



## Technical Report ANCKER DOLL PROJECT REPORT: CONSERVATION TREATMENTS

### I. Work Plan:

Fourteen dolls were examined and treated according to the project agreement with the Ancker Nurse Alumni Association.

The components of the project were:

1. Identification and analysis of materials as appropriate.
2. Survey of the current condition of each doll.
3. Correction of "sleep eyes" that stick closed.
4. Stabilization of paint where needed.
5. Re-attachment of limbs (one doll).
6. Cleaning of the costumes (all dolls).
7. Photo-documentation of treatment process (before/during/after) on all dolls.
8. Preparation of final report and individual treatment reports.
9. Design and creation of support mounts to prevent damage to eye mechanisms and other components.



### II. Analysis Results:

Four dolls that were representative of the entire collection in terms of materials were sampled for materials characterization and identification. Micro-forceps were used to remove two to three fibers from unobtrusive areas of the clothing and hair. The samples were mounted on clean glass slides with a transparent mounting medium and examined under transmitted and polarized light. Comparison sets of animal and common commercial fibers (Cargille Co.) were used as standards to aid in identification. Solubility tests were performed on small fragments of a chip of "skin" that had spalled off one of the dolls. The samples were immersed in a series of solvents for 10 minutes at room temperature (approx. 70° F) and observed for relative extent and rate of solubility in each solvent.



- A. **Hair:**  
The head hair on thirteen of the dolls is mohair (sheep's) fiber that has been dyed various colors. One doll has auburn human hair (1983.82.1), and is tentatively identified as being manufactured by the Madame Alexander company. That doll is qualitatively different from the 13 other dolls in the collection in terms of the quality of the doll features and body materials. The clothing appears to be of the same vintage and quality as the others.  
The dolls with three-dimensional eye lashes have boar bristles attached to the underside of the eyelids.
- B. **Shoes:**  
The shoes are of tanned leather. Some have been dyed black, while others are white.
- C. **Capes:**  
Both the blue fibers that are dyed wool. The red fabric in lined capes is also wool. The fabric is plain weave.
- D. **Fasteners and pins:**  
All are made of steel. No corrosion was noted on the exterior fasteners. On the doll that was restrung, the interior hooks are oxidized.
- E. **Dresses:**  
The dresses, bibs and aprons are cotton. The dresses consist of blue and white dyed cotton woven into vertical stripes.
- F. **Underwear:**  
The stockings and garters are of dyed nylon; while the other undergarments are cotton, usually white.
- G. **Accessories:**  
Watches, etc., consist of small strips of metallic-colored plastic, paper, and clear plastic (watch faces), and ink; the insignia pins are composed of copper alloy (brass) and enamel.
- H. **"Skin" and features:**  
The solubility tests indicate that the paint used for the skin over the composition heads and body parts is probably shellac with pigments in it. This formulation was very commonly used during the time period of the dolls' manufacture. It is very soluble in ethanol and acetone, and slightly soluble in water. This solubility is very similar to that of shellac. The solubility of the paints used to embellish the skin and to create features was not tested due to the fact that sampling would have damaged the dolls irreversibly.
- I. **I: Eyes and mechanisms:**  
The eyes are of glass and are attached to steel clip mechanisms that fit inside the head of each doll. The weight, which allows the eyes to open and close when the doll is moved in relation to the vertical plane, is usually lead or a combination of lead and cork. The doll that was restrung was originally strung with a natural rubber band, which is

typical of the time period of manufacture of the dolls in this collection. The rubber band was in poor condition and friable.

**III. Condition Surveys:**

Full documentation was done for each doll. The overall conditions will not be repeated here. Specific condition problems will be discussed below in the relevant sections on treatment.

**IV. Correction of Sticking Sleep Eyes:**



Four dolls had "sticking" eyes due to the fact that they had been stored for an undetermined period of years on their backs. This forces the counter weight forward, where it can become wedged into the front interior surface of the composition of the head, keeping the eyes in the "closed" position. Fortunately in these cases, turning the dolls over for cleaning and continued storage was enough action to allow the weight and mechanism to move and open the eyes.

