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American Society of Ichthyologists and Herpetologists

NEW SMITHSONIAN MUSEUM SUPPORT CENTER --- On May 16, 1983, the Smithsonian Museum Support Center (MSC) in Suitland, Maryland (approximately 7 miles from the National Museum of Natural History) officially opened. The new 4 l/2 acre building will serve as a museum conservation, storage, research and teaching facility, providing optimal conditions of climate and physical security for our collections. The physical structure consists of 4 huge, contiguous storage areas or "pods", each the size of a football field, separated from the laboratories by an enclosed street.

The Institution plans to move collections from the downtown Mall museum to the new facility over a span of 3 years. At least 75% of the items being moved will come from the National Museum of Natural History. The Natural History's Oceanographic Sorting Center has already started packing and will be the first Natural History unit to take up residence at MSC. The Division of Amphibians and Reptiles will move their dry collection (stuffed skins, skeletons, and cleared and stained herpetological specimens) to Pod 2 designated for Vertebrate Zoology, Entomology, Botany, and Invertebrate dry collections. The turtle, crocodilian, and tank collections will be housed in Pod 3 designated "wet" collections. The Division of Fishes will move the alcohol preserved cephalochordate, agnathan, elasmobranch, selected North American freshwater and Ocean Acre Program, and tank specimen collections (excluding types) to Pod 3 also. Both Divisions had planned to begin moving in early 1984 but have been rescheduled for late in the year when recommended changes in the storage equipment system will have been completed.

During the shipment of collections to the MSC, each collection will be temporarily unavailable for loan and examination. In addition, our collections management staff may be occupied with the move. We request your forbearance with the likely interruptions and delays in specimen transaction services. --- Janet Gomon, Division of Fishes, and George Zug, Division of Amphibians and Reptiles, National Museum of Natural History, Washinton, DC 20560.

COMMENTS ON "ACETONE IN ISOPROPANOL" BY GEORGE H. BURGESS [in] (Curation Newsletter 6:1, May 1983) --- William R. Taylor, Division of Fishes, National Museum of Natural History, Washington, DC 20560.--- In my opinion some of the implications made in this short paragraph require discussion. In addition, the observed specimen damage may have resulted from conditions or combinations of conditions other than those implied by the odor of acetone in isopropanol. The data presented were inadequate for drawing any significant conclusions

The isopropanol may have been a "bad batch." This is implied by the two drums with an "acetone" odor; other drums apparently lacked such an odor. There is no indication that the specific gravity of the alcohol or diversion of pH from near neutrality was determined. Either can sometimes indicate the presence of impurities.

I strongly doubt that acetone was the problem. It was detected subjectively, not by their chemical analysis. Contrary to the article, I have yet to find (after talking to chemists and manufacturers of isopropanol) that it is used in separation of water from the alcohol.

For many years acetone was prepared from petrohol (= isopropanol) (Hatch, 1966). More recently some manufacturers have been preparing isopropanol from acetone (a by-product of other chemical production). Thus, it may be expected that in some preparations a small, yet probably insignificant quantity of acetone may be present.

Regardless, I must question the conclusion that acetone cleared specimens. It is a solvent of some materials but does not break down proteins. Pearse (1968: 85) indicates that it, like alcohol, precipitates proteins and it has been used as a fixative in enzyme histochemistry.

Thus, if the problems were because of "bad batches" of isopropanol, the observed damage had to result from impurities other than acetone. Therefore, I wish to point out some other possible reasons for the preservation failure.

1. The cleared specimens may have been poorly fixed before transfer to the 50% isopropanol - 50% water solution.

2. I have indicated (Curation Newsletter 2:1) that water in specimens will materially dilute the percentage of alcohol in an alcohol-water solution. The amount of dilution depends upon the volume of specimens added relative to the volume of the solution.

Also indicated (Taylor, 1972 in the abstracts of ASIH 52nd annual meeting) were the observations that in both ethanol and isopropanol at equal percentages, with distilled water and with other conditions being equal, closely similar enzymatic activity occurs. The rate of enzymatic activity in both increases with decrease in alcohol content and conversely decreases with increase in alcohol content. There are also indications that several other chemical reactions that break down tissues react similarly in the two alcohols. For example, certain mucins are soluble in water and dilute alcohols, but have remained undissolved for years in strong ethanol solutions and the effects of anhydrous acetic acid on bone is nil or virtually nil in dry alcohol but very active in alcohol-water solutions (in ms). Likewise, oxygen requires the presence of water for many reactions, and in theory (as well as some circumstantial evidence) its combination with melanin (bleaching) takes place readily in water dilute alcohol-water solutions but is greatly reduced in strong alcohol solutions (Taylor, Curation Newsletter 3).

Thus, diluted alcohol permits destruction of specimens, even if the are well fixed. If poorly fixed, specimen degeneration would proceed at a faster rate. I believe that 50% alcohol (either ethanol or isopropanol) is inadequate for preservation.

3. Formalin solutions are often made alkaline by the addition of sodium borate (sodium tetraborate), theoretically to retard acid degradation of bone structures. Borax added to distilled water or 10% formalin prepared with distilled water results in pH readings of about 9.1. Traces of borax added to either ethanol or isopropanol solutions can yield pH readings of 10.0 or higher.

