

Nitrogen Metabolism in Plants. T. W. GOODWIN and R. M. S. SMELLIE (eds.), Biochem. Society Symposium No. 38, 351 pp., London 1973. £8.00.

Twelve chapters of this volume are concerned with the detailed consideration of mechanisms and sites of synthesis of nucleic acids and proteins in plant cells. One further chapter deals with the role of indole-3-yl acetic acid in cell extension, and the remaining three with the biosynthesis of auxins, cyanogenic glycosides and glucosinolates. No mention is made of nitrogen assimilation nor of the biosynthesis of compounds such as the amino acids, alkaloids and betalain pigments. With such omissions the all-embracing title is misleading.

In the opening chapter, Chen analyses the chronological order in which the various biosynthetic pathways to the proteins and nucleic acids are "turned on" during the early stages of germination in wheat, and concludes that the synthesis of protein (coded for by conserved *mRNA*) precedes the synthesis of new nucleic acids. Detailed reports on the mechanism of protein chain initiation, the isolation of "elongation factors" and the method of binding amino acyl-*tRNA* to ribosomes in the same plant species are dealt with in contributions from other laboratories. Dure provides complementary information on the regulation of protein synthesis in cotton seed.

The interrelated roles of nuclear DNA and chloroplast DNA are the concern of several authors and a particularly useful account of chloroplast protein synthesis is given by Ellis. Blair and Hartley. Other contributions draw attention to the differences in RNA polymerases of nuclear and chloroplast origin in maize and *Chlamydomonas reinhardtii*, the differences between cytoplasmic *tRNA* and chloroplast-specific *tRNA* species in

Phaseolus vulgaris and between cytoplasmic and chloroplast aminoacyl-*tRNA* synthetases in the same plant. The distinctive characteristics and complementary functions of nuclear and chloroplast genomes are considered in relation to the possible mode of evolution of the eukaryotic cell. The role of mitochondrial nucleic acids receives attention in a chapter by Leaver and Harmey, while Skoog and his coworkers contribute a review on cytokinins and cytokinin antagonists with particular reference to their role in nucleic acid and protein metabolism.

The last three chapters are concerned with the biosynthesis of small molecules. Wightman discusses the site and mode of auxin synthesis. He shows that tryptophan and tryptamine act as precursors of indol-3-yl acetic acid in tomato, but that the tryptophan-phenylpyruvic acid pathway predominates. He also presents evidence of the occurrence of phenylacetic acid in this plant and discusses its possible role as a new natural auxin. Conn reviews the distribution and biosynthesis of cyanogenic glycosides and discusses the biochemical significance of polymorphism (with respect to cyanogenesis) found in *Trifolium repens*. The final chapter by Underhill and coworkers reviews present knowledge on the biosynthetic origin of the glucosinolates and indicates that these compounds can arise in three different ways.

This symposium volume is good value for specialists in the fields of nucleic acid and protein biosynthesis. It is likely (with the exception of the last three chapters) to be of less value to readers with a more general interest.

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