could be made, even without tackling the bigger problems. The chief of these is the "socialisation" of processing and distribution. There is little room for argument as to the desirability of control. The question of how much of the possible saving should be passed on to the consumer and how much should revert to the producer raises all the attendant issues already suggested.

NUTRIENT SOLUTION CULTURE OF PLANTS

Soilless Culture Simplified

By Prof. Alex Laurie. (Whittlesey House Garden Series.) Pp. xiii + 201 + 14 plates. (New York and London: McGraw-Hill Book Co., Inc., 1940.) 12*s*. 6*d*.

MUCH interest has been aroused in this subject by virtue of the publicity afforded it by the popular Press and by a number of publications, many of which contain statements and claims which are unwarranted. It is refreshing, therefore, to find that the aim of the author of this book is "to present the actual status of the subject; to disabuse the average person, the enthusiastic gardener or the commercial grower of false notions; and to discuss the real possibilities that the field of chemical plant culture promises".

Prof. Laurie considers that before successful soilless culture can be accomplished, the grower must possess a thorough understanding of cultivation in soil. Accordingly, more than a half of the book is devoted to this latter aspect with chapters headed "The Soil and the Functions of Elements", "Nutrient Deficiency Symptoms of some Horticultural Crops", "Fertilisation of Crops in Soil and the Effect of Overdoses", and "How Plants Grow". Whilst there are many interesting details regarding flower culture within these chapters, their presence means that the title of the book does not correctly describe its contents.

From the point of view of nutrient solution culture, there are sections on the growing of crops in sand, growing of plants in "water", growing of crops in gravel and soilless gardening for the amateur.

The author, who is professor of floriculture in the Ohio State University, is mainly concerned with flower cultivation throughout the book, and the technique of growing carnations, sweet peas and other flowers in sand is described. It is noteworthy that satisfactory cropping has been obtained at Ohio when the fertilizer mixture (a complete fertilizer of the 15–3–15 type plus magnesium sulphate) has been applied *dry* to the surface of the sand bed at regular intervals. Such a method obviates the necessity of making up a nutrient solution and the bed requires water only in between fertilizer applications.

Little space is devoted to growing plants in "water", or "tank culture" as the method which has so fired the public imagination is sometimes called. Prof. Laurie points out that most unjustifiable comparisons have been made between plants grown in tanks of nutrient solution and those grown in soil, and is faithfully fulfilling his mission when he states that "No convincing evidence has yet been presented where on a large scale production in the greenhouse, crops grown side by side, one group in water and the other in soil, differed greatly in yields". For the inquiring amateur full details of this particular method are given, and it is pleasing to note the stress laid upon the need for adequate aeration of the nutrient solution when using this technique.

In the Floriculture Department of Ohio University, the sub-irrigation system involving the periodic flooding and draining of beds of gravel with the nutrient solution has found most favour. Consequently, Prof. Laurie gives authoritative details of the many aspects of this method and specific instructions for the growth of a number of flower crops. It is disappointing that in this section, which is the longest chapter on nutrient solution culture in the book, there is no reference to the growing of vegetable or other food plants. Much useful information is included on the construction and use of equipment including pumps and growing media, the formulæ of a number of nutrient solutions and their use, the testing and control of the *p*H of the solution, and the simple determination of some of the elements present.

The book ends with a chapter on soilless gardening for the amateur, and in bold relief is the author's own conclusion that as a hobby it is an interesting and absorbing subject, but that it is not yet ready for development on a large scale by commercial growers who need to look beyond the novel. That excellent flower crops can be grown in purely inorganic media and solutions is well demonstrated, and as Prof. Laurie points out when dealing with the sub-irrigation method "it should be noted that organic matter—so important when plants are grown in soil—becomes unnecessary because its functions are taken care of automatically, and the nutrients are presented in such form as to be readily available to the plant". If this book assists the reader to view in clearer perspective the role of organic matter in relation to the growth of plants, no mean service will have been performed.

W. G. TEMPLEMAN.