some attention is paid other reactions of diagnostic interest. Thus, the book is helpful to those who want to see a photograph of a stained smear, a typical colony, or a special test -- but the picture may not be the specific one that the reader desired. For example, the only picture of Mycobacterium tuberculosis is a Ziehl-Neelsen stain, which helps little if the reader would like to see a photograph of a positive Auramine O stain. Or the picture may be of a culture on blood or MacConkey's agar, while the reader was interested in colonial form on another medium. Colonies of Salmonella Spp., for example, are pictured only on DCA agar; photographs of salmonellae on other media would be extremely useful to many people.

The last section (47 pages) contains flow charts and text outlining procedures for bacteriological examination of various types of specimens. This information is a handy review for students and practitioners, but similar charts can be obtained free of charge in the newly-revised BBL Manual of Products and Laboratory Procedures and from other sources. A bibliography lists selected references helpful to those seeking more information. The index is adequate.

The cost of the book is reasonable, considering the fact that two-thirds of the illustrations are in color. Inclusion of more illustrations would raise the price of the book, but would increase its usefulness substantially. The title of this book infers that it is a veritable wealth of photographs; in reality, the book contains fewer figures than do most new texts in bacteriology. The next edition could well be enlarged and improved substantially if this book is to maintain a prominent place on the bacteriologist's bookshelf; the second edition was little improvement over the first.

- Paul A. Hartman

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Acetic Acid Bacteria: Classification and Biochemical Activities. By T. Asai. University Park Press, Baltimore and University of Tokyo Press, Tokyo. Price \$17.50. 1968.

This book is a 343-page compilation of data on the classification of the acetic acid bacteria and on their biochemical activities. The reason for writing the book is given by Professor Asai in the Preface:

"Acetic acid bacteria were first recognized and isolated in 1837 by F. T. Kützing, who obtained the organism from naturally fermented vinegar and called it Ulvina aceti. Since then many strains have been isolated from sources such as spoiled alcoholic beverages and vinegars. These strains are responsible not only for the development of commercial vinegar production, but also for opening up new vistas to biologists and biochemists in studies of morphology, physiology, metabolism, etc.

The acetic acid bacteria are typical oxidative bacteria whose importance is comparable to that of the lactic acid bacteria and yeasts in anaerobic metabolism and alcoholic fermentation. Since the discovery by Kluyver and de Leeuw in 1924 of Acetobacter suboxydans, much has been learned about the microbial oxidation of sugars and polyols using the particular oxidative patterns of this organism as a model. Studies of cellulose biosynthesis in Acetobacter xylinum, to give another instance, have contributed to the understanding of polysaccharide synthesis. And, in addition to their usefulness in the study of basic biochemical processes, these bacteria produce many substances of importance to industry.

Most of the thirty years that I have spent in research have been devoted to the study of these bacteria. When I retired from the University of Tokyo six years ago I began to assemble the published data together with my own research findings for a book on their taxonomy and biochemistry. It is my hope that this book will contribute to an understanding of the acetic acid bacteria."

Professor Asai proceeds through 13 chapters on classification of this interesting group of bacteria; 129 references are cited, but these are arranged in the order they are mentioned in the text and there is some duplication. Various characteristics of the acetic acid bacteria are summarized in 27 tables, and the section is concluded with a 9-page list of species and varieties.

The biochemical activities of the acetic acid bacteria are described in 18 chapters; 517 citations are listed; data reported in 26 additional references are summarized in an Addendum.

A general index is supplemented with an index of bacteria mentioned. The book is printed on paper of only fair quality; however, there are only a few photographs that suffer from

lack of adequate reproduction.

The book is a comprehensive, succinct and accurate resume of one investigator's view of the acetic acid bacteria. There are very few omissions: Rainbow's excellent review on "The Biochemistry of the Acetobacters" (Progr. Ind. Microbiol. 3, 43-70; 1961) seems not to have been mentioned: the treatment of base composition of cellular DNA is missing three references cited by L.R. Hill (J. Gen. Microbiol. 44, 419-437; 1966). These omissions do not detract appreciably from the value of this contribution to bacterial systematics and biochemistry.

- Paul A. Hartman