

THE CONSERVATION OF A NINETEENTH-CENTURY SIDEBOARD TABLE

by Deborah Bigelow* and Tamsen Fuller**

Introduction

A large American sideboard table, dating from the first quarter of the nineteenth century, was privately purchased at a New York City auction in February, 1986. The new owner and his curator realized that the form was a rare survival and that the surface and applied ornament were remarkably intact and free of extensive restoration. Furniture conservator Deborah Bigelow was contracted to conduct and coordinate conservation treatments that would respect this evidence of age and, at the same time, result in a piece of furniture that would be visually pleasing within a private home - dual and often conflicting aims. :

Although the sideboard table appeared, at first glance, to be chaste, thorough examination of its pre-treatment condition revealed a complex of materials suffering varying levels of abuse and deterioration. Consultancies and laboratory analyses were scheduled to identify the wood substrates, surface finish and the gold leaf and paint layers on the paw feet. Objects conservator Tamsen Fuller was subcontracted to clean, stabilize and repair the broken marble top, while the substantial losses to the brass-and-veneer inlay were reproduced by a local tool-and-die maker. With the exception of the marble top which will be conserved in the client's home, conservation treatment of the sideboard table was undertaken in the furniture conservator's studio.

The conventional approach to the treatment of similar period pieces with problem finishes, especially for the private owner, has been to remove the finish, apply a french polish and restore all other decorative elements to an appearance consistent with the flawless shellac finish. By contrast, our treatment objective was to retain evidence of age and by balancing the visual impact of each surface against the others, clean and reintegrate them only to the extent necessary to restore aesthetic unity. Because the final appearance of the finish and marble accounted for the major visual impact of the table, their projected conserved appearance established the visual framework for the treatment of the coexisting materials - brass, ormolu and gilt and painted wood.

Many of the treatments undertaken and described below represent familiar solutions to the problems presented by each material. What was unusual, however, was the procedure undertaken to preserve the original finish. Both its relative insolubility, extreme instability and the fact that it had been partially restored made the finish difficult to reattach to the wood substrate. To establish a treatment procedure for the reattachment and restoration of the finish, the strata were identified; the original finish was isolated; and tests were undertaken until a solvent was found that accomplished the reattachment. Merely stabilizing the finish was not satisfactory, because its discolored and uneven appearance was aesthetically unacceptable to all of the parties concerned with the table's conservation. After reattachment of the original finish, each surface was viewed as a component of the whole, with continuity within a field (e.g., horizontal band created by the drawer fronts) deemed essential to avoid a disfiguring appearance. Where restoration was required to bring the finish within an acceptable threshold of aesthetic unity, care was taken to document all the materials and processes used during treatment, and, in two areas, the original finish was left undisturbed as an in situ record.

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In private practice, a measure of experimentation and maintenance of professional standards can only be achieved through collaboration with regional conservation centers and museums, other conservators willing to share their expertise and local artisans able to supplement the conservator's craft skills. For the successful conservation of the sideboard table, the conservators relied upon such a network of consulting services and informal peer support. Finally, the willingness of the client to seek a conservative treatment, and his financial backing for the necessary examinations and testing, cannot be underestimated as contributing to the ultimate success of this project.

Description

An apparently rare survival of its form, this early nineteenth-century sideboard table provided additional serving area and storage space and would have been used in tandem with more conventional sideboard forms in the dining room of a wealthy urban family. Despite the absence of an identifying stamp or label, the table is stylistically attributed to Duncan Phyfe (1768-1854), the pre-eminent New York City cabinetmaker, and is considered to be an early example of Phyfe's work (c. 1820-25), combining regional influences with those of the English Regency period.¹

The sideboard table is comprised of mahogany, yellow poplar, maple and eastern pine secondary woods with rosewood veneer and ebonized string inlay.² The table features three short drawers on a curving front just below a faux-rosewood moulding edge. Its white, black-figured marble top has a reeded edge and a concave front which echoes the table's shape. Candle slides with sterling silver knobs fit into either end of the top. Top and drawers are supported at the front by marble columns (ornamented with ormolu capitals and base rings) which are screwed into the platform base. At the back, the table top is supported by marble pilasters with gilt wood capitals which are set in wood channels secured to the top and platform by tenons screwed into the carcass. Two brass-and-veneer inlay patterns form a decorative frieze across the top and around the platform and create a border on the center drawer. Matching solid brass foliated patterns are inlaid on ebonized rosewood veneer panels on the two front canted corners. Each of the end drawers is bordered on four sides with two parallel lines of inlaid brass stringing. The front and back carved paw feet are painted in the "verd antique" style and have oil-gilt acanthus leaves.³ The table was finished with a spirit varnish applied by a traditional french polishing technique.⁴

