

more and more to the study of insect transmission as the most promising field for study.

Studies recently carried on jointly by the writers have shown that the overwintered adults of the flea-beetle, *Chaetocnema pulicaria* Melsh.,¹ which commonly feed upon young corn on emerging from hibernation, harbor *Aplanobacter stewarti*. Adults of *C. pulicaria* were collected from orchard grass and alfalfa at Arlington Experiment Farm near Rosslyn, Va., during April, 1934. Four lots of these adults were sterilized externally in a solution of 4 per cent. sodium hydroxide and then rinsed in a solution of 0.1 of 1 per cent. hydrochloric acid before being macerated in sterile beef broth for plating. Large numbers of *A. stewarti* in practically pure culture were obtained from all four isolations. Healthy corn plants in the greenhouse were inoculated with transfers from these isolations, all developed typical symptoms of bacterial wilt and the organism was reisolated. These organisms appeared to be particularly virulent, as the symptoms developed in three to four days and the plants died soon afterward.

Other adult beetles from the same collection referred to above were permitted to feed for several days on healthy corn plants in the greenhouse. Typical symptoms of bacterial wilt developed in these plants and *Aplanobacter stewarti* was isolated from them in pure culture. Preliminary isolations from 175 single individuals of overwintered adults of *Chaetocnema pulicaria* collected from several different species of host plants indicated that the organism occurred in abundance in approximately 19 per cent. of these beetles.

It has been known for a considerable time that *Aplanobacter stewarti* may overwinter in infected seed to a limited extent, but there is no direct evi-

dence of overwintering in naturally infested soil in the field. Since *A. stewarti* has been found to overwinter in a common flea-beetle under natural conditions, and since infection in healthy corn plants has resulted from the feeding injuries of these beetles, it appears probable that *Chaetocnema pulicaria*, and possibly other insects, may be largely responsible for overwintering as well as dissemination of bacterial wilt of corn.

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INTERNAL PRESSURE IN LATEX SYSTEM

SOON after a sudden shower on a recent afternoon I was removing some almost fully grown fruits from a *Cryptostagia grandiflora* shrub in my garden. I pierced the bark of the fruit stalk near the base of one fruit and a stream of latex spurted from the wound with unusual force. The stream continued, I estimated, from two to three seconds and reached the foliage of a row of *Arundina* orchids which were about three and a half feet away from and about one foot below the source of the latex stream.

This same phenomenon is often noticed, but in a smaller degree when one pricks the bark of a tree of *Hevea brasiliensis* in the early morning or soon after a shower, when turgidity is high within the tree. The emission in such a case is, however, usually only a sudden spurt of latex and I have not heretofore witnessed such a long-continued flow.

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SCIENTIFIC BOOKS

CRYSTAL STRUCTURE

The Crystalline State. Edited by Sir W. H. BRAGG and W. L. BRAGG. Vol. I. A General Survey, by W. L. BRAGG, xiv + 352 pages, 23 × 14.5 cm, with 186 figures and 6 appendices. Published by Macmillan and Company, 60 Fifth Ave., New York City, 1934, \$5.50.

THIS is the first of a projected set of three volumes dealing with all aspects of the application of x-rays to the determination of crystal structure and with many of the physical properties of crystals which can be explained in terms of the structure thus determined. It is in some respects a revision and amplification of

the "X-Rays and Crystal Structure" of the same authors, first written in 1914 and revised in 1924. The title is thus to a certain extent misleading, because certain groups of crystalline phenomena, such as those which can be treated formally and which have been so exhaustively treated in Voigt's monumental "Kry stallphysik" are not included, and in fact Voigt's name is not even mentioned.

It is intended that the two remaining volumes of the series shall be technically complete expositions of the detailed topics; the articles in these volumes are to be written by a number of collaborating experts. This first volume gives a general survey of the whole field and is complete in itself. The sections in this first volume serve as introductions to the more detailed treatment in the later volumes. The endeavor is to so arrange the material that consecutive reading is not

¹ Identification verified by Mr. H. S. Barber, Division of Identification and Classification of Insects, Bureau of Entomology, U. S. Department of Agriculture.

necessary, and it is expected that after reading in the first volume the sections pertaining to the special topic of interest one can pass directly to the more detailed treatment in the later volume, or indeed stop with the first volume if the technical details are not of interest. This scheme of presentation makes necessary a certain amount of duplication, which however the authors feel is no disadvantage if thereby the work can be made to serve its intended double purpose as a "review of the subject and a work of reference."