**V. Paint Stabilization:**

Upon observation of all of the dolls, it was noted that the dolls that had the most severe loss of adhesion of the paint to the composite substrate, also had the natural bristle eyelashes (seven dolls). Cracking and loose paint was the worst on the head, neck, arms and legs of those dolls. The body appeared to be stable, perhaps because of the buffering effect of the clothing on changes in ambient relative humidity (RH) and shielding from light (particularly in the infra-red wavelengths [IR]). It is surmised that the bristle eyelash dolls were made by one manufacturer who used a poor paint formulation, and the painted eyelash dolls (six dolls) were by another whose paint formulation, while ageing slightly, has kept it's adhesion and cohesion over the years. The doll that is tentatively attributed to Madame Alexander (1983.82.1) does have boar bristle eyelashes, but the quality and stability of the paint is excellent.

The condition of the skin on each doll was noted as follows:

<b>Boar Bristle eyelashes</b>		<b>Painted eyelashes</b>	
<b>slight cracking</b>	<b>severe cracking</b>	<b>no cracking</b>	<b>slight cracking</b>
1980.51.1	1980.51.3	1980.51.5	1980.51.4
1980.51.2	1980.51.7	1980.51.6	1980.51.13
	1980.51.8	1980.51.10	
	1980.51.9	1980.51.12	
	1980.51.11	1983.82.1 (boar bristles)	

The paint was stabilized by the following method:

1. It was re-adhered to the composite substrate with Acryloid B-72 1:1 in acetone. The B-72 is a very stable, clear acrylic resin widely used in conservation treatments. The mended areas were clamped until set.
2. The wider gaps were filled with an acrylic emulsion-based putty, smoothed down, and in-painted to blend with the original skin paint color using acrylic emulsion paints.
3. The repaired surfaces were then coated with Matte Medium acrylic emulsion as a stabilizing varnish and a filler for the narrower cracks and crizzled areas. All seven bristle eyelash dolls were treated in this manner. The two painted eyelash dolls, which exhibited slight cracking, were not treated or coated at this time. The skin on those dolls should be observed periodically for physical changes.

## **VI. Reattaching limbs:**

Doll 1980.51.3 had one leg detached from the body due to slippage of the rubber band from the hook at the top of the leg. In the attempt to reattach the limb to the hook using a wire hooking tool, the rubber band broke. The remainder of the deteriorated rubber band was removed from the doll and the limbs and head were restrung with a modern fiber and elastomeric "bungee" type cord. The correct tension was applied to avoid further breakage to the doll.



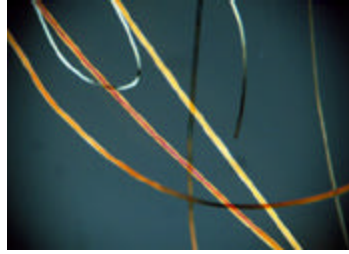
## **VII. Cleaning the Costumes:**

The Society Textile and Costume Conservator examined the clothing and textiles on the dolls before the project began and determined that they were all in excellent condition, except for dust. The clothing was cleaned on the dolls with a variable pressure vacuum and brushes to remove dust and extraneous fibers.

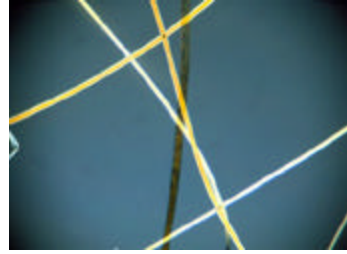
## **VIII. Photographic Documentation:**

Both color slides (Kodak Ektachrome 100) and black and white prints (T-Max 64) were taken. The photographs for each doll are filed in the conservation office, and these web pages on this project, including color photographs, display some of them.

