

<b>Acc. No.:</b>		<b>Conservation No.:</b>	07-5-2426
<b>Cat. No.:</b>	FC-7.9	<b>Date Examined:</b>	September 20, 2007
<b>Owner:</b>	Shelburne Museum	<b>Date Completed:</b>	December 20, 2007
<b>Title:</b>	Carousel Giraffe	<b>Conservator:</b>	Laura Brill
<b>Structure:</b>	painted wood, leather, iron, brass, and glass		
<b>Artist/Country:</b>	Gustav Dentzel Factory Philadelphia, PA		
<b>Signature/Date:</b>			
<b>Accessories:</b>			
<b>Labels/Legends:</b>			

**Digital Photographic Documentation:**

File Name	Description of Image
CO200752426A1	Before Treatment-Romance Side
CO200752426A2	Before Treatment-Plain Side
CO200752426D1	After Treatment-Romance Side
CO200752426D2	After Treatment- Plain Side
CO200752426B1	During Treatment- Plain Side Half Cleaned
CO200752326B2	During Treatment- Halfway Cleaned from Back
CO200752426B3	During Treatment- Halfway Cleaned Turquoise
CO200752426D3	After Treatment- Replacement Bit Detail
CO200752426x1V	Cross Section 1- Body Color
CO200752426x1UV	Cross Section 1- Body Color

**Reason for Treatment:** This object is scheduled to be part of the 2008 carousel exhibit in the Round Barn. As part of the Adopt-a-Carousel-Animal program, Kathryn Heminway sponsored the treatment of this carousel giraffe and named it Lucia in honor of her daughter. The aged coatings of linseed oil are disfiguring and will be reduced.

**Building Location:** Circus Building. Temporary Exhibition in the Round Barn Summer 2008

**Description**

The object is a hollow bodied, wooden carousel giraffe that is part of a forty-animal 1902 Dentzel carousel purchased by Electra Havemeyer Webb in the early 1950s. Although Mrs. Webb intended to use it as a functioning carousel, it was never re-assembled. Today the Shelburne Museum owns all 40 animals as well as the chariots, the carousel organ, its associated painted decorations, the rounding boards that decorated the exterior of the carousel, and the painted textiles that enclosed the carousel's mechanism. Unfortunately, the mechanism and carousel building are no longer extant.

The carousel was a three abreast type, referring to the placement of three of the animals in a line across the carousel's platform. The grouping of the animals is speculative as there are no photographs of the carousel as it was originally assembled, but it is generally believed that similar animals, such as all three giraffes, were placed together.

The overall appearance of the three giraffes is similar. All three are *standers* (having all four hooves on the ground) and are expertly painted to imitate the coat of a giraffe, including variations in color between different parts. The giraffe is composed of multiple pieces of wood, and it seems that the legs were replaced when worn or updated to suit current fashion. Legs that simulated prancing or jumping often replaced standing legs. While the forms are the giraffes are

similar, the level of decoration of each varies. This giraffe is the least decorated of the three giraffes, and was likely placed on the interior of the carousel.

The giraffe has an English saddle, girth, rump harness, pommel, bridle, bit, stirrups and reins. There is no saddle blanket or martingale. The romance side of the giraffe faced towards the public and is fancier than the plain side that faced the interior of the carousel. The romance side is embellished with four glass bezels within brass settings, a girth that continues over the saddle skirt, and a rounded flourish of the harness near the front shoulder.

The saddle is a light warm tan with black edging. A *fleur-de-lis* is painted in black on the saddle's cantle. At the pommel are two small rectangular areas of green/blue paint. The bridle and the elements of the harness that are over the back of the giraffe are red with an inner black stripe outlined with yellow/gold. The rump harness from the shoulders around the rump and the girth are red with two small lines of black outlined with yellow.

The reins and stirrup leathers are leather. The stirrups, stirrup bar and the 'bit' are iron.<sup>1</sup> The eyes are glass.

## **Condition**

### **General Structure**

The wooden components of the object are structurally stable. The metal and glass components are also structurally stable. One side of the 'bit' is missing. The leather elements are fairly stable with some weak areas particularly on the reins.

### **General Surface**

Repeated applications of linseed oil have darkened considerably, obscuring the visibility of the original surface. Streaks and large clumps of linseed oil create an uneven appearance, particularly on the legs and the underbelly. There are numerous abrasions and loss of paint on the romance side front leg. The leather shows some mold and other surface accretions.

### **Specific Condition Issues**

#### *Wood*

The wood is in structurally good condition overall, but several areas are superficially damaged. Losses are evident on the back of the giraffe's left ear and under the first and above the third bezel (from the front of the giraffe). The legs and the area around the stirrup bars were damaged by riders swinging their feet in the stirrups. The back portion of the front leg on the romance side is particularly damaged to the point that bare wood is showing. There is a curved crack extending approximately 4 inches on the plain side two inches up from the rump harness.

