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Peeling back the layers: Eileen Gray's brick screens

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Eileen Gray (1879–1976), renowned designer and architect, created several lacquer block or 'brick' screens during her career. Although there are approximately 15 extant screens, the focus of this study is limited to 10 white and black screens with known provenance. Exhaustive archival research, screen examination, and technical and material analyses confirm the hypothesis that these 10 screens are dissimilar in fabrication. This study tracks and records the history, provenance, fabrication, condition, use, and material analysis of these 10 screens. Letters, journals, and analyses show the design evolution of the screens and provide further insight into unpublished material on Eileen Gray's lacquer brick screens.

Keywords: Lacquer, Screens, Eileen Gray, *Urushi*

Introduction

Eileen Gray (1879–1976), was an Irish-born architect and designer and was considered to be one of the early pioneers of the Modernist movement. Born into an aristocratic family, she divided her youth between Ireland and England but lived most of her adult life in France. After studying at the Slade School of Art, London, UK, she moved to Paris in 1902 where she remained until her death. During the 1910s and 1920s she designed and created some of her most innovative furniture, carpets, and interiors for private clients. It was during this period that Gray was introduced to the traditional *urushi* lacquer technique which she continued to use successfully for two decades.

In 1917 during the refurbishment of the rue de Lota apartment for Mme Mathieu-Lévy, a prominent figure in the fashion world of Paris, Gray created a design that she would repeat for the rest of her life. Gray lined the walls of the entrance hallway with rectangular panels of lacquered wood, placed like bricks, in offset rows (Fig. 1). The 450 lacquered bricks (*briques* as Gray referred to them) were interlinked in a stepwise or brick pattern and connected by vertical metal rods designed to create wall texture and a subdivision of space. The stepped brick concept evolved into a free-standing screen design when Gray exhibited two painted white brick screens at the 1923 Boudoir de Monte Carlo, *XIV Salon des Artistes Décorateurs.*

Figure 1 Entrance hallway of rue de Lota apartment, National Museum of Ireland. © Eileen Gray Archive/Eileen Gray NMIEG 2003.908.

Historic photographs (Victoria & Albert Museum Archive of Art and Design Eileen Gray Archives, AAD/9/63 – 1980) reveal that the screens were composed of 11 rows of interlinked, painted wooden bricks. Gray created a number of brick screens in her life starting with this specific design, repeating it again in the 1970s.

Gray employed Seizo Sugawara and Inagaki (known only by his last name in Gray's correspondence), two Japanese craftsmen living in Paris at the time, to fabricate her designs. Sugawara taught Gray the process of the traditional Japanese lacquer technique, detailing as many as 30 steps to produce the *urushi* lacquered surface. This labor-intensive process

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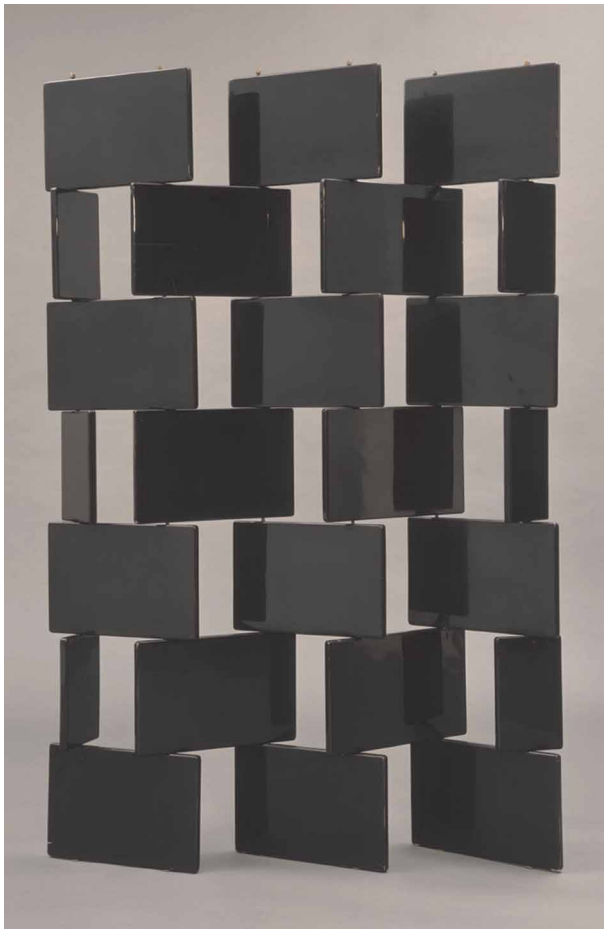

