CONSERVATION OF WALL COVERINGS AT GILLETTE CASTLE

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ABSTRACT—In 1999 Gillette Castle State Park in East Haddam, Connecticut, was closed to the public in order to undertake a $10 million restoration project. Included in this plan were not only the 1919 stone castle but also the grounds and several outbuildings designed by the eccentric American actor William Gillette. Made famous as the first man to portray the character of Sherlock Holmes, Gillette created for himself an elaborate home evoking Victorian stage sets and Gothic mansions. Among the furnishings of his six-story castle are 16 rooms decorated with woven grass and knotted bast fiber wall coverings. Totaling over 372 square meters (4000 square feet) of material, these textiles required an enormous amount of effort to organize, maneuver, and conserve. Working entirely on site, a team of four conservators cleaned, stabilized, restored lost painting, and when necessary, replicated the wall coverings. This intimate contact led us to discover things not only about the wall coverings but about the history and technology of grass and bast fiber fabrics. This paper will share the experiences of working with odd materials, under odd conditions, in a very odd castle.

TITULO—CONSERVACIÓN DE TEXTILES MURALES DEL CASTILLO GILLETTE. RESUMEN—En el año 1999, el Parque Estatal Castillo Gillette, en East Haddam, Connecticut, fue cerrado al público para llevar a cabo un proyecto de restauración de US$ 10 millones. Este plan no sólo incluyó la restauración del castillo de piedra de 1919, sino también sus terrenos y varios edificios externos diseñados por el excéntrico actor estadounidense William Gillette. Famoso por ser el primero que representó el papel de Sherlock Holmes, Gillette creó para si mismo una elaborada casa que evocaba un set de teatro de estilo victoriano y mansiones góticas. Entre el amoblado de su castillo, existen 16 habitaciones decoradas con cubiertas murales de hierba tejida y sisal anudado. Estos textiles, que totalizan más de cuatro mil pies cuadrados de material, requirieron de un enorme esfuerzo para organizarlos, estabilizarlos, maniobrarlos y conservarlos. Un equipo de cuatro conservadores textiles, trabajando en el mismo sitio, limpiaron, estabilizaron, repararon y restauraron las pérdidas de pintura en los murales. Este íntimo contacto nos permitió descubrir información no sólo acerca de estos tejidos murales, sino de la historia de reparaciones del Gillette Castle y la tecnología de los tejidos de hierba y fibre líber. En esta ponencia compartiremos nuestra experiencia de trabajar con materiales raros, bajo extrañas condiciones y en un no menos excéntrico castillo.

1. INTRODUCTION

High on a bluff overlooking the Connecticut River sits an eccentric stone castle built by William Gillette (fig. 1). Born in Hartford in 1853, Gillette became famous as the first man to portray Sherlock Holmes on stage. Called by some a marvel of early 20th century architecture, design, and engineering, viewed by others as a monstrosity and a blight on the landscape, Gillette Castle is all of these things. Built between 1914 and 1919 in the town of East Haddam, Connecticut, the castle was largely designed and engineered by Gillette himself.

Museum Textile Services was contracted to complete the conservation of over 372 square meters (4000 square feet) of plant-fiber wall coverings

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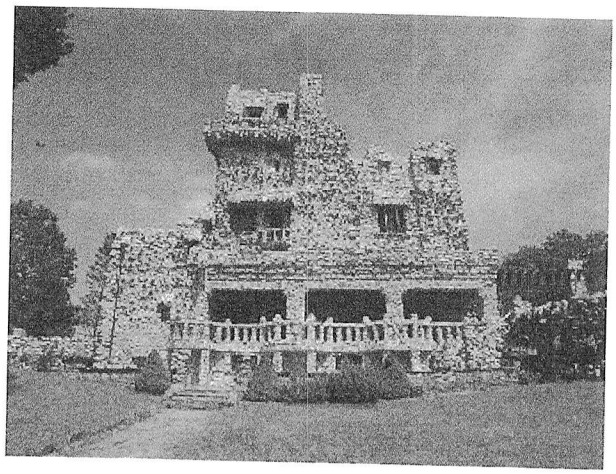


Figure 1. Exterior of Gillette Castle after restoration.

