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EMBEDDING IN CLEAR CASTING RESIN

PREPARATION OF SPECIMENS PRIOR TO EMBEDDING

General Remarks: It will be obvious that no water must come in contact with the casting resin. This presents no difficulty in the case of dry objects and the procedure is to follow the example given in number 4.

Objects preserved in formalin or 70% alcohol can be dried superficially in which case they will embed as opaque specimens, or it may be desired to have the specimen translucent in order to see internal structures. In this case they must be dehydrated completely.

All specimens other than those such as the insects, which may be dried completely, must be preserved in some way because of the spoiling action of anaerobic bacteria when they are preserved fresh.

A brief outline of the common techniques is as follows: -

OBJECTS IN FORMALIN

Most often used for tadpoles to show the metamorphosis of the frog.

(a) Opaque. Wash in running tap water for one hour. Dry by gently rolling in blotting paper. Air dry for approximately one hour, or better, immerse for a few minutes in absolute alcohol and dry in a vacuum desiccator. Immerse in uncatalysed casting resin and transfer immediately to embedding.

(b) Translucent. Dehydrate the tadpoles completely by passing through successive grades of alcohol 30%, 50%, 70%, 80%, 90%, 95%, absolute, preferably on successive days. Transfer the dehydrated specimens to uncatalysed casting resin until the required translucency is reached. embed as described. Quite an amount of internal detail is revealed in many specimens by treating in this way.

OBJECTS IN ALCOHOL

Embedding a large centipede.
The usual concentration of alcohol when used as a preservative is 70%. The normal procedure here is to continue up through the dehydrating alcohols - 80%, 90%, 95%, absolute, and after soaking in uncatalysed casting resin, embed as described.
Many objects such as those with exoskeletons may be dried from the 70% alcohol and then treated as a dry object.

OBJECTS IN GLYCERINE

Alizarin transparency of a mouse.
An alizarin transparency of a mouse is quite transparent in its glycerine solution, but if it is embedded with any glycerine present, it will embed opaque because glycerine is not optically miscible with the casting resin. Transfer the specimen to 70% alcohol and follow on successive days into 80%, 90%, 95%, and absolute alcohol. The glycerine will now be removed. Transfer to uncatalysed casting resin, and when it sinks, it is ready to embed as described later.

DRY OBJECTS

Dried Echinoderms, bones, shells, insects, etc.
Here the problem is not one of eliminating water, but of eliminating trapped air in and around the specimen. If care is taken in the stirring and pouring, plus treating the specimen in uncatalysed resin just prior to embedding, most of this type of problem will not occur. When the specimen is glistening with resin all over and it is known that no large air spaces are inside, it can be safely embedded.
Catalysed casting resin can be injected into large empty body cavities such as the abdomens of dried insects, using a syringe.

Technical Data Embedding in Clear Casting Resin

A vacuum desiccator, or any device, which will lower the pressure, helps greatly in getting air out and up to the surface.

METHOD OF EMBEDDING SPECIMENS

There is almost no limit to the variety of common items, which can be used as moulds. All must be scrupulously clean. Polythene containers are usable, but tend to distort in shape.

Cover the mould evenly with mould release. Taking particular care in sealing off the seams where the ends join on. Set the mould aside to dry for at least one hour at room temperature, or warm in an over to hasten to process.

If the specimen is one, which sinks in the resin (this will be known from the preparation of it), the procedure is straightforward. It is arranged on a 6mm layer of catalysed resin, which has been allowed to gel sufficiently to support the specimen, but is still tacky enough to bind in the covering layer.

If the specimen is one, which floats, two techniques are available: -
(a) The specimen may be adhered to a partially gelled 6mm layer and when this is firm enough to hold the specimen down, a covering layer is poured.
(b) The specimen may be introduced with the first pour in such a way that it floats 6mm from the bottom. When this has gelled, a shallow layer is then poured to cover the specimen by about 6mm.

NOTES TO REMEMBER

When mixing catalyst into the casting resin it is wise to make sure you have not only stirred the middle, but also scraped around the sides of the mixing container. Mix thoroughly, but as carefully as possible to avoid air bubbles. When pouring the resin/catalyst mixture do not be tempted to scrape the insides of the container as there may still be uncatalysed or under catalysed resin here which will spoil the finished article. This mixture will harden at room temperature in approximately 45 - 60 minutes.
Additional catalyst will harden the material quicker, and lower catalyst levels will slow down the process. It is unwise to have any layers set in under 30 minutes. An hour's setting time is advisable and will give very satisfactory results. Fast setting times lead to overheating, discolouration, and the tendency for thick blocks to develop internal crack from the exotherm on curing.
The catalyst system is tolerant over a considerable range, and satisfactory results will be achieved by using approximately 0.9% catalyst for layers 12mm thick, dropping down to 0.5% for very thick layers and increasing to 1.0% for very thin layers.
Remember, a by-product of the reaction of the catalyst with the resin is exothermic heat. The quicker the reaction time, or larger amounts of resin will create problems from the exotherm. These will show themselves as discolouration of the finished product, or internal cracking.
Air bubbles must be avoided at all costs for a professional finish. To avoid air bubbles in the layers of resin, take care with the stirring, and then pour the resin into the mould directing the flow over the stirrer. Even so, some bubbles may occur. Guide these to the side with a pin or draw them off with a dropper. For air bubbles in the specimen itself - see preparation of the specimen.
Arrange the prepared specimen on a layer of catalysed resin. At this stage also, any labelling is included. Typewritten or hand printed labels can be embedded with the specimen. Very thin rice papers become quite transparent, leaving only the printing to be seen. Prepare sufficient resin to cover the specimen by about 6mm, cover and leave undisturbed until set.
The casting will cure at room temperature in about 24 hours in warm weather. In cold weather, it will take longer. If a 40 Deg. C. oven is available, this will hasten the final curing to 4 - 6 hours, but as sudden changes in temperature at this stage are to be avoided, it is not really worth going to a lot of trouble.

FINISHING TO ARTICLE

Three grades of wet and dry abrasive paper are needed. Commence with the coarse grade on a flat surface and with plenty of water. Grind all the faces flat. Follow this with the medium grade and then fine grade papers again with plenty of water. You should achieve a smooth silky appearance on all faces. It is at this stage that the shape and condition of the mould you used becomes important. A block from a neat mould with square faces can be finished off in a few minutes.
Finally, using a soft cloth and brasso (or superfine buffing compound), a high gloss finish will result.
Rinsing in acetone solvent, followed by washing in hot water with any good household cleaner will remove the casting resin from equipment used.