Condition Prior to Treatment

Visual examination and solvent tests established numerous problems with both the substrates and the surface coatings. The carcass was loose at several joints, and there were splits in the boards used to make the top and the platform. Sections from the top moulding edge were missing above the canted corners, while the remainder of the moulding was extensively worn with numerous small losses. A flat moulding section was also missing from the center drawer. The drawers' mahogany runners were worn; several had been previously repaired. The top's maple medial braces had suffered extreme wear.

There were lengths of missing brass string inlay as well as runs of the inlay popping out of their channels. The center drawer was missing its brass-and-veneer pattern on three sides, while a total of five inches of the larger brass-and-veneer pattern was missing from both ends of the platform. The remaining brass on the table had areas that were lifting or bent with some loss to the veneer inlay. Areas of both the rosewood veneer and the ebonized string inlay were split, lifting and missing. The feet had suffered losses to the carved leaf tips and spines, and all of the front toes were crushed and without nail defini-

tion. The end grain of the front feet was discolored and slightly spongy as the result of moisture retention caused by the presence of salts left by what was identified as urine.⁵

The marble top was broken into two pieces, on a line roughly perpendicular to the long axis. One major chip, approximately 3/4-inch wide, and a number of smaller chips were missing along the break. The breaks were also soiled and abraded from subsequent handling. In the absence of any contused area indicating that the marble was struck by a falling object, it was concluded that the slab probably broke under its own weight while being carried flat rather than on edge. The proper right marble pilaster had two breaks which were seriously discolored, and the pieces, after having been repeatedly reglued into the wood channel, were held in place with masking tape. Both front marble columns were faintly and unevenly discolored with chips, scratches and other abrasions visible across their polished surface. The extant brass-and-veneer inlay had an extremely dark patina over which were the remains of a deteriorated spirit varnish coating. Streak marks down the surface of the proper left foliate brass pattern resulted in an uneven appearance of light and dark areas. The ormolu capitals and base rings had a discolored coating with thick accumulations of dirt in the design crevices. The lacquer coating on the bronze-vernici abaci was discolored with the presence of several corrosion-products in areas across its surface. The faux-rosewood finish on the top's moulding edge was chipped with numerous losses. The surface coatings on both the gilded and the painted areas of the paw feet were dessicated with deep crack patterns in the gesso, serious cleavage and losses throughout the layers. The coatings on the front feet bore evidence of accelerated deterioration due to the reaction of uric acid with the upper layers of paint and gold leaf.

There were areas of extensive finish loss (e.g., around the edge of the platform). Most losses, however, were more random in nature and resembled missing pieces from a finish puzzle. From the opaque yellow color, in addition to the nature of the losses, it was concluded that the finish had lifted away from the wood substrate and was holding itself together as much as it was being held to the wood's surface. A restoration coat of pigmented spirit varnish had been brushed over the deteriorated original finish on the platform and across the top from under the edge of the moulding edge to and including the drawer fronts. A second restoration occurring only on the front of the top, involved the removal of the first two finish layers and was followed by an application of padding lacquer and wax. The second restoration stopped, abruptly, midway across the top in the middle of the center drawer.

Treatment

Wood: Structural Repairs

The wood substrate required only minor stabilization at a few joints and under lifting veneer which was accomplished by the injection of hot hide glue followed by clamping. Large areas of missing veneer were repaired with rosewood veneer chosen for its similarity of color and grain and reattached with hot hide glue.⁶ Areas of veneer loss which were not highly visible were stained with alcohol soluble stains or filled with lacquer stick stained to match the rosewood. Replacement moulding sections for the upper edge of the top at the canted corners were fashioned by hand from mahogany, attached with hot hide glue and slightly distressed to follow the line and appearance of the original. Although several proposals for repairs to the drawer runners and medial braces on the carcass were advanced, the owner preferred to let them remain worn as evidence of the table's original construction and repair history. Therefore, exposed nails from a prior repair were countersunk and new guides fashioned from old pine and attached

along either inside end of the carcass to help support the drawers. All contact areas were then coated with wax to facilitate drawer movement, and the owner strongly advised to limit use of the drawers.