Figure 2. Interior of Gillette Castle during restoration.

within 14 months in preparation for the reopening of the castle on Memorial Day, 2002. All of the work was required to take place on site while the castle was being restored. The collaboration between conservators and construction workers on the project was extremely harmonious. Kronenberger & Sons, a restoration construction company overseeing the project, followed a similar ethical code as the conservators on the project regarding the preservation of original materials, and, when necessary, the sympathetic and responsible introduction of modern materials, technology, and construction.

2. GETTING STARTED

Hanging in 16 of the 24 rooms of the castle, the plant-fiber wall coverings were dirty, faded, and often damaged. These artifacts were not removed from the castle along with the other historic furnishings used in the interpretation of Gillette's home. They were literally considered part of the fabric of the building (fig. 2).

The immediate goals of the project were to: digitally photograph all of the wall coverings in situ, tag and number each piece, make a schematic diagram of each wall on which the location of each piece was noted, and cover all of the wall coverings with Reemay until they could be deinstalled. As pieces were taken off the walls they were wrapped in Reemay and stored on two wooden racks built by Kronenberger & Sons.

3. IDENTIFICATION

Identification of the wall coverings, what they were made of, what their origins may have been, and more illusively, why Gillette had put them all over his castle, followed. The wall coverings were identified on the project blueprints as belonging to one of five types (Table 1). Although the wall coverings in the castle were, and unfortunately still are

Type	Structure	Material	Location
A	3/3 plain weave	stem & leaf parts; cotton thread; paint	five rooms; one level of stairs
B	coiled braids	stem & leaf parts; cotton thread; seed beads; paint	12 rooms; three levels of stairs
C	contiguous square knots	bast fiber	two rooms
D	coiled braids	probably leaf fiber; cotton thread; paint	one object in one room
E	unbalanced plain weave	stem & leaf parts (weft); cotton warp; cotton thread; paint	one room

Table 1. Categories of wall coverings found in Gillette Castle.

referred to as "raffia," none of the original artifacts actually contained any raffia (1). The material found in types A, B, D, and E is clearly not just leaf strips. Nodes can be seen, and in some areas, groups of stem, leaf, and flower. Type C is something altogether different: it has the characteristics of a bast fiber such as jute or ramie.

Plants contain many parts that are used in the manufacturing of artifacts (Table 2). The first is plant hairs, found in seeds, fruit, and seed pods. Cotton is an example of a fiber made from a plant hair. The second plant part that yields usable fiber is primary supporting tissues, found in stems and leaves. These tissues grow and die within a growth season and are therefore often soft and flexible. The stems of the dicot plant yield bast fibers such as flax, which are prized for their longitudinal strength and flexibility. Type C wall coverings appeared to be made from a bast fiber such as jute. The stems of monocot plants, such as bamboo, are also used in artifacts. More common, however, is the harvesting of monocot leaves, such as sea grass, raffia, and sisal, for their strong fibers. Types A, B, D, and E appeared to be made from the leaves and stems of a grass. The third plant part used in the manufacturing of artifacts is secondary supporting tissue, more commonly know as wood (Florian et al. 1990).

The question of the origin of the wall coverings was answered when a tag was found on the reverse of one of the Type B panels (fig. 3). The tag read "Benkei straw rug ... Made in Japan for John Wanamaker." The 1906–1907 Wanamaker catalog lists many plant-fiber furnishings and floor coverings made from materials such as reed, rattan, prairie grass, plaited rush, and Japanese grass. The

Plant Material	Where Found	Examples	Qualities
Plant hairs	seeds, fruit, and seed pods	cotton, kapok, milkweed	fine, soft fibers that can be spun into yarn or used unspun
Primary support fibers	stems and leaves	dicot stems: bast fibers such as linen, hemp, jute, ramie	long fiber staples yielding yarns of varying fineness
		monocot stems: bamboo, rattan, rush	strong materials that can be worked whole or in strips
		monocot leaves: sea grass, other grasses, corn, raffia, pineapple fiber, sisal (agave)	durable fibers good for weaving, braiding, knotting, etc.
Secondary support fibers	trees, bushes, shrubs	wood	hard, durable, versatile

Table 2. Types of plant materials used in artifacts (abstracted from Florian et al.).

