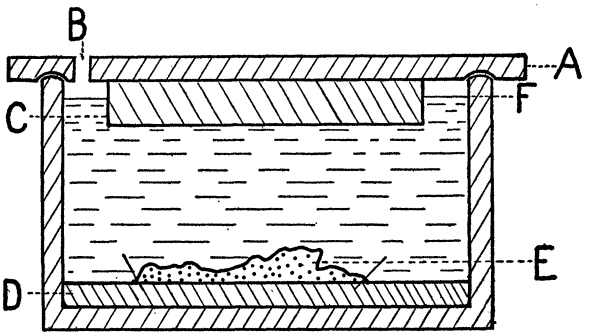
SCIENTIFIC APPARATUS AND LABORATORY METHODS

A CLEAR-VIEW SPECIMEN DISH

AFTER a number of experiments a museum dish has been evolved which can be used under the binocular microscope to good advantage. Valuable embryos and delicate dissections can be kept unharmed and viewed without optical distortion by this method. The accompanying figure gives the details of the dish.



A. Lid of stender dish.
B. Drilled hole for filling.
C. Plate glass disc cemented to A with Valspar.
D. Layer of wax.
E. Specimen attached to wax.
F. Upper surface of preserving fluid.

Clear glass imported stender dishes of various sizes were obtained. These had plate glass covers with a groove ground on the under surface. We next secured thick discs of clear polished plate glass (C in figure), somewhat smaller in diameter than the inner diameter of the stender dish. These discs were cut and polished at a local mirror and windshield factory. Such a disc (C) was then cemented to the under side of each lid (A). After many trials, an ideal cementing substance was found to be clear Valspar. The method for cementing was as follows: lid (A) is put with the upper surface down on a warming plate. A number of drops of Valspar was then put on the clean surface, and then the plate glass disc, perfectly clean, was placed upon the drops of Valspar, care being taken that no air bubbles were included and that a sufficient amount of Valspar was used to insure a small excess oozing out at the edges. A weight of about two hundred grams was then placed upon the plate glass disc and small pieces of lead plate were used as anchors to keep the glass from sliding while the varnish was still wet. The covers remained untouched for a number of days, the temperature of the warming plate never being over 60 degrees centigrade. It should be added that the lids of the dishes were previously bored at the glass factory with a hole (B), large enough to admit the tip of a small pipette.

A thin layer of beeswax, paraffin or ozokorite (D) was put into the bottom of each dish, and to this an embryo or dissection (E) was fastened by means of glass needles. The dish was then filled with formalin solution, alcohol or other preserving fluid, so that the upper surface of the liquid (F) was somewhat higher than the lower surface of the plate glass disc (C). Lid (A) was now cemented on to the dish by museum jar cement (Sealo), and the opening (B) plugged with a small stopper or a bit of beeswax. If there should be any subsequent loss of liquid from the dish, the plug can be removed and a small mouthed pipette used to replace the liquid through this opening.

The advantages of such a dish are evident. The air space is entirely out of the field of view, and there is no condensation of moisture on the under surface of the part of the lid used under the microscope.

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A STARCH TEST IN PHOTOSYNTHESIS EXPERIMENTS

A SEARCH for better methods of conducting routine experiments in photosynthesis has led to results that may prove useful to others. So far as I am aware these exact methods have not been reported before.

We find that with a number of leaves such as those of the horseshoe geranium the chlorophyll may be dissolved much quicker by first rinsing or lightly rubbing them in gasoline. Kerosene seems to be somewhat useful but is not as good. While we have not determined the reason we find that hot alcohol penetrates many times as rapidly after this treatment, thus very quickly and evenly extracting the chlorophyll. The extreme brittleness from the alcohol treatment may be overcome by immersing the leaves for a moment in water.

With this method we find that ordinary white vaseline is excellent for coating the leaves instead of the various waxes commonly used to prevent the entrance of carbon dioxide in certain experiments. The vaseline is quickly dissolved by the gasoline treatment, thus permitting rapid penetration of the alcohol and iodine solutions.

A *fresh* solution of iodine in gasoline gives a clearer starch test than does the iodine solution in potassium iodide or in alcohol. It is, however, subject to a slow deterioration and becomes inactive after a week or two. It should be mixed in small quantities as needed.

To facilitate the use of this method a schedule is given below:

(1) Wash in gasoline one minute.
(2) Clear in hot alcohol until leaves are white. If needed change alcohol as soon as green with dissolved chlorophyll.
(3) Water momentarily to relieve brittleness.