OFFICERS:

Robert G. Lodge
President

Gina McKay Lodge
Secretary/Treasurer

GSA Contract Holder

MCKAY LODGE CONSERVATION LABORATORY

PROBITATE SAPIENTIA ET OPERE PRAESTAMUS

EST 1989

Art on Paper
Documents
Paintings & Murals
Mosaics
Sculpture & Historic Objects
Public Art
Historic Fountains
Monuments
Architectural Elements
Military & Industrial Artifacts

Specialists in Industrial Coatings
Specialists in all Metals
Specialists in Stone

September 13, 2013

Treatment of the Tadeusz Kościuszko Monument

Gastano Trentanove (Fecit), 1905
Kosciuszko Park, 2201 S 7th St., Milwaukee, WI 53215
Patinated Cast Bronze

Introduction

This treatment report will make reference to the condition assessment performed by Conservation of Sculpture and Objects Studio Inc. (CSOS) dated 2008. The details of this report should be read as they are not repeated here.

There are several technical terms which will be used throughout this report. The meanings are listed here for reference. A full explanation of lost wax casting is not provided but can be found on Wikipedia.

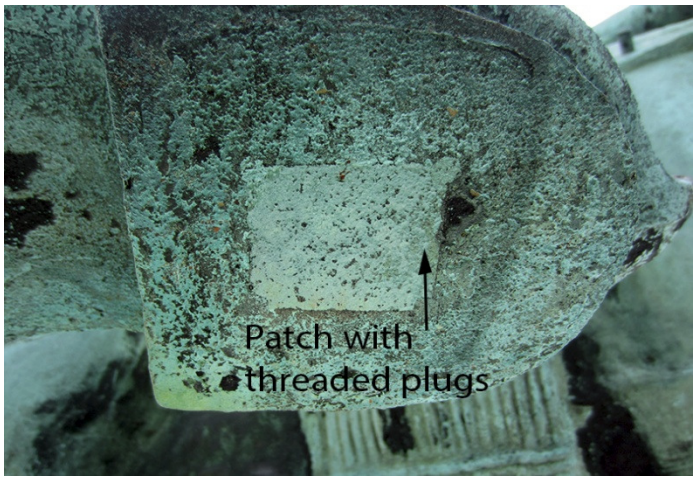
Casting Porosity

The formation of bubbles within the metal during the casting process, this causes a porous or textured surface similar to that of a sponge.

10915 Pyle South Amherst Road, Oberlin, Ohio 44074
Phone: 440-774-4215 Fax: 440-775-1368 Email: mckaylodge@gmail.com

Patches and Plugs

On historical bronze castings smaller voids were drilled out and a threaded plug was made from bronze rod which would be fed into the hole and cut flush with the surface of the bronze. Large voids were often repaired with rectangular patches held in place by threaded plugs.

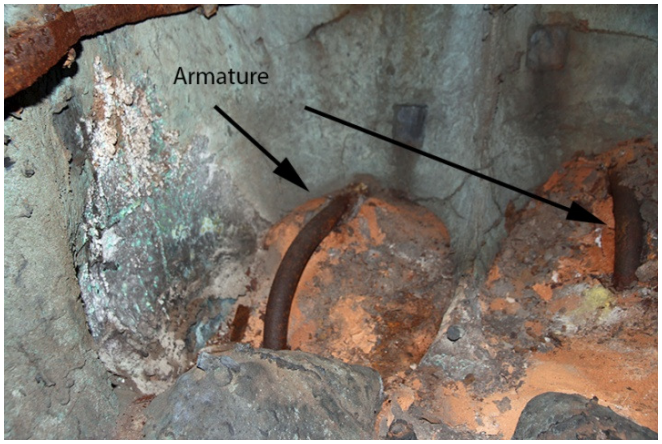


Chill Cracks

Lack of a complete join where two streams of molten metal meet, resulting in a crack, or a weakness. These cracks are typically caused by improper pouring temperature.

Armature

An internal structure usually made from ferrous metal such as iron or steel. Used in the casting process to provide strength and support for the "core" of the mold.



Treatment

The exterior of the entire artwork work was closely examined and the quality of the casting evaluated. The casting quality was found to be very poor. We have noted the same level of quality in other castings from the Galli foundry in Florence. Large areas of porosity, numerous patches, and chill cracks are evident in many locations of the sculpture. All of the chill cracks had been treated by the original foundry and filled with lead, a common historical method. Almost all are stable with the one exception being the crack at the knee on the proper left leg. This is the site which had been opened and deformed by freeze thaw cycles (CSOS assessment page 7).

The top portion of the figure was removed at the joint line. This allowed for an inspection of the interior of the artwork. In the condition assessment prepared by CSOS it was stated that the legs of the horse were filled with concrete (CSOS assessment page 10). In fact, the artwork had not been filled with concrete; rather the artwork was full of core material (crushed brick) left behind from the casting process. This material was packed in the interior of the legs and covered 6 inches or so of the interior stomach area of the horse. No concrete was found within the casting.

This core material had to be removed from the sculpture as it can cause the sculpture to fracture or burst when the material saturates with water, freezes and expands. This material can also block the flow of water that must be allowed to escape from the interior of the sculpture to avoid damage caused by freezing.

Particular existing patches were removed to allow complete access to the interior of the legs of the figure and horse. The core material was then removed by high pressure water blasting, leaving the interior of the legs and the entire interior of the horse clean and empty.

Once clear of core material the internal armature was exposed and closely examined. The armature is made from wrought iron rod approximately 2 inches in diameter. It was found to be in excellent structural condition with only light surface corrosion. The armature was also discovered to be cast in place, trapping it internally within the matrix of the bronze casting. This cast in place method not only provided added support to the bronze but the iron rod was also used as a fastener to attach the legs of the horse to the base of the sculpture.

