Richard Kelly

Selected Works

IES
NEW YORK SECTION

An exhibition of works presented by IESNY and The Richard Kelly Grant

SELECTED WORKS OF RICHARD KELLY
A Traveling Exhibition

The New York Section of the Illuminating Engineering Society of North America (IESNA) established the Richard Kelly Grant in 1980 to preserve and carry forth Richard Kelly's ideals, enthusiasm and reverence for light. Richard Kelly is widely recognized as one of the founders of the architectural lighting design profession, contributing a career that spanned more than four decades and included over three hundred projects worldwide. The purpose of the grant is to recognize and encourage young individuals in North America whose work displays creative thought and activity in the use of light. The Grant is administered by the New York Section under the auspices of the IESNA. For more information about the Grant, please contact the IESNA at 212 248 5000, extension 118, or go to: http://www.iesna.org/PDF/Awards/Kelly/2008.pdf.

In 1992, research conducted by a student for his MFA thesis prompted the New York Section of the IESNA to form a committee dedicated to preserving and presenting the original project documents belonging to the late Richard Kelly. From this extensive collection a selection of important historical materials was made and organized into an exhibit highlighting the work and philosophy of Mr. Kelly.

Richard Kelly: Selected Works contains a total of thirty-seven framed works and photopanels which display original drawings, prints and photographs and is accompanied by labels, ten explanatory text panels and a catalogue brochure. Together these museum quality materials explain Kelly's philosophy of light and his visionary approach to fixture design, building illumination and daylighting. Many well known projects from Kelly's impressive portfolio are included, such as: the Kimbell Museum of Fine Art and the Yale Center for British Art, Louis Kahn, architect; Philip Johnson's Glass House and the New York State Theater at Lincoln Center, Philip Johnson, architect; and the Seagram Building, Mies van der Rohe and Philip Johnson, architects.

The exhibit first opened at a gallery space in the offices of Haines, Lundberg Waehler Architects, in New York City, in May 1993. It was subsequently made available as a touring exhibit to schools and cultural institutions. It was shown in New York concurrent with Lightfair in 1994, and with the IESNA Annual Conference in 1995. It traveled to Texas Christian University in Fort Worth, Texas in 2000. In 2006, the exhibit was again in New York at The Center for Architecture as part of an event entitled "Light/Energy/Impact: The Legacy of Richard Kelly". In 2007, the exhibit was sent on tour in Europe, being shown in Stockholm, Berlin, Paris, Barcelona, Amsterdam, London and Vienna.

The Richard Kelly Archive from which the exhibit materials were selected is now housed in the Yale University Library as part of the Manuscripts and Archives collection. These resources are available to researchers outside the Yale community who wish to make use of them. For further information on the Yale Library, go to: http://www.library.yale.edu/mssa/home1.htm.

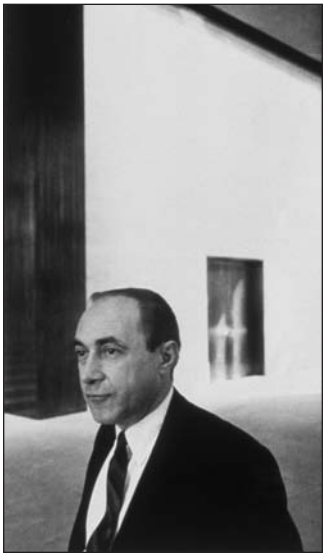
For more information regarding availability and loan conditions of the exhibit, please contact the New York Section directly at:

IESNY
The Center for Architecture
536 LaGuardia Place
New York, New York 10012
Telephone 212 473 3139
admin@iesny.org

RICHARD KELLY: Selected Works

Architectural & planning consultant in light & form, illuminating engineering in values and impact.

from Richard Kelly's letterhead



Richard Kelly in the lobby of the Seagram Building, c. 1958.

In the brief history of architectural lighting as a profession, Richard Kelly is widely recognized as one of its pioneers and great contributors. He collaborated on over 300 major projects including the Seagram Building, the Kimbell Art Museum, The Yale Center for British Art and Lincoln Center, all highlighted in this exhibition. As these landmarks broke new ground in architecture, so did Kelly's lighting design.

Kelly's passion for light developed at a young age, while his professional involvement with lighting was gradual. While he was majoring in science and English literature (and took all his electives in architecture) at Columbia University in New York, he also designed lighting fixtures for a local manufacturer. Soon after graduation in 1932 he opened an office, as he described, "for designing and selling lighting ideas and the equipment to make them work."[1]

Wartime restrictions having interrupted his design work, in 1942 Kelly returned to his studies, attending Yale University School of Architecture. There he studied with Stanley McCandless, a master of theatrical illumination. In addition to learning valuable theatrical lighting techniques, he assimilated McCandless' ideas about light intensity, color, distribution and control, and their influence on human emotion. Kelly realized that light could be manipulated to create excitement or boredom, comfort or discomfort. Based on his understanding of "light energy impacts" he identified three types of light: ***focal glow*** or highlight, ***ambient luminescence*** or graded washes and the ***play of brilliants*** or sharp detail.

To Kelly, lighting was planning what we see and how we respond to it, and he felt strongly that the best way to achieve this was to develop the architectural and lighting schemes concurrently. The three types of light were a palette from which the designer could mix and compose to achieve the desired results. Although any one type of light could dominate, he considered the "order of imaginative planning" similar to the creation of a watercolor painting. "First, major highlights are imagined – then, graded washes of different luminosity are added and – then, the detail of minor lightplay makes the idea clear and entertains the eye."[2]

Richard Kelly's philosophy and its application in practice, are a lasting legacy. Much of the lighting and lighting control equipment available today was initially developed in response to lighting solutions which Kelly identified. The drawings and photographs presented in this exhibit were chosen to represent the strength of Kelly's work and indicate its impact on today's lighting for architecture.

