

# Illuminating the Glass Box

## The Lighting Designs of Richard Kelly

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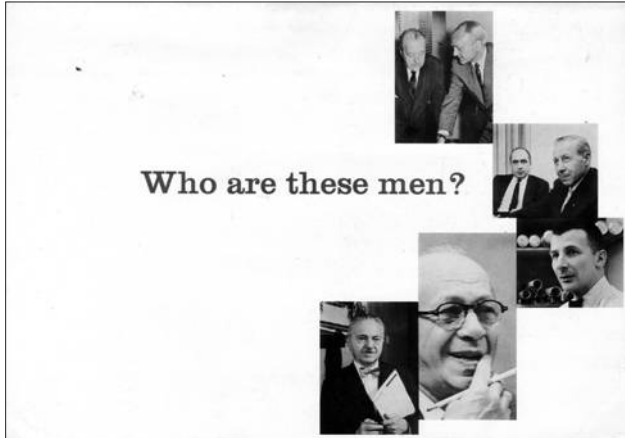
The House of Seagram is made of dream stuff: air and light as well as bronze and concrete. And it is light which makes the most spectacular contribution . . . by day for work, by night for drama.<sup>1</sup>

A promotional brochure celebrating the completion of the Seagram Building in spring 1957 features on its cover intense portraits of seven men bisected by a single line of bold text that asks, “Who are these Men?” The answer appears on the next page: “They Dreamed of a Tower of Light” (Figures 1, 2). Each photograph is reproduced with the respective man’s name and project credit: architects, Mies van der Rohe and Philip Johnson; associate architect, Eli Jacques Kahn; electrical contractor, Harry F. Fischbach; lighting consultant, Richard Kelly; and electrical engineer, Clifton E. Smith. To the right, a rendering of the new Seagram Tower anchors the composition, standing luminous against a star-speckled night sky; its glass walls and bronze mullions are transformed into a gossamer skin that reveals the tower’s structural skeleton. Lightolier, the contract lighting manufacturer, produced the brochure to promote its role in the lighting of the Seagram Building, but Lightolier’s promotional copy was not far from the truth.

At least two of the key personalities involved in the design of the Seagram Building, the architect Ludwig Mies van der Rohe and the lighting consultant Richard Kelly, had been interested in creating a “tower of light” for some time, albeit independently and for different reasons. Mies’s pro-

posals for such structures as the Friedrichstrasse skyscraper (Berlin, 1921) and the Adam Building on Leipziger Strasse (Berlin, 1928) both rely on glass’s reflective and transmissive qualities for aesthetic effect and compositional unity. An obvious correlation exists between the image in the Lightolier brochure of Seagram’s “tower of light” and Mies’s famous skyscraper proposals from the twenties, suggesting an aesthetic continuity from the unrealized glass edifices of his early career to the Seagram Building. Yet, while architectural historians have given much attention to Mies’s role in the planning and realization of the Seagram Building, the contribution of Richard Kelly and the lighting program are rarely discussed.<sup>2</sup>

My study of Kelly and his impact on the “look” of modern architecture asserts the importance of lighting design in the production and reception of modern architecture. Drawing on original materials from the Kelly Archive, this article expands on Dietrich Neumann’s seminal discussion of the illumination of the Seagram Building in *Architecture of the Night* by placing this building within the larger context of Kelly’s collaborations with Philip Johnson and Mies and the development of Kelly’s responses to the challenges of lighting modern architecture. Revisiting the history of iconic modernist buildings such as the Glass House, 860–880 Lake Shore Drive Apartments, and the Seagram Building, I argue that Kelly’s lighting programs significantly contributed to the appearance and performance of these buildings.<sup>3</sup>




**Figure 1** Lightolier, promotional brochure, produced for a special Seagram section of the *New York Times*, 7 Apr. 1957

**Figure 2** Lightolier, interior of brochure, showing a rendering of Seagram's "tower of light"


This advertisement appears in the special SEAGRAM section of the New York Times on Sunday, April 7, 1957

architects:  
**MIES  
VAN DER ROHE**  
  
**PHILIP  
JOHNSON**





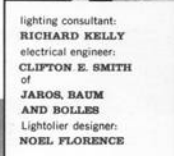
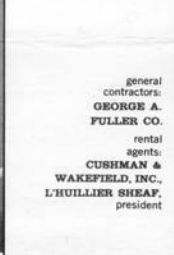

associate architect:  
**ELI JACQUES  
KAHN**  
of  
**KAHN AND  
JACOBS**

electrical contractor:  
**HARRY F.  
FISCHBACH**  
of  
**FISCHBACH AND  
MOORE,  
INCORPORATED.**



lighting consultant:  
**RICHARD KELLY**  
electrical engineer:  
**CLIFTON E. SMITH**  
of  
**JAROS, BAUM  
AND BOLLES**  
Lightolier designer:  
**NOEL FLORENCE**

general contractors:  
**GEORGE A.  
FULLER CO.**  
  
rental agents:  
**CUSHMAN &  
WAKEFIELD, INC.,**  
**L'HULLIER SHEAF,**  
president

**THEY DREAMED OF A TOWER OF LIGHT**

... lighting by **LIGHTOLIER**  
made their dream come true

The House of Seagram is made of dream stuff, air and light as well as bronze and concrete. And it is light which makes the most spectacular contribution... by day for work, by night for drama. This dream became a reality when Lightolier's engineers joined the Seagram design team. We devised a luminous ceiling where the space above the diffusers is not open, but enclosed in modular cells. This produces completely shadowless light and virtually eliminates sound transmission, via the ceiling, from one office to another. It is also easy to maintain, provides ample space for services like air conditioning and wiring. We can make a creative contribution to your illuminating problem too, whether your project is large or small. For consultation without obligation, call or write our Architectural Contract Division, 9 E. 36 St., New York, LE 2-2900.

**ARE YOU REMODELING?** The talents that went into the House of Seagram can be applied to any kind of job, large or small. And the results can be quite as gratifying. Call us and see.

A central figure in the field of architectural lighting design in the postwar era, Kelly persistently argued for the acceptance of lighting design as a distinct and essential element of any architectural program. Throughout his career, Kelly described light as the key mode through which one understands and experiences the designed environment. The Seagram Building offered him a rare opportunity to create a total lighting program, one that began in the initial planning stages of the building and developed in direct consultation with the principal architects. This project enabled Kelly to test his hypothesis by fully integrating his lighting concept throughout the structural components and aesthetic devices of the building, from executive offices to broom closets to the Four Seasons Restaurant in the lobby. In this respect, the Seagram Building realized Kelly's dream.

How Kelly commanded such a level of involvement in this project and how he arrived at his lighting program for the Seagram Building directly relates to his prior work on projects involving Mies and Johnson. During this period, roughly 1948 to 1958, Kelly's work and writing show an increasing closeness between his lighting schemes and the programmatic concepts of the designs with which he was involved. In the early projects with Mies and Johnson, Kelly popularized several important architectural lighting techniques that transformed the articulation and performance of space and structure, both internally and externally. Kelly's approach to lighting design also allowed a variety of emotive and decorative effects acceptable within the rationalized ethos of modern architecture. This article traces the development of Kelly's collaborations with Mies and Johnson, beginning with Johnson's Glass House (New Canaan, Connecticut, 1948–50), continuing with Mies's 860–880 Lake Shore Drive Apartments (Chicago, 1948–51), and finishing with their coproject, the Seagram Building (New York, 1954–58), and demonstrates the important role of lighting in realizing the aesthetic goals of Mies and Johnson.

### From Theater to Architecture: Illusionism and Abstraction

Like most of his contemporaries, Kelly's career in architectural lighting design began with an early interest in theatrical lighting. Moving to New York City from Zanesville, Ohio, in the late 1920s, Kelly enrolled at Columbia University and joined the theater department, for which he designed both lighting and stage sets.<sup>4</sup> After graduating from Columbia in 1932, Kelly began working with a number of architects and designers on a variety of retail, hospitality, and residential projects. In the period leading up to

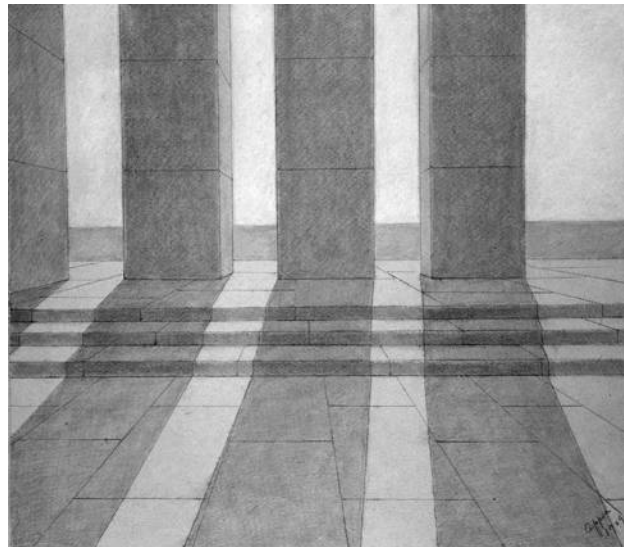


Figure 3 Adolphe Appia, *The Three Columns*, 1909

World War II, Kelly found that the stateside adoption of modern European building idioms and materials, especially glass, required new lighting technology and equipment as well as a thorough theoretical and tectonic understanding of the principles of modern architecture.<sup>5</sup> He believed that these requirements needed to be considered and new illumination solutions developed for modern American architecture to realize its full potential.

To increase his credibility and marketability within the architectural community, Kelly enrolled in the Yale University School of Architecture in 1942, graduating in 1944 with a bachelor's degree.<sup>6</sup> In addition to his architecture courses at Yale, Kelly studied with Stanley McCandless, a well-known theatrical and architectural lighting designer whose approach to stage design was informed by the modern theater reform movement first established by European designers Adolphe Appia and Edward Gordon Craig in the early decades of the twentieth century. Appia's designs for rhythmic space from the early 1900s illustrate the radical abstraction of traditional scenic elements into basic geometric forms and unadorned vertical and horizontal surfaces. In the rhythmic space composition *The Three Columns*, Appia proposes two horizontal surfaces joined by three steps, with three massive pillars occupying the upper horizontal surface (Figure 3). Long shadows emphasize the weight and imposing quality of these "columns." Reduced to such primary architectural elements, the stage could then be activated through the design and performance of light. Similarly, McCandless taught that the primary characteristics of light—

intensity, color, form, and movement—had a direct effect on sensual perception. He held that the studied combination and manipulation of these elements allowed the designer to determine the emotional and psychological experience of any individual within that environment.<sup>7</sup>

McCandless promoted the principles of modern theater not only in the practice of stagecraft, but also in architectural lighting design.<sup>8</sup> The principles of modern theater reform originally outlined by Appia and Craig called for a shift from illusionistic to abstract representation and from a focus on specificity of content to one of idealized form.<sup>9</sup> Appia argued that light was the most important plastic medium in theatrical design. In 1899 he wrote, “Without its unifying power our eyes would be able to perceive what objects were but not what they expressed.”<sup>10</sup> Both Appia and Craig believed that illusionism in theater caused disharmony between the two-dimensional “painted plasticity” of stage settings and the three-dimensional “real plasticity” of the actor and stage architecture. To resolve this disharmony, Appia proposed the use of “real” three-dimensional plastic volumes within the architecture and setting of the stage that could transform in appearance and importance with the use of form-giving light (*gestaltendes Licht*).<sup>11</sup> This approach to stagecraft aimed to create an abstract perceptual environment that would engage the audience directly with the experience of modernity not through illusion, but rather through a dematerialized reality and a unity of form and material expression.

If one compares this concept of modern theater with the contemporary discourse of modern architecture, a strong continuity between the two disciplines emerges. Architects and architectural critics from the mid-nineteenth century and well into the twentieth century strove to define an architecture appropriate to the conditions and materials of the modern age, similarly calling for a rejection of historical illusionism (as embodied by ornament in particular). Likewise, they advocated an abstraction of architectural forms and a plastic or volumetric approach to space to achieve an idealized, universal architecture.<sup>12</sup> Within the first several decades of the twentieth century, the overlapping interest of theater and architecture to define a new type of spatial expression found shared ground in the realm of lighting design. Designers such as McCandless and Kelly played critical roles as mediators and transmitters between the seemingly disparate fields of theater and architecture.

After graduating from Yale, Kelly used his architectural degree to distance himself from his prior theatrical lighting experience; consistently emphasizing his architectural training and accreditation, Kelly legitimized himself in the eyes of the architectural community. Yet, despite this strategic positioning, his approach to lighting design remained

strongly aligned with the teachings of some leading stagecraft and lighting designers of the modern theater movement.

By the latter 1940s, Kelly had developed a unique approach to lighting design that carefully considered the role of illumination in the articulation and performance of modern architecture. His strong belief in the capacity of designed light to control the perception and experience of space traces back to McCandless’s theories of lighting design.

