Module 4-Historical Examination of Lighting

“I sense Light as the giver of all presences, and material as spent Light. What is made by Light casts a shadow, and the shadow belongs to Light.” -Louis Kahn

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Pantheon

"It is, as it were, the visible image of the universe; in the perfection of its proportions, as when you regard the unmeasured dome of heaven, the idea of magnitude is swallowed up and lost." - Percy Bysshe Shelley

The spherical rotunda and pedimented facade of the Roman Pantheon persist as one of the most iconic images in the history of architecture. Built to honor all the gods, the majority of its construction was completed around 126 BCE under the rule of Emperor Hadrian, but the portico is 100 years older, attributed to Marcus Agrippa. The Pantheon remains somewhat of an enigma to historians. Roman temples always faced west, towards the setting sun and the assumed location of the underworld, but the Pantheon is directed to the north. It also does not follow the typical Greek temple-based layout. Uniquely, its orientation and design appear more focused on the sun than the celebration of gods or emperors.

Scholars disagree on its exact use, but nearly all believe that the Pantheon functioned as a sun dial. Its northern orientation allows a single sunbeam through its 27-foot oculus and onto particular portions of the interior throughout the day and during seasonal events, including the equinoxes and April 21--the anniversary of Rome’s founding. The oculus also serves as the only source of direct sunlight and ventilation. The Pantheon is an early example of architecture driven by lighting. The Egyptians and Greeks had previously utilized the cosmos and rising sun as guides for orientation, but the Pantheon is one of the first examples of redesigning of building typology based upon light.
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La Sainte-Chapelle

"That most beautiful of chapels, the chapel of the king, most decently situated within the walls of the king's house, enjoys a complete and indissoluble structure of the most solid stone. The most excellent colors of the pictures, the precious gilding of the images, the beautiful transparence of the ruddy windows on all sides, the most beautiful cloths of the altars, the wondrous merits of the sanctuary, the figures of the reliquaries externally adorned with dazzling gems, bestow such a hyperbolic beauty on that house of prayer, that, in going into it below, one understandably believes oneself, as if rapt to heaven, to enter one of the best chambers of Paradise." -Jean de Jandun, "Tractatus de laudibus Parisius" (1323)

La Sainte-Chapelle, “the Holy Chapel,” was built to house Louis IX’s collection of religious relics. But after its consecration in April of 1248, it became more than a religious monument and was crowned the seat of Christendom in Western Europe.

Today, Sainte-Chapelle is regarded not for its political importance, but for its “jewel box” like interior. The exterior is simple by thirteenth century standards, lacking extensive tracery and carving. But Sainte-Chapelle’s unadorned facade hides one of the most striking examples of Gothic stained glass.
Rising from floor to ceiling, stained glass windows illuminate the small chapel with a multi-colored ambient glow. Fifteen windows run from the nave to the apse, revealing stories from the New and Old Testaments.

Sainte-Chapelle suffered extensive damage during the French Revolution, losing many of its religious relics, but the revolutionaries could not bring themselves to destroy the windows, sparing two-thirds of them. The chapel continues to inspire visitors and receive praise from critics who point to the stained-glass's ability to dissolve the stone walls into a multi-colored screen.
Photo credits:

Image 1-Sainte-Chapelle Chapel, interior view towards the apse, 1239-1248, Paris, France. photographed by author.

Image 2-Sainte-Chapelle Chapel, interior view towards the apse, 1239-1248, Paris, France. photographed by author.

Image 3-Sainte-Chapelle Chapel, interior view towards the apse, 1239-1248, Paris, France. photographed by author.
The Süleymaniye Mosque

"The earth challenges the sky... with a dome that is even higher than paradise." - anonymous

The Suleiman Mosque was commissioned by Sultan Suleiman the Magnificent. It sits on the Third Hill of Istanbul, Turkey and is the second largest mosque in the city and was the largest building project of the Ottoman empire. Mimar Sinan, the chief Ottoman architect under Suleiman, designed the Mosque and more than 300 other projects before his death in 1588. He was buried in a self-designed tomb next to the mosque.

The Suleiman Mosque was inspired by Byzantine churches, in particular Hagia Sophia, as well as Suleiman’s desire to recreate Solomon’s Temple. The central dome is 53 meters high with a diameter of 27.5 meters. In an effort to reduce the heavy appearance of the buttresses, Sinan incorporated them into the walls of the building so that they protrude on both the exterior and the interior.

