

**Annual Review of Microbiology**

Vol. 14. Edited by Charles E. Clifton, in association with Sidney Raffel and Mortimer P. Starr. Pp. vii+391. (Palo Alto, California: Annual Reviews, Inc., 1960.) 7 dollars.

OVER a period of thirteen years, microbiologists have become confident of finding in the *Annual Review of Microbiology* concise and critical surveys of literature covering a wide range of topics. Volume 14 comes up to the standard set by its predecessors.

This year, out of a total of seventeen articles, four will be of direct interest to virologists. Recent observations relating to the fine structure of virus-infected cells have been ably reviewed by Rose and Morgan, although it is, perhaps, to be regretted that this article is not illustrated. D. L. Walker, discussing *in vitro* cell-virus relationships resulting in death of the cell, provides a valuable survey of the links between cell degeneration and virus-induced metabolic alterations. Intramural spread of bacteria and viruses in human populations is discussed by Williams, and Kissling reviews ecological aspects of arthropod-borne viruses of man and other animals.

Scherbaum's contribution provides an overdue comparison of observations on synchronously dividing micro-organisms with established knowledge of normal cellular metabolism. In discussing the problem of protein synthesis, Novelli has focused his attention on the sequence of enzymic steps between free amino-acids and the formation of peptide bonds, as observed in cell-free systems.

Other topics reviewed include: microbial nutrition; nutrition, metabolism and pathogenicity of mycoplasmas; variation in phytopathogenic fungi; genetics and cytology of *Chlamydomonas*; gene action, a review of the gene-to-protein relationship; immunological speculations; interpretation of immunodiffusion tests; energy metabolism of chemolithotrophic bacteria; industrial fermentations; intracellular symbiosis in insects and enzyme localization in bacteria.

This volume also includes a cumulative index of authors and chapter titles for Volumes 1-14, an addition which will be of inestimable value to all faced with the task of reviewing the literature.

B. A. NEWTON

**Non-Benzenoid Aromatic Compounds**

Edited by David Ginsburg. Pp. xii+543. (New York: Interscience Publishers, Inc.; London: Interscience Publishers, Ltd., 1959.) 135s.

THE editor was clearly faced with a dilemma in devising a terse yet fully descriptive title for this collection of review articles. As Sir Robert Robinson points out in the foreword, the word 'aromatic' in its ordinary sense was applied to benzene and its derivatives; later it began to imply a measure of stability associated with a benzenoid structure. This brings in the pyridine group, and there is a remarkable similarity in the physical properties of analogous compounds in the thiophen and the benzene series. At the other end of the scale, it was stated at the Chemical Society Symposia, Bristol, 1958 (Special Publication No. 12) and reiterated herein that cyclo-octatetraene shows no aromatic character and behaves as a typical polyolefin.

Appropriately, therefore, the first chapter discusses 'aromaticity' from the theoretical side for both benzenoid and non-benzenoid compounds, with

particular reference to the  $\pi$ -electron concept. The chapter on the cyclobutadiene group, which includes diphenylene, is a considerably extended version of matter presented at Bristol. The chemistry of ferrocene and related compounds forms the major part of the section on cyclopentadiene derivatives: pentalene and heptalene follow. Azulenes were considered at Bristol, but are here discussed in great detail in two chapters dealing respectively with the theoretical and preparative aspects; the latter includes most of the recent work of Hafner. The seven-membered systems, tropones and tropolones, form another major topic, a condensed form of more than five hundred papers; this group includes colchicine. The final two chapters discuss shortly cyclo-octatetraene and higher cyclopolyolefins.

To the main texts of most chapters, notes of later publications have been added at the proof stage, their number indicating the lively interest being taken in these subjects. We thus have a timely, authoritative, well-documented and up-to-date series of monographs on an interesting group of substances.

B. A. ELLIS

**Investigations on Norwegian Cirque Glaciers**

Edited by W. V. Lewis. (Royal Geographical Society Research Series, No. 4.) Pp. iv+104+19 plates. (London: Royal Geographical Society and John Murray (Publishers), Ltd., 1960.) 22s. 6d.

THIS volume gathers together many valuable observations which are mainly concerned with two small cirque glaciers in the Jotunheim, Norway. These particular glaciers have been studied in great detail by a number of specialists, each of whom reports his or her own observations in the book. The geology of the area, as it affects glacial action, is usefully discussed by Dr. M. H. Battey, while Mrs. J. M. Grove supplies very detailed observations of the ice banding of both glaciers, from which she deduces their régime and movement. A detailed physical analysis of the ice-fabric of Vesl-Skautbreen is contributed by Dr. R. J. Adie, and survey results are briefly discussed by J. E. Jackson and Miss E. Thomas.

The major contribution is the valuable analysis by Dr. J. G. McCall of observations made in two tunnels cut through to the corrie back-wall. These results, which required extremely accurate survey work, have given a detailed picture of the mechanics of flow of a small and fairly simple type of corrie glacier. They show that although rotation is important it is not the only type of movement. The observations made of the ice-rock contact at the base of the glacier are incorporated in a discussion of the processes of corrie formation. W. R. B. Battle's contribution discusses techniques and results of recording changes in temperature in bergschrunds, mainly at the Jungfrauoch, Switzerland, and in Norway, with the view of obtaining quantitative evidence of the part played by thaw-freeze in corrie formation. The first and last chapters are contributed by the editor, W. V. Lewis, in which he introduces the authors and sums up the results by applying them to the formation of a typical Lake District corrie, Blea Water.

Although much of the work reported here was done nearly a decade ago and some results have already been published, this very well-produced and illustrated volume is a worth-while contribution to glaciological literature.

C. A. M. KING