An article Kelly wrote in 1950 for *Flair* magazine reveals his assimilation of McCandless’s theories and the refinement of his own distinct vocabulary. Emphasizing the phenomenological role of light in the apperception of the physical environment, Kelly argued that simple lighting effects appeal to instinctual responses. Furthermore, he suggested that the most complex and profound illumination solutions could activate creative or intellectual responses.<sup>13</sup> He wrote, “Planned lighting is an art; it is not nature, but the artificial control of selected natural elements. Light and seeing are inseparable conceptions. We in fact make what we see by making things visible, and we make them appear and disappear to suit the nuances of our desires.”<sup>14</sup> Kelly presented light as the primary architectural material of emotive potential and believed it largely determined the perception of architectural space and proportions:

The rooms of a house can be connected more closely or further separated by emphasis on similarity or on a change of character; by a succession of focal points; by a continuous line of emphasis, created by the lighted corridor . . . a sweep of wall washed by cool lights; or by exaggerated attractions at the end of the vistas. . . . [The] far reaches of a pleasant room can lead the imagination beyond the ordinary boundaries of the room.<sup>15</sup>

The blending of Kelly’s theatrical and architectural experience is apparent in this passage. Kelly’s suggestion to “lead the imagination” beyond the “boundaries of the room” with various lighting effects is remarkably similar to the desire of modern theater designers to transcend psychically the boundaries of the stage. Just as Appia and Craig had sought to reform the conceptions and practice of stagecraft with the use of flexible, abstract light, Kelly argued for a new definition of architecture that called for the manifestation of architectural abstraction through lighting design, where the physicality of the architectonics could be manipulated to shape specific experiences within the designed environment.

While Kelly devoted much time and energy to developing his theories of the phenomenological and performative properties of light, he also actively applied his principles to the practical architectural integration of light. Within six years of graduating from the Yale School of Architecture,



**Figure 4** Richard Neutra, architect; Richard Kelly, lighting design; Kaufmann House, Palm Springs, Calif., 1947

Kelly had completed over thirty commercial projects and as least as many private residences, including the lighting for Tiffany & Co. (New York, 1938), the Stork Club Cub Room (New York, 1940), Richard Neutra's Edgar J. Kaufmann Sr. House (Palm Springs, California, 1947), Bonwit Teller (New York, 1948, and Boston, 1949), and the Container Corporation of America's executive offices (Chicago, 1949). In particular, Kelly's lighting program for Neutra's Kaufmann House illustrates his early experimentation with illumination techniques he would successfully develop in the following decade, including a luminous ceiling, luminous walls, and perimeter downlighting (Figure 4).<sup>16</sup>

During this productive period, Kelly first collaborated with Philip Johnson on the Glass House.<sup>17</sup> The lighting scheme for this residence functionally and ideologically illustrates Kelly's theories regarding the role of lighting design in modern architecture and introduces many illumination methods that would characterize his later projects.

### The Glass House

Philip Johnson designed his first major architectural project, a 56-by-32-foot glass pavilion, for a secluded wooded plot in New Canaan, Connecticut. Intended to serve as his weekend retreat, this project became a glass and steel manifesto of Johnson's definition of modern architecture. As described by Alfred Barr in the preface of their copublica-

tion of 1932, *The International Style*, the three distinguishing principles of modern architecture included: "Emphasis upon volume—space enclosed by thin planes or surfaces as opposed to the suggestion of mass and solidity; regularity as opposed to symmetry or other kinds of obvious balance; and, lastly, dependence upon the intrinsic elegance of materials, technical perfection, and fine proportions, as opposed to applied ornament."<sup>18</sup> These principles, not surprisingly, neatly summarize the formal characteristics of the Glass House as well. They underlie Johnson's choice of clear-glass cladding for the entire perimeter of the house, the exacting precision and regularity of the structure's massing, and the emphatic avoidance of any historicizing detailing, as well as the treatment of the electric lighting for the project.

In 1948, early in the planning stages of the Glass House, Johnson approached Kelly with his concern regarding the problem of glare and the challenge of after-dark illumination in an all-glass enclosure.<sup>19</sup> Johnson described his concept for the house: "My plan was first of all a shelter, which is the goal of every home. But having used transparent walls to enclose myself within a decorative landscape, instead of hiding behind conventional walls, I wanted to enjoy that environment at night. I didn't want to clutter the place with drapes and shut myself in. Neither did I want to live in a goldfish bowl."<sup>20</sup> Seeking assistance, Johnson asked Kelly to develop a lighting program for the house. After evaluating Johnson's concept and plan, Kelly suggested that



**Figure 5** Philip Johnson, architect; Richard Kelly, lighting design; Glass House, New Canaan, Conn., 1949, night view. Photograph ca.1960

the house be illuminated from “the outside in,” a novel but costly and inefficient solution. Unconvinced of the merits of this program, Johnson decided to design the lighting for the Glass House himself. However, unable to eliminate the sharp glare and reflections on the blacked-out glass after dark and finally reducing his total lighting scheme to six taper candles, Johnson failed. His inability to adapt traditional lighting technologies initially kept the Glass House from fulfilling his ideal of a functional modernist residence.

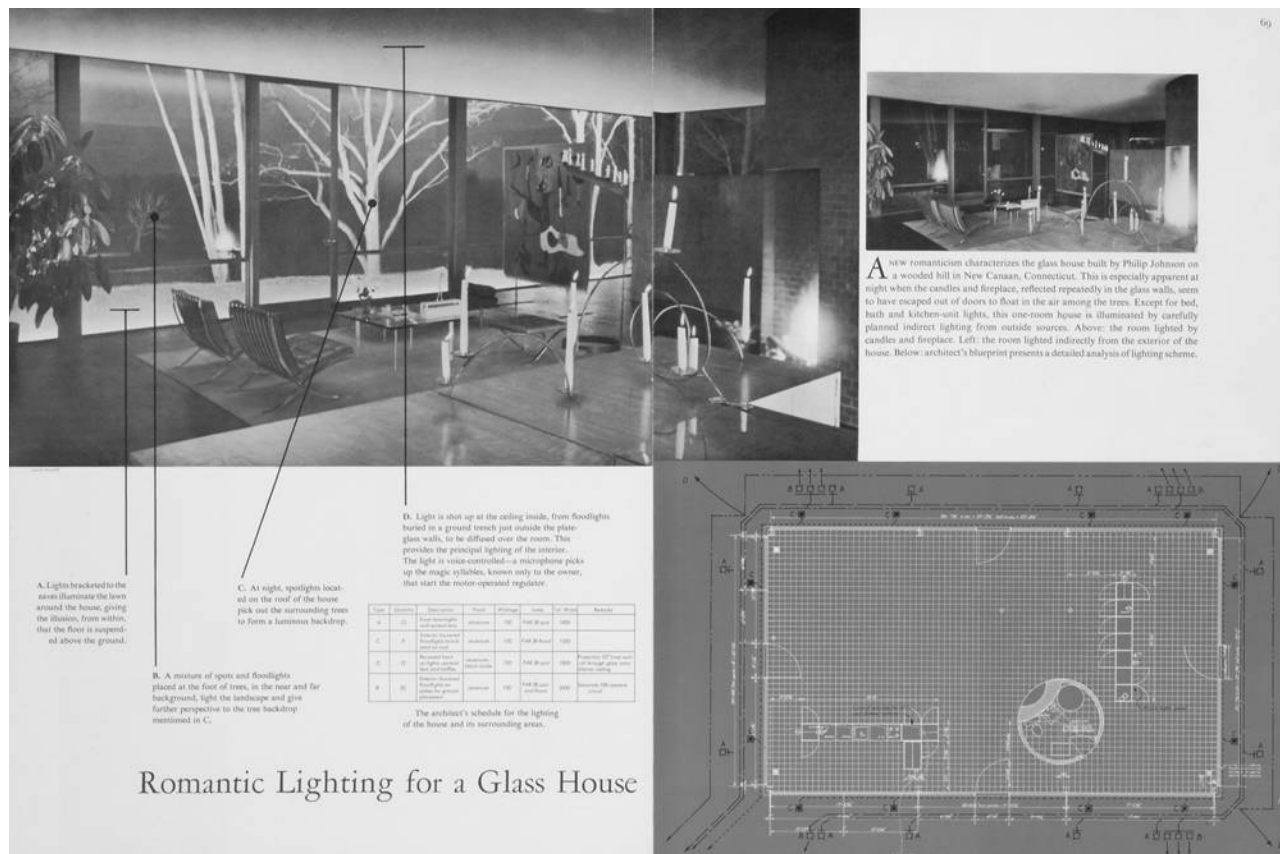
When Johnson and Kelly came together in 1950 for the remodeling of John D. Rockefeller III’s Manhattan townhouse, Johnson again sought Kelly’s advice on the illumination of the Glass House. Kelly returned to his original concept for Johnson’s design, explaining that the best way to effectively illuminate the interior of the structure without incurring the problem of glare and reflection was to illuminate the exterior. In this way, Kelly argued, the interior would be illuminated indirectly and the glass would retain the desired transparency. Moreover, he suggested that following his program, the glass walls would not only serve as transparent protection from outside elements but also as frames for planned compositions made visible through select nighttime illumination of the landscape. In this way, the external illumination would serve a two-fold purpose: one of fitness, allowing continued transparency of the glass at night, and one of aesthetics, creating decorative scenery from the surrounding environment. As Kelly explained,

There have been a great many more glass houses . . . where the indoors mean nothing after twilight without carefully plan-

ning of artificial light. The entire idea of the use of glass to this extent was to relate the outside [to] the inside, and we have found by experiment that when we do not have the outside lighted properly the inside is a bleak, separated hole. On the other hand, when you at evening try to use the glass as it was intended to be used, as the cushion between the outdoors and the indoors, it is very easily possible to make the surrounding scenery the wallpaper of the home.<sup>21</sup>

Employing his unique approach, Kelly presented a program completely aligned with Johnson’s architectural concept. Johnson’s original plans had no permanent lighting fixtures to interrupt the interior architectural volume or the transparency of the glass walls.<sup>22</sup> Flat, contiguous surfaces characterized the interior and the exterior; no allowances were made in the original dwelling for ceiling or wall-mounted fixtures. Kelly maintained the character of this design, the clarity of the glass, and the rigor of the architectural structure by devising a lighting scheme comprised entirely of hidden and indirect lighting sources, successfully illuminating the interior of the enclosure without a single visible fixture.<sup>23</sup>

To achieve the desired effects, Kelly positioned powerful lights in regular intervals along the cornice to illuminate a strip of lawn on the perimeter of the building. After dark these lights created a band of highly illuminated grass around the house, forming a light-frame for the structure, emphasizing the footprint of the pavilion and defining the Glass House against the landscape (Figure 5).<sup>24</sup> The intensity of this light-frame on the lawn also made the floor of



**Figure 6** The Glass House illustrated in *Flair*, 1950; upper left, interior with Kelly's lighting program; upper right, interior without Kelly's lighting program; lower right, lighting plan

the pavilion appear to be suspended above the ground. Outside the glass walls, floodlights buried in a trench surrounding the house directed strong beams of light onto the interior ceiling, providing soft diffused illumination that served as the principal and functional lighting for the interior. To create the “wallpaper” for the Glass House, Kelly drew from the natural site, placing individual spot- and floodlights at the base of selected trees in the near and far ground, and he mounted spotlights on the roof to accent certain trees from above (Figure 6). Kelly described this effect as similar to that “in Japanese prints where the wallpaper (or in this case, the landscape) has been rendered more distant in the three-dimensions by five different levels of illumination.”<sup>25</sup>

As an added benefit, Kelly's multilevel approach allowed Johnson to maintain twenty-four-hour control of the visual space of the Glass House. Day or night, as occupant of the house, Johnson retained the primary power of the gaze. After dark, the perimeter downlighting of the lawn

and the landscape illumination cast soft reflections on the outside of the glass, camouflaging those inside the Glass House from unwanted observation. With privacy as a persistent issue for modern glass-walled houses, the visual screening of the interior with exterior nighttime illumination was an important effect that directly impacted the performance of the architecture. The after-dark illumination allowed the glass to remain transparent inside the pavilion by mimicking the effects of natural daylight on the exterior of the glass. Kelly's lighting scheme enabled Johnson to survey the surrounding environment without exposing himself to unwelcome exterior observation. The lighting design eliminated the need for drapes and the unease of feeling as if “in a goldfish bowl” or of being on display. Kelly's lighting program permitted Johnson to control the appearance, performance, and importantly, the experience of the Glass House.<sup>26</sup> After dark he could gaze over the domain of his “decorative” landscape from the serenity of his glass pavilion without threat of unwanted exterior surveillance.<sup>27</sup>

