**Abstract**

Architects Charles and Henry Greene designed the Gamble House in 1908 for David and Mary Gamble of the Procter & Gamble fortune. The family maintained the house and its architect designed furnishings until 1966, when they gave them to the City of Pasadena in a joint agreement with the University of Southern California. Public tours began that year. Only in 2004 was the first dedicated curator hired, bringing focused collections management and care to the site for the first time. Long-term preservation initiatives begun in the 1990s realized the restoration of the house exterior in 2003-2004. A Getty funded collections conservation survey followed in 2006, and in 2010-2013 a comprehensive collections conservation project funded by the Institute of Museum and Library Services. For the latter project, Griswold Conservation Associates have taken an innovative archaeological approach to the treatment of 267 objects in the collection with condition issues determined largely by context and use.

**Keywords**

Architecture, arts and crafts movement, decorative arts, Regalrez 1094, stereo-binocular microscopy

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**The Gamble House: Conservation, Preservation, and Interpretation of a Historic House Collection**

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**Introduction**

The Gamble House in Pasadena was designed by architects Charles and Henry Greene, and built in 1908 as a winter residence for David and Mary Gamble of Cincinnati, Ohio. This 762 square meter building, now an architectural icon of the Arts and Crafts movement, remained in the Gamble family for over two generations, complete with its architect designed furnishings and fixtures. In 1966, the Gambles gave their home to the City of Pasadena in a joint agreement with the University of Southern California. Already considered a local landmark, it was designated a state landmark in 1974 and a National Historic Landmark in 1978. As of 2012, The Gamble House has been open to the public for 46 years, both house and furniture over a century old. Its mission is both to preserve the house and educate the public about the vital role of architecture within our nation’s cultural history.

The Gamble House currently supports a staff of eight, including a Director, Curator, Archivist, Financial Officer, Operations Manager, Tour Coordinator, and Housekeeper. Until approximately seven years ago, the majority of the staff had offices within the house itself. When the house was opened to the public, two upstairs bedrooms were converted for use as office space, with one serving briefly as the home of the local chapter of the AIA. An HVAC system was also installed to offer a modicum of climate control to these office spaces and to the attic, which is often used for lectures and docent training classes.
The Gamble House has been open for tours since 1966, with an estimated 25,000 visitors per year for at least the last three decades. As revealed by recent archival findings related to the Gamble family’s tenure in the house, they did their best to maintain it while living here – re-creosoting the exterior, then painting it, repainting the kitchen, cleaning screen frames, etc. In more recent years, there have been additional attempts at conservation: repainting the interiors in the 1970s; staving off dry rot in the rafter tails by the application of an epoxy compound in 1985; and replacing the roof membrane in 1987.

**Preservation Initiative**

Beginning in 1998, a new preservation initiative was launched with the establishment of the James N. Gamble Preservation Fund. The Getty Grant Program sponsored the production of a Historic Structure Report, which continues to serve to this day as a valuable reference for the history of the house’s maintenance, as well as the condition of all architectural features of the exterior and interior of the house, along with recommended treatments. The report was completed in 2000, produced in conjunction with Historic Resources Group, now of Pasadena, and Griswold Conservation Associates, LLC, of Culver City [The Gamble House et al 2000].

In 2002, the Gamble House received an implementation grant from the Getty Trust, and along with this and other grants from Save America’s Treasures, Proposition 12, and private donations, the exterior conservation of the house was undertaken over a nine month period between 2003 and 2004. This secured the house membrane, addressing downspout design failures, replacement of a failed roof application, and severe rot in nearly all of the 262 Douglas fir rafter tails and beam ends. Key to the success of the project was the great care
taken by project staff, which included preservation architect Peyton Hall of Historic Resources Group, project architect Kelly Sutherlin McLeod, and project conservator John Griswold. Their goal was to successfully conserve the house without it taking on the appearance of new construction, adopted from the Secretary of the Interior’s Standards for the Treatment of Historic Properties [Weeks and Grimmer 1995] and from the Code of Ethics and Guidelines for Practice of the American Institute of for the Conservation of Historic and Artistic Works [AIC 1994].

In 2004, Anne Mallek was hired as the first dedicated curator of the Gamble House. Previously, the Director had undertaken curatorial duties, which necessarily limited the amount of attention or time that could be devoted to tracking and caring for the collections and house. Having secured the building envelope with the completion of the exterior conservation project in 2004, director, Edward Bosley, determined that the next priority should be the care of the decorative arts collections.

