IN THE LABORATORY

A Method for Making Lantern Slides

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Professional workers often have the problem of preparing illustrations for a lecture to a lay or technical audience. The decision regarding the number of lantern slides to be used rests frequently upon three factors: (a) the available funds, a consideration rarely negligible at academic institutions, particularly when slides are to be shown on a single occasion; (b) facilities for preparation of reproducible drawings; (c) the availability of prompt photographic service (capable of filling last-minute orders). The end result is often a great dearth of illustrations and a crowding of information on a few slides. This latter usually leads to illegibly small print of letters or numbers.

The effective lecture appeals to the visual rather than the auditory comprehension of an audience. Particularly, the merely oral mention of numerical values or the description of conditions, arrangements, trends, etc., generally leave too much to the imagination of the listeners and tax their retentive capacity to such an extent that they find it difficult to follow subsequent statements or reasoning. Therefore, the generous employment of lantern slides is highly desirable. In most cases, it is not necessary to exhibit masterpieces of draftsmanship. Legibly printed words or numbers, schematic sketches of diagrams, and even cartoons serve in good stead.

The author happened upon a direct method of making slides which eliminates the expensive photographic process and may be useful to others.

Typing on cellophane, with an inverted sheet of carbon paper on the back side for increased density of the print, is probably a well-known expedient. The results of this method are, however, often disappointing because of unwanted carbon adhering to the cellophane or because of smudges from the typewriter ribbon. Also, cellophane does not offer a good drawing surface.

A more versatile and convenient material for making slides is available in "Permafilm (dull),"[1] a cellulose acetate with a dull finish on one side and an adhesive on the other. When this film is smoothly applied to a slide cover glass, it exhibits a high transparency and facilitates the writing, drawing, or copying of diagrams onto the slide.

While India ink is the most efficient medium for writing and drawing, ordinary pen and ink, soft pencil, or carbon pencil will also give very satisfactory results. All of these media can easily be erased or wiped off with a piece of moist tissue paper. After the desired information has been put on the slide, a mask and another cover glass is placed on top and binding tape applied as usual. Heat from the projector lamp apparently does not affect the film even during prolonged exposure.

[1] Formerly "Dulseal," by Denoyer-Geppert Company, Chicago, Illinois.

Glass Trough for Filter Paper Partition Chromatography

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With the increasing use of filter paper in partition chromatography (*1–4*) has come a need for a trough to serve as a reservoir into which the filter paper dips. The solvents used and the necessity for the avoidance of impurities practically demand glass as a material for the trough.

Using the tools available in most laboratories, a suitable glass trough (Fig. 1) may be constructed in accordance with the following variation in the method described by Consden, Gordon, and Martin (*1*).

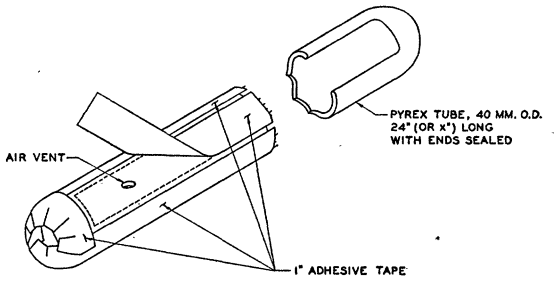

FIG. 1. Diagram of glass trough. *Left:* before cutting; *right:* completed channel.

Seal off the ends of a 40-mm O.D. pyrex tube of desired length, providing a small vent on the side of the tube to equalize air pressure while sealing the second end. Affix to the tube a 1″-wide strip of adhesive tape the length of the trough opening, covering the vent. Affix 4 more strips of tape adjacent to each side and each end of the first strip, but ⅛″ distant from it, to form a path on the glass for the cutter and a reinforcement for the tube during cutting. Lay the glass tube on a sponge-rubber mat on a flat sink drainboard, and cut the glass with a carborundum disc, 2″ or smaller in diameter, mounted on a flexible-shaft power take-off, a moto-tool, or a dental engine arm; play a stream of water on the disc and glass while cutting. When the panel of glass has been cut around, it will probably fall off intact. Smooth the

edges carefully with the side of the carborundum disc. A 24″-long trough may be completed in an hour.

