too readily. The apparatus, after being inverted, is placed in a large split iron ring attached to a ring stand and then has the appearance indicated in the drawing. The cotton in the side arm D of the overflow vessel is removed and a glass tube (not shown) is attached to it by means of a short rubber tube. This glass tube conducts the overflow to a beaker sitting on the table top. The 1 mm constriction in the side arm provides a liquid seal to prevent any chance of contamination through that member. The cotton plug is then removed from the bell-shaped shield and the apparatus is ready for use. The stopcock is turned so that the pipette fills. When a few drops of liquid have run out of the tip at the top, indicating that the pipette is completely filled, the stopcock is turned through 180° and the measured quantity is discharged into a sterile flask which is placed on the table underneath the bell. The interchangeable ground glass joint is provided to facilitate the use of various-sized pipettes from 10 to 100 ml. When different amounts of one solution are to be measured, but with less rapidity and accuracy, a graduated burette E can be inserted, instead of the pipette, by means of the interchangeable joint.

NEIL E. RIGLER
GLENN A. GREATHOUSE
TEXAS AGRICULTURAL EXPERIMENT STATION
AND BUREAU OF PLANT INDUSTRY,
U. S. DEPARTMENT OF AGRICULTURE,
COLLEGE STATION, TEXAS

## A DRY-ICE FREEZING UNIT FOR CUTTING FROZEN SECTIONS

THE advantages in time-saving of different freezing methods in cutting microscope sections is well recognized, but available techniques are in many cases difficult or costly to use. Freezing by carbon dioxide gas is both costly and tedious in practice. The use of commercially available dry-ice freezing units has some disadvantages. Ordinarily these units are too small for pieces of tissue larger than 2 square cm, they fail to freeze the tissue uniformly, since the dry-ice container is arranged on an arm extending from the tissue table, and they do not hold enough dry ice to keep the tissue at a uniform temperature for a sufficiently long period of time.

In order to facilitate the cutting of rather large brain sections, a dry-ice freezing unit has been devised to eliminate many of the difficulties described above. The unit is constructed so that it can be used on different kinds of microtomes.

Fig. 1 presents a diagram of the apparatus in cross-section. The device consists of a cylindrical cast-aluminum container, constructed with a center table, to which is fitted a bakelite support. The block of tissue to be sectioned is placed on the center table, which is grooved in concentric circles, and powdered dry ice is packed around it within the container. The bakelite support is clamped to the block-holder of the microtome.

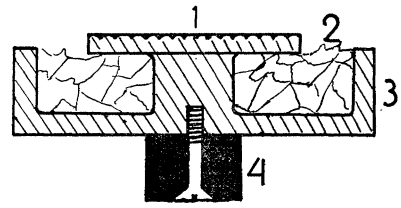


FIG. 1. The Dry-ice Freezing Unit: 1 represents the circular table of the freezing unit, 2, the circular container into which the dry ice is packed, 3, the side wall, and 4, the bakelite support, which is clamped into the block-holder of the microtome.

The dry-ice container measures 8.4 cm in diameter, 2 cm in height, and has a wall and base 0.4 cm thick. The tissue table is supported at the center of the container on a base 1.5 cm in diameter. The table itself is 5 cm in diameter and 0.5 cm thick, and is raised 0.2 cm above the wall of the container in order to avoid the possibility of fouling the knife. The hexagonal bakelite support is 1.5 cm high and 2.5 cm in width. Additional economy of space may be secured by constructing the apparatus so that the base support may be clamped directly in the microtome, thus eliminating the block-holder.

Using this device, complete frontal sections of the brains of large dogs, 30, 40 and 50 microns in thickness, have been cut very satisfactorily. The tissue is frozen uniformly since the tissue table is completely surrounded by dry ice. The dry ice keeps well, for it is partly enclosed within the container. Furthermore, the container is insulated from the metal of the microtome by the bakelite support. In these respects the freezing unit described has been found superior to other devices of this sort, both those which utilize dry ice or carbon dioxide gas in order to freeze the tissue.[1]

KARL U. SMITH
THE UNIVERSITY OF ROCHESTER

[1] The freezing unit described may be obtained from Merle Hanford, Physics Department, University of Rochester, Rochester, N. Y.

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