Collection Care

After completing a computerized database of the collection (using Gallery Systems’ EmbARK program), the Gamble House applied for and received a grant for a conservation survey of the collection from the Getty Trust. Completed by Griswold Conservation Associates (GCA) in 2006, this was the first comprehensive conservation survey ever undertaken of the Gamble House collection – a collection that includes not only

Fig. 2. First-floor hall of the Gamble House, with living-room entrance at left. ©Tim Street-Porter

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original Greene & Greene furnishings and light fixtures, but work by the likes of Rookwood and Weller potteries, Dirk van Erp, Frederick Leuders, Tiffany, Steuben, and Stickley.

For the Getty funded project, a new Filemaker Pro relational database was designed by GCA as a tool for describing the nature and condition of both selected interior architectural elements and features, and the collections. This database was set up to track information about routine household care, past treatments, treatment rationale and goals, recommended treatment steps, and a time and cost estimate for each assessed item. Assignment of a priority rating allowed strategic deployment of resources to accomplish treatment objectives over time. It also allowed crossover searches to identify analytical results common to architecture and furnishings, etc. The project included a limited analytical component, where original coatings and subsequent coating stratigraphy, including any additions, alterations and accumulations, were identified on samples collected from selected architectural elements and furnishings. [1]

Given the close similarity in fabrication and finishing methods and materials found between the house and related collection items, and also given the generally unaltered condition of these surfaces, a unifying philosophy for conservation treatment was established. GCA strived to design conservation treatments that were minimally invasive and highly reversible. This approach indefinitely deferred more intensive repairs, restoration or even eventual refinishing. Repairs and refreshment of furniture surfaces need not be robust, as these pieces are no longer subjected to daily use, and the interior environment of the house has been so substantially improved. Furthermore, with high confidence that the patterns of wear and patina of use seen on the collections bear witness to the daily life of the occupants, such a light touch is required to help preserve the primary historical evidence that the collections retain.

As of fall 2013, The Gamble House and GCA have completed a nearly three year collection conservation treatment project supported by the Institute of Museum and Library Services (IMLS). At project completion, 267 objects in the collection will have received treatment, complete with full visual and written documentation, all to be folded into the Gamble House collection database.

For the IMLS-funded treatment project, the conservation database developed for the Getty funded project was expanded to include detailed information about methods and materials used during treatment, additional observations made during treatment, and the results of any sampling and laboratory analysis performed. A full treatment report is generated within the database for each item treated, in adherence to the AIC Guidelines for Practice [AIC 1994]. Recommendations for ongoing monitoring and maintenance are also included as appropriate. The powerful search capabilities of such a database allows the generation of lists of items having similar issues or made of common materials, and the ability to sort search results to identify upcoming or remaining tasks.

Since the original furnishings remained largely in place, condition information could be directly related to the context of most pieces. For example, localized deterioration of finishes on wooden surfaces could be correlated to sunlight exposure from adjacent windows, and water damage to programmatic placement of flower arrangements, etc. Conservation treatments were designed to preserve this evidence of use and placement, while stabilizing the pieces and visually reintegrating the more distracting aspects of their appearance.

Several interesting challenges required a conservator’s touch where routine household maintenance practices would normally simply dispose of the original material, to be replaced in kind. This would include replacing worn leather seat cushions or replacing the rush on a chair seat or back. At The Gamble House, an almost ‘archaeological’ approach was invoked, where heavily damaged and degraded leather or fibers were stabilized, and damaged or blemished areas were visually reintegrated with reversible means commonly
reserved for delicate ethnographic basketry and hide artifacts in museum collections. In so doing, patterns of wear and use became more legible, interpreted more readily as an aesthetically acceptable and authentic patina of age.

One particularly successful example of this approach was the treatment of the rush fiber seats on two side chairs, one designed by Gustav Stickley, the other by the Greenes. The twisted plant fiber material was particularly degraded, actively shedding fibers and segments of cordage. Initial experiments showed that replica segments of missing cane could be fabricated to match the existing material, and these segments could be painstakingly inserted and connected to the frayed ends of the original cane using bridges of Japanese tissue fibers. Initial treatment revealed further intricacies of the patterning. Right and left hand twists existed on the cane cords on opposite sides of each of the four quadrants of the seats, while the replacement caning only came in a clockwise twist. Select cane segments were masked with ultra thin Japanese tissue to simulate an opposite twist matching the original. Detailed inpainting methods were developed to mimic the wide range of ‘patina’ and wear found on the seats. This approach permitted the retention of virtually all of the remaining original workmanship, along with physical evidence of household use. For example, what appears to be an India-ink stain on the Stickley side chair remains intact on the seat. Such an ‘archaeological’ detail would surely had been lost if a more traditional approach to re-caning had been taken.