The scope of the book can perhaps be best indicated by the chapter headings: "The Crystalline State," "Diffraction by the Crystal Lattice," "Experimental Methods of Crystal Analysis," "Examples of Crystal Analysis," "Crystal Symmetry," "The Principles of Structure Analysis," "Chemical and Physical Crystallography," "Crystal Texture," "X-Ray Optics," "Applications of X-Ray Methods to Problems of Pure and Applied Science," "The Diffraction of Electrons," "Historical."

The exposition of the various symmetry properties of the crystal and the physical significance of the various methods of classification of crystals into 7 or 14 or 32 or 65 or 230 groups is much fuller and more lucid than one usually finds and will be illuminating after some of the rather muddled expositions that are to be found in the literature. But it is the detailed exposition of examples of crystal analysis in Chapter IV that is particularly happy and exemplifies the vivid physical visualization which is in the best tradition of the English school of physics, and which all those who have heard the author will remember as one of the most charming features of his lectures. Other notable features are the chapter on "Texture," in which a brief account is given of the results of a structure analysis of substances like rubber or cotton fiber which is coming to be so important in industry, and the historical chapter, which could have been written only by one who himself has played a foremost part in the developments which he describes.

One does not get the impression from reading the book that the subject of x-rays is in danger of becoming exhausted in the immediate future, as one so often hears, but on the contrary Bragg sees in the application of x-ray analysis to a determination of the structure of proteins the opening of an immense new field in which x-rays will play a unique part in helping to solve the problems of living matter.

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THE PROGRESS OF BIOCHEMISTRY

Annual Review of Biochemistry. Edited by JAMES MURRAY LUCK. Stanford University Press, Stanford University, California, Vol. III, 558 pages, \$5.00, 1934.

THE increase in the literature concerned with the medical and biological sciences has of recent years been so great as to make almost impossible detailed and comprehensive study of even a small part of the important contributions. Abstract journals, many of which are available, fail to afford the necessary critical point of view. This need for critical interpretation of the literature in the field of the biological sciences has been met in part by such publications as the older *Ergebnisse der Physiologie* of Asher and the more recent *Physiological Reviews*, *Biological Reviews* and *Medicine*. The limitations imposed by the broad fields to be covered are obvious. Three years ago, under the editorship of Professor James Murray Luck, of Stanford University, there appeared the first volume of the *Annual Review of Biochemistry*, a publication which aimed to discuss critically the recent developments of the more important phases of biochemistry. The immediate success of the venture has encouraged both the editorial committee and the contributors to enlarge the scope of the work.

The present volume, the third of the annual reviews, continues along the lines which have made the earlier volumes so valuable. To readers familiar with the preceding reviews, it is sufficient to point out that, in freedom from errors of typography and in general excellence, the present volume conforms to the high standards already set. In addition to the discussion of broad general subjects treated yearly, the editorial committee has announced the policy of the inclusion of "occasional reviews on topics of timely nature in which a lively interest has recently developed and significant advance been made." In accordance with this policy, the present volume includes a discussion of the biochemistry of malignant tissues and another on biochemistry in relation to dentistry. The forthcoming volume is expected to contain reviews on choline, the possible importance of which as a hormone has been suggested, and on the growth substances of plants, the auxins of Went and related substances. Continuation of this new policy should add greatly to the value of the reviews. Those topics "which by universal consent constitute the traditional divisions of the subject" will continue to be reviewed at annual or biennial intervals, however.

"The diversity of interest and outlook which characterizes investigation in any of the numerous fields of biochemistry" is shown by a survey of the laboratories of the workers who have contributed reviews to the present volume. Of the twenty-six articles included, ten only are from workers in the United States, seven originate from British laboratories, four from Germany, while Czechoslovakia, Japan, Sweden, Switzerland and Canada are each represented. The review is truly international. The word "worker" has