Figure 3. Wanamaker's department store tag found on wall coverings.

1908 Sears catalog, a major competitor to Wanamaker, also lists Chinese and Japanese imported floor matting. By 1920, Sears lists "real seamless Crex Rugs" made of American prairie grass, in addition to Asian varieties. These plant-fiber floor coverings were touted as being especially desirable for summer cottages, porches, and bedrooms. They offered high-quality materials at a minimum of cost. And at the time of the 1919 influenza epidemic (the same year Gillette Castle was completed) they were also viewed as a sanitary alternative to traditional oriental rugs. An exact match to the patterns on the wall coverings at Gillette Castle was never found among the extant Wanamaker or Sears catalogs from this time period; however, it is clear that Gillette decided to adapt these attractive, exotic commercial floor coverings to cover his walls.

4. CONDITION

The wall coverings were found to be in good condition considering the length of time they had been hanging, the lack of environmental control in the castle, and the neglect or mishandling they had received. Wall coverings with color were found to have faded from light exposure. In extreme cases, such as one covered exterior tower door, both excess moisture and light had caused the grass material to buckle, delaminate, and discolor, and the dyes to fade.

The majority of damage, however, was caused by humans. As tourists passed through the castle, they were drawn to (and directed toward) the unique wall coverings. Consequently many of the wall coverings exhibited patterns of surface abrasion, paint damage, fraying, and loss (fig. 4). Above all they were dusty and dirty. Fortunately, neither insects nor microbial activity were found anywhere in the collections. Also noteworthy was the lack of physical damage from the stress of hang-

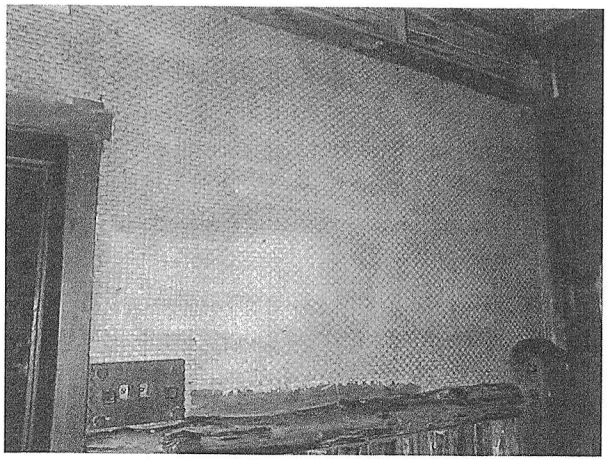


Figure 4. Damage from vandalism and cleaning.

ing. Wall coverings exhibiting dye loss did not, as a rule, exhibit a correspondingly higher rate of fiber weakening or damage.

These factors were taken into consideration in developing an appropriate conservation plan. The original restoration proposal was rewritten as a comprehensive conservation program consisting of: surface cleaning, stabilization and repair, replication, dyeing, stenciling or overpainting of both original and replica materials, and coating. In the new conservation plan, restoration of some lost materials and coloring, as well as replication of some original materials that could not be conserved, were still imperatives. Without accomplishing what the owner wanted (aesthetic restoration) our established goals of conservation could not be met.

5. CONSERVATION

5.1 CLEANING

Early cleaning tests performed at the Metropolitan Museum of Art had shown that discoloration from water damage was irreversible. Museum Textile Services' tests confirmed that neither wet cleaning with surfactants nor solvent cleaning changed the appearance of the staining. Surface cleaning with a vacuum followed by a vulcanized rubber sponge procedure yielded the most satisfactory cleaning results. Cases where surface cleaning did not yield an aesthetic outcome were almost always the wall coverings already deemed too fragile to reinstall.