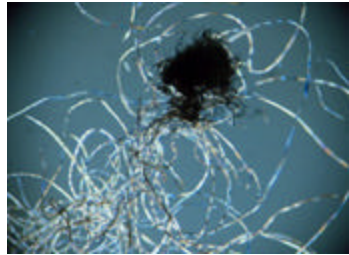
### **Details of fibers**



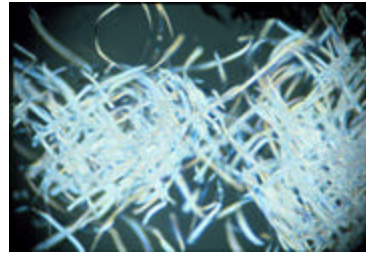
**Human hair**



**Dyed wool from doll's wig**



**Cotton from doll's stockings**



**Cotton from doll's dress**

*Microphotography by Eric Mortenson*

#### **IX. Storage housing:**

To ensure the long term preservation of the sleep eye mechanisms, drawer inserts of Ethafoam 220 expanded polyethylene foam were carved and finished. These are two parallel blocks that fit into the drawer and have openings in which each doll was placed face down. Small pillows of unbleached muslin over polyester batting were placed under the dolls' faces to provide extra padding. The dolls are stored in Delta Design collections storage cabinets in a climate-controlled storage vault.

#### **X. Acknowledgements:**

The author would like to sincerely thank volunteer **Carol Finwall** for graciously providing her time, tools, reference library and expertise in doll restoration for this project.

---

**Paul S. Storch, Objects Conservator**  
**Minnesota Historical Society**

#### **Project Participants:**

**Dan Cagley, Objects Conservation Technician**  
**Angela Demma, Objects Conservation Technician**  
**Sherri Gebert-Fuller, Project Manager**  
**Claudia Nicholson, Museum Collections Curator**

---

*This information is distributed by the Conservation Outreach Program of the Minnesota Historical Society as a public service. The distribution of this handout does not constitute recommendation of a technique for any specific application by the Society, and the Society will not assume liability for results of the application. Each application must be evaluated individually, and materials and techniques selected that best suit the condition of the object and how it is to be used. If you have questions about a particular application, please contact the Society's Conservation Outreach Program at: 651-297-1867, 1-800-657-3773, FAX at 651-296-9961 or e-mail at [conservationhelp@mnhs.org](mailto:conservationhelp@mnhs.org).*

## ANCKER DOLL PROJECT: Photo captions



Paul Storch, objects conservator, and Claudia Nicholson, museum collections curator, assess the condition of the 14 dolls from the Ancker Hospital nursing school. The dolls lie in special cradles designed to allow them remain face down without supporting their own weights.



This doll wearing a cape jauntily over her shoulder is dressed in the uniform of the class of 1898. The pin she is wearing says "Training School for Nurses, St. Paul," and the date 1898 is inked on the hem of her apron.



This detail shows an enameled Ancker Hospital pin on the doll.



This doll is dressed in the probationer's uniform, which does not bear a date. The name "Mary Lee" is stamped on the back of her head, probably indicating the name of that particular model of doll.

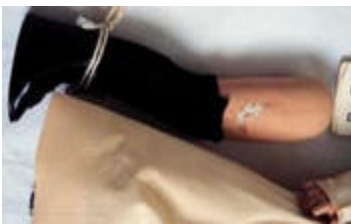


Left: Modern, bungee-type cord use to re-string one of the dolls.

Right: Pieces of the deteriorated original (ca. 1930s) natural rubber band used to string the dolls.



Examples of doll sleep-eye mechanisms from different manufacturing periods. Left to right: 1920s to 1950s. (Eyes property of Carol Finwall).



Before treatment view of doll's leg showing peeling paint and shrinkage cracks in the paint layer overall.



View of doll's legs after stabilization and filling treatment.



Storch and Nicholson discuss the results of the treatment of paint problems on the neck of one of the dolls.