In the original assessment by CSOS, an assumption was made that the armature had failed and needed replacement. As we discovered, the existing armature was still in place and providing support to the sculpture. Any attempt at removal of the existing armature would be risky as it would require complete removal of the legs and then cutting them into sections to release the armature. Due to the poor quality of casting, any treatment of this nature would prove to be dangerous as there is a high probability of not being able to weld the sculpture back together. Due to these reasons, the existing armature was left in place.

The armature was coated with a very effective rust inhibitor called Ship-2-Shore (Liquid Corrosion Control Systems, LLC, Vancouver, BC) to prevent further corrosion and external staining of the artwork. This corrosion inhibitor hardens into a waxy state and inside the sculpture will provide permanent protection against future corrosion .

The split in the proper left front leg was reformed and welded back together. At this time all of the foundry-installed patches that had been removed for cleaning of the interior were also set and welded into place.

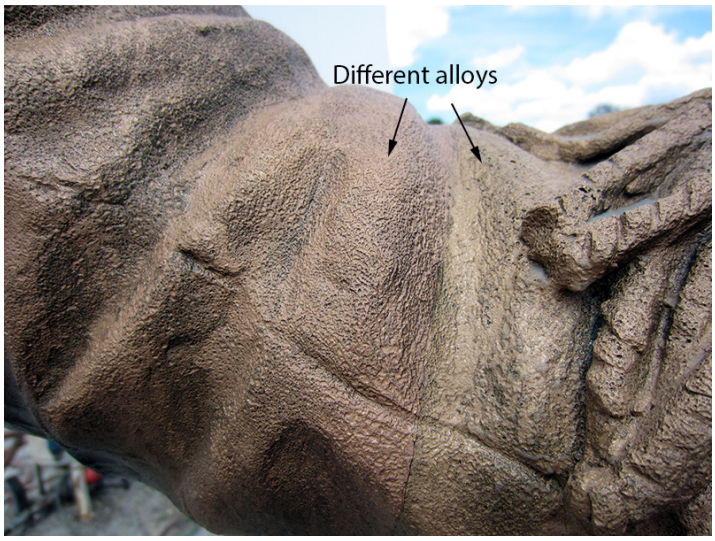
Strategically placed weep holes were drilled into the sculpture to allow any water that finds its way into the interior either by condensation or leakage, to be able to escape from the sculpture.

Because of the extent of invasive work on exterior surface areas of the bronze, the crust of green copper corrosion products (the naturally formed patina) could not be saved or restored. The only way to refinish the bronze was to repeat the original preparation of the metal surface and the original method of chemical patination resulting in the “statuary brown” finish most commonly provided for bronze statuary of this period.

The entire sculpture was cleaned using the German proprietary JOS system (a low pressure process which uses a mixture of compressed air, fine inert powder and water). This process is

able to clean the bronze of copper corrosion products without damaging or removing any of the bronze metal.

Once cleaned it became evident the sculpture was comprised of differing alloys of bronze. The evidence of this can be seen in color variation between different sections of the sculpture. The reins of the artwork were also discovered to be made of copper.



Patination

Historically most sculptures of this era were one of two colors, black or what is commonly referred to as “florentine” or statuary brown, with brown being the most common. Early historical photographs of the artwork show the sculpture was lighter in color which is probable evidence of a brown patina.

A “statuary brown” patina was then applied to the surface of the bronze using a mixture of ferric nitrate and sulfurated potash. The patina formula was adjusted slightly in areas of different alloys and metals to make the color of the sculpture appear uniform.

After the patination, a protective coating of microcrystalline wax (a 50/50 mixture of Kindt-Collins, 278 E and 479J) was applied to entire surface of artwork, using a propane torch to heat the surface of the bronze allowing the wax to melt and saturate into the bronze surface. This provides a uniform layer of protective coating on the surface of the bronze. The newly applied wax surface was then allowed to cool and was buffed with natural bristle brushes to achieve an aesthetically pleasing low luster.

Comparisons

	
Before Cleaning	After Cleaning

Before

After

Maintenance Recommendations

Initial Cleaning and Waxing:

After approximately 6 months, or in the spring of 2014, the sculpture should be gently washed through careful and gentle use of a pressure washer by an experienced operator and then given its first coating of protective and sacrificial paste wax. A protective coating of paste wax such as Mohawk Blue label (Mohawk finishing products, www.mohawk-finishing.com) should be applied to the surface, allowed to dry, and then buffed to a low luster with natural bristle brushes.

Maintaining a paste wax layer protects the heat applied wax applied as part of the conservation treatment. The heat applied wax is the primary protective layer. Periodic applications of paste wax on top of this provide a sacrificial protective layer.

At this time too, all weep holes should be checked and cleaned if necessary. They can become slogged with dirt and insect nests.

Annual Cleaning and Waxing:

Following the initial cleaning and paste waxing, it is recommended that once a year the sculpture be cleaned gently with a pressure washer and additional paste wax applied. Over time, these annual applications of paste wax may cause the accumulation of wax and so the intervals of waxing may be increased. Whether to continue annual waxing or extend the schedule of paste waxing to avoid a heavy accumulation is something that those providing these maintenance treatments will have to decide based on observations.

Eventual Need for Renewing the Heat Applied Wax:

At some time in the future, the surface will need professional conservation attention through the removal of accumulated waxes and dirt and renewal of the heat applied wax. It is not possible to predict precisely when this will be needed. It may be expected, however, that this need may occur in about 10 years, perhaps longer in the sculptures northern climate. The time for this is something that those providing the maintenance treatments will have to decide based on their observations.