Figure 2 Eileen Gray Screen. Museum of Modern Art® Hector Guimard Fund.

involves the use of resin from a tree of the acacia family, *Rhu vernicifera*, native to China and Japan (Webb, 2000). Gray kept extensive journals on the historic *urushi* process, now housed in the archives of the National Art Library, London, UK, and the National Museum of Ireland Dublin, Republic of Ireland. She continued to collaborate on furniture projects with Sugawara for the next 20 years. During this period Gray opened a decorating shop, Jean Désert, located at 217 rue du Faubourg Saint-Honoré, selling her furniture and carpet designs (Constant, 2000). Although the shop was not profitable, it remained open for eight years until closing in 1930, an important date in Gray's career, marking an apparent hiatus in production of commercial work, which she would return to in the 1970s.

In 1978 the Museum of Modern Art (MoMA) acquired a brick screen for the exhibition *Eileen Gray Designer*, curated by J. Stewart Johnson (Fig. 2). The screen has been on view continually, except during MoMA's renovation in 2000–2004 when the screen was moved to the conservation department for study. This provided the opportunity for investigation and the evolution of a treatment strategy for MoMA's screen. Screen versions in other collections were also examined and compared, revealing contradictory and confusing physical characteristics. These findings brought to light the need for a search for relevant documents including journals, letters, receipts, and photographs to assemble a chronology of all the screens in this study.

Screen-by-screen assessment

The focus of this study is limited to four screens, one white and three black, and results of the assessment of these screens are summarized in Table 1. The following institutions currently own the screens used in this study: MoMA; Virginia Museum of Fine Arts (VMFA), Virginia, USA; National Museum of Ireland (NMI); and the DeLorenzo Gallery, New York, USA. Prior to research, it was assumed on the basis of existing information that all the screens were fabricated in the 1920s. When research began, anomalies surfaced which raised questions regarding fabrication, surface treatment, and dates of manufacture. Our research acknowledges that some screens studied were fabricated before 1930 yet assembled in the 1970s.

The white and black screens fall into three chronological categories: screens made prior to 1930; screens assembled during the 1970s; and screens fabricated in the 1970s. Although each screen's history is unique, the general manufacture of the screens can be best presented by examining key examples to provide an overall narrative of the development of the free-standing brick screen. The NMI screen falls into the category of manufacture prior to 1930, the DeLorenzo and MoMA screens were assembled in the 1970s from traditional *urushi* lacquered bricks, and the VMFA screen was completely fabricated in the 1970s.

NMI white screens

This has a composition of 10 rows of rectangular bricks with a right angle at the outer corners and a single chamfered edge. Connected by eight vertical round steel rods, these bricks are secured at the top with domed spanner nuts (Fig. 3).

