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CONSERVATION OF A MARIONETTE ATTRIBUTED TO TONY SARG

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FASHION AND TEXTILE STUDIES: HISTORY, THEORY, MUSEUM PRACTICE

BY

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ABSTRACT

This qualifying paper examines the possibilities and limitations for the conservation and treatment of a cow character marionette that is estimated to be one hundred years old.

The marionette was purchased by its present owner, Sharon Lerner, in the mid to late 1970s in New England. Though the cow marionette's true provenance is unknown, legend has associated her with Tony Sarg and his traveling marionette company. Sarg was a noted commercial artist and personality and his puppet troupe was a popular American entertainment in during the 1920s and 30s.

The cow marionette is a mixed media object. In puppetry, she would be described as a junk body marionette. The cow's head, legs, neck, and tail are manipulated with strings by a puppeteer giving her lifelike qualities. As with any object where multiple materials that may not be compatible are assembled to make a whole, there are inherent conservation problems to be solved.

Research draws from published articles and book excerpts highlighting the marionette's history, as well as methods and materials used by artists and puppet makers of the early to mid-1900's, with the intention that this information will be useful in implementing a conservation project using contemporary conservation methods and artist's supplies.

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INTRODUCTION

During the summer of 2002, while working on a puppet show for television, *Johnny and the Sprites*, at Kaufman Astoria Studios, one of the show's producers, Sharon Lerner, brought a cow marionette in to ask if one of the puppet builders could do anything to repair it and restring it. In the middle of a busy production no one had time to do the work, so a make-shift box was quickly put together for the cow and it sat on a shelf for the duration of the shoot. When the show wrapped, the marionette was shipped off to storage with the tools and materials from the show. The cow marionette sat untouched in the warehouse for several years. (fig.1)

The marionette had been purchased by Sharon Lerner from a New England antique dealer in the 1970's. When Tony Sarg, an early puppet pioneer, declared his company bankrupt in the 1940s he gave away or sold his marionettes to settle his debts. It is not known who was given or bought the cow marionette prior to it being purchased by Ms. Lerner. She believed that the marionette might be a Sarg marionette. At the time of its purchase, that presumption had been a selling/purchasing point.

Tony Sarg was a man of many interests. He was not only a showman, but an illustrator, author, and designer. His innovations still touch us today. He was the designer of the first giant balloons for the 1927 Macy's Thanksgiving Day Parade. In 1935, he filled for the first time, the holiday windows of the store

(Macy's), with mechanically animated dolls and scenery. This Christmastime delight was adopted by other department stores and remains popular today.¹

The point of this paper is not to explore the life and career of Tony Sarg; much has already been written on that subject.^{2 3} It is, rather, to research his methods of marionette construction for a broader understanding of Sarg puppets for the marionette research field, and to respect those materials and methods in the conservation of this cow. This will also require research into artists' and conservation materials in order to carry out this conservation.

Tony Sarg, (Anthony Frederic Sarg, April 21, 1880 - March 7, 1942) came to the U.S. in 1915 with his wife and daughter, from England, just prior to WW I. *Jack and the Beanstalk* is an early Sarg production, which as we recall from childhood, has a cow in the story. The first documented performance of *Jack and the Beanstalk* in the United States is during the 1915-1916 season. Sarg presented it along with *A Night in Delhi* and *The Singing Lesson* ⁴ in his first studio space in the Flatiron Building where he gave performances for friends and acquaintances.⁵ The first newspaper reference of the show being presented for

¹Eileen Blumenthal, *Puppetry A World History*. (New York: Harry N. Abrams, Inc., 2005.), 244.

²Tamara Robin Hunt, *Tony Sarg: Puppeteer in America 1915-1942*. (North Vancouver, Canada, Charlemagne Press, 1988.) 40.

³ Paul McPharlin, *The Puppet Theatre in America: A History 1524-1948*. (Boston: Plays, Inc., 1949.) 334-340.

⁴ McPharlin. 464.

⁵ Ibid. 334.

commercial purposes is September 3, 1919, at the Provincetown Players' Theatre at 133 MacDougal Street, in Greenwich Village.⁶

The show appeared at several venues in New York City during the fall season, and then disappeared from the announcements in the newspaper. In comparison to later shows, *Jack and The Beanstalk* was a small show and may have disappeared from the repertoire as Sarg's productions became more elaborate. It may have been reserved for shows that traveled and were given in schools or became a "short" coupled with grander marionette plays and did not receive a mention on the program. Or it could have been set aside because as Marjorie Batchelder comments in, *The Puppet Theatre Handbook* "...this fairy story is one of the most overworked in the puppet repertoire."⁷

The play was not totally discarded. An article by Sarg appears in the *Ladies Home Journal*, December 1927, describing how to build a marionette theatre, construct marionettes and mount a show that uses *Jack and the Beanstalk* as an example. The cow is referenced as an illustration of how to make an animal with four feet.

More intriguing evidence for establishing the cow as a Tony Sarg marionette is a photograph found in the online photo archives of the Nantucket Historical Association, Nantucket, Massachusetts. The photo, dated 1920, shows Sarg seated at a worktable with marionettes hanging against the wall

⁶ *New York Times*. September 3, 1919. 6.

⁷ Marjorie Batchelder, *The Puppet Theatre Handbook*. (New York and London: Harper Brothers Publishers, 1947.) 18.

behind him. One of the marionettes is a cow similar to the cow that is the subject of this paper. (fig. 2)

Almost every biographical article about Tony Sarg includes this story of Sarg learning his craft by careful observation of the secret techniques of Holden's company as recorded by F. J. McIssac in his small volume, *The Tony Sarg Marionette Book*, published in 1921. Much of what McIssac wrote was based on his personal interviews with Tony Sarg.

"It is characteristic of Tony Sarg that he gives credit freely to everything that has helped him in his career. "These Holden marionettes," he says, "were mechanically the best the best I'd ever seen. They were almost miraculous."

"I attended more than fifty performances, studying them carefully. Finally I made the acquaintance of Holden himself, but I was never given the chance to see how the dolls were manipulated. The whole outfit behind the scenes was enclosed in a huge sheet of white canvas, and not even the stage hands were permitted to get a glimpse of operations."

"Nevertheless, I have a mechanical eye, and by watching carefully I managed to guess a number of Holden's secrets." ⁸

Theatre historian George Speaight corroborates Holden's secrecy:

"The construction of their marionettes was regarded by these showmen as a secret to be handed down from father to son and jealously guarded from outsiders. Holden insisted on having the back of his stage hidden behind a kind of tent, let down from the flies, when he was playing in a big theatre, so that not even the stage-hands should see how it was done; when he did once, unwillingly and after much bargaining, agree to sell a figure to a fellow-performer he carefully cut the strings off before allowing it out of his hands." ⁹

⁸ F.J. McIssac, *The Tony Sarg Marionette Book*, (New York: B.W. Huebsch, Inc., 1921), 5-6.

⁹ George Speaight, *The History of The English Puppet Theatre*. (London: George G. Harrap & Co., Ltd., 1955), 260.

Holden's was one of the largest and longest enduring of England's touring family marionette companies.¹⁰ Begun in 1830 by Thomas Holden (Grandfather) who was a fairground entertainer, Holden's eventually became two marionette companies. The first was begun in 1860 by Thomas Holden's son, John Holden, joined by his son, John Jr. in 1866, and the second company was started in 1873 by two more of John Sr.'s sons, Thomas and James.¹¹

As Victorian entertainments, traveling shows moved from town to village to fairground in caravans. Family members did all the work, making and maintaining the marionettes, and performing in the shows. Their shows were based on stories, legends and popular plays of the day.¹² (fig. 3)

The marionette show that inspired Tony Sarg is said to be that of Thomas Holden, who theatre historian George Speaight has called the greatest of all the English puppeteers.¹³ This would have taken place in London about 1905 or 1906.¹⁴ However, author John McCormick says that two Holden brothers, John and Thomas retired in the 1890's, leaving only James Holden giving marionette

¹⁰ John McCormick, *The Victorian Marionette Theatre*. (Iowa City, Iowa: University of Iowa Press, 2004.),3.

¹¹ McCormick, 29-30.

¹² *Tiller Clowes Booth*, PeoplePlay UK Theatre History Online. www.peopleplayuk.org. Accessed 4/20/2006.

¹³ Speaight, 257.

¹⁴ Bart P. Roccoberton, Jr., *U.S. Non-tradition*, Puppet Arts Program, University of Connecticut, 1999, http://www.o-puppet.com.tw/class/article/US_Non_tradition.doc. Accessed 4/20/2006.

shows until about 1910.¹⁵ So there is some question as to exactly which Holden Sarg actually saw perform.

Though Sarg greatly admired the Holden marionettes' mechanical and trick abilities and ease of movement, he found Holden's manipulation of the marionettes and overall concept of the marionette theatre lacking.

“Although the Holden marionettes were excellent mechanically, they were not handled by an artist. Obviously, from the costumes and the scenery and the things they did, the puppet showman was an uneducated person. I could see the great possibilities, which the Holden's were completely overlooking.”¹⁶

Though he had been well established in England as an illustrator, when he arrived in New York in 1915, Sarg had to begin his career over again. Taking a studio on the top floor of the Flatiron Building, he soon became friendly with other artists that worked in the building. Along with fellow artists Frank Godwin (1889-1959)¹⁷ and Charles E. “Mat” Searle he began to put on marionette shows to entertain friends.¹⁸

Charles E. “Mat” Searle (1872-1952), became Sarg's puppet workshop supervisor, serving in that capacity for 18 years, from 1916 to 1934. Though he spent many years with Sarg and was obviously an important member of the

¹⁵ McCormick, 31.

¹⁶ McLissac, 6.

¹⁷ *Frank Godwin: Education and Community*. The James A Michener Art Museum: Bucks County Artists. Copyright 2001-2005.
<http://www.michenermuseum.org> Accessed 4/16/2006.

