# Curator's Choice

## *Jamestown Project*

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In 2003, staff members of Historic Jamestown, VA prepared the site for the onslaught of Hurricane Isabel to prevent flood water damages. Unfortunately, the combination of the hurricane and its related storm surge brought in waters from the nearby Pitch and Tar Swamp measuring five feet deep at the National Park Service Visitor Center. Approximately 34,000 iron, ceramic and wood objects including a significant number of Colonial pipe stems, were sent for re-treatment as a part of an agreement between the National Park Service under the Department of Interior and the MAC lab.

As with most of the irons in the project, rust appeared on the surface layers of the objects because of their contact with chlorides contained in the flood water and the significant indoor relative humidity. Exposure to chlorides can contribute to the corrosion which is evident from the loose powder-like residue seen on many of the irons from Jamestown.


(Fig.1, Irons before dewaxing)

(Fig. 2, Measuring chloride levels)

(Fig. 4, After tannic acid and coating)

(Fig. 3, Tannic acid application)

In order to remove old paraffin wax from their previous treatment in the 1950s, the objects are placed in a solvent recycling still using a hot xylene vapor for six hours. They are moved into various storage bins containing reversed osmosis water (RO) and a small percentage of sodium hydroxide (NaOH) with regard to the volume of RO used after completing de-waxing. Chloride readings are logged daily by the laboratory's conservators to determine if the levels indicate the removal of soluble salts from the objects. (Fig. 2)

The objects are removed from desalination and are immersed in bins containing deionized water. The bins sit in a hot wash bath intended to eliminate any more soluble salts and to neutralize the objects. The pH of the water inside of the bins is tested daily until the standard measurement reading between the number 6 and 7 has been achieved. Next, the objects are set to dry in an oven for no more than three days and then tannic acid is applied. (Fig. 3) Tannic acid is effective for the stabilization of the iron oxide. Once this affect takes place the irons lose their brownish color and take on a black finish. (Canadian Conservation Institute, 2002). The final phase in treatment includes an Acryloid protective coating in a mixture of acetone and xylene.

After the objects are coated they are labeled and packaged for return to the Jamestown facility. (Fig. 4) Unlike the irons, the treatment cycle for the pipe fragments does not require as many steps. The pipe fragments are separated in small nets and set in an acetone solution for a period of one to two days. The pipes were removed from the solution and then cleaned using a cotton compress containing acetone.

(Fig. 5, Cleaning pipe fragments using acetone)

Following the cleaning process, the pipes are put back in the nets to soak in deionized water where daily chloride levels are recorded. pH levels between four and five are required in order to receive an accurate chloride reading. If the results reveal low chloride levels, the fragments are removed from their nets and put onto a tray to dry for one to two days. Each fragment is labeled, coated with a mineral oil mixture to protect the number written, and packaged for return to Jamestown.

Approximately 23,000 ceramic pipe fragments and a number of wood objects have completed treatment and have been returned to Jamestown's facilities intermittently throughout the span of the project. There remains over 5,000 objects that are still undergoing assessment and treatment including iron and ceramic shards. The project is anticipated to end September 2009.

*References Cited*

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