This screen appears in two inventory lists in Gray's hand recording the contents of the Jean Désert's when it closed. One item on the first inventory list reads (AAD/9/20 – 1980); *'1 Paravent briques – 13 000. 2 Paravent Briques à -800*'. The second inventory list is titled (AAD/9/20 – 1980): *'Eisk es Meubles, à la boutique,*' at their original price with a strike through and then a second, reduced price: '2 *Paravent briques blancs F 750*. On 7 June 1935, Mrs Madeline Miller, owner of the Duncan Miller Gallery in London, requested that Gray ship two white screens to London, and suggested that Gray not bother to 'touch up' the surfaces 'because they will have to be

Table 1 Eileen Gray block screen comparison

Screen	Rows of bricks	Number of large bricks	Number of small bricks	Dimensions H × W × D in cm, large bricks	Dimensions H × W × D in cm, small bricks	Dimensions H × W × D in cm of relief	Corner	Edge profile	Finials/nut	Feet	Additional hardware: Spacers
MoMA black	7	18	6	40 × 26.5 × 2	16 × 26.5 × 2	N/A	Round	Round	Cap: 1 steel, 5 brass	Flat Metal Washer	N/A
V&A black	7	21	7	40 × 26.5 × 2	16 × 26.5 × 2	15.5 × 15.5 × 0.2 12: double relief 9: no relief	Round	Round	Cap: brass	Flat Metal Washer	Washer misc. dims.
DeLorenzo black	8	36	8	40 × 26.5 × 2	16 × 26.5 × 2	15 × 15 × 0.2 36: double relief	Round	Round	Spanner	Misc. Brass	N/A
Private collection (PC) 1 black	7	21	7	40 × 26.5 × 2	16 × 26.5 × 2	N/A	Round	Round	Cap	Flat Metal Washer	N/A
VMFA black	7	32	6	35.5 × 25 × 2	18 × 25 × 2	N/A	Square	Round	Stainless	Stainless 1.5 × 2	Washers metal and leather
PC 3 black	9	32	8	31.5–32 × 21.5 × 2	11 × 22 × 2	16 × 9.5 × 0.2 10: double relief 22: single relief	Square	Combination of chamfer double and single sides	Spanner	Misc. Brass	Washers
PC 2 black	9	32	8	32 × 22 × 1.5	11 × 22 × 2	16 × 10 × 0.3 32: double relief	Round	Round	Cap	Hexagonal nuts	Black spacers
NMI white	10	45	10	32.5 × 21.5 × 2	11 × 22 × 2	N/A	Square	Chamfer front	Spanner	Misc. Brass	N/A
PC 4 white	10	45	10	32.5 × 21.5 × 2	11 × 22 × 2	N/A	Square	Chamfer front	Spanner	Misc. Brass	N/A

N/A, not applicable.

Figure 3 Spanner nut from Eileen Gray Screen, DeLorenzo Gallery, New York. Image: R. Griffith.

Figure 4 Eileen Gray Screen. DeLorenzo Gallery, New York. Image: Chandler Strange.

done again' (AAD/9/11 – 1980). A letter dated 11 May 1936 states that the screens were displayed in the London store (AAD/9/11 – 1980). However, there is no record that the screens were purchased by Mrs Miller.

During the 1970s there is extensive correspondence between Gray and her niece Prunella Clough discussing everything from Gray's failing health to the production of new furnishings by Gray. Buried in this correspondence are invoices pertaining to screens made and/or re-lacquered by Pierre Bobot, a Parisian lacquer restorer whom Gray employed between 1971 and 1974. The letters account for a total of six brick screens produced from a combination of pre-existing wooden lacquer bricks, resurfaced bricks, and completely new bricks.

Bobot wrote that he had studied a large folding screen with 45 large bricks and 10 small bricks (NMI or screen Private Collection D), in order to fabricate an entirely new screen (Private Collection B) (AAD/9/170 – 1980). The only screens with 45 large bricks and 10 small bricks are the two white screens in this study. Bobot's working method typically included consultations with Gray on size, number of small and larger bricks, and the age of the bricks. If Bobot repaired or made entirely new bricks he did not use the traditional *urushi* lacquer. In sharp contrast to Sugawara and Inagaki, Gray wrote to Prunella, (National Museum of Ireland, Eileen Gray Archives (NMIEG) accession number 2003.308); 'Bobot says no one here uses oriental lacquer now', and noted that she had set up an appointment for the craftsman to bring samples of his work for her to view. Prunella's opinion and help in coordination and production of the screens was critical for Gray in the continuation of her designs. One can imagine Gray's reaction when Bobot sent her a quotation to resurface an original white screen in black synthetic lacquer, referring not to *urushi* but to a pigmented coating such as Japanning. Gray in concert with Prunella strongly recommended leaving the white screen alone as she was disappointed that Bobot no longer used traditional *urushi* (NMIEG 2003.308).