¹⁸ Baird, p.177.

company, relatively little is known about him personally. He was an architect, illustrator and cabinetmaker.¹⁹

Mclsaac says that Sarg gave Searle credit for many innovations that enhanced the realism of his marionettes. Meeting Searle as a fellow occupant of the Flatiron Building (known as The Fuller Building, located at the intersection of Broadway, Twenty-third Street and Fifth Avenue), the two put together, *The Music Lesson* in which Searle's innovative device caused the tiny prima donna's chest to rise and fall as though singing.²⁰

Throughout the 1920's and 1930's when Sarg's company was a popular attraction, Searle traveled, puppeteered and supervised the touring shows.²¹ Many of the next generation of puppeteers began their careers with Tony Sarg's Marionettes. Bil Baird, Rufus and Margo Rose, Sue Hastings, (Sue Hastings studied with Sarg but was never a puppeteer with his company²²) and Lillian Owen Thompson all honed their skills under Searle's tutelage with Sarg's company.²³

Veteran puppeteer Ed Johnson (1918-1988) wrote that when he was a boy in the 1920's and 30's there was a dearth of published "how to" information

¹⁹ Mclsaac, p. 6-7.

²⁰ Ibid. p.7.

²¹ Baird, p.179.

²² McPharlin. 338.

²³ Bell, 60.

on puppet and marionette making. Sarg's book along with books by Helen Haiman Joseph, *A Book of Marionettes*, and Edith Flack Ackley, *Marionettes: Easy to Make! Fun to Use!* were among the few publications available at the time. Even having a vague idea of what a puppet or marionette was meant you had to have seen one of the few shows that traveled the country. If you were at all interested in staging a puppet show yourself, there was very little help to be found.²⁴

Tony Sarg liked to share his knowhow with others, especially with the younger members of his audience. Unlike the Holdens, he had no qualms about exposing the secrets of his craft. A 1927 article in *The Ladies' Home Journal* features the production of *Jack and the Beanstalk* as its subject matter with directions and illustrations for building a stage, scenery, and a cast of marionettes, "Daphne" (the family cow) is among them. These instructions are somewhat simplified for the novice puppet maker. To be fair, a certain amount of ingenuity and expertise is required of the amateur show person in order to carry out the instructions, but they do provide the basic outline for the construction of a genuinely workable theatre and fairly sophisticated marionettes.²⁵

²⁴ Ed Johnson and Rod Young, *The Puppeteers of America: What It Is And Where It Came From*, The Puppeteers of America.
<http://www.tcpuppet.org/NewFiles/poa.html> Accessed 5/16/2006.

²⁵ Tony Sarg, "How to Make and Operate a Marionette Theatre." *The Ladies' Home Journal*, December, 1927. The Buxton Scrapbook—Tony Sarg. The Ballard Institute and Museum of Puppetry Library, University of Connecticut, Depot Campus, Storrs, Connecticut, 2003. np.
http://www.sp.uconn.edu/~wwwsfa/library_publications-buxton_tonysarg.htm . Accessed 3/22/2005.

“Puppet animals are always very amusing, and I will give brief instructions how to make a cow. All four-legged animals could be modeled after the same principle. Wood putty should be used for all modeling; the legs should be attached with a strong nail with a big head leaving plenty of play. Do not attempt to give animal legs a bend at the knee. The tail—a thick piece of cord with the end slightly unraveled—should be loose. The neck and head should be flexible. In order to make a good neck, make it of cloth and attach like a hollow stocking on the head and shoulders. Inside of hollow stocking put a piece of wire twisted in a spiral fashion. This will give the head a good flexibility and help retain shape of the neck. The legs have no strings attached, but the head has a separate control to enable it to be lifted up and down to shake. The tail should also have string attached. To move the cow, lift the front feet and then the back feet; always the feet that are not suspended should touch the ground and create a sort of a galloping movement. To show the audience that the cow is very astonished, let her sit down on her hind legs.”²⁶ (fig. 4)

Master puppeteer Bil Baird (1904-1987) writes that he was inspired to pursue his own career in puppetry after seeing one performance of Sarg’s touring production of *Rip Van Winkle* in 1921 in his high school auditorium in Mason City, Iowa. This show was among the first of Sarg’s public successes.²⁷

McPharlin records that after a few public successes, Sarg left most of the puppeteering, building and touring to the members of his company. He pursued other creative endeavors but continued to design and supervise the marionette productions.²⁸ A well written play, based on a familiar story, with production details carefully incorporated, puppets, properties and even the printed programs

²⁶ Sarg. np.

²⁷ Bil Baird, *Art of The Puppet*, (New York: The Ridge Press, Inc. Bonanza Books, a division of Crown Publishers, Inc. ,1965), 179.

²⁸ McPharlin, 337,338.

all reflected Sarg's artistry.²⁹ The beautifully executed and innovative shows set a new standard and interest for puppetry in America.³⁰

Besides Rip Van Winkle, some of the shows that Tony Sarg's Marionettes toured during the 1920s and 30s were The Rose and The Ring, Don Quixote, Treasure Island, Ali Baba, Alice in Wonderland and Robin Hood.

In December of 1939, Tony Sarg's Marionettes gave their final performances of Robin Hood and Treasure Island.³¹

Paul McPharlin suggests that due to the hasty manner in which Tony Sarg's marionettes were disposed of during bankruptcy, most were scattered to the wind and survive only in memories of his shows. It has been a long time since McPharlin wrote those words in 1949 and in the intervening years many of Sarg's marionettes have found their way into both private and museum collections.³²

Some of Tony Sarg's marionettes as well as many other puppets and marionettes live on in both private and public collections. In the United States, three of the most comprehensive collections of puppets and archives related to puppetry arts are in The Ballard Institute and Museum of Puppetry (part of the University of Connecticut in Storrs, Connecticut); The Center for Puppetry Arts in

²⁹ McPharlin, 337,338.

³⁰ Roccoberton, Jr.,5.

³¹ Hunt, 145-150.

³² McPharlin, 339, 340.

Atlanta, Georgia; and The Paul McPharlin Puppetry Collection at the Detroit Institute of the Arts, Detroit, Michigan.

The Nantucket Historical Association has a collection of Tony Sarg related material. Sarg and his wife Bertha (née Bertha Eleanor McGowan 1874-1950)³³ and daughter were summertime residents of Nantucket, Massachusetts. His daughter, Mary Sarg Murphy (1911-1986),³⁴ donated many personal objects, memorabilia and photographs belonging to her family to the Nantucket Historical Association.³⁵

³³ *New York Times*, June 28, 1950. 27.

³⁴ *Nantucket (MA) Inquirer and Mirror*, May 29, 1986. 20.

³⁵ *Nantucket (MA) Inquirer and Mirror*, August 18, 1983. 42.

CHAPTER 1

CONDITION REPORT AND DISCUSSION

Object: Cow marionette attributed to Tony Sarg.

Date: Made during or after 1915, but before 1919.

Materials:

Surface materials:

Calf skin, chamois, cotton rope, brush bristles, electrical tape, brads, paint, dry paint pigments, glue, putty, glass eyes.

Interior materials:

Wood, plywood, string, cotton rope, threads, cotton batting, brads, nails, screws fiberboard, muslin, printed cotton textile, wire, metal rod, glue, putty, modeling wax, red rubber hose, black rubber hose, wood shavings, pink and white textile.

Measurements:

Height: 17" Tail head to hoof

Length: 28" Tail head to muzzle

Weight: 8.75 lbs

Country of origin: United States

Owner: Sharon Lerner

Description:

A cow character marionette. The cow has markings typical of a Jersey or Holstein cow. The colors are a yellowed version of white with patches of dark brown to black.

The understructure of the marionette is what is typically described in puppetry books as a plywood body or a 'junk' body. This means it is made from a variety of materials and media.³⁶ This particular understructure is a combination of wood and plywood, fiberboard, fabric, and papier-mâché. The visible body surface is covered in leather and hide. The head and horns are molded from sculptor's wax, water putty, papier-mâché, fabric and covered in leather. The cow has two brown glass taxidermy eyes. The cow's markings are applied with paint. See figure 5 for what will be noted as "side 1" and figure 6 for "side 2".

³⁶ David Currell, *The Complete Book of Puppetry* (Boston: Plays, Inc., 1975), 125.

In order to avoid repetitive descriptions of the various complicated components, descriptions are embedded in the next section discussing their condition.

The Overall Condition:

The overall condition of the cow is poor.

Deterioration of the cow is due to age, rough handling, poor storage conditions, and fluctuating heat and humidity. Stored for many years without a box and uncovered the marionette was exposed to damage via light, dust, dirt and pollutants. The desiccation of the leather and hide is the result of these factors.

1. Head and Muzzle

The cow's head and muzzle are made of sculptor's wax, covered with a layer of papier-mâché. That basic shape is covered with two or three layers of glue-soaked muslin before being covered with hide and painted.

The cow's ears are cut from 3/8-inch-thick leather. Her horns are wire armatures covered with sculpted water putty and painted.

The skull and upper jaw are intact. There is an area of loss on the muzzle (Side 1). The nostril has been damaged, close examination shows insect damage. The insects have long been inactive and /or eradicated.

The most obvious deficit to the head is the missing lower jaw. Ethically it would be problematic to re-create it, and thus it will not be attempted. (fig. 7)

2. Neck

Exterior Neck

The exterior neck is a tube made of chamois. It is narrow where it joins the cow's head behind the ears and wider at the end where it joins the body at the shoulders. It is caked with paint that is cracked, fractured and cupped. In addition, there is one long tear in the chamois from the cow's shoulder to beneath the chin. (figs. 8, 9)

Interior Neck

The interior neck support is composed of cotton batting encased in loose weave cotton fabric and secured in several places with stitches throughout to keep the batting from shifting, creating a package. Attached to the batting package are two short lengths of hose. One is red, ¾ inch diameter and one black piece, ½ inch diameter. Hardened with age, presumably they were once flexible and acted as guides for extra strings. (fig.10)

Further examination finds that the cotton batting package is partially attached at the cow's shoulders to a fiberboard joint with cotton cord and

also anchored inside the cow's upper jaw. Additionally, the chamois neck skin is glued to the batting package at the center top seam of the neck.

