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At the present time E. J. Newcomer is chairman of the project and Anthony Spuler is secretary.

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E. J. NEWCOMER, *Chairman*

## SCIENTIFIC APPARATUS AND LABORATORY METHODS

### A METHOD FOR CUTTING GLASS TUBING

A THIRD method for cutting heavy glass tubing may be added to those described by Seemann, SCIENCE, No. 1726, and Tolmachoff, SCIENCE, No. 1733.

A piece of stout string about two feet long is wound once and a half around the tube. The two ends are allowed to hang down on opposite sides of the tube. The tube is held in a wooden vise, clamped on a desk with a wooden clamp, or held by a fellow worker, so that the edge of the desk acts as a guide for the string at the point where the tube is to be cut. The two ends of the string are grasped firmly, one end in each hand. The hands are pumped rapidly up and down, keeping the string tightly pulled around the tube. This is continued a short time until the tube and string are hot enough so that the string begins to smoke. Cold water from a beaker is quickly poured on the hot tube causing a clean break. The entire process may be completed in two or three minutes.

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### AN INEFFECTUAL ATTEMPT TO DEMONSTRATE THE VACUOME OF CERTAIN PLANT CELLS

IN an investigation concerning the nature of the plant-vacuole the writer had occasion to attempt a silver impregnation of the vacuome of various kinds of cells. The Golgi method of Da Fano was used because it is recommended by Guilliermond. This method involves the following steps:

(1) Fixation of the tissues in Da Fano fluid, a solution of cobalt nitrate in dilute neutral formalin. This fluid has a pH of 6.7.

(2) Impregnation of the tissues with a silver salt solution, silver nitrate.

(3) Reduction of the pieces of tissue thus treated by means of a modified photographic developer, Cajal solution.

(4) The customary procedure of dehydration, infiltration with paraffin, embedding, sectioning, mounting and counterstaining the tissues.

Root-tips of four-day-old wheat, barley and pea seedlings were used. Guilliermond recommends the use of root-tips of barley and pea seedlings.

By means of the Da Fano method, using the concentrations of Da Fano, Cajal and silver nitrate solutions recommended by Da Fano, the writer attempted to demonstrate the vacuome of the cells of the above tissues. In four of the experiments, the concentration of the solutions used was increased and the time of exposure of the tissues to the solutions was increased. Material on 153 slides, each containing from eight to ten sections, was subjected to the Da Fano procedure and examined carefully. In all cases examination of the sections failed to reveal the existence of a silver impregnated vacuome described and sketched by Guilliermond. In a few sections of wheat-root-tips examined, round black granules appeared in the vacuoles of 80 per cent. of the cells of the meristem. These granules resembled very closely in general appearance, distribution and occurrence the granules described by Guilliermond.

Changes in hydrogen-ion concentration of the fixative used, cobalt nitrate in dilute formalin, were tried. This modification has not been recorded by Guilliermond. The solution was brought to pH 2.4, 3.0, 4.6, 7.0 and 8.0 by the use of potassium acid phthalate and potassium dihydrogen phosphate buffer mixtures. The root-tips fixed in these solutions were then submitted to the remaining steps in the Da Fano procedure. Examination of sixty-two slides, twenty-three of barley containing the sections of ten root-tips and twenty-seven of wheat, containing sections of eight root-tips, revealed empty vacuolar spaces. Nuclei of cells of material fixed in solutions of pH 7.0 and 8.0 contained more granules of reduced silver than did those of material fixed in more acid solutions. The cytoplasm of the former cells also contained a much heavier deposit of silver than did that of the latter cells.