The last example of a screen at the NMI which was most probably constructed prior to 1930 is in a photograph of Gray's last architectural building project Lou Perou (AAD/9/20 – 1980), in St Tropez, France. This has a white screen in the living room, 10 rows high, indicating that the screen was reduced in height by one row (NMIEG 2003.281). This evidence supports and is consistent with the physical characteristics of the white screens produced before 1930.

DeLorenzo black screen

The DeLorenzo Gallery owns a black lacquer screen that is composed of a total of 44 bricks: 36 large and 8 small, arranged in eight rows (Fig. 4). The overall shape of each brick is rectangular, with rounded outer corners and edges which have a slightly rounded profile. This description also defines examples from MoMA, the VMFA, and Private Collection A. Raised relief applications attached to the surface with flat-head nails characterize the face of the larger bricks (Fig. 5). The lacquer coating is the last step in the manufacture of the bricks.

Figure 5 Detail: raised panel, Eileen Gray Screen, V&A. Image: R. Griffith.

The bricks are connected by eight vertical round steel rods, secured at the top with brass domed spanner nuts as found in Private Collection C and two white brick screens. An excellent example of this hardware can be found as a decorative element on the *Transat chair – Fauteuil Transatlintique* designed by Gray and produced in three prototypes in the late 1920s (Fauteuil Transatlantique; Transat chair. Eileen Gray. Museum number CIRC.578-1971 V&A).

MoMA black screen

This is composed of a total of 24 black bricks with no relief: 18 large and 6 small arranged in seven rows (Fig. 2). The hardware used on the MoMA screen is a threaded brass acorn nut (Fig. 3) at the top of each rod, unlike the hardware on the screens discussed above. The assemblage can be clearly traced to the 1970s. A letter dated 4 January 1972 describes the assembly as a folding screen with 18 large and 6 small bricks, including metal hardware (AAD/V&A 9/11 – 1980). In a typewritten note dated 23 March 1972 an inventory of the contents of Gray's apartment, lists a 'folding screen behind the curtains with 18 large, 6 small, without relief' (NMIEG 2003.262). This particular screen entered the Museum's collection on September 27, 1978.

VMFA black screen

The VMFA black screen has seven rows of 32 large and 6 small bricks, and it differs from all others in its dimensions and fabrication. Specifically, the mounting rod hardware is significantly larger, measuring 10 mm in diameter, and is made of stainless steel, where the other screens have mounting rod hardware of 7–8 mm diameter made of mild steel. This screen's rods are topped with decorative stainless steel fixtures and stand on stainless steel feet. Metal and leather spacers/washers have been added between the bricks, presumably to make up for minor discrepancies in the brick size and/or to allow the screen to move more freely. Because the metal rods pierce the bricks further from the vertical edge, the voids are smaller between the bricks and therefore create a unique positive/negative visual pattern.

Records indicate that this screen entered the VMFA collection in 1973, through Galerie Félix Marcilhac, and was not made by Bobot. The archival documents regarding this sale help us to date production to the 1970s and are consistent with our technical findings (Incoming documentation Museum of Modern Art registrar files. 1979). Again, Prunella Clough supported the ongoing production, writing to Gray that Marcilhac was negotiating the price with an American museum (Virginia Museum of Fine Arts Conservation Records). Her involvement with ongoing production cannot be ignored.