I have indicated that specimen clearing takes place in

borax-formaldehyde, solutions (Taylor, 1977) and suggested that the use of borax be discontinued. Also, the presence of borax in formaldehyde fixed specimens ca materially change the pH of an alcohol solution unless borax is removed from the specimen. If and to what degree specimen clearing will take place in borax-alcohol solutions (pH 10.0+) is unknown but any combination of additives including borax, other chemicals, or natural mineralized waters, added to alcohol must be suspect until checked out.

Similar to reactions noted above, I theorize that the clearing effect any degree of alkalinity is greatest in dilute alcohol solutions and diminishes with increase in alcohol concentration.

I thank Stanley Weitzman for comments on this note.

References

Hatch, L.F. 1966. Isopropyl Alcohol; revised edition by W.R. Fenwick, et al., Enjay Laboratories, New York.

Pearse, A.G.E. 1968. Histochemistry; theoretical and applied, ed. 3, vol. l, Boston.

Taylor, W.R. 1977. Observations on specimen fixation. Proc. Biol. Soc. Washington, 90: 753-763.

ADDITIONAL COMMENTS ON THE ABOVE--- The clearing process immediately halted upon removal of specimens from the "aromatic" isopropanol and placement into "unaffected" isopropanol. In addition, other specimens preserved at the same time and in a similar fashion showed no clearing when placed in the "unaffected isopropanol"; thus, poor fixation can be ruled out. It should be noted that this short note was intended as a warning call for isopropanol users, with the "acetone-like" aroma as the signal, rather than an investigation into the chemical basis of the clearing process. --- George H. Burgess, Division of Fishes, Florida State Museum, University of Florida, Gainesville, FL 32601.

STORAGE OF CLEARED AND STAINED SPECIMENS --- Housing vials of cleared and stained specimens stored in glycerine can be a vexing problem. The vials tend to fall over and leak, getting drawers and shelving sticky, yet the cost of glycerine necessitates that small vials be used.

Recently at the University of Kansas Museum of Natural History, we began using one-inch thick blocks of styrofoam in the bottom of metal drawers for cleared and stained material. Holes the size of the vials were cut in the styrofoam so the vials remain upright as the drawer is opened and closed. After proper spacing of the vials is arranged, the holes can easily be made by cutting with a scalpel or small knife around an outline of the vials pressed one-quarter inch into the block surface. An upturned vial may be pushed into the block, or electrical conduit which corresponds to the circumference of the vials to be housed could be used to "core out" the holes

We also found that styrofoam egg cartons may be used in the same way as the solid blocks, but due to their thinness, they do not hold up as well as the blocks. The most efficient way to form holes in the cartons is to heat a loop of stiff wire (bent around the vial to form the right size and shape) and push it through the

styrofoam.
A further advantage of the styrofoam blocks is that they can be cut with a knife to any shape desired when housing vials of a variety of sizes in the same drawer.

The styrofoam blocks may be obtained from hobby shop suppliers at a cost of approximately $3.25 per 12 x 36 x 1 inch sheet. --- John E. Simmons and Raymond K. Loraine, Museum of Natural History, University of Kansas, Lawrence, Kansas 66045.

MORE LEAKY JARS --- In November, 1982 I alerted you to a problem we had encountered with leaky 12 oz. bail-top jars. Replacement jars from Wheaton proved unsatisfactory so we discontinued purchasing that product. Shipments of Wheaton 1 and 2 liter "French-style" jars, purchased within the last year and one-half, were also found to contain a high proportion of leaky jars. These products differ from those received in earlier shipments and are marked "not for canning" on the bottom of each jar. My suspicions as to the cause of the problem again lie with the metal used in the closure ("trigger" and "bail"). Wheaton states that no quality change had occurred but has been unable to explain the cause of the leakage in so many of the newer jars. French "Le Parfait" 1 and 2 liter jars available through Grant Howard Associates, Stamford, Conn., have not been found to present leakage problems and continue to be used in our collection. --- S.L. Jewett, Division of Fishes, National Museum of Natural History, Washington, DC 20560.

COLLECTION VALUE --- Jon Barlow and Nancy Flood's Research collections in ornithology - a reaffirmation appears as Chapter 2 in Brush, A.H. and G.A. Clark, Jr. (eds.) Perspectives in Ornithology, Cambridge University Press, 1983. This chapter contains sections on history, uses, priorities and needs that could be equally applied to ichthyological or herpetological collections.

Except where noted, this newsletter is written and compiled by the ASIH Committee on Curatorial Supplies and Practices and is intended for use by our membership. Comments are not to be construed as an endorsement of practices or products by ASIH. Correspondence should be addressed to: Karsten E. Hartel (Committee Chairman) MCZ, Harvard Univ. Cambridge, MA 02138- George Burgess, Div.Fishes, Florida State Museum, Univ. of Florida, Gainesville, FL 32601; Janet Gomon, Susan Jewett or Leslie Knapp, Div. Fishes, WG-12, National Museum of Natural History, Washington, D.C. 20560; William Saul, Academy of Natural Sciences, Philadelphia, PA 19103; Allan Resetar, Field Museum of Natural History, Chicago, IL 60605; or John Simmons, Museum of Natural History, Univ. of Kansas, Lawrence. KS 66045.