

CONTENTS

PART I

The Plant Cell: Substructures and Subfunctions

Chapter 1. Cell and Subcell	3
Chapter 2. Enzymes	14
Chapter 3. Ribosomes	21
Chapter 4. The Nucleus	38
Chapter 5. Cellular Membranes	64
Chapter 6. Mitochondria and Electron Transport	89
Chapter 7. The Chloroplast	124
Chapter 8. The Substructure and Function of the Cell Wall	151

PART II

Basic Metabolism

Chapter 9. Enzymology	189
Chapter 10. The Path of Carbon in Respiratory Metabolism	213
Chapter 11. Mono and Oligosaccharides	231
Chapter 12. Starch Inulin and Other Reserve Polysaccharides	258
Chapter 13. Biogenesis of the Cell Wall	298
Chapter 14. Lipid metabolism	323
Chapter 15. Protein Metabolism	346
Chapter 16. Origins of the Amino Acids	361
Chapter 17. The Biosynthesis of Coenzymes	391
Chapter 18. Mineral Metabolism	438
Chapter 19. Biological Reduction of Sulfate and Nitrate	467

PART III

Some Plant Metabolism

Chapter 20. The Plant Acids	493
Chapter 21. Alkaloid Biogenesis	526
Chapter 22. The Tannins	552
Chapter 23. Coumarins Phenylpropanes and Lignin	581
Chapter 24. Flavonoid Pigments	618
Chapter 25. Ethylene and Polyacetylenes	641
Chapter 26. The Isoprenoids	665
Chapter 27. Steroids	694
Chapter 28. Porphyrins and Bile Pigments	717

PART IV

Control

Chapter 29. Seed Development and Germination	763
Chapter 30. Fruit Ripening	793
Chapter 31. Cell Extension	827
Chapter 32. Development	850
Chapter 33. Death	867

PART V

Autotrophy

Chapter 34. Photosynthesis The Path of Carbon	875
Chapter 35. Photosynthesis: The Path of Energy	904
Chapter 36. Nitrogen Fixation	961
AUTHOR INDEX	981
SUBJECT INDEX	1014