The missing moulding from the center drawer was reproduced and attached with hot hide glue after being scored - as was the original - to provide a better gluing surface for the brass-and-veneer inlay. A mahogany wedge was cut to shape and placed under the proper right back paw foot to compensate for an unevenness which had resulted from a twist in the platform substrate (three solid boards).

Metal: Brass

Each of the missing brass-and-veneer patterns was reproduced from brass sheeting of equivalent thickness, cut to width and punched with a metal stamp of the pattern's negative space. Veneer inserts were also punched out in a similar manner and then pushed into the brass.⁷ New brass stringing was scored on the reverse side and adhered to the wood substrate with hot hide glue to which a small amount of whitening was added. Care was taken that the glue mixture not abrade the patina on the original brass.

The patina on the original brass was so dark that it would have been difficult to "read" the frieze pattern against a restored rosewood or ebonized rosewood surface. In consultation with the owner, it was decided that the patina should be slightly reduced in an attempt to restore the brass' decorative role on the table. The desiccated finish which remained over roughly 50% of the brass was, therefore, removed with a wood scraper to expose the entire patinated surface. After testing ten polishing compounds, the brass was polished with a compound of stannic oxide in mineral oil to an appearance judged satisfactory. The residue was removed with Stoddard solvent which was also factored-in as a patina-reducing agent.

Prior to finishing the table's wood surfaces, the new brass was inpainted (to blend with the old) with alcohol soluble stains mixed with a small amount of 1 pound-cut orange shellac; these areas of new brass were then protected from the french polishing process with a brush coat of 20% Acryloid B-72 in diethylbenzene.⁸ Streak marks on the proper left foliate brass pattern which were judged to not detract from the overall appearance of the sideboard table were allowed to remain as evidence of age.

Metal: Ormolu

Tests on the ormolu capitals and base rings revealed that the original fire gilding (including the burnished areas) remained largely intact.⁹ The consensus among consulting conservators was that the discolored coating was not original and should be removed to restore the beauty of the gilding. A commercial paint stripper was chosen as the general cleaning agent because its use reduced the risk of abrasion to the original gilt surface. Thick accumulations of dirt in the design crevices required mechanical removal with wood and metal (dental) tools. Residue from both cleaning procedures was removed with acetone. Both abacus exhibited the corrosion by-products, copper oxide and copper carbonate. These deposits, however, were not judged active, nor did they interfere with the overall appearance of the ormolu capitals. Consequently, no treatment was undertaken. Small discolored areas on the ormolu elements were also considered stable, and therefore, no general or local coating was applied to their surface.

Gilt and Painted Wood: Paw Feet

The paw feet were painted in a "verd antique" style (intended to resemble aged bronze) and had oil-gilt acanthus leaves. The strata were identified from the wood up by the furniture conservator and a contractor, CBK Laboratory, Inc., as gesso, varnish (sealer: light amber color), size, gold leaf (22k), varnish (toner: dark amber color), size, gold leaf (22k) and wax. The top three layers were applied during a prior

restoration.¹⁰ The strata on the paw feet were identified from the wood up by the furniture conservator as gesso, paint (green, water soluble), varnish (toner: brown color), bronze powder, varnish (toner: brown color) and wax. There was no evidence of restoration layers on the feet.¹¹ The restoration gilt surface was retained because of its excellent appearance on the rear leaves and the risk that its removal from the front leaves would result in extensive ingilding.

Choice of a conservation treatment also had to address the discovery of the presence of salts in the wood of the front feet. With relative humidity above 60%, the feet smelled strongly of urine, the exposed wood surfaces felt wet and sticky, and the paint and gold layers also felt damp. Where urine had run down the glazed oil-gilt surface, the strata were especially dessicated and crumbling away from the substrate. After consulting with conservators, organic chemists, a wood scientist and an urologist, the feet were “dried out” by lowering the relative humidity to between 30% and 40%. The affected area was next treated with materials chosen for their ability to inhibit moisture from penetrating to the wood substrate, to consolidate the lifting strata and to provide a compatible interface with the proposed method for augmenting the losses.