Technical investigation

The technical investigation of the four screens allows appreciation of the complexity of visually differentiating between the various screens and their respective materials. In a previous investigation in partnership with MoMA, samples from the first black layers of the MoMA screen were examined by pyrolysis gas chromatography mass–spectrometry (Py–GC–MS) and found to contain traditional *urushi* lacquer. Py–GC–MS identified *laccol*, the major component in *urushi* derived from *Rhus succedanea* (undertaken by Dr T. Miyakoshi of Meiji University). It is related to *Rhus vericifera*, which also grows in Japan and China, from which urushiol-based lacquer is obtained (Webb, 2000).

For the current investigation, samples for reflected light microscopy of cross sections, and examination by Fourier transform infrared microscopy (μFTIR) were obtained. Sampling was limited to the areas adjacent to damaged edges and drill holes at the top and bottom of several bricks. On average, a total of three samples were taken from separate bricks on each screen. The thickness of the layers may not be representative as it is likely that some of the lower layers may have been scraped down or may not reflect the average thickness of the layers. Py–GC–MS results from the MoMA screen support the findings of the autofluorescence examination of the coarse aggregate and associated traditional lacquer layers in other screens. For the screens examined in this study, a total of five have cross sections showing a sequence of layers consistent with *urushi* lacquer (Kuraku, 1988); these are MoMA, VMFA, DeLorenzo, and Private Collections A and B. The *urushi*-containing layers exhibited a minimum of three and a maximum of nine distinct layers. Found above traditional

urushi layers were contemporary layers containing alkyd, cellulose nitrate lacquer, and acrylic emulsion paint.

NMI white: fabricated in the 1920s, later repainted

Cross sections of the NMI white screen (Fig. 6A) reveal a minimum of two successive layers of white opaque paint. Each layer sits directly over a soiled layer, suggesting the layers were applied at two different times. Results from μFTIR suggest that the bottom layer contains oil – possibly with a natural resin – therefore alkyd and cellulose nitrate can be ruled out. The topmost layer (a recent repainting) contains coarse blue pigment particles mixed into the bulk of the white. A sample corresponding to this layer was analyzed by μFTIR and determined to be an acrylic emulsion paint.

MoMA black: fabricated in the 1920s and assembled in the 1970s

In the MoMA screen the stratigraphy characteristic of black *urushi* lacquer is observed (Fig. 6B). Starting from the bottom, there are two ground layers, each a warm ochre color, and with similar particulate distribution. Next is an opaque red-pigmented layer, containing particles of varying size, ranging from medium to light red. Following the red layer is a homogeneous, slightly transparent brown/black lacquer layer which autofluoresces under ultraviolet (UV) light. Over that sit two brown/black translucent layers containing small brown particles and round fluorescent globules (Baumeister, 2001). In visible light these two layers appear similar to the layer below; however, they do not fluoresce in UV light. The final layer is an opaque, thin, dense layer with finely ground particles (sharply contrasting with the thick translucent lower layers), identified by μFTIR and polarized light microscopy as cellulose nitrate and lamp black. The results for the analysis of the top layer confirm that these bricks were restored using a contemporary method, and most likely in the 1970s by Bobot.

DeLorenzo black: fabricated in the 1920s and assembled in the 1970s

In this sample (Fig. 6C), the lower layer is a single ground of similar color and particle distribution to that of the MoMA screen. The sample has a thin layer that appears dark under UV light. Following this are two distinct layers of *urushi* lacquer, which fluoresce under UV light and appear relatively free of inclusions. Upon visual examination, it is unclear how many layers make up each lacquer layer. From μFTIR, however, the top opaque layer clearly shows fine dense particles identified as cellulose nitrate with lamp black. The cellulose nitrate layer flows into the breaks or disruptions in the surface of the lower layers, suggesting that the brick was damaged and that the cellulose nitrate was used as a restoration material, most likely in the 1970s by Bobot.