Exhibition curated and catalogue/exhibition text written by Renee Cooley and Matthew Tanteri.

[1]Life Notes – R. Kelly 1974.

[2]Lighting As An Integral Part of Architecture. R. Kelly 1952, College Art Journal, Vol. XII.

PHILOSOPHY

Excerpted from a magazine article entitled "Lighting's Role in Architecture", published in *Architectural Forum* Magazine, February 1955

Based on a speech given by Richard Kelly at the conference on Architectural Illumination at the School of Design of North Carolina State College

"The American Association of the Blind states that 87% of all sense perception comes through our eyes, and the National Society for the Prevention of Blindness concurs. Though architectural work is done to control nature, 87% of the impact of our architecture is due to the way we see it. Architectural forms, their material, scale, proportion, color, decoration, and even our feeling of their durability and stability, are revealed to us mostly through our eyes according to how they accidentally appear or are planned to appear. In front of the mind's eye are three elements in the perception of visual design – three elemental kinds of light effect which can be related to the art of painting for easier visualization: 1) focal glow or highlight, 2) ambient luminescence or graded wash, and 3) the play of brilliants or sharp detail. These three elements are also the order of imaginative planning.

"**Focal Glow** is the campfire of all time. It is also the celebrated limelight of aphorism, because of the early English music halls and their use of antiquated projectors which burned a gas resulting from wetting a kind of lime. Focal glow is the "follow spot" on the modern stage, it is the pool of light on your favorite reading chair, the shaft of sunlight that warms the far end of the valley, candlelight on a face or a flashlight's beam. Focal glow draws attention, pulls together diverse parts, sells merchandise, separates the important from the unimportant, helps people see. Focal glow sometimes becomes multiple foci desirably producing a significant composition of attention. As the number of foci increases in more complex compositions, a pattern results which can continue and come to resemble the second element of light, ambient luminescence.

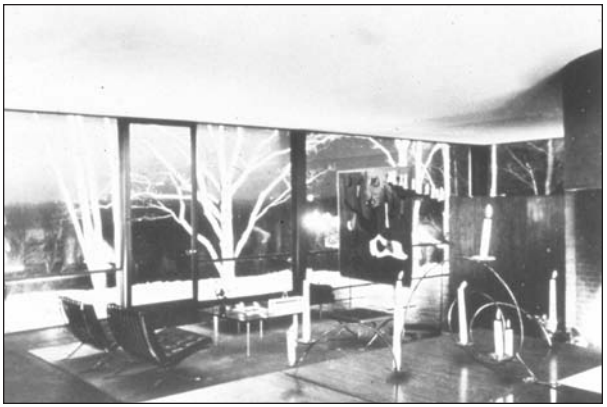
"**Ambient Luminescence** is the uninterrupted light of a snowy morning in the open country, fog light at sea in a small boat, twilight haze on a river where shore and water and sky are indistinguishable. The show lighting in a dome amphitheater, the full cyclorama of the open theater, an art gallery with strip-lighted walls, translucent ceiling and white floor. It is also all we know of indirect lighting. Ambient luminescence produces shadowless illumination. It minimizes form and bulk and consequently the importance of all things and people. It suggests the freedom of space and tends to suggest infinity which is usually reassuring, quiets the nerves and is restful.

"**The Play of Brilliants** is Times Square at night, an eighteenth-century ballroom with a crystal chandelier of many candle lamps. It is sunlight on a fountain or brook, a cache of diamonds in an open cave, the rose window at Chartres Cathedral, night automobiles at a busy clover-leaf, a city at night from the air, the trees outside your window interlaced with the beams of a spotlight or a shaft of sunlight, a sparkling cabinet of glassware. Play of brilliants excites the optic nerve and in turn stimulates the body and spirit, quickens the appetite, awakens curiosity, sharpens the wit, and is distracting or entertaining as it is used and desired.

"Visual beauty is perceived by an interplay of all three kinds of light, though one is usually dominant. It is therefore of first importance to plan lighting whether creating a new structure, altering an old or making existing conditions tolerable. By the judicious and artful control of these three elements you can make an imagined water-color rendering become the real thing, become your idea of the beauty of architecture or decoration. These three kinds of light make it easier to see (focal glow), make surroundings safe and reassuring (ambient luminescence) and stimulate the spirit (play of brilliants). *To play with light is like playing with magic and is best done with a trained eye to recognize real and relative values, with experience and knowledge of physical techniques.*[1] LeCorbusier says: 'Architecture is the correct and magnificent play of forms brought together in light.' "

[1]*Italics by RCK Committee, 1993.*

GLASS HOUSES



Philip Johnson's Glass House
New Canaan, Connecticut, 1948 – 49
Architect, Philip Johnson

Philip Johnson described his success with using a conventional lighting technique on the inside of the glass house, "If you had one bulb, you saw six." The challenge encountered in the illumination of this renowned residential space was to light a glass box in a way that considers light's affect on interior materials and the psychology of its inhabitants. Kelly invented basic principles of interior and exterior lighting which he reapplied in numerous residences and commercial spaces that featured large expanses of glass such as picture windows and glass curtain walls. Philip Johnson once stated, "Richard founded the art of residential lighting the day he designed the lighting for the Glass House."

Kelly understood the optical properties of glass and the modernist aesthetic which made broad use of it. It was transmissive in day and reflective at night. The methods that Kelly investigated followed the architect's original intent for using glass – to extend space.

In the daytime, the penetration of daylight into the interior made the inside and outside visually continuous. At the same time, it created abrupt contrasts between brightness and shadow and wrenched the eye from one focus to another. The result was strain and fatigue. To reduce the problem of glare and to soften the contrast between outdoor brilliance and interior darkness, Kelly used dimmers to adjust the level of illumination so that the brightness of the interior wall surfaces balanced with the brightness of the exterior. He believed the use of blinds as a means to shield glare not only obstructs the outdoor view but eliminates the feeling of spaciousness the glass was supposed to create. A more innovative solution, pictured in this exhibition in the photograph of the Wiley House, was Kelly's use of a daytime south sun baffle which doubled as a nighttime indirect reflector.