### Mies's Early Experiments with an Architecture of Light

In early 1950, around the same time as the Glass House project, Kelly began working with Mies van der Rohe on the 860–880 Lake Shore Drive Apartments (1948–51), two vertical glass-and-steel boxes constructed on the edge of Lake Michigan in a prestigious area of Chicago. These apartment towers represented an opportunity for Mies to realize his long-held architectural ideal—the modern glass skyscraper. Throughout Mies's early career, unfavorable economic and political circumstances in Europe limited much of the architect's work to hypothetical projects and proposals.<sup>28</sup> After World War I and throughout the first half of the 1920s, Mies published a number of architectural manifestoes and theoretical projects. In his first publication, which appeared in 1922 in the journal *Frühlicht* edited by Bruno Taut, Mies presented two designs for glass-sheathed steel towers accompanied by an uncompromising statement of glass's role in modern architecture. Mies suggested that glass, employed as a transparent cladding material, would allow the unobstructed expression of “the constructive thought” inherent in the exposed architectural skeleton.<sup>29</sup> However, in both of these early designs there is a significant contradiction between Mies's architectural rhetoric and the pragmatic construction conditions of his proposed buildings. Although Mies proclaims unambiguously in the *Frühlicht* essay that glass-sheathed skyscrapers offer unobstructed views of their structures, this is not unconditionally true.<sup>30</sup> Glare and reflection frequently obscure the visual penetration of glass-sheathed structures—both by day and by night—and it is after dark that these conditions can be modulated or controlled with the use of electric light. Furthermore, in Mies's renderings of the Friedrichstrasse skyscraper, daytime reflections obscure the majority of the façade, hiding—not revealing—the building's exact structural system.<sup>31</sup>

Despite the inconsistencies between text and drawing, Mies did consider the reflective and projective qualities of natural and artificial light as well as their effects on the appearance and performance of modern architecture.<sup>32</sup> For example, in a draft of a letter from 1928, Mies outlined his concept for the Leipziger Strasse Adam department store, placing special emphasis on the importance of lighting in the overall function and success of this project:

May I say in all frankness that in my opinion a building has nothing to do with taste but must be the logical result of all requirements that result from its purpose. . . . You need layered floor levels with clear uncluttered spaces. Furthermore you need much light. You need publicity and more publicity. . . . I therefore

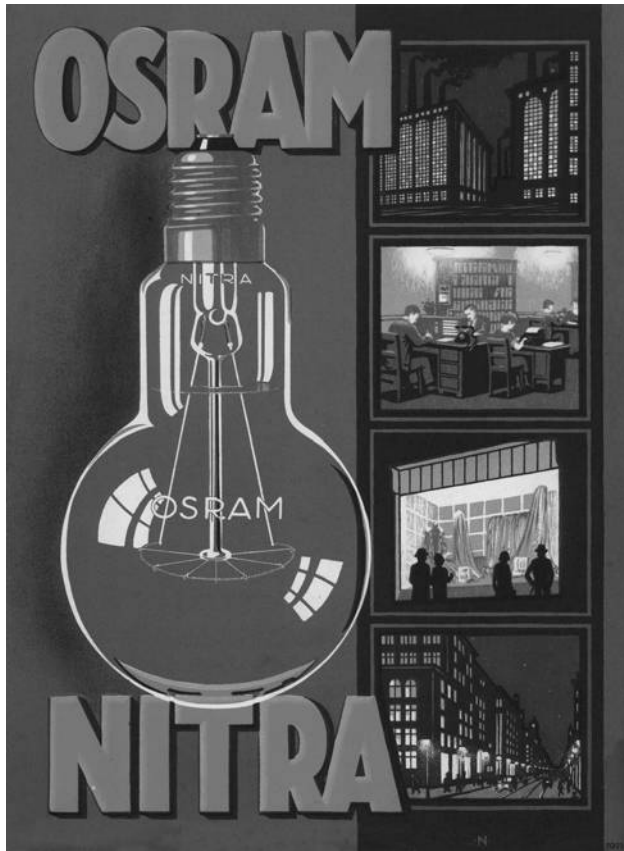
suggest to you making the skin of your building of glass and stainless steel, with the bottom floor of transparent glass, the others of opaque glass. Walls of opaque glass give the rooms a wonderfully mild but bright and even illumination. In the evening it represents a powerful body of light and you have no difficulties in affixing advertising. . . . [Such] brightly lit advertising on an evenly illuminated background will have a fairytale effect.<sup>33</sup>

In this letter, Mies references the complex interrelations of glass, light, and luminosity, both within the department store and from the vantage point of Leipziger Strasse. He discusses the use of translucent glass to diffuse daylight throughout the interior space of the building as well as to create a “powerful” backdrop for nighttime advertisements.

It is hardly surprising that Mies would suggest such a “publicity” strategy considering the discourse on *Lichtarchitektur* (architecture of light) and *Lichtreklame* (light advertising) in Berlin during the 1920s.<sup>34</sup> Throughout the Weimar era, there was much interest in the use of artificial light to capture the attention of the overstimulated urban dweller. Artists, architects, and civic leaders alike called for the use of artificial light to transform architecture after dark into expressive, mutable surfaces that actively engaged the mass culture of the streets.<sup>35</sup> An advertisement for Osram, a leading German electric lamp manufacturer, illustrates the important presence of electric light in the nightscape of German metropolitan centers in the late 1920s (Figure 7).<sup>36</sup> The ad features an enormous electric Osram bulb flanked by four vignettes. One vignette depicts a shop window flooded with light and framed by the silhouetted bodies of mesmerized evening strollers, while another shows a wider perspective of a busy, brightly lit urban street with glowing streetlights and storefronts. Indeed, many Weimar architects advocating *Lichtarchitektur* felt that buildings should be conceived as diurnal compositions, with the nighttime appearance of equal—if not greater—importance than that of the daytime.<sup>37</sup> *Lichtarchitektur* developed in a reciprocal relationship with the “architecture of pure façade,” as electric light illuminated, celebrated, and promoted this newly freed façade. Electric illumination could simultaneously focus attention on the surface and emphasize the structural geometry of the modern building.

The use of light to bring attention and clarity to architectural compositions has another important precedent—a physically realized example—in Mies's early career: the German Pavilion at the Barcelona World's Fair of 1929. For this structure, Mies designed an illuminated double wall of translucent glass that served as the pavilion's only evening light source.<sup>38</sup> Undoubtedly, the solemnity and structural containment of this white light was emphasized further by





**Figure 7** Advertisement for Osram Nitra electric light bulbs, late 1920s

its contrast to the vivid colored lights and illuminated fountains featured across the fairgrounds after dark. Mies's glowing white wall carried the fluidity and weightlessness of the building's composition into the nighttime experience of the German Pavilion. Importantly, this early suggestion of an illuminated core is fully realized in both Mies's designs for the 860–880 Lake Shore Drive Apartments and the Seagram Building.

### The 860–880 Lake Shore Drive Apartments and the Luminous Core

Unable to realize his glass skyscrapers in Europe, Mies revived these architectural proposals during the postwar building boom in North America. Like many other European artists, designers, and architects, Mies immigrated to the United States shortly before World War II. Settling in Chicago in 1938, Mies accepted the appointment of director of the Architecture Department at the Armour Institute and reestablished his private architectural practice.<sup>39</sup> After

roughly ten years in America, Mies began a working relationship with the Chicago real estate developer Herbert Greenwald, agreeing to collaborate on three proposed projects beginning in 1946.<sup>40</sup> With these projects, Greenwald looked to expand his properties northward along a prestigious stretch of Lake Michigan's shoreline. Among the three schemes, the Delaware, later known as the 860–880 Lake Shore Drive Apartments, offered Mies the greatest potential to realize his ideal of the glass and steel tower.<sup>41</sup>

For this project, Mies proposed an original program consisting of a plaza and two twenty-six-story towers. Approaching the design of the site and the buildings as an integrated whole composed of solid and void, he situated the towers on a shared travertine plinth and raised them on columns, creating a single open terrace with a canopied space beneath each building (Figures 8, 9).<sup>42</sup> The thick steel-faced columns supporting the towers reinforced the impression of the externalized architectural skeleton while simultaneously defying the optical gravity of the soaring towers. Especially after dark, artificial light emphasized and sustained the appearance of weightlessness, which underscored the dematerialization of the wall enclosure. At the 860–880 Lake Shore Drive Apartments, Mies employed artificial light to accentuate the tectonics of column and load as well as optically organize and unify the architectural composition (Figure 10).

As he had done with the luminous wall of the German Pavilion in Barcelona, Mies chose translucent glass to enclose the core of the ground and mezzanine floors of the Lake Shore Drive apartments. Some have explained this decision as utilitarian, arguing that Mies selected semi-opaque glass to hide unsightly service areas located in the core of each building.<sup>43</sup> This reasoning, while no doubt partially correct, overlooks the significant implications of Mies's decision to use translucent glass. Any opaque material would have sufficed if Mies's only concern was the visual camouflage of the service areas.<sup>44</sup> However, an evenly and brightly illuminated central core, uninterrupted by any interior services or articulations, preserved the optical purity and volumetric integrity of the tower's structure. Furthermore, the glowing core provided a perfect backdrop for the load-bearing columns, themselves visual extensions of the steel I-beams that traced the structural logic of the towers on their glass façades. Although these I-beams had little structural purpose, they served to express the inner composition of the steel-frame construction. Thus by silhouetting each tower's perimeter-support columns against the high luminosity of the central service core, Mies called attention to the rhythm and geometric uniformity of the I-beams. This shadow play of light, structure, and load



**Figure 8** (top left) Ludwig Mies van der Rohe, 860–880 Lake Shore Drive Apartments, Chicago, 1948–51, view of towers from Lake Michigan

**Figure 9** (top right) 860–880 Lake Shore Drive Apartments, view of plaza and shared canopy

**Figure 10** Richard Kelly, lighting design, 860–880 Lake Shore Drive Apartments, night view of towers from the city

emphasized—even advertised—the essence of the building’s “skeletal” construction. Illuminating the core of each tower, Mies materialized and projected his “constructive thought” in a subliminal manner.<sup>45</sup>

A telegram from Mies to Kelly on 22 February 1950 offers insight into their collaboration and the design of the illuminated core and plaza at the Lake Shore Drive apartments. In this message, Mies indicated that he was “anxiously awaiting” Kelly’s lighting-program recommendations for the two towers.<sup>46</sup> Kelly’s detailed response to Mies’s telegram provides a glimpse into the design process of both men and shows how Kelly translated Mies’s architectural concept for the 860–880 Lake Shore Drive Apartments into a lighting program for the public areas of the project. Responding to Mies’s inquiry, Kelly wrote:

I have, of course, held to your idea of lighting the obscure glass walls and still believe, very much, in downlighting from the soffits of the two ends of each building. After developing the lighting of the glass walls, it became possible and I think advisable to use linear highly concentrated downlights under these outside instead of the row of individual recessed spotlights I suggested in Chicago for the sake of unity of light quality, color and to some extent appearance of installation, though my preference for this end-lighting is primarily one of fitness. With your conception of the buildings, this linear projection of light on the ground and terrace makes apparent the open continuity of space under the buildings, makes a pleasant outlook from the lounges and also lights the ramp for underground traffic.<sup>47</sup>

Precedent for Kelly’s suggestion to place concentrated downlights in the end soffits of either building can be found in his lighting program for Johnson’s Glass House, where Kelly demonstrated the need to illuminate the perimeter of the glass-enclosed volume after dark to control the glass’s transparency. Once again, Kelly created a light-frame using concentrated downlighting around the perimeter, thereby delineating the towers’ footprints and focusing attention on the structures’ glowing cores. This solution also emphasized the slender void between the two towers, defining each tower as autonomous while preserving the unity of the total composition. With the Lake Shore Drive apartments, Kelly refined his earlier solution, not only satisfying the practical requirements of material and site, but achieving a clear spatial composition and visual organization of public space.