Fig. 3. Rush seat, detail, before treatment. ©John Griswold, Griswold Conservation Associates, LLC
Some damage was known to have already existed when a particular object was in use. In such cases, consultation between the curator and conservator helped determine the most appropriate goals for conservation treatment. For example, one of the beautifully detailed doors on an exquisite letterbox likely became warped due to previous exposure to the winter and summer conditions in a home in Buffalo, New York (the letterbox re-entered the Gamble House collection through a family member’s bequest in 2002). The composite nature of the box, made of different hardwoods, fruitwoods, and exotic materials such as mother of pearl, intimately layered and inlaid, made it especially vulnerable to deformation because of these materials’ different dimensional responses to moisture and heat. Gradual reshaping was achieved by carefully establishing the different solubilities of the surface coatings, and subjecting the warped door panel to an alcohol vapor-rich atmosphere, gradually increasing pressure in a specially constructed sandwich-like jig of perforated Plexiglas sheets by tightening a series of miniature bar clamps. The door’s deflection was mitigated by approximately 50%. This correction allowed the door to remain closed without springing back open, while still retaining part of the history inherent in the change, much to the delight of the docents who highlight the object during their tours.
Fig. 5. Letterbox, before treatment to correct warped door at right of image. ©John Griswold, Griswold Conservation Associates, LLC

Fig. 6. Letterbox, after treatment, retaining some warping but improved. ©John Griswold, Griswold Conservation Associates, LLC
Light levels have traditionally been low inside the Gamble House, and this is maintained both for the preservation of the contents and for the authentic ambience. These conditions, achievable in the temperate climate of Pasadena in southern California, further reinforce the possibility of a minimally invasive approach to conservation intervention. However, certain furniture items bear the mark of a century of sunlight exposure because of their proximity to a window. This was the case with the settee in the living room. The delicate, translucent finish had faded and oxidized on the back, while contiguous areas of the woodwork remained in excellent condition. Finding a reversible method of applying a subtle gradation of translucent color, feathered into the ‘good’ areas, required many tests. There were also several disfiguring gouges and one area with a ‘halo’ of rubbed finish around a blemish, also requiring visual reintegration. The key to the process was finding an isolating resin that could be applied to the wood without overly saturating the existing finish, and that would serve as a readily reversible barrier between the original finish and the subsequent color layers. Solubility testing of the surface finish in a range of organic solvents showed that an applied coating could be delivered, and later reversed, in petroleum ether. This hydrocarbon solvent evaporates quickly, minimizing the ‘dwell time’ where the solvent would be in contact with the wood. After testing several, RegalRez 1094, a low molecular weight resin, was found to have the desired application properties, plus long-term stability and solubility in the required solvent. [Piena 2001] Once protected, the damaged areas on the back of the settee were gradually reintegrated with dilute acrylic emulsion colors applied with a technical airbrush. Further testing yielded ways to adjust the gloss to blend successfully with the surrounding original surface.
The collections conservation project required close examination of the condition of some of the coated metal artifacts in the house. These appeared to have a grimy, darkened coating layer obscuring an intact, golden lacquered surface. In fact, the darkening and opacity were caused by preferential corrosion processes occurring in areas where a translucent, tinted lacquer had been lost due to a combination of gradual deterioration and years of conscientious housekeeping attempts to remove the darkened areas with more polishing. Stereo-binocular microscopy showed that the presumed dark grimy accretions on a fireplace screen were actually copper corrosion products emerging through losses in the lacquer coating. Attempts to remove all of the corrosion in search of an intact, smooth surface would certainly have resulted in a mottled surface, temporarily refreshed but subject to rapid re-darkening, pitting and more build-up of corrosion minerals. GCA developed an approach to reduce the corrosion with a mild organic acid, burnish it slightly to make the porous mineral build up less absorbent, and to apply layers of pigmented microcrystalline wax and synthetic resin coatings [2] that would help protect the remaining lacquered areas while visually integrating the corroded zones.

The kitchen worktable presented a cleaning challenge. The delicate, transparent finish on the blond-colored maple had been compromised by years of use, even beyond the period of historical occupancy when students and others used the kitchen. Very tenacious, greasy and encrusted deposits were found to be residue from food preparation. Careful, gradual removal with scalpels, followed by dissolving the deposits with an ammonia solution, allowed the underlying finish to be saved. The tabletop had also been recoated over the years with wax and possibly a clear varnish, which, once removed, yielded a nicely worn, honest work surface bearing knife marks and other signs of an active kitchen. The cleaned top took a protective wax coating nicely. Also noteworthy was the discovery of generations of tack holes left from multiple campaigns to affix a covering to the tabletop, possibly oilcloth.