All materials involved in the neck region are brittle and joined together in complicated ways that make any intervention dangerous to the object.

3. Udder

The udder is a pocket made of chamois. It has a center machine sewn seam with two pairs of teats (four teats altogether) whittled from wood dowel and poked through holes on either side of the seam. (figs. 11, 12)

The udder has become partially detached from the under belly of the cow. Due to gravity it is somewhat misshapen and collapsed in on itself. The leather of the udder is stiff and brittle. The surface of the udder has been painted a flesh pink color and the paint is crazed and cracked. The chamois of the udder is fragile and brittle and the edges are especially so. Any small movement causes the edges to crumb away and the thin coating of pink paint to flake off the udder.

It was originally thought that the stuffing in the udder cavity was more or less a random tucking of material into the udder to maintain its shape. When looking at the batting in the cavity it was discovered hidden in the fibers were a series of stitches, made with cotton string, holding the tuft of batting together and the tuft was in turn secured to the cow's underbelly with wire and string in several spots. The tufting is closer in appearance to an upholstery technique than a random stuffing out of a shape. This seems to be a method used by the artist and important construction information to leave undisturbed. (figs. 11,12)

There are some wood chips or shavings in the udder cavity. It is likely that they accumulated in the udder as another feature of the cow was being carved or refined and the puppet maker left them where they fell

4. Rump/Tail

The leather on the rump appears to be the first or oldest of the leather coverings. The leather is water damaged, stiff and splitting at the center back machine sewn seam.

The tail is part of one piece of rope that begins in a loop at the cow's shoulders and runs back towards the rump along a wooden spine. The rope is secured at 2" intervals with cotton cord threaded through holes drilled in the wood at two-inch intervals. The tail falls from the rump at the tailhead and hangs free from the cow and is finished with a switch of brush bristles. The overall measurement of the rope in length is 27 inches. The tail measures 13 inches including a 2-inch switch.

At the point where the tail falls from the body the cotton rope is frayed and partially detached from the rump. There is a double wire loop where the strings tie to the body. The double wire loop is also partially detached.

A previous attempt to repair the tailhead and the wire loop with black friction (electrical) tape wound about it has become aged and brittle and is no longer useful.

The length of the tail is covered with leather strips that are shrinking and pulling away from the cotton rope. Some strips are missing exposing the white rope. (fig.13)

5. Leg joints

The front leg joints are made with a short piece of wooden dowel spanning the body cavity as a spacer and the legs are either screwed or nailed into the dowel leaving them swing loose to facilitate movement. The hide covering the front leg joints is intact and will not be disturbed.

The hind leg joints are made with a 5 5/8ths inch piece of welding rod, with a 3/16ths inch diameter threaded through the body cavity with the legs mounted on either exterior side of the cow. A metal washer is placed on either side of the body and the end of the rods have been hammered flat in order to keep the washer and leg secured. The legs swing freely making a walking movement when the marionette is animated by a puppeteer.

The metal rods that allow the hind legs to move have made holes in the hide. Besides surface damage to the hide, rust is visible on the end of the rods and underneath the hide.

6. Overall body surface

There are small repairs needed to be made overall on the body, primarily re-adherence of the cow's layers of leather skin to its under structure. (fig. 14)

7. Previous repairs

The marionette we see today is not the character that made her debut in 1915. A marionette is a functional object intended to be strung for use in performance and in this case display or storage. The size, weight of the cow, (either lying flat or strung) fragility of its hide covering hide and painted areas, and flexing of moveable parts all add to the difficulty in handling the cow without causing further damage during treatment and thus sometimes prevents close determination of which parts may be original.

It is possible to view some of the interior structure and materials by easing the neck support and mechanism out of the way and peering through the tear in the neck with a flashlight. Interior materials can be seen, but most remain out of reach and little can be done toward their definitive identification and conservation.

The cow's basic understructure may be unchanged, but her visible surface has been repaired often and recovered at least once. The recovering seems plausible because the present hide covering appears to be applied over a hard surface that is painted sienna and dark brown colors. Another

reason the covering or recovering on the cow may not be original is the work does not appear to live up to the company's reputation for fine craftsmanship. It is important to note, that there is no way to prove this is the case.

If indeed she was part of the Sarg repertoire in her useful life the cow was part of a touring show that gave multiple performances daily. Sarg's company actively toured the United States from the 1920s until 1939 when he declared his company bankrupt. There is the possibility the marionette may have endured thirty-five to forty years of intermittent use, repairs, and neglect before its retirement. The surface covering of the cow is very fragile. There is a continual loss of hairs from the hide, flaking of paint, cracking of hardened leather and the surface is easily marred or dented.

The surfaces on the cow that appear untouched/uncovered are the lower legs, from her elbow to the hooves in the front and from the hocks to the hooves in the back. The back leg (side 2) may be the original surface treatment and color of the cow. (fig.15)

CHAPTER 2

INVESTIGATION OF MATERIALS

Before a treatment proposal was developed, a close analysis of the extensive range of materials present on the marionette was conducted. Some limitations on exact identification of materials are due in part to either the extreme brittleness of some components, or their location on the object, or lack of access to advanced technical equipment. The following is a listing of the materials that were found to be present or those that were likely to be, determined by best available methods.

Leather

Leather makes up the most visible part of the cow's body materials.

The words leather, hide and skin have specific meaning in conservation and the commercial leather trade. Leather is the skin of a mammal, presumably a young cow or calf in this object, that has been preserved by a tanning process.³⁷ Hides are the whole, uncut, preserved skin of any larger mammal with or without its surface hair intact. Skin or skins, generally refer to the hides of smaller mammals such as calf, goat or sheep with or without surface hair intact.³⁸ For the purposes of this paper, the hide or skin covering the marionette's body is considered a hair-on cowhide or calfskin. Specific hair and skin follicle patterns are identifying characteristics of cow or calfskin. Both young and older animals will have hair

³⁷ Roy Thomson, "The Nature and Properties of Leather." *Conservation of Leather and Related Materials*. (Butterworth-Heinemann, Amsterdam, 2006), 3.

³⁸ *Hide (skin)*, en.wikipedia.org. Accessed 1/4/2020.

and follicles arranged in orderly rows. It is only the size of the follicles and spaces between the follicles that increase as the cows matures.³⁹

When the skin covering was newly applied to the cow frame, it would have been pliable. Considering the abundance of glue that was used to adhere the covering to the cow's body, plus the surface application of paints, long term flexibility does not seem to have been a concern of the artist.

Chamois leather is also part of the cow's makeup. Chamois is the split flesh of sheep or lambskin. It is soft and pliable. Chamois is known for its water absorbency and non-abrasive properties. Chamois is both inexpensive and readily available.⁴⁰

Fibreboard

The main body cavity is made of a sheet of material that looks like fibreboard. It is partially visible by looking into the body through the tear in the neck. As the commercial literature claims, fibreboard is virtually indestructible.⁴¹ This guess is supported by the fact that the body has held its shape without any interior structure, such as ribs or cross bracing, for many years.

Fibreboard or trunk fiber has been in existence since the 1880's. It is considered a moldable material made from cellulose. 100% cotton fiber is

³⁹ B.M. Haines, "The Fibre Structure of Leather." *Conservation of Leather and Related Materials*. (Butterworth-Heinemann, Amsterdam, 2006),17.

⁴⁰ *Chamois Leather*. en.wikipedia.org. Accessed 1/4/2020.

⁴¹ Robert A. Zembower, *Vulcanized Fibre Revisited, Electrical Insulation and A Whole Lot More*, Toyo Fibre USA, Inc. <http://www.toyofibre.com/fibre.html>. Accessed 9/5/2006. Non paginated product publication.

gelatinized by immersion in acid and then vulcanized. The result is a tough, lightweight, flexible sheet that can be used in numerous applications.⁴²

Modeling wax and papier-mâché for head

Modeling wax in combination with papier-mâché and glue-soaked muslin was used to make the cow's head and muzzle.

"A child who has a gift for modeling may make fascinating character heads with modeling wax. It can be bought at any art store. If these wax heads are to be made permanent, they should be covered with some fine gauze soaked in glue which when it dries, will form a hard protecting surface, which may be painted."⁴³

Modeling wax or impasto is a combination of microcrystalline wax, (a type of paraffin, used in small amounts as a plasticizer, paraffin is a refined petroleum product⁴⁴) and beeswax.⁴⁵ Paraffin is a hydrocarbon and it is particularly stable and has a wide range of melting points. Beeswax comes in two forms, yellow and unrefined from the bees and white, purified and bleached. White beeswax is somewhat harder than the yellow. Beeswax melts at 145 degrees Fahrenheit. Beeswax is the principal wax used in artist's materials.⁴⁶

Making papier-mâché

⁴² Zembower, Non paginated product publication.

⁴³ Mclsaac, 33-34.

⁴⁴ Ralph Mayer, *The Artist's Handbook of Materials and Techniques*, (New York, The Viking Press, Third Edition 1970), 412.

⁴⁵ Blick Art Materials, *R&F Impasto/Modeling Wax*, <http://www.dickblick.com> Accessed 9/17/2006.

⁴⁶ Smith, 37.

Marjorie Batchelder, in her important book on puppet making before 1947, said that every puppet maker had a recipe for papier-mâché.