In the same letter, Kelly described his recommendations for the illumination of the buildings’ cores: “As noted, commissary lighting must be restricted to downlighting and shielded local lighting to prevent its spilling in any noticeable way, patterns, patches, etc., on the obscure glass walls

and thus spoiling the smooth exterior wash of light on these walls from above.”<sup>48</sup> Kelly was particularly concerned with the difficulties of illuminating the semi-opaque glass of the core with an even “wash” of light from top to bottom, as it was essential to the presentation of the space and to the precision of the overall luminous composition.<sup>49</sup> To provide a sharp silhouette for the support columns and create the optical impression of weightlessness for the towers, light needed to be distributed evenly across the surfaces of their translucent glass-enclosed cores. In order to achieve the desired effect, Kelly suggested a customized solution: “I had in mind one lens made from a privately owned mold by Corning which works to much greater effect than the commercial ones on the open market and is of similar low cost though I do suggest some hand grinding after molding as the additional cost is minor compared to the difference in performance.”<sup>50</sup>

The Lake Shore Drive apartments advanced architectural lighting design, not only in terms of the aesthetic integration of light into the architectural program, but also in developing new illumination technologies. The suggestion to use a privately owned mold indicates the innovative nature of Kelly’s approach to lighting design as well as his refusal to adapt his vision to readily available lighting solutions. Kelly wished to illuminate the entire length and height of the core’s obscure glass walls to appear as a continuous wash of light. The private Corning lens he mentioned was specially designed to project a light beam downward with the luminosity and intensity necessary to evenly cover the entire height of the wall. The hand grinding created better diffusion and eliminated shadow lines between horizontal bulb joins.<sup>51</sup> Kelly’s lighting program for the 860–880 Lake Shore Drive Apartments helped establish standards for wall-washing illumination—an aesthetic device that became ubiquitous in modern architecture during the next two decades, particularly in corporate lobbies and prestigious public spaces.<sup>52</sup>

At the Lake Shore Drive apartments, Kelly articulated Mies’s vision of a glowing core, translating the concept of the luminous plaza into three-dimensional space. Compositionally offset by the dark lines of the vertical support columns and the intersecting horizontal band of the first-floor service area, the illuminated core is a vivid expression of Miesian tectonics (Figure 11). Kelly’s recommendations for this area confirm that Mies’s choice of translucent glass was the result of complex ideological and aesthetic goals, not simply to camouflage the service areas. This important point has been omitted from previous histories of the 860–880 Lake Shore Drive Apartments, yet the glowing core was critical to Mies’s concept for the project and recurs

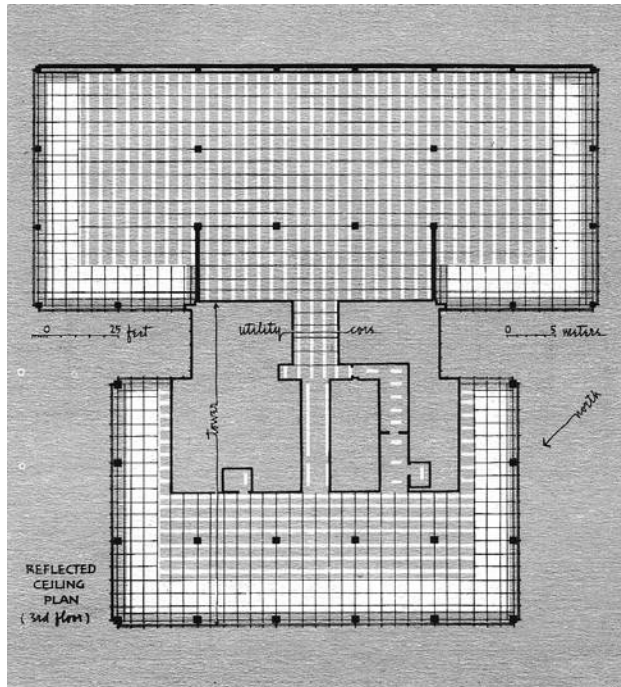


**Figure 11** 860–880 Lake Shore Drive Apartments, night view of glowing core and lobby

as a programmatic device throughout Mies's career.<sup>53</sup> Traditional architectural histories generally have overlooked the aesthetic tools with which Mies called attention to the well-celebrated structural clarity and dignified proportions of his projects. In many cases this has as much to do with architectural special effects, such as those provided by lighting, as it does with the tectonics of construction. Indeed, at the Lake Shore Drive apartments, the lighting scheme for the lobby and plaza level was central to the presentation of Mies's architectural ideal, dramatically framing and projecting the logic of the towers' skeletal construction and controlling the optical experience of the plaza and lobbies after dark.

### **Seagram's "Tower of Light" and the Luminous Ceiling**

Three years after the completion of the 860–880 Lake Shore Drive Apartments, Mies, Johnson, and Kelly began collaborating on the design of the Seagram Building (1954–57), the prestigious new headquarters for the Seagram Corporation located on New York City's Park Avenue. Like its Chicago predecessor, the Seagram Building represented a further refinement of Mies's glass-tower ideal: a structural core surrounded by a glass envelope, balanced on heavy columns atop a substantial granite plinth. Unlike the residential Lake Shore Drive apartments, the Seagram Building embodied one of the most significant statements of



**Figure 12** Richard Kelly, lighting design, plan of the luminous ceiling for the Seagram Building, ca. 1957

the corporatization of modern architecture in the United States. It was Mies's first building in New York City and the most expensive office tower built to that date.<sup>54</sup> A monumental glass and steel tower characterized by the use of the finest materials and customized fittings, including amber glass, bronze-sheathed I-beams, travertine-wrapped elevator banks, and luminous ceilings, the Seagram Building personified the ideal of "corporate magnificence" in the mid-century era, setting a rarified example that many would imitate in the following decades.<sup>55</sup>

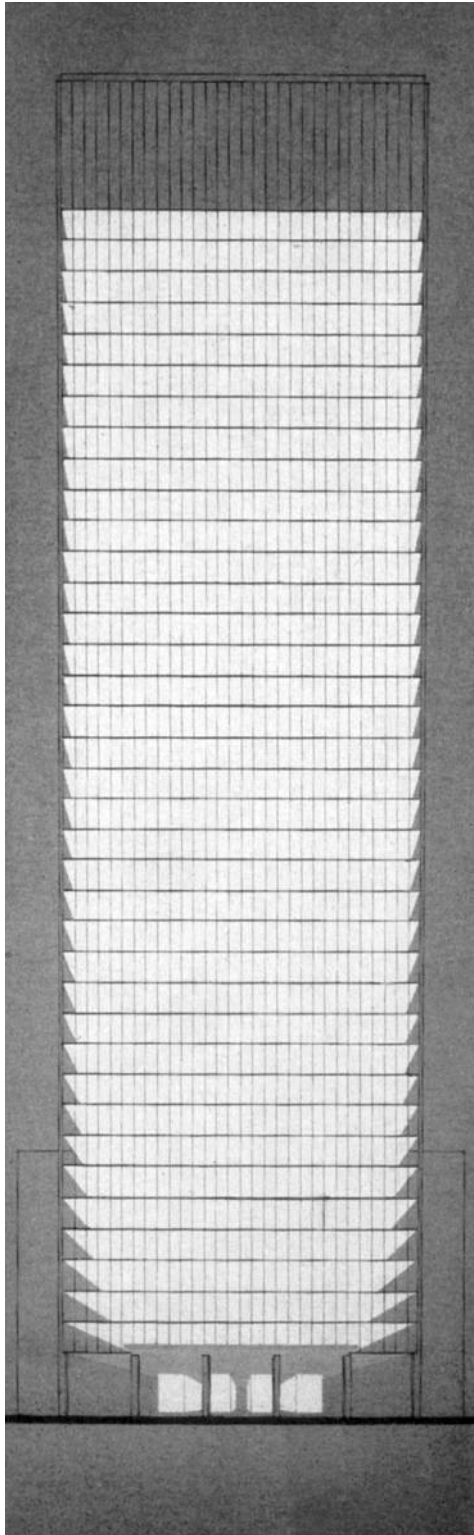
The Seagram Building's nighttime lighting program was a key component in the imaging of modern corporate magnificence and in promoting Seagram's monolithic new tower.<sup>56</sup> Widely heralded as a gleaming "tower of light," the Seagram Building showcased a tightly integrated lighting program that functioned on both a practical and symbolic level. Central to Seagram's lighting scheme was the interior luminous ceiling that extended from the second to the thirty-eighth floor in a twenty-foot band from the glass curtain wall inward. As illustrated in the reflected ceiling plan, the band of luminous ceiling hugs the perimeter of the building, serving primarily as an aesthetic device for the benefit of viewers outside the tower (Figure 12). While the luminous ceiling provided the functional lighting for the executive offices throughout the day, the full aesthetic

impact of the ceiling was most apparent after dusk when it provided the "tower of light" effect. This glowing luminosity was critical to the presentation of the Seagram Building and, in particular, to its promotion in the popular media and architectural journals, as exemplified in the "tower of light" rendering of the Seagram Building that accompanied a February 1957 article in *Architectural Forum* and Lightolier's promotional materials (Figure 13; see Figure 2).

The meticulous uniformity and appearance of the Seagram Building owes much to the tower's lighting program and Kelly's collaboration on the project. An article in the *International Lighting Review* published three years after the completion of the Seagram Building called attention to the "specially designed and engineered luminous ceiling system created by Lightolier, Inc. The ceiling which glows at night as well as during the day . . . introduces several new concepts in architectural lighting."<sup>57</sup> As the article details, Seagram's lighting system contained 52-inch-square translucent vinyl diffuser panels in an anodized aluminum-trimmed modular grid that were configured to correspond exactly with those of the exterior bay structure.<sup>58</sup> Kelly worked in consultation with Lightolier's head engineer Noel Florence to develop panels emitting a nondirectional light pattern that would provide the most "natural" illumination possible.<sup>59</sup> This soft, diffuse illumination emphasized the grid's superstructure rather than the light source.

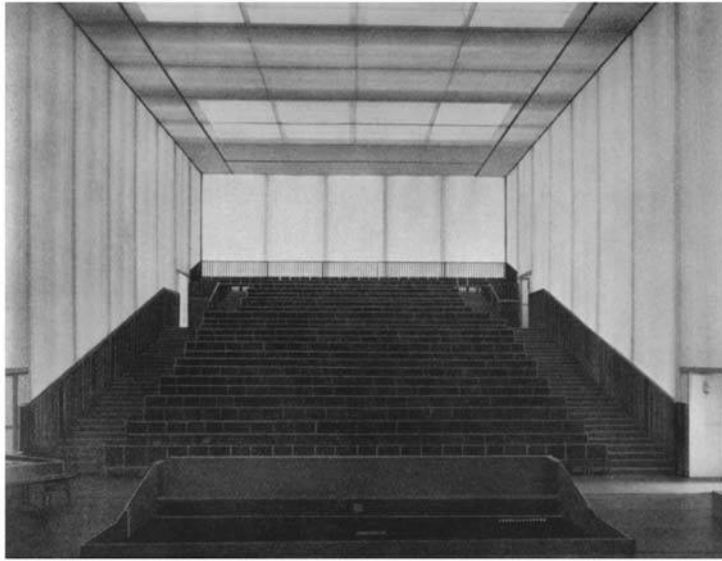
On a more abstract level, the luminous ceiling lit and projected the Miesian grid, mapping the geometry of the façade's applied I-beams onto the upper horizontal surfaces of the interior (Figure 14).<sup>60</sup> Mies had determined a 55½-inch module as the basic building unit for the Seagram Tower. Six modules comprised each of the structural bays delineating the façade. On the interior the luminous ceiling mirrored the bays with a 55½-inch modular grid. Like Seagram's glass curtain wall, the luminous ceiling served as an expression and embodiment of the Miesian grid.

Responsive to the demands of Miesian aesthetics, Kelly went to great lengths to maintain the visual simplicity of the luminous ceiling. He designed diffuser frames to fit cleanly inside the skeleton of the ceiling grid to avoid the "clutter of a frame within a frame."<sup>61</sup> To prevent visible latches or hinges, he dropped portions of the grid down a short distance with a hidden spring device that permitted insertion or removal of diffusers and access to services. To reduce complaints about sound spill, which were common with contemporary open-plenum ceiling systems, Kelly and the engineers at Lightolier developed a modular system of sound-insulating sheet-metal boxes that formed the reflecting cavity for the lamps and supported the ceiling grid. In addition to reflecting and diffusing light, the modular boxes



**Figure 13** Richard Kelly, lighting diagram for Seagram's "tower of light," 1957

**Figure 14** Ludwig Mies van der Rohe and Philip Johnson, architects; Richard Kelly, lighting design; Seagram Building, New York, 1954–57, corner executive office with luminous ceiling. Photograph ca.1957 by Ezra Stoller © Esto



**Figure 15** Heinrich Tessenow, Festspielhaus, Hellerau, Germany, 1912, luminous ceiling and walls

shielded all ducts, pipes, and beams passing above, creating a closed-plenum system and eliminating shadows that would interrupt the continuous glow of the luminous panels.<sup>62</sup> The inner-ceiling space also provided instant equalization of air pressure so, when a door was opened or closed, no movement would be perceptible along the diffuser panels. Finally, the ceiling's grid structure incorporated hidden metal plates to which prefabricated metal room partitions could be attached. This feature allowed individual tenants ease and economy of office space reconfiguration.<sup>63</sup>

Custom designed venetian blinds installed throughout the building further enforced the visual uniformity of the Seagram Tower. The blinds could be set to one of three standardized positions: fully opened, fully closed, or exactly half-open, and the blinds' slats were fixed at an angle of 45 degrees to allow pedestrians the "full impact of the lit-up building at night."<sup>64</sup> Thus, through sublimation of the service elements of the building and careful aesthetic regulation, the Seagram Building's luminous ceiling represented and illuminated the Miesian grid, projecting with exacting clarity the building's "constructive thought" thirty-eight stories into the sky.

