 and p. 362, where the footnote is no longer needed, Fig. 37 and description on p. 207, and p. 472 where the figure referred to does not appear.

The chief addition to the original volumes is the fine collection of plates. Few books of this nature are so well illustrated. Other valuable additions are line drawings of the chief insect pests, a section on renovating old trees, another on growing bush peaches and brief references to D.D.T. and the artificial setting of tomatoes. It is difficult to see why Section 3 was honoured by a re-written introduction when the fact that the original introduction was no longer suitable might have been seized on to omit it altogether, thus assisting the unification of the parts. It is surprising that it was considered necessary to number the chapters in parts since the pages are consecutively numbered right through, and the present arrangement leads to awkward cross-references in the text.

Considered as a handbook on fruit-growing, the arrangement could be much improved. It is disconcerting, for example, to find the subject of plan-

ning a fruit garden dealt with piecemeal in each of the three parts, with certain overlapping. The same is true of spraying. The chapter on books would be more appropriate at the end, and the important subject of spring frosts might have appeared nearer the beginning. The presence of chapters on nuts, mushrooms and tomatoes in the Soft Fruit Section seems scarcely justified. Naturally, one must accept this arrangement in an omnibus volume, but it is a pity Mr. Bush did not spare time to rearrange or rewrite the original Penguin booklets into a carefully planned manual covering the whole field of fruit-growing.

There is little doubt, however, that "Fruit Growing Outdoors" will find an honourable place on the bookshelves of keen amateurs, professional fruit-growers and even hardened research workers.

H. B. S. MONTGOMERY

BREEDING OF FARM ANIMALS

The Breeding of Farm Animals

By Chapman Pincher. (Penguin Handbooks, PH.10.) Pp. 150+7 plates. (Harmondsworth and New York: Penguin Books, Ltd., 1946.) 1s. net.

ATTEMPTS at popular exposition of the scientific principles of farm livestock breeding have usually been made by those who have worked in one or other of the many fields of study which make up this 'practical' subject. No doubt, it is because of the intricacy of the considerations involved that the authors usually refrain from too sweeping or dogmatic statements, although they must recognize that their efforts to meet popular approval and appreciation are thereby weakened. Here, a fresh attempt to get some of the newer knowledge across to the practical man is made by an author whose name is hitherto unfamiliar in this particular connexion. Mr. Pincher brings his journalistic experience into action, and traverses reproduction, genetics, breeding policies, beliefs, and practical problems in pursuit of his objective.

He apologizes to professional biologists for certain conscientious sacrifices to clarity in his treatment of the reproductive processes. But it must be confessed that this apology in itself raises doubts as to the origin of his lack of clarity and precision in other aspects of the general topic. His compilation of facts and his interpretations are open to criticism from men of science and practical men alike. As examples, from the many: few geneticists would agree that "The only test for the purity of a dominant character in a beast is to cross it with another animal known to be impure for that character", or that the F_2 ratio for a single pair of genes, with dominance, is 1:3:1; both groups of people would doubt the implication that true hermaphrodites are common in poultry flocks; and most sheep-breeders would object to the Black Welsh being included if the main breeds of mountain sheep were to be restricted to six.

The author has made a courageous attempt to expound principles usually considered applicable; but commendation is withheld for two main reasons. First, the numerous blemishes could easily have been removed without much effect on the content or the style of the book. Secondly, as at best such a text could only serve as an introduction to the subject, and not be entirely authoritative in itself, a general bibliography or selected references should have been given.

J. E. NICHOLS