Built to represent the heavens, Sinan’s nearby tomb bears an inscription referring to the Mosque as a “symbol of paradise.” Its ten domes were also designed to portray the heavens, and the arched windows below let in light, which represented God. To reinforce God as light, Sinan inscribed the Quran’s light verse on one of the Mosque’s walls: “God is the light of the Heavens and the Earth” (24:35). Stained glass is only utilized in the most holy area of the mosque—the qibla wall that faces Mecca.
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Louis Comfort Tiffany

"I have always striven to fix beauty in wood, stone, glass or pottery, in oil or watercolor by using whatever seemed fittest for the expression of beauty, that has been my creed." -Louis Comfort Tiffany (1916)

Louis Comfort Tiffany was born in 1848 in New York City. His father, Charles Lewis Tiffany, founded Tiffany & Co. in 1837, but the younger Tiffany followed his own artistic endeavors. After military school he pursued a painting career, traveling and studying under master artists. Tiffany’s paintings drew critical acclaim and several were exhibited at the 1876 Centennial Exposition in Philadelphia, but by the late 1870s his focus shifted to the decorative arts and interior design.

Tiffany began experimenting with glass in the early 1870s. He and Arthur Nash, an English glassmaker, opened a studio in Queens, New York to revolutionize stained glass, whose process had remained almost unchanged since the Middle Ages. Tiffany and his closest competitor, John
La Farge, tested various compositions and densities of glass to create rich hues and textures. Within a few years Tiffany defied the static compositions of the past and created glasswork with the bold colors and fluid movement of a painting.

Tiffany did not confine his stained glass to windows and skylights. In 1898 he began designing lamps. As in Tiffany’s previous work, he continued to incorporate abstracted themes from nature. Architects such as Frank Lloyd Wright and Charles and Henry Greene embraced his organic designs and incorporated them into their architecture. In 1957 Wright wrote, “Tiffany was one of the most creative artist spirits of his time. He took that spirit into craftsmanship and did some remarkably beautiful things for any period.”
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Charles Rennie Mackintosh

"(The artist) must possess technical invention in order to create for himself suitable processes of expression - and above all he requires the aid of invention in order to transform the elements with which nature supplies him - and compose new images from them."-Charles Rennie Mackintosh

Scottish designer, Charles Rennie Mackintosh, combined art and architecture in his furniture, decorative arts, and built environments of the early 20th century. Trained in both art and architecture he focused on details—light fixtures, stencil work, silverware, and furniture—overlooked by other architects. Mackintosh also argued publically for architects to have greater artistic independence and a larger role in the design process.

Many of Mackintosh’s commissions were for tearooms—popular meeting spaces in Glasgow where friends of different social classes could interact freely. One of Mackintosh’s most prodigious patrons, Catherine Cranston, owned several tearooms in Glasgow and offered him complete design control, including menus, lighting, and staff uniforms.

With the increasing availability of electricity, light fixtures were becoming an important design element. Mackintosh, like most early modernists, created fixtures with the same patterning as his other design elements. His early designs relied on abstracted natural forms, with his later work becoming increasingly geometric. Mackintosh incorporated these forms on the surface of his light fixtures, creating an applied pattern that integrated into his larger design ideas.
Photo credit:


Adolf Loos

"Be not afraid of being called un-fashionable." -Adolf Loos

Adolf Loos was a master of space and a warrior against ornamentation, but he should also be recognized for his manipulations of light. He married natural and artificial light to add complexity to his interiors; he was methodical and intentional in managing light; and he designed his lighting layouts based upon the function of a particular space. Whether focusing light to highlight products or providing an ambient environment for conversation, Loos bound light to function. Yet light and light fixtures were for him more than functional or stylistic gestures: they were fundamental to his method of constructing space.
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Mariano Fortuny y Madrazo
“It is not the quantity, but the quality of light, that makes things visible” - Mariano Fortuny y Madrazo

A modern-day “Renaissance Man,” Fortuny excelled as an artist, scientist, lighting technician, inventor, and fabric designer. Today, he is remembered primarily for his fabrics designs, but his innovations in stage lighting are also significant.

Fortuny first discovered his interest in lighting as a painter, experimenting with light and shadow to enhance the drama of his artwork. He translated these ideas into theater and in 1901 patented an indirect lighting system. Fortuny then began a series of studies that investigated sunlight leaking into a dark room. This allowed Fortuny to conclude that the light’s intensity could be controlled and inspired his creation of the dimmer switch.