The lighting program for the Seagram Building permitted the aesthetic control of Mies's architectural ideal as well as the promotion and projection of that ideal onto the urban nightscape. As a corporate project, the Seagram Building afforded Mies and his coarchitect Johnson the opportunity to design and build an aesthetically unified structure of rigorous proportions and composition. The order and discipline that defined Mies's approach to building, as well as his architectural ideology, had proved difficult to implement (and to enforce) in prior residential tower projects.<sup>65</sup>

Despite publicists' claims for the "new" lighting program, the use of a luminous ceiling was far from new at the time of the Seagram Building's design. Several key installations reaching back to the early years of the century preceded Kelly's use of this technique in the Seagram Tower. One of the earliest and perhaps most important examples can be found in the Festspielhaus located in Hellerau, Germany (constructed between 1911–12). The central theater in Germany's first garden city, the Festspielhaus was designed by Heinrich Tessenow for Emile Jaques-Dalcroze and his institute of Eurhythmics. Dalcroze and Adolphe Appia, who met just after the turn of the century, found common ground in their desire to reform the principles of stagecraft. Together they collaborated closely with Tessenow on the design of the Festspielhaus. Inside the theater the ceiling and walls were covered with incandescent lamps, over which were draped white cloth dipped in cedar oil (Figure 15). The glowing ceiling and walls were intended to create an "immaterial and diffuse light."<sup>66</sup> Mies knew of the lighting in the Festspielhaus and may have experienced it personally, as his wife Ada Bruhn was a dance student of Dalcroze in Hellerau.

Mies's memory of the Festspielhaus perhaps influenced his decision to include a similar installation in the Glasraum he designed for the Werkbund exhibition (Die Wohnung, Stuttgart, 1927).<sup>67</sup> With walls comprised entirely of different kinds of glass, the exhibition room was lit by a luminous ceiling. The evenly diffuse light was created by incandescent lamps recessed in the ceiling and covered with taut white canvas—a technique unmistakably similar to that used at Hellerau.<sup>68</sup>

An important American precedent for the illumination of Seagram's tower was the installation of luminous ceilings in Manufacturers Hanover Trust Building (1952–54)



**Figure 16** Gordon Bunshaft for Skidmore, Owings, and Merrill, Manufacturers Hanover Trust Building, New York, 1952–54. Photograph by Ezra Stoller © Esto

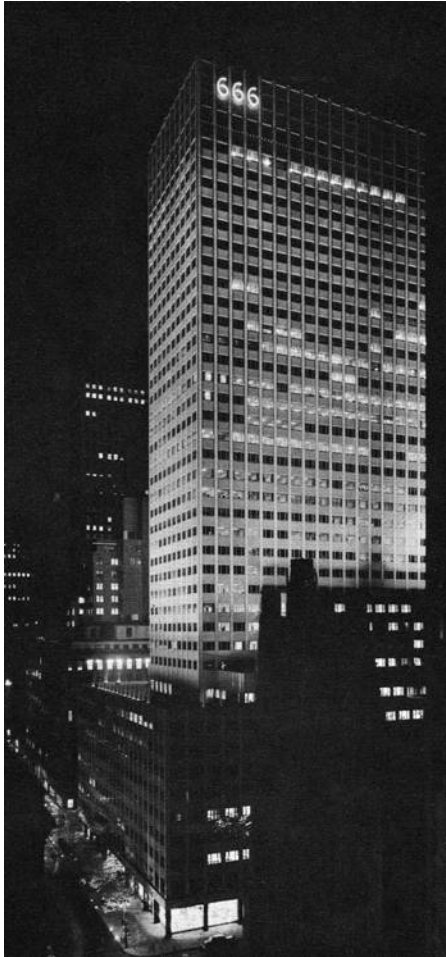
designed by Gordon Bunshaft for Skidmore, Owings, and Merrill and located on Fifth Avenue, just ten blocks south of the Seagram Building (Figure 16). The open and transparent glass and aluminum curtain wall distinguished the Manufacturers Hanover Trust Building, uncharacteristic for bank construction at the time.<sup>69</sup> To counteract glare during daytime hours and maintain the building's transparency after dark, Bunshaft developed a luminous ceiling for the building in collaboration with mechanical engineers Syska and Hennessy and electrical contractor Fischbach and Moore.<sup>70</sup> Luminous ceilings in the five-story building were installed throughout the second floor; on the third and fourth floors they appeared in an L-shape along the walls bordering Fifth Avenue and Forty-third Street. The effect of the luminous ceilings in the Manufacturers Hanover Trust Building was noted by numerous reviewers, including Lewis Mumford, who described the building as a “crystal lantern,” and Ada Louis Huxtable, who credited the building's illumination with the ability to make “material walls disappear.”<sup>71</sup> In this period, other architects and designers explored the functional and aesthetic lighting of glass box buildings, a significant challenge to the success of modern architecture. The critical acclaim garnered by Manufacturers Hanover Trust Building's luminous ceilings indicates the value of such architecturally based lighting solutions.

The illumination of the Seagram Tower as a single unit also was significant in the history of American architecture. Throughout the first half of the twentieth century, façade illumination in the United States typically relied on the use of floodlighting and, for iconic skyscrapers, the floodlighting of setbacks. Many examples of this approach exist: the Woolworth Building (1914), the American Radiator

Building (1924), and the Empire State Building (1931), all in New York City and characterized by the nighttime floodlighting of tower setbacks. With little deviation, the popularity of floodlighting in the United States continued well into the late 1950s. In 1957, Carson, Lundin, and Shaw employed an innovative program for their thirty-nine-story aluminum-and-glass-sheathed Tishman Building (New York, 1957), which was floodlit at night with powerful mercury vapor lamps that could illuminate almost the entire tower in a continuous wash (Figure 17). This system, designed by Abe Feder, avoided the common look of faded washes rising from setback to setback but remained within the American floodlighting tradition.<sup>72</sup> The Seagram Building broke with this tradition and revealed the potential of a truly luminous architecture, an important step in the synthesis of European architectural ideology and modern American architecture.

Perhaps due to the rarity of this approach in the United States and its striking difference when compared to conventional American floodlighting, the aesthetic effect of the luminous ceiling on the nighttime appearance of the Seagram Building received particular attention and praise upon the building's completion. Jürgen Joedicke's 1962 overview of office design in the United States singled out the Seagram Building for its lighting program: “The external effect of the lighting at night was deliberately utilized by the architects as an aesthetic feature, thus giving artificial light an entirely new significance as an element of architectural design.”<sup>73</sup> Under an image of the building fully illuminated at night, the caption reads, “lighting by ‘luminous ceilings’ is provided on all floors which strikingly reveals the building's structural pattern at night.”<sup>74</sup> Early in the





**Figure 17** Carson, Lundin, and Shaw, architects; Abe Feder, lighting design; Tishman Building, New York, 1958, night view of floodlighting



**Figure 18** Seagram Building, night view. Photograph by Ezra Stoller © Esto

design Mies had specified just this effect, indicating that he wished the entire tower to glow after dark.<sup>75</sup> To realize this effect, Kelly designed a secondary lighting circuit within the main ceiling system that allowed for the illumination of the tower as a singular unit. This secondary circuit enabled two levels of illumination. During office hours, the primary circuit produced illumination levels of roughly 85 foot-candles. At night, to create the “tower of light,” the system was switched to the secondary circuit, which used separate lamps running at one-quarter maximum output to produce light levels near 20 foot-candles. To ensure a soft light complementary to the bronze-tinted glass of the curtain wall, Kelly used warm white deluxe fluorescent lamps rather than the contemporary standard of cool white fluorescents.<sup>76</sup> When illuminated at quarter power, these special lamps

rendered a color and quality of light similar to that of incandescent bulbs, more closely approximating the color of the incandescent lamps in the lobby and thereby creating a greater continuity between the illuminated tower and lobby. The combination of the warm fluorescent lamps and the custom amber-tinted glass, when lit at night by the luminous ceiling, transformed the shimmering reflective daytime façade of the Seagram Building into a warm, glowing tower (Figure 18). Illuminated as a single unit, the House of Seagram served as a lavish corporate image within the New York City skyline.

While the luminous ceiling incorporated practical improvements on traditional office lighting systems—minimizing interoffice noise pollution, reducing glare, and facilitating office partition reconfiguration—the design’s

formative impetus was aesthetic, concerned with creating an iconic presence for the Seagram Building.<sup>77</sup> In an interview, Kelly candidly remarked about the illumination program, “The night lighting of the [Seagram Building] is a purely promotional use.”<sup>78</sup>

On its completion, the nighttime appearance of the tower commanded attention in both popular and trade publications. In July 1958, *Architectural Forum*'s cover featured a photograph of the Seagram Building; inside, a tripartite feature praised many aspects of the new corporate headquarters. In the second section of this article next to a nighttime photograph of the glowing Seagram Tower, *Architectural Forum* credited Kelly with the lighting design and, in the caption, described the Seagram Building as “one of the best-illuminated buildings ever constructed.”<sup>79</sup> In 1959, to promote Phyllis Lambert's biographical article on the construction of the Seagram Building, “How a Building Gets Built,” the *Vassar Alumnae Magazine* chose as its cover image Ezra Stoller's emblematic photograph of the “tower of light” gleaming against the dark masonry facades of Park Avenue (see Figure 18).<sup>80</sup> Popular magazines, newspaper articles, and specialized journals alike praised the Seagram Building for its drama and beauty as well as for its clarity and discipline, and nearly every article mentioned the impressive effect of the building's nighttime illumination.<sup>81</sup>

While the illuminated tower could be appreciated only from a distance, Kelly designed the luminous ceiling to improve the daytime visual environment within the Seagram Building offices.<sup>82</sup> Arthur Drexler praised the daytime effects in *Architectural Record* in July 1958: “Beautiful as this controlled illumination appears at night, the effect is perhaps at its best, when on certain late afternoons the glass walls glow softly. In the offices this lighting counteracts the brightest glare and has the curious effect of making New York City seem like a photographic mural mounted on the other side of the glass.”<sup>83</sup> In addition to offsetting daytime glare, the lighting, Drexler noted, had striking decorative effects, which turned the glass curtain wall into a “photographic mural,” capturing the cityscape with the counter-illumination of the luminous ceiling. Just as Johnson credited Kelly's lighting program for his Glass House with creating “continuously changing wallpaper” to be enjoyed from within the pavilion, with the Seagram Building, the view of the “landscape” is transfigured on the interior of the glass curtain wall. In his discussion of the effects of the luminous ceiling on the experience of the Seagram Building office interiors, Drexler described the potential of the glass curtain wall in terms of decoration.<sup>84</sup> While modernist discourse called for the abandonment of traditional ornament and decorative finishes, new architec-

tural lighting techniques enabled the glass curtain wall to appropriate the “view” as decoration.<sup>85</sup> The increasing integration of architectural lighting design into the architectural form allowed for a range of decorative effects that accentuated the surfaces and volumes of modern architecture. The collaboration of Mies, Johnson, and Kelly in the design of the Seagram Building excellently demonstrates the coalescence of the rational and the decorative in modernist architecture.

### The Seagram Building's Lobby and Plaza

The overall success of the Seagram Building's lighting program owes much to the lighting design of the lobby and plaza, which returns to the principle of Mies's glowing core explored in the 860–880 Lake Shore Drive Apartments. As Kelly wrote on a photograph of the Seagram Building illuminated at night, “A tower of light, but the lobby predominates.”<sup>86</sup> Building on his work at the Lake Shore Drive apartments, Mies proposed a brightly illuminated core to levitate the tower visually and emphasize the structural support columns.<sup>87</sup> Since the core of the Seagram lobby was comprised of massive elevator banks, the choice of their surface materials was of vital importance. Mies originally selected deep green marble to clad the elevator banks; aware of the technical difficulties of lighting this dark surface, Kelly recommended a light travertine stone instead. For the lobby to remain visible at night from the plaza or street and not disappear into darkness beneath the projecting canopy, Kelly stressed the necessity of a light-colored material with strong reflective properties. Following Kelly's advice, Mies adopted the off-white travertine for Seagram's core. Kelly then faced the challenge of making the travertine glow. While the desired effect was the same as that of the Lake Shore Drive apartments, the new core material necessitated an entirely different solution.