#### *Paint*

Overall the paint layers are stable. There is some cleavage and loss around the joins of the legs and neck to the body. Loss of the paint due to abrasion is particularly prominent on the front leg of the romance side. The paint layers appear intact and in good condition, but the layers of linseed oil coating have discolored.

#### *Leather*

Overall the leather is stiff but is not brittle. There is some mold and surface accretion, and a few weak or torn areas. The stirrup strap on the romance side was broken in the past and repaired by forcing the loose ends of the leather through the buckle. The leather is now too stiff and brittle to work through the buckle. The rein was likely broken and repaired, as one end features a ring, while the other end terminates in a clip.

#### *Iron*

The iron elements are stable with minimal corrosion, but some pitting. The iron element that represented the bit on the romance side is missing. It seems that the 'bit' on the plain side is a replacement, as it is considerably larger than the 'bits' on the other Dentzel carousel horses. The stirrup bars appear to have been painted red, but are now painted black.

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<sup>1</sup>It is likely that the iron 'bit' is a replacement. In comparison with the other carousel animals in the collection, the 'bit' is significantly larger.

### *Brass*

The brass elements are in good condition. Visually they are tarnished and dark from the linseed oil applications. The brass second from the back of the giraffe sustained mechanical damage resulting in a crack on the proper right side towards the top.

### *Glass*

The glass has minimal surface grime, but appears stable. The silver backing is torn and tarnished in small areas on each of the jewels.

### **TREATMENT PROPOSAL:**

- 1) Document the condition of the animal before and after treatment.
- 2) Vacuum all loose surface dirt.
- 3) Remove leather elements where possible.
- 4) Conduct cross sectional analysis of the paint layers.
- 5) Determine solubility of the linseed oil, and test gels and solvents for its removal.
- 6) Remove the linseed oil coating.
- 7) Apply a protective varnish over the surface of the giraffe.
- 8) Remove linseed oil and corrosion from brass elements.
- 9) Remove surface grime on glass with an ethanol/water mixture.
- 10) Vacuum and repair leather elements.
- 11) Clean and wax iron elements.
- 12) Create replacement 'bit.'

### **TREATMENT**

- 1) Began written and photographic documentation.
- 2) Cleaned surface with a soft brush and vacuum.
- 3) Removed the reins and stirrup on the romance side. Unable to remove the stirrup on the plain side.<sup>2</sup>
- 4) Took four representative cross sections. Determined that the very thin stratigraphy of the paint is very similar to the paint structure found on the previously treated giraffe.<sup>3</sup> As no new information was likely to be gained, staining was not undertaken. As with the previous giraffe, a thin layer of varnish is likely present between the paint and the linseed oil coatings.
- 5) Tested effectiveness of gels and emulsions on the back leg of the plain side. Determined that Pemulen TR2 gelled in distilled water, TEA and Tris ( 2% Tris in deionized water), as well as Carbopol gelled in distilled water, TEA and Citric Acid and the same Pemulen gel emulsified with benzyl alcohol all had useful applications.<sup>4</sup>
- 6) Reduced linseed oil coating overall with gels. Primarily used the aqueous gels with no added solvent.
- 7) Brush applied the cleaning solutions. The gels were left on the surface of the giraffe for 20 seconds to a minute. They were cleared with a dry cotton swab followed by a cotton swabs moistened with the buffered solution or distilled water. Large accretions of oil were reduced with ethanol or acetone.<sup>5</sup>

<sup>2</sup>The reins and the stirrup on the romance side were easily removed. The strap on the plain side had been broken and then repaired by forcing the ends of the leather through the buckle. The buckle is now rusted and the leather is too brittle to bend. It is not possible to remove the strap without humidifying or cutting the leather or applying WD40 to the buckle that would penetrate into the leather. As any of these methods would cause some degree of harm, it was elected to leave the stirrup attached.

<sup>3</sup> Cross sections were taken from several areas of the giraffe. Extensive sampling has already been performed on the previous giraffes. See report for 04132146. Four samples were taken and examined under magnification in both normal and ultraviolet light. The samples revealed a very minimal stratigraphy that is very similar to the other giraffe's paint layers. It was decided to forgo further characterization of the materials, as it has already been carried on numerous other carousel animals. See attached image of the cross section from the giraffe's body color.

<sup>4</sup>Past treatments for the removal of the linseed oil varnish layer have varied widely. For the giraffe cleaned in 2004 (04132146) the intern decided to use the modular cleaning system, developed by Chris Stavroudis with the support of Richard Wolbers. In the summer of 2007 inter Kim Crozier in the summer of 2007, elected to use an aqueous gel of Carbopol with the addition of Triethanolamine (TEA) and citric acid buffered to approximately 7.5 to 8 pH. The museum contracted Wolbers as an advisor on an IMLS funded project on the Dentzel carousel. He visited the Shelburne in August shortly before my arrival. He suggested the use of two gelling agents, Vanzan and Pemulen TR2. Both have the advantage over Carbopol that they are able to emulsify solvents and keep them in suspension. Pemulen TR2 proved to be more useful as an aqueous gel.

