

DOLL CONSERVATION: ADVANCED TREATMENTS

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The Minnesota Historical Society, in St. Paul, MN, houses a collection of approximately 800 dolls, most of which are currently stored for future display. Over the last 3 years, curators, conservators and volunteers have studied the dolls, evaluating their current physical condition. The goal of the project has been to prioritize dolls which show signs of deterioration for conservation treatment. The purpose of this article is to present recent doll conservation treatments that go beyond what is usually done outside of museum and institutional conservation departments. It is not presented as a “How-to” recipe, but to show what methods and techniques are available to conserve and preserve materials and structures in historically valuable dolls that may be considered “beyond repair” in some contexts.

Museums typically apply conservation treatments to artifacts which may not remain stable over time. Past repairs will remain untouched if they do not compromise the stability of the piece. Throughout the conservation process, adhesives, fillers, and techniques for restoration will be chosen which avoid long-term, negative chemical reactions with the medium from which the doll is manufactured. Further measures are taken to ensure the original design won't be altered, except where necessary to save a piece.

Conservators use different terminology for techniques or products they work with, although the steps they take during a repair may seem very similar to what restorers have done in doll repair for some time now. Glues are called “adhesives”. Water-based (or latex) emulsions are sometimes used instead of a solvented adhesive, their chemical compositions often being better and more stable than a proprietary glue. The term for stabilizing a fragile, broken area is often “consolidation”. “In-painting” disguises a repair and is usually applied by hand rather than by airbrush.

When applying paints, emulsions, solvented adhesives or other materials to the object, applications will be confined to chipped or missing areas. An example of this would be a composition doll with a chip of paint missing. The conservator or technician would apply an appropriate adhesive to the unprotected area, up to the remaining edges, but not over them. This technique differs from what a restorer might do during an invisible repair where sanding and painting are feathered over edges or airbrushed to hide a restoration. While restoration is more aesthetically pleasing, it does take the chance that applications used will initiate faster deterioration of a piece or portions of an object than conservation techniques which seek to preserve existing materials. A filler might be added on top of the adhesive after it has dried. The filler may be sanded, but will not be feathered over the existing edges, and then “in-painted” only over the patch.

A varnish sealer or top layer may be applied on top of the painted area to create one more barrier to environmental factors and to replicate the original finish of the area. A good conservation application may be visible to the human eye when held closely, but the observer will not be able to discern the repairs when standing six feet in front of a piece on display.

With this background in mind, Senior Conservator Paul Storch decided to tackle a preservation job many might find daunting. His chosen task was that of repairing a broken celluloid shoulder plate doll. Although the doll was a beauty in her “hey-day”, she was a sad sight when she came to the lab.



Fig. 1. Condition of celluloid head before treatment.

From the description in a survey compiled by volunteer Carol Fenwall, the doll stood 17 3/4" tall. She has blue, glass eyes, set to sleep and four celluloid teeth. Her kid body had a paper label on the front, some remnants of which are still present, resembling a Kestner insignia.



Fig. 2. Remnants of the paper label on the kid body of the doll.

She bore markings on the back of her shoulder plate of a turtle, the mark of Rheinische Gummi and Celluloid Fabrik, Co. (This mark eventually stood for the Schildkrote Co.) The top, back of her head is incised J.D. K. 2014. Her existing arm bears a small “#4” near the pin joint area (See Fig. 3).

By the time she reached conservators, her head was broken in many places, held only together by the plaster of her eye rockers and a wooden bar that spanned the interior of her head, nailed through the temple areas. Her pin jointed, leather body was somewhat dusty and her left arm was missing. Her mohair wig and several pieces of clothing were original, but very dusty.



Figure 3. Detail of back of head before conservation treatment.

After much deliberation, it was decided to remove the eyes to give access to all cracks. Pieces of cotton padding were dampened and placed on the rockers until they softened the plaster enough to carefully pull them out of the head. The unbroken portions of her head were stabilized by applying a layer of an emulsion called Lascaux 498 and spreading Japanese paper, a flexible and porous grade, over the Lascaux. As the Lascaux penetrated the paper, it adhered to the inside wall of the doll's head. Due to the brittle condition of the celluloid, some additional cracks developed as Paul worked, but he carefully replaced each until the head was intact again. Further paper patches were added to newly glued pieces and fillers were placed in areas of loss. The eyes could now be reinserted.



Figure 4. Detail of face during treatment after patching from the interior.

Due to the heat generated by plaster as it cures, it was decided that a normal process of creating eye rockers would be too dangerous for the celluloid. (Celluloid is extremely heat sensitive and will spontaneously combust or deteriorate). An alternative technique was devised which used a two-part epoxy putty, called Abatron Wood Epox. The putty compounds were combined, molded

around the eyes and allowed to cure. Once set, the new rockers were carved to fine-tune their shape and allow appropriate sleep movement for the eyes. The rockers were then glued into proper position to maintain the sleep eye motion. To complete the head repair, Paul used acrylic paints to “inpaint” cracks or loss areas to match adjacent, unbroken edges.



Fig. 5. Detail of restored eye rockers inside stabilized head.



Fig. 6. Detail of head repairs after treatment.

To recreate an arm for the doll, Paul used another 2 part compound, distributed by the Micro-Mark Co. He made a mold of the existing arm and then filled it with Smooth-On Smooth Cast 70D Fast Setting Beige Liquid Plastic Compound. When hardened and cured, the new arm was painted to match the other with acrylic paints. It was rejoined to the upper, existing portion of the arm by inserting into the previous arm repair which consists of a fabric tube sewed into the original kid arm opening. This poor dear will no longer miss a limb, but she may not be the best gardener as she will truly have “2 left thumbs”.