Above left, with exterior lighting on.
Below, the exterior lighting is off.

At night, the reflective property of glass, combined with the darkness beyond, created a black mirror effect. Multiple reflections on the inside face of the glass that were invisible during the day – of light sources, people, objects and the room itself – formed a barrier between inside and outside at night. "The glass inside becomes a solid black mirror bleakly reflecting all indoor light, giving a feeling of insecurity to people because they still know that anyone outside can see in though they cannot see out, thus completely defeating the purpose of using

Van Meter Residence
Springfield, Illinois 1962 – 63
Architect, King & Murphy

glass at all." Kelly's solution was to provide a sufficient level of illumination to the exterior surrounds and establish various lines of distance. In order to make the distance visible, he lighted trees, shrubbery, and elements of the natural landscape. "When the surroundings outside are beautifully illuminated the glass house has much more than a landscape wallpaper because of depth, changing perspectives, etc." In a letter to a fixture manufacturer Kelly described the exterior lighting he designed for the eight acres of landscape surrounding Johnson's glass house:

(a) The lawn immediately outside the glass walls was lighted from the fascia of the house, thus lighting the floor. This was the primary means of letting the eye visually penetrate the glass.

(b) The very handsome trees nearest to the house were all illuminated in a large part from skylights set back on the roof of the house.

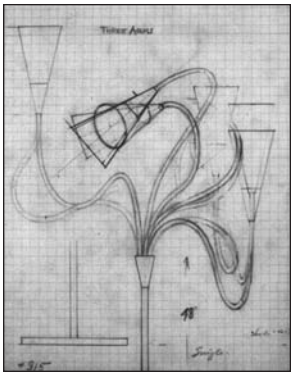
(c) Over the edge of a lawn plateau and a valley surrounding the house a second level of distance was established by lighting the trees from shielded ground stations combining the new side prong PAR-46 and 56 lamps both spot and flood housed in waterproof holders by Magniflood, Inc. installed at eight shielded station points for maintenance convenience.

(d) Distant stations lighting trees 400 and 600 feet as a distance periphery painted by light a scenic wall which had depth and detail to continually entertain and fascinate the eye.

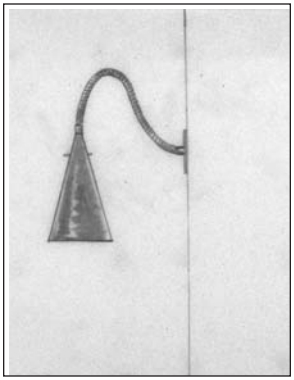
Kelly suggested the use of candles not only to add "sparkle, stimulating conversation, appetite, etc., because of myriad reflections back and forth which also appear outside in the trees." He observed that although the candles threw some light onto the ceiling, the reflection of that was not enough to obliterate the exterior view.

Wiley House
Westport, Connecticut 1954
Architect, Philip Johnson

FIXTURE DESIGN

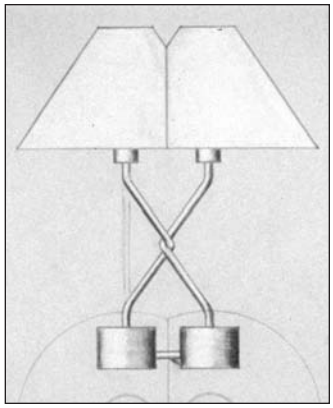


Above, "Three Arms #315".
Below, untitled, #393.



Kelly's first employment in 1928 was designing fixtures for a New York City manufacturer. Not long thereafter, with Chauncey A. Thompson, he opened Kelly & Thompson for the stated purpose "to design and execute good lighting". They considered their office a clearinghouse for lighting and made use of equipment from all manufacturers. However, to more closely tailor design solutions to clients' needs and to fill the gap in "good lighting" fixtures, they designed and produced a line of fixtures. They were primarily portable cord-and-plug lights for residential application, but also included some hard-wired ceiling and wall fixtures as seen in these sketches.

World War II material restrictions ended this endeavor; however the design of lighting fixtures, especially where suitable ones for a particular application were not available, was a continuing involvement for Kelly. The design of these fixtures not surprisingly parallels Kelly's overall approach to lighting: the fact that light can be controlled for a desired impact or quality. It's not uncommon to see baffles and louvers which shield the eye from glare, reflectors and translucent materials used to redirect and/or diffuse the beam, and fixtures which are adjustable in height or swing to more comfortably reach the task at hand.



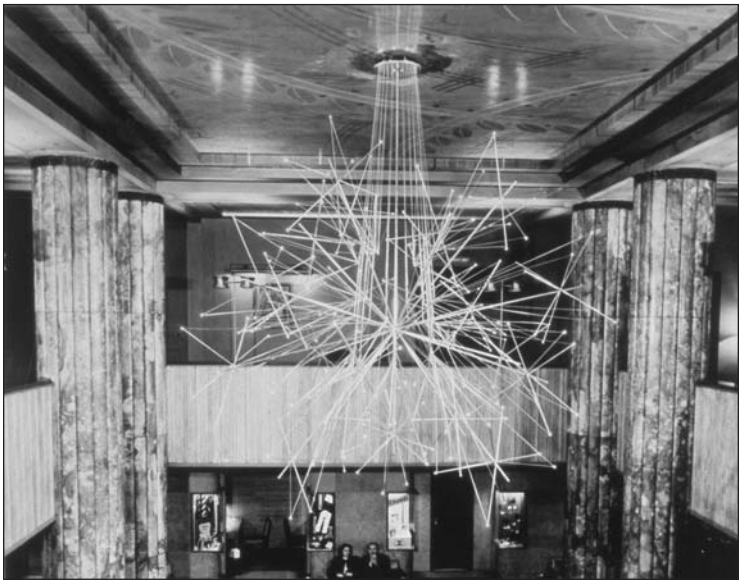
Untitled, intertwined double lamp with shade.

