

Book Review

Pathology of the Plant Cell. Part I: Pathology of Protoplasm

Ernst Küster.

Saad Publications, Karachi, 1996, 273 pp.

Hardback, DM 75.00.

'Pathology of protoplasm' makes one expect a treatise on cellular alterations in response to pathogenic attack. However, the book is a literal translation, on behalf of the US Department of Agriculture, of a German monograph dating from 1929 and summarizing descriptions of injured plant cells under a variety of experimental circumstances. The project of translating this book into English was undertaken to broaden the access of modern plant cell scientists to this classic work. The book deals with the dynamic reactions of the cytoplasm to treatments inflicted on plant cells, and is divided into chapters on changes in form and changes in structure. A wealth of careful light microscopic observations on systems ranging from epidermal and root hair cells to algae is discussed, highlighting many details and variations pertaining to, e.g. plasmolysis, partitioning of protoplasts, displacement of cytoplasm and 'solidification' of cytoplasm. The author is painfully aware of 'how incomplete our knowledge is of structural changes and how little a summarizing presentation is justified regarding the changes observed so far'. However, the description of plasmolysis, although lengthy, is almost up to date, as the phenomenon was already fairly well understood at the time. In contrast, the role of the cytoskeleton was entirely unknown then

and the descriptions of changes in form and structure, such as the formation of cytoplasmic strands, vacuolation and effects related to cell wall strengthening, can now be interpreted much better within that framework. The nucleus, and its organizing activity on the cell, is not considered at all. In contrast, cell rupture, release of naked protoplasts and protoplast fusion, now common techniques, are already described with reference to changes in osmotic conditions. Of interest to plant pathologists are those sections that deal with pathological processes preceding the death of the cell or of specific parts of the protoplasm. Today it is popular to equate hypersensitive cell death during an incompatible host-pathogen interaction with apoptosis, and the book both describes the stages of cytogenesis passed through before necrotization and discusses processes causing subsequent cell death.

The book contains some excellent drawings that, regrettably, are reproduced only moderately well. The text often refers to figures in original publications, most of which will by now be inaccessible to the reader. The latter will have to do, then, with descriptions that are sometimes difficult to interpret in modern terms, and in places some editorial explanations would have been helpful. In summarizing the views of the time, the book is a curiosity, with certain parts still useful for plant cell biologists. An extensive list of references (up to 1929), index of subjects and plant names, and author index conclude the volume and provide access to further information.

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