After cleaning the feet with swabs of stoddard solvent to remove surface dust and dirt, three coats of a 15% solution of Acryloid B-72 in diethylbenzene were brushed over the surface and injected under lifting areas of paint.¹² Following each application, the surface was allowed to dry and was then pressed back to the substrate with a warm tacking iron. A wax mixture (9 parts beeswax/ 1 part carnauba/1 part microcrystalline: Multiwax X-145A) with the addition of dry powder pigments to approximate the surface color was applied hot with a brush to fill the most prominent losses. The fills were then shaped (micro- spatula), smoothed (fingernail and solvent cloth) and distressed (scalpel). 24k gold powder was lightly dusted over the wax, and, following a sealer coat of the same acrylic resin, inpainting proceeded with a series of tinted varnish glazes.¹³ Any areas that were too glossy were abraded gently with fine steel wool, and a final coat of Renaissance wax was applied to all four feet.

Using the same technique, the leaves were stabilized with from one to three coats of a 15% solution of Acryloid B-72 in ethyl alcohol. Only obtrusively dark areas were cleaned with swabs of a very thin solution of shellac in denatured alcohol and were then recoated with the acrylic solution. With the addition of a small balsa wood wedge support to the front of the proper left leaf tip, wax (9 parts beeswax/1 part microcrystalline) was mixed to color, applied to fill the major losses, shaped, smoothed and distressed. After sealing the wax with a brush coat of 20% Acryloid B-72 in diethylbenzene, the most prominent fills were oil-gilded with 22k gold leaf over japanner’s quick size. The sharp edges of the new leaf were blended with a swab of stoddard solvent, and inpainting and toning then proceeded as described above. The end grain on the bottom of each foot was sealed in two steps: Butcher’s wax applied hot was readily absorbed into the wood and was followed by a hot mixture of beeswax and carnauba wax (3 parts/1 part) which was ironed-on to both penetrate and seal the wood’s surface.¹⁴

Gilt and Painted Wood: Pilaster Capitals

Dark areas of the oil-gilding were gently cleaned with a dry-damp swab of distilled water. The remaining gilt surface was softly brushed to remove any traces of dust. Two nail holes from a prior repair were plugged with pigmented wax and inpainted to blend with the original surface.

Marble

In consultation with the client, both conservators agreed to restore the marble across the breaks on the proper right pilaster and the top to provide stability, create visual unity and inhibit the settlement of dirt into the repaired cracks. Although the noticeably dark chipped areas around the columns were to be lightly cleaned, the rest of the marble surface was to remain untreated.

The chipped areas on the columns were cleaned with a 5% solution of Vulpex in water followed by a water rinse until only a slightly lighter appearance was obtained. On the pilaster, an unidentified silver-colored adhesive was removed from the marble's edges with a commercial paint stripper. A poultice of baking soda was then applied to the break sites and removed after ten minutes with a water rinse. Paint stripper was then applied to the breaks and after a few minutes the freed dirt and solvent were mechanically removed with swabs soaked in acetone.¹⁵ The result was a stark white surface through the break with slight discoloration remaining along the edges of the break. The pilaster pieces were then clamped into place, and the breaks were filled with a polyester resin, Akemi (free-flowing grade), which was applied across the crack with a microspatula. Excess resin was removed with acetone. The resin was then inpainted to blend with the marble, and the remaining area of loss was filled with pigmented wax.

At this writing, treatments on the substrates, metals, paw feet and marble pilasters and columns have been completed, permitting reassembly of the table in the client's home. Only the conservation of the marble top remains. The treatment regimen which will be carried out includes: cleaning the break sites with organic solvents to remove grease and dirt; manipulating the slab halves on a support to insure alignment; devising a clamping system for use with the mending adhesive (a white knife-grade Akemi polyester resin which will be tinted to a neutral color) to bring the broken edges tightly together; and using solvents and mechanical paring tools to remove excess resin.¹⁶ After curing overnight, the marble will be turned over and reinforcing strips of an epoxy-impregnated fibreglass material will be applied along the join. Left overnight, the marble will be turned face-up and final cosmetic work such as sanding the polyester and inpainting and filling the loss with pigmented wax will be undertaken. The marble top will then be placed on the sideboard table.

Finish

Finish layers were identified by their appearance, from solvent tests and after consultation with furniture conservators familiar with nineteenth-century finish recipes¹⁷ as an unpigmented spirit varnish (original finish), a pigmented spirit varnish (restoration coat 1) and synthetic padding lacquer (restoration coat 2). A layer of wax was also found on the platform and across the front of the top. Finish samples have been taken and await further laboratory analysis for more precise identification. In addition to finish samples, the areas under the front marble columns and ormolu base rings remain undisturbed documents of the original finish.