A floor lamp, designed by Richard Kelly for Philip Johnson, combines an uplight housed in the cylindrical body with a conical reflector/hood overhead. This created a soft pool of local light without any significant surface brightness which would reflect in the glass walls of the residences where it was installed.

No mention of Richard Kelly's fixture design is complete without acknowledgment of the contributions of Edison Price. Mr. Price was a long-time collaborator in the design, engineering and fabrication of both portable fixtures, including the exhibited lamp, and those designed for permanent installation.

Floor fixture for Philip Johnson, metal, acrylic and glass.

WIRELESS CHANDELIER
THE BARBIZON-PLAZA HOTEL
New York, New York 1955



The celestial-like Wireless Chandelier, as Kelly referred to his design, was installed in the main lobby of the Barbizon-Plaza Hotel and is an example of the artful and judicious control of electric light for decorative purposes. The delicate form of the twelve-foot diameter fixture was possible because, instead of wiring, the structure itself carried the electricity (40 amperes at 6 volts) to 192 miniature low voltage lamps, each equivalent to about one candle's output of light.

A complex maze of nickel tubing and brass rods, the fixture weighed only 140 pounds. The smooth, lustrous finish acted like an illusive system of reflectors which gave the slowly rotating sphere a scintillating sparkle.

Electrical power was supplied from an above-ceiling assembly to the fixture by way of a vertical, seven-foot nickel rod. At the lower end the rod was connected to a 2 3/4 inch diameter bronze ball located at the exact center of the fixture. Twenty four 5/8 inch diameter nickel "lead" tubes were precisely positioned in the ball and locked into perfect balance. Four smaller nickel tubes were welded at irregular angles to the outer ends of each of the leads which were then fitted with insulated sockets and the miniature lamps. Brass rods, 1/8 inch in diameter, were used as a current return to complete the circuit and provided an interesting contrast in size and color to the nickel tubing. The rods from each lamp connected to 24 vertical brass rods held in exact position by a 15 inch diameter gold anodized aluminum ring at the top of the chandelier.

A novel clutch system permitted the chandelier to be lowered for ease of relamping. Because of the low voltage the structure was safe to touch and there was no danger in keeping the electrical current on to locate burned out lamps. In addition to fabricating and installing the fixture, Edison Price (in photograph with Kelly) was instrumental in solving many of the engineering problems.

Richard Kelly and Edison Price with a scale model of the Barbizon chandelier.

SEAGRAM BUILDING

New York, New York 1957

Ludwig Mies van der Rohe and Philip Johnson, Architects

The Seagram Building at night.

Kelly's illumination of the Seagram Building uses light as a unifying, architectural element. As with Philip Johnson's Glass House almost a decade earlier, Kelly's contribution to the lighting of the tower's lobby and offices reveals his understanding of the new glass curtain wall aesthetics which aimed to reduce the distinction between outside and inside.

Materials were fundamental to architect Ludwig Mies van der Rohe's concern for "Baukunst" – the craft of good building. Early in the design process, Kelly suggested using a highly reflective, light travertine stone for the building core walls in the lobby, instead of the dark marble initially proposed by Mies. Kelly knew that in order to see the lobby from outside, through the floor-to-ceiling glass window walls, the building core had to glow. With fixture manufacturer Edison Price, he designed a wall washing system using PAR-lamps. Located along the perimeter of the ceiling, it uniformly illuminates the lobby walls.

The effect accentuates the height of the ceiling and makes the building seem to float. On both sides of the lobby's glass walls, Kelly placed two rows of downlights. Their linear pool of light defines the lobby's perimeter and allows the eye to visually penetrate the glass. Another row of downlights under the entrance canopy projects a narrow slit of light, extending the interior glow of the building's lobby onto the plaza. Conceived by Mies, a continuous luminous ceiling forms a band inside the building's glass-walled perimeter and is the primary lighting element in the office tower. Kelly's principal contribution to the luminous panel system, developed by Noel Florence for Lightolier, was his specification of warm white deluxe fluorescent lamps, instead of cool white, the standard at the time.

The luminous ceiling was circuited to produce two levels of illumination. During office hours, the system was designed to maintain a light level of 85 footcandles. For the "tower of light" effect in the evening, Kelly specified a "night circuit" which uses separate lamps that run at one quarter of their maximum output and produce a light level of 20 footcandles. The selected lamps, with a color rendering index of 85, provide pleasant light with color qualities approaching those of the incandescent lamps used in the lobby.

Finally, the glass on the office floors is tinted amber-gray to match the color of incandescent even more precisely. To maintain the building's visual uniformity, venetian blinds with a limited range of adjustments were installed in the windows. The entire system can be set to one of three standardized positions: fully open, fully closed and exactly half open. Kelly's concept for the illumination of the Seagram Building at night is summarized by the caption he included under its photograph in his portfolio: "a tower of light, but the lobby predominates."

THE FOUR SEASONS RESTAURANT

New York, New York 1957 – 1958

Architect, Philip Johnson Associates

Richard Kelly worked closely with architect Philip Johnson on the design of the Four Seasons Restaurant. Located on the first floor of the Seagram Building, this project marks the first application of International Style aesthetics to an interior restaurant space. The absence of ornament, exaggeration of scale, use of rich materials, and superior craftsmanship characterize the restaurant's architectural program.

The primary purpose of the lighting is to enhance the significant architectural materials used and create a setting for a refined dining experience. In the illumination of the white Carrera marble pool, solid walnut paneled walls, interior plantings and collection of fine art, Kelly masterfully applied his philosophy of "light energy impacts".

