

It was suggested in the review¹ of the first volume of these *Proceedings* that they should be assessed as a work of reference if their high price was to be justified. On this basis the absence of an index, combined with the somewhat illogical grouping of the papers, can be criticized in that it makes the tracing of a particular subject difficult. Papers on diseases of apples appear both in the section on fruit growing and the section on plant pathology, while papers on electrical soil warming are included under flower growing and under greenhouses. Perhaps more serious is the fact that information in some of the papers was published elsewhere as long ago as 1958, the year of the Congress. I myself noted three papers in the section on flower growing to which this applies.

In spite of the criticisms levelled at these volumes they will represent a worthwhile addition to the horticultural library. From them can be derived a view of horticultural research and thought in many different countries and they are a useful source of factual information on many horticultural topics. Whether the two volumes will prove to be of great interest to biologists, as is suggested on the flap of the dust-cover, is more debatable.

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¹ Harris, G. P., *Nature*, 194, 223 (1962).

BIOSYNTHESIS IN BACTERIA

The Bacteria

A Treatise on Structure and Function. Edited by I. C. Gunsalus and Roger Y. Stanier. Vol. 3: Biosynthesis. Pp. xv+718. (New York: Academic Press, Inc.; London: Academic Press, Inc. (London), Ltd., 1962.) 139s. 6d.

THE fact that this volume is more than 100 pages longer than either of the two previous ones is itself an indication of the enormous interest in and the great fruitfulness of bacterial systems in the elucidation of biosynthetic processes. The bacterial world has become a Utopia for biochemists and this volume will be as much (if not more) welcomed by biochemists as by bacteriologists. There are twelve chapters dealing with every known aspect of synthesis in both 'autotrophs' and 'heterotrophs'. Chapters 1 and 2 survey our knowledge on carbon dioxide fixation, Chapters 3 and 4 on nitrogen assimilation, in 'autotrophs' and 'heterotrophs' in each case. The remaining chapters deal with the synthesis of vitamins and coenzymes, nucleotides, tetrapyrrole, homosaccharides, peptides, cell walls, proteins and nucleic acids, and finally enzymes.

As in Volumes 1 and 2 there are extensive author- and subject-indexes and a wealth of references. More than 2,500 papers are cited (most of these published in the past decade), and numerous headings and sub-headings make reference easy. As a comprehensive survey of the state of knowledge of bacterial biosynthesis this volume cannot be bettered and every effort was made to give an up-to-the-minute coverage at the time of publication. These extracts underline this attitude: "Nitrogen fixation in cell-free extracts has only recently been obtained; information on the requirements and properties of the enzyme systems is now available. Since the data are of recent origin, have not been presented in general form, and reviews covering these enzymatic data are not yet available, this subject will be treated in some detail" (Chapter 3). Chapter 11 (proteins and nucleic acids) ends with three sections entitled "Discussion (1959)", "Discussion (1961)" and "Addendum (1962)". The second of these sections starts, "The period between finishing the script and correcting the galley proofs has seen the publication of over 300 papers relating to the general field which this chapter is supposed to cover and references to some 200 of these have been darned in". The Addendum commences, "The 9 months that have passed since correction of the galley proofs have seen

changes and advances that are of fundamental importance to the understanding and interpretation of much that has been written in this chapter". Such is the *tempo* of industry and discovery in the field covered in these chapters.

This volume is also of some interest to geneticists in that the mechanism of heredity must ultimately have a biochemical explanation and there is much which sheds light on the significance of genetic changes, especially in the final chapter. One of the outstanding general impressions obtained by reading this book is the rapidly increasing number of 'vital' processes which may now be performed in cell-free systems, and one gets the feeling that the possibility that man may eventually manufacture living matter from undoubtedly inanimate starters is not so remote after all. Should that day arrive, this volume will have played a part in bringing it nearer.

It is curious how some simple grammatical errors have been overlooked.

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PATHOLOGY IN MAN AND BEASTS

An Introduction to Comparative Pathology

A Consideration of some Reactions of Human and Animal Tissues to Injurious Agents. By G. A. Gresham and A. R. Jennings. Pp. xi+412. (New York: Academic Press, Inc.; London: Academic Press, Inc. (London), Ltd., 1962.) 84s.

MORE than at any previous time, effective methods are being sought, at an international level, to improve the quality of domestic animals and to eliminate diseases to which they are susceptible or for which they are intermediate hosts of human afflictions. This trend has led to closer associations between veterinary pathologists and their counterparts in the field of human disease, thus reviving, in some measure, collaboration of the sort that flourished in the late nineteenth century. The joint authorship of this book is encouraging testimony of such co-operation.

Gresham and Jennings have chosen to deal with their subject primarily on an aetiological basis and have presented it in twelve chapters, all roughly of equal length. The authors state that "... the examples we have used to demonstrate specific modes of action (of different pathogenic agents) have been taken from well recognized, common naturally occurring disease processes rather than from the sometimes narrow and artificial field of experimental pathology. Where necessary, however, we have not hesitated to describe ... some purely experimental conditions if by so doing we could better illustrate the topic ...". It is on the latter basis, presumably, that there are, happily, included in this volume such important aspects of experimental pathology as the general adaptation syndrome, some experimental oncology, diseases attributable to radiations, immunological tolerance and even aspects of auto-immune diseases and aging. The references to these subjects are not quite up to date; however, the very inclusion of these topics is most gratifying. Similar remarks apply to the inclusion of some electron micrographs at least in one chapter and attempts to direct attention to the nature and significance of modern work on the structure and role of DNA in genetically determined diseases.

On the other hand, it is strange to find so little reference to geographic pathology. In a volume on comparative pathology the peculiar world distribution of many diseases is surely appropriate. This applies, perhaps especially, to many viral and parasitic diseases and to particular neoplasms (for example, childhood lymphomata in Africa; primary hepatic carcinoma) so much better known to-day than previously. Little attention has been directed to the significant role of climatic factors and vegetation in promoting or even localizing the