For Seagram's glass-enclosed entrance lobby, Kelly proposed an indirect lighting system to wash evenly with warm incandescent light the length and breadth of the travertine elevator banks, making them appear to glow. The success of this type of “light-washing” involves the invisibility of the light source, which enables the focus to remain on the architectural surface and the effects of the light. In partnership with lighting engineer and fixture manufacturer Edison Price, Kelly designed a tailored wall-washing system using powerful dark lights recessed in troffers along the ceiling perimeter of the elevator banks. Kelly and Price's system effectively articulated the drama of Mies's proportions, emphasizing the soaring elevation of the twenty-four-foot-high lobby walls and the solidity of the bronze-



**Figure 19** Seagram Building, lobby, view towards illuminated elevator banks. Photograph by Ezra Stoller © Esto

sheathed support columns (Figure 19).<sup>88</sup> Finally, as he had done with Johnson's Glass House and the 860–880 Lake Shore Drive Apartments, Kelly created a light-frame for the lobby, placing two rows of downlights in the soffits of the building's canopy. Tracing the luminous footprint of the tower on the plaza floor, the light-frame maintained the transparency of the lobby's glass walls, readied the eye for the intense illumination of the core, and carried the suggestion of the building's interior glow onto the plaza. Four times the level of brightness of the upper floors, the combined illumination of the core and the perimeter light-frame visually reinforced the building's "free-plan" construction and defied expectations of gravity and mass.<sup>89</sup>

It is the nighttime presence of the Seagram Building that projects the Miesian ideal of the glass and steel skyscraper in a manner unmatched by its daytime appearance. This may account for the frequent use of photographs of the Seagram Building taken at dusk or after dark. As Peter Smithson wrote in 1958, "The Seagram Tower certainly communicates a dream of a controlled, spacious, *machine age* environment, even at the popular level."<sup>90</sup> The illuminated Seagram Building, with its many custom elements

and aesthetic devices, cleverly interprets the strict rationalism of modernist architecture while simultaneously expressing the luxury of mid-twentieth-century corporate culture. As Kelly suggested, "The look of things determines more of how we feel and know them than the things themselves."<sup>91</sup>

## Epilogue

"If light is so vital to the fulfillment of the architect's scheme, then light is not an added component, as it is sometimes treated, but a basic material in the architectural solution. It is at once the material that renders all other materials visible and the one material common to all spaces."<sup>92</sup>

Kelly's innovative approach to architectural lighting design had significant impact on the look of modern American architecture in the mid-twentieth century. The ubiquitous presence of light-washed lobby walls and the numerous glowing plazas of corporate architecture in the decades following the completion of the 860–880 Lake Shore Drive Apartments and the Seagram Building can be traced to Kelly's lighting installations of the late 1940s and 1950s. Kelly's numerous collaborations with Eero Saarinen also had a significant impact on the look, as well as the reception, of modern architecture in America. Kelly's integrated lighting designs for Saarinen helped shape a variety of typologies of modern American architecture, including corporate headquarters, universities, theaters, auditoriums, and airports. Perhaps most influential were their collaborations on a number of corporate research laboratory complexes including the General Motors Technical Center (Detroit, 1956), the IBM Thomas Watson Research Center (Yorktown, New York, 1961), and the Bell Telephone Laboratories (Holmdel, New Jersey, 1962). These sprawling modern laboratory campuses were designed and built as expressions of corporate power and brand as much as centers for scientific discovery.<sup>93</sup> For each of these projects, Kelly designed complex and integrated lighting programs encompassing offices, laboratories, lobbies, showrooms, facades, and landscape. Kelly realized his ideal of the complete synthesis of light with the designed environment in these projects, which have been interpreted as a uniquely American form of modern corporate industrial architecture (Figure 20). Assessing Saarinen's contribution to mid-century American architecture, Allan Temko praised the General Motors Technical Center as "one of the first major triumphs of the new architecture in this country. Where else, in the early 1950s, could one see industrial technology brought to bear so imaginatively on so many vexing problems of contemporary design?"<sup>94</sup>



**Figure 20** Eero Saarinen, architect; Richard Kelly, lighting design; General Motors Technical Center, Warren, Mich., 1956, Administration Building staircase and lobby. Photograph by Ezra Stoller © Esto

**Figure 21** Eero Saarinen, architect; Richard Kelly, lighting design; Dulles International Airport, Chantilly, Va., 1962, nighttime illumination. Photograph by Ezra Stoller © Esto



Saarinen and Kelly also collaborated on the design of two of the most critically acclaimed examples of modern American airport architecture during the postwar era: the Dulles International Airport (Chantilly, Virginia, 1962) and the Trans World Airlines (TWA) Flight Center at the Idlewild (now John F. Kennedy) Airport (Queens, New York, 1962). Dulles International, the first airport in the United States to be designed specifically for commercial jets, expressed the notion of modern high-speed travel with

a soaring roof suspended by steel cables from massive sloped pylons. The monumental and open quality of the terminal is perhaps best appreciated at night, with the pylons silhouetted against the glowing light-washed canopy of the sweeping roof (Figure 21). Kelly's lighting program for the entire complex—interiors, exteriors, the control tower, and the “mobile lounges”—enhanced the unique character of Saarinen's architecture while simultaneously maintaining the function and integrity of the modern architectural sur-



**Figure 22** Eero Saarinen, architect; Richard Kelly, lighting design; Trans World Airlines (TWA) Flight Center, John F. Kennedy Airport, Queens, New York, 1962. Photograph by Ezra Stoller © Esto

faces and materials. The TWA Flight Center similarly represents the expressive synthesis of lighting design and modern architecture. The sculptural qualities of Saarinen's design for the TWA Flight Center are activated not only after dark with the design of electric light, but also during the day with natural light, an aspect of lighting design that would play an increasingly larger role in Kelly's later work (Figure 22).<sup>95</sup> In these projects, vastly different in character from the projects discussed in this article, Kelly developed lighting programs that articulated the essential structure and character of Saarinen's architecture and significantly affected both the appearance and experience of these iconic buildings.

While Kelly has been largely omitted from modern architectural history, the architectural community did honor his contribution to American architecture during his lifetime. The American Institute of Architects honored Kelly twice, first in 1964 with a Collaborative Achievement Award for his contributions to the Seagram Building and the Fours Seasons Restaurant, and again in 1967 with a Gold Medal for his cumulative work on "light in architecture." Kelly's belief in the comprehensive integration of light into the architectural concept and form resulted in some of the most celebrated and influential examples of modern architecture in the United States. Increasing scholarship will resituate figures such as Richard Kelly and his

fellow lighting designers in the historical record and establish the fundamental role of lighting design in the production of modern architecture.

### Notes

I give much credit to those who helped me in the process of researching and writing this article. In particular, I am greatly indebted to Dietrich Neumann for his considerable contributions to the history of architectural lighting design and his support of my research. Enormous thanks must be given to Amy Ogata for her editorial guidance and encouragement and to Pat Kirkham and the Bard Graduate Center for Studies in the Decorative Arts, Design, and Culture for the continuous support of my research. Additionally, I thank the anonymous reviewers of the *JSAH* as well as Roberta Prevost at the Canadian Centre for Architecture. Finally, this article would not have been possible without the generosity and assistance of Addison Kelly and the financial support of the Richard Kelly Grant.

1. "They Dreamed of a Tower of Light," advertisement, *New York Times*, sec. 10, 7 Apr. 1957, 15.

2. An example of the typical treatment of lighting design in architect-driven histories can be found in the catalog for the 2001 retrospective *Mies in America*, which devotes many pages to discussion of the Seagram Building but contains only a brief mention of Kelly's involvement in the project. See Phyllis Lambert, ed., *Mies in America* (Montréal and New York, 2001). However, there are a few scholars who give close attention and measured consideration to the role of lighting design in the imaging and production of modern architecture. Dietrich Neumann has contributed significantly to the recognition and understanding of the history

of architectural lighting design with his publication *Architecture of the Night* (Munich and New York, 2002), and with the exhibition (and catalog) *Leuchtende Bauten: Architektur der Nacht / Luminous Buildings: Night Architecture* (Germany, 2006). Neumann's *Architecture of the Night* is one of the most comprehensive studies on the history of modern architectural illumination to date. Here Neumann specifically addresses the nighttime illumination of the Seagram Building as well as the relationship developed between Kelly and the building's architects. Yet, owing to the brevity of this section on the Seagram Building, important context is omitted. Phyllis Lambert's recent article, "Stimmung at Seagram: Philip Johnson Counters Mies van der Rohe," *Grey Room* 1, n. 20 (June 2005), 38–59, also examines the integral role of architectural lighting in the design of the Seagram Building, giving close attention to Johnson's collaboration with Kelly in the interior designs of the Seagram Building and the Four Seasons Restaurant. However, Lambert's study focuses most closely on the evolution of Johnson's attitude towards decoration. She does not address significant collaborations between Kelly and other modern architects, including Mies, prior to the design of the Seagram Building, even though these earlier relations directly influenced the final lighting program for Seagram's new headquarters. While limited to European design, Tag Gronberg in *Designs on Modernity: Exhibiting the City in 1920s Paris* (New York, 1998) and Janet Ward in *Weimar Surfaces: Urban Visual Culture in 1920s* (Berkeley, 2001) both explore the critical role of electric light in the experience of modernity and the imaging of the modern city. Other texts central to the historiography of architectural lighting design include John Jakle, *City Lights: Illuminating the American Night* (Baltimore, 2001), and David Nye, *Electrifying America: Social Meanings of a New Technology, 1880–1940* (Cambridge, Mass., 1990).

3. This article is based in part on my research at the Kelly Archive, which was housed at the U.S. Lighting Offices in New York City until 2005. The Kelly Archive has since been acquired by the Sterling Library at Yale University and is currently in the process of being cataloged. While the archive has no finding guide and retains access restrictions until preservation issues are resolved, some materials are available to the public. The archive, collection number 1838, contains roughly 350 boxes, some of which have not yet been processed. Additionally, due to damage from floods and multiple moves prior to the archive's relocation to the Sterling Library, significant projects and correspondences are missing. However, important materials and correspondences exist within the collection that offer insight into the design process for the 860–880 Lake Shore Drive Apartments and the Seagram Building but little that directly relates to the Glass House. When I examined the Kelly Archive it had not been indexed or organized in any manner, so unfortunately I am not able to provide folder or box numbers for my notes citing materials from the archive.

4. Richard Kelly, "Lighting Starts with Daylight," *Progressive Architecture* 54 (Sept. 1973), 82–85.

5. Thomas Ennis, "Lighting, Once Mere Utility, Has Become an Important Element of Design," *New York Times*, sec. R, 26 Oct. 1958, 1. In this article examining the "new" role of lighting design in architecture, Ennis discusses the careers and theories of lighting consultants Abe Feder and Richard Kelly. He describes Kelly's entry in architectural lighting designs: "Mr. Kelly's part-time job with a lamp manufacturer while attending Columbia University some thirty years ago led him to his career in the lighting field. He had concluded that the use of artificial illumination was lagging years behind its capabilities. This feeling was strengthened when architects began putting more and more glass into homes and office buildings, and the need for reflected artificial light supplemented with natural light became apparent."

6. As Kelly later recounted in an interview for the *Saturday Evening Post*,

"When I landed a sizable contract and suggested such things as the use of reflected light instead of glaring overhead fixtures, or varying light intensity according to the hour of the day, I got nowhere. The really ambitious ideas seemed to founder in architects' offices. They were impractical, I was told, 'for architectural reasons.'" Kelly continues, "They had pinned a Four-F label on me, due to the aftermath of an abdominal operation. There wasn't any lighting business then. . . . I figured it was a good time to investigate those architectural reasons." Quoted in Arnold Nicholson, "Mr. Kelly's Magic Lights," *The Saturday Evening Post* 231 (5 July 1958), 61. Also see Der Scutt, "Richard Kelly, 1910–1977, A Personal Memento," *Lighting Design and Application* 9 (Oct. 1979), 56–58.

7. Stanley McCandless, *A Syllabus of Stage Lighting* (New Haven, 1964). As yet, there is no monograph on McCandless or overview of his career. Brief mention of McCandless appears in various histories of modern theater; for example, see Christopher Baugh, *Theatre, Performance and Technology: The Development of Scenography in the Twentieth Century* (New York, 2005), 130–31, 135, 142. To understand McCandless's theories and the scope of his work, it is helpful to review McCandless's own publications; see n. 8.

8. In addition to serving from 1925 to 1964 as professor of lighting with the Drama Department of the School of Fine Arts at Yale University, McCandless worked for many years as a consulting engineer at Century Lighting, a leading supplier of lamps and lighting equipment for theatrical productions. He also designed the lighting for New York's Radio City Center Theater. For more on his theories of architectural lighting design, see Stanley McCandless, "Conditioned Lighting," *House and Garden* 3 (Sept. 1937), 62–63; "Lighting in Architecture," *Architectural Forum* 73 (July 1940), 25–37; "Lighting," *Arts and Architecture* 65 (May 1948), 35–37; and "Characteristics of Downlighting," *Architectural Record* 109 (Feb. 1951), 142–45.

9. On Appia and Craig and the emergence of the principles of modern theater, see Gösta M. Bergman, *Lighting in the Theater* (Stockholm and Totowa, N.J., 1977), 323–39.

10. Adolphe Appia, *The Work of Living Art: A Theory of the Theater*, trans. Harry Darkes Albright (Coral Gables, Fla., 1960).