Focal glow was used in three areas: 1) At the foot of the Picasso painting in the entrance corridor, Kelly placed cold cathode lamps behind translucent alabaster panels to create a glowing uplight source. 2) In the Pool Room, Kelly used low brightness, silver-bowl incandescent downlights to create a luminous pool of water and to provide a variable source of general illumination. 3) Lastly, Kelly recessed four incandescent underwater "cans" into the planters to uplight the interior plantings and silhouette their foliage.

Ambient luminescence was the effect desired on the walnut paneled walls. To make the walls glow, Kelly co-designed, with fixture manufacturer Edison Price, a continuous, linear wall-washing system. Used throughout the restaurant, the curve of the unit's bronze-finish reflector provides glare-free illumination, despite the wall's glossy, dark surface.

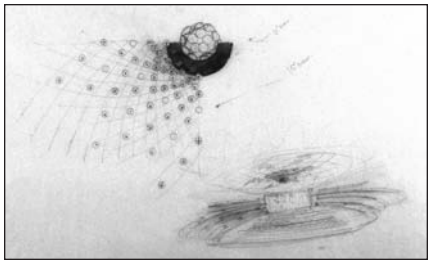
To create a "play of brilliants" Kelly used miniature downlights in several of the private dining room ceilings. Called "sparkle lights", the fixture uses a low-voltage source set in a one-inch diameter multi-faceted reflector. The effect of an overhead constellation is created by the fixtures' random placement and transforms the room into a magical setting.

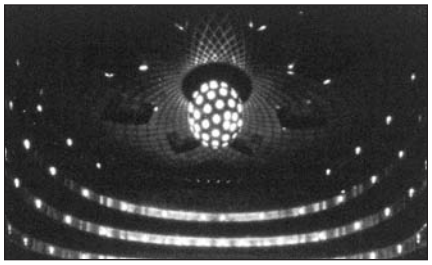
The Four Seasons Restaurant artfully exemplifies Richard Kelly's philosophy of light and design. The success of the restaurant's International Style interior is one of Kelly's most noted collaborations with architect Philip Johnson. It has recently obtained recognition by the New York City Landmarks Preservation Commission and stands as a significant architectural achievement to which Richard Kelly made a substantial contribution.

View of the Pool Room.

NEW YORK STATE THEATER
Lincoln Center for the Performing Arts
New York, New York 1965

Philip Johnson, Architect





Sketch of auditorium with chandelier and downlights, above; and as realized, below.

Kelly borrowed the term "play of brilliants" from the jewelry industry and, in designing the lighting for this project, embraced fully the meaning of the metaphor. Studying the crystalline structure of titanium diamonds, he developed the geometry for the auditorium chandelier and the balcony fascia fixtures.

For the theater auditorium he composed a cluster of 21-inch and 15-inch diameter light "diamonds" in a central, ten-foot diameter chandelier which floats in a galaxy of downlights that are recessed in the swirl of acoustical ceiling panels.

The grand foyer on the first balcony level is 45 feet high and three levels of balcony promenades line its perimeter. "Diamond" light fixtures punctuate the rings of the balconies like jewels in a crown, accentuating the stately richness and grandeur of the space. The multi-faceted, polyhedral structure of these fixtures maximizes the internal reflection of light and results in their brilliance. The face of the diamond is clear, molded Plexiglas and the light sources contained within are shielded from the front face by housings which are highly reflective on the exterior. The interior backing of the fixture is lined with a molded, specular reflector. The light is mirrored in this back reflector and the play of its reflection creates the diamond-like sparkle which also obscures the dark spots which would otherwise result from the light shields.

Grand foyer with "diamond" light fixtures.

Lincoln Center is a complex of five monumental structures, a large central plaza and several smaller connecting plazas. Each structure was designed by a different architect. Wallace K. Harrison, of the firm Harrison & Abramovitz, was coordinator of the design group and architect for the Metropolitan Opera House; Max Abramovitz, his partner, was architect of Philharmonic Hall; Eero Saarinen, in collaboration with Jo Mielziner, designed the Vivian Beaumont Theater; the Library-Museum of the Performing Arts was designed by Gordon Bunshaft of Skidmore, Owings and Merrill; the architect for the Juilliard School of Music and Residents' Hall was Pietro Belluschi and the collaborating firm of Catalano and Westermann. Philip Johnson designed the central plaza as well as the New York State Theater.

New York State Theater exterior at night, facing the central plaza.

Kelly designed the lighting for each area with the exception of the interior of the Metropolitan Opera House.

THE KIMBELL ART MUSEUM

Fort Worth, Texas, 1972

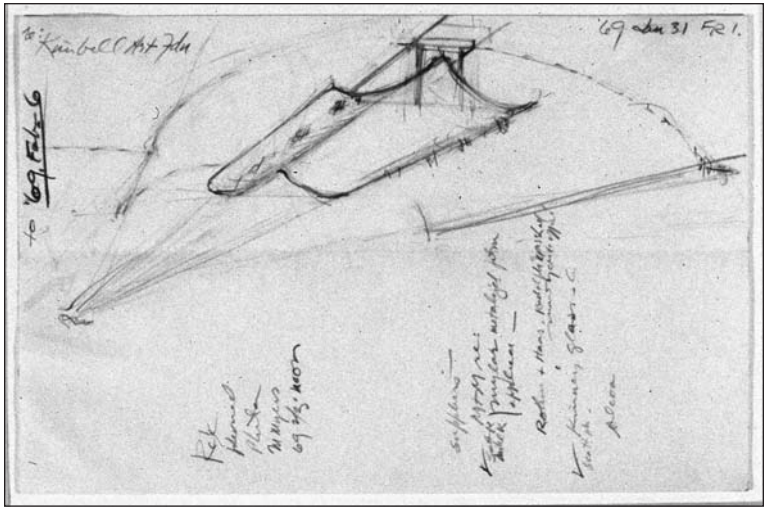
Louis I. Kahn, Architect

In his late career, Richard Kelly consulted on two art museums in which daylight is the central theme – The Kimbell Art Museum in Fort Worth and the Yale Center for British Art in New Haven, Connecticut.

