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Archaeological Conservation Using Polymers: Practical Applications for Organic Artifact Stabilization

BY C. WAYNE SMITH (TEXAS A&M UNIVERSITY ANTHROPOLOGY SERIES 6). PP. XIV + 129, FIGS. 47, TABLES 28. TEXAS A&M UNIVERSITY, COLLEGE STATION 2003. $19.95. ISBN 1-58544-218-6 (PAPER).

This book is apparently aimed at "all archaeologists, conservators and museologists working with perishable artefacts," and the foreword by Klosowski likens the process to cooking, with the possibility of varying the outcomes by adjusting the recipes. The focus of the book is the production of durable artifacts for traveling exhibitions and interactive displays. Most of the material treated was from a 17th-century shipwreck off the coast of Texas, and from underwater excavations from the 17th-century site of Port Royal, Jamaica.

While the reversibility of traditional conservation methods is briefly mentioned in the introduction and elsewhere in the text, retreatability is suggested as a better option. Reference is made of Velson Horrie's comments about the irreversibility of silicone treatments, but following comments that other consolidants and adhesives may also have time-dependent reversibilities is not an adequate excuse for using silicones. It is good to see that the relevant health and safety issues are stated at the start of chapter 1, but throughout the text, many of the substances recommended would be considered too hazardous for nonspecialist users. Chemicals such as ether, toluene, and hydrochloric acid would not be allowed in many ordinary conservation laboratories. The comments about the conservation requirements should perhaps make the hazards clearer.

It was not at all easy to discover exactly what the chemicals listed in the tables were. The numbers are presumably mainly trade references, but a simple chart could have been added to make identifications easier, rather than having to refer to relevant parts of the text. This is not a book for the nonchemist. Unless the instructions are simply followed, it will be very difficult for someone without a degree in polymer chemistry to actually understand what is happening. It would have been useful to know where these chemicals can be obtained or who manufactures them. Having said that, the procedures are very detailed but carefully explained. The main drawback in procedures is the necessity for complete dehydration before any of the silicone treatments. It was surprising to see that the introduction of the liquids after vacuum treatment of dry material was not used. It is a simple process to allow the liquids into the vacuum chamber, via a separate tube, to avoid the formation of air bubbles in porous materials. The process is commonly used in the treatment of objects with coatings, inlays, or friable surfaces. The comments about the problems with polyethylene glycol are well known, and, apart from molecular attachments, depolymerization caused by iron compounds is a cause for concern.

The discussion on the use of polyvinyl acetate (PVA) should have mentioned the increasing cases of insolubility among the other ageing problems. The recommendation for the use of hydrochloric acid for iron removal on wooden artifacts is particularly alarming, in view of the serious risk of contamination of metal artifacts. Its full removal after treatment should have been clearly stated, although it is when used in the treatment of leather later in the book. It would seem that numerous sources were used in the preparation of this book of varying standards. Several other acids could

Issue 110.3 (July 2006)
American Journal of Archaeology Online Book Review

have been used without the risk of introducing more chlorides into the conservation laboratory. The treatment of iron shot using electrolytic cleaning and microcrystalline wax should clearly state that such methods are not suitable for most archaeological metalwork. There are some very good explanations of the natures of the materials and the decay processes, with some useful reviews of other conservation practices. The final chapter describes techniques for restoration, three-dimensional reconstructions, and imaging rather than conservation, which is very interesting but not strictly relevant to the book. The whole work has the air of interventionist treatment with an unknown degree of reversibility. There may be suitable cases for the limited use of such methods, but, as with all conservation processes, every artifact must be considered unique, with the ideals of minimum intervention and maximum reversibility always being remembered.

The work is concerned primarily with the treatment of marine artifacts, difficult material at the best of times, and it is hard to directly relate many of the treatments to terrestrial artifacts. Although accelerated aging tests were carried out, the real long-term effects must be considered to be unknown; likewise, it is not known if any attempts were made to remove the cross-linked silicones from the artifacts.

The book would probably be of most use to experienced conservators with a considerable knowledge of polymer chemistry, and possibly to students of polymer chemistry looking for applications for their materials.

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