The problem of how to treat damaged and deteriorated leather upholstery on various armchairs and side chairs was also addressed. The goal was to retain as much of the original surface as possible, focusing only on the areas where repeated contact and flexure had led to flaking, rot and loss of the outermost grain/finish layer. Reversible means of stabilization and visual reintegration were needed. Finding a consolidant that did not darken the leather or disturb the finish layers, and that did not introduce excess moisture took some experimentation. GCA ultimately chose an ethylcellulose (EHEC) as the consolidant because of its compatibility with the collagen structure of the leather, its inherent flexibility, and its long-term solubility in alcohol, a solvent that was least aggressive to the original surfaces. The EHEC also acted as an isolating barrier to ensure the reversibility of local inpainting and toning measures such as watercolor stippling. The EHEC system was then protected with neutral pH, microcrystalline wax, resulting in more stable, protected, and less visually distracting areas of deterioration. Losses in the grain layer were compensated by adhering shaped pieces of Japanese Gampi tissue, pre-coated with Paraloid B72 resin dissolved in a mixture of acetone and alcohol. Dampening the tissue with alcohol reactivated the coating enough to ensure good adhesion without introducing excess solvent into the leather. The new tissue ‘skin’ was then inpainted with watercolors and fine brushes to closely match the surrounding surface.

While some of the most dramatically damaged areas of original wood finish were addressed during the first year of the project, as in the case of the living-room settee, other minimally invasive, reversible treatments of damaged wood finishes continued to be developed. There were many instances of water related blanching of resin and shellac based finishes, along with sun damaged areas. It had become clear that some surfaces had been maintained over the years with waxes and polishes, and reducing these deposits was necessary to help eliminate oxidized accretions and soiling residues embedded in the grain texture. With the use of pure, pH stable microcrystalline wax as an initial isolating and saturating barrier layer, further aesthetic adjustments could be made by applying traditional tinted waxes, thus reducing the need for tedious and potentially
intractable tinting of abrasions, scratches and other flaws with watercolor and fine brushes. This method also establishes the basis for a simple and straightforward maintenance process, and affords an increased measure of protection against accidental spillage of water from the placement of ikebana flower arrangements.

As the project progressed, close examination of objects in the conservation lab revealed issues not previously or sufficiently assessed during the condition survey process. Where possible, additional hours were contributed toward a satisfactory treatment, while in some cases recommendations were made for a future phase of the ongoing conservation plan, with careful monitoring prescribed in the meantime. Oil paintings and textiles called out for specialized treatments are currently in the care of private conservators Gary Hulbert and Ann Svensen, and their treatment reports will be incorporated into the artifact files as well as the databases. The IMLS-funded conservation campaign yielded critically important baseline condition and treatment information that remains in the conservation specific Filemaker Pro database, facilitating future monitoring and maintenance tracking by conservators. The data has also been exported into the curator’s EmbARK collection management database, where historical research, inventory, location tracking, loan history, etc. can be integrated with the conservation information.

**Conclusion**

Throughout the IMLS project, The Gamble House has maintained a commitment to providing information to its staff, visitors, volunteers, as well as to its members, through training sessions, newsletter updates, and bulletin board postings. This has helped to ensure that everyone in intimate contact with the house and collections can participate in their preventive care. Without such support this project would not have been as
The exterior restoration and collections conservation project have been strategic steps in the overall conservation plan for the Gamble House, in addition to other practical measures such as the addition of blinds and UV filters on windows. The collection’s environment overall is more stable and better monitored than it was 10 years ago. The treatment program outlined in this paper provides the Gamble House with an important baseline of condition for more accurately monitoring any changes in future. Further stabilizing the objects will help to ensure its ongoing ability to share them with the public as supreme examples of the Arts and Crafts design as executed by architects Charles and Henry Greene and their craftsmen.

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Endnotes

[1] Analytical investigations carried out by GCA, with the help of Orion Analytical, LLC (James Martin), underscored the rarity and delicacy of what were found to be largely original finishes that had escaped damage from aggressive maintenance.


References:


Materials:

Description: Ammonium Hydroxide


Description: Ethulose (EHEC)

Description: Paraloid B-48N


Description: Paraloid B72


Description: Japanese tissue


Description: Petroleum Ether

Company Information: Hi-Valley Chemical, P.O. Box 69, Centerville, UT 84014. T: +1 (801) 295-9591. E: sales@hvchemical.com, W: http://www.hvchemical.com

Description: Regalrez 1094


Description: Renaissance Micro-Crystalline Wax

Company Information: Picreator Enterprises Ltd., 44 Park View Gardens, London NW4 2PN, United Kingdom. T: +44 (0)208 202 8972. E: info@picreator.co.uk, W: http://www.picreator.co.uk

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