Fortuny’s ideas of indirect lighting and dimmer switches were later adapted to architecture, along with several of the stage fixtures he designed. The Fortuny Moda is his most well-known light fixture and appears surprisingly contemporary for its 1903 patent. It reflects a diffused light off of a concave surface on the lamp’s interior. The Fortuny Moda continues to be appreciated both for its design and its soft quality of light.
Photo credits:


Le Corbusier

"Architecture is the learned game, correct and magnificent, of forms assembled in the light." -Le Corbusier

Le Corbusier is better known for his canonical writings and white villas, than for his lighting design, but his use of natural light was an important element in many of his projects. From his belief in the health properties of light in Unite d’Habitation to his representation of light as God in Notre Dame du Haut, Corbusier utilized light to drive his designs.

In Notre Dame du Haut, a chapel for the Catholic Church, Corbusier created a seemingly opaque and amorphous exterior. But when inside the small exterior openings grow larger and stream beams of light through colored glass insets. Towers above are open to the sky and release ambient streams of light across the white concrete walls. Notre Dame du Haut does not reference past church typologies, but its dramatic lighting and womb-like interior create an experience that could only be described as spiritual.
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World's Columbian Exposition

"Perhaps the portion of the World's Exposition which America is far ahead of all in competition is the Palace of Electricity; here she is seen in her natural splendour, eclipsing by her dazzling light ever other nation."-Naylor

In 1893 the World's Columbian Exposition was held in Chicago, Illinois to commemorate the 400th anniversary of Columbus’s voyage to America. Fair planners, Daniel Burnham and Frederick Law Olmstead, designed an idealized Neoclassical city, meant to raise the moral and design standards of 19th century America. Nicknamed "the White City" because of the building's white staff facade, the fair included exhibits from around the world as well as the first Ferris wheel and full-size replicas of Columbus’ ships. But one of the most innovative and talked about sites of the fair could only be seen at night—its electric lighting.

Electricity was introduced at the 1889 Paris Exposition, but most Americans were still unfamiliar with electric lighting and none had seen it on such a large scale. When President Grover Cleveland officially opened the fair on May 1, 1893 he flipped a switch that illuminates over a million light bulbs. But the spectacular display of lighting technology was more than an opening act; it was also integral to many popular exhibits. Both Westinghouse and its competitor Thomas Edison had displays in the Hall of Industry. Westinghouse displayed an immense column surrounded with light bulbs, and Edison presented his latest inventions powered by electricity. Many visitors recounted electric lighting as one of the most spectacular sites of the fair.
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Luis Barragan

“Solitude. Only in intimate communion with solitude may man find himself. Solitude is good company and my architecture is not for those who fear or shun it.” -Luis Barragan

Luis Barragan is regarded as one of the most prominent Mexican architects of the twentieth century. His architecture introduced the West to Mexican modernism, and in 1980 he became the first Mexican to win the prestigious Pritzker Prize.

Barragan’s architecture is modern but with a sense of place. Much of his work is both distinctly Mexican, utilizing bold colors and traditional building techniques, but universal, designing simple spaces that focused on materiality and light.
In contrast to other modernists, Barragan embraced color. His brightly hued planes accented with swashes of light add a mystical quality to his work. He was a master of balancing light and shadow to produce bold, narrow streaks of light against a dark background.
Photo credits:


Richard Kelly

"A feeling for light and lighting starts with visual imagination, just as a painter's talent does...first major highlights are imagined--then, graded washes of different luminosity are added and--then, the detail of minor lightplay the idea clear and entertains the eye." -Richard Kelly

Richard Kelly worked on many of modernism’s most iconic designs, but his name is rarely mentioned alongside his well-known colleagues. He was not an architect, but a lighting designer whose projects included the Seagram Building, the Kimbell Art Museum, the Glass House, and the Yale Art Museum, among others.

After graduating from the Yale School of Architecture and studying the work of theater designer, Stanley McCandless, Kelly opened a lighting consulting business. Clients were initially hesitant to pay for a lighting designer, but his architectural knowledge helped to convince them of the integral nature of light and architecture.