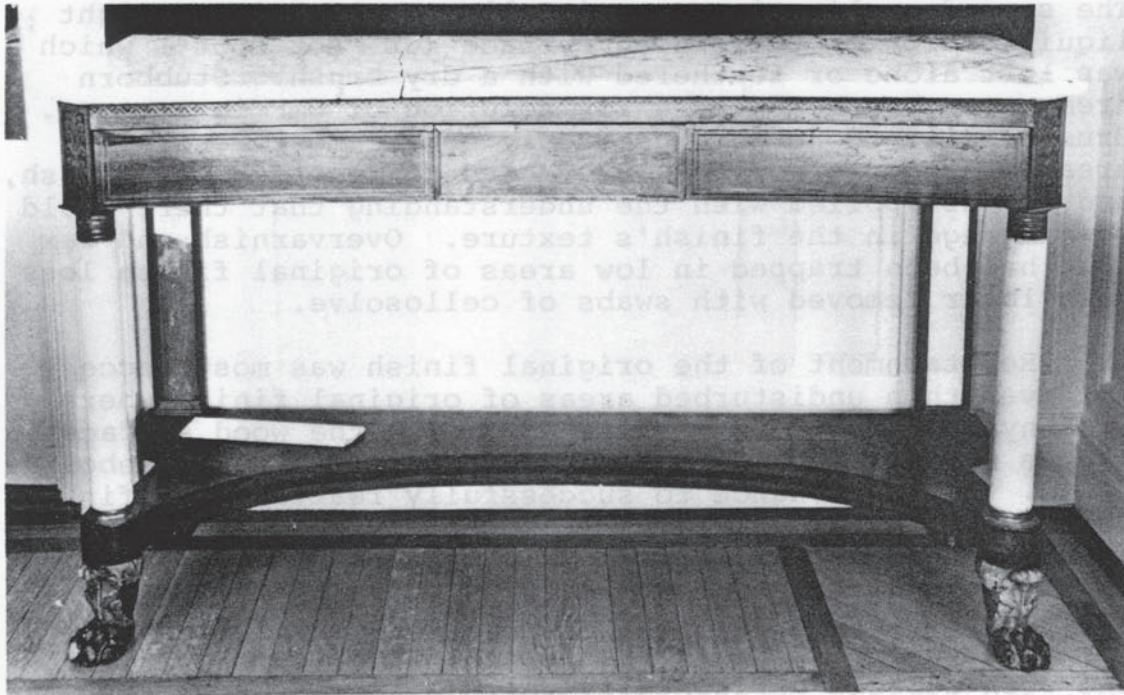
Prior to solvent reattachment of the original finish, restoration layers were removed with 400- and 600-grit sandpapers. Despite the technical problems posed by sanding an uneven surface with many areas of loss (both the original finish and the restoration coats varied in thickness), abrasive removal was selected to avoid reamalgamating (i.e., sealing) the top layer of original finish which would have reduced the reattachment solvent's ability to penetrate under the original finish. Sanding was monitored by checking the residue on the sandpaper and the appearance of the sanded area with an ultraviolet light. The surface

was cleaned with naphtha.

