cellent for describing some intriguing problems in biological adhesion.

Except in rare cases, however, the specialist will find his topic handled in an abbreviated and dated fashion. A. C. Taylor's article, for example, omits much progress on the measurement of cell adhesiveness that has been made since the symposium was held, despite the editor's stated invitation to the participants to update their contributions. R. E. Baier's chapter is an interesting and informative account of the relationships between wettability and adhesion. It contains a fascinating discussion of some data which suggest that the degree of cell spreading may be partially dependent on the critical surface tension of the substrate. Another chapter depicts, all too briefly, the attachment of marine bacteria to slides immersed in aquaria. Four chapters are concerned with the morphology, histology, and biochemistry of barnacle and mussel attachment to moist surfaces. The remaining nine chapters are devoted to a description of existing and potential artificial adhesives for soft and hard tissues.

For readers seriously interested in biological adhesion the greatest shortcoming of the book is its failure to include any summary of the biochemistry of intercellular adhesion. Weiss's introductory article concentrates insistently on the theoretical, biophysical level of adhesion and does little to alleviate this shortcoming. It is, after all, biological adhesion that one would like to be able to duplicate in preparing clinical adhesives. Although the molecular mechanisms are unknown, cell-to-cell adhesions are specific, nontoxic, and tenacious in the presence of water. It would seem, therefore, that when the mechanisms are understood, artificial adhesives will utilize them. For these reasons, omission of work on natural biological adhesions is a major flaw and one that could have been rectified easily at the expense of one or two of the nine chapters devoted to excessive description of synthetic adhesives.

All things considered, this volume contains much information about adhesion research in biology, but the experimental embryologist, pathologist, and student interested in the possible relationship between the contents of this book and cellular adhesion in vivo will be disappointed.

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Diseases of Plants

Plant Virology. R. E. F. MATTHEWS. Academic Press, New York, 1970. xviii, 784 pp., illus. $29.50.

The preface to this weighty book states that it "was written primarily for graduate students in plant pathology, plant virology, general virology and microbiology and for teachers and research workers in these fields," and that the author hopes "it will also prove useful as a reference book for those in disciplines related to plant virology—molecular biologists, biochemists, plant physiologists and entomologists." In attempting to serve so many purposes and to deal with all aspects of such a wide-ranging subject, the author set himself a formidable task, but to a large extent he has achieved his intentions. Not all chapters are of equal quality, and those on subjects in which the author has worked read more consecutively than the others; all summarize a great deal of information, however, with many references to work published in 1969 and 1970. The text is shorter than the number of pages suggests, because the book is profusely illustrated and the bibliography and index occupy more than 100 pages. The half-tone illustrations are well chosen and reproduced, but if the color plates add anything it is only to the price. Perhaps the greatest compliment the book can be paid is to say that every graduate student should have a copy, but probably few outside North America will be able to afford one.

Reading the book brings home how uneven has been development in knowledge about plant viruses and virus diseases. While almost every feature except the sequence of nucleotides has been discovered about the composition and architecture of strains of tobacco mosaic virus, there is still no inkling of an explanation for the fact that strains differ in host range and in the type of symptoms they cause. Also, although a multitude of phenomena has been discovered that shows how greatly changes in the environment of plants affect their susceptibility to infection, the extent to which viruses multiply in them, or the kind of symptoms produced, the phenomena all still await explanation. The viruses with particles most amenable to study in the laboratory are obviously proving most attractive to workers, although they are not necessarily the most important ones or the ones for which there has been most success in developing control measures. Indeed, although it would be an exaggeration to say that the more that is known about the composition and architecture of a virus the less probable it is that a method has been developed for controlling the diseases it causes, there is more than a grain of truth in the statement; certainly epidemiological work has led to methods of controlling some viruses before anything was known about their shape, size, or constitution. Others, including some whose particles have been much studied, still spread almost unrestricted, and will do so until workers turn from taxonomy to epidemiology and pathology. It may seem ridiculous to cavil at a book for students because it deals largely with what is known, especially when there is so much information to summarize, but a little more emphasis on the large gaps in our knowledge would have been valuable, and might have attracted people to work in subjects that would fill the most important ones.

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(Continued on page 316)