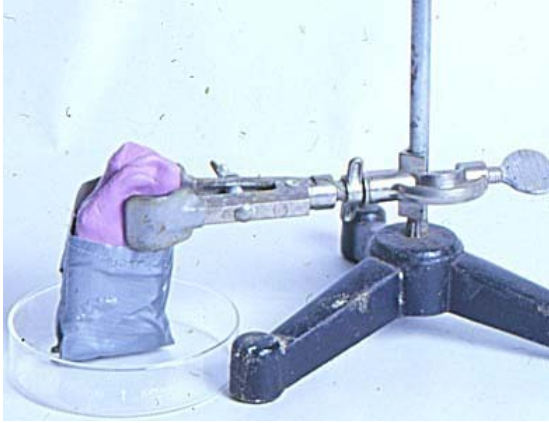


Fig.7. Detail of doll arm mold set up for casting.



Fig. 8. Quick curing silicone molding compound components in the foreground, polyurethane two-part casting compound in the rear.

With the most difficult jobs done, the doll can now be rejoined to her wig and clothing. They will be dusted with a very light suctioning vacuum and micro-tools, to prevent damage. Her body will be lightly brushed with a vulcanized rubber soot sponge. This will remove surface soil and dust without roughing the surface of the leather too much.



Fig. 9 Overview of completed doll, before arm reattachment.

The last challenge in preserving this doll will be finding a way to store her which protects, but also prevents, the natural deterioration of her celluloid from creating problems for dolls near her. It has been determined that gases given off by celluloid nitrate may negatively impact plastic dolls in close proximity. As the celluloid deteriorates, by-products of this early plastic may also leach outwards and stain items nearby. She will need to be stored face down to keep gravity from pulling too hard on the lead weight in her eye mechanism.

A second doll, recently undergoing conservation at the Historical Society, is a beautiful turned, porcelain shoulder plate head on cloth body. She dates no later than 1888 and markings of 698#10 found on the back of her shoulder plate suggest her head was manufactured by Alt, Beck and Gottschalk. Her arms are also porcelain while her feet are a bluish-green leather, sewn into the body pattern as a pair of boots. Her lower legs have stockings, also built into the design of the doll, although someone earlier placed home-made, blue polished cotton stockings over these, perhaps to hide some damage. Her body is likely manufactured by the Goldsmith Co. Her coloring is exquisite and her porcelain nearly flawless.



Fig. 10. Overview of cloth body doll.

Unfortunately, this doll had several problems. Her eyeballs had been broken and dislodged from their original setting within her head. Her leather arms were very fragile, although still intact. They were showing signs of flaking and would likely tear soon, if nothing were done to prevent further deterioration. Lastly, a large chunk of leather was missing from her boot.



Fig. 11. Detail of condition of boots.



Fig. 12. Unstable condition of kid leather arms.

It was decided that if the eyeballs could be glued into globes again, the eyes would be reinserted to sleep as they were originally set. In choosing an appropriate adhesive to consolidate the eyeball pieces, several factors had to be considered. It needed to dry clear, yet malleable enough to create the correct shape. It also needed a slow drying time to allow for piecing together and could not compromise the glass over time. Some adhesives cause glass to yellow or flake in the long term. An adhesive called Butvar B-73 in ethanol was chosen as it met the specifications listed above. When a few pieces were put into place, a small bit of polyester fiberfill, impregnated with B-73 was added internally to provide internal, structural support. When it had cured, the last pieces of the eyeball were put into place. In one area, there was a loss with no matching chip, so it was filled with an acrylic emulsion-based putty called Permafilla and gently sanded after drying. Acrylic paints matching existing eyelid color and glass color were applied to areas where paint had chipped off and to the filled/sanded area.

Once the eyeballs were repaired, new plaster rockers needed to be poured and molded while the plaster was wet to configure to their shape and necessary movement. Because the eyeballs had been broken, seams after repair created tiny ridges which required a looser eyerocker setting to accommodate the sleep motion without rubbing. Further fine-tuning was accomplished by using a dental tool to carefully remove extraneous plaster that impeded the sleep motion. Once the eyes could “sleep” again, attention was turned to reinserting several internal pieces not seen in newer porcelain doll heads. These pieces sat in and around the eye mechanism and were inserted after the plaster eye rockers were developed. They included a horizontal wooden piece, stretching side to side, across the inside of the head, over the back of the eyes. It’s purpose was probably to prevent the eye mechanism from swinging too far or perhaps from falling out altogether. A second piece sat between the forehead area and the top of the eye mechanism. It was made of red cardboard and ran parallel to the first piece. A forward projecting section of wood extended from the horizontal wood bar to the outer edge of the head. Original patches of cloth which lined the head near the plaster rockers, also had to re-adhered.

Once the eyes were reset, our attention turned to preserving the leather arms. Fortunately, they had not torn yet. To prevent this, a leather consolidation compound consisting of hydroxypropyl cellulose solution in ethanol, was brushed over the entire surface of the arms. It was allowed to soak into the leather. Once absorbed and dried, the consolidant created internal and external support, by revitalizing the leather on the fiber level. Although the treatment darkens the leather, this result was preferred to future, probable damage to the arms.



Fig. 13. Leather arms after consolidation treatment.

The boot was repaired by applying a patch of leather coordinating with existing portions in texture and weight (See Fig. 10). Afterwards, the patch was inpainted with acrylic paints to match the undamaged, adjacent edges.

While conservation work can be tedious and require much patience, there are many rewards seeing a piece of history restored and ready to teach future learners about cultures and people of the past.

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The authors can be contacted at the MHS through the institutional website via the conservation pages at www.mnhs.org. Further information on dolls and other object materials can be accessed as well.