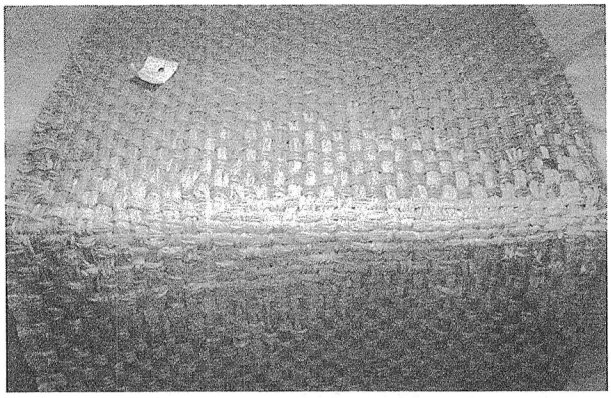


Figure 5. Damaged area after repair and before inpainting.

5.2 STABILIZATION AND REPAIR

The majority of the more than 372 square meters (4000 square feet) of wall coverings were in little or no need of stabilization and repair. In many cases, panels had been cut to fit into the spaces on the walls delineated by the woodwork and only needed new whip stitching with cotton thread around their perimeter to further protect against unraveling. Areas of damage or missing material required a sympathetic repair to provide both strength and visual compensation.

Each type of wall covering called for its own method of repair. Type A is found in five rooms of the castle plus one level of Stair B. Each location contained sections of wall covering that had been vandalized by tourists with subsequent losses. These losses were rewoven using raffia, which ironically was the best material found to imitate the appearance and behavior of the historic plant-fiber materials (fig. 5).

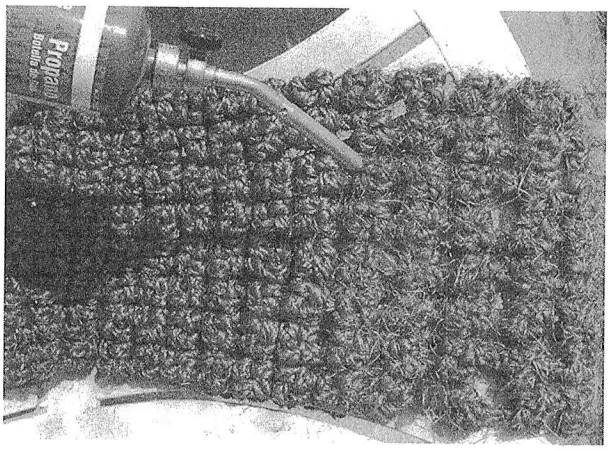


Figure 6. Replica panel being singed for desired effect.

Type B panels were stabilized where possible with cotton thread. Repairs were made using braids of raffia that simulated the original grass braids extremely well. Type D required no stabilization or repair. Type E was deemed too fragile to reinstall. The original Type E wall coverings were archived and new replica wall coverings were woven.

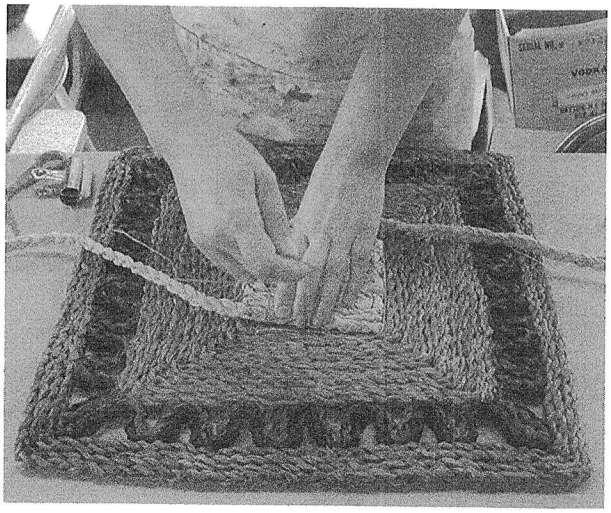


Figure 7. Replica being made of raffia braids.