Kelly pushed the bounds of technology. When fixtures did not fit a project, he designed his own, working with manufactures such as Edison Price and Lightolier. And by the 1950s Kelly had defined a vocabulary for modern lighting that included bold punches of light (focal glow), ambient lighting (graded washes), and detailed spots (sharp detail).
But artificial light was not his only medium. Kelly utilized daylighting as a primary source for Louis Kahn’s Kimbell Art Museum, a design that continues to be a model for even, ambient light that enhances the art collection.
Photo credits:


Tadao Ando

"Light gives objects existence as objects and connects space and form. A beam of light isolated within architectural space lingers on the surfaces of objects and evokes shadows from the background. As light varies in intensity with the shifting of time and changes of season, the appearance of objects are altered. But light does not become objectified and is not itself given form until it is isolated and accepted by physical objects." -Tadol Ando

Tadao Ando is an architect that embraces fully the potential of natural lighting. Born in Japan, his designs reflect the Japanese concern for craft through the use of modern materials, typically cast-in-place concrete.
Ando, a self-educated architect, was once a truck driving and a boxer, but despite his lack of formal training his designs are both powerful and connected with nature. His architecture is simple in form and use of materials but becomes rich and complex with his attention to detail and use of lighting. Powerful swashes of light graze his rough concrete forms, but they are tempered by ambient light that softens his spaces.
Photo Credits


Mid-Century

"Design in this sense is related to many other human activities, engineering and art in particular. Politics, economics, philosophy and science affect design and the way we look at it. That is to say, design is a central human activity, interlocked with everything people do. Hence its exceptional capacity to epitomize the character of an age and of the people who create it." - Edgar Kaufmann jr. [sic.] "What is Modern Design?" (1950)

The years following the Second World War were a period of technological growth and experimentation in design. Designers and architects embraced new fabrics and materials, promoting plastics and plywood as essential to the post-war modern lifestyle. The Museum of Modern Art in New York and magazines, such as Life and Time, advocated good design down to the smallest detail. Lighting, kitchen appliances, irons, and even spatulas were judged on their beauty as well as function. Architects and designers including Charles and Ray Eames, George
Nelson, Arne Jacobsen, and Poul Henningsen among others, found inspiration in both nature and mass-production. This marriage often produced brightly colored objects—chairs, lamps, and fabrics—with ties to organic themes.
Photo credits


Las Vegas

"The artificially lit, air-conditioned interiors complement the glare and heat of the agoraphobic auto-scaled desert. But the interior of the motel patio behind the casino is literally the oasis in a hostile environment." -Robert Venturi, Learning From Las Vegas: The Forgotten Symbolism of Forgotten Form (1972)

Las Vegas was a city built on government money and vice. But in 1930 the street that would become the glitzy Las Vegas Boulevard was only a dusty road lined with dude ranches. A combination of the construction of the Hoover Dam, liberal divorce laws, and legalized gambling spurred a rush of tourism in the 1940s and 1950s. By 1960 the population boomed to 64,000 residents, and Vegas contained 22 percent of Nevada’s population on just .02 percent of its land. Eccentric millionaire Howard Hughes transformed the once underground gambling scene into a corporate empire, and stars, such as Elvis Presley and Frank Sinatra, became common fixtures at lounges and clubs.

The casinos and performers have changed, but Vegas is still famous for its lights. The locus has moved from the historic downtown to the strip, but both sites tell a narrative of design, technology, and marketing. Early signs utilized newly developed neon gas to entice visitors. The first neon sign was installed in 1929 at the Oasis Cafe on Fremon Street. From the 1930s until the 1960s neon was the major marketing tool for most Vegas establishments. Recent casinos and business now utilize LED and LCD screens to project large high-definition images, but the
history of neon continues to be important. Over the last two decades preservation efforts have been undertaken to protect Vegas’s original signs, and in 1996 the Neon Museum opened to the public, telling the history of Vegas through lights.
Photo credits


Contemporary Fixtures

"When I design, I don’t consider the technical or commercial parameters so much as the desire for a dream that humans have attempted to project onto an object." -Philippe Starck

Contemporary lighting has changed little since the mid-century. Architects and designers continue to specify rows of recessed lights when other options are available. Fixtures may utilize new materials, but their shapes and colors also remain strikingly similar to ones from fifty years ago.

The major changes in lighting involve sustainability and bulb technology. LEDs (light emitting diodes) and CFLs (compact fluorescent lights) are increasing in popularity as their color properties improve and regulations demand more energy-efficient options. Designers should be encouraged by these new technologies and be inspired to create equally innovative fixtures and applications for them.
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