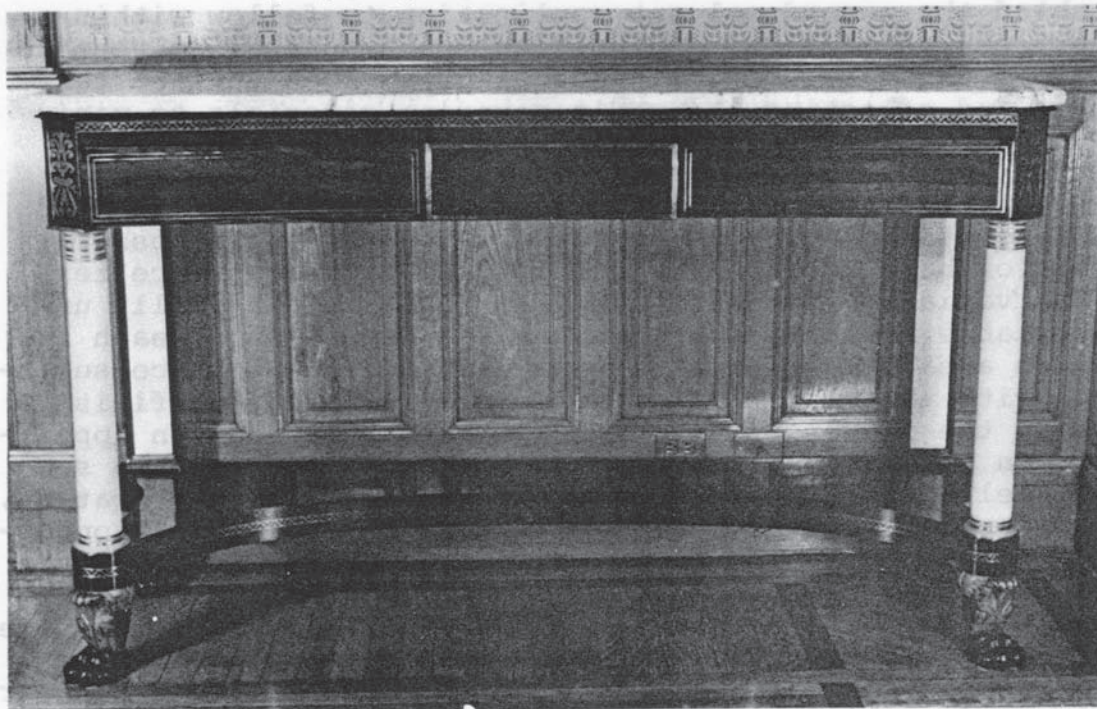
Tests with ethyl alcohol, dimethylformamide (DMF), ethylene glycol monoethyl ether (cellosolve), ethylene glycol monobutyl ether (butyl cellosolve) and mixtures of ethyl alcohol, DMF, cellosolve and acetone (varying the number and concentration of chemicals in solution and their sequence and method of application) were conducted over areas of original finish and areas where the over-varnish had been removed.¹⁸ The best solvent sequence was an initial padding with butyl cellosolve followed by pouncing the finish areas with a second application of the same solvent (necessary due to the resistance of the finish which has been attributed to an, as yet, unidentified component of the spirit varnish) within five minutes of the first.¹⁹ Allowing the finish to dry thoroughly before applying the second solvent was found to minimize its effectiveness. The surface was rubbed firmly during the first application and pounced vigorously during the second with a moderately wet pad. Immediately after the first solvent application, a color change was evident and increased in depth within minutes. There was no change to the finely crazed pattern (i.e., texture) of the finish. The second application occasionally resulted in a slight liquification of the finish surface (or “hot spot”) which was left alone or feathered with a dry brush. Stubborn areas were brushed with a 25% solution of DMF in acetone. Brush applications were used only on the most resistant areas where more solvent was needed to reattach the finish, and it was applied with the understanding that there would be a change in the finish’s texture. Overvarnish and wax that had been trapped in low areas of original finish loss were later removed with swabs of cellosolve.

Reattachment of the original finish was most successful over thin undisturbed areas of original finish where its physical bond was most tenuous with the wood surface. As was discovered during the conservation of the sideboard table, the best chance to successfully reattach the finish occurred with the initial solvent application. Variables in the method of application which affected the success of the procedure included: heating areas of original finish just before applying the reattachment solvent which was observed to increase the rate of reaction; positioning the work surface horizontally which allowed for better solvent control and the use of greater pressure during solvent application; applying the solvent with a pad which facilitated the use of force during the procedure and enabled the second solvent application to follow within a short period of time; controlling the amount of solvent in the pad which ensured maintenance of an even surface texture; and selecting the pad’s covering materials to minimize lint and dust from sticking to tacky finish areas.

After reattachment, the original finish was restored because its appearance (uneven from prior finish loss with areas of bare wood and with color and slight surface textural variation across the surface) was aesthetically unacceptable. Taking into account the condition of each finish area and its location on the table, and in consultation with the client, it was decided to level the finish across the drawer fronts, but to maintain an uneven appearance on all other surface areas to enable one to both see and feel the areas of original finish. (Prior restoration, described above, had resulted in a different finish appearance on each drawer. In a visually important area (across the front and close to eye-level) perceived as one unit, it was considered necessary to restore the finish to an even surface from drawer-to-drawer.) The original finish was then restored with a variety of shellacs selected for their color and applied with a traditional french polishing technique. The restored shellac finish surface was later abraded with rottenstone and coated with wax.