The masterful use of natural light found throughout these museums is the result of Kelly's collaboration with architect Louis Kahn. The museums' project architect Marshall Myers described the Kahn-Kelly association as a "perfect communion". Kahn integrated natural light into the architectural structure of both museums. The conceptual approach that Kelly followed in illuminating their interior spaces articulated his belief that "the handling of forms, the meaning of a room, have to relate to daylight."

The philosophy of the Kimbell Art Museum's director called for a link between the changing quality of outside daylight with the observer's experience of the art inside. However, the danger posed by direct sunlight and ultraviolet rays to works of art on paper or fabric had to be addressed. Kahn envisioned a series of vaulted galleries with a north-south orientation at the apex of which ran a narrow slit to bring light into the interior. Light would be modulated by open courtyards, spaced in between the vaults, and crescent-shaped slits of glass placed in between the structural and non-structural parts of the vault. Together these daylighting elements give the museum the "luminosity of silver" and the viewer "the comfort of knowing the time of day".

According to Kahn, Kelly's involvement began early at "the inception of the idea of the shell, skylight and lighting fixture integration". The scope of Kelly's work extended to the overall illumination program which blended electric light with daylight. It included advising on ultraviolet filtration for the skylights and the night-lighting of the gardens and suggesting the planting of vines and foliage in the courtyards to filter light and to reduce its intensity as it flowed into the courtyards and building. The centerpiece of the lighting program is a winged reflector which runs along the peak of the cycloid vault and fills its underside with ambient light. Kelly provided the necessary breakthroughs for the two most important elements of the reflector's design, its material and shape. At first Kelly thought Plexiglas was more practical than the one-way mirrored glass initially proposed by Kahn. Later Kelly suggested perforated aluminum because it offered both transparency and reflectivity. Moreover, it reduced the initial cost and required far less maintenance than acrylic. In February of 1969, Kelly drew a sweeping freehand curve that experience told him would produce maximum reflectance given the shape of the cycloid vault. A year later, Isaac Goodbar,



Preliminary sketch of daylight fixture.

an associate of Edison Price in New York City, ran a computer program that calculated the precise coordinates for the reflector curve and the intensity of light expected along the cycloid.

Budget considerations eliminated Kelly's design for a small linear source of electrical light on the underside of the reflector which would have illuminated its surface at night; instead, track lighting was successfully integrated. The final design consists of a supporting yoke, a light track and a frame on which is attached a curved aluminum sheet. Perforations allow some daylight penetration to soften the contrast between the underside of the fixture and the adjacent daylighted concrete vault. The central portion of the sheeting that rises into the skylight was left unperforated to block direct sun. In areas safe to allow occasional sunlight – the lobby, bookstore, dining room, and library – a totally perforated reflector was used.

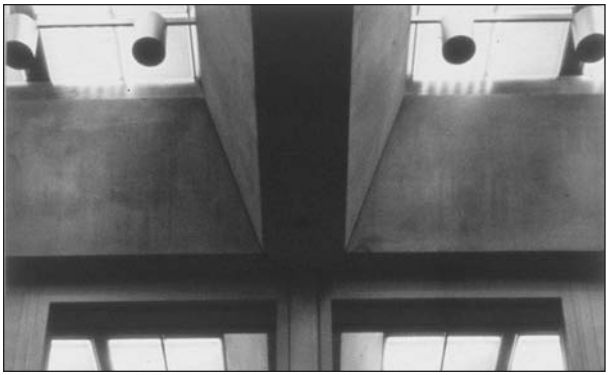
In the auditorium a motorized shutter system, designed by Kelly, allows the room to be darkened.

YALE CENTER FOR BRITISH ART

New Haven, Connecticut, 1969 – 1974

Louis I. Kahn, Architect

At the Yale Center For British Art daylight is the primary source of interior illumination. The "natural light fixture" Kelly helped design was a system of skylight bays through which daylight is diffused into the interior. During the building's design, a memorandum sent to Louis Kahn by the Center's director defined the skylights' basic objectives:



View upward into the skylight wells.

- On a brilliant sunny day we would like to rely solely on natural light to illuminate the pictures; however, we do not want hot spots on the floors and walls.
- On bright but overcast days we would like to rely mostly on natural light for illumination, using little or no artificial light to supplement it.
- For less bright days we would use artificial light, preferably incandescent, to bring the natural illumination up to an acceptable level.
- We desire the option of eliminating all natural light from any gallery skylight.
- We do not want any beam of light to fall directly on the walls or floors.
- The light admitted to the skylight should come through clear glass or plastic, treated only to remove ultraviolet rays.

- We want to be able to sense change in the level of brightness of the sunlight available and do not object to sensing changes in the sun's position.

The central element of the daylighting design is a rectangular grid of skylight wells which penetrate various levels of the four-story building. Kahn conferred with Kelly on the form of the structural members which support the roof and which determine the skylights' shape. Like the perforated aluminum in the Kimbell's natural light fixture, "the deep-slanted, textured concrete surface on the inside of the wells helps soften the contrast between the luminosity of the skylights and surrounding surfaces. Kelly thought some type of inverse shielding might allow the skylights to take advantage of the sun's elevation. His research led him to believe that north light had a high ultraviolet content which could damage artwork. With the aid of computer calculations run by Isaac Goldbar, Kelly developed what he described as "a kind of unit louver to create a sun shadow pattern on a diffusive material that then becomes the source of daylight for the paintings." His louver design minimizes north light but transmits some warm-colored south light into the space to attain a full range of color.

