Ellen Promise, graduate fellow Winterthur/University of Delaware Program in Art Conservation
Bruno Pouliot, Winterthur Museum Objects Conservator and University of Delaware Adjunct Assistant Professor

Abstract

For centuries before the mid 19th century, window panes in lanterns were commonly made of horn. Though it resembled less light than glass, horn was durable, abundant and much less expensive. To achieve the desired level of transparency, panes were cut from light-colored horns and most often achieved from diamond sheets of horn that were delaminated into two or more layers after prolonged soaking in water. This process resulted in considerable variation in thickness, direction of grain and tint amongst different horn panes. Horn-paned lanterns that have survived in museums or private collections often have one or more damaged or missing windows. For a conservator, replacing these panes with true horn is usually not practical, as it is difficult to obtain or process horn in the traditional way of the hornsmith. The use of real horn may also be undesirable, as it does not create a clear distinction with original panes, or because other components of the lantern may be too damaged to accommodate an entirely new and strong horn pane. Therefore an adaptable method for mimicking horn panes becomes a useful tool for conservators.

Methodology

A method for imitating horn panes was initially devised in 2003 by Bruno Pouliot and employed on a lantern missing all of its original panes. This method was then used by graduate fellow Ellen Promise in the fall of 2010 on a different lantern in imitation of two horn windows that remained in place. The technique was used to prove out in two different scenarios, demonstrating its usefulness and to adjust for individual treatment goals and imitate horn of different thicknesses.

The approach utilizes the polyester film Melinex® 516 and a 1:1 solution of Agateen Lacquer #27: Agateen Thinner #1 which has been appropriately tinted using Orasol® dyes and acrylic paints. To match the grain of horn and increase opacity, the polyester film is first sanded on both sides using fine grit sandpaper and Micro-mesh® and acrylic paints. To match the grain of horn and increase opacity, the polyester film is first sanded on both sides using fine grit sandpaper and Micro-mesh®. After the initial color application has been applied to the polyester film with brush coats of tinted Agateen, further adjustments can be made using acrylic paints. The polyester film panes can be detached to imitate aged horn by creating creases, delaminations, or making strategic cuts with a scalpel blade. The method is easily accomplished, and the panes can be quickly inserted without any stress to the original lantern frame, while being barely distinguishable from real horn panes.

Case Studies

A Decorative Lantern

In 2003, a tinned iron lantern in the Winterthur Museum collection was treated by Bruno Pouliot in preparation for a publication and display. The metal framework of the lantern contains many decorative elements, including various pierced designs. The crispness of these features suggests mechanized production, dating the object to the late 18th or early 19th century. There are six dot-and-circle projections from the dome, which add to the embellished appearance of the object.

Past Modifications

Before treatment, several stylistic characteristics pointed to the past modification of the lantern. Most notably, four glass panes had been soldered to the underlying framework. The solder around the box was applied poorly and thinly and appeared much darker than the solder that seems visible elsewhere on the object. In comparing the two areas of solder, X-ray fluorescence (XRF) detected small differences in the relative amounts of copper and zinc. The glass panes were cut from window openings, with scuffed and pierced designs, similar to those on the lantern dome. Residue formed within the metal sleeves on the interior of the window frames were analyzed with Fourier transform infrared spectroscopy (FTIR). The resulting spectra matched well with a spectrum for modern on horn and the spectra of samples obtained from another horn-paned lantern in the Winterthur collection. This confirmed that the window panes were horn panes that had previously contained horn panes. It was decided to remove the glass panes and return the lantern to its original appearance.

Treatment of Windows

The glass panes were removed using a hot air gun and a de-soldering tool, followed by mechanical cleaning with a scalpel to remove excess solder. The use of true horn panels to replace the missing panes was considered, the methodology described above was ultimately developed to avoid placing stress on the interior metal sleeves. In imitation of horn panes, which are typically thin and translucent, one sheet of 5 mil thick Melinex® 516 was used for each of the three faux horn panels. Several different shades of Orasol® dyes and acrylic paints were used to tint Agateen, which was brush-applied only to the vice of the polyester film. Some additional color was added with a sealing layer of orange shellac. To remain consistent with the appearance and condition of the metal framework, the Melinex® panes were not brightly colored. In order to indicate the appropriate window and rotation for each of the true panes, small triangular cursors (one, two, or three) were made in the bottom edge of each pane.

An Everyday Lantern

The lantern treated by Ellen Promise in 2010 was acquired by Winterthur Museum in 2009 as part of the Roland Cadle Historical Horsemanship Collection. The metal framework is tinned iron, and the form and construction are typical of English and American lanterns from the 19th century. Unlike the object treated by Bruno Pouliot, this lantern is virtually unaltered and would likely have served a predominantly utilitarian purpose.

Extant and Missing Panes

Two of the three window openings contain horn panes. Before treatment, an unused sheet of plastic was serving as a replacement for the missing horn pane. This pane had become thickly coated in grit. The two remaining horn panes are each approximately 1/16” thick. This is much thicker than average, compared with horn panes in other lanterns in the Winterthur Museum collection.

The thickness of the horn panes lends them a semi-opaque quality and a dark yellowish coloration. The abrasion in thickness could be a sign that these panes are not original to the object, or are old replacement panes, fabricated at a later date by an inexperienced horner. It would be another indicator of the lantern’s practical function. The condition of the horn panes suggests age and use; throughout their surfaces, there are scattered abrasions, discoloration, and superficial cracks.

Treatment

In crafting the new replacement pane, two sheets of 5 mil thick Melinex® 516 were needed to achieve the proper illusion of thickness and opacity. The panes were cut to fit the thin metal sleeves on the interior sides of the window opening. Lengthwise, the Melinex® sheets were cut to rest comfortably on the bottom of lantern, to reduce the likelihood that they will slump or slide down in the future. As there are two existing horn panes in the lantern, one with a vertical grain and one with a horizontal grain, a decision was made to imitate the general appearance of the pane with the vertical grain, set in the door panel. This pane is in better condition, as the other pane is significantly bowed outward. The imitation horn panes were fabricated according to the methodology outlined above. Super blonde shellac was selected to seal the Agateen, because no additional color was desired. The Melinex® sheets were then gently inserted into the lantern.

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References


Handouts

Bone, antler, ivory and horn.

Colonial Lighting.

Early Lighting – a pictorial guide.