References

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A Simple Micromethod for Rapid Extraction of Lipids[1]

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Ever since Soxhlet's (1848–1905) extractor came into general use, many modifications of the fundamental method have been proposed. The problem has been how to extract all the lipids as completely as possible without undue expenditure of time and exposure of the tissue and extract to oxidation. Recently Bloor (*1*) recommended boiling 95% ethanol followed by ethyl ether as the most generally useful solvent in the microdetermination of lipids. The tissue is boiled in an Erlenmeyer flask and the extract separated from the tissue by filtration. Ernst (*2*) uses a sintered-glass plate fused into a separatory funnel for rapid and repeated extraction of fats from meat, combining extraction and filtration into one process. But the method suffers from being a cold extraction only. In the present method the tissue is extracted with boiling solvent, the processes of repeated extraction with fresh solvent and the final filtration are all combined into a single step in the procedure, and the apparatus used can be easily assembled in any laboratory.

The extractor (Fig. 1) consists of a cold finger, A, the end of which is drawn out into a hook and with a bulb blown near the other end in order to rest on and close the mouth of a 100-ml Kjeldahl digestion flask, B. A thin glass rod, C, with a hook on its upper end, is attached on the lower end of the cold finger and leads into a glass tube, E, placed inside an insect vial, D. The inner tube, E, is made from a 6-cm section of ordinary glass delivery tube with a coarse, sintered-glass plate fused onto its bottom. (The sintered-glass plate used here was made by pulverizing a piece of glass tube and fusing the powder onto one end of a 6-cm section of the same material.) The insect vial, D, has a round opening, F, blown out at its lower third.

For microextraction of lipids from tissue the latter is placed in the inner sintered-glass tube, E, which is placed inside the vial, D. The whole is introduced into the Kjeldahl flask with the help of a glass rod while the apparatus is in a horizontal position. Ten–20 ml of redistilled 95% ethyl alcohol is poured slowly into the flask. After clamping the flask and starting the circulation of water through the cold finger, the bottom of the flask is gently heated with a microflame. As the alcohol boils, its vapor is condensed on the cold finger and flows along the guiding rod, C, into the inner tube, E, and onto the tissue which is being boiled at the same time. Condensed alcohol will at first accumulate in the inner tube, E, extract the lipids, and be filtered into the outer tube, D, through the sintered-glass plate. As soon as the alcohol in tube D reaches the level of the opening, F, it flows out

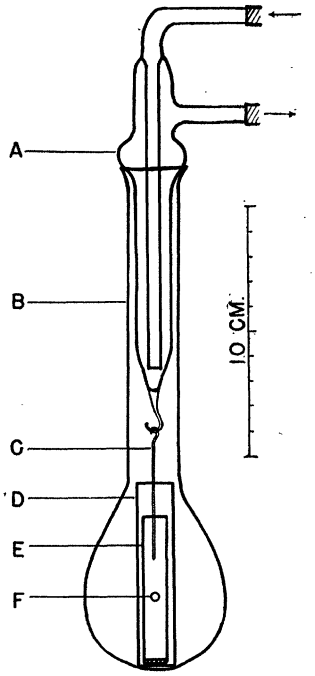

FIG. 1

into the flask. In this way the solvent in tube D is never higher than the level of F, while fresh condensate keeps on coming into the inner tube to extract the tissue. After a specified time the extract is removed from the tubes and the flask. A cork mounted on the end of a 25-cm-long glass rod is convenient for taking the outer tube, D, with its contents, out of the flask. The extraction is completed with ethyl ether in the same way.

In charging the tube with tissue and in removing the extract, precaution is observed against introducing foreign lipids from either the operator's hands or other objects. As some air is always trapped under the vial, D, which then serves as a boiling tube, there is no danger of bumping, for the solvent boils smoothly.

The total extracts recovered after evaporating the solvents under reduced pressure, extracted from different tissues for various length of time (5–20 min), are shown in Table 1. There is apparently no gain in increasing the

[1] Contribution No. 409 of the Woods Hole Oceanographic Institution, Woods Hole, Massachusetts.

[2] This work was done at the Marine Biological Laboratory as a part of a research program. I am very grateful to the chairman and members of the Osborn Zoological Laboratory for providing laboratory facilities at Woods Hole.