“A basic recipe for papier-mâché begins with newsprint or old newspapers, this will make a grey colored papier-mâché because of the ink, or other soft paper that has been soaked overnight in water and reduced to pulp by pushing it through a food mill or rubbing it on a wash board or between the palms of the hands. After the water is squeezed out some adhesive is added to bind the mixture together. Wallpaper paste, flour paste, liquid or casein glue, casein paste are frequently used. The mass is kneaded and a little whiting (refined calcium carbonate⁴⁷) is added to make the mixture smooth.”⁴⁸

Metals and rust

The metals used in the cow are ordinary household metals; dressmaker's pins, tacks, nails, pieces of wire, washers, and short lengths of steel rods.

As is often the case, materials used in composite objects can be detrimental to each other. Leather and metal are two such materials. In general, fatty acids from the tanning process react with the metals and cause them to corrode. At the same time, the corrosion product will cause the leather to deteriorate.⁴⁹ Wood has a similar effect on metal: acids present in wood will cause metals to corrode, giving rust another chance to deteriorate the leather.⁵⁰

⁴⁷ Mayer, 46-47.

⁴⁸ Batchelder, 83-85.

⁴⁹ Barbara Applebaum, *Guide to Environmental Protection of Collections*. (Madison, Connecticut: Sound View Press, 1991), 222.

⁵⁰ Ibid, 222.

Moisture, either alone or in combination with sulfide and /or chloride forming atmospheric pollutants is the most serious cause of corrosion. In the presence of humidity, iron and steel rust easily. And in the reverse direction, metal corrosion can be attributed to the off-gassing of art supplies, building, and storage and display materials, such as plastics, paints, adhesives, and textiles.⁵¹

Active Corrosion

Stable iron (steel, welding rod) shows a surface that is smooth and dark blue-black or red- brown in color. Active corrosion in iron and steel is easily recognized. Defined as a continual loss of material from the object in question, it is evident by flaking and powdering of the metal's surface. Other characteristics of iron corrosion are fragmentation and pitting of the metal surface and orange colored spots in the center of the depressions.⁵² Active corrosion will continue to erode the metal and it will eventually fail or fall away.

The best rust preventative is a stable storage and display atmosphere with relative humidity as low as 35% to 45%. While this is good for the metals, so low a RH may be detrimental to the other materials used in the mixed media object.

⁵¹ Elayne Grossbard, "The Care and Conservation of Metal Artifacts" Konstanze Bachman, editor, *Conservation Concerns* (Washington, D.C.: Smithsonian Institution Press. 1992),101-2.

⁵² *Recognizing Active Corrosion*, Canadian Conservation Institute Notes, vol. 9, no.1 (Canada: Canadian Conservation Institute, 2007),1-3.

Thus, a RH of 55% is recommended for the entire object. A rise in relative humidity to 65 or 70% will cause the metal to actively corrode again.⁵³

Glues

There is a large amount of glue present on the surfaces and in joining parts all over this object. Some preliminary testing shows that most of it is water sensitive (at least shows some swelling with the application of a drop of water). Of the glues available and commonly used in this time period of the early twentieth century, animal hide glues and/or casein-based glues are probably the most likely to be found on this object.

Preparation of the hide glues consists of boiling down the animal hide until a thickened viscosity is reached and the collagen protein is extracted from the skins. Rabbit skin glue is considered the most refined and of lesser adhesive strength.⁵⁴ Applied warm, its strength is developed as it cools and the water evaporates, allowing the protein molecules to set their secondary bonds.

Casein glues are made by separating out the casein protein from milk. As an adhesive, it is easier to use and forms a more durable bond than animal glues.

⁵³ *Storage of Metals*, Canadian Conservation Institute Notes. vol. 9, no.2 (Canada; Canadian Conservation Institute, 2007)1-3.

⁵⁴ Marion Kite, "Collagen products: glues, gelatin, gut membrane and sausage_casings." *Conservation of Leather and Related Materials*. (Butterworth-Heinemann, Amsterdam, 2006),192-3.

Casein is applied cold and dries quickly. The bond is more water resistant when treated with specific amounts of chemical hardeners such as formalin or alum.⁵⁵

Batchelder mentions other glues as well in her story of early puppet making; name brand glues available at the time were Le Page's Mucilage and Weldwood. Le Page's is an edible, plant based mucilage glue, known to school children by its distinctive shaped dispenser as a paper and craft glue.⁵⁶

Weldwood is a synthetic urea formaldehyde resin glue useful for woodworking. When Marjorie Batchelder wrote her book, vinyl glues and resins would have been fairly new (adhesives made of synthetic polymers were introduced just before WW II).⁵⁷ So probably they would have come too late to have been used on the cow marionette.

An object's age, fluctuations in humidity and temperature in its environment may cause animal glues to discolor, harden, craze and crack. Even though the cow marionette remains intact, it is difficult to restore flexibility and a cohesive surface to the object with either heat or humidification due to the coating of glue, even more so than due to the nature of the leather substrate.⁵⁸

⁵⁵ Mayer, 402,404.

⁵⁶ *Mucilage*, Wikipedia. Accessed 11/17/2019.

⁵⁷ Carl A. Eckelman, *Brief Survey of Wood Adhesives*, Forestry and Natural Resources, Purdue University, Cooperative Extension Services. www.extension.purdue.edu. Accessed 11/17/2019.

⁵⁸ Ágnes Tímár-Balázy, Dinah Eastop, *Chemical Principals of Textile Conservation*. (Butterworth-Heinemann, Oxford, 2002),120-1.

The large amount of glue on all the surfaces makes it difficult to separate the pieces of leather one from the other or open any seams to evaluate and carry out treatments. The leather is old and does not react well to any type of moisture. The glue readily softens with warmed distilled water, but the moisture causes the leather to stiffen as the water evaporates.

Paints

Both Marjorie Batchelder and Rufus Rose recommended the use of oil paints for the painting of faces and features and details.⁵⁹ Batchelder also suggests the general use of tempera paints, dry pigments that are mixed with a binder such as white flake glue or animal glues.⁶⁰ White flake glue is animal glue (rabbit skin) that is mixed with a white pigment such as whiting (calcium carbonate) or zinc. Both are added to increase the strength of the animal glue. The paint is water soluble when dried. The paint on the cow marionette seems quite water soluble – with the introduction of humidity, a drop of water on a paintbrush, the paint begins to swell. Water causes the colors to reactivate.

Casein paints were also available at this time. They came pre-mixed with pigment in tubes, or in powder (casein) form to be mixed with water, ammonia and pigment.

Casein paints are made from soured milk proteins. Having a relatively brief shelf life, they must be used quickly. The main advantage for theatrical uses

⁵⁹ Rufus Rose, The Secrets of Making Marionettes Part 2, *Popular Mechanics*. September 1934, 434-8. <http://blog.modernmechanix.com> Accessed 6/03/2006.

⁶⁰ Batchelder, 95-96.

is quick drying and resulting matte finish of the paints. Once dry, casein is moisture resistant, but is still soluble. Painted surfaces can be reactivated with water and ammonia.⁶¹ Other sources contradict that and say casein paints are impermeable once dry.⁶²

Choice of Adhesives for Repairs

There was an abundance of glue used in making the marionette. While it is advisable to add as little more as possible, there is no reason to avoid using adhesive for repairs. Furthermore, the leather is dry and brittle and there are only a few places where stitching will make a successful repair.

Primarily because it thins easily with distilled water, BEVA® D-8 Dispersant was chosen as the adhesive. The solvent for Beva D-8 is toluene (and xylene). Toluene is readily available and can be purchased locally. Both Beva D-8 and toluene require good ventilation to be used. The manufacturer's literature describes the product as "an aqueous, non-ionic dispersion which consists mainly of ethylene vinyl acetate emulsified by a volatile material which evaporates during drying and leaves no residue."⁶³

⁶¹ Ralph Mayer, *The Artist's Handbook of Materials and Techniques*, (New York, The Viking Press, Revised Edition, 1970) 396,399,402.

⁶² Ray Smith, *New Artist's Handbook*, (New York, DK Publishing, 2003.) 169.

⁶³ *Instructions for the use of Beva D-8 Dispersion*. Conservator's Products Company, (Manufacturer's Information Sheet) <http://talasonline.com> Accessed 4/7/2006.

The adhesive dries clear, colorless and remains very flexible even when applied directly and used without dilution. Prepared swatch tests showed that D-8 adheres well textile to textile and textile to leather. In addition, D-8 adheres well to surfaces that are not absolutely smooth and clean. Once dry, the adhesive is not soluble in water.

Chapter 3

PROPOSAL AND TREATMENT

The goal of this conservation treatment is to improve the aesthetic and physical condition of the marionette where possible. A conservator must be aware that sometimes there are materials in such condition that there is no aesthetic or functional improvement possible, and only limited stabilization. This cow object represents several of those conditions. Thus, the final goal in this case is to give the object a stable storage environment, stabilized enough to allow for limited handling and future study.

PROPOSAL

Upon testing and studying the various materials present on this object, the following is a summary of the treatment proposal.

1. Vacuum exterior and interior surfaces where possible to remove soil, dust and dirt.
2. Humidify the cow generally with passive humidification to restore lost moisture and some flexibility. When applicable, use local humidification on specific areas to ease treatments. (Detached hide/skin.)
3. Clean and repair damaged nostril area on muzzle.
4. Examine and evaluate cotton batting and batting package supporting the cow's neck.

5. Re attach components of the cow's interior neck and repair the cow's exterior neck with adhesive treatment.
6. Examine and evaluate the cotton batting supporting the cow's udder.
7. Re-attach udder with adhesive treatment.
8. Repair damage at cow's rump.
9. Repair frays in rope tail. Repair damage at join of tail. Reattach wire eyelet for strings.
10. Examine and evaluate front and back leg joints. Clean and repair losses at leg joints.
11. Re-adhere detached hide where necessary
12. Make a new controller.
13. "Short string" marionette to controller.

TREATMENT

The following is a description of the procedures attempted. Some were successful, others proved to be less so. Sometimes the presence of one material in a composite component prevented treatment from continuing.

