



NEW ZEALAND  
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**NEW ZEALAND ARCHAEOLOGICAL ASSOCIATION NEWSLETTER**



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AN INEXPENSIVE, EFFECTIVE HARDENING MATERIAL FOR  
CONSOLIDATING FRIABLE SPECIMENS

I.W. Keyes

Friable bones, bone artefacts, shells or weathered lithic materials (along with delicate fossils) usually require strengthening before they can be safely handled without further damage or disintegration and for permanent preservation. A range of materials is used for such consolidation purposes including solutions of P.V.A., shellacs and lacquers in a variety of solvents, and each person or laboratory has their own preferences. A particularly inexpensive material well worth consideration as a strengthening solution is that of polystyrene in a suitable solvent. This suggestion cannot claim originality as it has been presented by Thurmond (1974); however it is worth repeating. The material has been used successfully for some time by myself for the hardening of delicate acid-extracted fossil teeth.

Polystyrene can be obtained in its raw pelletised form as used in the plastics industry for injection moulding. However it can be obtained more easily still and without cost as processed waste material from the packaging industry. Most people encounter polystyrene as a white, low-density "expanded" bead foam, forming ultra-light crush resistant packing, moulded to encase glassware or precision equipment or, more particularly, as loose packing made up of individually moulded disc, tube (and other configurations) particles. This "expanded" polystyrene is soluble in most petroleum based solvents, the most satisfactory being toluene and white spirit, particularly toluene. (Acetone should be avoided as it inhibits satisfactory drying). Crystal polystyrene is known for its brilliant clarity and when particles of the "expanded" foam are added to toluene they dissolve almost instantly to form a crystal clear solution. The strength and viscosity of the solution can be increased by increasing the amount of polystyrene dissolved.

As a hardener polystyrene solutions have the distinct advantage of being very inexpensive (only the cost of the toluene solvent being involved), dissolve readily into a low viscosity brilliantly clear solution which penetrates well and dries fairly quickly. It does not "bloom" in cold weather and is water resistant. It is not brittle when dry but has a tough flexibility. It can be readily redissolved and any shiny surface build-up can be easily removed.

As a parting thought in line with present day ecological concerns (which should appeal to archaeologists who are conservationists and environmentalists) Thurmond (1974) points out that the re-use of polystyrene waste is reducing society's disposal problem of this increasingly used material by efficient recycling! After all who has not encountered polystyrene fragments being blown along by the wind or floating on water at some time in our modern environment! It can be put to better use in helping to preserve our past!

REFERENCE

- Thurmond, J.T.                    1974    Polystyrene solutions as fossil hardeners:  
save money and recycle too. *Jl. Paleontology*  
48 (1): 195-6.