Preservation Practices

by Hugh Phibbs

Preservation Problem Solving: Learning From Accidents of History

Last month we looked at some of the techniques and structures used in the past to preserve valued materials. More frequently than one might imagine, our predecessors devised simple, practical solutions to problems that continue to vex us today.

The warping of support structures is a problem that affects most works made of animal or vegetable matter. Counter tension has been used the world over to solve this problem. Oriental scroll and screens are made so that each layer that is added to one side is balanced by a similar layer on the other side, applied with equal tension. American photographer Alfred Stieglitz kept his photographs flat by dry mounting "failed" photos to the backs of those he deemed successful. He could then secure the pair to a support board without fear of warping.

Other, older techniques are not so well thought out. Drum mounting of old prints and drawings to support boards, in which the moistened sheet is glued at its margins and allowed to dry, has left us with works that must be removed by a conservator so that the tension on the sheet does not lead to its tearing. Here, we find an example in which our predecessors forgot counter mounting and allowed the warping of the mount board to permit over-tightening of the print or drawing. This is because the back of the board was not under tension and was allowed to bow backward in the frame.

When items were pasted onto the pages of albums, they were stored under gentle, steady pressure that maintained their shape. This same sort of pressure is found when a sheet is overmatted.

Our look at the past can reveal numerous examples of storage vessels that sheltered delicate materials from harm. Storage boxes for rolled scrolls and matted prints and drawings are commonly made of cellulosic material. Pallonia wood is used to make scroll boxes in the Orient, while paper-based board reinforced with basswood is often used for print storage boxes. The wood is incorporated into both box designs so that only side grain is exposed, limiting emission of acids. In both instances, these materials serve to slow changes in relative humidity within the box. The moisture typically found in the boxes themselves serves as a fire deterrent.

Metal has been successfully employed to protect photographic images and other delicate materials. Daguerreotypes have been protected by the vapor barrier capacities of the glass in front of them and the metal "keepers" which surrounded them. Old documents and maps can be found in pristine condition

after a century of storage in tinned tubes, where the coating kept the steel of the tube from rusting and staining its contents.

Antique lockets of metal and glass have protected hair, a material that is extremely difficult to maintain. Recently, a locket with two domed pieces of glass that had been tightly sealed together was opened. The importance of this locket derived from the fact that it contained a sample of Beethoven's hair and those who opened it hoped to find some of the roots so that DNA sampling could be attempted. The fact that no root material was found is less important than the fact that the degree of sequestration the locket had maintained was high enough to allow for a realistic hope at such attempted sampling.

A British ship named the Mary Rose sank in the English Channel during the Tudor era and was buried in mud. When the wreck was found, bottles of beer sealed with wax were brought out of it. The glass of the bottles and the wax that covered their tops formed such a successful seal that samples of live yeast could be collected, and beer incorporating them could be brewed.

Other shipwrecks show us more than how well minerals such as clays and silts can protect perishable materials. A Swedish ship named Vasa sank in Stockholm harbor and settled in the mud. It was found in amazingly good shape, was raised, and brought to a museum.

Those who maintain the ship have recently become aware that the mud that protected it was suffused with sulfur, which penetrated the timbers of the ship. Now it has become clear that even in the mild conditions of a museum, the sulfur-riddled wood is reacting in the presence of the iron fasteners that hold the ship together and causing the wood to degrade. This problem proves to be quite challenging, but it may inform our response to another dramatic find.

Within the last 10,000 years, the Black Sea was a lake, cut off from the Mediterranean. A geological cataclysm broke open a path that allowed sea water to flood into what is now the Black Sea, where the greater density of the salt water caused it to sink beneath the fresh water in the lake. Over time this lower layer of water lost its oxygen and became rich in hydrogen sulfide.

As this fact became widely appreciated, the possibility that wooden artifacts might have survived in this lifeless environment galvanized efforts to search the area. A team led by Robert Ballard has found a Bronze Age ship lying undisturbed on the sea floor in remarkable condition despite the acidity of the water. Since it is visible from above and from both its sides, we can hope that this wreck will be left undisturbed, since raising it might only create unforeseen problems.

In ancient Europe, certain people were bound and thrown into bogs as sacrificial victims. The tannic acid released by decomposing plant materials thoroughly penetrated and tanned the victims' bodies. Hundreds of them have been found by workers while cutting the peat that was formed from the bogs. It is hard to imagine that those who sacrificed the victims intended them to be preserved, but the only way they might have succeeded more completely would have been to throw them into glaciers. The Bronze Age man recently discovered in an Alpine glacier and the young girl found on an Andean peak both show the power of cold to slow destruction over time.

From all of these examples, we can learn how our ancestors intentionally or unintentionally preserved delicate materials. The results are proof of the efficacy of each method or circumstance and can inform our efforts to create successful techniques and structures. Next we will consider the preservation principles that can further guide our efforts. ■