

For the phytochemist this volume should be of considerable interest because it raises so many unsolved problems. For example it appears that there are distinct differences in chemical composition and in changes of enzyme activity with development in female and male plants of the same species. Why should hormones determine sex expression of plants, and at what level do they act? Some early work using immunochemical analysis of hemp indicate higher metabolic rates in female than in male plants of hemp, as a result of differences in gene activation. No doubt many of the early observations, particularly at the biochemical level should be re-exam-

ined using modern techniques, but the effort should be well worthwhile. The editorial remarks of K. V. Thimann add important additional information to this book. I would strongly recommend readers of 'Phytochemistry' to browse through this volume. They will find much information to interest them, and many problems which remain to be tackled, which are of interest to plant chemists.

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The Growing Plant Cell Wall: Chemical and Metabolic Analysis: by S. C. FRY, Monographs & Surveys in the Biosciences. Longman, Harlow, U.K., 1988, 333 pp, Paperback £19.50.

When we say a plant cell has grown or has differentiated we are referring to phenomena associated with the cell wall. It is one of the distinctive and diagnostic organelles of the plant kingdom and is tightly coupled to all stages of development. There has always been a thread of cell wall investigation running through plant physiology, but in the past it has been woven by only a few perceptive and tenacious workers, often with a reputation for eccentricity. This situation arose mainly from the sheer complexity of the constitutive chemistry, and the technical difficulties associated with interpretation. Indeed there has even been difficulty in defining what actually may be called a plant cell wall (Lamport, *Annual Review of Plant Physiology*, 1970). Despite these problems, the lack of input to cell wall experimentation is somewhat perplexing when we consider that any true understanding of, say, the hormonal control of cell extension or of differentiation can only be attained through a clear knowledge of the wall modifications.

With the publication of this book, I hope many more young workers will carry their studies to the level of the organelle most intimately involved. The first impression is that here is a format of an unusual but effective structure whereby the discursive text is heavily inter-

calated with boxed sections giving the technical schedules used in the appropriate study. Thus, we have both a story book and a D. I. Y. manual. I find this helpful and not at all confusing, although I am sure others will disagree.

The nuts and bolts of the book are well put together: the Content is informative, with a separate list of the recipe panels; an excellent reference list, and the index seems to work. There are 11 chapters dealing with the wall components, their chemistry and biosynthesis, the constituent enzymes and the basis of growth through wall loosening. In addition there are peripheral chapters including a review of the techniques of radioactively labelling cell walls and the relatively new field associated with biologically active wall fragments.

Stephen Fry has not set out to write a descriptive or comparative text on the biology of cell walls. He has instead put together a manual to encourage and guide more workers to join him in the elucidation of the multitude of outstanding problems. In this he has succeeded and deserves our appreciation. Those who buy this book will not just read it and then leave it on a bookshelf; it will usually be found lying open on a laboratory bench. Perhaps the publishers should have used a chemically resistant material in its production as this is the only book I know of that gives clear instructions on how to bring about its own destruction.

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Cell Culture in Phytochemistry, Volume 4 in the series **Cell Culture and Somatic Cell Genetics of Plants**, edited by F. CONSTABEL and I. K. VASIL. Academic Press, San Diego, 1987, pp. 314, \$59.

In this comprehensive series of books on plant cell culture and biotechnology, phytochemical aspects are being dealt

with in two volumes, the one under review and a second one, yet to be published on phytochemicals in cell cultures. Without having both volumes at hand, it is difficult to evaluate the completeness of the coverage of the topic, but a reading of this first volume indicates that the pair will probably provide a useful up-to-date review of a field, which has not been lacking in recent coverage through