Vacuumed Exterior surfaces

As per the recommendations of the Canadian Conservation Institute, the cow was vacuumed with various micro nozzle attachments using several sizes of artist brushes with soft to medium bristles to loosen the particulates from the

leather.⁶⁴ The black/brown and cream colored areas were brushed using a separate sets of brushes. The intent is to avoid further soiling of the cream colored area with dirt and dust and paint particles from the black/brown areas. The brushes become dirty very quickly and must be cleaned or replaced during the process.

Vacuumed Interior Surfaces

The interior surfaces that were reachable were vacuumed by inserting a micro nozzle attached to a length of PVA tubing through the opening in the cow's neck. Dust and dirt particulate matter was also removed by attaching strips of flannel to a length of dowel and "dusting" the interior surfaces.

Humidification

It was thought at first that generalized passive humidification would be of benefit to the cow, relaxing its overly dried skins and structure. However, the heavy use of hide glue in the construction of the cow makes overall humidification a risky prospect. Papier-mâché in combination with glue-soaked muslin was used to mold some of the cow's features. In areas tested, water or alcohol immediately swells and softens the glue. In addition, on some painted surfaces, glue is used as a binder for pigment or as glaze over the paint, and introduction of humidity makes the surface sticky within seconds.

⁶⁴ *Care of alum, vegetable, and mineral tanned leather*, Canadian Conservation Institute Notes, vol.8, no. 2. Canada: Canadian Conservation Institute 2007), 1-4.

The metals used in construction of the cow are rusty, and though they appear to be fairly stable, an increase in humidity will reactivate the corrosion process. Therefore, overall humidification was ruled out.

Head and Muzzle Repairs

Repairs of the cow's head and muzzle are confined to fairly small repairs. The damaged nostril, where the various layers of wax, papier-mâché and muslin are exposed was repaired with an insert of carved medium density ethafoam, shaped to closely mirror the opposite relatively undamaged nostril. This, in turn, was glued with adhesive (Beva D-8) to the muzzle and covered with a layer of pre-scoured brown cotton. The loose flap of hide was then glued back in position.

The areas where the pieces of hide overlap and are lifting away from the head were reattached in position with direct application of adhesive. (Beva D-8) These areas were held in place with entomology pins until the glue dried and the pins could be removed. (figs.16, 17)

Neck Repairs

Exterior Neck Repairs

The neck is a tube made of chamois. The flexibility of the chamois would no doubt help in the constant movement of the head. It is narrow at the end where it joins the cow's head behind the ears and wider at the end where it joins the body at the shoulders. There is a center top machine sewn seam measuring 5 ½ inches.

There is a 7½ inch tear in the chamois neck that extends from the cow's shoulder to beneath the jaw. Along the tear there are a few remaining threads, evidence of hand stitching. This may be an indication of multiple openings and closings of the neck to make repairs to the marionette. (fig.18)

In preparation to close the neck, a ½ inch strip of muslin was sewn to the lower edge of the tear. At the end of the repair process the top edge of the tear will be glued to the muslin strip, joining both edges, closing the tear. (see figure 21 with all repair strips in place)

Interior Neck Repairs

In order to repair the interior neck, the few remaining stitches along the tear were removed and the chamois was opened up as far as possible.

The marionette's body cavity is a hollow space. It hides the joint mechanisms for the legs and a fibreboard hinge that was once a moveable connection between the cow's body and her neck and head. That hinge is no longer functional. When functional, the hinge moved on a wire mounted between the shoulders of cow allowing her head to move up and down. The hinge is already pierced with five holes, making it easy to reattach cotton and batting neck support with sewing tacks. The tacks are made with linen thread. (fig.19)

A ½ inch strip of dark brown cotton was glued to the edge of the body cavity at the shoulders where the chamois neck painted dark brown had pulled away. Adhesive was applied to the edge of the chamois was then eased into

place and glued to both the brown cotton and muslin repair strips, reattaching the tears at the neck. (fig. 20)

Udder Repairs

The udder's circumference is approximately 17 inches. The udder had separated from the cow's underbelly about two thirds of the way around the udder. The depth of the separation is approximately $\frac{1}{2}$ inch at the sides of the udder to 1 inch at the front. (figs. 21, 22)

Repair for Side One of the cow's udder was easiest as there were two surfaces that were stable and could be glued to. A 1 inch by 6-inch bias cut strip of beige cotton repair fabric was slipped into the gap from the back of the split toward the center front seam and trimmed to length. The top edge of the cow's body above the broken-away udder was glued to the repair fabric and allowed to dry. The top of the broken-away udder was then coated with glue and was eased into position attaching to the other end of the repair fabric which then acted like a reinforcing bridge behind the break. (fig. 23)

The separation on Side Two of the udder was larger. A strip of muslin 6 inches long by 1 inch wide was glued directly to the underbelly, in the position where the udder had been previously adhered. The muslin was trimmed back to make $\frac{1}{2}$ inch hinge where the repair fabric could be attached to the cow's underbelly.

The udder was glued to a 2 inch by 6 inch strip of beige cotton repair fabric and allowed to dry. The udder was then lifted into position, only as far as it

would easily go without forcing and glued to the muslin hinge. Excess repair fabric was trimmed away along the edge of the cow's belly. This did not replace the udder in its original position, but it did close the gap, contain the batting and did not disturb the shape of the batting or how it was secured inside the cow with cotton string. (fig. 24)

Rump and Tail Repairs

Rump Repair

The leather on the rump that is in need of repair appears to be the oldest or first of the leather coverings. The leather is brittle, crumpled and split. There are losses and holes that allow the interior of the cow's hindquarters to be seen. (fig. 25)

Even though overall humidification of the cow has been ruled out, some localized application of moisture is needed to ease the misshapen leather and aid in cleaning away old glue to make a smooth surface for new repairs.

Both leather and glue were softened by moistening pre-washed white 100% cotton flannel strips with distilled water and applying them to small areas of leather at a time. The flannel strips were changed each time they became sticky with glue. Additional jagged points of glue were softened with drops of distilled water and the softened glue was picked off the leather with tweezers or removed by repeatedly rolling cotton tips across the surface. This was repeated as often as necessary until the leather was cleaned and softened.

Once the leather was softened enough to reshape it was paper clipped between strips of mylar and blotter paper and allowed to dry in a flattened position. (fig. 26).

The missing part of the rump cover was made with an infill of 3/8 inch ethylene sheet cut to shape, edges mitered and slid into place between the leather and the understructure of the cow's end. This was covered with a piece of dark brown cotton and then the leading edges of the leather were glued into position with a brush line of glue. The pieces of leather were manipulated only as much as was safe, and they were attached only where they would go safely. Forcing them back into exact position would only damage the brittle pieces further. (figs.27, 28)

Tail Repair

The tail is made of 8 strands of a 1/4" diameter cotton rope, braided about a cotton fiber core.⁶⁵ At the tailhead the rope falls free from the spine and makes the tail. The rope is or has been wound with leather strips. The length of the tail from the tailhead to the end of the switch is 13". The switch is 2" long. The switch is made of brush bristles and is attached to the end of the rope with glue, friction (electrical) tape and wound with a leather strip.

There are breaks in the leather, where it has been repeatedly flexed, or the breaks were on purpose to allow the tail to be flexed. The leather is stiff and split, most likely due to water damage.

⁶⁵ Paul Carter. *Backstage Handbook An Illustrated Almanac of Technical Information*. (Shelter Island, New York: Broadway Press, 1994), 87.

A previous repair of the tailhead has been made with several layers of friction (electrical) tape wound around the rope core in a conical fashion. A piece of small gauge wire has been bent into a double eyelet. Originally, the eyelet would have been threaded through a hole drilled through the cow's wooden spine. (One eyelet on either side.) The marionette's strings would have been threaded through the eyelets. (fig. 29)

At the tailhead the rope has a visible $\frac{3}{4}$ inch long break and fray in 3 of the 8 stands. The break is most likely due to repeated pulls on the tail with a string in order to animate the tail.

Repairs were made to the tail by first removing the wire eyelet, old friction (electrical) tape and attached leather. The fray in the tail was then patched with a 2 x 2 inch bias cut piece of muslin tightly wound around the rope over the fray and glued to itself, but not the rope. In order to increase the circumference of the tail at the tailhead two pieces of polyester needle punch felt were wrapped around the rope and stitched into place and that in turn was covered with a piece of dark brown cotton. (figs.30, 31)

Obvious breaks in the leather on the tail were reinforced with 1 inch strips of dark brown cotton, wound securely around the tail and glued to themselves, not the leather or the rope.

A new double loop was bent in stainless steel wire and was threaded through the existing hole in the cow's spine and the tail head was covered with dark brown Ultrasuede. Ultrasuede is a 100% polyester microfiber textile chosen

for its uniform color, softness and flexibility. Ultrasuede emulates leather or hide without being obtrusive on so old an object.

Leg Joint Repairs

The front leg joints are made with a piece of wood or dowel spanning the lower front part (technically this is the lower shoulder area) of the cow's body cavity as a spacer. The legs are anchored to the wood with either a nail or screw threaded through metal washers loosely enough to allow movement when animated by a puppeteer. The nail or the screw heads are on the outside of the body and covered by the cow's exterior hide.

It is likely that the metals of the front leg joints are affected by rust similar to those of the hind leg joints. However, the hide covering the front leg joints is intact and intervention will damage and mar its appearance, therefore, the covering and front leg joints will not be disturbed.

The hide covering over the hind leg joints has worn away and the rod ends are poking through holes the skin. Through a break in the hide it was possible to see that the washer and the exposed end of the welding rod were covered with rust. Using a circle template, and an Exacto blade, $\frac{3}{4}$ inch circles were cut from the skin directly over the washers and end of the welding rod. When the circles of hide were removed, flakes of rust and rust powder fell away from the metal. The undersides of the hide circles were also covered with rust flakes and rust powder. (fig.32)

The rear leg joints are securely attached despite the corrosion. It was decided not to replace the pin and washer. Additionally, a loop of string is wrapped around the welding rod inside the cow's body. The loop appears to be a partial support for the mass of cotton batting which supports the udder. This would make it difficult to thread a replacement pin through the body.