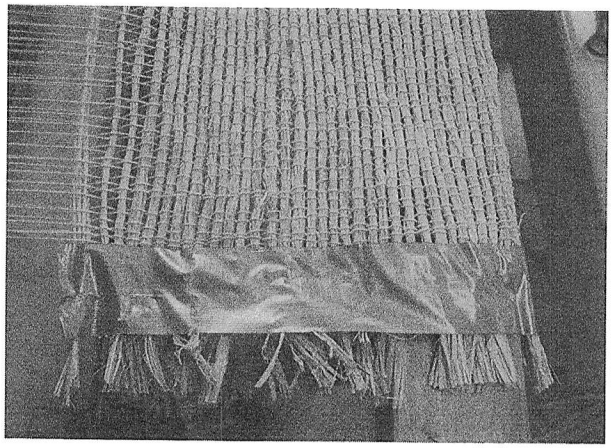


Figure 8. Weaving replica of raffia and pearl cotton.

5.3 REPLICATION

Because of both damage and changes in the castle's floor plan to accommodate modern fire codes, some wall coverings needed to be deinstalled and replicated. Type C wall coverings had been extensively vandalized and required repair. After testing an array of bast fibers without finding a suitable material, commercially available sisal cordage was chosen instead to replicate the appearance of the original square knots. The sisal cord was knotted into large panels from which sections of the appropriate size were cut for each area needing repair. In order to give the new sisal fibers the smooth appearance of aged bast fiber, the surface of the knotted panels was singed with a propane torch. This removed any stray fibers and provided a sheen, which made the repair materials look more like the original (fig. 6).

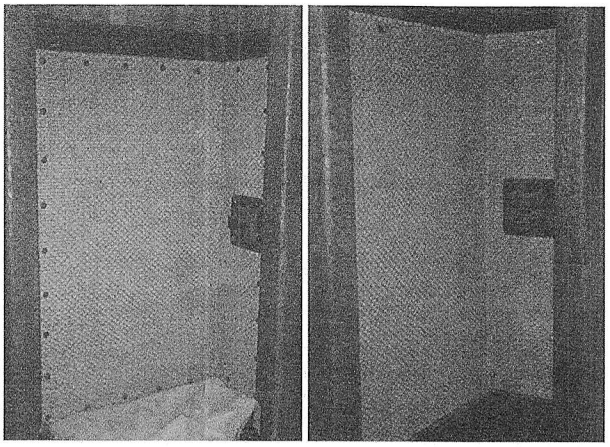
Several Type B panels were constructed from new braids of raffia and hung alongside original materials (fig. 7). Type E wall coverings, which were

Figures 9a, 9b. Gillette's bedroom before (top) and after (bottom) color restoration.

only found in the library, were replicated in their entirety to avoid reinstalling any of the damaged originals. A four-harness loom was lent by a nearby craft center and new yardage was woven using pearl cotton for the warp and raffia bundles for the weft (fig. 8).

5.4 COLOR RESTORATION AND COATING

Dylon brand fiber-reactive dyes were used to dye the knotted sisal panels made to repair or replicate

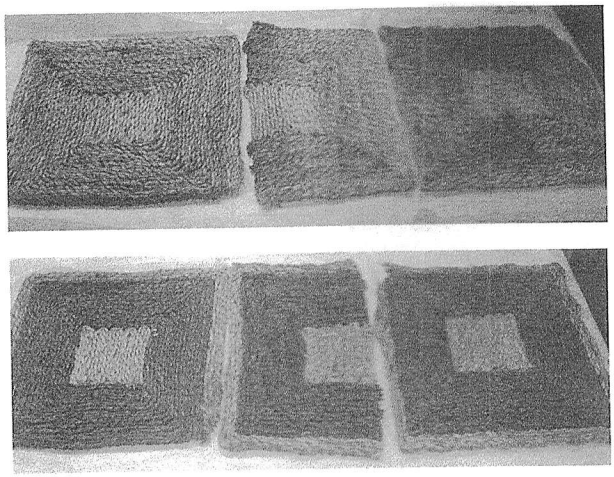


Figures 10a, 10b. Dining room wall before (left) and after (right) color restoration.

