

Dr. Fraser Darling notes that, in addition to the barnacle geese, many butterflies have been attracted to the land and the cliff's edge through the application of basic slag.

This book is indeed one of unusual interest, written by one who knows his subject as no one else at the present day. It is written simply, and in attractive prose, and is illustrated by some fine photographs, which have resisted the austerity production of war-time. This war production may account for the absence of an index. SETON GORDON.

DISK-HARROWING VERSUS PLOUGHING

Plowman's Folly

By Edward H. Faulkner. Pp. v+162. (Norman, Okla.: University of Oklahoma Press, 1943.) 2 dollars.

WHERE is the folly? Mr. Faulkner declares it to be with ploughmen who bury green manures, weeds and stubbles many inches below the surface. He is of the opinion that ploughing places such material out of reach of crop roots and creates a sub-surface "blotter" which interferes with capillary movement of moisture. He advocates the use of the disk-harrow as a means of incorporating such materials into the soil surface. If land is prepared in this way, and not ploughed, Mr. Faulkner is persuaded that crop yield may increase five- or ten-fold. By disking plenty of green manure into the surface he believes crop yields can be secured against the vagaries of the weather. According to his predictions, such crops will not be seriously affected by drought, nor, on the other hand, will they suffer in wet seasons. Land drainage would be not merely unnecessary, it would be detrimental to such crops. They would also be practically immune from the ravages of insect pests. Furthermore, Mr. Faulkner is confident that by using the disk-harrow in place of the plough, weeds could be much more easily controlled, provided this practice is adopted over the whole of a considerable area.

All these high hopes have sprung from Mr. Faulkner's experiences in growing vegetables in a garden in 1938 and in growing market garden crops, mainly tomatoes, in 1939 and 1940. No measurements are quoted, presumably because none was made. Mr. Faulkner's folly in committing himself to print on so slender a pretext is infinitely greater than that of any ploughman.

The heavy disk-harrow must be drawn by a tractor. No horse-drawn implement could incorporate a green crop in the soil surface as a tractor-drawn disk-harrow can do it. Mr. Faulkner's thesis that it is better to incorporate a heavy green crop in the surface layer than bury it at plough depth is not unreasonable, and results of independent field trials are quoted in which a fifty per cent improvement in yield was obtained. There is a case for investigation.

Investigation by field trial is inevitably a slow business. The experimentation must be sufficiently extensive both in time and space to cover normal variations in climate and soil. The desire to short-circuit this process is understandable, but should be held in check. The factors influencing plant-growth are many and complex. Patient investigation has greatly extended our knowledge of them in recent years. In the long run, agriculture is best served by using this knowledge to design field experiments.

We do not commit the folly of declaring that no benefit can be derived from disking that could not equally be obtained by ploughing. Traditional methods should be constantly under critical review. It may be that the plough has gained and maintained its favour with farmers on account of the neat appearance of skilfully ploughed land. The awards in ploughing contests have undoubtedly been based on the tidiness of the work. No proof has been sought, and certainly none has been obtained, that land judged to be best ploughed is thereby put in the way of producing the best crops.

Hitherto the record of green manuring in Great Britain has been chequered. On the whole the benefits predicted by its advocates have not been matched by practical results. Admittedly most of these green crops have been ploughed under, not disked-in. Now that tractor-drawn disk-harrows are more widely available, some enterprising farmers in Great Britain will no doubt try their hand at disking-in a green crop without waiting for the results of carefully controlled experiments. Farmers are cautious men, and are not likely to take very seriously the extravagant claims made by Mr. Faulkner. R. K. SCHOFIELD.

STARCH

Starch and its Derivatives

By J. A. Radley. (Monographs on Applied Chemistry, Vol. 11.) Second edition, revised. Pp. xii+558+47. (London: Chapman and Hall, Ltd., 1943.) 36s. net.

THE second edition of this book is an improvement in many respects on that published three years ago. There has been a good deal of pruning of older work now obsolete, and many new chapters have been introduced which deal with a wider field of interest. Some of these have been contributed by recognized experts in the subject. An example of this is the section on the structure of starch which has been contributed by Prof. E. L. Hirst and Dr. G. T. Young. The reader is therefore introduced to some of the newer concepts of the constitution of starch derived from chemical evidence.

It is clear that the author has been at some pains to effect a considerable revision in this edition, and the result is that the monograph has gained in interest both for the general reader and for the expert. Even so, it cannot be said that the present volume provides much more than an introduction to a very complex subject, and, although the attempt has been made to give a critical review of the literature, the selection which has been made is not always well balanced or authentic in the conclusions which are presented. This is perhaps to be expected at this stage of the development of the chemistry of starch, where claims are often made which are conflicting, and where so much that has been written in the vast literature of the subject has to be discarded.

It can be said that the author has made a brave attempt to present in a concise form a very readable account of many of the reactions which starches undergo, and of the industrial and other uses to which they are put. Many readers will be grateful for the opportunity to use this monograph as a guide to the literature of the subject, including the original papers, and for a general survey which brings together much of the research which has been published and which is at present in progress.