Bobot's black restoration layers from the 1970s

The 'Bobot' restoration layers on the V&A screen (Fig. 6D) are composed of an opaque medium-gray layer, a homogeneous matrix of coarsely ground opaque and translucent particles, which were identified by μFTIR as calcium carbonate and barium sulfate. The top layer was observed to have a cellulose nitrate binder with lamp black as the colorant. This pattern of layers was observed on most of the black screens in this study. The 'Bobot' restoration layers are best illustrated by the sample from the VMFA (below). The DeLorenzo sample had no upper *urushi* lacquer layers. Instead on the top of the ground layer are three cool, thick gray layers with opaque and translucent inclusions, now dubbed the 'Bobot ground layers'. These preparation layers are not characteristic of the traditional *urushi* lacquer process but have not been fully characterized. On top of this is a thin layer of opaque dense black particles of lamp black tinting cellulose nitrate. These observed layers are consistent with what we know of Bobot's process of preparing old bricks, that is, resurfacing them to re-create luster.

VMFA black: fabricated and assembled in the 1970s

The VMFA samples (Fig. 6E) exhibit a white ground layer and a thick opaque black layer with small inclusions which fluoresce in UV light. The top layer was identified by μFTIR as an alkyd resin. The colorant was not characterized. Although treated in 1985, the treatment report does not record a varnish coating. It is possible that a thin wax coating was applied to even out the surface.

Discussion

One goal of the study was to determine whether the screens were fabricated before 1930, or refabricated later. Through analysis, the black brick screens have been divided into three categories based on microscopic observation of samples:

1. Traditional *urushi* lacquer underlayers followed by a thin contemporary surface layer;
2. Thick pigmented layers between early and recent layers;
3. Multilayered paint not involving traditional lacquer but instead a modern ground and finish coatings.

The irregularities found in the samples support Gray's practice of using old bricks to create the screens, but also of making new bricks if necessary, as well as making entirely new screens.

