MICROCHEMICAL TESTS.

Microchemical tests are important in revealing the character of cell-walls and of cell contents. The material to be tested should be fresh. It should be sectioned, a section placed on a slide, the reagent applied, a cover-glass placed over it and examined under the microscope. While making microchemical tests cover the stage of the microscope with a sheet of glass. Tests for the most important constituents of plants are given below.

Cellulose—Chloroiodide of zinc turns cellulose violet. This reagent may be prepared by dissolving chloroiodide of zinc in 10% less than its own weight of water and adding sufficient metallic iodine to give the solution a dark brown color.

Lignified Tissue—Apply a saturated aqueous solution of phloroglucin followed by a drop of concentrated hydrochloric acid. After a few minutes the lignified tissue becomes pink and finally rose-purple.

Starch—Add a dilute aqueous solution of iodine which turns starch blue.

Sugars—Test by applying Haine's solution and heating gently, when any of the sugars give a reddish-brown coloration. Haine's solution is made up as follows:

Copper sulphate	2 grms.
Potassium hydroxide	6 grms.
Glycerine	15 cc.
Distilled water	160 cc.

Proteids—Apply Millon's reagent and warm gently, when proteids turn brick-red. This reagent is prepared by dissolving 1 cc. of mercury in 9 cc. of concentrated nitric acid and adding 10 cc. of water.

Fats and Oils—Leave material in alcannin solution for six hours, when fats and oils will be red. This solution may be prepared by making a saturated solution of alcannin in absolute alcohol and adding an equal volume of water. As alcannin also colors tannins and resins red, the tannins, if their presence be suspected, should be extracted by boiling in water, and the test for resins should be made if there is any likelihood of their occurrence.