Kelly's design for the skylights went through several modifications, including his investigation of motorized shutters. His second design proposal, illustrated by the drawing in this exhibit, had four basic parts. From the top down it consists of:

1) a truncated pyramid shaped exterior louver system;
2) a double dome of acrylic with an ultraviolet coating on the inner dome;
3) a diffuser made from two sheets of prismatic acrylic lenses; and
4) a small four-sectioned hanging baffle.

A full-scale mock-up with movable louvers was constructed to test the complex skylight design. After close study, the hanging baffle placed below the diffuser was eliminated and the diffuser went through several more stages of development involving other consultants. The final design of the interior diffuser utilizes a sandwich of three light-modifying elements. From the top down they are:

View showing different levels.

1) a sandblasted plastic sheet, to soften light and protect the diffuser sandwich from dust;
2) an eggcrate louver; and
3) two prismatic acrylic lenses.

These last two bottom elements inverted the order of Kelly's second diffuser design. The hanging baffle that Kelly specified was substituted with a specular one-by-one inch parabolic cube louver, but the two prismatic (pyramid patterned) acrylic lenses from Kelly's initial design were retained. Below this a lighting track supports a combination of wall washers and narrow beam accent fixtures.

The final skylight design functions as follows: The fixed angles of the exterior louver structure moderate the changing quantity and quality of sunlight. When the sun is low in the sky, the louvers transmit an increased amount of daylight into the building, and a reduced amount when the sun is high. This keeps the illumination levels inside more or less the same throughout the day, as well as throughout the seasons. During periods of insufficient daylight, as in winter, electric light is used as a supplement.

SELECTED PROJECTS

APARTMENT HOUSES

860 Lake Shore Drive, Chicago, IL; 1950.
Mies van der Rohe, arch.

900 Lake Shore Drive, Chicago, IL; 1951.
Mies van der Rohe, arch.

Commonwealth Promenade Apartments, Chicago, IL; 1952.
Mies van der Rohe, arch.

BANKS

Chase Manhattan Bank, New York, NY; 1959.
Skidmore Owings & Merrill, archs.

Bankers Trust Building (headquarters); also Lincoln Center Branch of Bankers Trust, New York, NY; 1963.
Henry Dreyfuss, arch.; Shreve Lamp & Harmon, designer; Emery Roth & Sons, assoc. archs.

Northern Trust Bank Building, Chicago, IL; 1964.
C.F. Murphy, arch.

First National Bank (now called Chase Tower); Chicago, IL; 1969. C.F. Murphy, arch.

Royal Bank of Canada, Montreal, Canada; 1963.
I. M. Pei, arch.

CIVIC

US Embassy, Oslo, Norway; 1954.
Eero Saarinen, arch.

Toronto City Hall, Toronto, Canada; 1965.
Viljo Revell; John B. Parkin Assoc., arch.

CLUBS

Stork Club Cub Room, New York, NY; 1940.
Sherman Billingsley, owner

Lido de Paris (nightclub) at the Sands Hotel, Las Vegas, NV, 1958. Jac Lessman, designer

CORPORATE

IBM Educational Center, Poughkeepsie, NY; 1956.
Eliot Noyes, arch.

IBM World Headquarters: Showroom, Exterior, Calculator Room, President's Office, New York, NY; 1956.
Eliot Noyes, arch.

General Motors Technical Center (entire, including exterior lighting), Warren, MI; 1956. Saarinen and Saarinen, arch.

Seagram Building (entire); also Brasserie Extension, Barbershop, Seagram's Publicity Department, New York, NY; 1957. Philip Johnson, arch., with Mies Van der Rohe

IBM Olympic Data Processing Center, Squaw Valley, CA; 1960. Eliot Noyes, arch.

John Deere & Co., Moline, IL; 1963.
Eero Saarinen, arch.

Place Ville Marie, Office Building Lobby, Montreal, Canada; 1963. I.M. Pei, arch.

CULTURAL

Lincoln Center, Plaza and Fountain, New York, NY; 1965.
Harrison & Abramovitz, archs.

Lincoln Center, Philharmonic Hall, New York, NY; 1963.
Max Abramovitz, arch.

Lincoln Center, New York State Theater, New York, NY; 1964. Philip Johnson, arch.

Lincoln Center, Repertory Theater, New York, NY; 1965.
Eero Saarinen, arch.

Clowes Memorial Auditorium, Indianapolis, IN; 1963.
John Johansen, arch.

EXHIBIT

New York World's Fair, American Home Building, Living Kitchen, New York, NY; 1939. Fordyce & Hamby, arch.

"Good Design" (Permanent Exhibition, Merchandise Mart), Chicago, IL; 1952. Paul Rudolph, arch.

New York World's Fair, New York State Pavilion, New York, NY; 1964. Philip Johnson, arch.

EXTERIOR

Flamengo Park (O Parque do Flamengo), Rio de Janeiro, Brazil; 1965. Roberto Burle Marx, landscape arch.

HOSPITALITY

The Desert Inn, also the Painted Desert Room, Las Vegas, NV; 1950. Jac Lessman, arch. Designer: Wilbur Clark, owner.

Virgin Isles Hotel, St. Thomas, VI; 1950.
Harold Sterner, arch.

Pier 66 Hotel & Marina, Ft. Lauderdale, FL; 1964. Philips Petroleum Architectural Dept., George Downs & Milton Dornblaser, archs.

Squaw Valley Inn, Squaw Valley, CA; 1965.
Shepley Bulfinch Richardson & Abbot, arch.

LIBRARY

The Exeter College Library, Exeter, NH; 1972.
Louis I. Kahn, arch.

MUSEUMS AND GALLERIES

Corning Museum of Ancient Glass, Corning, NY; 1951.
Harrison & Abramovitz, arch. Thomas Buechner, director

Yale University Art Gallery, New Haven, CT; 1953. Louis Kahn, arch.