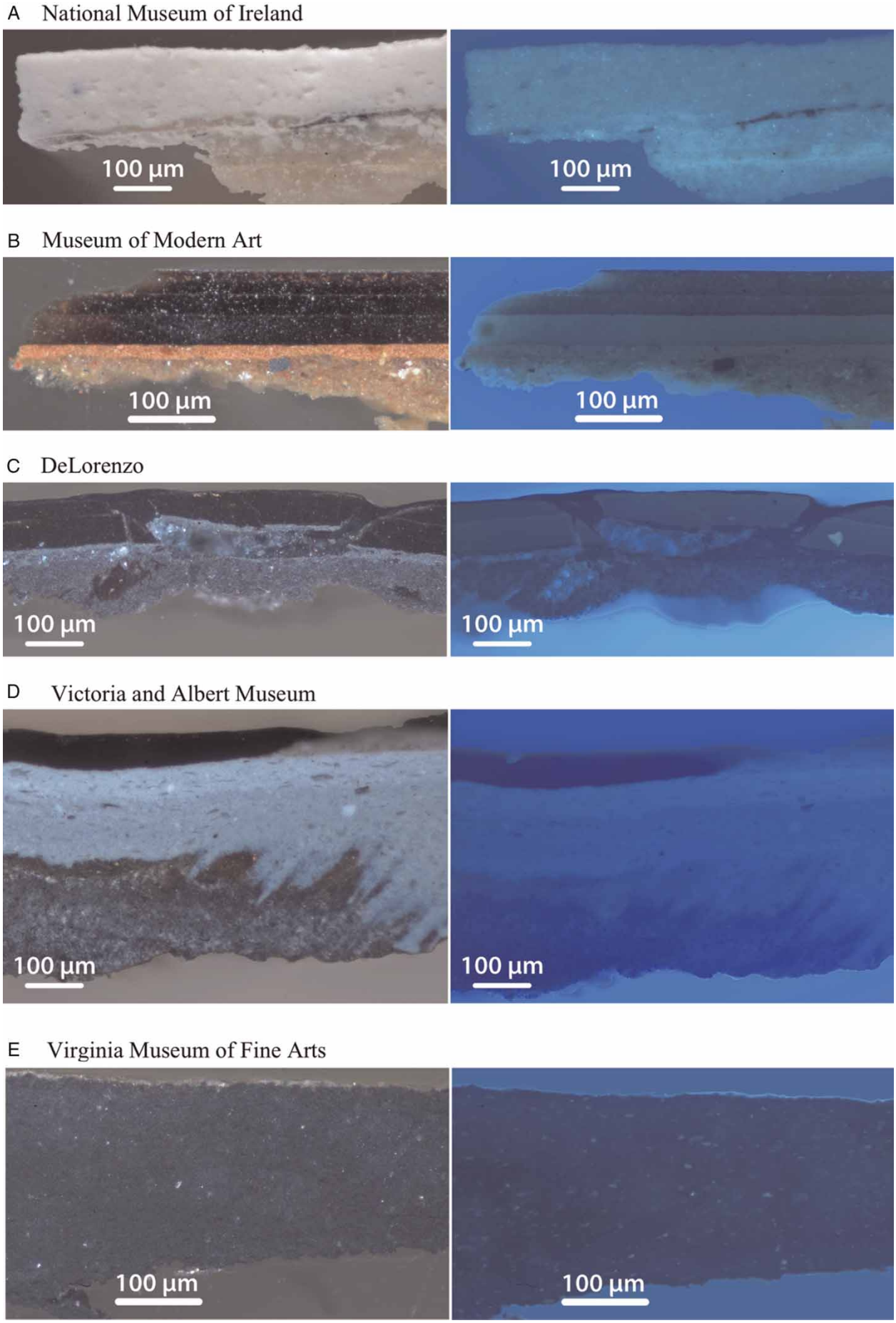

Figure 6 Cross sections. (A) White screen, NMI. (B) Black screen, MoMA. (C) Black screen, DeLorenzo Gallery, New York. (D) Black screen, V&A. (E) Black screen VMFA.

This study, involving research and extensive technical analyses has dispelled the uncertainties surrounding Gray's working methods. Along with her collaborators she was making, remaking, resurfacing (*lustrage*), and reassembling screens which were then sold to individuals and museums. Before undertaking this study, it was popularly believed that all of the screens were produced using the traditional *urushi* lacquer technique. Correspondence among Prunella Clough, Peter Adam, Félix Marcilhac, Pierre Bobot, and Eileen Gray, along with recent interviews with Gray scholars, help to focus a previously vague notion of the fabrication of the five black brick screens remade in the 1970s, and as the process behind the fabricated two new black brick screens fabricated in the 1970s using contemporary materials. Although the two white-painted screens have at least two distinct paint layers, it is not possible to date them accurately nor record their histories. These screens could be the 1923 Monte Carlo room screens, as analytical results identify oil and resin layers (oil enamel?) (Unsold, 2010). As the top layer of the MoMA example was characterized as an acrylic paint, it is likely that this screen was restored or repainted sometime after 1950 when it changed hands. Indeed, it has recently been confirmed that the NMI screen was painted using acrylic paint by Prunella Clough in her kitchen! (Adams, 2010).

Conclusion

Gray died at the age of 98 years on 31 October 1976. Throughout her life she worked assiduously, finding new materials, keeping her designs current and conversant with the times. Letters from Gray during the last decade of her life to her niece Prunella detail the production of the screens, their size, and color, whether they were made from old bricks or new and to whom they should be sold. Gray's family and collaborators enabled her to assemble, recreate, and find buyers for her now famous brick lacquer screens.

By analytically peeling back the layers of paint and lacquer – the layers of history – we can now verify the authenticity and refabrications of the design components of the screens in this study. Gray's signature screens, whether original or reworked, were all authorized by her. A framework for the characterization of Gray's screens based on the extent and chronology of restorations has been developed. Although these movable walls have been examined, exhibited, and discussed, few publications present the depth and detail of our study. These objects share anomalies and present a rich, complex field of material for future investigation. Each object is different, and their evolving style parallels the woman herself: original, unique, and at the forefront of the design world of her time.

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