doleacetic acid in concentrations of .1, .05, .025, .01 and .005 per cent., respectively. In all concentrations there was apparently normal development of the achenes which, upon subsequent examination, proved to be empty seed coats. With the .05 and .1 per cent. concentrations a number of the receptacles or fleshy portions developed and ripened into apparently normal fruits. In the lower concentrations, however, the receptacles made only an initial growth, which soon stopped. Unsprayed flowers made no development of receptacle or achenes.

Trees of the Starking apple, a self-sterile variety, were protected from cross-pollination and, when in bloom, sprayed with indoleacetic acid in concentrations ranging from .01 to .06 per cent., but no fruits developed. Likewise, the Brighton grape, which is self-unfruitful, failed to respond to naphthaleneacetic acid in concentrations ranging from .0005 to .01 per cent. These concentrations were of course arbitrarily selected and, having failed, there was no opportunity to try other concentrations, since the flowering period had passed. Perhaps these plants might also have responded if the proper concentration had been applied. In the case of the grape, which has a very short style, as has also the holly, it was thought that the stimulus should have little difficulty in reaching the ovary.

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SCIENTIFIC APPARATUS AND LABORATORY METHODS

THE PRESERVATION OF BIOLOGICAL SPECIMENS BY MEANS OF TRANSPARENT PLASTICS

SOME months ago it occurred to the writer that the transparent type of plastic more or less typified by polymerized methyl methacrylate would make a suitable medium for the mounting and preservation of specimens of all descriptions. Some botanical specimens, such as leaves, flowers, small plants and petals, and biological specimens, such as a chicken heart and various types of insects—bees, beetles and lately butterflies—were consequently mounted in this medium. The results have exceeded expectations. There is no apparent deterioration, even though some specimens have been exposed to full sunlight for several weeks.

The method lends itself to easy manipulation, and the resultant product is a hard, water-clear case for the article which is to be preserved. This case or covering can be made in any reasonable thickness and shape. There is no danger of breakage and any face may be ground and polished or sawn with ease. This property facilitates the preparation of thin specimens. Once hardened, there is no softening of the polymer within the temperature ranges one is likely to encounter. Inorganic materials susceptible to attack by vapors or humidity may likewise be preserved intact as well as fragile specimens of archeological interest.

The primary advantage of this medium rests in the ease of preparation, in its superior physical and optical properties, and in its capacity to preserve material which would otherwise deteriorate.

Not only may different plastic materials be used, but the manipulative procedure may be varied over a considerable range. This procedure is as follows: Methyl methacrylate monomer is first given a preliminary polymerization by heating to approximately 80° C. This increases the viscosity of the liquid from that of a relatively thin liquid to one that approximates the viscosity of ethylene glycol or glycerine. The degree of polymerization desirable at this point depends on the specimen. The greater the rapid polymerization under heat the less time necessary to complete the reaction in the cold. However, if the solution is too viscous, then the elimination of bubbles becomes more difficult. The specimen which is to be preserved is first treated briefly with a dilute solution of formaldehyde—if it is an organic specimen, although on occasion this step may be omitted. It is then dried rapidly in vacuum and immersed in the partially polymerized methyl methacrylate, taking care to remove any bubbles. This may be facilitated either by immersion in vacuum or evacuation of the air after immersion.

The final solidification or complete polymerization may be hastened either by exposure of the liquid containing the specimen to the radiation from a glass mercury arc, sunlight or other suitable source of light or by the addition of a small amount of benzoyl peroxide, sulfur trioxide or other suitable agents to the liquid. This will cause the complete polymerization in not more than a few hours, the exact time depending on the amount of initial polymerization. This final step can be carried out at a temperature sufficiently low so that there is no destruction of the specimens.

The vessel containing the methyl methacrylate may be of any desired shape, thus permitting any orientation of the specimen in the final solid. If it is desirable to have only a thin layer of the polymer over a cross-section of the specimen for microscopic examination, the specimen may be first totally immersed but after solidification a section sawn through the specimen at any point, thus exposing anew any desired face.

Over this face may be poured a thin layer of the partially polymerized methyl methacrylate, which will solidify on the already formed solid without appreciable demarkation. This work is being continued.

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A PARAFFIN BLOCK TRIMMER[1]

THE description of a paraffin block trimmer is offered because of its usefulness, inexpensiveness and simplicity of construction. An old discarded Bausch and Lomb dissecting microscope stand, with lens arm and glass stage removed, and a regular microtome blade were utilized in constructing the trimmer. The microtome blade can be inserted and removed by merely tightening and loosening two wing nuts.

A hard tough wood was used in the trimmer. The following procedure is suggested for constructing it. Cut out a piece $2\frac{1}{4}''$ ($2\frac{5}{8}''$ plus width of saw used) $\times 1\frac{5}{8}'' \times 6''$. If several are to be made increase the length accordingly. Drill holes for the four wood screws (a) on the $1\frac{5}{8}''$ side, $\frac{3}{8}''$ from one edge. These screws clamp block A and B to the rack. Rip the block so as to obtain block A, $\frac{3}{4}''$ thick, and block B, $1\frac{3}{8}''$ thick. Cut the groove for the toothed part of the rack only in the middle of block A. Make a V-shaped groove for the triangular-shaped rack in block B. On the opposite side from the V-shaped groove cut out an area $\frac{1}{4}'' \times 1\frac{1}{2}''$. Cut the inclined plane, on which the microtome blade rests, at 30° with the horizontal

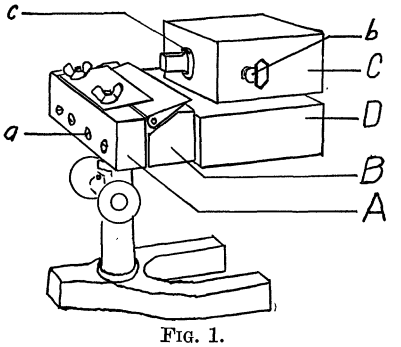

FIG. 1.

plane, beginning the cut at the corner. The finished block B should measure about 29/32″ on the side that clamps to A and 1 7/16″ on the opposite side. Finished block A measures $\frac{3}{4}'' \times 1$ 5/16″. Block C measures $1\frac{5}{8}'' \times 3\frac{1}{4}'' \times 3\frac{1}{2}''$. A $\frac{1}{4}''$ stove bolt (b), as a set-screw, holds the object block tight in the block. Block D measures $1\frac{3}{8}'' \times 3\frac{1}{2}'' \times 6''$. Cut out an area $\frac{1}{4}'' \times 1\frac{1}{2}''$ to coincide with the same size opening in block B. These two combined openings ($\frac{1}{2}'' \times 1\frac{1}{2}''$) allow trimmed-off paraffin to fall below.

This blade holder was constructed for use with a Spencer No. 942 blade. If a smaller blade is used the dimensions should be changed so that when block C is pushed up against block B, in the process of trimming the paraffin block, there will be about $\frac{1}{8}''$ clearance between block C and the cutting edge of the microtome blade. This obviously is for protecting the cutting edge.

The microtome blade is held in place by a piece of sheet metal $1\frac{1}{4}'' \times 4''$ fastened to block A by means of two stove bolts with wing nuts.

The trimming of the paraffin block is accomplished in the following manner: Block C, with the object block (c) held securely in a $\frac{3}{4}''$ hole drilled for that purpose, is pushed up repeatedly against block B. The height of the microtome blade is regulated by turning the pinion. It is suggested that the cutting edges at each end of the blade, which can not be used for sectioning, be used for trimming the block.

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[1] Contribution No. 183, Department of Zoology.

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