Surface corrosion was gently cleaned away with a vacuum and medium stiff bristle brush. The washers and rod were intact, but corrosion had pitted the surface of the washers and fused the washers and the ends of the rod together. Further cleaning was done using a bit of steel wool and a drop of sewing machine oil. The washer surface was wiped clean with a soft cotton cloth and left for several hours. To assure that there would be no possibility of oil migrating onto the cow or through the hide the washer was wiped again with mineral spirits and allowed to dry.⁶⁶

The rounds of hide were cleaned as possible with a medium stiff paint brush and the insides were covered with a small piece of brown cotton adhered to the inner surface. The circles were then re-positioned in their places on the cow and re-attached with a fine line of glue. (figs. 33, 34)

Creating a new controller

Marionettes are worked by means of a controller. This generally refers to a device made of narrow strips of hard wood that are tied, pegged or screwed together in a crossed-pieced fashion. From the end points of the cross pieces,

⁶⁶ *Care and Cleaning of Iron*, Canadian Conservation Institute Notes, vol. 9, no. 6 (Canada: Canadian Conservation Institute, 2007), 1- 4.

strings are attached to the marionette and the marionette is then held and manipulated by the puppeteer.

The controller belonging to the cow has long ago gone missing. It would not at all be unusual that a controller from one marionette would be salvaged for use with another marionette.

In order to eventually re-string and hang the marionette for display a new controller must be made. With advice from an expert, (Jim Kroupa⁶⁷) and reference materials, a new controller was built using hardwood, in this case, cherry wood, purchased at an art supply store, plus a dowel and a few nuts and bolts available in a hardware store. In comparison to an actual controller made for performance, this version is basic and utilitarian.

There are three points where the cow marionette will be strung to her new controller. All of these points are where pre-existing eyelets for strings are or were located. The first place is on either side of the cow's head just behind her ears. The second is at either side of the cow's shoulders and the third is at tailhead on the cow's rump.

The cherry wood pieces measure 1 1/4" by 3/8th". The centerpiece for the new controller measures 18", along the length of the cow with the crosspieces for the head measuring 10" and shoulders measuring 12". The crosspieces are bolted in place on the centerpiece when not in use.

⁶⁷ Jim Kroupa is a master puppet builder and puppeteer. He is one of three partners in 3/Design Studio. His credits include Eureka's Castle, Between the Lions, Sesame Street and Muppet movies. He teaches a master class in puppetry at the Eugene O'Neill Theatre Center, Waterford, Ct. every summer.

A description of a controller useful for animals is provided by Marjorie Batchelder in *The Puppet Theatre Handbook*:

“It does not matter greatly how you devise a controller, so long as it is easy to make and to hold in the hand; is compact while allowing sufficient leverage; provides for as many automatic motions as possible by a mere tilting of the controller; has a minimum of angles, projections, and crevices; and has an easy certain method of fastening and adjusting the strings. Use as few strings as you can on the puppet and keep the controller as simple as possible.”⁶⁸

Further on, she continues:

“Airplane controllers work very well for animals. The length should be determined by the length of the animal. Measure the distance between the point at which the head strings and back strings are attached, and make the controller about that long. Most animals need strings on the shoulders, back (one or two sets depending upon the size and type of beast), head and tail. All four feet can be controlled by using a regular leg bar; the back leg strings are crossed, with the right leg attached to the left side of the bar and vice versa. A fair animal walk is produced by rocking the bar, as for puppets representing human beings.”⁶⁹ (fig. 35)

Sarg said he originated something that he called the “controller” or the “airplane controller”, when he discovered he hadn’t enough fingers to produce all the movements in his marionettes that he desired. His controller allowed him to use as many as 22 strings to animate his puppets.⁷⁰ Prior to this invention, the device puppeteers used was two pieces of wood crossed in an “X” or “T”. By

⁶⁸ Batchelder, 73.

⁶⁹ Ibid, 74, 75, 77.

⁷⁰ McIsaac, 6.

adding the third bar, making the “airplane” Sarg increased the range of movements his marionettes were capable of.⁷¹ (fig.36)

Creating new strings

An old word for marionette strings is “slangs”. “Slang” is a cant or jargon term for a traveling show, but for the marionette performer it meant the strings. The verb, “slanging” meant operating the marionettes. A marionette operated with all strings is considered an innovation of the mid to late 19th century puppeteers.⁷² In the present day, fishline is considered the best thing to use to string marionettes. Historically, heavy cotton thread, woven silk line, or fine wires were used to string marionettes.

“Eighteen pound test is average for most marionettes. For rod-puppets and heavier marionettes, twenty-five pound test is necessary. Black is the usual color, but grey is less conspicuous against some backgrounds. Fishline should be of woven silk or rayon.”⁷³

Today, some fishline is made of woven Dacron. Because this marionette may hang for a long period of time on display or in storage, 50-pound test Dacron fishline will be used for restringing. Dacron is a Dupont trademarked name for a polyester fiber. It is durable, resistant to stress, abrasion, aging, sunlight, and insect attack.

The marionette was restrung, using the new hardwood controller and Dacron fishline. With the exception of the new stainless steel eyelets at the tail

⁷¹ Hunt, 45.

⁷² McCormick, 103,105.

⁷³ Batchelder, 286.

head, all other eyelets are original to the marionette. Care should be taken to ensure that the weight of the cow, if hanging for long periods of time in exhibition or storage, does not stress them and cause them to break.

Though restringing wasn't discussed until late within this paper, the restringing took place early on in the project. Replacing the eyelets at the tailhead was key factor in making repairs to the cow. Stringing and hanging the marionette distributed the weight of the cow and helped with positioning of the repairs. The stringing or restringing the marionette is an important part of this conservation process. Stringing her allows all her movable parts to hang freely and enables her to be operated by a puppeteer.

The cow's strings along with her weight and the skill and ability of a puppeteer manipulating her would certainly reveal her character and charm. Without strings and puppeteers, marionettes are inanimate objects.

Cow's Collar and Bell

At the beginning of the project, after initial photos were taken, the cow's collar and bell were removed from around her neck. This makes treatments on other areas on the cow's body easier. As there are no necessary repairs to be made on either item, both were vacuumed and set aside. The collar and bell were reattached at the end of the project. (fig.37)

(fig. 38 Side 1 Finished Cow)

(fig. 39 Side 2 Finished Cow)

(fig. 40 Cow Boxed for Storage)

List of repair materials and related supplies.

Vacuum, micro brush attachments
Assorted artists' brushes
Muslin
Beige cotton
Dark brown cotton
Beige Ultra Suede
Dark Brown Ultra Suede
3/8ths ethafoam sheet
Polyester needlepunch felt
Stainless steel rod
Linen thread, beige and dark brown cotton threads
Entomology pins, dressmakers' pins, straight and curved sewing needles
Blotter paper, flannel strips, Mylar, paperclips
Circle template, Exacto holder and blades
Adhesive: Beva D-8
Nuts, bolts, cherry wood lengths (1¼" x ¼")
Electric hand held drill and drill bits
50lb test black Dacron fishline

CONCLUSION

Age is the overriding factor that influences all the possibilities and choices for the conservation of this one hundred year old cow marionette. After researching and investigating the marionette's history and the multiple materials and their complicated combinations that make up the cow's body it is easily recognized that there is very little that can or should be attempted to ameliorate her fragile condition.

Any intervention, no matter how carefully done or well thought out leaves the cow with more scars. Use of modern materials, even those that are simple, an array of complimentary colored soft cottons, for example, all look too new and thus look out of place on the marionette's body.

The cow is built from the inside out. The most durable components of her body lie within a deteriorating leather outer skin. This makes inner repairs difficult and has the potential for causing unintentional damage to her outer surfaces.

Surface cleaning benefitted the marionette. Storage in a clean archival box in conditions away from direct light, humidity and heat will keep her safe. With proper care, the marionette will make an interesting study object for years to come.

A secondary quest of this project was to investigate the methods and materials used by Tony Sarg and his fellow artists in his puppet workshop with the idea that the marionette might have been one of his early creations. While

some of the evidence, both historical and artistic, points in that direction, no definite attribution to Sarg's workshop can be made.

As a cultural object, the cow marionette and marionette theatre in general, serves as a reminder of a time when entertainments were special occasions for the audience and a source of work and income for the touring showmen and women.

The cow marionette was returned to its owner, Sharon Lerner in 2009.

ILLUSTRATIONS



Fig.1. Sharon Lerner's cow marionette in its makeshift box. 2002.



Fig.2. Tony Sarg seated in his studio. c. 1920. Tony Sarg Photographic Collection. Image Number PH8-29-5. Photo: Winemiller and Miller. Courtesy Nantucket Historical Association. Note cow marionette hanging against wall upper right in photo.



Fig.3. Travelling Theatre of British company Tiller Clowes Marionettes (late 19th Century). Photo courtesy of Collection: The National Puppetry Archive.

Note the canvas tarps along the side of the theatre for secrecy.