11. Bergman, *Lighting in the Theater*, 323.

12. Steven Peterson discusses Mies's "architecture as metaphysics" and proposes that "the abstraction in Mies's work is not a preference for pure simplicity as such, but a philosophical method applied to architecture; it is philosophical abstraction, the logical isolation of aspects from the total in order to reveal essential relationships." See Steven K. Peterson, "Idealized Space: Mies-conception or Realized Truth?" *Inland Architect* 21 (May 1977), 4–11.

13. Richard Kelly, "Focus on Light," *Flair* (Feb. 1950), 66–71.

14. *Ibid.*, 66.

15. *Ibid.*, 67.

16. "House in the Desert," *Architectural Forum* 90 (June 1949), 90–96. Both the luminous ceiling in the entry and the luminous partition walls located in the bathroom used opaque glass with recessed cold-cathode lighting. Kelly also recessed cold-cathode tubes in the roof overhangs surrounding the perimeter of the house. In the article, a caption accompanying Ezra Stoller's iconic picture of the Kaufmann House at dusk reads, "Starlight on sand dunes may tracelessly dissolve under the shrill glare of a single bulb—therefore the soft light of cold cathode tubes continuous under the overhangs." All three lighting techniques are briefly described in the article.

17. Kelly discussed his approach to the illumination of Johnson's Glass House in several published sources. See Richard Kelly, "New Light on Living," unpublished lecture, 25 July 1955, Kelly Archive, Sterling Library, Yale University; Kelly, "Focus on Light," 67–68; Nicholson, "Mr. Kelly's

Magic Lights,” 28–29, 61, 64–65 (see n. 6); and “A House Decorated with Light,” *Vogue* 129 (1 Jan. 1957), 135–37.

18. Alfred Barr, preface, in Henry-Russell Hitchcock and Philip Johnson, *The International Style: Architecture Since 1922* (New York, 1932), 29. With their 1932 exhibition at the Museum of Modern Art and the accompanying publication, Hitchcock, Johnson, and Barr articulated what they believed to be the major tenets of modern architecture. On their role in the marketing of modern architecture in the United States, see Henry Matthews, “The Promotion of Modern Architecture by the Museum of Modern Art in the 1930s,” *Journal of Design History* 7 (1994), 43–59.

19. Preceding the Glass House, Kelly and Johnson served together on a jury as a part of the Museum of Modern Art’s Good Design program to select the ten best new lighting fixture designs for 1946. Eliot Noyes, director of the Department of Industrial Design, asked Kelly to participate in the museum’s program to foster “better design in objects of everyday use.” Eliot Noyes, letter to Richard Kelly, 23 Nov. 1945, Kelly Archive.

20. Johnson, quoted in Nicholson, “Mr. Kelly’s Magic Lights,” 61.

21. Kelly, “New Light on Living.”

22. At this time, new developments in illumination technology, particularly recessed or indirect lighting, facilitated the manipulation of light to enhance architectural form and materials without the visible “intrusion” of ornamental or decorative fixtures.

23. Numerous illumination problems stemmed from Johnson’s wish to keep his glass-enclosed house free of lighting fixtures. Eventually Kelly and Johnson designed their now-famous tripod lamp as an aesthetically pleasing solution to the challenge of localized task lighting. This lamp however, provided its own set of difficulties when the tripod form proved unstable; thus, a fourth leg was added. For more on the tripod lamp, see Martin Eidelberg, ed., *Design 1935–1965: What Modern Was* (Montreal and New York, 1991), 204.

24. Mark Wigley examines the lawn as a critically neglected architectural surface, including a discussion of its electrification and illumination, in “The Electric Lawn,” in *The American Lawn*, ed. Georges Teyssot (New York, 1999), 155–95.

25. Kelly, “New Light on Living.”

26. At night, the obstructed view of the interior of the Glass House from the exterior can only be maintained if the lighting levels inside the house remain less than those outside. In Kelly’s lighting plan, this camouflaging effect was possible but, if brighter interior lights were added, the interior would again be visible. I offer many thanks to Jean Sundin, principle at the Office for Visual Interaction (OVI), for clarifying the effects of Kelly’s lighting design on the exterior surfaces and interior visibility of the Glass House.

27. Kelly, “Focus on Light,” 67. Kenneth Frampton argues for the centrality of the landscape to Johnson’s concept of the Glass House in “The Glass House Revisited,” in *Philip Johnson: Processes, Institute for Architecture and Urban Studies* 9 (1978), 38–59. Here Frampton writes, “The trees surrounding the house serve as the perceptual limits of the domain. These limits are unambiguously established at night by floodlit trees, while during the day the domain is determined by the extent of the manicured lawn,” 45.

28. Mies designed several small residential projects early in his career, including the Riehl House (Neubabelsberg, 1907), and three other houses in the Berlin area, all completed before the outbreak of World War I.

29. Ludwig Mies van der Rohe, untitled, *Frühlicht* 1, n. 4 (1922), 122–24; repr. in Fritz Neumeyer, *The Artless Word: Mies van der Rohe on the Building Art*, trans. Mark Jarzombek (Cambridge, Mass., 1991), 240.

30. Ibid.

31. Dietrich Neumann examines the contradictions between Miesian rhetoric and drawing in three of Mies’s early projects, including the

Friedrichstrasse skyscraper competition proposal. See Neumann, “Three Early Designs by Mies van der Rohe,” *Perspecta* 27 (1992), 76–97.

32. For example, in his discussion of glass skyscrapers in his untitled 1922 article in *Frühlicht*, Mies explains, “It is not an effect of light and shadow one wants to achieve but a rich interplay of light reflections. . . . At first glance the contour of the ground plan appears arbitrary, but in reality it is the result of many experiments on the glass model. The curves were determined by the need to illuminate the interior, the effect of the building mass in the urban context, and finally the payoff the desired light reflections.” See Neumeyer, *The Artless World*, 240.

33. Mies van der Rohe, “The Adam Building,” draft of a letter to Firm S. Adam, 1928, Later German Projects, folder 1, Museum of Modern Art, New York.

34. Janet Ward discusses the complexities of the relationship between electric light, advertising, and architectural and social discourse during the Weimar period in Germany. See Ward, *Weimar Surfaces*, 92–141 (see n. 2). On this topic, see also Dietrich Neumann, “*Lichtarchitektur* and the Avant-Garde,” in *Architecture of the Night*, 36–53 (see n. 2).

35. Ward calls attention to the great interest in psychotechnics and their application to advertising practices in Weimar Germany. For example, she discusses Karl Marbe’s 1927 study of the benefits of “the shock-techniques of electric advertising” and the capacity of such an approach to induce “intensive perceptions of the senses, contrasting strongly with the environment.” These techniques were intended to take advantage of the “attention-principle” (*Aufmerksamkeitsprinzip*), which could awake “the individual out of his or her blind, automatic reverie.” Ward, *Weimar Surfaces*, 99.

36. Osram was instrumental in popularizing the use of electric light in advertising, especially with their 1925 introduction of a process that allowed electric bulbs to be shaped into letters or other symbols. Ibid., 103.

37. Many of the architects supporting and promoting *Lichtarchitektur* were closely associated with Mies, including Bruno Taut, Hans Scharoun, László Moholy-Nagy, and the Luckhardt Brothers. Ibid., 110–16, and Neumann, “*Lichtarchitektur* and the Avant Garde,” 36–53.

38. I am grateful to Dietrich Neumann for bringing my attention to this important precedent in Mies’s early career. Neumann discusses Mies’s use of the illuminated wall in the German Pavilion and its relationship to the other architectural lighting installations and spectacles at the fair in *Architecture of the Night*, 138. Also exploring the use of light in the German Pavilion is Jose Quetglas, “Fear of Glass: The Barcelona Pavilion,” in *Architectureproduction*, ed. Beatriz Colomina (New York, 1988), 122–51. Quetglas writes, “Oh, yes, there is light in the pavilion. A white wall, radiant, illuminated, backlit. Behind it is the center. . . . This sole source of light is enclosed between four walls of white glass. [The visitor’s] laborious circuit around it, detoured by the extension of the planes of glass, which never permit an outside corner to be seen, refer him again and again to the walls behind which there is light. There is no path to the other side,” 144.

39. Armour Institute became the Illinois Institute of Technology (IIT) in 1940 when Armour merged with Lewis Institute (est. 1895), another Chicago college that offered liberal arts, science, and engineering courses.

40. In his position as a design consultant for Greenwald, Mies was assigned the Promontory Apartments in 1946, his first high-rise project to be realized. However, the apartment building located on Chicago’s Near South Side proved to be a professional disappointment for Mies. As a speculative project, economic factors determined many design choices, forcing Mies to accept significant compromises to his original program. The finished construction, an exposed concrete frame with brick infill and applied stepped-back columns, was far removed from Mies’s initial proposal of a free-standing glass and steel slab. Lambert, *Mies in America*, 356–57, and nn. 46–49, 510 (see n. 2).

41. The planning for the Algonquin Apartments began a year before the 860–880 Lake Shore Drive project was to begin construction. Joe Fujikawa, Mies's student and later collaborator, said of this project, "[Mies] had the concept already in mind. . . . [He] had a big model [of 860] made in brass and got everybody excited. . . . [Maybe] that was one of the reasons that Algonquin was never brought to fruition, because Herb then jumped on 860." Quoted in Lambert, *Mies in America*, nn. 57, 357, 511. The Lake Shore Drive apartments were also Mies's debut in high-end, high-rise living. According to a contemporary trade journal, the 860–880 Lake Shore Drive Apartments were "Mies van der Rohe's most important [buildings] to date." Edward D. Mills, "860 Lake Shore Drive, Chicago, USA," *The Architect and Building News* 205 (8 Apr. 1954), 402–8.

42. Lambert discusses Mies's use of solid and void in the composition of the 860–880 Lake Shore Drive Apartments in *Mies in America*, 375–76.

43. See, for example, Mills, "860 Lake Shore Drive, Chicago, USA."

44. Mies's previous use of travertine and highly figured marbles, for example in the German Pavilion in Barcelona and the Tugendhat House (Brno, Czech Republic, 1930), suggest that he would choose a similar material for the cladding of the core section of the Lake Shore Drive apartments if concealment were his primary goal.

45. Mies wrote of the task of the modern architect, "The materials are concrete, iron, glass. Ferroconcrete buildings are essentially skeleton structures. Neither pastry nor tank turrets. Supporting girder construction with a non-supporting wall. That means skin and bone structures." Mies van der Rohe, "Office Building," *G 1* (July 1923), 3; repr. in Neumeier, *The Artless World*, 241 (see n. 29).

46. Ludwig Mies van der Rohe, telegram to Richard Kelly, 22 Feb. 1950, Kelly Archive (see n. 17).

47. Kelly's emphasis on the fitness of his solution suggests his desire to prove the architectural foundations of his designs as well as his faith in the tenets of modern architecture. Certainly Kelly was aware that Mies had helped define these principles in the earlier part of the century, and it is therefore possible that Kelly wished to prove his appreciation and understanding of modernist principles to the elder architect. Richard Kelly, letter to Mies van der Rohe, 28 Feb. 1950, Kelly Archive.

48. *Ibid.*

49. In his letter, Kelly explains his strategy to "wash" the core with light: "To make the most of lighting the glass walls around the first and second floors under the buildings, it is necessary to have first, a highly concentrated linear distribution of light, and second, a source of very high original lumen intensity per foot, and third, a source of long life in maintenance and replacement costs to allow for continuous evening operation at practical electric current cost. . . . Concentrated distribution in one plane is to spread the light evenly down the entire height of the glass walls. This [is] in place of an uncontrolled source which accidentally over-lights the top in a band of glare which tapers to practically nothing in a foot or two from the top." Kelly used this terminology to imply the same sort of even coverage offered by traditional "whitewashing." *Ibid.*

There is some debate over the origin of the use of the word "wash" to describe an even, overall illumination of an architectural surface (most commonly a wall or facade). Kelly's wife Betty has suggested that her husband "invented" this term early in his career, while Phyllis Lambert asserts that Philip Johnson first described "washing the walls with light." However, as the use of the word "wash" to describe the effects of electric light on various architectural surfaces was common within the lighting community by the late 1940s, it is problematic to credit a single individual for this term. Betty Kelly, interview by Margaret Maile Petty, New York, 15 Oct. 2002; Lambert, "*Stimmung* at Seagram," 52 (see n. 2).

50. Kelly, letter to Mies van der Rohe, 28 Feb. 1950, Kelly Archive. In the

early 1950s, the limited range of readily available architectural lighting equipment, including lamps and lenses, could be restrictive for the lighting designer. To realize the desired effects for his projects, Kelly in many instances relied on prototypes or enlisted the assistance of illumination engineers to develop new lamps and lenses in order to realize desired lighting effects for his projects.

51. The technological innovation of Kelly's solution was described by Addison Kelly, Kelly's daughter, also a lighting designer. Addison Kelly, interview by Margaret Maile Petty, New York, 25 Feb. 2002.

