

considered to be in some ways comparable with rejuvenescence.

The vernalization requirement of winter cereals is discussed only in so far as it is associated with a growth form which has far greater survival in cold weather than the spring form. No mention is made of the bulk vernalization of grain prior to planting which was advocated by Lysenko, but has apparently never been used extensively in the U.S.S.R.

In the final part of the book breeding for winter hardiness is described using the principles evolved by Michurin. The normal methods of hybridization and selection are used, but the Russians also 'shatter' heredity by exposing plants to different environments and afterwards 'fix' heredity by 'training', which includes grafting to acquire permanently the desirable characteristics of the stock.

The book is clearly written, but the reproduction of the text figures is poor and there is no index. The text includes references to some three hundred original papers and the bibliography covers more than a thousand altogether. Two-thirds of these are by Russian authors, but since they have contributed more than anyone else to world knowledge on this subject this is to be expected, and the book remains a review of major importance in this otherwise rather neglected field.

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## PROTEIN BIOSYNTHESIS

### Protein Biosynthesis

A Symposium held at Wassenaar, 29 August-2 September, 1960, under the auspices of Unesco and the Council for International Organizations of Medical Sciences. Edited by R. J. C. Harris. Pp. xii+409. (London: Academic Press, Inc. (London), Ltd.; New York: Academic Press, Inc., 1961.) 95s.

THIS volume contains a collection of papers which were given at a conference held in The Netherlands in 1960. The discussions which followed the presentation of papers are also included. The twenty-seven original papers are accompanied by an introductory paper and concluding remarks given by Siekevitz and Chantrenne, respectively. Both these participants aimed in their thoughtful contributions at placing the subject of protein biosynthesis in a broad perspective; this redresses the balance of the book as a whole, which is affected by the inevitably specialized nature of many of the papers. The mechanism of protein biosynthesis in animals, plants and micro-organisms is considered. Many of the papers deal with the synthesis of proteins by various subcellular components. Most attention is paid to protein synthesis associated with ribosomes or microsome material. For example, McQuillen gives an account of the comprehensive studies carried out at the Carnegie Institution on the involvement of ribosomes in protein synthesis in *Escherichia coli*. Butler *et al.* describe work on *Bacillus megaterium* and consider the possible involvement in synthesis of amino-acids associated with lipid. The structure of ribosomes is considered in a number of papers as is the significance to be attached to the association of proteins such as ribonuclease or  $\gamma$ -globulin with ribosomes. There are also contributions on protein synthesis associated with other subcellular structures, such as mitochondria (Work *et al.*), myofibrils (Winnick and Winnick) and nuclei (in particular, Allfrey and Mirsky). An appreciable number of

papers presents information on the role of 'soluble' or 'transfer' ribonucleic acid in protein synthesis, and some are concerned with its characterization. Several articles deal with anomalous nucleotides. Škoda gives an extensive list of such compounds and their biological properties. Gros and Naono describe the effect of fluorouracil on protein synthesis, and a brief mention is made of the concept of 'messenger' ribonucleic acid, which has received much attention since the conference in question was held. Many of the papers deal with general aspects of protein biosynthesis, but a number include consideration of more specialized aspects, such as the synthesis of serum albumin (Campbell), synthesis of globulins by plasma cell tumours (Askonas) and the effects of carcinogens on the function and fine structure of liver cells (Ermelot and Benedetti).

The general standard of the papers is high. Furthermore, the reader is supplied with a summary of most of the papers, the titles are given of most of the papers cited and there is an author index.

Despite the general excellence of the volume, the question does arise as to what useful purpose it can serve at the present time. There have been considerable advances in knowledge concerning the biosynthesis of proteins during the past two years, in particular, with respect to the parts played by the nucleic acids. The volume reviewed, therefore, cannot give an adequate overall picture of present knowledge. I consider, however, that it still retains some value for those who are actively concerned in this field of study.

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## ANTIBIOTICS

### Antimicrobial Agents Annual, 1960

Proceedings of the Conference on Antimicrobial Agents held in Washington, D.C., October 26-28, 1960. Edited by Peter Gray, Benjamin Tabenkin and S. G. Bradley. Pp. xviii+670. (Washington, D.C.: Society for Industrial Microbiology, 1961. Distributed by Plenum Press, New York; and Heywood and Co., Ltd., London.) 8.50 dollars; 80s.

THIS volume containing some ninety papers submitted at the conference held in Washington at the end of October 1960 also records discussions of the papers and details of panel discussions on modes of action, clinical laboratory testing and on clinical problems. The wide coverage is indicated by the section headings: new products, laboratory studies, modes of action, clinical studies, antitumour agents, agricultural and non-medical uses. Inevitably there is some overlap of interests in these sections and it would be well for anyone interested in a particular section to scrutinize the titles in the others. On the whole, however, the editors have carried out a difficult task well.

Of the panel discussion, that on modes of action is less well documented than the others, is rather difficult to follow and leaves the impression that little advance has been reported. The papers and the discussion on clinical laboratory testing should be of interest to both clinicians and laboratory staff. It is clear from the discussion that a great deal of work remains to be done to bring some measure of standardization at national and international levels, and that too little attention is paid to size of inoculum in relation to the amount of antibiotics in sensitivity