Asia House (museum & office building), New York, NY; 1959. Philip Johnson, arch.

Munson-Williams-Proctor Institute (museum), Utica, NY; 1960. Philip Johnson, arch.

Museum of Western Art (now Amon Carter Museum), Fort Worth, TX; 1961. Philip Johnson, arch.

Sheldon Memorial Art Gallery, University of Nebraska, Lincoln, NE; 1963. Philip Johnson, arch.

Museum for Pre-Columbian Art, Dumbarton Oaks (including exterior lighting), Washington, DC; 1964. Philip Johnson, arch.

Museum of Modern Art, new 54th Street Buildings and Garden, New York, NY; 1964. Philip Johnson, arch.

National Museum of Israel, Jerusalem, Israel; 1965. Dora Gad, arch.

Bielefeld Museum, Bielefeld, Germany; 1965. Philip Johnson, arch.

Timken Art Gallery (now Timken Museum of Art); San Diego, CA; 1965. Frank Hope and Assoc., arch.

The Kimbell Museum of Fine Art, Fort Worth, TX; 1972. Louis I. Kahn, arch.

The Yale Center of British Art and British Studies, New Haven, CT; 1974. Louis I. Kahn, arch.

RESIDENCES

Nelson Rockefeller House, Seal Harbor, ME; 1942. Wallace Harrison, arch.

Edgar J. Kaufman, Sr. House, Palm Springs, CA; 1947. Richard Neutra, arch.

Philip C. Johnson House (The Glass House), New Canaan, CT; 1948-9. Philip Johnson, arch.

Jean de Menil House, Houston, TX; 1950. Philip Johnson, arch.

John Johansen House, New Canaan, CT; 1953. John Johansen, arch.

Robert Wiley House, New Canaan, CT; 1953. Philip Johnson, arch.

Eliot Noyes House, New Canaan, CT; 1955/1963. Eliot Noyes, arch.

Boissonas House, Darien, Connecticut; 1957.
Boissonas House, Cap Ferrat, France; 1960. Philip Johnson, arch.

RESTAURANTS

The Four Seasons at the Seagram Building, New York, NY; 1959. Philip Johnson, arch.

La Fonda Del Sol, Time-Life Building, New York, NY; 1961. Alexander Girard, arch. Restaurant Assoc. owner

RETAIL

Tiffany & Co., new building, main floor, New York, NY; 1938. James Gordon Carr, arch.

Bonwit Teller, New York, NY; 1948. William Pahlman, designer

SCIENCE

Bell Telephone Laboratories, Holmdel, NJ; 1950. Eero Saarinen, arch.

IBM, Thomas J. Watson Research Center, Yorktown, NY; 1961. Eero Saarinen, arch.

Atomic Reactor Center, Rehovet, Israel; 1964. Philip Johnson, arch.

TRANSPORTATION

JFK International Airport, Arrivals (now Terminal 5), New York, NY; 1962. Eero Saarinen, arch.

Dulles International Airport (entire), Dulles, VA; 1963. Eero Saarinen, arch.

UNIVERSITIES

Brandeis University, Dining Hall and Recreation Building, and Dormitories; Waltham, MA; 1952. Eero Saarinen, arch.

Drake University Dormitories, Des Moines, IA; 1952. Eero Saarinen, arch.

MIT, Kresge Auditorium, Cambridge, MA; 1957. Eero Saarinen, arch.

Concordia Senior College, Fort Wayne, IN; 1958. Eero Saarinen, arch.

Brown University, Computing Center, Providence, RI; 1961. Philip Johnson, arch.

MIT, Earth Science Building, Cambridge, MA; 1963. I.M. Pei, arch.

HOUSES OF WORSHIP

Illinois Institute of Technology (Chapel), Chicago, IL; 1955. Mies van der Rohe, arch.

Knesis Tifereth Israel Temple, Port Chester, NY; 1956. Philip Johnson, arch.

"Roofless" Chapel, New Harmony, IN; 1960. Philip Johnson, arch.

The First Church of Christ, Scientist, New York, NY; 1971. Richard Kelly, arch.

RICHARD KELLY EXHIBITION

Committee Credit

This exhibition was originally organized in 1993 by:

Matthew Tanteri, Chairperson/Co-Curator

Philip G. Cialdella

Jim Conte

Renee Cooley, Co-Curator

Keesler Cronin

Addison Kelly

Clara Powell

The 1993 exhibition was based on original research conducted by Philip G. Cialdella for his Master of Fine Arts thesis in lighting design from Parsons School of Design, New York City.

The original exhibition was made possible through the financial support of:

Patrons

Jeffrey Milham

Edison Price, Inc.

Sponsors

Baldinger & Sons

Kurt Versen Lighting

Lighting Services, Inc.

Light America

Litecontrol

Lightolier

Neoray

IES/New Jersey Section

IES/New York Section

Contributors

Cline Bettridge Bernstein Lighting Design

Electric Lighting Agencies

Haines, Lundberg, Waehler Architects

Linear Lighting

National Cathode Corporation

Philips Lighting

Spectrolume

Stan Deutsch Associates

Friends

Jules Horton & Barbara Cianci

The Richard Kelly Exhibition Committee would also like to thank the following individuals for their assistance with the 1993 exhibition:

Constance Clement, Assistant Director, Yale Center for British Art, New Haven, Connecticut

Julia Moore Converse, Director, Architectural Archives, University of Pennsylvania

Tracy Edling, Preparator

Noel Florence

Mrs. Richard Kelly

Dr. Patricia Cummings Loud, Curator of Architecture, Kimbell Art Museum

Marshall Meyers

Janet Parks, Curator of Drawings, Avery Architectural and Fine Arts Library, Columbia University

Edison Price, Nulux Inc.

Ann Schiffers

Erica Stoller, Esto Photographics

USL/Greenleaf Litho

Kevin Hesslin, LD&A Magazine