Sideboard Table. Before Conservation. (Photograph by John Parnell.)



Sideboard Table. After Conservation. (Without marble top.)



Finish reattachment with butyl cellosolve. In Progress.



Finish amalgamation with DMF (top half) versus finish reattachment with butyl cellosolve (bottom half).



**Gilt and painted Paw Foot.
Before Conservation**



**Gilt and painted Paw Foot.
After Conservation.**

Solvent reattachment of the original finish resulted in an excellent change in finish color without loss of finish texture. The application of new finish coatings still permitted the reflection of the original finish's finely crazed pattern. While the original finish has been conserved and restored, it has also retained the characteristics of age. Despite its fragility and despite the fact that it won't last forever, the effort to save the finish - even for a potentially limited period of time - was, in this case, thought to be aesthetically and historically preferable to wholesale removal.

Acknowledgments

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Special recognition is due to conservation technicians, Elizabeth Hickey and Cynthia DeHaven for their work on this project, and to John Lovell for his editorial assistance in the preparation of this paper.

Footnotes

¹A similar sideboard table in the collection of Gracie Mansion (New York City) was examined by the furniture conservator prior to treatment on May 6, 1986. Standard references on Duncan Phyfe include: Charles Over Cornelius, Furniture Masterpieces of Duncan Phyfe, (New York, 1922); Edward V. Jones, "Charles-Honoré Lannuier and Duncan Phyfe, Two Creative Geniuses of Federal New York," American Art Journal 9 (May, 1977):4-14; and Nancy McClelland, Duncan Phyfe and the English Regency 1795-1830, (New York, 1939).

²Two wood samples were identified by Dr. R. Bruce Hoadley (Professor, Department of Forestry and Wildlife Management, University of Massachusetts, Amherst, MA) as (1) eastern white pine (*Pinus strobus*) from the platform and (2) yellow poplar (*Liriodendron tulipifera*) from the gilt and painted paw feet. (Correspondence: August 18, 1986).

³The feet were painted and gilded in a style familiar to the furniture conservator from her previous experience with similarly treated feet on early nineteenth-century American furniture. Reference to the term "verd antique" to describe the treatment is found in the catalogue, Nineteenth-Century America, Furniture and Other Decorative Arts, by Berry B. Tracy, et. al., (New York: Metropolitan Museum of Art, 1970), Plate 45.

⁴Consultation with Robert Mussey, Chief Furniture Conservator and David Mitchell, Associate Furniture Conservator (Society for the Preservation of New England Antiquities (SPNEA), 185 Lyman Street, Waltham, MA) on October 28, 1986. The reader is referred to the bibliography accompanying this paper for a partial listing of Mr. Mussey's published articles on finish identification.

⁵Telephone communication with Dr. Demetrius Bagley (Associate Professor, Department of Urology, Thomas Jefferson University Medical Center, Philadelphia, PA) on November 16, 1986. Dr. Bagley

identified the components of urine which would have migrated into the wood as phosphates and nitrates in crystalline form. He felt that positive laboratory identification would not be possible given the strength of the poultice that would be required to extract the salts. However, Dr. Bagley concurred with our assessment of the problem, basing his support for our working hypothesis primarily upon the urine smell emanating from the damp feet.

⁶Although our procedure varied slightly, the reader is referred to the article by Marc Williams, "Musical Malady: the case of an empire piano," AIC Preprints, Washington, D.C.: American Institute for Conservation, 1981), pp. 192-193, for a more detailed description of the type of structural work required by the sideboard table.

⁷The exacting work of duplicating the brass-and-veneer patterns was done by Mr. Vincent Napoli (R.D. 2, Forest Road, Wallkill, NY). If the tool-and-die maker is willing to undertake a small production run, according to Mr. Napoli, the technology for reproducing brass patterns is available in every machine shop.

⁸Airbrushing a protective coat of blonde shellac over the reproduction brass was suggested as an alternative to a brush coat of acrylic resin (SPNEA consultation: October 28, 1986). This procedure was tried on one area of the table with excellent results.

⁹A test was made on a small area of the proper right base ring with a swab of methylene chloride based paint stripper. The excellent condition of the original gilding was, subsequently, evident.