52. Many of Kelly's lighting solutions would not have been realized without the collaboration of Edison Price, a lighting engineer, and Isaac Goodbar, an electrical mathematician, both prolific in their respective fields. On Edison Price, see Stanley Abercrombie, "Edison Price: His Name Is No Accident," *Architecture Plus* 1 (Aug. 1973), 34–43.

53. The glowing core repeatedly appears in Mies's glass tower proposals from the 1920s forward, whether only on paper or realized in built work. A quick review of his plans and projects reveals a consistent use of this important aesthetic device to accentuate the skeletal construction of his towers.

54. As an editor of *Architectural Forum* noted in 1958, "In Mies's career, Seagram is something of a milestone: it is his first building in New York; it is the largest structure he has ever built anywhere; and it is, finally, the climax of Mies's forty year search for a new kind of skyscraper." See "Seagram's Bronze Tower," *Architectural Forum* 109 (July 1958), 67–71.

55. The *New York Times* described the completion of the Seagram Building in 1957: "When Samuel Bronfman . . . conceived the skyscraper project, it was his desire that it represent something beyond a realty venture. It was his belief that industry should contribute to the cultural and architectural development of the community." *New York Times*, sec. 10, 7 Apr. 1957, 3. Arthur Drexler, in an article praising the Seagram Building upon its completion, cast Samuel Bronfman, chairman of the board of Joseph Seagram and Sons, as a "patron of the arts," elevating his commission of the new Seagram Tower to a form of corporate "magnificence." See Arthur Drexler, "The Seagram Building," *Architectural Record* 123 (July 1958), 139–47. The same year, *Architectural Forum's* editors described the effect of the Seagram Tower on Park Avenue, writing, "the first result adds up to high prestige—and a fine public relations gesture; the second to high showmanship—and a fine institutional advertisement." See "Seagram's Custom Look," *Architectural Forum* 109 (July 1958), 72–75.

56. Phyllis Lambert, director of planning on the Seagram Building project and daughter of Samuel Bronfman, describes Bronfman's mission in building the Seagram Tower, "[He] became convinced of the architectural responsibility of corporate good-citizenship . . . and the willingness to venture beyond the status quo of speculative commercial buildings. It was recognized that the building could have a pervasive effect, not only on the occupants, but also at the level of the street, the neighborhood, the city, and even architecture at large." Lambert, *Mies in America*, 391 (see n. 2).

57. "Seagram Building, New York City," *International Lighting Review* 12 (1961), 68–69.

58. Seagram's luminous ceiling panels, custom designed and manufactured, were the largest flat diffusers manufactured to that date. *Ibid.*, 68.

59. *Ibid.*

60. The embodiment of the façade's articulation within the composition of the ceiling suggests the importance of the horizontal surfaces in Mies's work. As Quetglas argues, "In all of Mies's architecture the first trace on the paper is horizontal. The formal definition of space is produced always and only by horizontal planes. Vertical planes and lines appear later, once the scene has been set." "Fear of Glass," 133 (see n. 37).

61. "Seagram Building, New York City," 68.

62. *Ibid.*



63. The accommodation of flexible modular partitions within the ceiling grid system at the Seagram Building predates the first instance of a *Bürolandschaft* (office landscape) in the United States by nearly a decade. The German Quickborner Team advanced this methodology of office design and installed the first “office landscape” in North America for the DuPont Company’s Freon Division in Wilmington, Delaware, in 1967. See C. Ray Smith, *Interior Design in Twentieth-Century America: A History* (New York, 1987), 282–83.

64. “Seagram’s Custom Look,” 72.

65. Perhaps the Seagram Building best distinguished itself from its predecessor at Lake Shore Drive in terms of aesthetic control. Not surprisingly, it proved more difficult to regulate the decorating behavior of residents. For the 860–880 Lake Shore Drive Apartments Mies required (written into tenant leases and paid for by the tenants) that silver-colored curtains be installed throughout, and the personal draperies could only be hung inside of the standardized curtains. As Joe Fujikawa said, “anything to help pull the wall together as a monolithic unit, he [Mies] was all for.” Quoted in Lambert, *Mies in America*, 374.

66. See Marco DeMichelis, “Modernity and Reform: Heinrich Tessenow and the Institut Dalcroze at Hellerau,” *Perspecta* 26 (1990), 143–70, 161; and Kathleen James-Chakraborty, “The Drama of Illumination,” in *Art, Culture, and Media Under the Third Reich*, ed. Richard A. Etlin (Chicago, 2002), 181–204.

67. Many thanks to the anonymous reviewers of *JSAH* for bringing my attention to the luminous ceiling in Mies’s Glasraum. On Mies’s glass exhibition room at Stuttgart see James-Chakraborty, “The Drama of Illumination,” 354, and Quetglas, “Fear of Glass,” 130.

68. By the end of the 1920s, Europe boasted numerous examples of “luminous architecture,” such as De Volharding Building (the Hague, 1928–33), clad entirely in glass of varying types and intended to serve as a glowing nighttime three-dimensional billboard, and Erich Mendelsohn’s Rudolf Petersdorff Department Store (Wrocław, Poland, 1928), which was brilliantly illuminated after dark, transforming the store’s ribbon windows into luminous bands wrapped around the building. Architect Hans Pfeffer’s pronouncement in AEG’s journal in 1928 characterizes the German attitude towards luminous architecture during the 1920s: “At first luminous advertising merged continuously with the buildings that carried it. Soon, however, certain architectural elements were left out altogether in favor of artistically valuable light carriers. Entire buildings were designed for this luminous art . . . [and] we already see beginnings pointed towards a great future: towards an absolute architecture of light.” Quoted in Neumann, *Architecture of the Night*, 39 (see n. 2).

69. The building’s curtain wall contained some sections of plate glass as large as ten by twenty-two feet—the largest sections of glass ever used in a curtain wall to that date. See Neumann, *Architecture of the Night*, 184.

70. Fischbach and Moore also served as electrical contractors for the Seagram Building.

71. Lewis Mumford and Ada Louise Huxtable, quoted in Neumann, *Architecture of the Night*, 184.

72. See “Lighting is Architecture: Assertion of Purpose,” *Progressive Architecture* (Sept. 1958), 145–49; and Neumann, *Architecture of the Night*, 191.

73. For a period discussion of luminous ceilings in office lighting design, see Jürgen Joedicke, *Office Buildings* (New York, 1962), 140–41, 158–59.

74. *Ibid.*, 160.

75. According to Lambert, Mies originally suggested that lights be placed in pots on the floor along façade’s interior with their beams directed upward to create an indirect lighting scheme. This would have freed the ceilings of lighting fixtures but would have been less energy efficient and generally

impractical. The luminous ceiling system was the ideal solution to both Mies’s aesthetic and practical needs. See Lambert’s comments on the luminous ceiling, *Mies in America*, nn. 127, 514.

76. Philip Cialdella, “Richard Kelly, Selected Works,” unpublished notes for the Illuminating Engineering Society of North America (IESNA) exhibition, “Richard Kelly: Selected Works,” New York, 1993.

77. The luminous ceiling extends from the glass curtain wall into the building in a twenty-foot-wide band, creating the impression of even and consistent lighting throughout. However, beyond this band of luminous ceiling is a more typical office lighting system comprised of acoustic panels alternating with low-brightness reflecting troffers—a considerably more energy efficient system. Kelly argued to have the luminous ceiling continue throughout each floor, but this was deemed too expensive and unnecessary.

78. Nicholson, “Mr. Kelly’s Magic Lights,” 61 (see n. 6). Unfortunately, the cost of illuminating the tower after dark, as well as the enormous amounts of energy consumed in the process, proved prohibitive during the 1970s energy crisis, and Kelly’s two-circuit installation has not been used since 1973.

79. “Seagram’s Custom Look,” 72–75 (see n. 55).

80. Phyllis Lambert, “How a Building Gets Built,” *Vassar Alumnae Magazine*

44 (Feb. 1959), 13–19.

81. For example, see “The Seagram Building,” *Arts and Architecture* 77 (Jan. 1960), 14–15; Richard Kelly, “New Progress in Light,” *Architectural Forum* (Feb. 1957), 152–55; Nicholson, “Mr. Kelly’s Magic Lights,” 28–29, 61, 64–65; William H. Jordy, “Seagram Assessed,” *Architectural Review* 124 (Dec. 1958), 374–78; “A House Decorated with Light,” *Vogue* 129 (Jan. 1957), 135–37, 146; “Building is Designer’s Testament,” *New York Times*, sec. 8, 10 Nov. 1957, 8; “Seagram Building, New York City,” 68–69 (see n. 57); “Seagram’s Bronze Tower,” 67–71 (see n. 54); and Henry Wright, “Introduction: Light as Architecture,” *Progressive Architecture* (Sept. 1958), 115–23.

82. I would like to thank Jean Sundin of OVI for calling to my attention to the effect of the luminous ceiling on the visibility of the city from inside the Seagram Building. As she rightly suggests, the luminous ceiling when lit at night would cause disruptive glare and reflections inside the executive offices, making it difficult to view the nightscape of Manhattan.

83. Drexler, “The Seagram Building,” 140 (see n. 55).

84. Lambert, “*Stimmung* at Seagram,” 42 (see n. 2).

85. On the historically overlooked role of the decorative and ornamental in modern architecture, see Mark Wigley, *White Walls Designer Dresses: The Fashioning of Modern Architecture* (Cambridge, Mass., 1995). On the integration and domestication of the decorative in modern design, see Pat Kirkham, *Charles and Ray Eames: Designers of the Twentieth Century* (Cambridge, Mass., 1995).

86. Cialdella, “Richard Kelly, Selected Works.”

87. “The architects and Kelly felt that the ground floor had to be much brighter than upper floors; otherwise, design effect would be lost.” Quoted in “New Progress in Light,” 155.

88. In “*Stimmung* at Seagram,” Lambert suggests that the Seagram lobby lighting was the result of a mature working relationship between Philip Johnson and Richard Kelly and the techniques employed to light this space evolved from their work together in lighting Johnson’s Glass House and New Canaan Guest House (52–53). Certainly Kelly and Johnson’s prior collaborations and shared approach contributed to the successful design of the Seagram lobby illumination (as well as the luminous ceiling of the tower), however, it is necessary to consider the formative role of Kelly’s experience lighting the lobby of the 860–880 Lake Shore Drive Apartments for Mies as well. The highly collaborative nature of the design of the Seagram Building makes assigning singular credit for many of the custom elements of this building problematic. Evaluating and honoring the unique

collection of talented architects, designers, and engineers who contributed to the design of the Seagram Building enables a more holistic understanding of the design process.

89. “Uniform intensity of brightness over the lobby walls with fixtures minimized was the design goal to achieve simple monumentality effortlessly and elegantly. It required the courage to spend enough wattage to achieve the minimum intensity that could be expressive. It is probably the highest wattage per foot yet used in a lobby.” See “Seagram Building: Definition of Structure,” *Progressive Architecture* (Sept. 1958), 139–43.

90. For Kelly, emphasis on “machine age” aesthetics did not mean the exclusion of decoration or ornament. He never polarized architecture and decoration, writing that “architectural design and decoration [are] created to serve mankind by bettering the sensual perceptions in life. Thus the purposeful and accidental action of light in creating visual perception determines . . . the total impact of architectural and decorating work.” Richard Kelly, “Lighting as an Integral Part of Architecture,” *College Art Journal* 22 (fall 1952), 26; Peter Smithson, “Footnote on the Seagram Building by Peter Smithson,” *Architectural Review* 124 (Dec. 1958), 382.

91. Nicholson, “Mr. Kelly’s Magic Lights,” 29 (see n. 6).

92. Howard Brandston, “A Profession Grows Up,” *Progressive Architecture* 54 (Sept. 1973), 74–78. Brandston, a colleague of Kelly’s, has been and continues to be an influential figure in the field of architectural lighting design; he too has helped define the role and practice of modern architectural lighting design.

93. Scott G. Knowles and Stuart W. Leslie, “‘Industrial Versailles’: Eero Saarinen’s Corporate Campuses for GM, IBM, and AT&T,” *Isis* 92 (Mar. 2001), 1–33. Knowles and Leslie discuss the design of these research campuses and how they impacted corporate research in the United States.

94. Allan Temko, *Eero Saarinen* (New York, 1962), 25.

95. Kelly collaborated with Louis Kahn on the design of three museums: the Yale University Art Gallery (New Haven, 1955), the Paul Mellon Center of British Art and Studies (New Haven, 1972), and the Kimbell Museum of Fine Arts (Fort Worth, Tex., 1972). Of these three, the Paul Mellon Center and the Kimbell incorporate daylight into the structure of the building, integrating natural light in the architectural program. Kahn and Kelly worked closely together on both of these projects, and their collaborations set new standards for the use of daylight in the illumination of gallery spaces. On Kelly’s theories of daylighting design and his collaboration with Kahn at the Kimbell, see “Lighting Starts with Daylight,” *Progressive Architecture* 54 (Sept. 1973), 82–85.

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