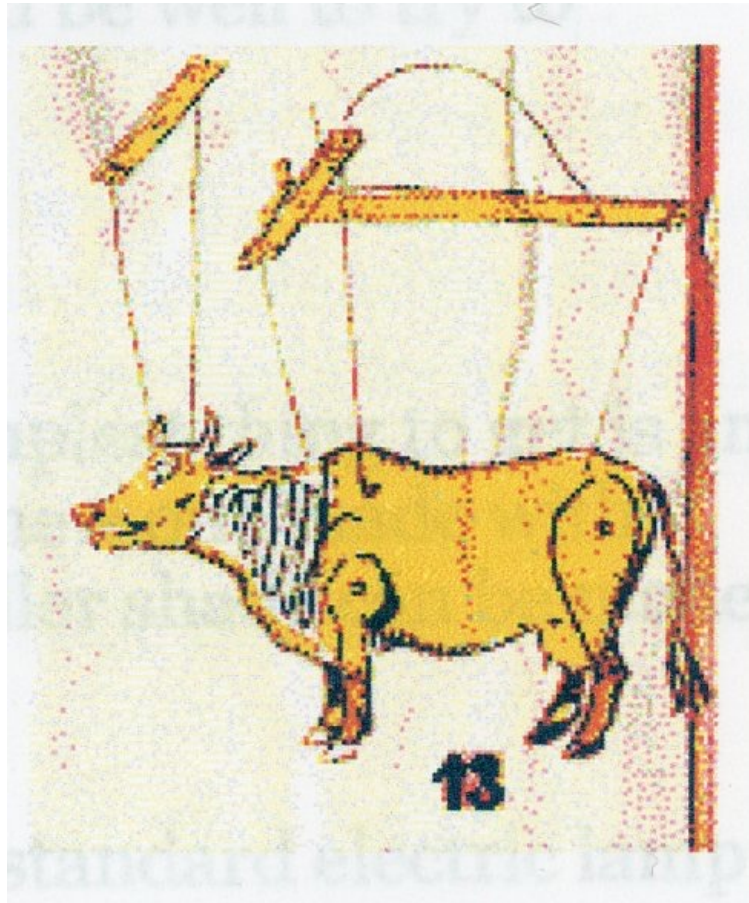


Fig. 4. Marionette cow illustration by Tony Sarg.
"How to Make and Operate a Marionette Theatre."
The Ladies Home Journal, December 1927. The
Buxton Scrapbook-Tony Sarg. The Ballard Institute
And Museum of Puppetry Library, University of
Connecticut, Depot Campus, Storrs, Connecticut.



Fig.5. Side 1. Marionette before treatment.

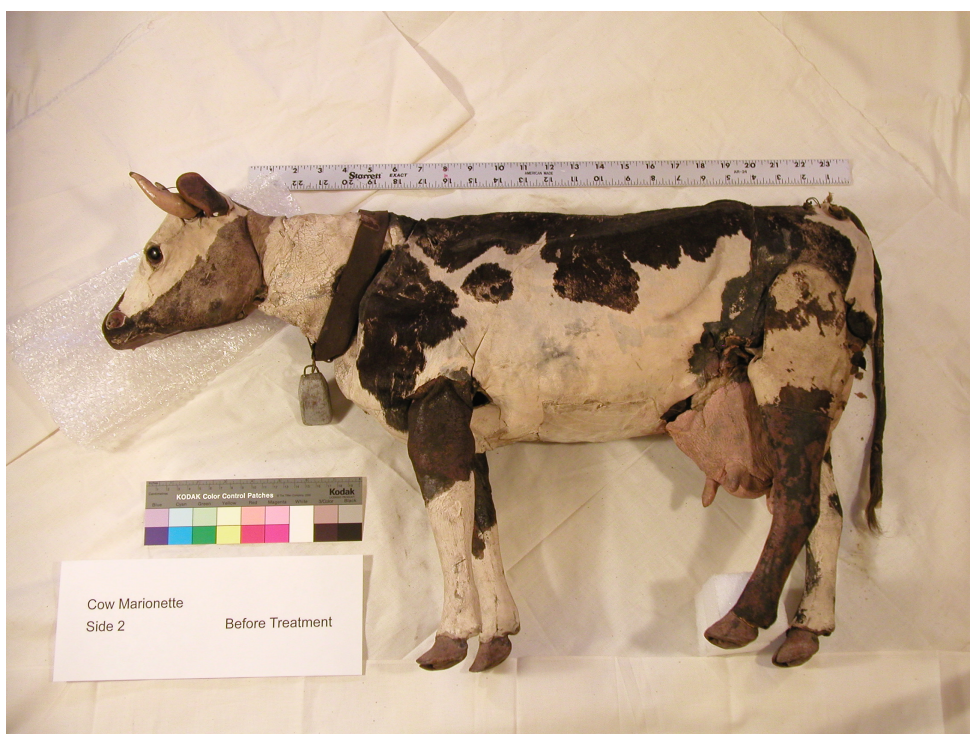


Fig.6. Side 2. Marionette before treatment.



Fig. 7. Side 1. Head and muzzle. Note missing lower jaw.



Fig.8. Side 2. Head and muzzle with nostril intact.



Fig. 9. Side 2. Back of head and distorted neck.



Fig.10. Side. 2. Tear in neck with neck support and pieces of hose.



Fig.11. Side 1. Udder with separation at underbelly.



Fig. 12. Side 2. Udder with separation at underbelly.



Fig.13. Rump and tail damage.



Fig.14. Separation of leather skin from understructure.



Fig.15. Hind leg with possible original surface treatment and paint colors.



Fig.16. Side 1. Muzzle with insect damage before repair.



Fig.17. Muzzle with repair completed.



Fig.18. Side 1. Open tear in neck with neck support exposed.



Fig.19. Side 1. Neck interior with fibreboard joint and neck support reconnected.



Fig. 20. Side 1. Neck with brown cotton and muslin repair strips in place, fibreboard joint and neck support in place.



Fig. 21. Side 1. Udder with open separation.



Fig. 22. Side 2. Udder with open separation and exposed batting.



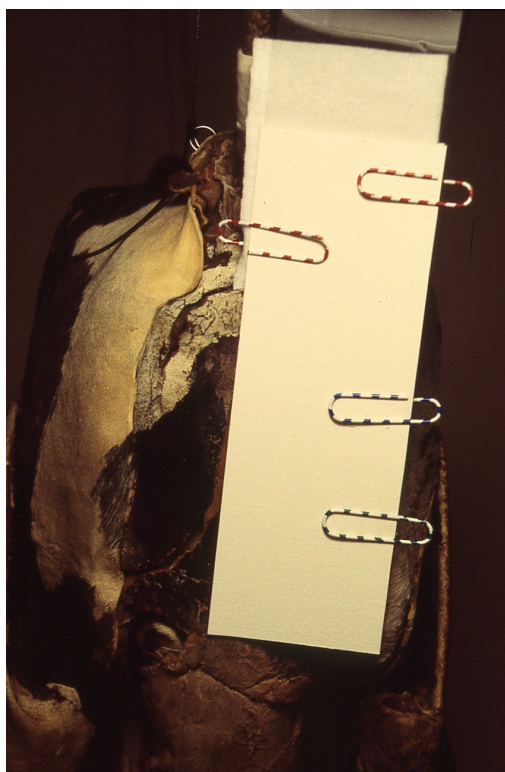
Fig. 23. Side 1. Udder with repaired separation.



Fig. 24. Side 2. Udder with repaired Separation.



Fig.25. Side1. Rump and tail before Repairs.



Fig, 26. Localized humidification of leather on rump using moist flannel strips, mylar, blotter paper and clips.



Fig.27. Rump with ethafoam insert and flattened leather in place.



Fig.28. Rump with dark brown cotton infill.



Fig. 29. Damage at tailhead with previous repairs of electrical tape, broken wire eyelet, frayed cotton rope and old string.

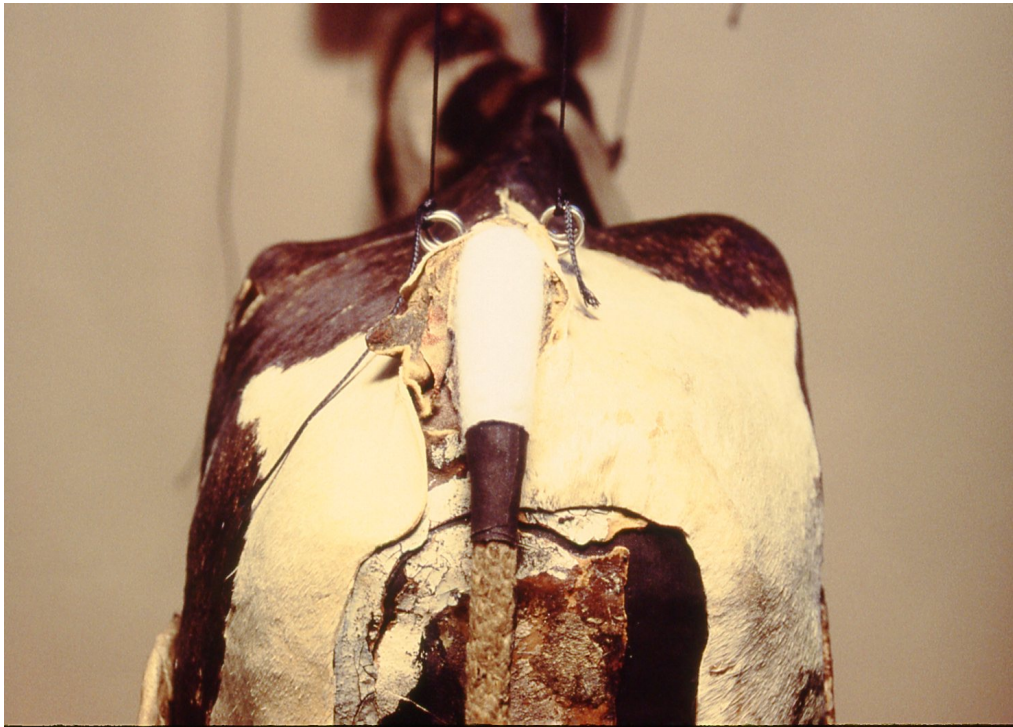


Fig.30. Polyester needlepunch covering repaired frays in cotton rope and new stainless steel wire eyelets. Re strung with Dacron fish line.



Fig. 31 Dark brown cotton covering securing tailhead repairs before addition of dark brown ultra suede covering.