Type C material. Dylon dyes provide excellent color matches, have good fade resistance, and were a practical decision given the low-tech environment of the castle.

Gillette's bedroom had Type A wall coverings that displayed colorful stenciled patterns. The faded patterns were overpainted using stencils cut from Mylar (figs. 9a, 9b). Golden MSA Paints were used for this and all other color restoration. An isolating barrier of Paraloid B72 in acetone was applied between all original material and the overpainting.

Type A wall coverings that had originally been a solid color, but had since faded to tan, covered other rooms. The color was restored using Golden MSA Paints which were applied with a high volume - low pressure (HVLP) spray gun over an isolating barrier of Paraloid B72 (figs. 10a, 10b).



Figures 11a, 11b. Verso (top) and recto (bottom) of three faded panels.

A joint decision was made between the parties involved to display the recto of some of the wall coverings that had incurred fading to their verso (figs. 11a, 11b). From a conservation point of view this raised concern about the need to protect the remaining original color from fading, which would leave little or no evidence of the original. A compromise was made in which a coating would be applied to the chosen display side of nearly all of the wall coverings. This solution would provide for some protection against soiling as well as providing UV absorption. One room and two levels of staircase were excluded from coating because they were uncolored and lightly trafficked.

Several colleagues were consulted in developing the coating. It consisted of Paraloid B72 in toluene with Tinuvin 327. Tinuvin 327 is a UV absorber that when added to B72 forms a UV barrier that helps to protect the artifact from the UV portion of the light spectrum. A mixture by weight of 3 g Tinuvin 327 powder to 97 g Paraloid B72 granules was first prepared. 30 g of this mixture was then dissolved in 70 ml of toluene. The coating was applied to the display side of each panel using an HVLP spray gun.

Coating of textiles can causes a loss of flexibility, most often when applied via immersion, or when consolidating the surface of a textile (Florian et al. 1990). The wall coverings in Gillette Castle are inherently inflexible and without need of consolidation, which made them candidates for coating. The Paraloid B72 and Toluene coating is not a cure-all to the problem of light fading and soiling from handling, but it allows the wall coverings to be reinstalled and appreciated in their original context. A comprehensive collections-management plan is needed for the entirety of Gillette Castle,

Figure 12. Interior of Gillette Castle after restoration.

and preventing light damage to the wall coverings as well as the original wood work and artifacts is a main priority.

6. CONCLUSIONS

The wall coverings at Gillette Castle were conserved and reinstalled in time for a major public opening on Memorial Day, 2002 (fig. 12). This project has brought to the attention of the State of Connecticut Department of Environmental Protection, as well as the park rangers who care for the castle on a daily basis, that this is a unique and valuable decorative arts collection within one of the foremost examples of American vernacular architecture. Museum Textile Services was very pleased to have contributed to their ongoing display, enjoyment, and preservation.

NOTES

1. Raffia is a leaf fiber from the raffia palm. It is a long, smooth, and continuous staple. It is grown principally in Madagascar and the Philippines but Madagascar raffia is recognized as having superior leaf length, suppleness, and strength.

ACKNOWLEDGEMENTS

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REFERENCES

Florian, M.E., D.P. Kronkright, and R.E. Norton. 1990. *The conservation of artifacts made from plant materials*. California: Getty Conservation Institute.

SOURCES OF MATERIALS

sisal
Ace Hardware stores

Tinuvin 327
Ciba Specialty Chemicals Corporation
540 White Plains Road
Tarrytown, NY 10591
Tel: (800) 873-1138

Dylon dyes; thread; pearl cotton; wire
Fabric Place
www.fabricplace.com

noncorrosive fasteners
Jamestown Distributors
500 Wood Street, #15
Bristol, RI 02809
Tel: (800) 423-0030
www.jamestowndistributors.com

solvents and respirators
Sherwin-Williams
www.sherwinwilliams.com

raffia skeins
Joseph M. Stern Company
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