

Microbial Growth on C_1 Compounds. Proceedings of the 5th International Symposium: edited by H. W. VAN VERSEVELD and J. A. DUINE. Martinus Nijhoff, Dordrecht, 1987. xi + 305 pp. £45.50.

Ever since the inception of the triennial International Symposia on Microbial Growth on C_1 Compounds, the organisers of the successive meetings have attempted to select invited speakers who will give a broad review of developments in the areas and topics that they represent. As a result, the Proceedings of the meetings are not mere compilations of heterogeneous research papers, but useful state-of-the-art reviews which in most cases give reasonably complete accounts of recent developments. The present volume is no exception. The whole field of microbial growth on C_1 Compounds has been divided into seven areas: autotrophic bacteria, methanogenic and fermentative C_1 -utilizing bacteria, methylotrophic bacteria, methylotrophic yeasts, energetics of C_1 metabolism, genetics and molecular biology of C_1 -utilizers and applied aspects of one carbon metabolism. Within these areas, experts in the field give short (up to 10 page) reviews of their respective topics. Rather than separate representatives from different research groups giving papers, several of the papers are joint presentations from different groups working in the same area. This prevents duplication while ensuring more complete coverage. The quality of most of the papers is excellent, and this book is strongly recom-

mended to all readers, both inside and outside the field, who want an up-to-date account of the present work in progress on microbial utilization of C_1 compounds. With its companion volume from the 1983 Minneapolis symposium (Washington: American Society for Microbiology, 1984), the reader has a complete updating of developments in this area since the books of Anthony (1982), Large (1983) and Hou (1984) were published.

If I may single out one paper for particular recommendation, it is the Opening Address by J.R. Quayle. All who have come to the C_1 area within the last ten years would read this admirable historical summary of the exciting days of the 1960s when the number of 'methylotrophologists' could be numbered on the fingers of one hand.

The book is produced from camera-ready copy in which all the individual contributions were retyped on a word-processor. Consequently it is a model of clarity and uniformity, despite some irritating errors typical of word-processors (e.g. data misaligned into the wrong columns of Table 1 on p. 141). The type-face is particularly clear and easy-to-read. The book contains a reasonably adequate index, which should enhance its usefulness. The book is essential for all microbiological libraries and for any individuals working in the area who did not attend the symposium.

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Recognition in microbe-plant symbiotic and pathogenic interactions: edited by B. LUGTENBERG, Springer, Berlin, 1987. 449 pp. Price DM 198.

This is the fourth volume in a new cell biology series, which derives from lectures given at a NATO Workshop held in the Netherlands in May 1986. Like most such symposium proceedings these days, it is produced from camera-ready copy provided by the participants and thus lacks any uniformity of style or print size. It covers two different areas of plant molecular biology: the *Rhizobium*-legume symbiosis and the infection of plants by pathogenic fungi. Although there are certain things in common between these two classes of plant-microbial interactions, I am not sure what there is to be gained by linking them together in this way. The chemistries of the signalling processes are by no means closely related.

It was a lucky circumstance that the organisers held this meeting at this particular time since several laboratories were independently discovering that legume root flavones are involved in turning on the nod genes of *Rhizobium*. As a result, we have four separate reports describing this latest episode in the nitrogen fixation story. To the outsider, it is difficult to gain an overall picture of the situation from these chapters, since there are some discrepancies between the different contributions. The lack of a summarizing chapter is particularly apparent, but perhaps we still do not have enough information to generalize about this discovery which shows for the first time that plant flavones have a function in primary plant metabolism. Certain flavones and flavanones released from legume roots are very potent at inducing transcription of the *Rhizobium* operons, while related substances

(particularly isoflavones and flavonol glycosides) turn off the process, perhaps by competitive or non-competitive inhibition. It is now clear therefore that the infection of legumes by *Rhizobium* involves both lectin receptors and flavone inducers for intercellular communication.

The second half of the book, not surprisingly, centres on phytoalexins and their elicitation and there are recent reports from many well known workers on various aspects of plant-pathogen interactions and on plant defence mechanisms. In this section, there is an excellent review by Noel Keen entitled pathogenic strategies of fungi, where he describes the two main types of plant pathogen as 'thugs' or 'confidence men', the first class for example, capable of eliciting phytoalexin synthesis and the second of skilfully side-stepping this defence mechanism. Keen also points to recent studies of Vanetten and his group who have established a clear correlation between the presence of an enzyme metabolising pisatin and pathogenicity in *Fusarium solani* f. sp. *pisi*. This constitutes convincing indirect proof of the importance of pisatin in the defence system of peas. There is also a useful contribution from Dr Albersheim and his group on the various oligosaccharides derived from cell walls that can trigger off the defence mechanism of the cell.

The book concludes with five brief contributions under the title: Recommendations for future research. A careful perusal of this volume shows indeed that this is only a progress report. Many more experiments will be needed before we can have a complete picture of the recognition processes of nitrogen fixation and of plant disease.

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