Fig. 32. Side1. Hind leg with leather cut away above washer and rod leg joint.



Fig. 33. Side1. Hind leg with infill in place at washer and rod joint.



Fig.34.Side 2. Hind leg with infill in place at washer and rod joint.

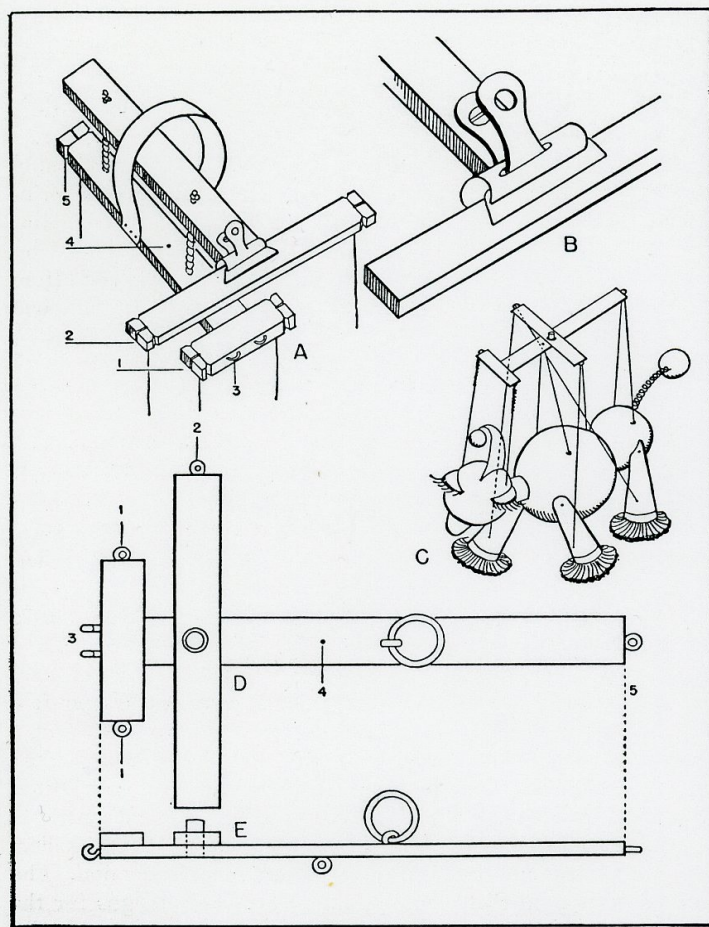


PLATE 22. AIRPLANE MARIONETTE CONTROLLERS

Fig.35. Illustration: Plate 22. Airplane Marionette Controllers. Marjorie Batchelder, *The Puppet Theatre Handbook*. Drawings by Douglas Anderson. (New York and London: Harper Brothers Publishers, 1974.) 74.



Fig. 36. Tony Sarg operating a marionette with an airplane controller.
C. 1930. The Tony Sarg Photographic Collection. Image Number PH-36-1.
Courtesy of the Nantucket Historical Association.



Fig. 37. Cow bell and collar.



Fig.38. Side 1. Cow marionette with completed repairs and restrung.



Fig.39. Side 2. Cow marionette with completed repairs and restrung.



Fig,40. Cow marionette in its storage box. 2009.

BIBLIOGRAPHY

- Ackley, Edith Flack. *Marionettes Easy to Make! Fun to Use!* New York: Frederick A. Stokes Company, 1929.
- Applebaum, Barbara. *Guide to Environmental Protection of Collections*. Madison, Connecticut: Sound View Press, 1991.
- Bachmann, Konstanze, Editor. *Conservation Concerns* Washington and London: Smithsonian Institution Press, 1992.
- Baird, Bil. *Art of The Puppet*. New York: The Ridge Press, Inc. Bonanza Books, a division of Crown Publishers, Inc. 1965.
- Batchelder, Marjorie. *The Puppet Theatre Handbook*. New York and London: Harper & Brothers Publishers, 1947.
- Bell, John. *Strings, Hands, Shadows: A Modern Puppet History*. Detroit, Michigan: The Detroit Institute of Arts, 2000.
- Blumenthal, Eileen. *Puppetry A World History*. New York: Harry N. Abrams, Inc., Publishers, 2005.
- Carter, Paul. *Backstage Handbook an Illustrated Handbook of Technical Information*. Shelter Island, New York: Broadway Press, 1994.
- Chamois Leather*. Accessed January 4, 2020. en.wikipedia.org.
- Currell, David. *The Complete Book of Puppetry*. Boston: Plays, Inc., 1975.
- Dacron*. Conservation and Art Materials Encyclopedia Online. mfa Boston. Accessed November 8, 2019. <http://cameo.mfa.org>.
- Dircks, Phyllis T., editor. *American Puppetry Collection, History and Performance*. Jefferson, North Carolina, London: McFarland & Company, Inc., 2004. (Volume 23 Of the Performing Arts Resources Series Of The Theatre Library Association.)

Eckelman, Carl A. *Brief Survey of Wood Adhesives*. Forestry and Natural Resources, Purdue University, Cooperative Extension Services. Accessed November 17, 2019 www.extension.purdue.edu.

Grubidg, Dorlis M. *Sue Hastings: Puppet Showwoman*. Vancouver, Canada: Charlemagne Press, 1989, 1993. (Doctoral Thesis)

Hide (skin). Accessed January 4, 2020. en.wikipedia.org.

"*Instructions for the use of Beva D-8 Dispersion*." Conservator's Products Company. Accessed April 7, 2006. <http://tallasonline.com>.

Johnson, Ed and Rod Young. *The Puppeteers of America: What is it and Where It Came From*. The Puppeteers of America. Accessed May 16, 2006. www.tcpuppet.org/NewFiles/poa.html.

Joseph, Helen Haiman. *A Book of Marionettes*. New York: B.W. Huebsch, 1920.

Logan, Judy, revised by Lindsie Selwin. *Recognizing Active Corrosion*. Canadian Conservation Institute Notes vol. 9, no.1 (Canadian Conservation Institute, 2007). 1-3.

Care and Cleaning of Iron. Canadian Conservation Institute Notes, vol. 9, no. 6. (Canadian Conservation Institute 2007). 1-4.

Storage of Metals. Canadian Conservation Institute Notes, vol.9, no.2 (Canadian Conservation Institute 2007) 1-5.

Mayer, Ralph. *The Artist's Handbook of Materials and Techniques*. New York: The Viking Press, 1970.

McCormick, John. *The Victorian Marionette Theatre*. Iowa City, Iowa: University of Iowa Press, 2004.

The Holdens: Monarchs of the Marionette Theatre. London: Society for Theatre Research, 2018.

McIssac, F.J. *The Tony Sarg Marionette Book*. New York: W.B. Huebsch, Inc., 1921.

- McPharlin, Paul. *The Puppet Theatre in America A History 1524 to 1948 With A Supplement Puppets in America Since 1948* by Marjorie Batchelder McPharlin. Boston: Plays, Inc., 1949, 1969.
- James A. Michener Art Museum: Bucks County Artists' Database. "Frank Godwin: Painter Printmaker" Accessed December 12, 2019. bucksco.michenerartmuseum.org.
- Mills, Winifred H. and Louise M. Dunn. *Marionettes, Masks and Shadows*. Garden City, New York: Doubleday, Doran & Company, Inc., 1930.
- Fling, Helen. *Marionettes How To Make And Work Them*. New York: Dover Publications, Inc., 1973.
- Hunt, Tamara Robin. *Tony Sarg: Puppeteer in America, 1915-1942*. North Vancouver, Canada: Charlemagne Press, an imprint of COAD Canada Puppets, 1988. (Doctoral Thesis)
- Kite, Marion and Roy Thompson. *Conservation of Leather and Related Materials*. Oxford: Butterworth and Heinemann, 2006.
- Pratt Institute with New York State Council on the Arts and co-operation of the Puppetry Guild of Greater New York and the Puppeteers of America. *Toward An Art of the Puppet: New York's Heritage*. 1976. Exhibition Catalogue.
- "Puppetry Collections-Suggestions from the Puppeteers of America". Puppeteers of America. Accessed July,7.2009. <http://www.ppuppeteers.org/collections.html>.
- R&F Impasto/Modeling Wax. Blick Art Materials. Accessed September 17, 2006. <http://www.dickblick.com>.
- Roccoberton, Jr., Bart. *U.S. Non-Tradition*. Puppet Arts Program, University of Connecticut. 1999. Accessed April 20, 2006. <http://www.o-puppet.com.tw/class/article/US Non tradition.doc>.
- Rose, Rufus. "The Secret of Making Marionettes Part 2". *Popular Mechanics*. September 1934. Accessed June 3, 2006. <http://blog.modernmechanix.com>.

- Sarg, Tony. "How to Make and Operate a Marionette Theatre". *The Ladies Home Journal*, December 1927. The Buxton Scrapbook—Tony Sarg. The Ballard Institute and Museum of Puppetry Library, University of Connecticut, Depot Campus, Storrs, Connecticut, 2003. Accessed March 22, 2005.
http://www.sp.uconn.edu/~wwwsfa/library_publications-buxton_tonysarg.htm.
- Smith, Ray. *New Artist's Handbook*. New York: DK Publishing, 2003.
- Speaight, George. *The History of The English Puppet Theatre*. London: George G. Harrap & Co., Ltd., 1955.
- Tiller Clowes *Marionettes*. World Encyclopedia of Puppetry Arts. Accessed April 20, 2020. wepa.unima.org.
- Tímár-Balázsy, Ágnes and Dinah Eastop. *Chemical Principals of Textile Conservation*. Oxford: Butterworth and Heinemann, 2002.
- Zembower, Robert A. *Vulcanised Fibre Revisited, Electrical Insulation and A Whole Lot More*. Toyo Fibre USA, Inc. Accessed September 5, 2006.
<http://www.toyofibre.com/fibre.html>.