¹⁰Dr. Robert Silberman (Chemist, CBK Laboratory, Inc., 45 White Street, New York, NY) conducted the tests on the gilding samples. His report on October 17, 1986 read, in part: "The white powder material is a mixture of calcium carbonate and zinc oxide. These were identified by a high refractive (index greater than 1.66) and isotropic behavior under crossed polarizers. The presence of zinc oxide was confirmed by yellow green fluorescence of the material under ultraviolet light characteristic of zinc oxide. The calcium carbonate was confirmed by the evolution of carbon dioxide when the sample was treated with dilute hydrochloric acid...The two amber layers appear to be rather brittle varnish...neither dissolved fully in ethyl alcohol. Both slowly dissolved in methylene chloride, a good solvent for varnish. Based on solubility characteristics, it is likely that the coatings are some form of dammar varnish. The metallic coating is gold powder or flakes as evidenced by the observation that the metal did not dissolve in 6 molar nitric acid. The purity of the gold was not ascertained." Gold carat content was determined by the furniture conservator based upon over ten years experience conserving gilt wood.

¹¹The layers were identified by solvent tests (see preceding footnote), examination with an ultraviolet light and the furniture conservator's familiarity with similar treatments on nineteenth-century furniture.

¹²Three references support the furniture conservator's decision to stabilize the degraded surface with Acryloid B-72: R. Barclay, "Wood consolidation on an eighteenth-century English fire engine," Studies in Conservation 1981, 26(4), pp. 133-139; E. Welsh, "A Consolidation Treatment for Powdery Matte Paint," AIC Preprints, (San Francisco: American Institute for Conservation, 1980), p. 144i and (Victor von Reventlow, "Use of B-72 in the Restoration of Marquetry Surface - Case History," Conservation of

Wood in Painting and Decorative Arts (London: International Institute for Conservation, 1978), pp. 37-40.

¹³Telephone communications with St. Julian Fishburne (Painting Conservator, 48 Jenkinstown Road, New Paltz, NY) and Victor von Reventlow (Furniture Conservator, 13 Bergen Street, Brooklyn, NY) on January 18, 1987, supported our preference to inpaint over the acrylic resin with leached oil colors mixed with a synthetic varnish. The reader is also referred to Victor C. B. Covey and Kay Silberfeld, "Notes on Treatment of Painted Furniture," Baltimore Painted Furniture 1800-1840, (Baltimore: Baltimore Museum of Art, 1972), p. 91.

¹⁴The use of wax as an hydrophobic material which could be used to seal the end grain of the feet was suggested by Jonathan Thornton (Associate Professor, Art Conservation Department, S.U.C.B., Box 71, Cooperstown, NY) during a conversation on November 14, 1986.

¹⁵Several attempts to clean the marble's edges with poultices (e.g., Attapulugus clay) failed to produce an absolutely clean glueing surface. Paint stripper was subsequently applied with excellent results.

¹⁶Epoxies were considered because of the possibility of preclamping the two pieces of marble and running a nonviscous epoxy into the join by capillary action. Two epoxy/hardener systems were tested, Ablebond 342-1 and HXTAL NYL-1. Test pieces of broken marble were clamped into position and each epoxy was run along the clamped join with a scalpel blade. Both epoxies flowed into the join with ease, but after ample curing time, the repairs broke apart easily because of adhesive-poor joins. A dowelling system was rejected because of the risk of cracking the marble during drilling the dowel holes.

Two white Akemi polyester resins with benzoyl peroxide catalysts were tested: the free-flowing and the knife: grade. The free-flowing was found too runny and messy. The knife grade stayed on the marble edges easily, allowing assemblage of the marble without adhesive loss. To obtain a longer working time and less shrinkage during cure, a 1% - catalyst mixture was used; the test pieces of marble were then clamped laterally to force the two pieces together and from the top and bottom between a board and piece of acrylic sheet to prevent either piece from moving up or down. When rebroken, the marble broke in another area rather than along the join, thus proving the polyester resin more suitable as the adhesive for the marble top.

The rigid backing needed to be local because the understructure of the sideboard table permitted very little room for the backing material. Crisscrossing strips of fibreglass fabric impregnated with epoxy were chosen to meet these requirements.

¹⁷SPNEA consultation: October 28, 1986.

¹⁸Idem. Both SPNEA conservators recommended that the furniture conservator experiment with a series of solvents alone and in combination until one was discovered that would effectively reattach the finish.

¹⁹A solvent mixture that was also tested with very good results was cellosolve (30%), DMF (30%), ethyl alcohol (30%) and acetone (10%). It was applied in a similar manner.

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