<sup>5</sup>Both the Pemulen and the Carbopol at a pH of 7.5 to 8 were used to reduce the linseed oil layer. Working methods were similar, but varied slightly depending on temperature and relative humidity, the area of the giraffe, the thickness of the linseed oil, and the constituents of the gel. The Pemulen emulsion with benzyl alcohol was much stronger than the aqueous gel. It was also applied with a brush, but removed much more quickly. On occasion it was applied with a very small swab that minimized its cleaning power to some degree, making it slightly more controllable.

8) Before cleaning the brasses, the area around the outside of the brasses and the glass bezels were taped. Cleaned brasses alternating between the proprietary polish, Autosol and 5% DPT, a chelating agent. Cleared the Autosol with benzine and the DPT with distilled water.<sup>6</sup>

9) Taped glass elements before applying Golden MSA varnish containing ultra violet light stabilizers (UVLS), 3:1 satin to glossy to the body and brass elements.

10) Vacuumed the leather components. Reinforced weak areas with toned Remay backed with BEVA film. Removed stress from leather stirrup straps by inserting twill tape straps.

11) Cleaned iron components with a stiff brush and vacuum. Cleaned with benzyl alcohol and coated with Butchers wax.

12) Cleaned the glass components, eyes and bezels, with an 50:50 ethanol:water mixture.

13) Replaced missing iron bit with a similar diameter copper wire. The copper wire was formed, painted, and coated with Golden MSA varnish with UVLS. The wire fit snugly in the pre-existing holes on the giraffe and no adhesive was necessary.<sup>7</sup>

Total Treatment Time: **34 days**

## MATERIALS

### Cleaning Solution Recipes

#### Pemulen gel

200mL Distilled Water  
10mL TEA  
10mL Tris (2% Tris in de-ionized water)  
2g Pemulen

#### Pemulen gel with benzyl alcohol

200mL distilled water  
10mL TEA  
10mL Tris  
10mL benzyl alcohol  
2g Pemulen

#### Carbopol Gel

200 mL  
10 mL TEA  
10 mL Citric Acid  
2 g Carbopol

#### Buffer Solution

200 mL distilled water  
buffered to a pH of 8 with TEA and Citric Acid

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<sup>6</sup>The brasses were cleaned to a high level of polish to match the brasses of the previously cleaned animals. Autosol, a proprietary polish used in the automotive industry, for fine polishing, was applied using a small swab. The interior glass bezels were taped with painters tape to prevent accidental scratching. Sarah Milton, a pre-program intern, began polishing three of the four brasses, while I completed the polishing, and the entire polishing of one of the brasses. A weak solution of DPT, 5% solution in distilled water, was used to facilitate corrosion removal.

<sup>7</sup>A similar diameter copper wire was selected and cut to size. The ends of the wire were shaped on a sander, as the pre-existing holes were too small to accept the thickness of the wire. The copper was cleaned with benzine and acetone. The surface was lightly sanded. Two coats of Rustoleum high temperature matte spray paint was applied. After drying, two coats of Golden MSA varnish with UVLS was applied.

**Purchased Materials**

Acetone Acetone: J.T. Baker Inc., Phillipsburg, NJ

Acryloid B-72: Conservation Materials, 240 Freeport Blvd., Box 2884 Sparks, NV 89431

Autosol Metal Polish: Solvolene Lubricant Limited, London, SE 8 England

Butcher's Boston Polish Amber wax: The Butcher Company, Marlborough, MA 01752

Beva 371 Film: Conservator's Products Co., Chatham, NJ

Carbopol 934: Conservation Materials, 240 Freeport Blvd, Box 2884 Sparks, NV 89431

Dissolvine D-40 (DPTA (5Na): Akzo Nobel Functional Chemicals, Lima OH 45804

Golden Acrylics, Blick Art Materials, Galesburg, IL 61402-1267

Golden MSA (Mineral Spirit Acrylic) Varnish with UVLS (Satin and Matte): Blick Art Materials,  
Galesburg, IL 61402-1267

Pemulen®TR 2: Protameen Chemicals, Totowa, NJ 07511

Reemay non woven polyester fabric: Talas, NY

Rustoleum Rust-oleum, local hardware store Specialty High Heat Spray Enamel

Triethanolamine: Fisher Scientific, Fairlawn, NJ

Tris(hydroxymethyl)amino methane: Sigma-Aldrich, St. Louis, MO 63103

Twill Tape, Talas, NY

Conservator's Signature: \_\_\_\_\_ Date: \_\_\_\_\_

Approved by:  
Director, Preservation & Conservation: \_\_\_\_\_ Date: \_\_\_\_\_

Curator: \_\_\_\_\_ Date: \_\_\_\_\_