IN THE LABORATORY

A Method for Reclaiming Dried Zoological Specimens

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In most zoological laboratories alcoholic specimens which have dried out are discarded, regardless of their original significance. Material of distinct taxonomic value and critical specimens on which distribution records are based are often included in the losses to which laboratory collections are exposed, in spite of improved types of containers and systematic replacement of preservatives. Various methods have in the past been suggested as a means of reclaiming and at least partially restoring accidentally dried specimens. Potassium hydroxide and lactic acid are two reagents which have been used with some success on certain kinds of dried specimens, especially on some arthropods and nematodes. Both of these chemicals have definite limits to their usefulness, however. Caustic potash has the very real disadvantage of destroying tissues.

In this laboratory it was discovered a few years ago that commercial grade of trisodium phosphate in aqueous solution alters the permeability of membranes of preserved specimens of various invertebrates. This chemical has been of great value in treating specimens of parasitic worms to ensure free passage of fluids through the body wall when permanent whole mounts are being prepared. It has been observed that specimens which have become hardened and somewhat shriveled in the preserving medium become softened and pliable in trisodium phosphate. The specimens also become somewhat plumped but show no evidence of unnatural swelling. Furthermore, treatment with this chemical does not destroy the internal tissues. It thus has a very distinct advantage over caustic potash.

The highly satisfactory results obtained from the use of trisodium phosphate on small objects suggested the possibility of using this detergent for recovery of larger specimens which had become useless through drying. In numerous preliminary tests various kinds of dried animals have been subjected to the action of trisodium phosphate, and in most instances the results have been extremely gratifying. The results are not uniform for all kinds of dried specimens treated, but in every instance the reclaimed specimens showed restoration of general body form and revealed details of diagnostic characters which had been wholly unavailable in the dried specimens and in those treated with water or alcohol alone.

Trisodium phosphate becomes effective on dried specimens at low concentrations. A very dilute solution working for a long time seemed to be as satisfactory as a stronger solution for a shorter period. In routine procedure, quantities of the chemical were not measured, but it was later found that 0.25 to 0.5 per cent of commercial trisodium phosphate in distilled water was effective in restoring the appearance of specimens treated. Warmed solutions were more rapid in their action than cold. In many instances, with small or originally delicate objects, the maximum effect was obtained in about one hour, although longer treatment continued to soften tissues and make the specimens more pliable. Some leeches that had been dry for several years were placed in trisodium phosphate in an oven at 35°C. After about an hour most of the external features had been restored to normal appearance, and after two days the leeches were relatively soft and pliable without showing any evidence of dissociation of the tissues.

Insect nymphs and delicate crustaceans which had been completely dried out in storage vials were restored to conditions wherein all characters needed for classification were observable. Dried centipedes and millipedes had all the shriveled appendages restored to condition fully available for identification. A preserved sample of fresh-water plankton which had been dry in a bottle for more than two years was covered with warmed trisodium phosphate. Less than one hour thereafter five species of cladocerans, two species of copepods, and several species of shelled rhizopods were all readily determinable.

A small minnow infected by a large liguloid tapeworm had dried to badly shriveled condition and chalky whiteness. Treatment with trisodium phosphate restored general external appearance of the fish, and the coils of the cestode were readily observable through its body wall.

Many other discarded objects have been reclaimed by this simple process. Perhaps the most striking example is a collection of relatively large nematodes which had been dry for many years. Some of these worms were reclaimed while the others were left dry for comparison. Samples of the reclaimed specimens were stained and mounted by the usual procedure for making microscopic mounts. These show details of buccal armature, form and structure of the esophagus and pharynx, and details of the uterine coils.

Vacuum Infiltration as a Method for Determining Enzymic Activity *in Vivo*

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The usual method for the study of enzymes is to extract them from macerated tissues and observe their activity in a controlled medium outside living cells. Shortly before the war there appeared in Russian literature a description of a method for the determination of the activity of enzymes inside living cells. This was based on the vacuum infiltration of living cells with an enzymic substrate and on subsequent determination of what is left of it after a period of time. In the original