

The book opens with an account by Prof. N. K. Adam of the theory of water-repellency with particular reference to contact angle and structural effects, illustrated by examples from the subjects dealt with in the body of the work. Then the effects of structure on the water-repellency of fabrics are discussed in more detail by F. L. Warburton in preparation for the next six chapters which deal with practical aspects of fabric waterproofing.

Dr. Moilliet's own contribution concerns waterproofing emulsions; here, and elsewhere, the difficulties of writing about processes that are largely based on proprietary products are manifest; it has been necessary to rely largely on patent specifications (notoriously unreliable as a source of information) and B.I.O.S. reports, and discussion of the products widely used in Great Britain, such as 'Dipsanil V' (Imperial Chemical Industries, Ltd.) and 'Mystolene' (Catomance), is avoided.

A chapter on durable water-repellents by Dr. Baird may be of interest to organic chemists, but one doubts whether most of the compounds mentioned (there are 289 references) are worth discussing nowadays, for scarcely any of them have been, or are ever likely to be, used as the basis of a commercial waterproofing process. On the other hand, only a little information about fluorocarbon water-repellents is included, whereas, in view of the present-day interest in, and potential importance of, these materials, a much more detailed account would have been desirable.

R. L. Bass and M. R. Porter have written an excellent account of the chemistry and applications of silicones, and some interesting numerical data illustrating the effects on fabrics, leather and other materials are given. Here there is some overlapping with subsequent chapters which deal with the waterproofing of cellulose, wool and synthetic-fibre fabrics. As already mentioned, it is regrettable that it has not been possible to compare the effects of the different classes of agent in a systematic manner so that the less-experienced technologist can obtain a clearer idea of their relative merits.

The section on textiles is concluded with an excellent account of testing methods by C. A. Norris and a chapter on waterproof-coated fabrics which, though interesting, is really not in keeping with the main theme of the book; the same comment applies to those parts of the chapter entitled "The Waterproofing of Paper" that are concerned with improvement of wet-strength and reduction of permeability to water-vapour.

The last three chapters entitled "The Waterproofing of Soils and Building Materials", "The Dropwise Condensation of Steam" and "Waterproofing Mechanisms in Animals and Plants" deal with subjects with which I myself am not familiar. I can only say that they are all clearly written and extremely interesting. The last is illustrated by superb electron micrographs.

The book is clearly printed on high-quality paper and the price is not unreasonable in relation to the large amount of information it contains.

R. S. HIGGINBOTHAM

BACTERIAL GROWTH

The Bacteria

A Treatise on Structure and Function. Vol. IV: The Physiology of Growth. Edited by I. C. Gunsalus and Roger Y. Stanier. Pp. xiv+459. (New York and London: Academic Press, 1962.) 114s. 6d.

THIS is the slimmest of the four volumes so far issued in this series. It costs as much as Volume 2 which contains a hundred more pages. There are nine chapters dealing with synchronous growth, nutritional requirements, ecology of bacteria, coenzymes, permeation, physiology of sporulation, temperature relationships, halophilism and antimicrobial agents: mechanism of action and use in metabolic studies.

The layout is as before, with good author and subject indexes, and more than 1,600 references are listed. It seems, nevertheless, that some topics have been omitted or very summarily treated. For example, since the volume deals very largely with the results of biochemical experiments performed on samples of populations, greater emphasis could have been placed on our present-day knowledge of the growth of individual cells and the cell-to-cell phenotypic variation in 'normal' populations. It is nowhere stressed that logarithmically developing populations are composed of cells the age distribution of which is heavily weighted on the side of 'youth', and the "average properties of growing cells", referred to in Chapter 1, are similarly weighted by the metabolic activity of the larger proportion of young cells which are present during 'balanced' growth. Indeed, the production of synchronously dividing populations provides the tool by means of which the sequential steps in metabolism from the formation to the division of each individual may, despite the limitations, be finally elucidated. A wider scope to Chapter 1 would, therefore, have been valuable.

Unfortunately, there is virtually no reference to population dynamics and in particular to the dynamics of continuous culture systems. In view of the undoubted importance of continuous culture methods in providing samples grown in definable systems (of first choice for biochemical investigation), and increasingly in the future for the industrial application of our knowledge of fundamental bacterial processes, a chapter on this subject should have been included. Lightly touched on also is the question of viability, both of spores and vegetative cells. In the section on "Thermal Death", the logarithmic order of death is discounted, perhaps correctly, but only one reference is cited.

One or two sentences appear to be misleading, for example, although the 'crushing' effect of ice crystals during freezing may not be a major factor in killing at low temperature, to state "if crushing were the principal cause of death, it would be expected that rapid freezing would be less injurious than slow freezing, for ice crystals would form in greater abundance when the medium is frozen slowly" is to state the wrong reason, since (a) the size of the ice crystals would be a most important factor and these would certainly be much larger on slow freezing, and (b) the number of crystals formed on rapid freezing is greater although each crystal is smaller. These, after all, are the principles on which the frozen food industry operates.

Volume 4 is welcomed despite the impression that in some sections the job has been less thoroughly done than previously.

L. B. QUESNEL

A TEXT-BOOK OF PLANT ANATOMY

Pflanzenanatomie unter besonderer Berücksichtigung der Kultur und Nutzpflanzen

Von Prof. Dr. Bernhard Kaussmann. Pp. xii+624. (Jena: Veb Gustav Fischer Verlag, 1963.) 71·80 D.M.

PROF. BERNHARD KAUSSMANN'S text-book of plant anatomy is a good one, and it can with confidence be recommended for the use of university students. Research workers wishing to refresh their memories or to obtain an up-to-date picture of many aspects of plant anatomy will be able to find the information they require in this book. It is, moreover, written in simple language that can be easily followed even by those whose knowledge of German is limited. It is a book of factual information rather than of theoretical discussion of the various topics concerned. However, where there is more than one view concerning the morphological interpretation of such things as the different parts of a flower, the alternatives are clearly presented, but it is left to the reader to draw his own conclusions concerning the relative merits of each.